

REPORT ON MACHINERY.

No. 4980

Received at London Office 4 MAY 1925

Writing Report MAR 31 1925 When handed in at Local Office MAR 31 1925 Port of PHILADELPHIA

Survey held at CHESTER, PA.

Date, First Survey FEB 19 1923 Last Survey MAR 31 1925.

Book 8 on the STEEL S.S. "BETTERTON"

(Number of Visits 18.)

Tons } Gross 7366
Net 4504.
When built 1920.

Built at BALTIMORE. By whom built BALTIMORE D.D. & S.B. CO.

Machinery made at HAMILTON, OHIO By whom made HOOVEN OWENS & KRENTSCHELER when made 1923.

Machinery made at BALTIMORE, MD. By whom made BALTIMORE D.D. & S.B. CO. when made 1920.

Registered Horse Power

Owners ASSOCIATED OIL CO.

Port belonging to SAN FRANCISCO

Horse Power as per Section 28 536 Is Refrigerating Machinery fitted for cargo purposes NO Is Electric Light fitted YES

MACHINERY, &c.—Description of Engines TRIPLE EXPANSION VERTICAL. No. of Cylinders 3. No. of Cranks 3

Diameter of Cylinders 24 1/2" 41 1/2" 72" Length of Stroke 48" Revs. per minute 80 Dia. of Screw shaft as per rule 14 3/4" Material of STEEL

Screw shaft fitted with a continuous liner the whole length of the stern tube YES Is the after end of the liner made water tight

Propeller boss YES If the liner is in more than one length are the joints burned — If the liner does not fit tightly at the part

Between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive — If two

Shafts are fitted, is the shaft lapped or protected between the liners — Length of stern bush 4'-8 1/2"

Dia. of Crank shaft journals as per rule 13.75" Dia. of Crank pin 14 3/8" Size of Crank webs 9 1/2" x 27" Dia. of thrust shaft under

Shafts 13.96" Dia. of screw 17'-9" Pitch of Screw 14'-6" No. of Blades 4 State whether moveable YES Total surface 91.65

No. of Feed pumps 2 Diameter of ditto 5" Stroke 21" Can one be overhauled while the other is at work YES.

No. of Bilge pumps — Diameter of ditto — Stroke — Can one be overhauled while the other is at work —

No. of Donkey Engines 10. Sizes of Pumps TWO INDEPENDENT No. and size of Suctions connected to both Bilge and Donkey pumps

Engine Room 2 @ 6" 1 @ 4" FEED PUMPS 12" x 8" x 14" BALLAST PUMP 10" x 12" x 12" DUPLEX

SANITARY 6" x 5 1/4" In Holds, &c. FIRE PUMP 7 1/2" x 7" x 10" DUPLEX

Bilge Injections 1 sizes 10" Connected to condenser, or to circulating pump YES Is a separate Donkey Suction fitted in Engine room & size YES 4"

All the bilge suction pipes fitted with roses YES Are the roses in Engine room always accessible YES Are the sluices on Engine room bulkheads always accessible —

All connections with the sea direct on the skin of the ship YES. Are they Valves or Cocks VALVES.

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates YES. Are the Discharge Pipes above or below the deep water line ABOVE.

Are they each fitted with a Discharge Valve always accessible on the plating of the vessel YES. Are the Blow Off Cocks fitted with a spigot and brass covering plate YES.

Are the pipes carried through the bunkers NONE. How are they protected —

All Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times YES.

Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges YES.

Screw Shaft Tunnel watertight NONE. Is it fitted with a watertight door — worked from —

MATERIALS, &c.—(Letter for record YES) Manufacturers of Steel

Heating Surface of Boilers 7926 Is Forced Draft fitted YES No. and Description of Boilers THREE MULTITUBULAR.

Working Pressure 200 lbs. Tested by hydraulic pressure to — Date of test — No. of Certificate —

Can each boiler be worked separately YES. Area of fire grate in each boiler 67.5

Boiler TWO SPRING LOADED Area of each valve 9.621 Pressure to which they are adjusted 200 lbs. Are they fitted with easing gear YES.

Least distance between boilers or uptakes and bunkers 8'-0" Mean dia. of boilers 15'-4 9/16" Length 11'-5 3/4" Material of shell plates STEEL.

Tensile strength 19 1/16" Range of tensile strength 58000-73000 Are the shell plates welded or flanged NO. Descrip. of riveting: cir. seams D.R. LAP

Seams D.B. STRAPS Diameter of rivet holes in long. seams 1 9/16" Pitch of rivets 10 3/16" Lap of plates or width of butt straps 22"

Proportions of strength of longitudinal joint rivets 100.3 plate 84.65 Working pressure of shell by rules