June 1961

PLAINTIFF'S EXHIBIT
CE-356



Another C-E Vertical Superheater Boiler goes aboard! Shown above is one of the main boilers for S. S. WASHINGTON MAIL, first of three new American Mail Line cargo liners now building at the San Pedro Yard of Todd Shipyards Corporation. Accorded worldwide acceptance, boilers of this design are demonstrating dependable performance on both merchant ships and naval vessels.

C-319

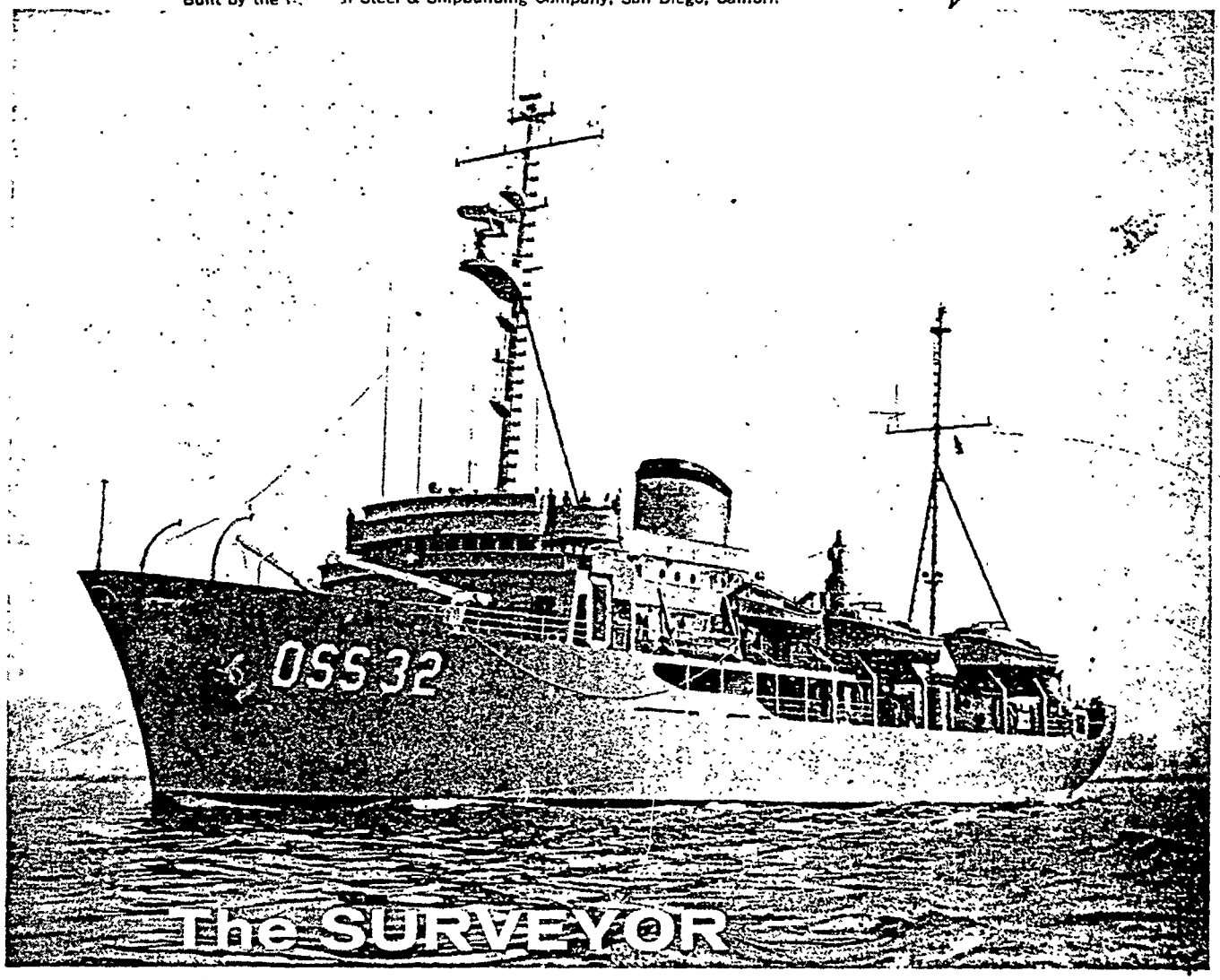
COMBUSTION ENGINEERING

GENERAL OFFICES: Windsor, Conn.
NEW YORK OFFICES: 200 Madison Avenue, New York 16

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

54

Built by the N. al Steel & Shipbuilding Company, San Diego, Californ.



Newest seagoing laboratory powered by C-E Boilers

The Surveyor, newest ship of the U.S. Coast and Geodetic Survey, will soon undertake her vital assignment to extend the frontiers of knowledge in the science of oceanography.

The Surveyor's primary mission will be to develop navigational data in support of our submarine Navy and, coincidentally, to conduct new, important studies of the Arctic in collaboration with land-based survey parties. The ship may also serve as a means of supply to outlying Alaskan and Aleutian communities.

A steam propulsion plant was selected for the Surveyor, not only to provide maximum reliability during extended periods, but also to assure the quiet, vibrationless operation necessary to proper functioning of the many sensitive instruments with which the ship is equipped.

Along with the many notable C-E powered ships operating in the fields of "pleasure, commerce and national defense," one has now been added to serve the field of science.

COMBUSTION ENGINEERING

General Offices: Windsor, Conn. • New York Offices: 200 Madison Avenue, New York 16, N.Y.
CANADA: Combustion Engineering-Superheater Ltd.

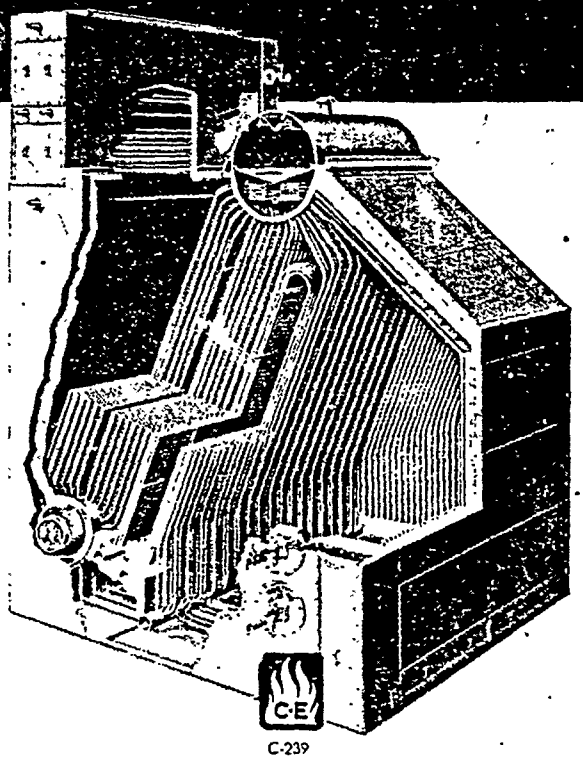
C-273

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

February 1961



"White Glove Inspection" of a SUPERHEATER?



C-239

Certainly marine boiler practice doesn't go as far as "white glove inspection"—but there is *one* boiler design that would stand a much better chance to get by than others. The firesides of some boilers are so designed that substantial collection of slag and soot is unavoidable. In those cases—especially where boiler access is limited and superheater space is cramped—you have a grueling and expensive job to do at frequent intervals.

But what a difference with a C-E VERTICAL SUPERHEATER BOILER! This unit almost permits "white glove inspection." Here's why:

MINIMUM SLAG ACCUMULATION—even when "distress" fuels are being burned. Vertical, parallel tube arrangement eliminates horizontal, slag-collecting surfaces, provides clear paths for effective soot blowing. Design steam temperatures and efficiencies are maintained. Far fewer cleanings are necessary.

NO SUPPORT REPLACEMENT—with superheater elements supported from below—by the headers—bulky, costly alloy supports in the high temperature zone are eliminated.

EASY ACCESS—ample space within the superheater assures easy access for inspection and the occasional cleaning that may be required.

IMPROVED CASING DESIGN—fewer casing joints are required. With this simplified design, soot and gas leakage are minimized.

Obviously, this all adds up to a big improvement in design with outstanding advantages that result in top operating performance and minimum maintenance.

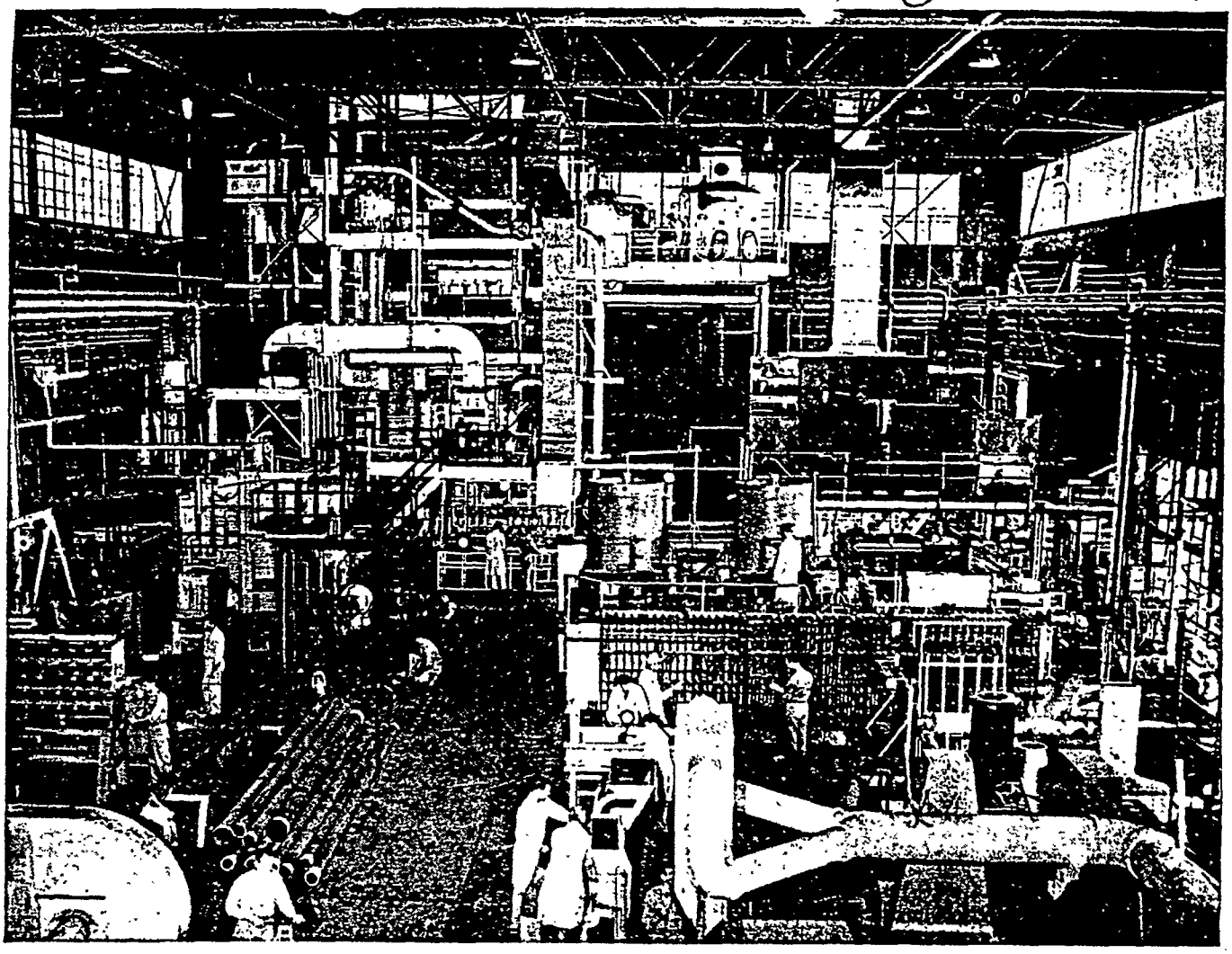
COMBUSTION ENGINEERING

General Offices: Windsor, Conn.
New York Offices:
200 Madison Avenue, New York 16, N. Y.
CANADA: Combustion Engineering-Superheater Ltd.

34

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

October 1960



C-E RESEARCH IN ACTION

At C-E's Kreisinger Development Laboratory (above), one of the Company's eight research facilities, the time and talents of many experienced specialists are devoted to a single purpose—to enable Combustion to continue to provide the most reliable, the most efficient, and the most economical steam generating and fuel burning equipment for use on land or sea.

C-E laboratory activities have included the design, construction and operation of various types of full size marine boilers. Built for research purposes, they have been the subject of long and vigorous tests in the areas of theory, design and operation.

Research, knowledgeable and in depth, is reflected in the advanced design of all C-E equipment and is one of the main reasons why C-E Marine Boilers have achieved world-wide acceptance on ships of all types.

The picture shows part of the Kreisinger Development Laboratory at C-E's Chattanooga Division. The large structure shown at the rear of the building just left of center is a controlled-circulation test boiler capable of operating at 2000 lb per sq in pressure. At right center, the series of panels is a superheater simulator where the distribution, flow and pressure losses of a fluid may be determined under specified test conditions. Much work is performed here on fuels and their firing, and on the behavior of water, steam and flue gas in environments similar to those encountered afloat or ashore.

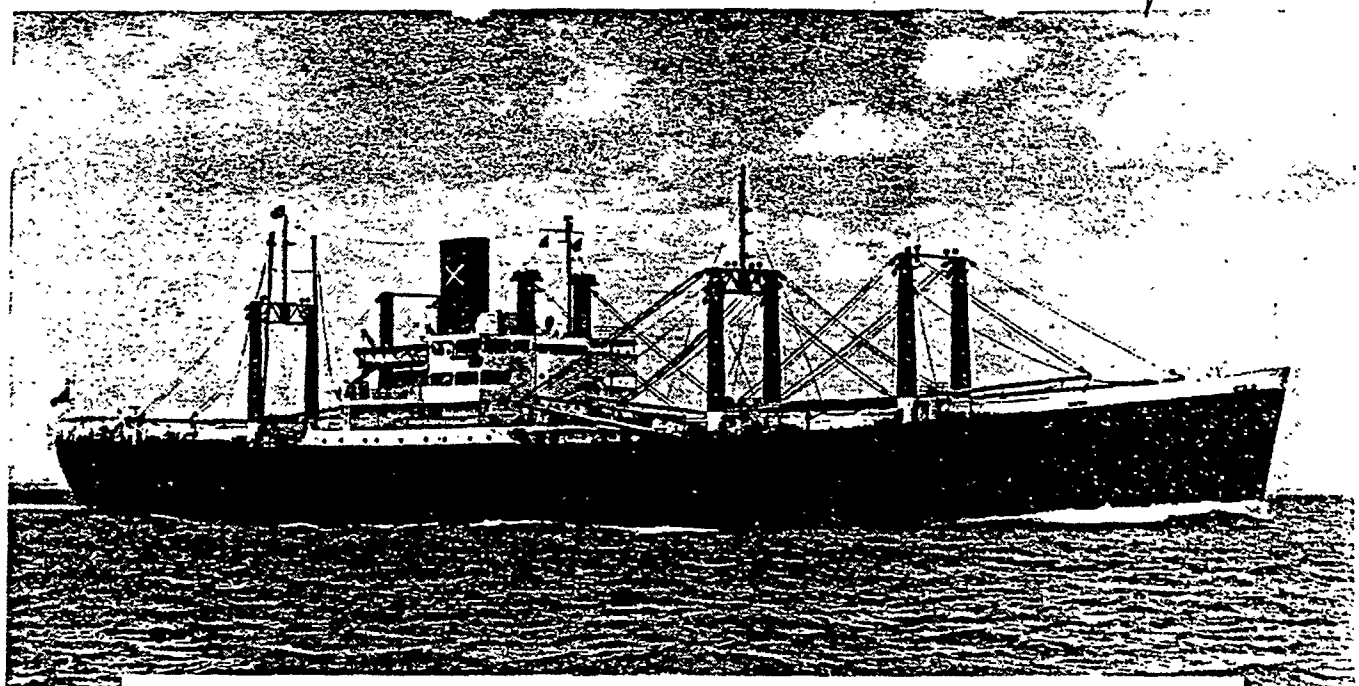
COMBUSTION C-E **ENGINEERING**

General Offices: Windsor, Conn. • New York Offices: 200 Madison Avenue, New York 16, N. Y. C-2800

35

All Types of Steam Generating, Fuel Burning and Related Equipment; Nuclear Reactors; Paper Mill Equipment; Pulverizers; Flash Drying Systems; Pressure Vessels; Soil Pipe

September 1948



C-E powered ships inaugurate service to new Liberian Port

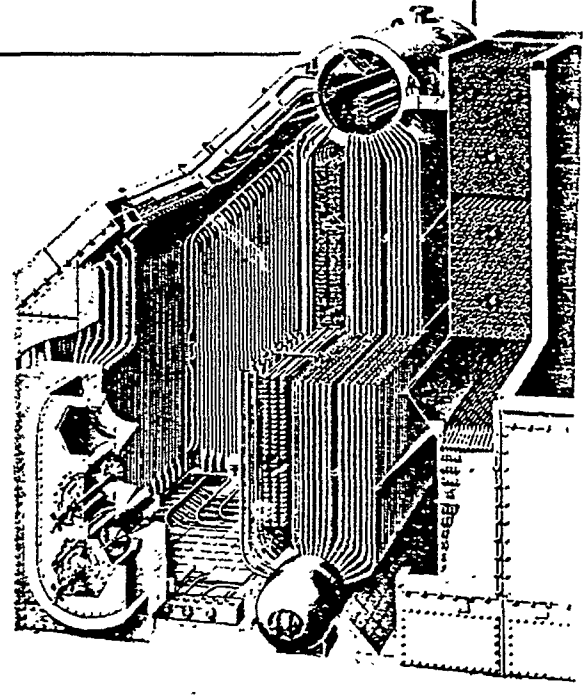
C-E powered ships of the Farrell Lines maintain a regular service to the newly completed twenty million dollar harbor of Monrovia, Liberia. This new harbor, considered the finest on the West African Coast, is already being used heavily as a transhipment port, and from it the Farrell Lines operate a coastwise service to smaller ports in Liberia, Sierra Leone and the Ivory Coast.

The AFRICAN PILOT, pictured above, is typical of Farrell Lines ships in the modern West African Fleet. Also C-E equipped are the AFRICAN PILGRIM and AFRICAN PATRIOT.

Farrell Lines not only maintain a fortnightly service to West Africa, but are the only line operating between the United States and all three ocean coasts of Africa. The C-E equipped ships AFRICAN SUN and AFRICAN DAWN operate principally in the weekly service to South and East Africa.

Wherever modern shipping plies the trade routes of the world, you will find C-E Marine Boilers maintaining their deserved reputation for efficiency, reliability and low maintenance.

B-249



The five Farrell Lines ships mentioned in the text are each equipped with 2 C-E Marine Boilers, Type V2M, each designed to supply, at normal capacity, 26,500 pounds of steam per hour at 465 psi and 765 F.

COMBUSTION ENGINEERING CO., Inc.

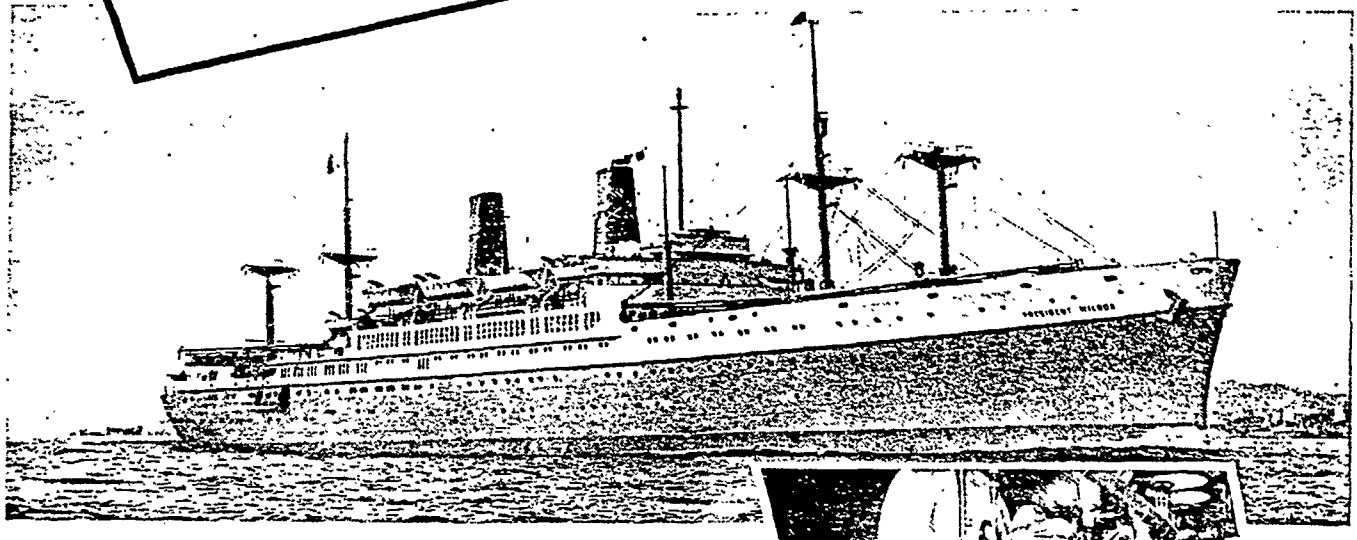
200 MADISON AVENUE • NEW YORK 16, N.Y.

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

DISTR

August 1948

PRESIDENT WILSON
goes into service



...powered by C-E Boilers

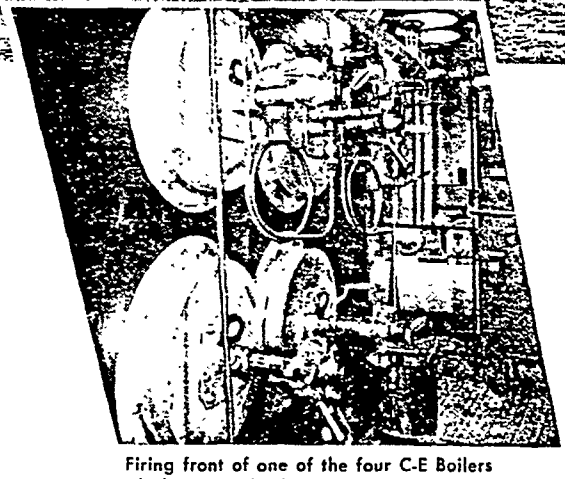
Joining her sister ship, the PRESIDENT CLEVELAND, in trans-Pacific service, the PRESIDENT WILSON, of the American President Lines, sailed for the Orient on her maiden voyage May 8.

Like her twin, the WILSON represents the finest modern luxury-liner construction and the two vessels, built by the Alameda Yard of Bethlehem Shipbuilding Corporation, have been watched with interest by all shipping men. They are the largest American-built vessels since the AMERICA and the largest ever to be built on the Wes' Coast.

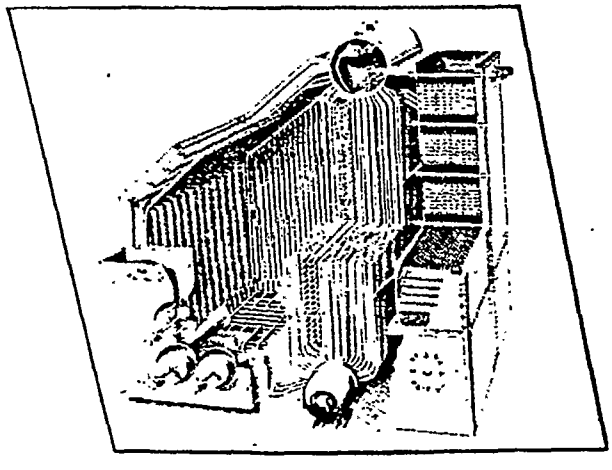
Four C-E Marine Boilers, Type V2M, power the WILSON. Identical boilers have already amply demonstrated their efficiency on the CLEVELAND, in service now for more than six months. Each boiler is designed to supply 40,000 lb of steam per hr at 600 psi and 840 F under normal operation, with an overload capacity of 44,000 lb of steam per hr.

High pressure, high temperature developments of C-E in the marine field are daily proving their value, not only on the new President liners, but on other notable post-war ships.

B-245



Firing front of one of the four C-E Boilers which power the PRESIDENT WILSON



Cut-away section showing internal construction of the boilers.

COMBUSTION ENGINEERING CO., Inc.

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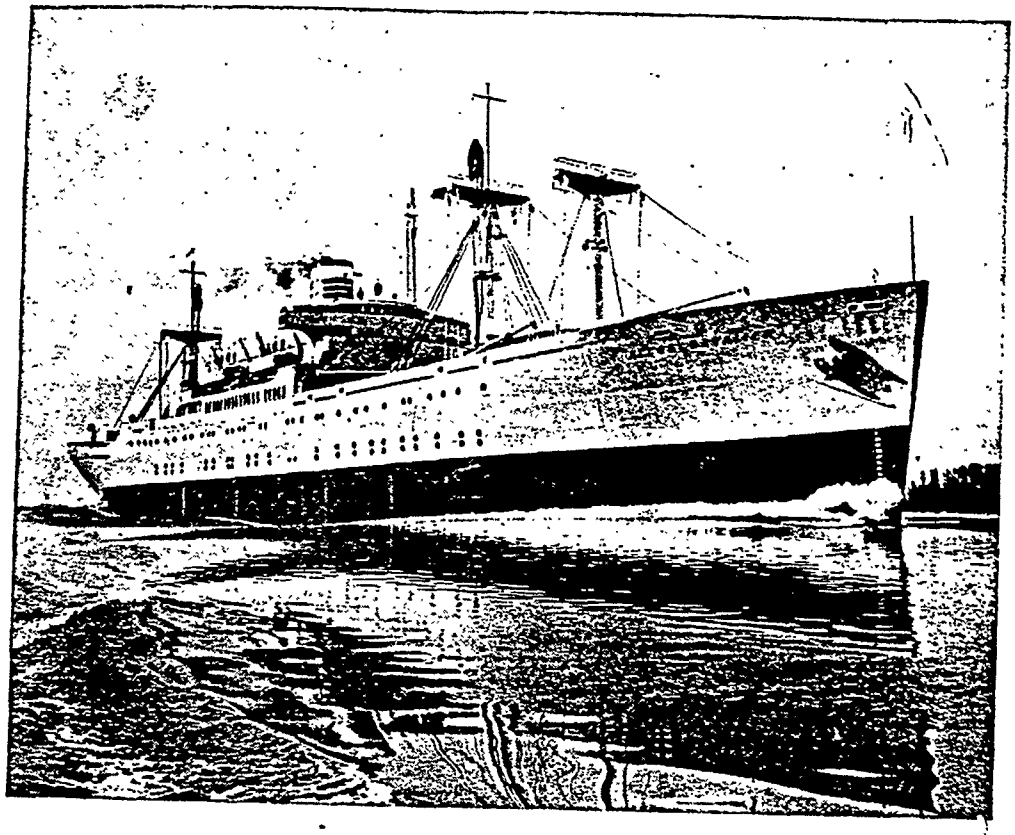
C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

May 1947

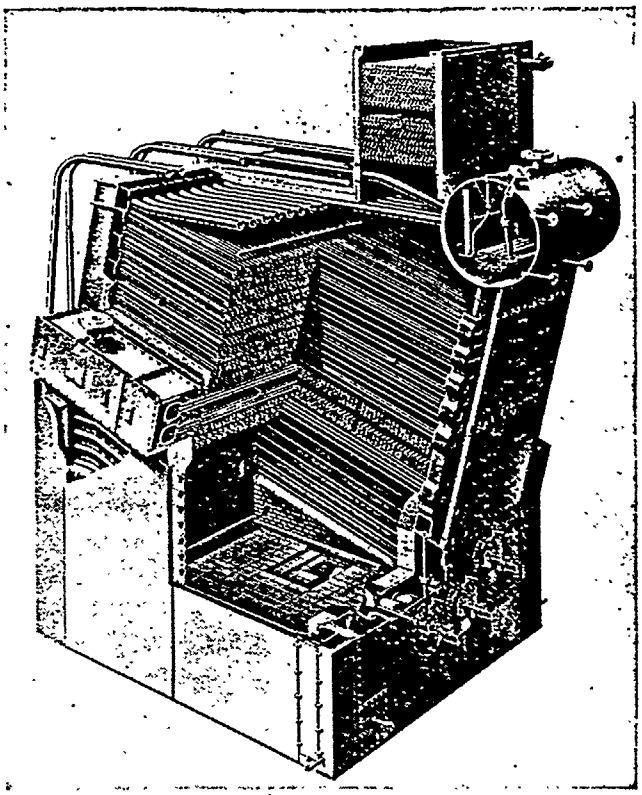


BOILERS BY C-E

for the new ALCOA ships . . .

COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS



The ALCOA CAVALIER, one of the three new liners of the Alcoa Steamship Company, which has begun a series of seventeen-day cruises from New York to West Indies ports. Her sister ships are to be used for cruise service from New Orleans to the Caribbean and South American ports at which Alcoa vessels call.

C-E Type SM Boiler as installed in the new Alcoa vessels. One boiler as shown, one opposite hand. B-138

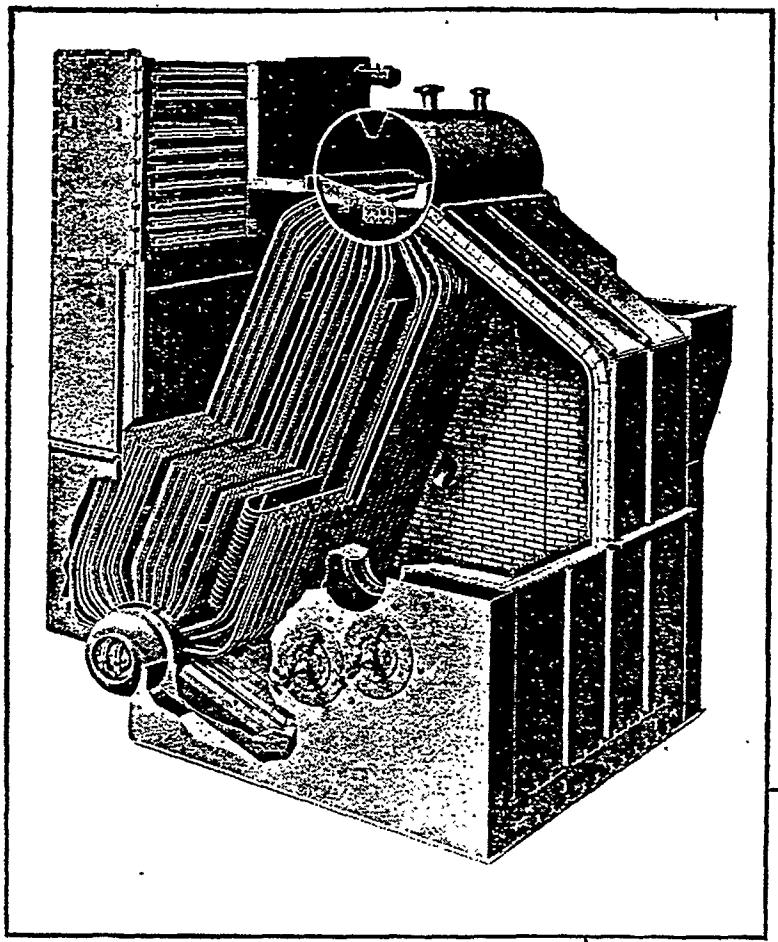
The three new luxury liners — ALCOA CAVALIER, ALCOA CLIPPER and ALCOA CORSAIR — are powered with Combustion Engineering Boilers, two boilers per ship. They are of the single-pass, sectional-header type designed to produce — at normal output — 37,500 lb of steam per hr at a pressure of 465 psi and a total temperature of 750 F.

Hundreds of C-E Boilers of this type proved the merit of their design and construction on the ships of the nation's Victory Fleet. Now, in peacetime and as in wartime, C-E continues to provide advanced designs in marine steam generating plants for any specifications of pressure, temperature and capacity. We invite you to use C-E marine experience in solving your requirements.

COMBUSTION ENGINEERING

200 MADISON AVENUE, NEW YORK 16, N. Y.

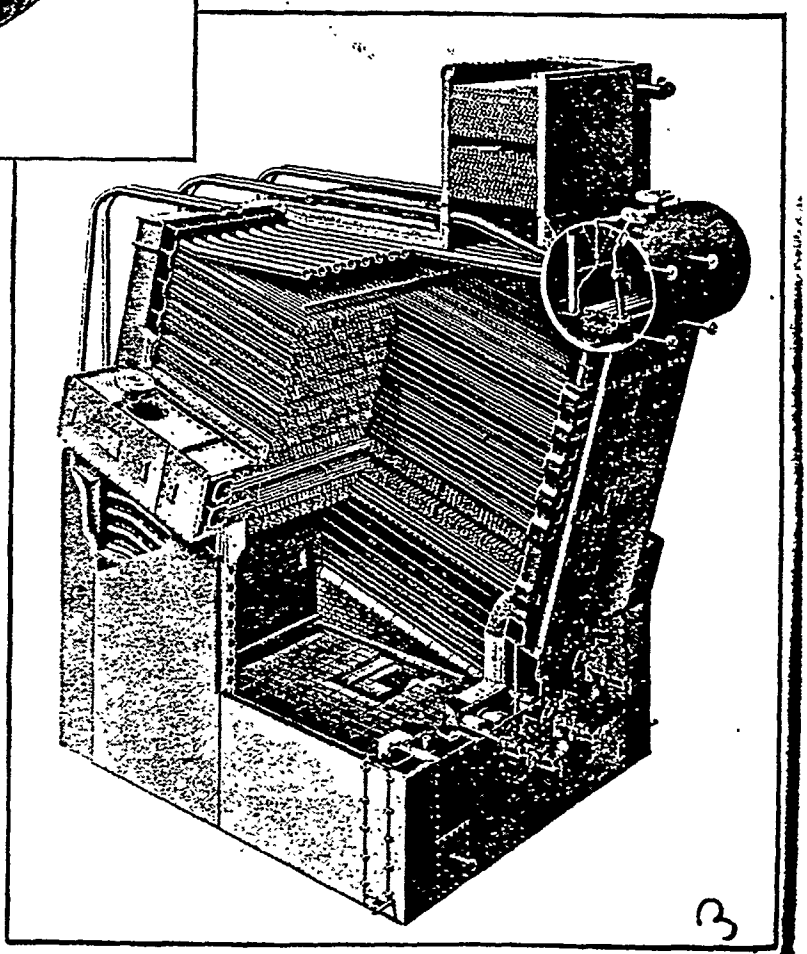
STRAIGHT TUBE OR



C-E Bent Tube Boilers are built in a variety of designs to suit individual application and operating requirements. They are adapted to the inclusion of superheater, and economizer or air heater or both, depending on the steam cycle selected. These boilers range in size from 2500 lb of steam per hr up to maximum requirements of capacity, pressure and temperature.

The two-drum design, illustrated at the left, is well adapted to the space and steam load conditions customarily encountered. Other designs are available for unusual situations. The absence of baffles assures low draft loss without sacrifice of heat absorption and efficiency; soot collecting areas are eliminated.

The boiler furnace, as shown, has water-cooled side wall, roof and floor; the rear wall may also be water cooled. The unit is completely steel encased and insulated; partial or complete double casings are available.



C-E Sectional Header Boilers are designed to meet a wide range of conditions — capacity, steam pressure and temperature, efficiency and available space. Normal capacity range is from about 5,000 to 50,000 or more lb of steam per hr with pressures limited to about 750 psi.

Illustrated at the right is the single-pass design. Absence of baffles assures low draft loss and avoids soot collecting shelves and pockets. Tubes are properly grouped and staggered for maximum heat absorption.

The boiler, as shown, is equipped with Elesco Interbank Superheater, submerged type Desuperheater and Economizer. A C-E Tubular Air Heater may be substituted for the economizer.

Modern practice favors the use of water-cooled furnace side walls. Completely steel-encased, insulated settings are standard; complete or partial double casings are available.

BENT TUBE BOILERS

March 1947

for Every Requirement

Modern marine practice is disposed to select boilers from two basic types — straight tube sectional header and 2-drum bent tube. Up to about 750 psi pressure, the factors influencing selection center around space available and preference for one type or the other, based on operating or maintenance considerations. For higher pressures, now the subject of widespread consideration, the bent tube boiler is the practical answer — aside from forced circulation designs.

Combustion Engineering offers exceptionally broad experience with all of these designs, having designed and built many hundreds of both straight and bent tube types for a wide range of capacities, pressures and temperatures. Notable among these are the highest pressure marine boilers in service — 1535 psi design pressure.

The C-E line offers numerous variations of the two types of boilers here illustrated and described, and includes C-E Controlled Forced Circulation Marine Boilers which have been built for pressures up to 1200 psi and temperatures as high as 900 F.

A-975

Combustion Engineering

C-E

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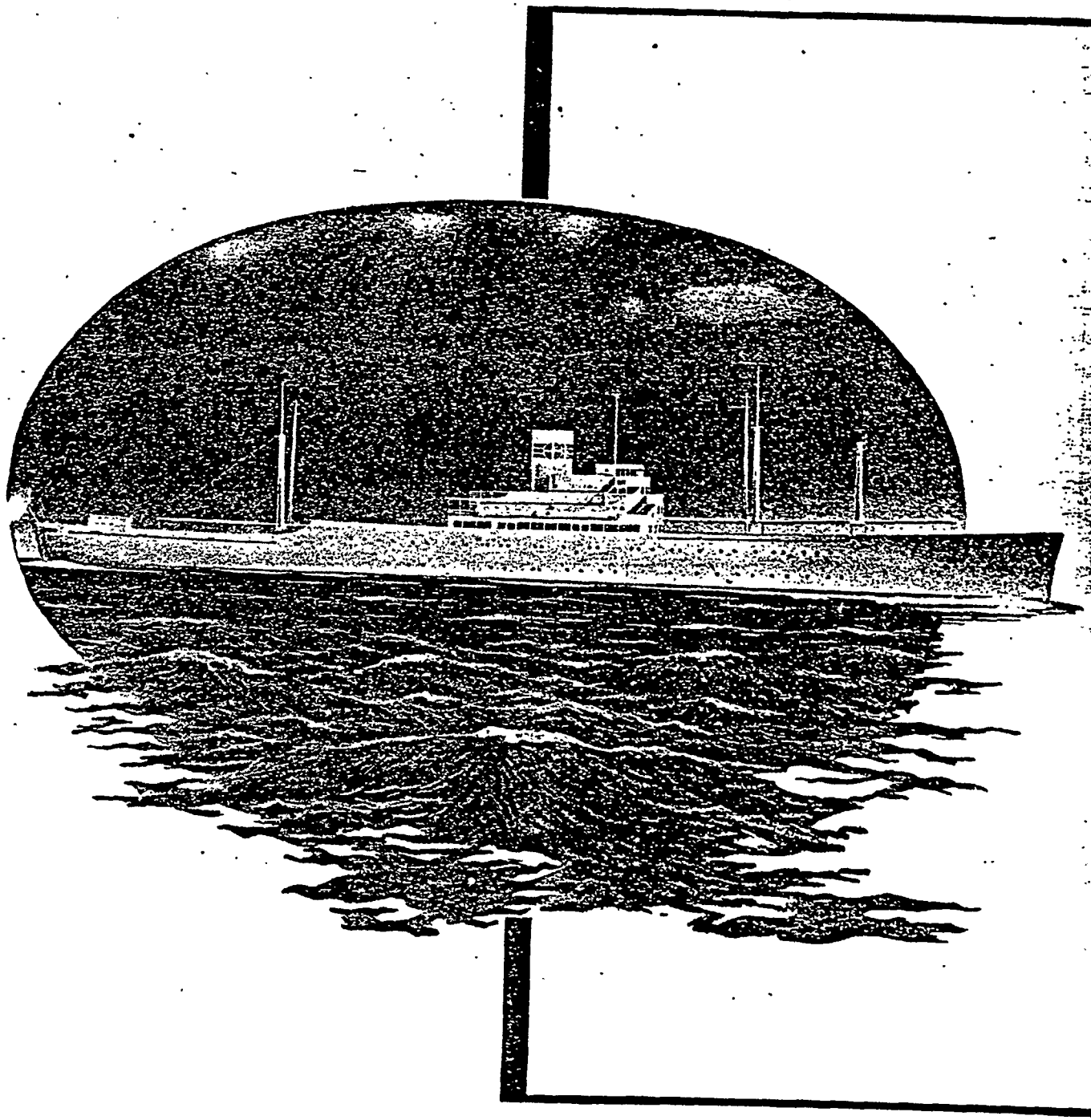
C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT, FOR STATIONARY AND MARINE APPLICATIONS

5 NEW ALCOA SHIPS.

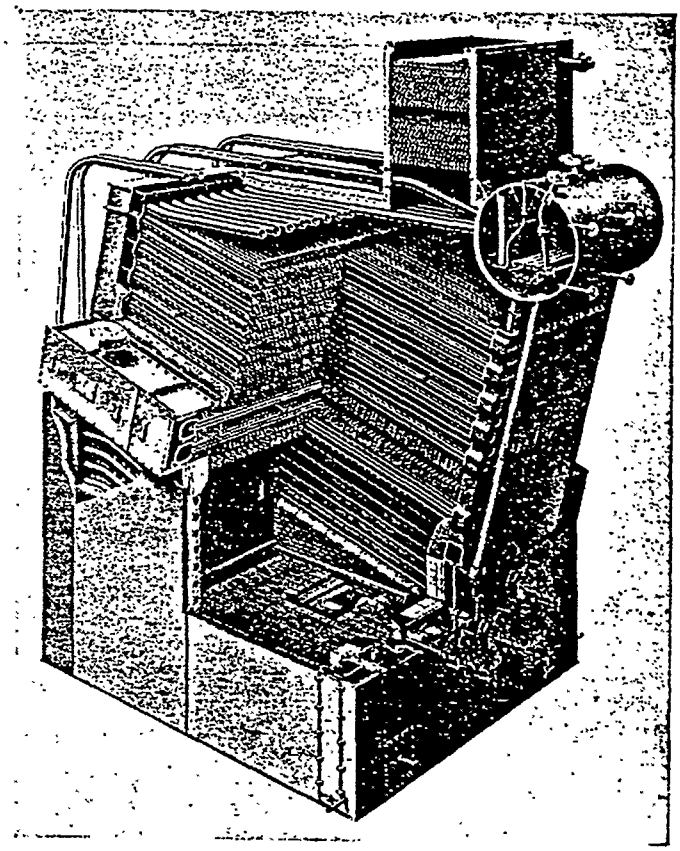


COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

powered by C-E BOILERS

Down the ways recently — and now being outfitted for the South American and Caribbean trade of the Alcoa Steamship Company — are the ALCOA CAVALIER, ALCOA CLIPPER and the ALCOA CORSAIR. These ships, officially designated as VC2-S1-AP7, are Victory ship hulls converted to modern passenger-cargo liners under the supervision of the George G. Sharp organization. They are unique in the fact that the superstructure above the sun deck, as well as equipment such as lifeboats, hatch covers, furniture and many items of hardware and fittings, will be constructed entirely of aluminum. Greater stability and increased deadweight tonnage are achieved by the use of this lightweight metal, and its non-corrosive qualities should result in material decrease in maintenance.



All three ships will be powered with Combustion Engineering Boilers—two boilers per ship. These boilers, illustrated at the left, are of the single-pass, sectional-header type designed to produce — at normal output — 37,500 lb. of steam per hr. at a pressure of 465 p.s.i. and a total temperature of 750° F. Hundreds of C-E Boilers of this type proved the merit of their design and construction on the ships of the nation's Victory fleet.

B-105

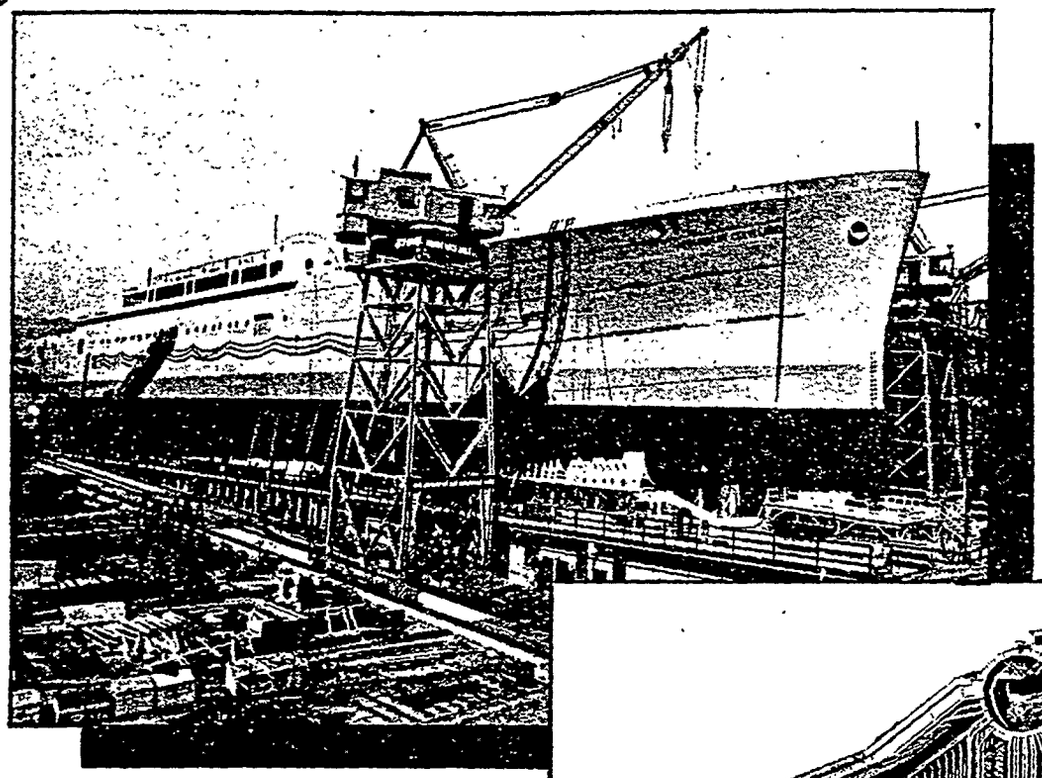
ENGINEERING

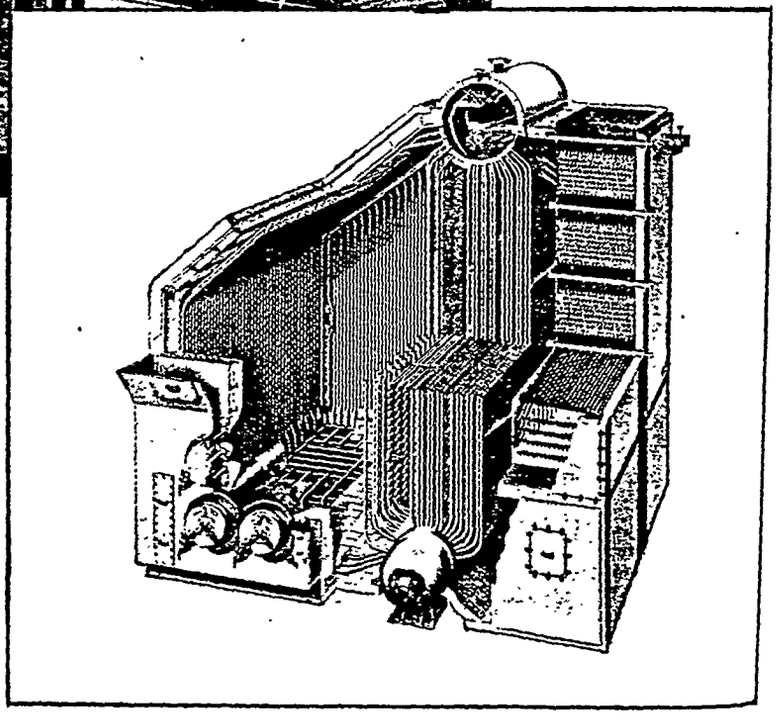
200 MADISON AVENUE, NEW YORK 16, N. Y.

PACIFIC COAST: R. L. JOHNSON CO., MONADNOCK BLDG., SAN FRANCISCO, AND PETROLEUM BUILDING, LOS ANGELES

NOV 1946

President Luxury Liners





The PRESIDENT CLEVELAND and all 9 of her sister ships are powered with C-E Boilers of the design shown at the right. There are 4 boilers per ship, each designed to supply 40,000 lb of steam per hr at 600 psi and 840 F.

COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

Nov 1946

Powered by C-E Boilers

The S. S. PRESIDENT CLEVELAND, pictured here just prior to her recent launching, is one of the last two wartime P-2 ships built by the Bethlehem-Alameda Shipyards, Inc.

A number of the P-2 class ships were built during the war as fast troopships — with consideration given to their later conversion to peacetime passenger liners. With the war at an end the American President Lines concluded arrangements with the Maritime Commission to take over several of these vessels and proceed with conversion plans.

The PRESIDENT CLEVELAND and her sister ship the PRESIDENT WILSON, on which construction was not far advanced by VJ Day, were then built as modern passenger-cargo liners. When completed and luxuriously fitted out with every modern appointment, they will rate among the finest passenger ships afloat.

All of the P-2 ships, built at Alameda, are powered with Combustion Engineering Boilers of the type illustrated on the opposite page. A995

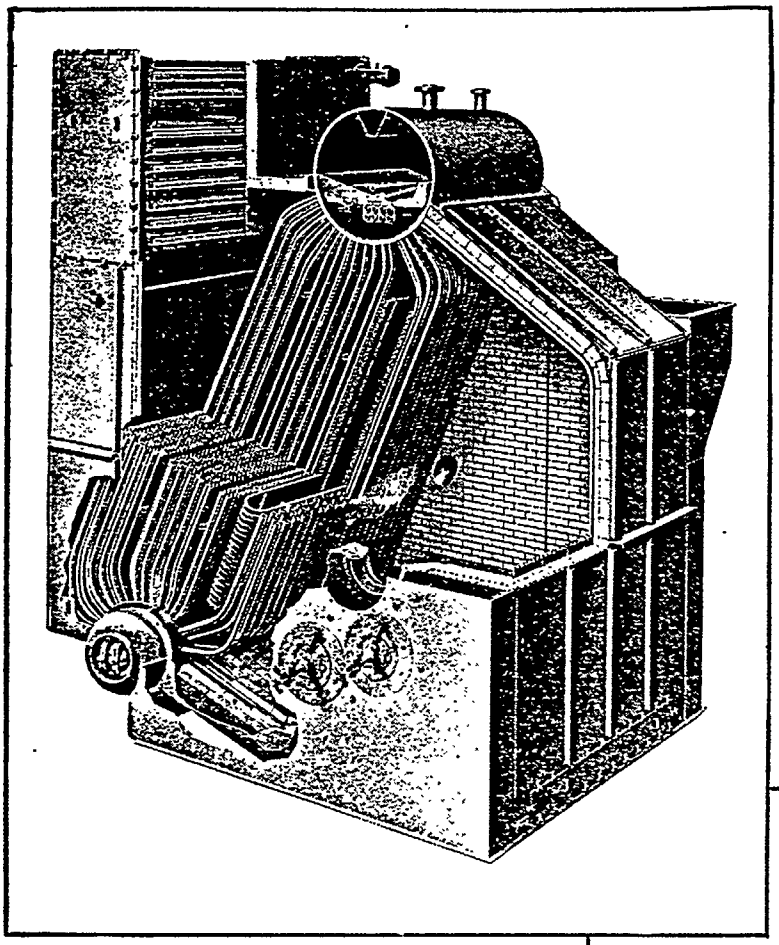
C-E

COMBUSTION ENGINEERING

200 MADISON AVENUE NEW YORK 16, N. Y.

July 1946

STRAIGHT TUBE OR



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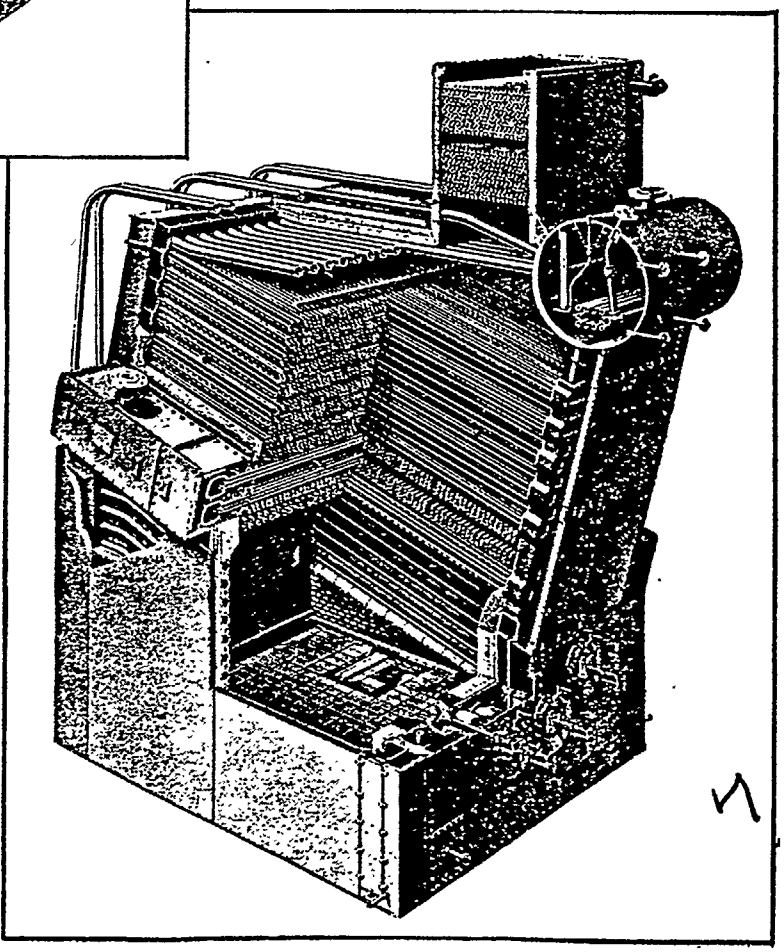

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Modern practice favors the use of water-cooled furnace side walls. Completely steel-encased, insulated settings are standard; complete or partial double casings are available.

Early 1946

BENT TUBE BOILERS

for Every Requirement

Modern marine practice is disposed to select boilers from two basic types — straight tube sectional header and 2-drum bent tube. Up to about 750 psi pressure, the factors influencing selection center around space available and preference for one type or the other, based on operating or maintenance considerations. For higher pressures, now the subject of widespread consideration, the bent tube boiler is the practical answer — aside from forced circulation designs.

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The C-E line offers numerous variations of the two types of boilers here illustrated and described, and includes C-E Controlled Forced Circulation Marine Boilers which have been built for pressures up to 1200 psi and temperatures as high as 900 F.

A-975

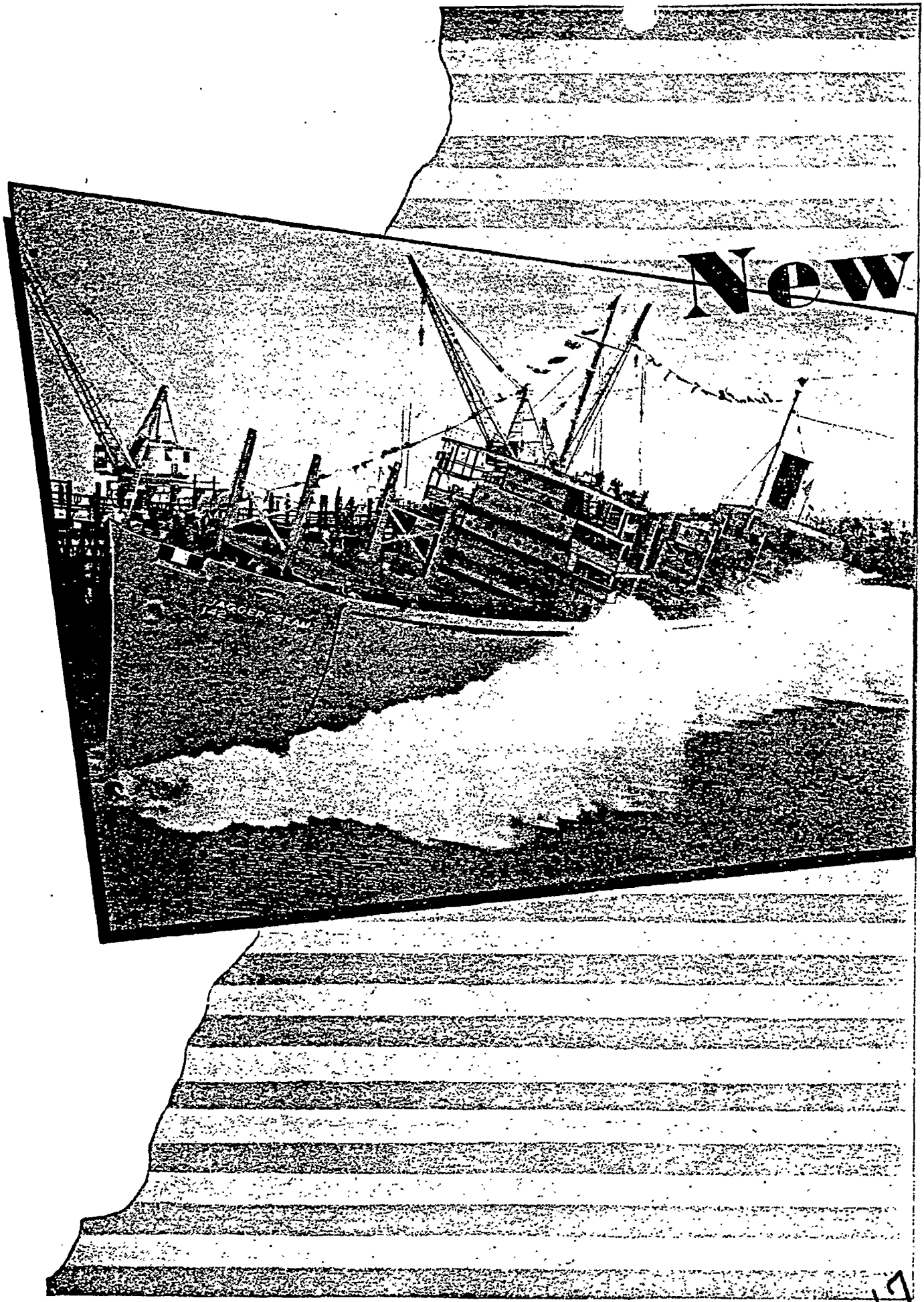
Combustion Engineering



200 MADISON AVENUE, NEW YORK 16, N. Y.

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT, FOR STATIONARY AND MARINE APPLICATIONS

December 1995



December 1945

Collier Fleet powered by C-E

Early in 1944 the U. S. Maritime Commission awarded the Delta Shipbuilding Company of New Orleans a contract to design and build a group of 24 new colliers. These were to be known as design EC2-S-AW1, an especially adapted design of the well-known Liberty ship hull. It was decided that the Liberty main propulsion unit would be used but the machinery space must be located aft instead of amidships. Furthermore, these colliers were to be designed as long-range ships in full compliance with all established rules and regulations — in short, post-war vessels in every sense.

Combustion Engineering, builder of more Liberty ship boilers than any other manufacturer, was requested to effect necessary changes in boiler design in order to fit the boilers into the space available in the new location. This accomplished, C-E was awarded the contract to supply boilers for all 24 ships of the new collier fleet, 48 boilers in all.

The illustration shows the launching of the S. S. Jagger Seam, first of the new collier fleet. The last of these ships has recently been delivered.

A-927

C-E products include all types of steam generating, fuel burning and related equipment, for stationary and marine applications

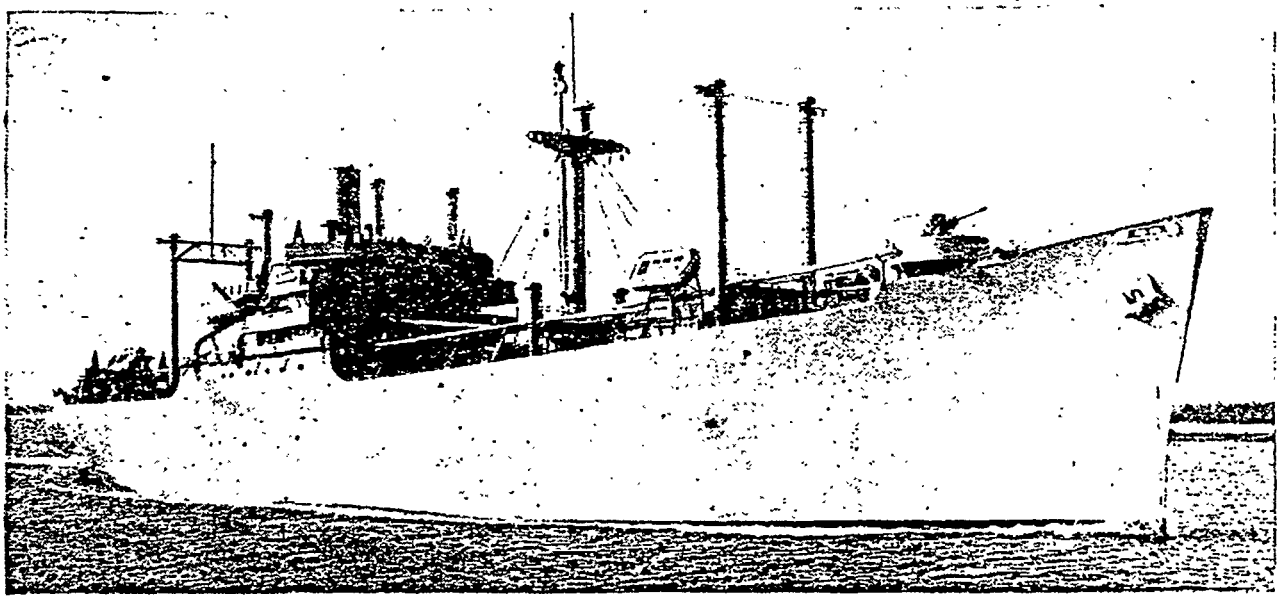
COMBUSTION ENGINEERING

200 Madison Ave. • New York 16, N. Y.

C-E

18

New United States



Red Jacket	American Farmer
Stag Hound	American Ranger
Onward	American Merchant
Courser	American Shipper
Resolute	American Importer
Rattler	American Forwarder
Rapid	American Clipper
Whistler	American Scout
Defender	American Banker
American Traveler	

By early 1946, the United States Lines will have in operation a new cargo fleet of 19 ships, acquired by arrangement with the U. S. Maritime Commission.

These ships, as listed opposite, are of the C2 design and are being built by the North Carolina Shipbuilding Company at Wilmington, N. C. Several of them have already been delivered.

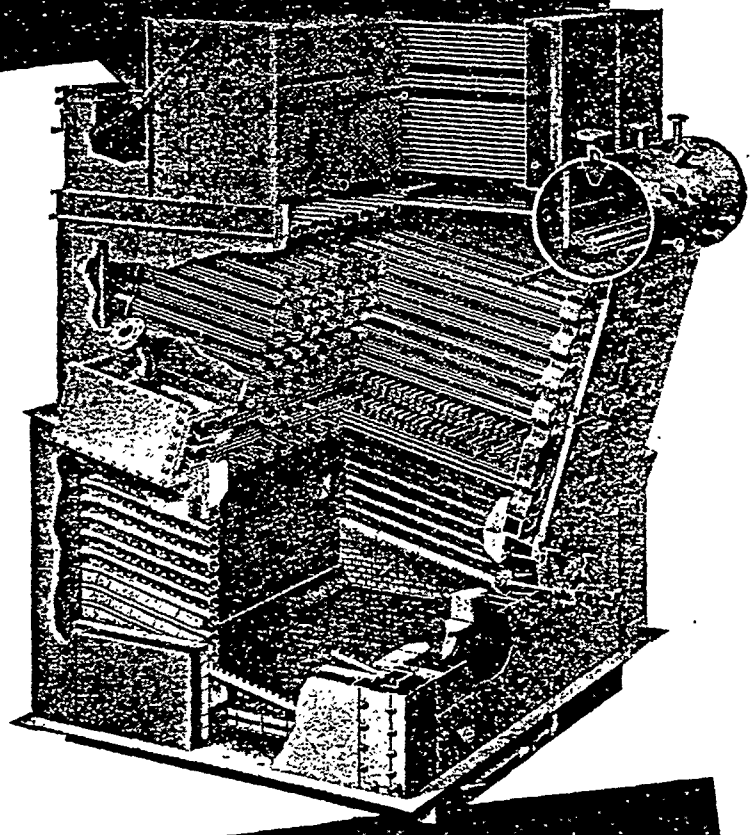
Various changes have been made to adapt these fast modern cargo carriers to the specific needs of U. S. Lines, but the basic design and equipment will be retained. All 19 vessels will be powered by C-E Sectional Header Boilers of the design illustrated on the opposite page. A-904A

COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

Lines Cargo Fleet

POWERED BY



Each of these new United States Lines' ships is equipped with two C-E Sectional Header Boilers of the design illustrated on the right. Each boiler has a normal capacity of 26,500 lb of steam per hr with an overload capacity of 39,750 lb per hr at 450 psi and 750 F. These boilers are representative of the most modern marine boiler practice and are designed for 87% operating efficiency.

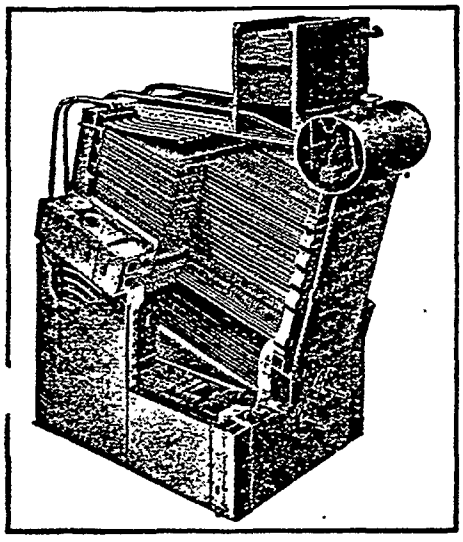
C-E BOILERS

COMBUSTION ENGINEERING

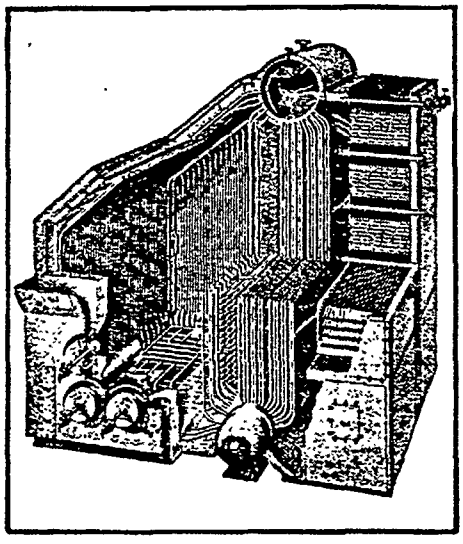
200 MADISON AVENUE, NEW YORK 16, N. Y.

October 1943

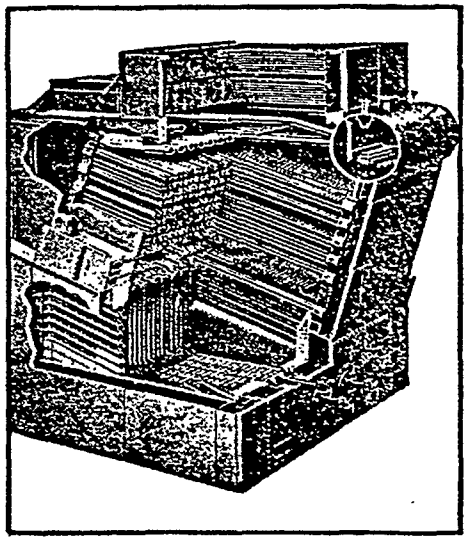
POWER...



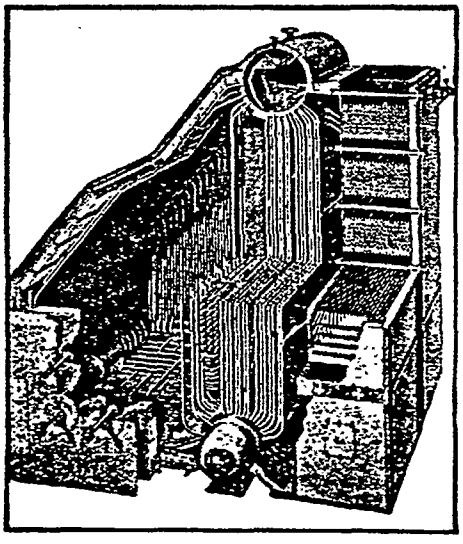
VICTORY



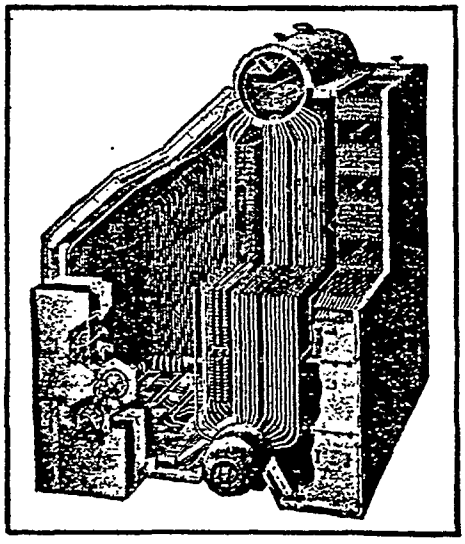
TROOP TRANSPORT



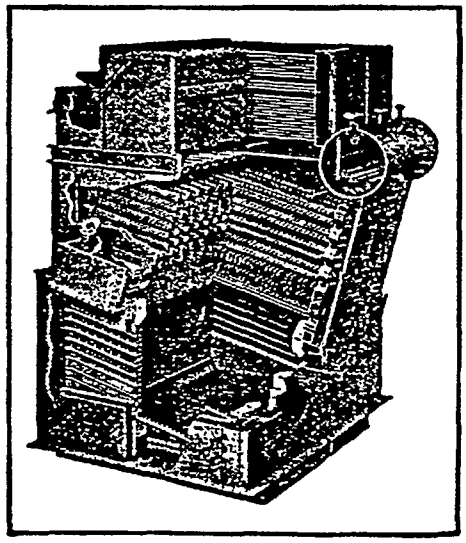
TANKER (T2-SE-A1)



TANKER (T2-SE-A2)



C2 CARGO

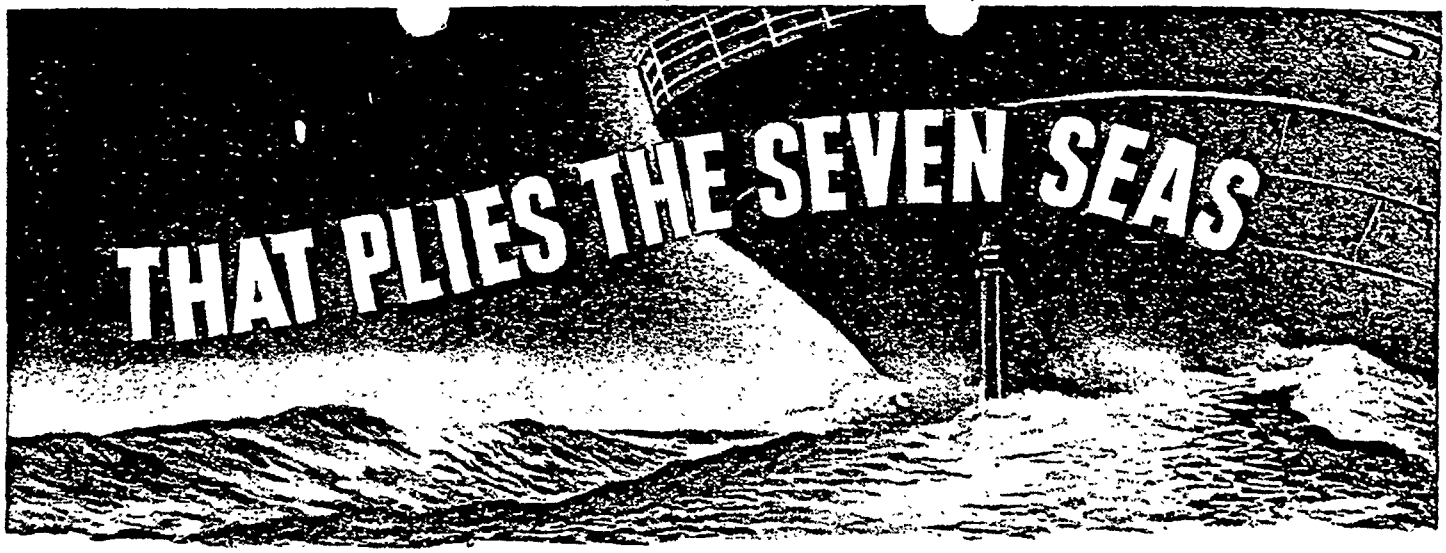


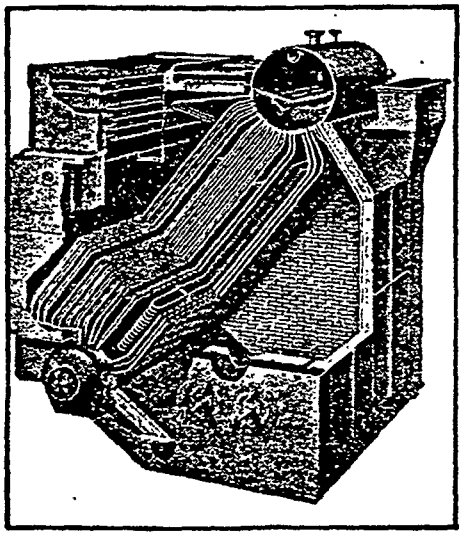
C2 CARGO

COMBUSTION

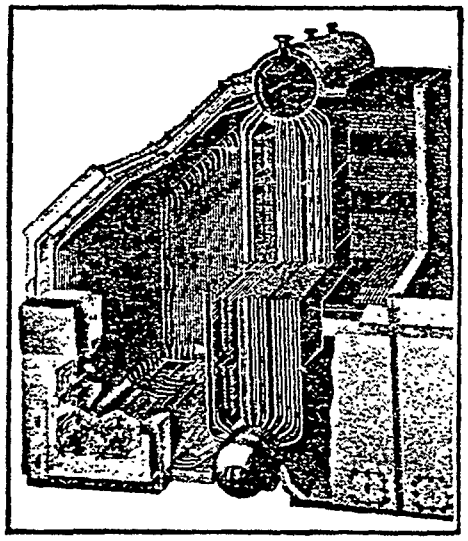
C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT, FOR STATIONARY AND MARINE APPLICATIONS

October 1945

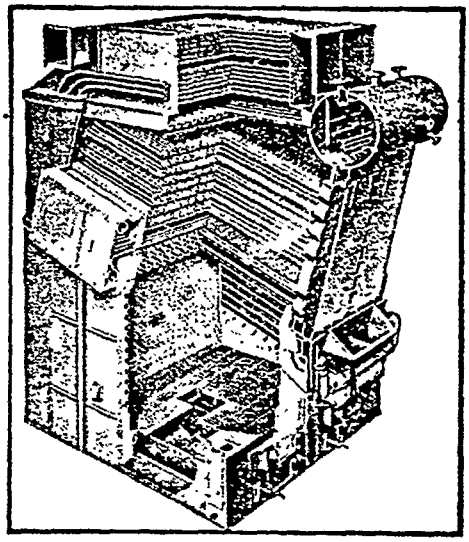




NAVAL SHIPS



C3 CARGO



ORE CARRIER

IT'S a good bet that you'll find one or more of the boilers shown here in virtually any port in the world today, that is if it's a port visited by American ships. For collectively these boilers are powering nearly twenty million tons of merchant shipping, not to mention a large number of naval vessels.

Even so this gallery of modern marine boiler practice doesn't tell the whole story of C-E designs. For example, it doesn't show a boiler recently placed in service that is designed for 1450 psi operating pressure, nor does it include several forced circulation designs.

The point is that no matter what your future requirements may be, Combustion Engineering is qualified to design and build precisely the kind of boiler that will best fit your needs. And that goes not only for the whole range of present-day capacities, pressures and temperatures, but also for conditions beyond the limits of present practice.

A-906

ENGINEERING

200 MADISON AVENUE ★ NEW YORK 16, N. Y.

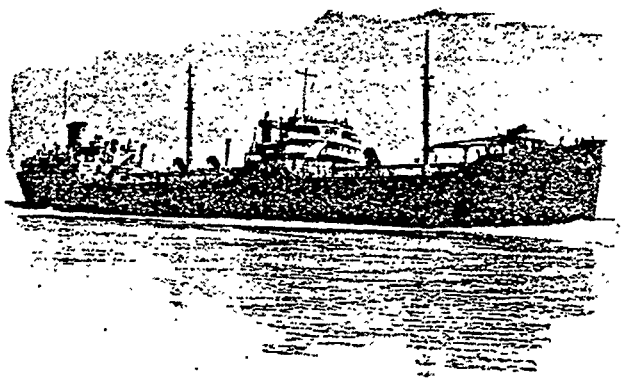
C-E

TIONS

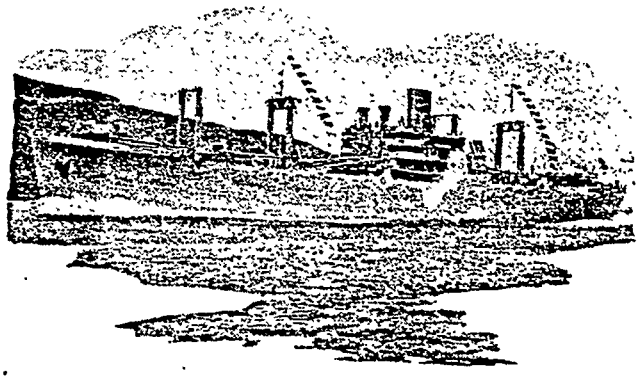
September 1945

HIGH RANK
ON THE
HIGH SEAS

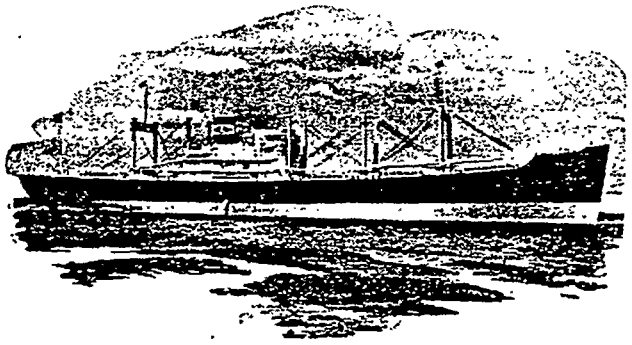
TANKER



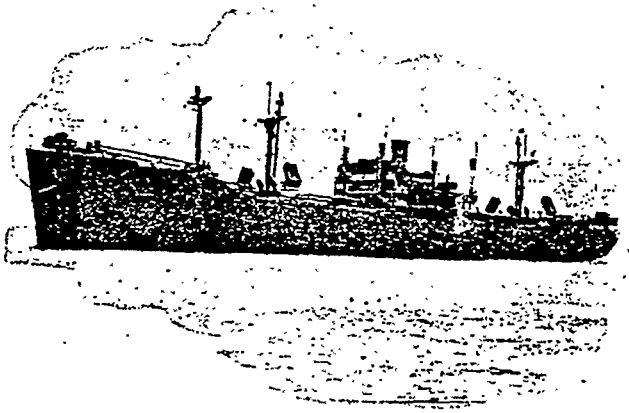
C-2 TYPE CARGO



C-3 TYPE CARGO



VICTORY SHIP



COMBUSTION

200 MADISON AVENUE, NEW YORK 16, N. Y.

September 1945

A FAMILIAR — and respected — sight in most ports of the world today, the ships of the American Merchant Marine are good will ambassadors for their country. The spectacular building program that created them in a brief few years will ultimately conclude with a total of well over 50,000,000 deadweight tons.

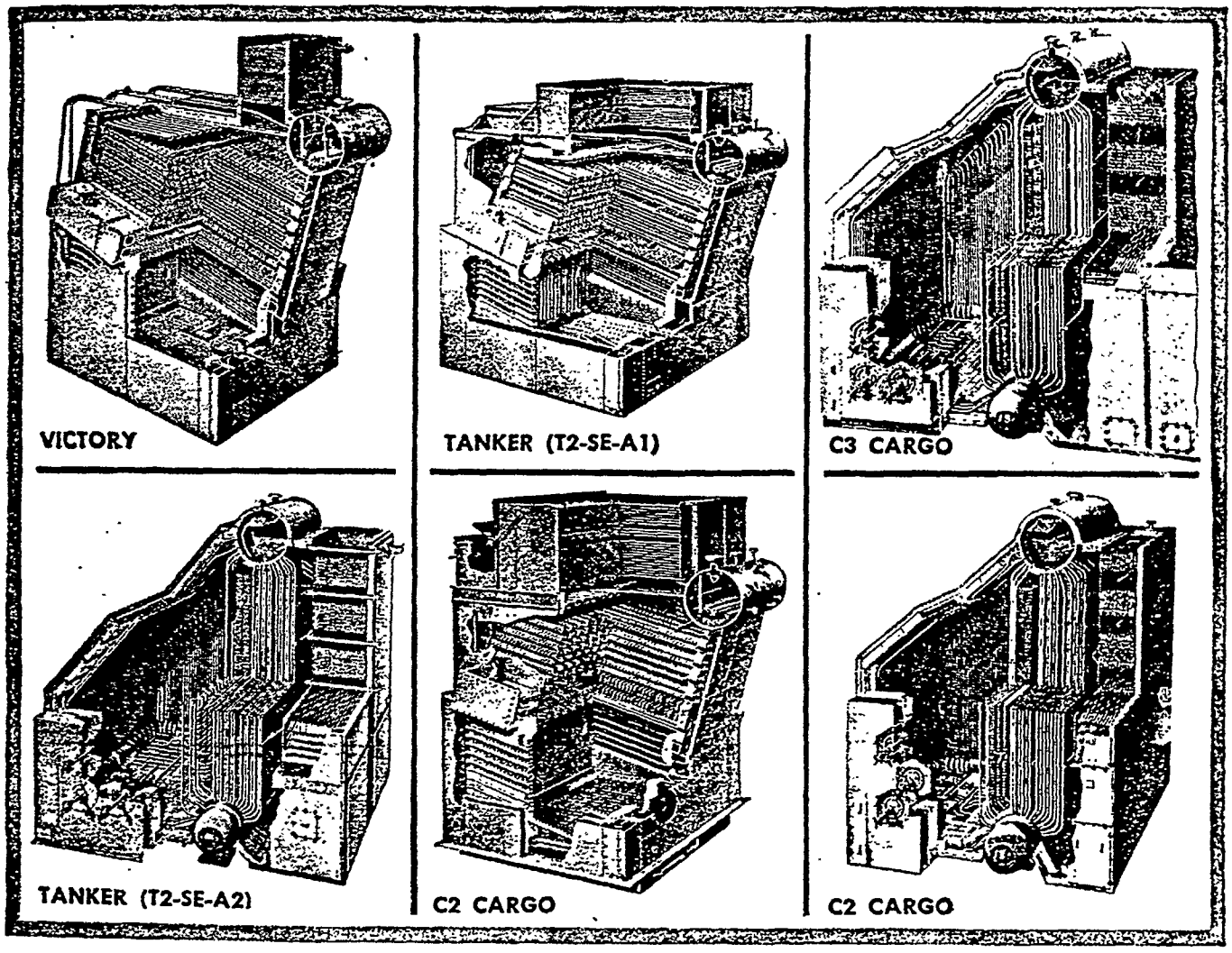
From this vast tonnage America will fashion its peacetime merchant fleet with two considerations uppermost. It must have capacity enough to transport the proper economic proportion of America's maritime trade. It must provide a strong reserve of merchant shipping to meet any war contingency the future may bring.

The four classes of ships shown here are typical of those that will form the backbone of such a fleet. And they're fine ships — built to the high standards of the U. S. Maritime Commission — of which every American can feel proud.

These ships have what it takes for war or post-war. Among their most important features, they have high efficiency boilers which assure low propulsion costs. They are protected by a standard of boiler construction that means reliability of service on the high seas and a minimum of maintenance in port.

Combustion Engineering is proud to have designed and built the boilers illustrated below which power so many of these ships of the present and future.

A-894

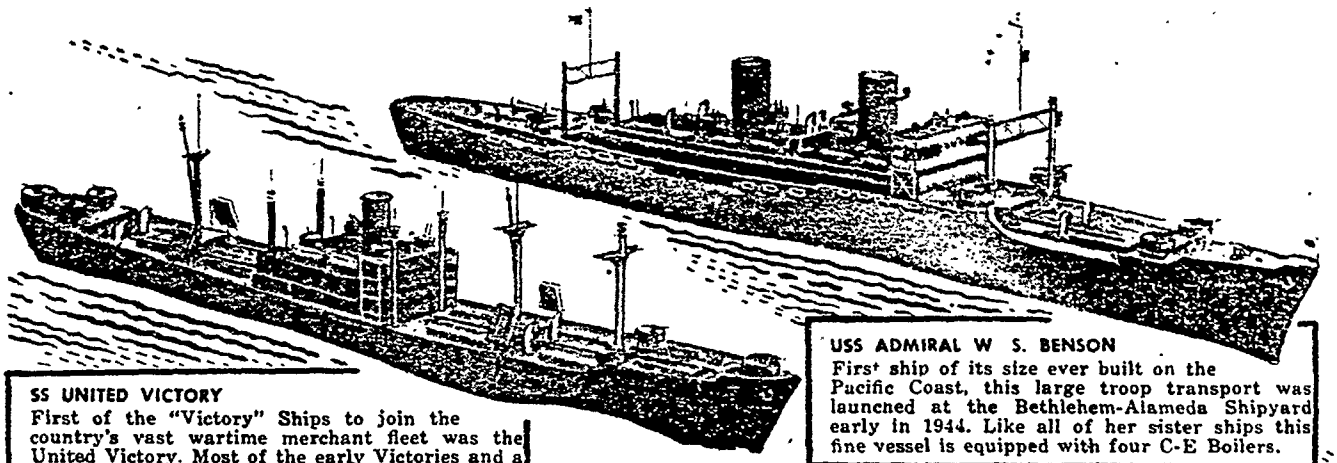


ENGINEERING

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT, FOR STATIONARY AND MARINE APPLICATIONS

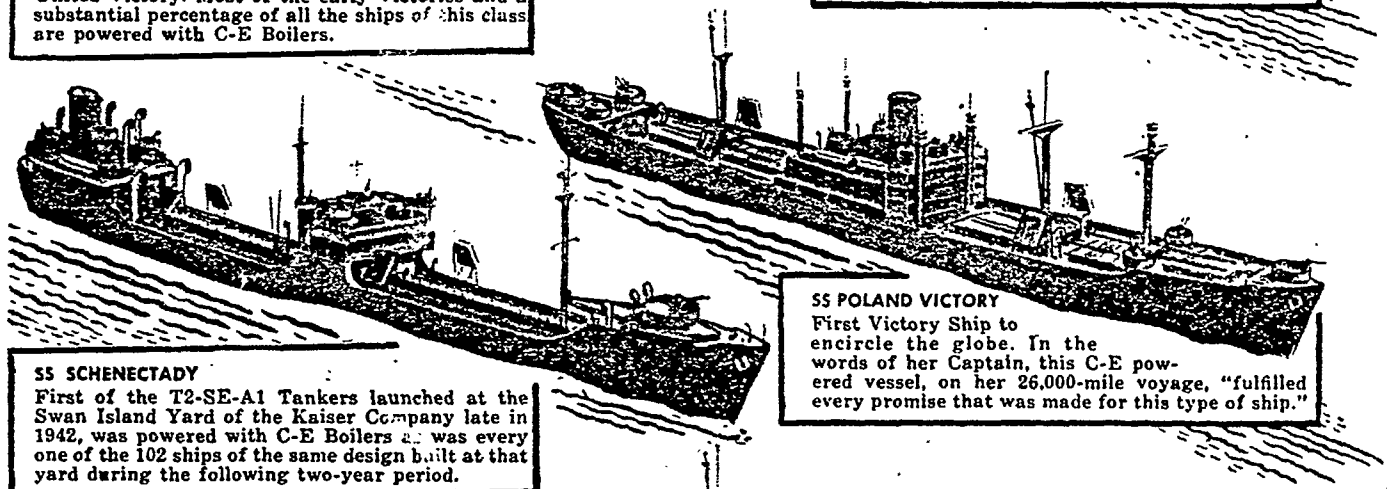
July 1945

Milestones of



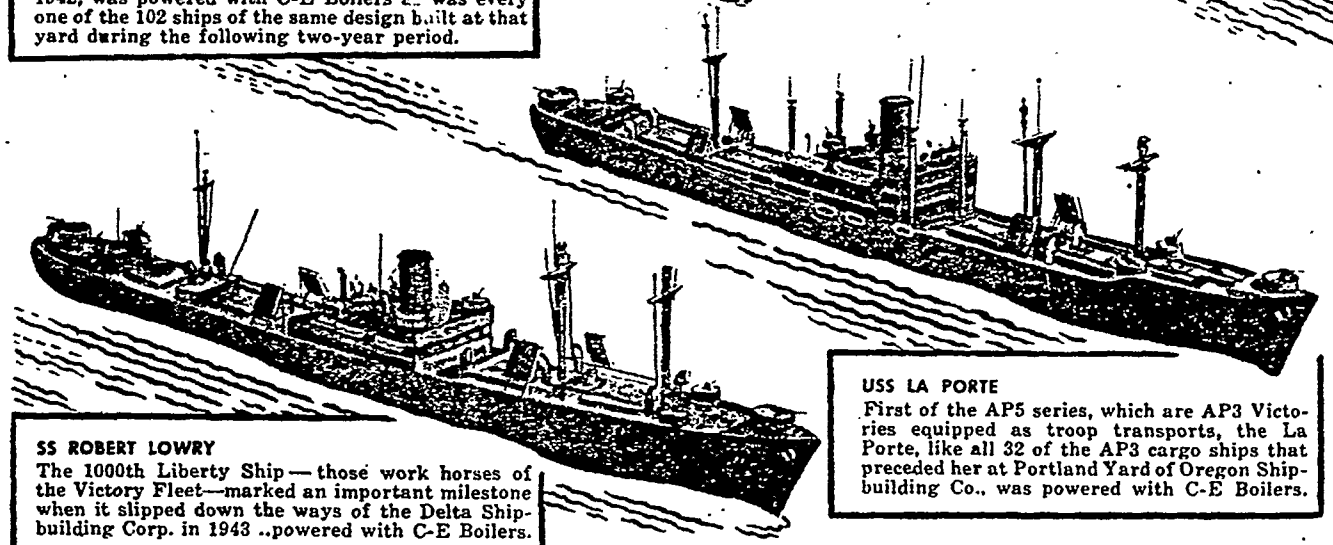
SS UNITED VICTORY
First of the "Victory" Ships to join the country's vast wartime merchant fleet was the United Victory. Most of the early Victories and a substantial percentage of all the ships of this class are powered with C-E Boilers.

USS ADMIRAL W S. BENSON
First ship of its size ever built on the Pacific Coast, this large troop transport was launched at the Bethlehem-Alameda Shipyard early in 1944. Like all of her sister ships this fine vessel is equipped with four C-E Boilers.



SS SCHENECTADY
First of the T2-SE-A1 Tankers launched at the Swan Island Yard of the Kaiser Company late in 1942, was powered with C-E Boilers as was every one of the 102 ships of the same design built at that yard during the following two-year period.

SS POLAND VICTORY
First Victory Ship to encircle the globe. In the words of her Captain, this C-E powered vessel, on her 26,000-mile voyage, "fulfilled every promise that was made for this type of ship."



SS ROBERT LOWRY
The 1000th Liberty Ship — those work horses of the Victory Fleet—marked an important milestone when it slipped down the ways of the Delta Shipbuilding Corp. in 1943 ..powered with C-E Boilers.

USS LA PORTE
First of the AP5 series, which are AP3 Victories equipped as troop transports, the La Porte, like all 32 of the AP3 cargo ships that preceded her at Portland Yard of Oregon Shipbuilding Co., was powered with C-E Boilers.

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

7/20 Jul

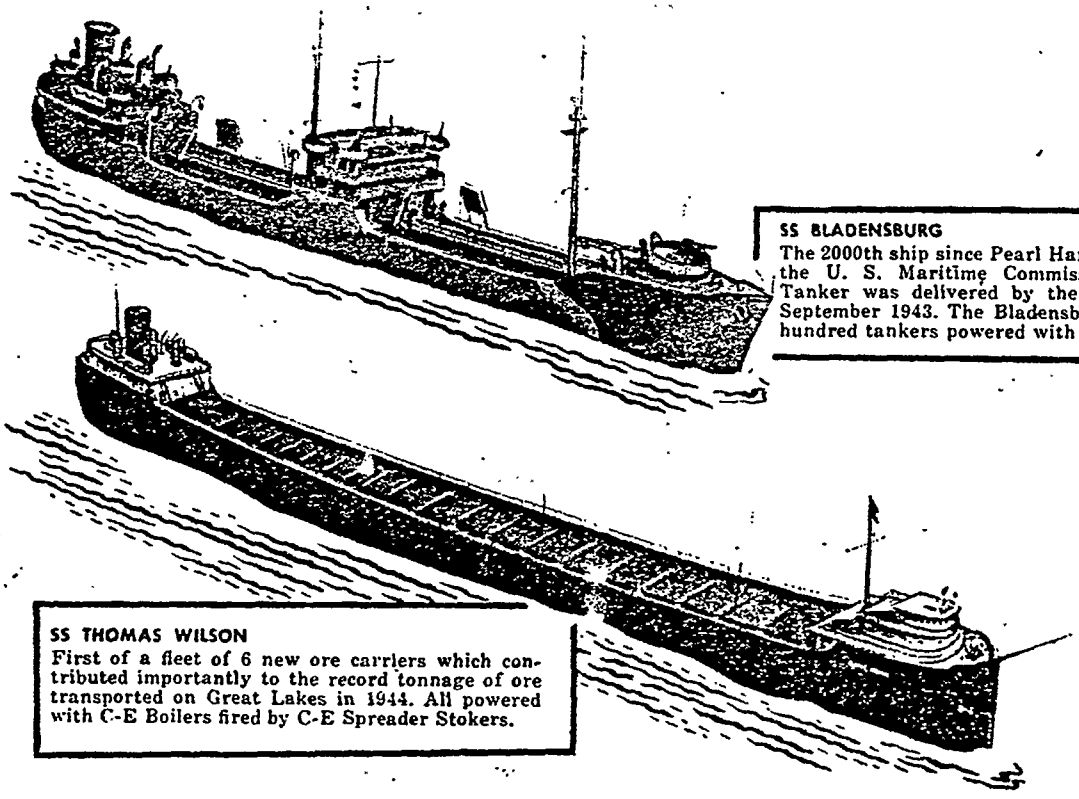
July 1945

War Shipbuilding

. . all powered with C-E Boilers

THAT so many of the ships representing milestones of our war shipbuilding program are powered with C-E Boilers is no mere coincidence. Rather it is a reasonable consequence of the fact that Combustion Engineering has supplied the boilers for nearly 20,000,000 deadweight tons of merchant shipping since Pearl Harbor.

For the ships of the future, C-E Marine Boilers will be available for any specifications of pressure, temperature and capacity. Combustion Engineering is especially qualified to design and build boilers for the higher steam pressures and temperatures that will mark the way to new standards of economy in ship propulsion. A-881



SS BLADENSBURG
The 2000th ship since Pearl Harbor to be delivered to the U. S. Maritime Commission, this 16,000-ton Tanker was delivered by the Kaiser Company in September 1943. The Bladensburg is one of several hundred tankers powered with C-E Boilers.

SS THOMAS WILSON
First of a fleet of 6 new ore carriers which contributed importantly to the record tonnage of ore transported on Great Lakes in 1944. All powered with C-E Boilers fired by C-E Spreader Stokers.

Combustion C-E Engineering

200 MADISON AVENUE • NEW YORK 16, N. Y.

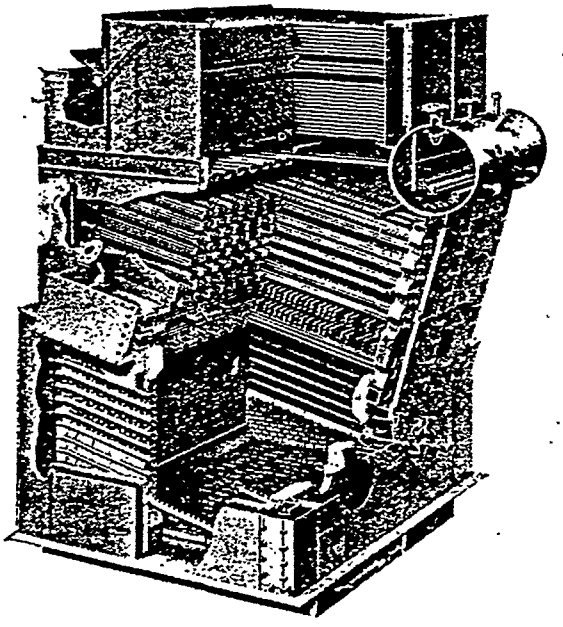
The USS Diamond Head Joins the Fleet

COINCIDENT with the celebration of its fourth birthday, the North Carolina Shipbuilding Company, Wilmington, N. C. completed its 200th ship, the USS Diamond Head, shown on the opposite page.

Headed for blue water as an Ammunition Escort, she is classed as an AKA ship. But like most AKA's, she is actually a C2 Cargo vessel converted to military use.

The "Diamond Head" is one of 60 C2's delivered by this yard in a 12-month period, thereby establishing her builders as the nation's leading producer of ships of this class.

Since 1941, North Carolina Shipbuilding has built 200 ships of various types and Combustion Engineering has supplied the boilers for more than half of them.



Boilers Designed and Built by C-E

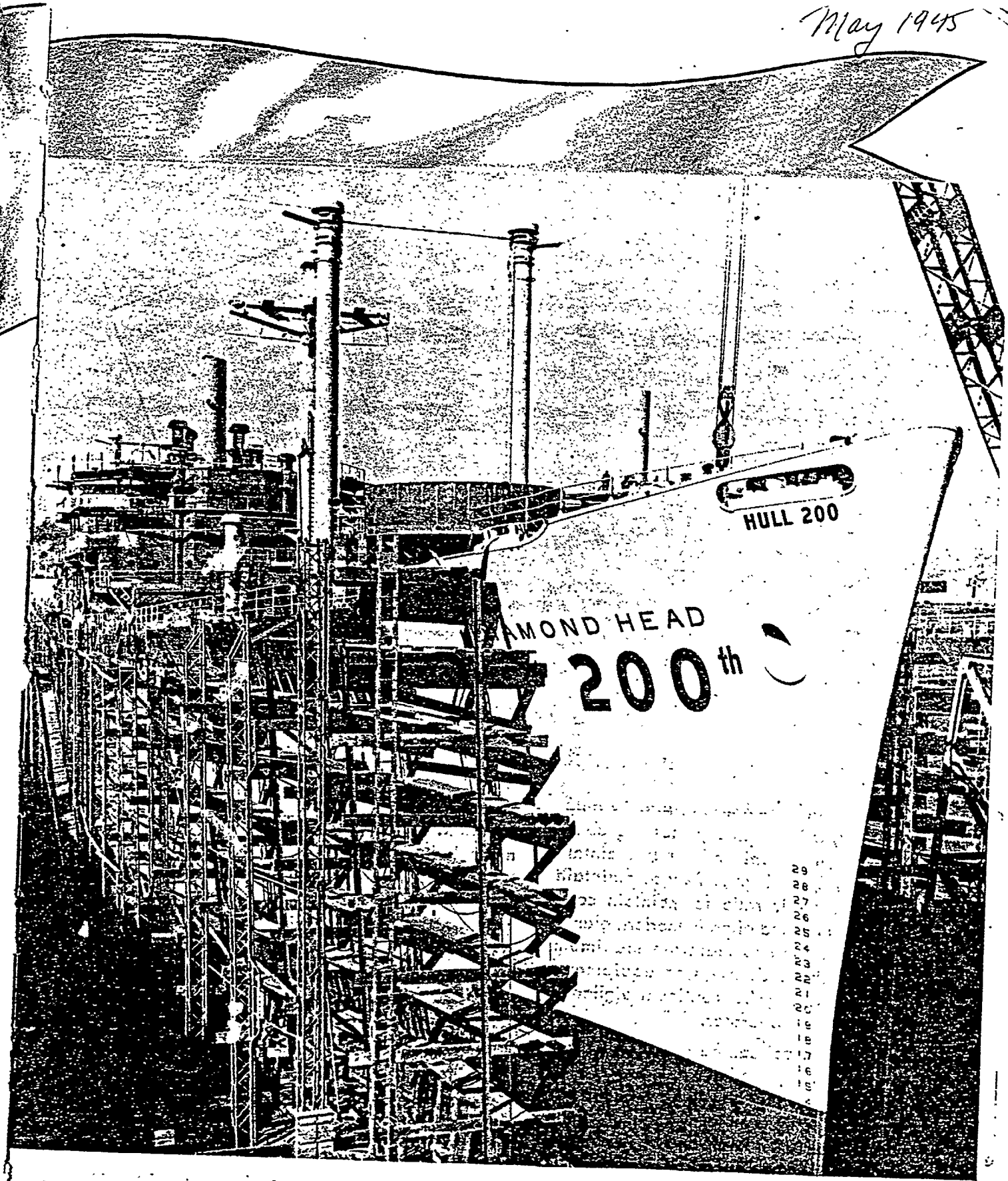
Two C-E Sectional Header Boilers of the type illustrated supply steam for the USS Diamond Head. Each boiler has a normal capacity of 26,500 lb of steam per hr at 450 psi and 750 F

Combustion Engineering has supplied boilers of this same general design for a large number of Maritime Commission ships including A1 tankers, C2's and AP2, AP3 and AP5 Victory ships. Capacities of the boilers for these ships range up to 37,500 lb of steam per hr with operating pressures to 465 psi and steam temperatures to 750 F

C-E Boilers of this and other designs have met the severe tests of wartime service. They may be depended upon to provide the high standards of economy and reliability that will be required in our merchant ships of the future.

A-870

May 1945



COMBUSTION ENGINEERING

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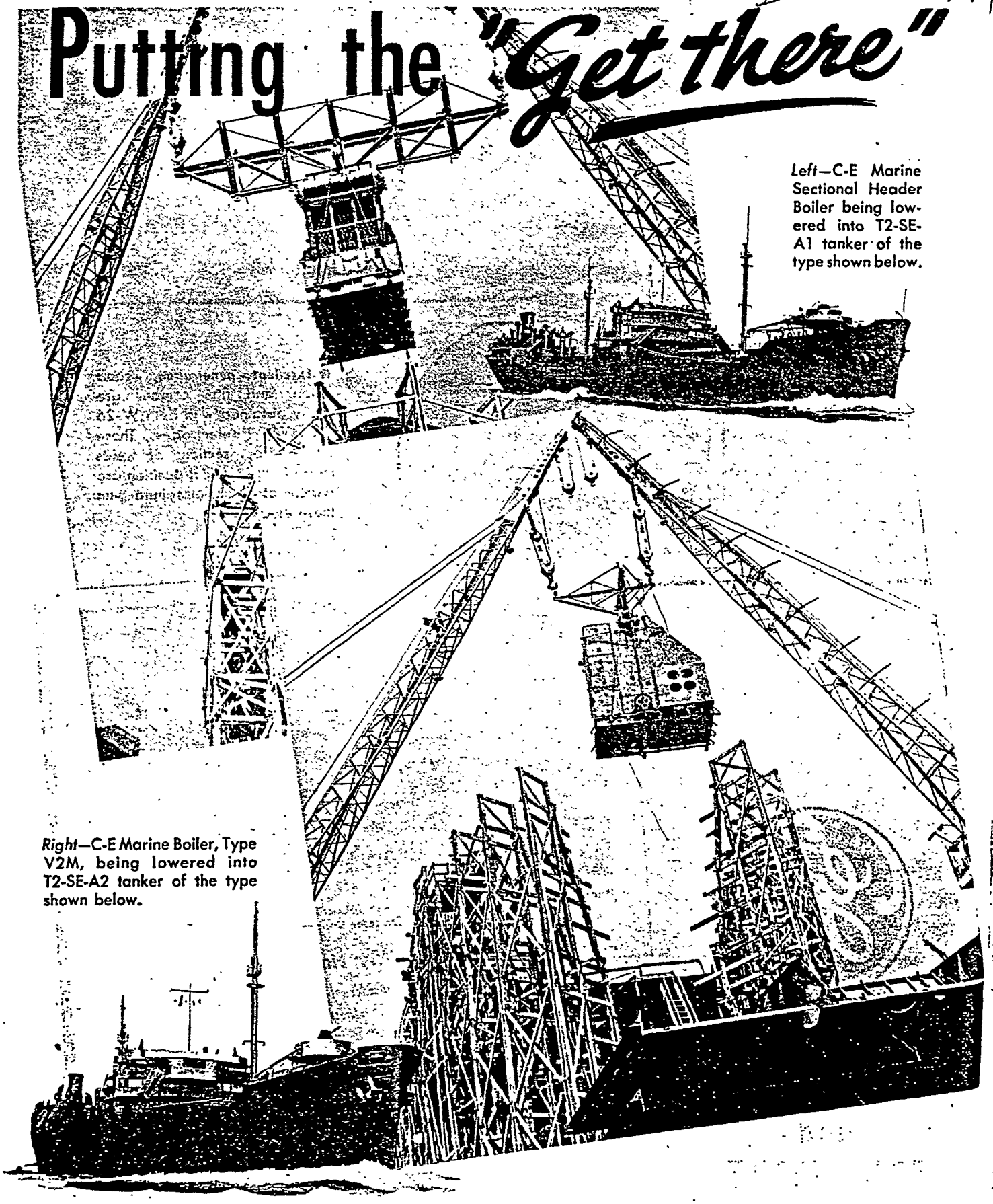
C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

May, 1945

December 1944

Putting the "Get there"



Left—C-E Marine Sectional Header Boiler being lowered into T2-SE-A1 tanker of the type shown below.

Right—C-E Marine Boiler, Type V2M, being lowered into T2-SE-A2 tanker of the type shown below.

COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATION

December 144

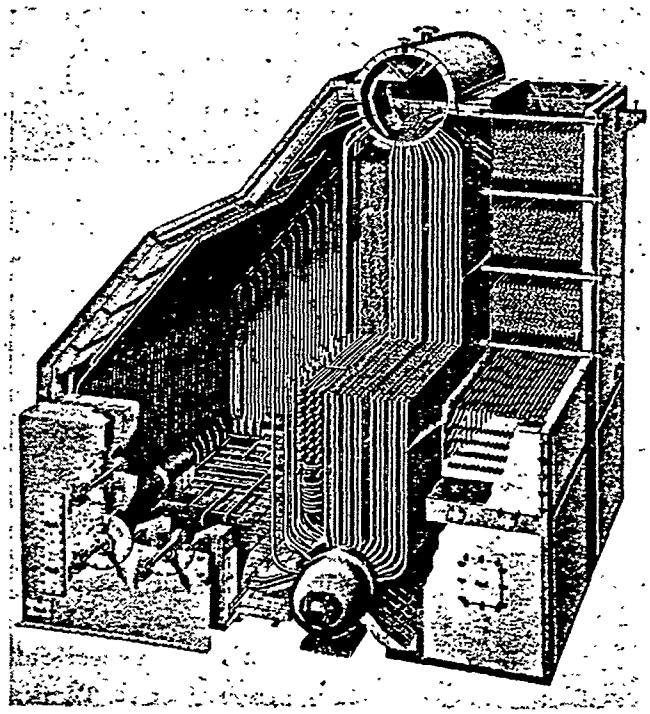
into America's Tankers

with C-E Marine Boilers

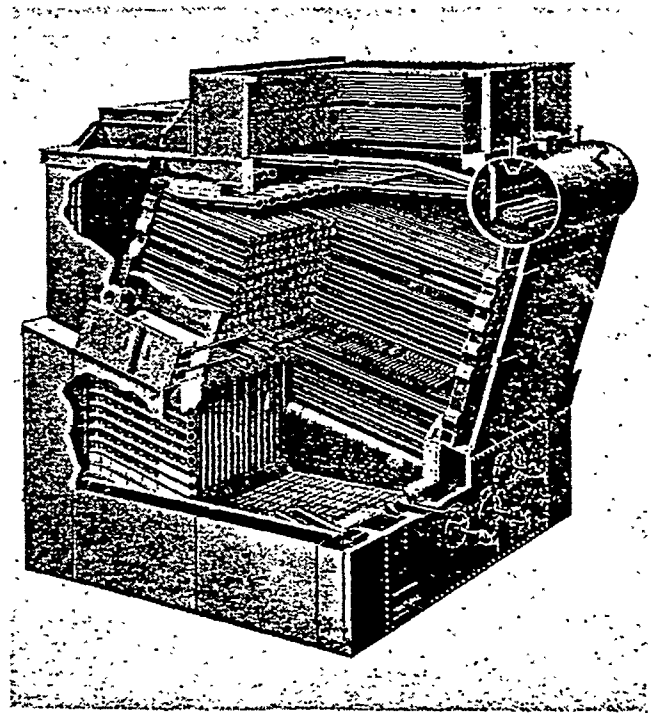
NOT until its boilers give it life, can a tanker respond to the will of its officers. An adequate and unfailing steam supply provides the "get there" that assures speedy delivery of its urgently needed cargo.

Here, two major classes of tankers are brought to life with Combustion Engineering Boilers. The lower view on the opposite page shows a C-E Marine Boiler, Type V2M, being lowered into its ship—a T2-SE-A2 tanker. Two of these boilers comprise the steam generating equipment for these ships — classed among the speediest tankers afloat. At upper left is shown a C-E Sectional Header Boiler, Type SM, ready for lowering into its ship—a T2-SE-A1 tanker. Several hundred C-E Boilers of this type—two per ship—power these standard tankers.

C-E Marine Boilers provide the power, not only for hundreds of tankers, but also for other hundreds of cargo vessels comprising our great Victory Fleet and for a great many naval and naval auxiliary ships. Designed and built for dependable, economical service these boilers contribute in full measure to the excellent performance records being rolled up by American ships all over the world. A-843



C-E Marine Boiler, Type V2M, designed and built by Combustion Engineering for T2-SE-A2 tankers. C-E Boilers of this general design are being supplied for many other types of cargo and naval ships.



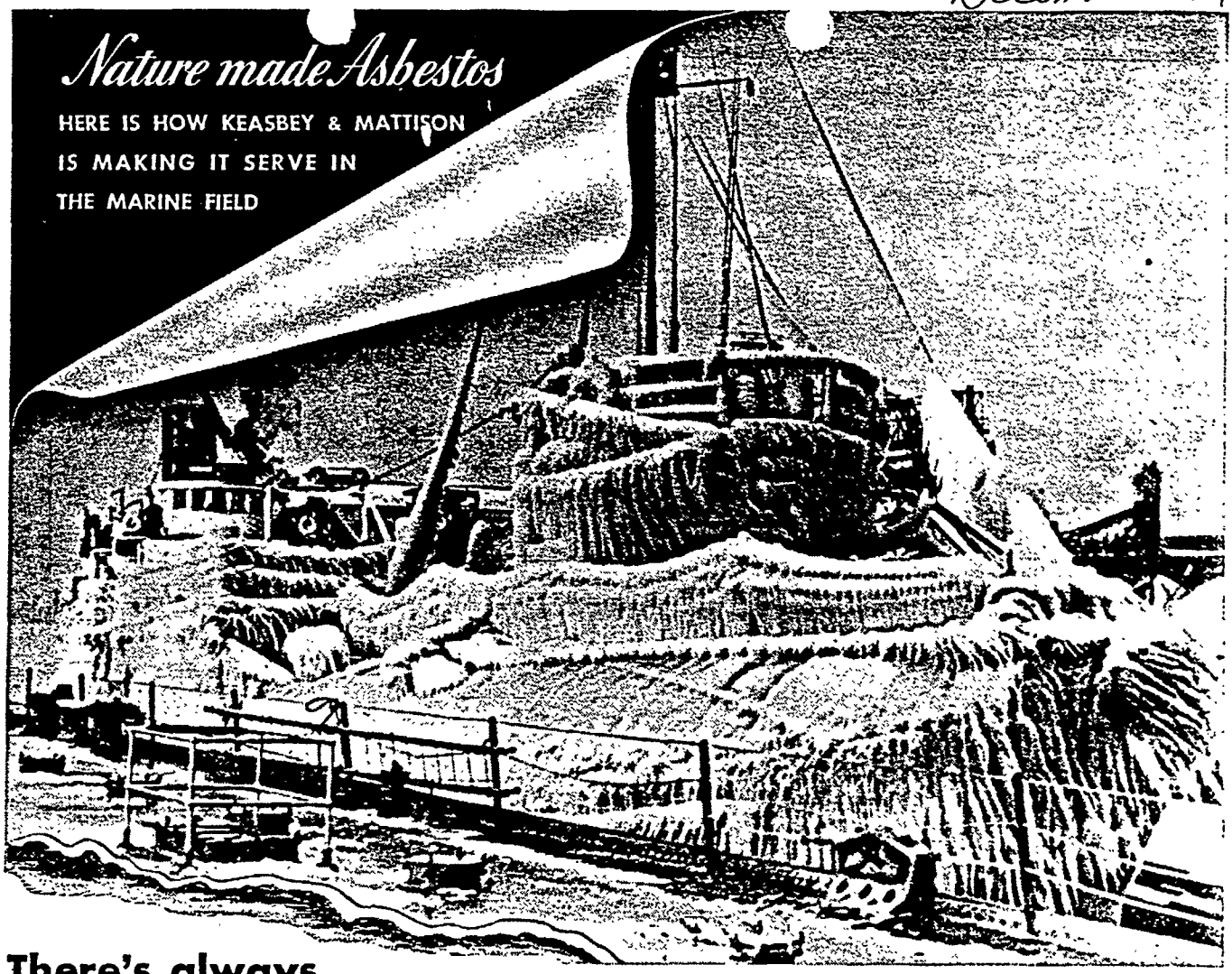
C-E Marine Sectional Header Boiler, designed and built by Combustion Engineering for T2-SE-A1 tankers. Observe its clean cut exterior with all risers and down-comers contained within the casing.

ENGINEERING

200 MADISON AVENUE • NEW YORK 16, N. Y.

C-E

December '77


Nature made Asbestos
HERE IS HOW KEASBEY & MATTISON
IS MAKING IT SERVE IN
THE MARINE FIELD

There's always comfort below deck . . . with Sprayed "Limpet" Insulation

No matter whether she's sailing the frozen Arctic or sweltering tropical waters . . . comfortable temperatures are always the rule in quarters treated with "Limpet." And little wonder . . . for here is a fireproof marine insulation that has "stood the test" in service . . . that has earned the confidence of ship builders by its performance under all sorts of conditions at sea.

The following features give further reason for "Limpet's" extensive use on ships of all types and tonnages—in crew quarters, on underdecks, hulls, casings and bulkheads.

- **Stands up better—no cutting or fitting—lower maintenance costs.**
- **Complete coverage—completely insulates, no seams, no joints.**
- **Does not crack or craze.**
- **Easy to apply around and over stiffeners, beams, projections.**
- **Easy to cut and patch—knits itself together when replaced.**
- **Does not deteriorate with vibration.**

ARMY E NAVY

K&M best in asbestos

The following are the *only* distributors authorized to apply K&M Sprayed "Limpet" Asbestos for marine work at the present time. Application is handled by experienced crews; men fully trained by K&M Factory Representatives.

ASBESTOS SUPPLY CO. OF OREGON
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Portland, Oregon

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1926 Pacific Avenue
Tacoma, Washington

EAGLE ASBESTOS & PACKING CO.
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New Orleans, La.
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New York City, N. Y.

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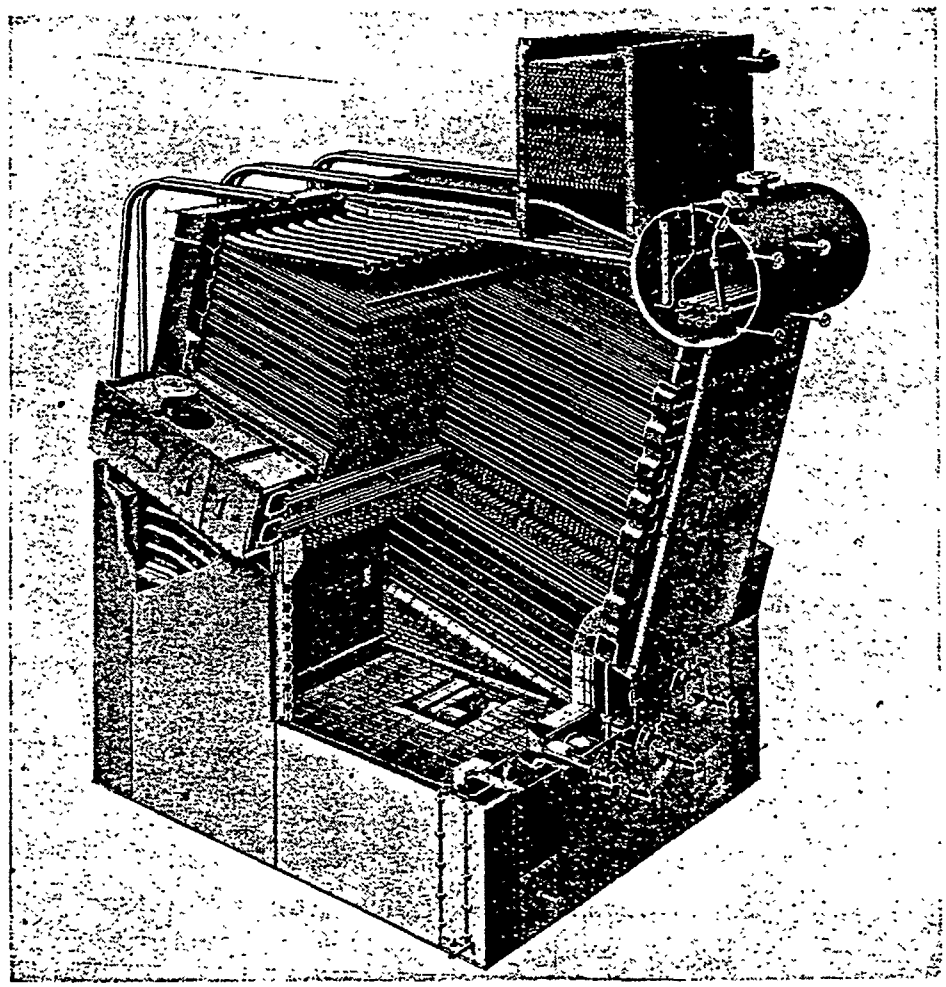
Houston, Texas

KEASBEY & MATTISON

COMPANY • AMBLER • PENNSYLVANIA

November 1944

C-E Marine Boilers help to give S. S.



VICTORY SHIP BOILER

as designed and built for AP-2, AP-3 and AP-5 ships by COMBUSTION ENGINEERING

SPEED, economy, maneuverability — that's what it takes, among other things, to give a Victory Ship the okay of the U.S. Maritime Commission. And speed, economy and maneuverability to spare were demonstrated by the S.S. Bluefield Victory chosen by the Commission for Victory Ship Standardization Trials.

These especially rigorous tests were made under the immediate supervision of prominent members of the Maritime Commission and were the most complete ever held on a commercial vessel since the beginning of the war-shipbuilding program. At the conclusion of the trials the broom was hoisted to the masthead, symbolizing a "clean sweep."

For speed, operating economy, and maneuverability, any ship depends, in very large measure, on her boilers. The Bluefield Victory is powered with C-E Marine Boilers. Her trials are further proof that C-E Boilers, expertly designed and ruggedly built to give economical, dependable performance, do just that. For nothing escapes the rigid tests and scrutiny of the Maritime Commission's experts. To "take it" a ship has to have what it takes — from boilers to bilge pumps.

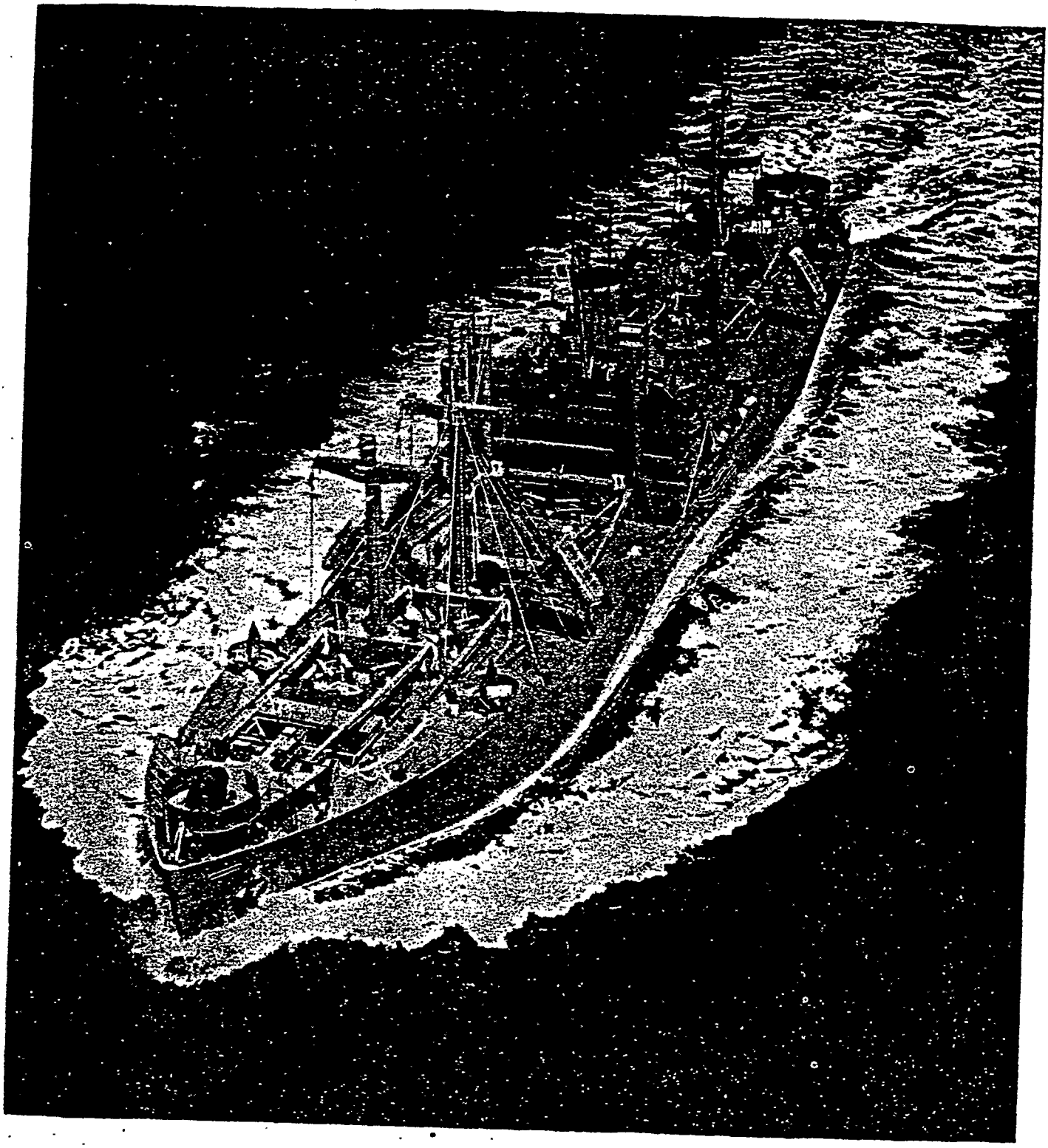
The Bluefield Victory is but one of many of the Victory class ships powered with boilers designed and built by Combustion Engineering. In fact, a substantial percentage of all the ships comprising the war-time program of the U.S. Maritime Commission are equipped with C-E Marine Boilers. A-832

COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATION

November 1944

Bluefield victory a "Clean Sweep"



ENGINEERING

200 MADISON AVENUE NEW YORK 16, N. Y.

November, 1944

FIRST VICTORY SHIP

THE NEW YORK TIMES

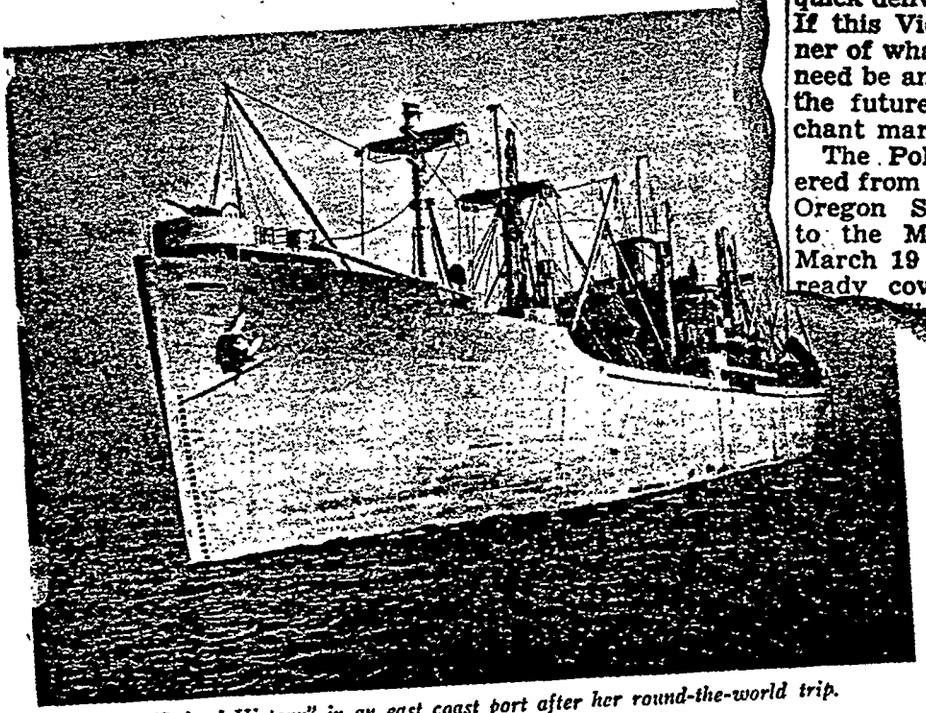
Wins high praise of Skipper and Crew

The recent arrival of the Victory ship Poland Victory on the east coast marks the first circumnavigation of the globe by a vessel of that type. The ship's performance during this, its maiden voyage, brought forth high praise from operators and crew, the War Shipping Administration announced last week.

The Poland Victory's skipper, Capt. Leonard Duks, a veteran of thirty-eight years at sea, declared that the vessel had "fulfilled every promise that was made for this type of ship even when it was in the blueprint stage." He said he considered the Victory ship highly suitable for post-war cargo-carrying operations.

"This vessel," he said, "is not only speedy but economical of operation. Even now I can see how satisfying it will be in post-war days to be able to guarantee quick delivery of our bills of lading. If this Victory ship is a forerunner of what is to come there never need be any cause for worry about the future of the American merchant marine."

The Poland Victory was delivered from the Portland yard of the Oregon Shipbuilding Corporation to the Maritime Commission on March 19 of this year and has already covered more than 26,000



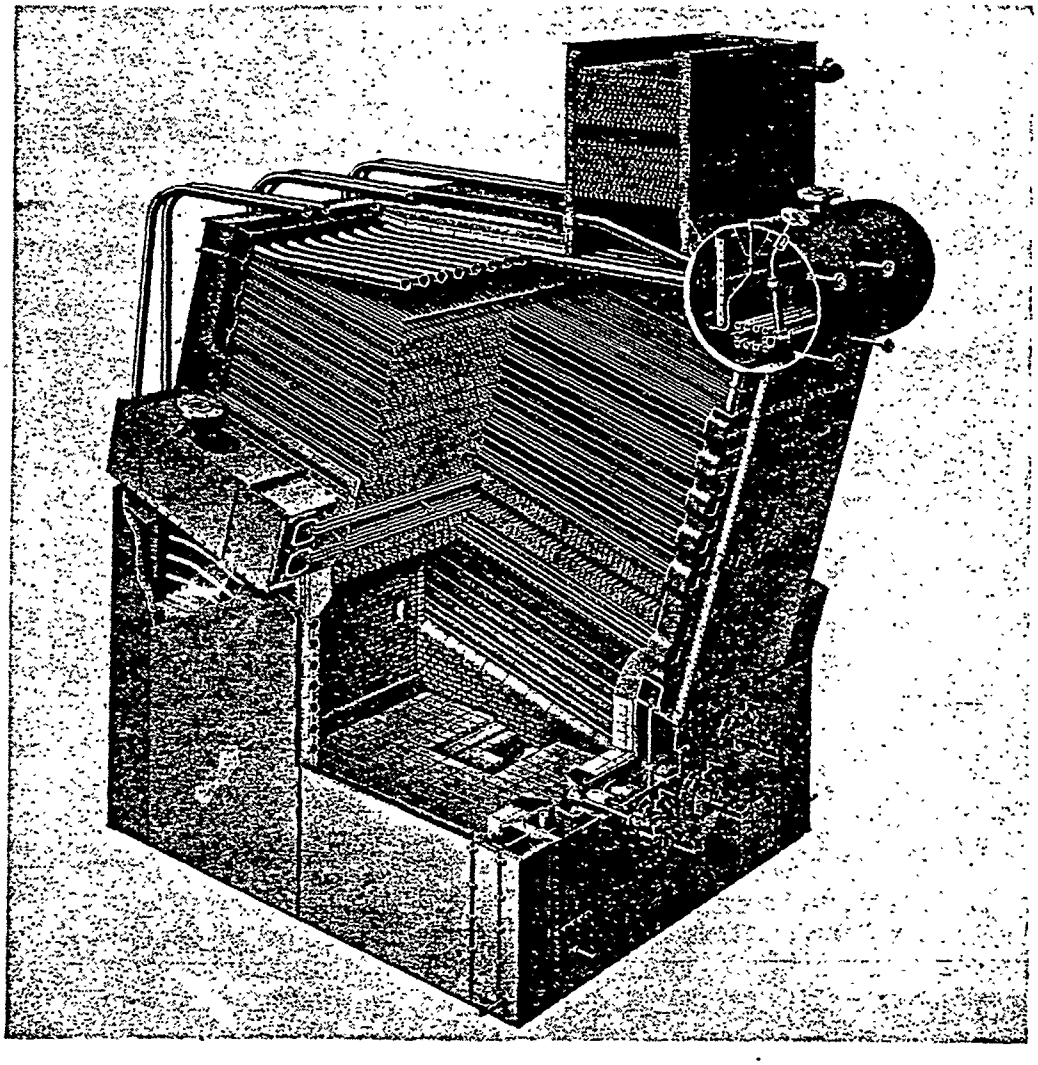
The "Poland Victory" in an east coast port after her round-the-world trip.

COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT FOR STATIONARY AND MARINE APPLICATIONS

September 1944

TO ENCIRCLE GLOBE



THE Poland Victory was one of the many Victory Ships completed ahead of schedule at the Portland yard of the Oregon Shipbuilding Corporation. Her recent arrival on the east coast marks the first circumnavigation of the globe by a vessel of her type and reflects further credit on the construction and equipment of these ships. Her performance during this, her maiden voyage, won high praise from her skipper and crew, according to a brief newspaper account reproduced on the opposite page.

The boilers which supplied the steam to power the Poland Victory on her 26,000 mile voyage were designed and built by Combustion Engineering. To their ruggedness, dependability and easy steaming qualities must be attributed a considerable part of the credit for the Poland Victory's performance, characterized by her Captain as "speedy and economical." Such performance is being duplicated by hundreds of other vessels of our great Victory Fleet which are also powered by C-E Boilers.

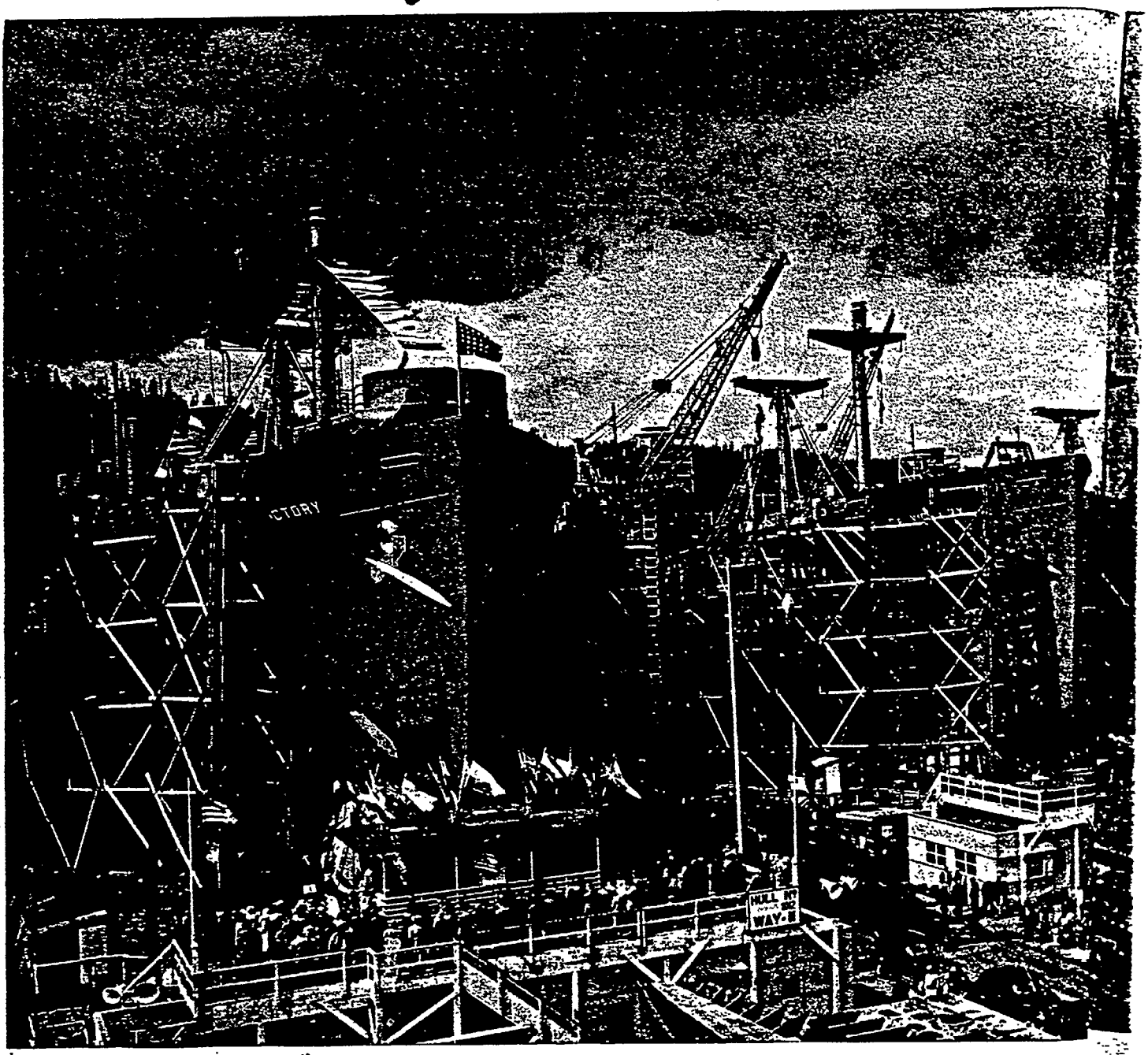
A-821

ENGINEERING

200 MADISON AVENUE NEW YORK 16, N.Y.

July 1944

and they're all powered

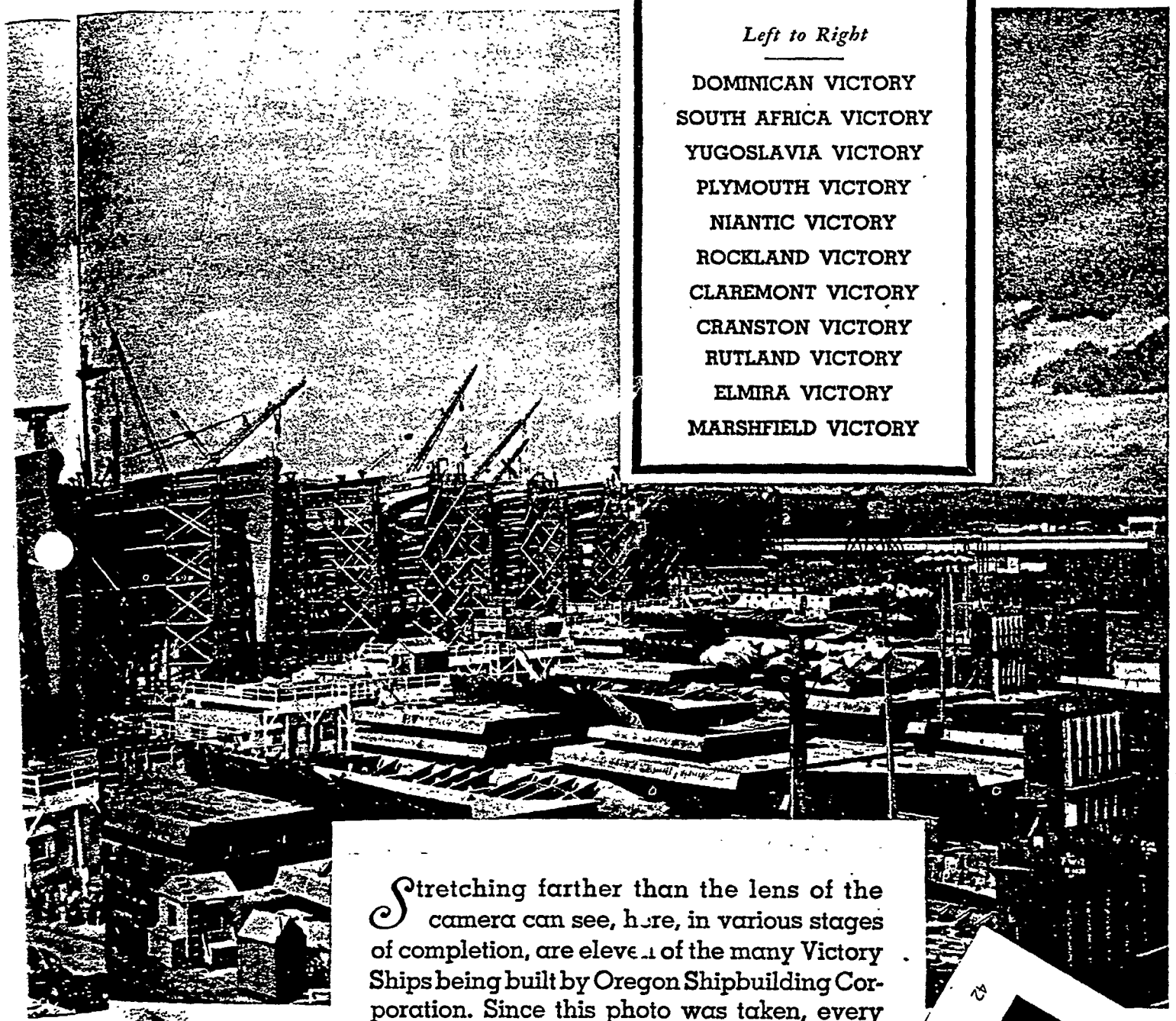


COMBUSTION ENGINEERING

200 MADISON AVENUE NEW YORK 16, N.Y.

July 1944

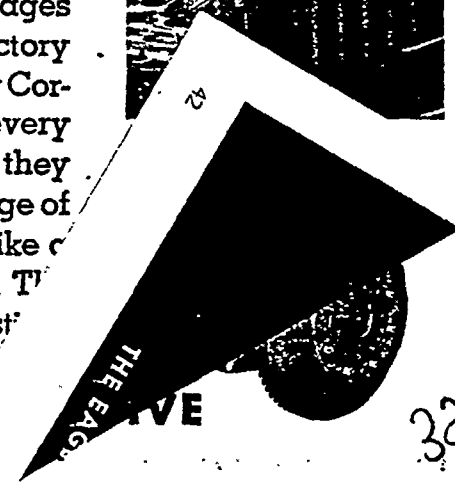
with C-E Boilers



Left to Right

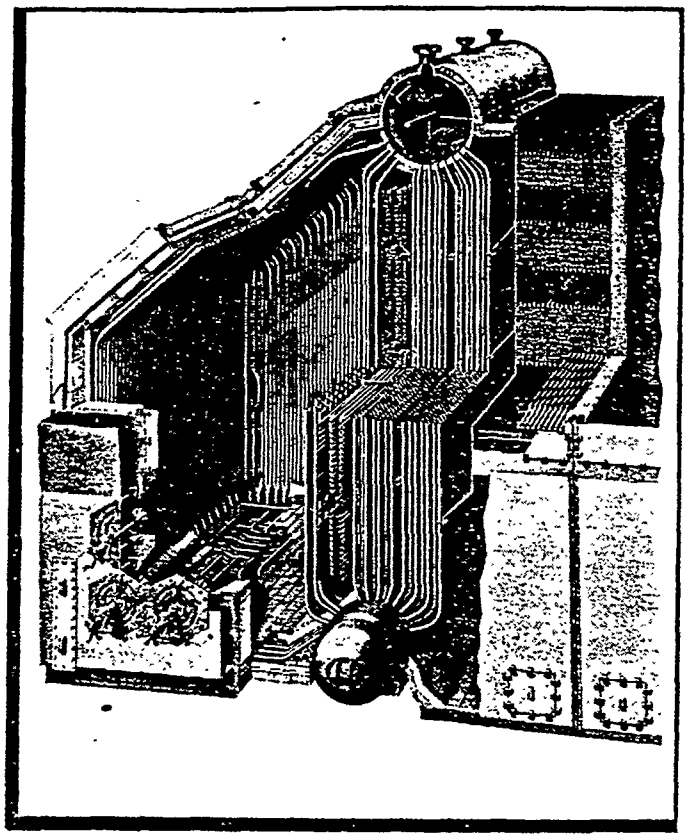
DOMINICAN VICTORY
SOUTH AFRICA VICTORY
YUGOSLAVIA VICTORY
PLYMOUTH VICTORY
NIANTIC VICTORY
ROCKLAND VICTORY
CLAREMONT VICTORY
CRANSTON VICTORY
RUTLAND VICTORY
ELMIRA VICTORY
MARSHFIELD VICTORY

Stretching farther than the lens of the camera can see, here, in various stages of completion, are eleven of the many Victory Ships being built by Oregon Shipbuilding Corporation. Since this photo was taken, every one of these ships has been launched. As they go to sea, increasing the enormous tonnage of our merchant fleet, all eleven of them, like a large percentage of their sister ships in The Victory Fleet, will be powered to their destinations by boilers designed and built by Combustion Engineering.

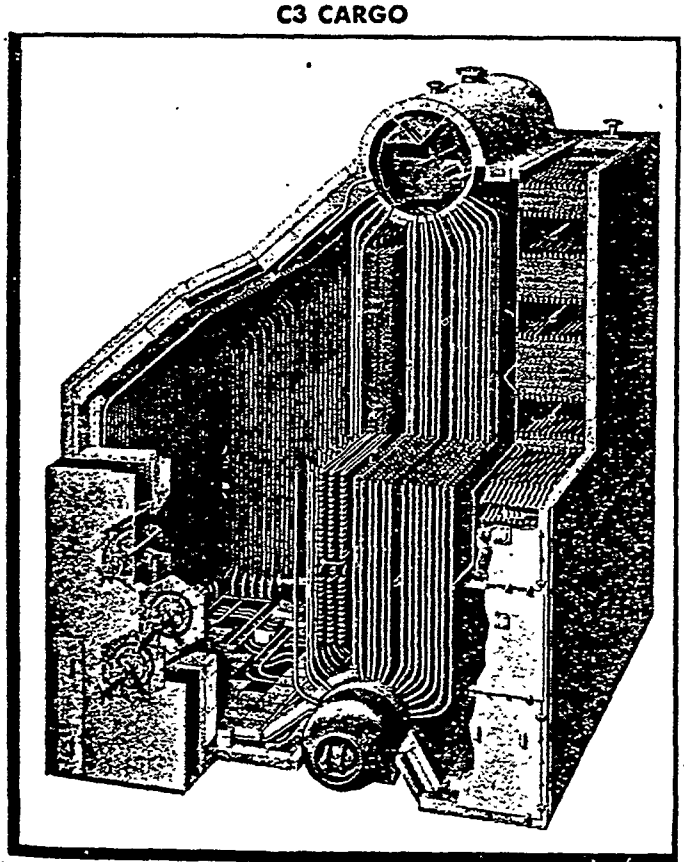


32

COMBUSTION ENGINEERING



C3 CARGO



C2 CARGO

For America's New Merchant Marine

Here is a comprehensive picture of today's marine steam generation practice. These designs, in conjunction with other C-E Marine Boilers now in course of manufacture, cover the complete range of present Merchant Marine practice.

Capacities

range from 25,000 to 60 000 lbs of steam per hr.

Operating Pressures

range from 220 psi to 1450 psi.

Total Steam Temperatures

range from 450F to 850F.

In addition, C-E Forced Circulation Marine Boilers are in operation for pressures up to 1200 psi with steam temperatures to 900 F. Designs for higher pressures and temperatures are ready.

A-793

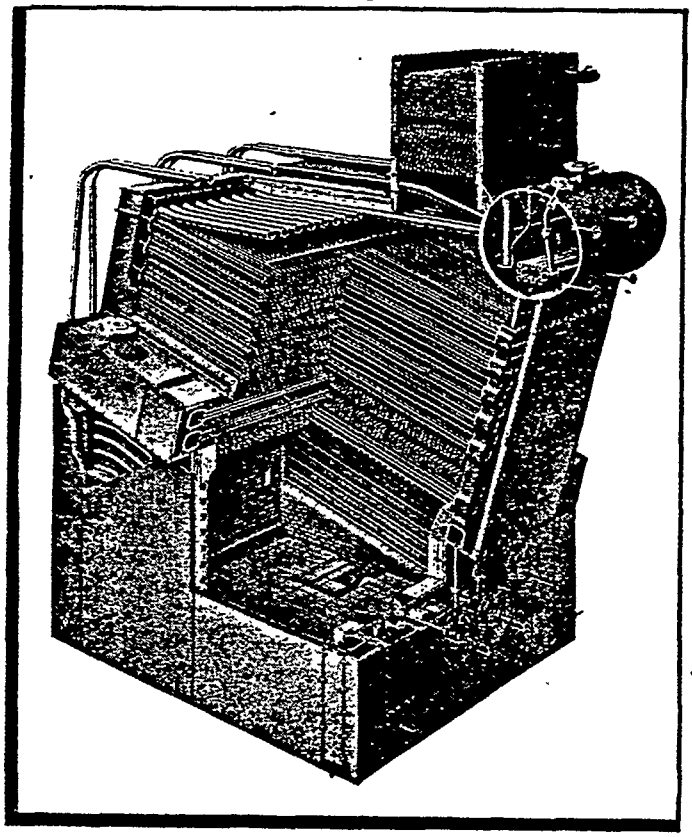
C-E

COMBUSTION ENGINEERING

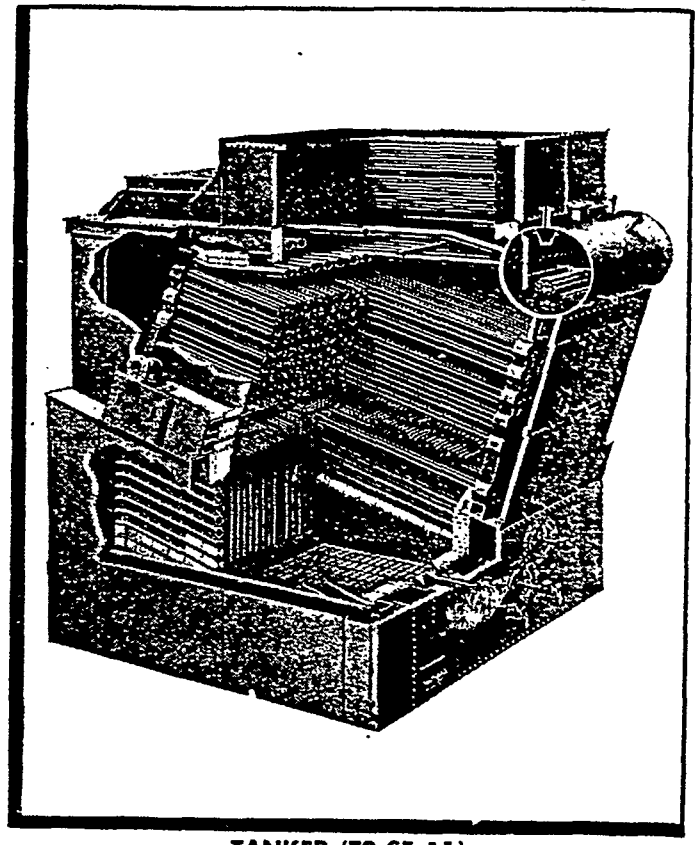
200 MADISON AVENUE, NEW YORK 16, N.Y.

May 1944

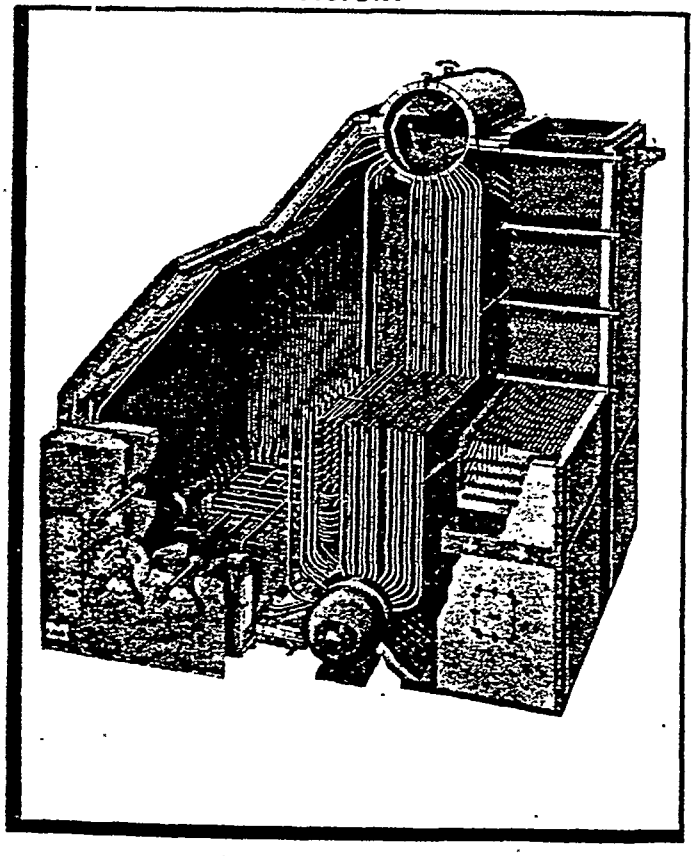
Designed and Built by



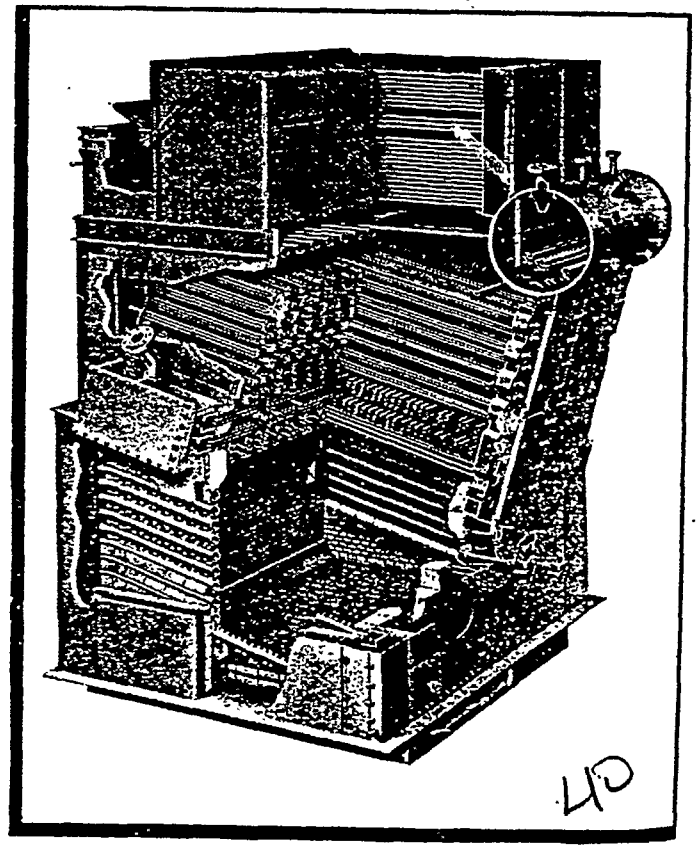
VICTORY



TANKER (T2-SE-A1)

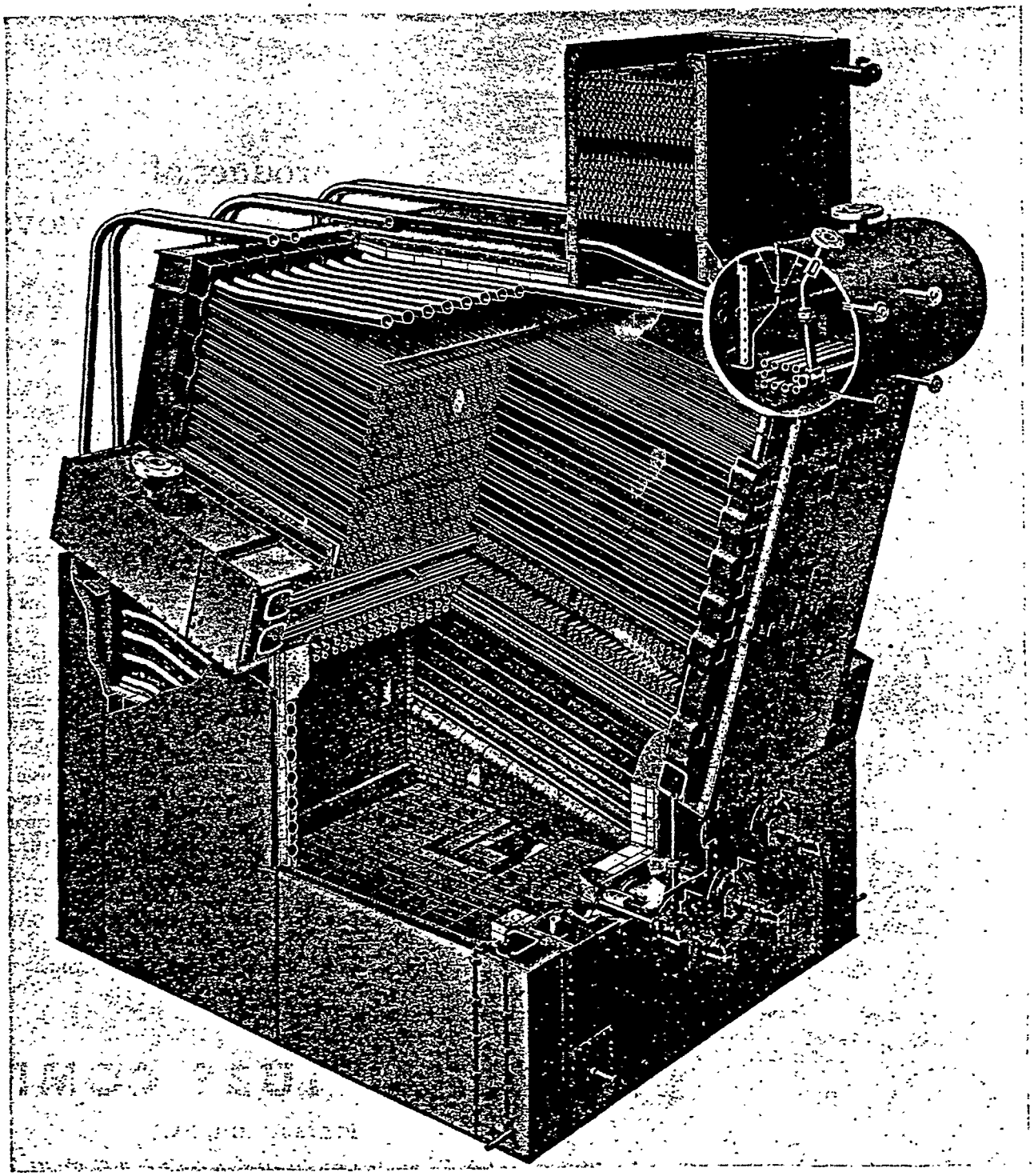


TANKER (T2-SE-A2)



C2 CARGO

April 1944



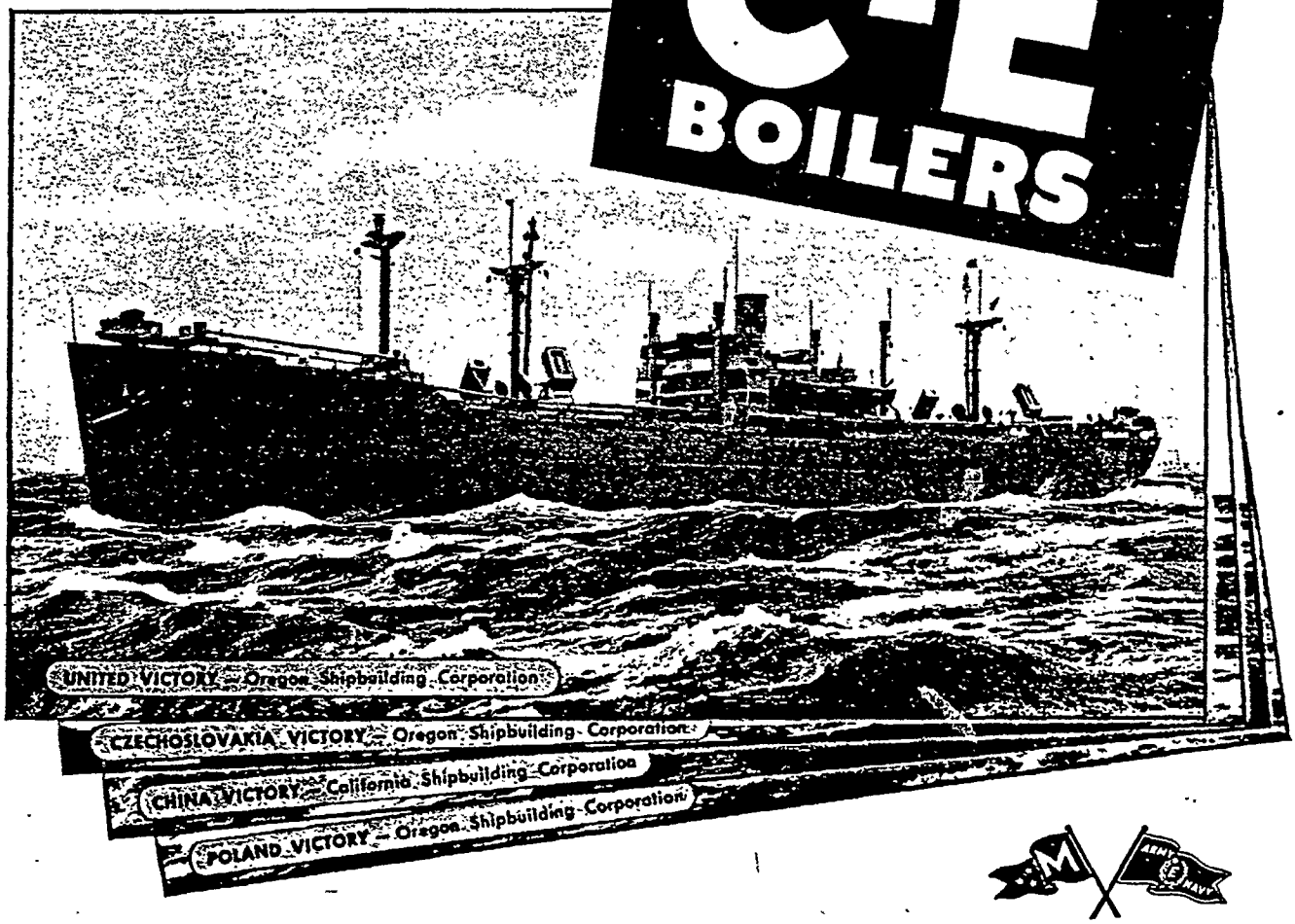
Victory Ship boiler as designed and constructed by C-E to operate at 465 psi and 750 F total steam temperature. Designed for exceptionally high efficiency.

38

April 1944

C-E BOILERS

United Victory is under charter to American President Lines



The greatest shipbuilding program ever undertaken has rounded the weather mark in its race against time. Speedier and more efficient than their predecessors, the famous Liberties, the new Victory Ships are joining the fleet.

The first four ships — all ahead of schedule — went down the ways with boilers designed and built by Combustion Engineering Company aboard.

Congratulations to the Portland Yard of the Oregon Shipbuilding Corporation and the Wilmington Yard of the California Shipbuilding Corporation for a real achievement in swinging over, quickly and smoothly, from the production of Liberties to building the larger, faster Victory Ships. The first of the new class — United Victory — was launched in but 55 days from the laying of her keel.

Here again is an amazing accomplishment to the credit of American production methods, not only in the shipyards but in the plants of hundreds of manufacturers who participated. As one of these — supplying a large percentage of the boilers for these ships — we are proud of the fact that even with the accelerated schedule, C-E boilers were on the job in every instance ready when the ships were prepared to receive them. A-786

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COMBUSTION ENGINEERING

200 MADISON AVENUE NEW YORK 16, N. Y.

February 1944



A scene at the awarding of the "Tanker Champs" Flag to Swan Island Shipyard. Left to right: John F. Bruns, Principal Hull Inspector, U. S. Maritime Commission; J. F. Reis, Administrative Manager of the Pacific Coast Kaiser Yards; Elmer Hann, General Superintendent of Swan Island Yard.

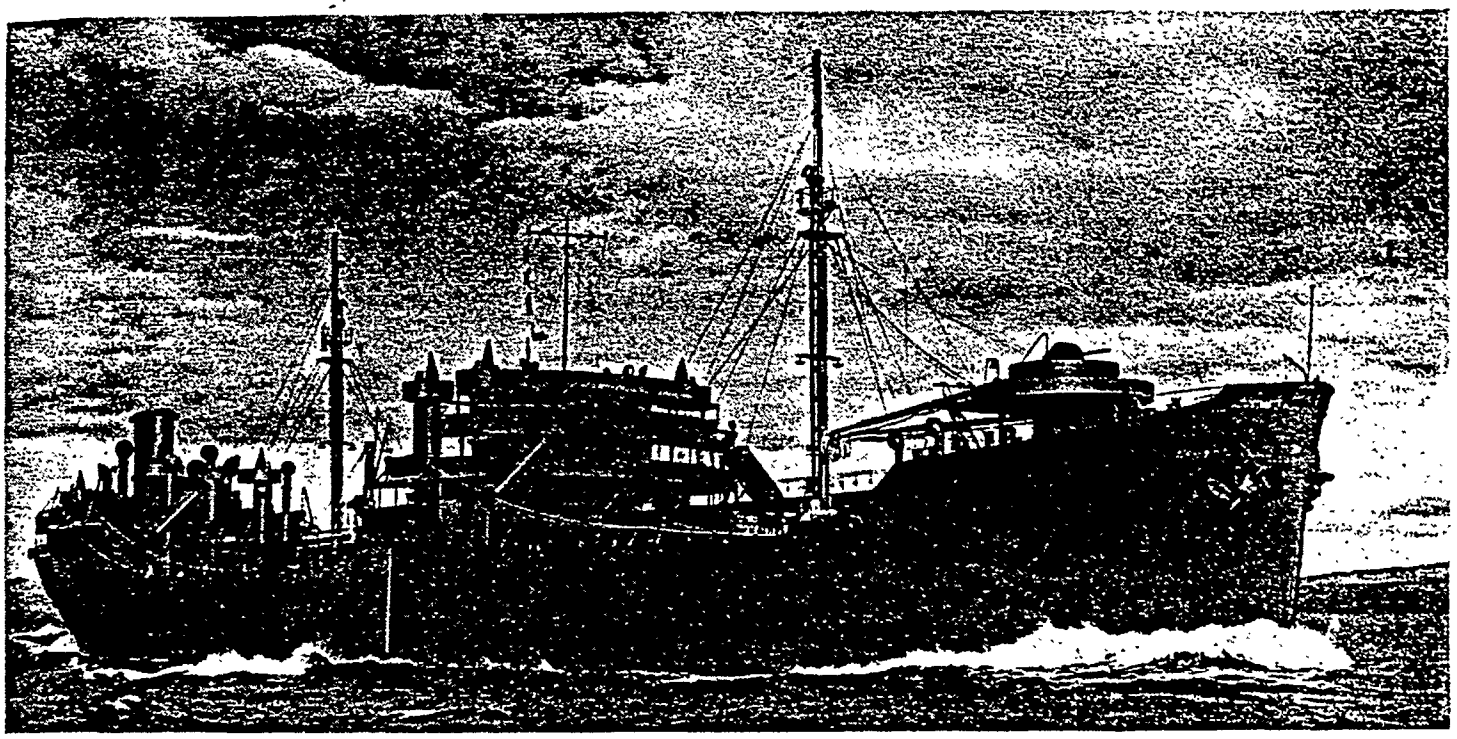
C-E COMBUSTION

36

Canadian Associates: **COMBUSTION ENGINEERING CORPORATION LIMITED, Montreal, Toronto, Winnipeg, Vancouver**

February 1944

"TANKER CHAMPS" TITLE



One of the big fleet of large fast tankers being built by Kaiser Company, Inc. at their Swan Island Yard — all powered by C-E Boilers.

FROM the flagstaff of Swan Island Shipyard of the Kaiser Company, Inc. there flies today the "Tanker Champs" pennant, newest award of the U. S. Maritime Commission. It is bestowed upon, or retained, each month by the yard which attains highest productivity of tankers in proportion to the number of ways operated. It was conferred for the first time last October and went to Swan Island for an outstanding record in September. Since then the pennant has been retained by this yard.

Certainly all the credit for this performance goes to the Kaiser management which inspired it and the men and women of the shipyard whose effort accomplished it. But to us it is a source of pride that all Swan Island tankers are powered by C-E Boilers and that boilers were on hand at all times to meet the yard's accelerated construction schedules. A 778

With the completion of present Maritime Commission contracts the merchant ships powered by C-E Boilers will total over 17,000,000 deadweight tons—nearly 1 ½ times America's entire pre-war merchant fleet.

ENGINEERING

200 MADISON AVENUE NEW YORK 16, N. Y.

37

July 1943

"the FACE that



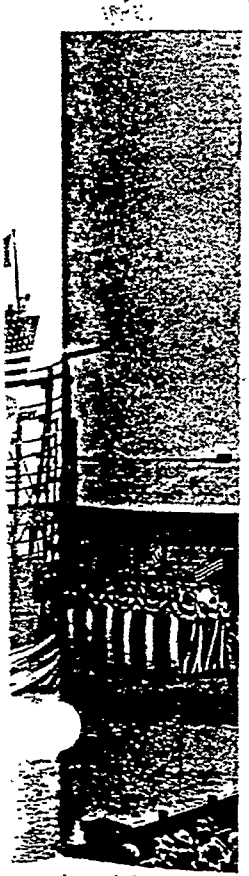
The Robert Lowry—1000th Liberty Ship—like hundreds of its predecessors is powered by C-E Boilers.

July 1943

at launched a thousand Ships" *

*1943 version

Today it is our own Miss Liberty who transforms into fact the legendary result of Helen of Troy's kidnapping which provoked the Greeks to launch a thousand ships against The Trojans.



July, 1943

★ Never in the world's history has so much of human values depended on the speed and success of a single maritime program. Never has any one industry exceeded the present accomplishments of America's shipyards. Their amazing achievement was dramatically emphasized by the recent launching of the 1000th Liberty Ship, the Robert Lowry, built by the Delta Shipbuilding Corporation and now being operated by the Standard Fruit and Steamship Company of New York.

The launching took place a mere 17 months after the first Liberty Ship was delivered in December, 1941. In that *month* two ships were completed. The current rate of construction is nearly 4 ships a *day*. Find your own words to describe this achievement.

It has been the privilege of Combustion Engineering to take a major role in building boilers for Liberty Ships. C-E shops have already delivered complete boilers for more than 600 of these ships and will continue to produce them at a high rate for many months to come. In addition to this, C-E is turning out partial assemblies — sectional headers, mud drums and superheater headers — for hundreds of Liberty Ship boilers being built by other manufacturers.

COMBUSTION ENGINEERING

200 MADISON AVENUE, NEW YORK, N. Y.

A-742

60

May 1943

FROM SHOP TO SEA

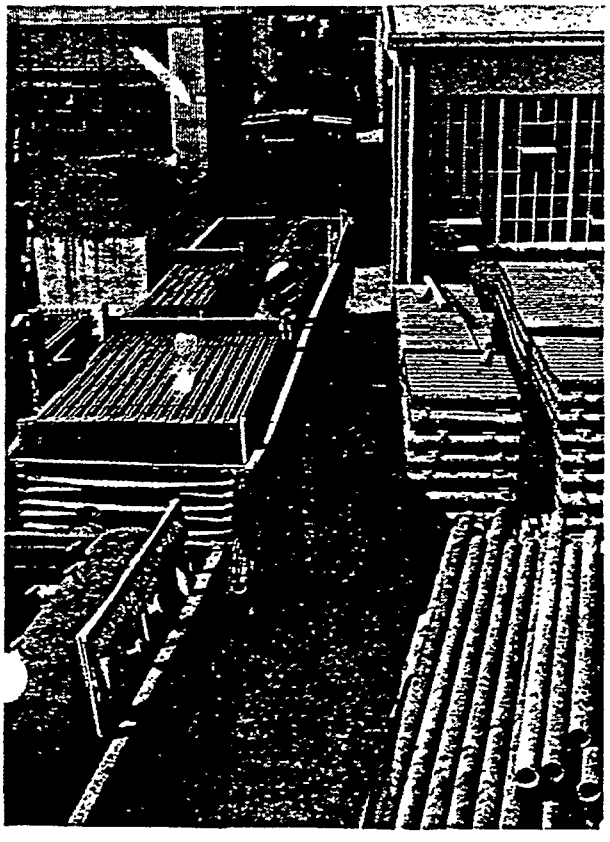
1 **Boiler drums . . . roll off a production line in continuous procession.**





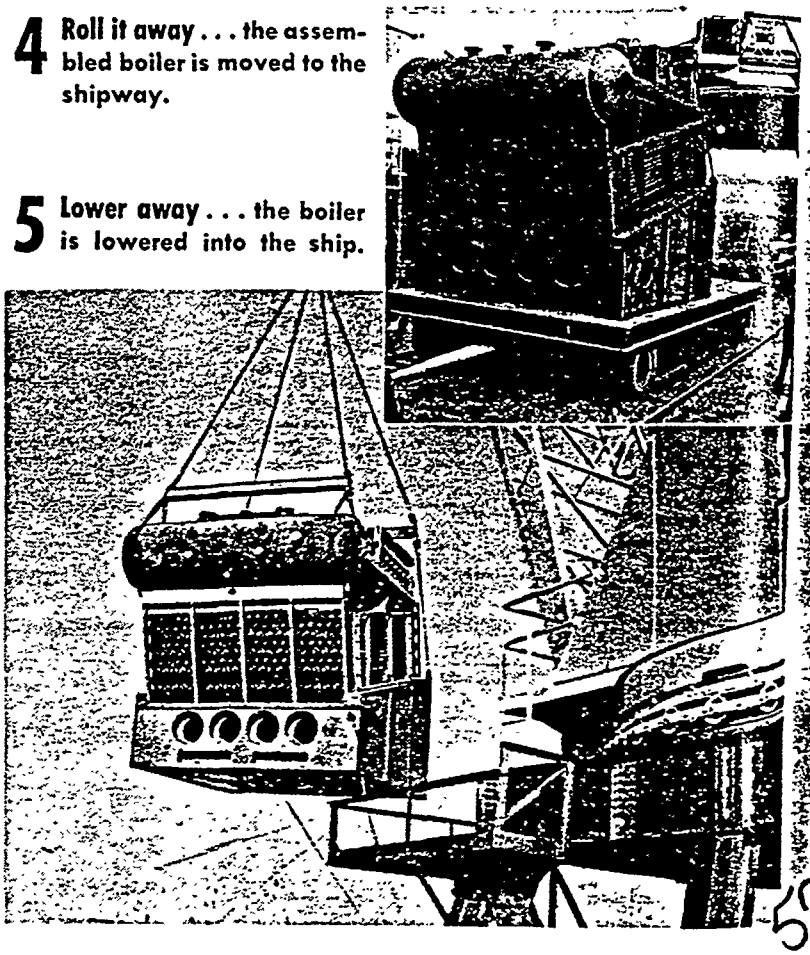
2 **Sinuous headers . . . as formed in the C-E Heade Forge Mill, are machined and sections are assembled to balance boiler drum production.**

3 **On their way . . . a string of railroad cars start the boilers toward some busy shipyard.**



4 **Roll it away . . . the assembled boiler is moved to the shipway.**

5 **Lower away . . . the boiler is lowered into the ship.**



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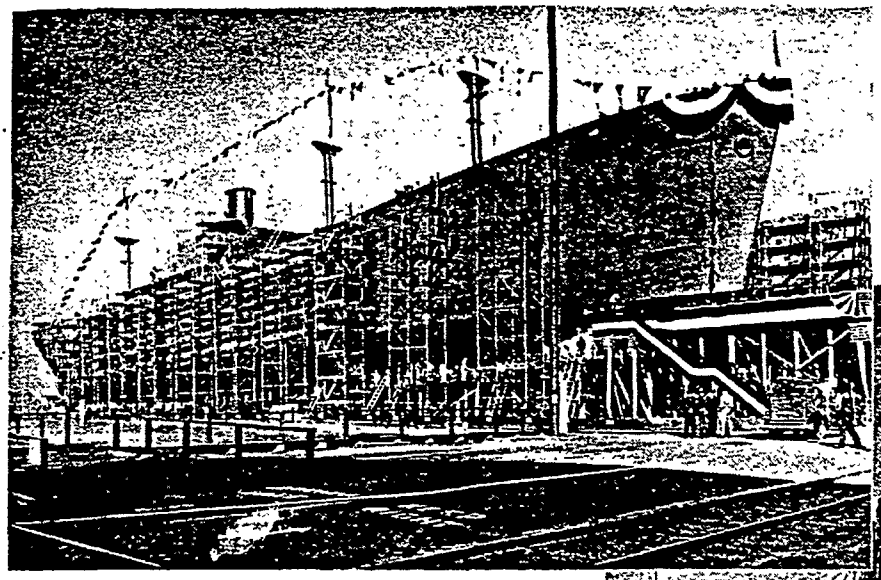
May 1943

A STEADY FLOW OF C-E BOILERS . . .

. . . for U. S. Maritime Commission Ships

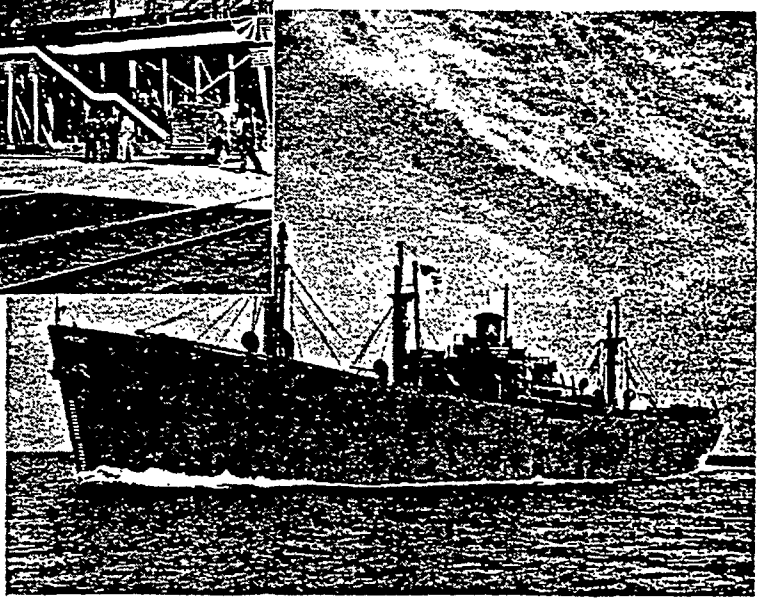


Header
assem-



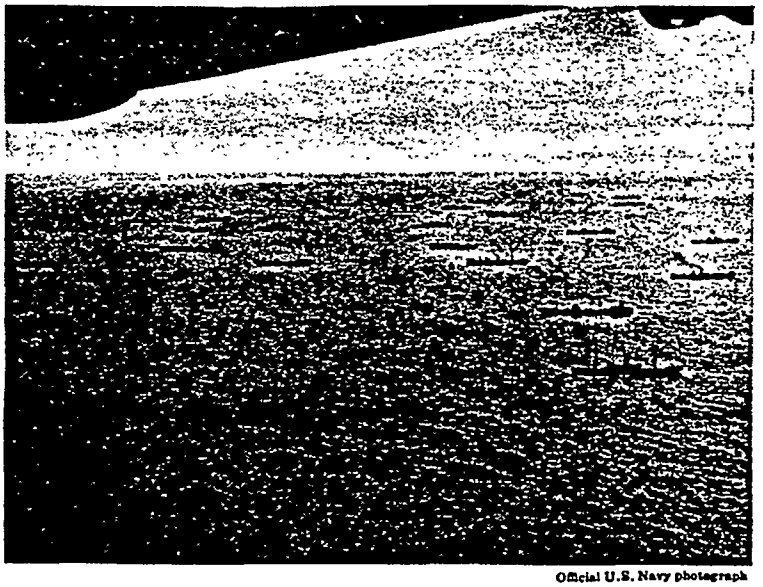
6 Launching day . . . the ship is ready for christening.

7 Full steam ahead . . . the boilers pass their tests on the trial trip and the ship is ready for service.



This pictorial report covers the high spots of the journey from *shop to sea* followed by hundreds of marine boilers being built today by Combustion Engineering. They are leaving C-E shops at a speed which, judged by pre-war practice in boiler manufacture, achieves the impossible. This rate of output is the result of multiple production methods especially developed for the present emergency in order to keep pace with the unprecedented shipbuilding program of the U. S. Maritime Commission.

8 Destination unknown . . . the ship joins her convoy.



Official U.S. Navy photograph





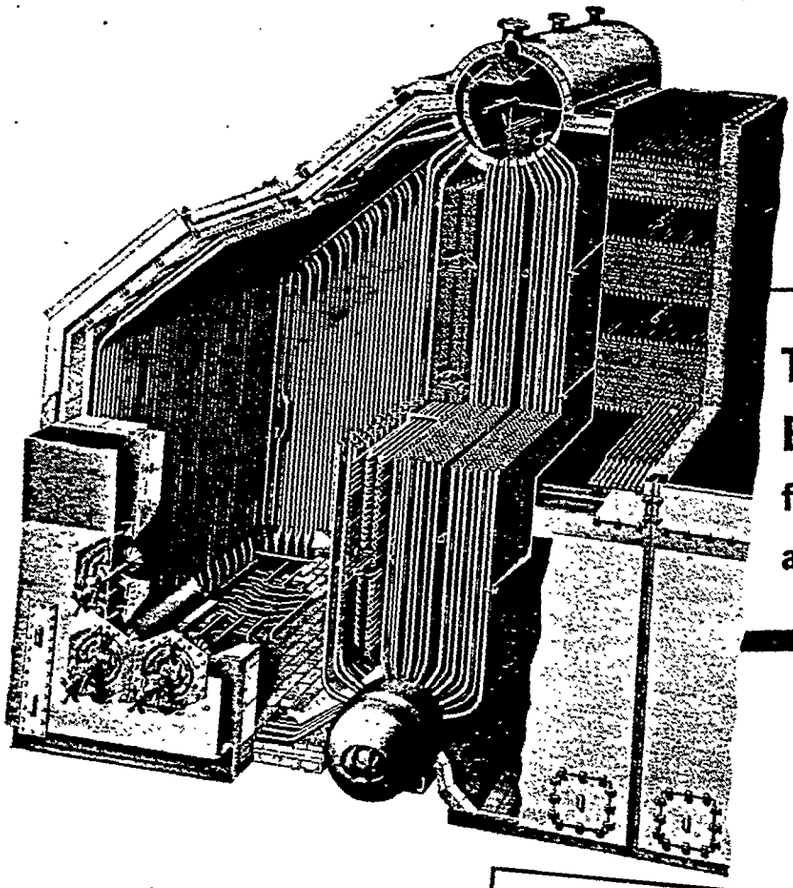
COMBUSTION ENGINEERING

200 MADISON AVENUE • NEW YORK, N.Y.

A-730

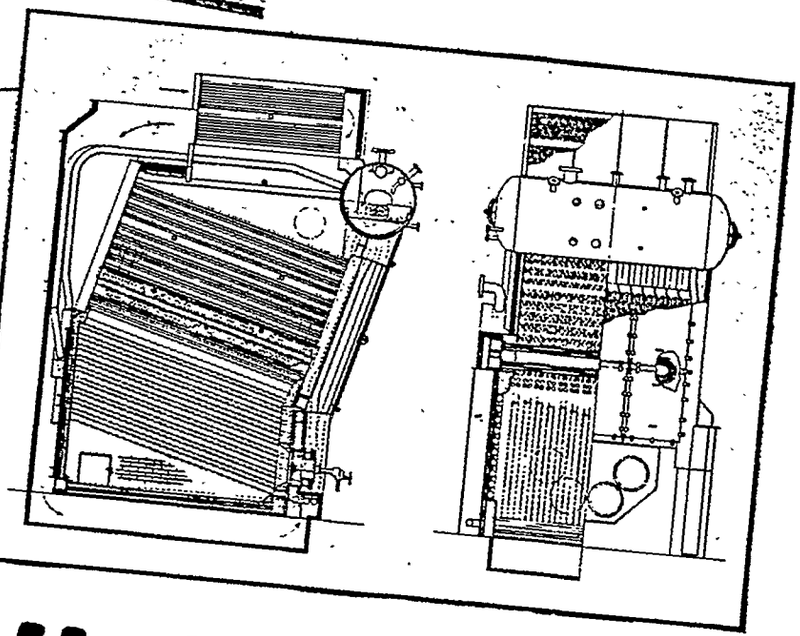
March 1943

C-E BOILERS TO POWER



TWO-DRUM, BENT-TUBE BOILER as supplied for the faster types of cargo and auxiliary vessels.

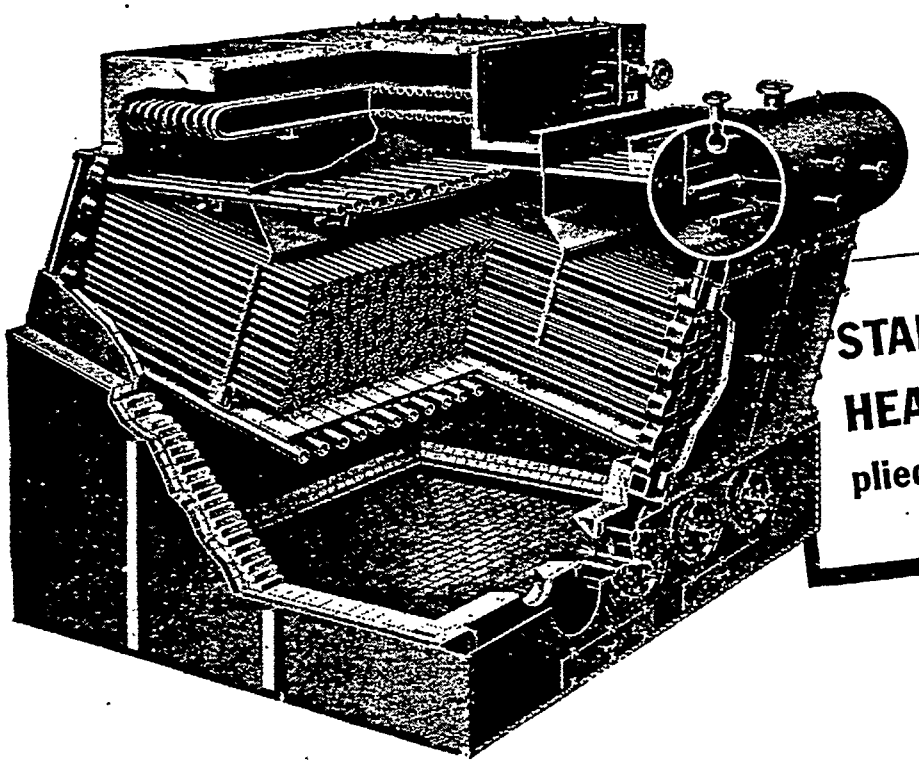
SECTIONAL HEADER BOILER as supplied for tankers.



COMBUSTION

March 1943

OUR BRIDGES OF SHIPS



STANDARD SECTIONAL HEADER BOILER as supplied for Liberty Ships.

In the vast shipbuilding program which is enabling America to make its might felt in every theater of this global war, Combustion Engineering has a leading role. For a very substantial percentage of the ships in the U. S. Maritime Commission's Emergency Program are powered by C-E Boilers.

These boilers are being turned out by streamlined, multiple production methods accelerated to keep pace with the remarkable performance of America's shipyards.

Of the complete line of C-E Marine Boilers, the three general designs illustrated here are of particular current interest, because of their widespread use on cargo and transport ships, tankers, ore carriers and important types of naval auxiliaries.

With the finest facilities available for the building of boilers plus the application of "know-how" that accrues from long experience, Combustion Engineering is able to provide efficient, dependable power for the bridges of ships which reach from the shores of America to every major theater of war.



A-713

COMBUSTION ENGINEERING

200 MADISON AVENUE, NEW YORK, N. Y.

56

November 1942

C-E marine boilers and

help Great Lakes ore carriers *speed up* vital war deliveries

● Continuing at a record-breaking pace, the ore carriers of the Great Lakes Fleet by September 1st of this year had delivered a full average year's quota of iron ore to speed up the war production program. The attainment of an all-time-high quota of 90,000,000 tons by the end of the season seems assured.

The modern steam generating and fuel burning equipment installed on many of the ore-carrying ships is contributing in no small measure to this record breaking result.

The vessels, here illustrated, are typical examples of today's ore-carrier fleet. These ships are equipped with C-E Marine Sectional Header Boilers and C-E Spreader Stokers. The fine performance records being established by these units are exemplified by recent test results. On tests of 8-hour duration made while running both light and loaded, overall efficiencies of from 84 to 85 per cent were obtained. Steam pressures and temperatures remained remarkably constant even while the ship was being maneuvered through locks and while docking.

Among the more important benefits that C-E Spreader Stokers bring to the Lake ships are:

1. Ability to handle a wide variety of coals with equal facility. This makes it possible to pick up coal wherever convenient without sacrificing operating results.
2. Ability to handle the load swings. The widely varying loads experienced while maneuvering in narrow waters and locks and the light intermittent loads in port are handled smoothly and easily.
3. Simplicity of operation. Helps to solve the personnel problems occasioned by limited man-power in the present emergency.
4. Clean and favorable fireroom conditions. Makes the fireman's job more desirable. Attracts capable personnel.
5. Low maintenance. Simple design and rugged construction with all moving parts outside the furnace assures a long life for the stoker mechanism. Accessibility encourages adequate inspection and attention.

The consistently favorable results obtained on the Lake vessels that have installed spreader stokers point the way to more economical operation and greatly improved performance for the many other coal-burning cargo ships not so equipped. For shipowners that may be planning to convert vessels from oil to coal, the advantages of spreader stoker firing should prove particularly attractive.

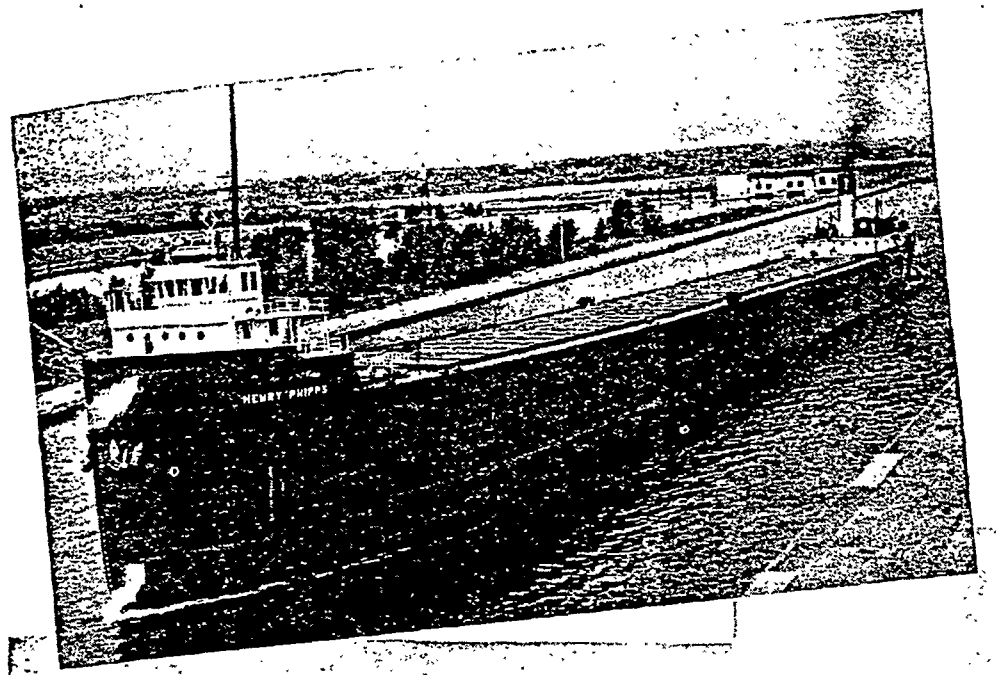
C-E Spreader Stokers are adaptable to most types of marine boilers. Send for catalog SS-2. C-E Marine Boilers are illustrated and described in catalog M-6.

COMBUSTION

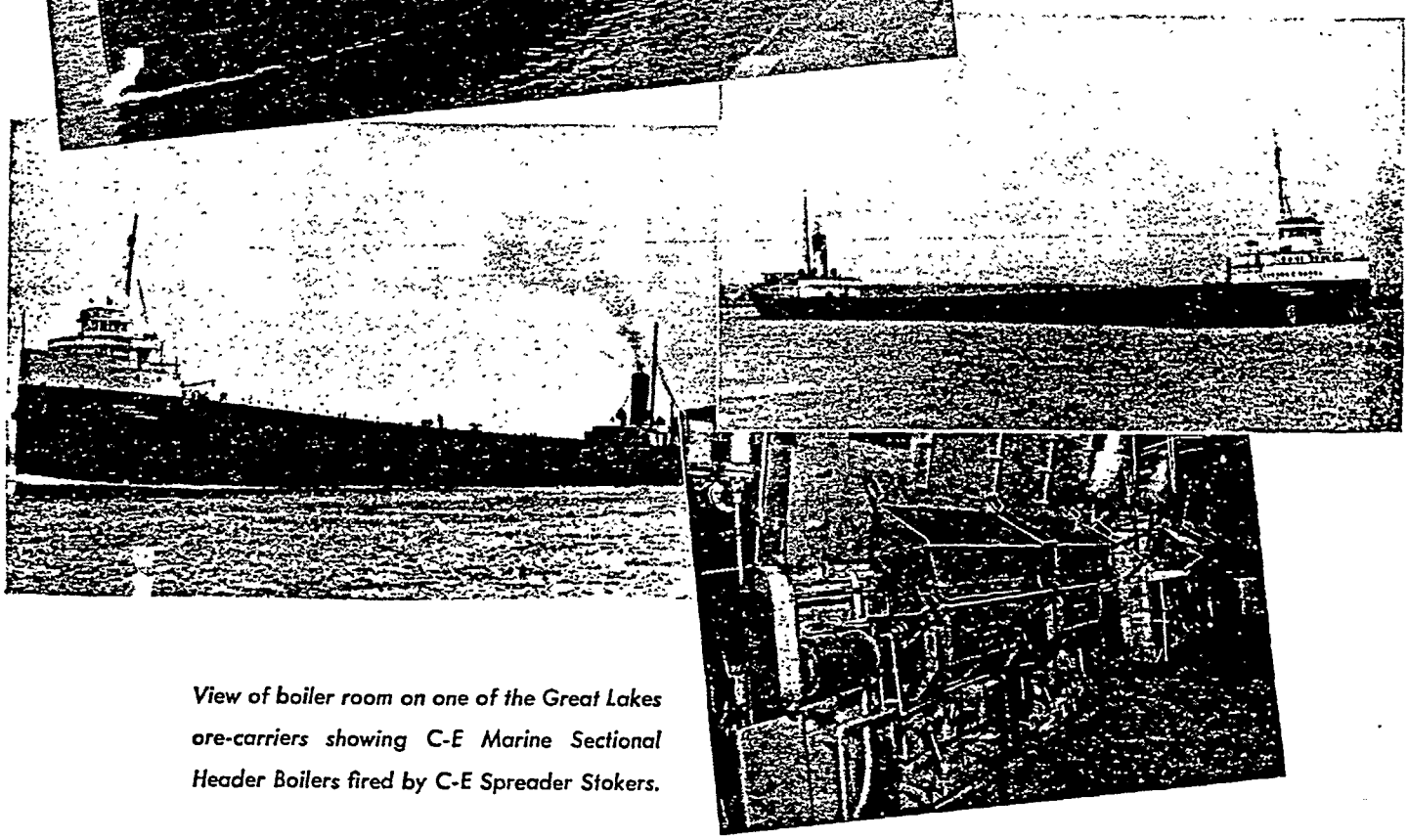
C-E PRODUCTS INCLUDE ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS, AND AIR HEATERS

November 1942

C-E spreader stokers....



The vessels pictured at the left and directly below are examples of ships of the Great Lakes ore-carrier fleet that have been modernized by the installation of C-E Marine Sectional Header Boilers and C-E Spreader Stokers.



View of boiler room on one of the Great Lakes ore-carriers showing C-E Marine Sectional Header Boilers fired by C-E Spreader Stokers.

A-692

ENGINEERING

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COMBUSTION ENGINEERING COMPANY, INC., 200 MADISON AVENUE, NEW YORK, N.Y. • CANADA: COMBUSTION ENGINEERING CORPORATION LTD MONTREAL

October 1942

because they "PASS THE



Nearly 3,000 employees accept the challenge of the Maritime "M" Award in presentation ceremony at Hedges-Walsh-Weidner Division of Combustion Engineering Co., Chattanooga, Tenn.

ADMIRAL EMORY S. LAND PRESENTS THE AWARD

Excerpts from address of the Chairman, U.S. Maritime Commission



"We are well on the way to realizing our objective of producing 2300 ships, 24,000,000 dead-weight tons, by the end of '43. I like to think of the eight or nine hundred plants throughout the United States contributing their share of equipment and material as ship-yards themselves. * * * Outstanding among these plants in this, your own Chattanooga, is the plant of the Combustion Engineering Company. Having contracted to produce between 35 and 40% of the complete boiler units requested for the entire ship building program of the Maritime Commission, you have a stupendous job on your hands. I know that you will do that job right on to victory with the same spirit you have shown in the past. The workers of the Combustion Engineering Company have a slogan that appeals to me tremendously—'pass the schedule—not the buck.' Believe me, that's a good one. I have memorized it and I am going to spread it around. I hope that you will make it a by-word in your daily work; yes, even a household phrase for the inspiration of your families and your friends. You, who have trained your minds to think in terms of what that slogan implies, have developed an objectivity which is priceless in our war effort. It means that you are not a lot of cogs in a machine turning out a product that is meaningless to you. It means that you are individual Americans, each making his skilled contribution to building our victory fleet. You will not 'pass the buck.' "

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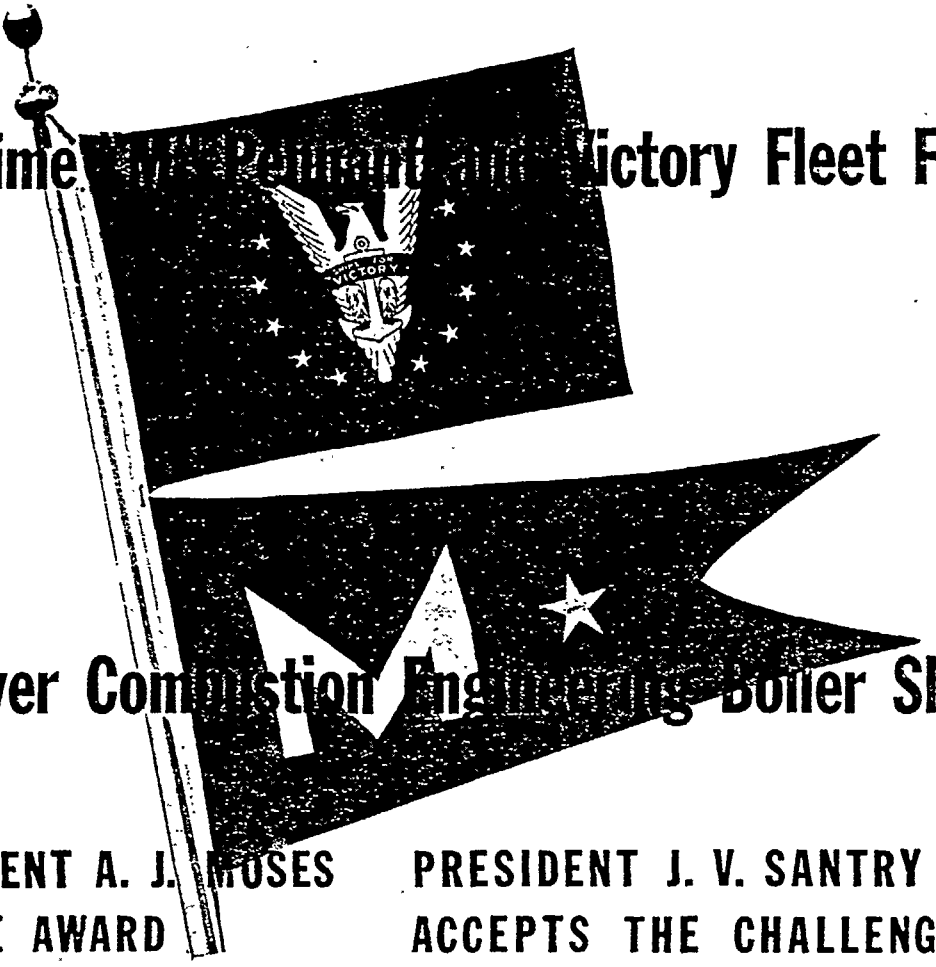
COMBUSTION

C-E PRODUCTS INCLUDE ALL TYPES OF BOILERS, FURNACES, PULVERIZED FUEL SYSTEMS AND STOKERS; ALSO SUPERHEATERS, ECONOMIZERS, AND AIR HEATERS

October 1942

SCHEDULE---not the buck"

The Maritime "M" Pennant and Victory Fleet Flag



Now fly over Combustion Engineering Boiler Shops

VICE PRESIDENT A. J. MOSES ACCEPTS THE AWARD

Excerpts from address of Vice President, Hedges-Walsh-Weidner Division, Combustion Engineering Co., Inc.

"When we think of the boilers we are building, we don't think of them merely as drums, headers and tubes, but rather as the source of power that will carry American ships—the VICTORY FLEET—through the seven seas with the supplies and equipment needed to bring utter defeat to Hitler and the Axis powers. Because this is our conception of our job, we are *not* going to regard our achievements in the past as a measure of what we shall do in the future. *We are determined to better those achievements.* * * * I can assure you, Admiral Land, that I reflect the spirit of the men in this organization when I say that we will let nothing stop us from *earning* the right to keep that "M" Pennant flying over our plant until the Battle is won."



PRESIDENT J. V. SANTRY ACCEPTS THE CHALLENGE

Excerpts from address of the President, Combustion Engineering Co., Inc.

"We are a long way from where they float ships, but Chattanooga is in the marine business and a very definite part of the maritime industry of this country. * * * It is my duty to acknowledge Admiral Land's challenge. There is no question in my mind about accepting this challenge. * * * You men have done a marvelous job to date and you are only starting, and I know that all Admiral Land need do is ask us for things that are possible and that you men will do them. We appreciate, Admiral, that the added responsibility of these honors is something that we must guard very, very carefully. We intend to guard these honors and we know that six months from now you or your representative will be back here to give us the star that will go on our flag."



ENGINEERING

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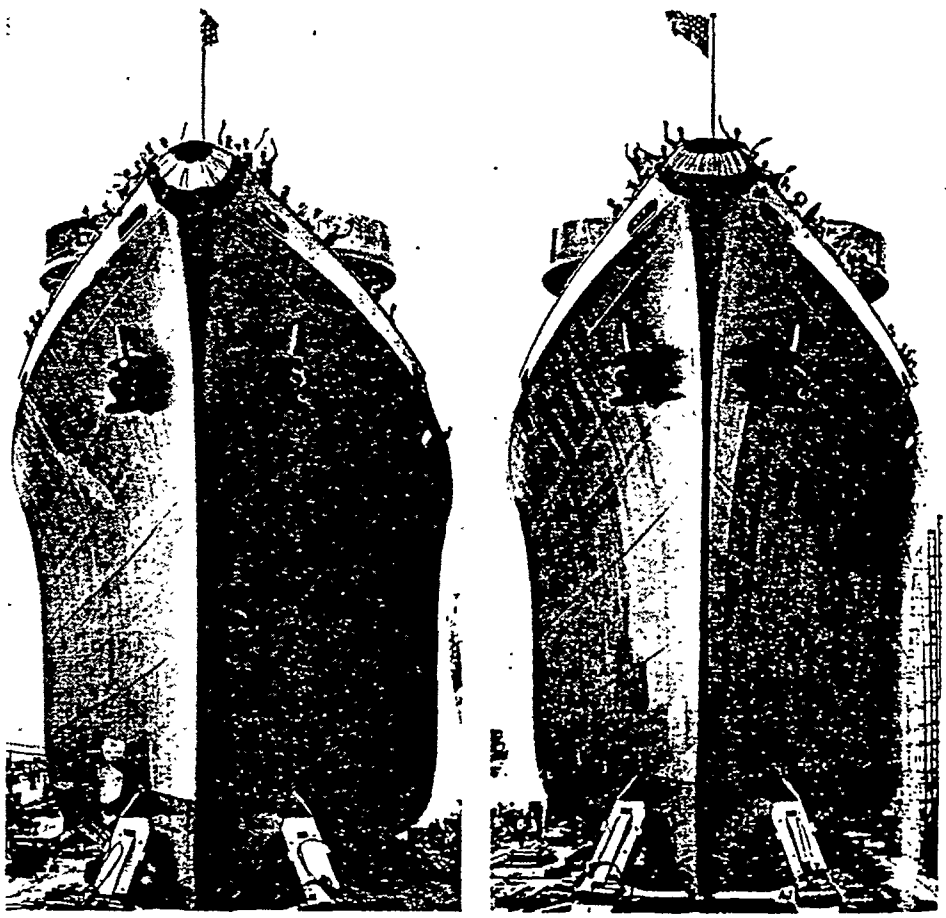
COMBUSTION ENGINEERING COMPANY, INC., 200 MADISON AVENUE, NEW YORK, N.Y. • CANADA: COMBUSTION ENGINEERING CORPORATION, LTD., MONTREAL

August 1942

C-E boilers



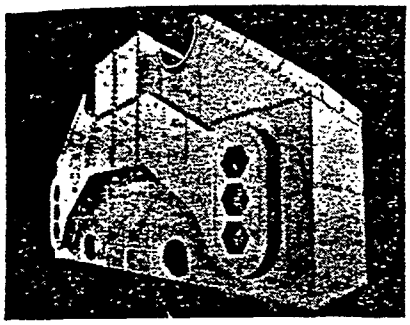
The Santa Cecilia and Santa Margarita as they were simultaneously launched at Kearny, New Jersey, by the Federal Shipbuilding and Dry Dock Company, a United States Steel Corporation subsidiary. They were built for the U. S. Maritime Commission and are scheduled to be transferred to the Grace Line upon completion.

Photo—Press Association Inc.

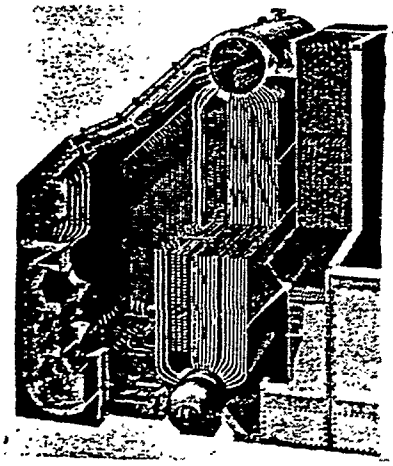
48

August 1942

for C-2 vessels



The assembled outer steel casing shows how duplicate V2-M Marine Steam Generators are set side by side with a common partition wall between them on C-2 Maritime Commission vessels to provide an unusually compact installation.



The modern V2-M Marine Steam Generator, equipped with completely water-cooled furnace, superheater, economizer and air heater provides high-efficiency steam generation for the Santa Cecilia, Santa Margarita and numerous other Maritime Commission vessels now under construction.

The recent double launching of the Santa Cecilia and Santa Margarita is another example of the important participation of Combustion Engineering in America's expanded shipbuilding program. These ships are being built by the Federal Shipbuilding and Drydock Company and are the first of a group of 16 C-2 cargo carriers to be equipped with C-E Boilers. They are being constructed for the U. S. Maritime Commission and are scheduled for transfer to the Grace Line when completed. Each of the vessels will have two Combustion Engineering V2-M Marine Steam Generators which will supply steam at 465 lb and 765 F to a 6000 hp geared steam turbine. Each unit has a maximum capacity of 40,000 lb of steam per hr.

These are standard Maritime Commission vessels of a type which a few years ago established a world's record for economy in fuel consumption.

For these new C-2 cargo vessels, V2-M Marine Steam Generators will provide the modern design features which are required to maintain such high-efficiency performance.

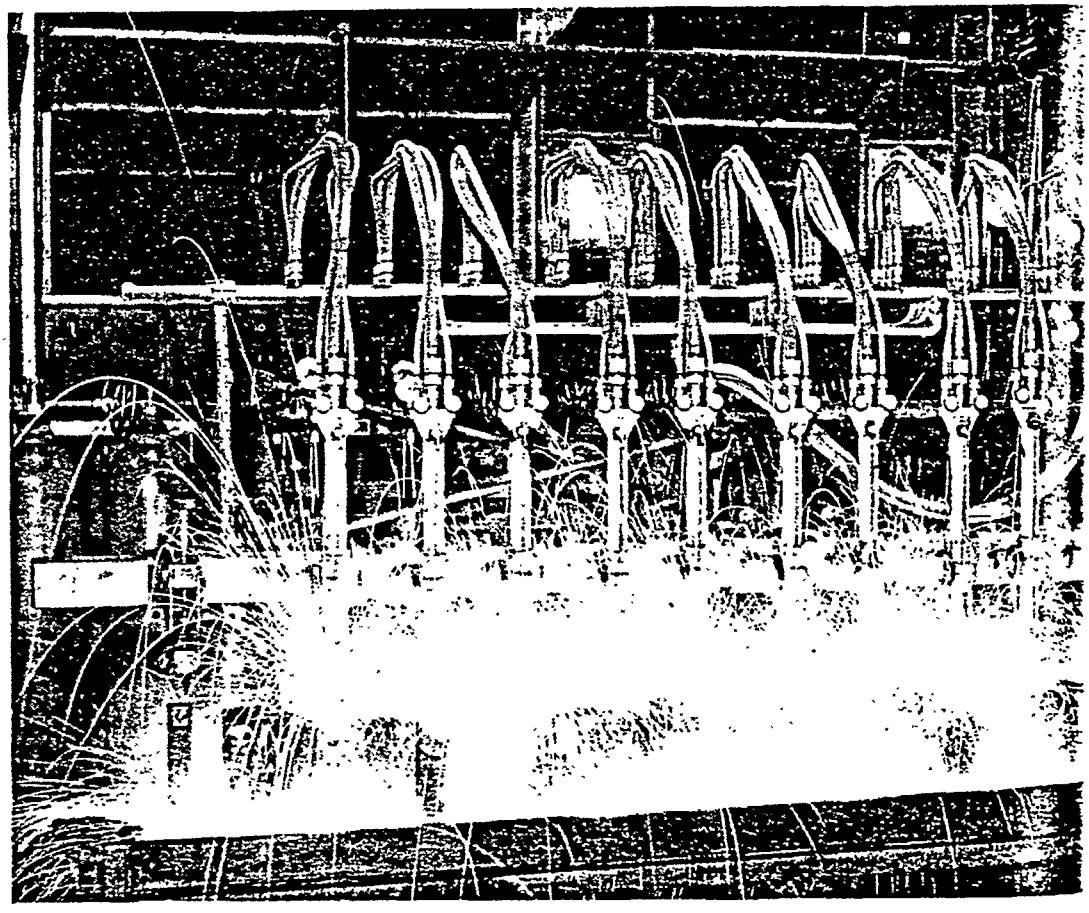
A-677-A

COMBUSTION ENGINEERING

200 Madison Avenue, New York, N. Y.

July 1942

20 times as many

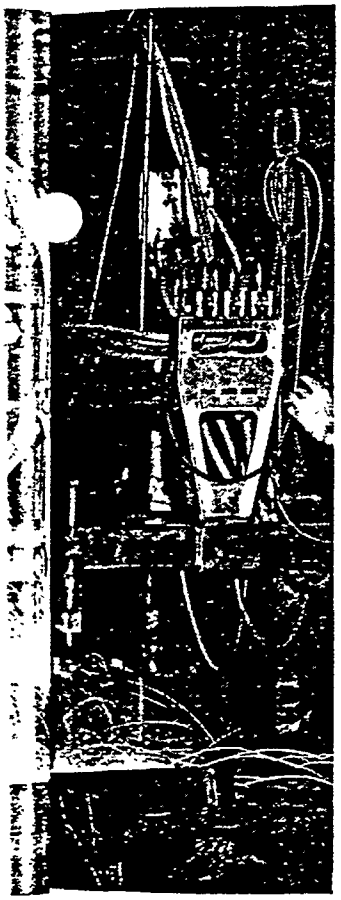


COMBUSTION

50

July 1942

boilers a month...



for Liberty Ships

produced by C-E multiple production methods

Since July of 1941, C-E production capacity for Liberty Ship boilers has been multiplied again and again. By September of this year it will reach a rate 20 times as great as in July of last year.

Newly developed machines, improved production methods, new buildings, streamlined plant layout and large additions to existing machinery have all been combined in an unceasing effort which today is achieving a speed of production which only a year ago would have been considered impossible.

Typical of new time-saving methods is the 10-torch oxygraph illustrated, which flame-cuts all the handhole openings in a sectional header simultaneously and with such precision that relatively little machining is required. This oxygraph, designed in collaboration with C-E engineers and placed in service nearly a year ago, was the first of its kind and capacity to be developed in this country.

Thus has American industry *in all fields* mobilized its men, machines and talents to meet its greatest challenge. Thus is American "Free Enterprise" playing a major role in preserving the free institutions to which it is inseparably linked.

ENGINEERING

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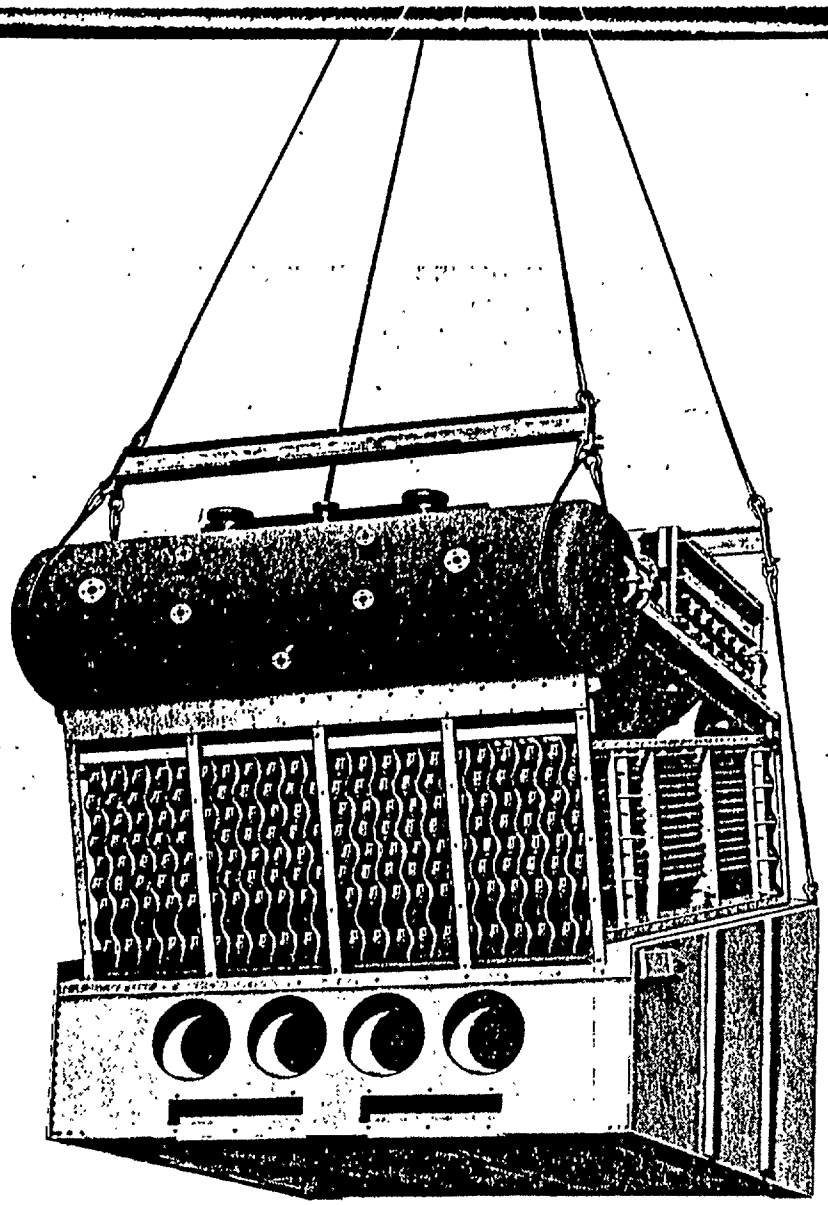

EXPERIENCE gained by Combustion Engineering Company in years of building Sectional Header boilers and

SPEED of its plants equipped for ***Multiple Production*** are playing an indispensable part in the urgent speed-up of the LIBERTY ship program.

COMBUSTION ENGINEERING

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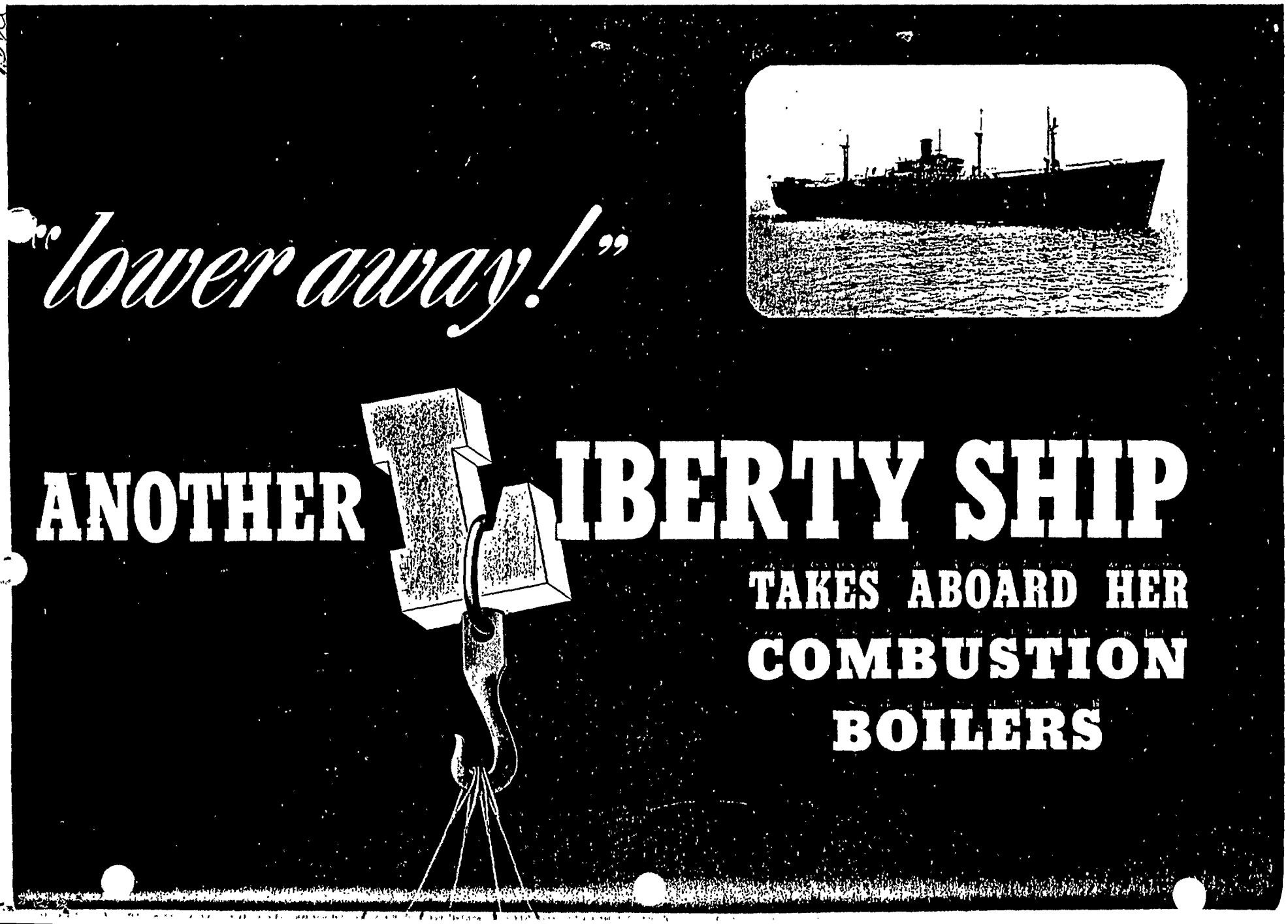
A-652


"lower away!"
ANOTHER LIBERTY SHIP
TAKES ABOARD HER
COMBUSTION
BOILERS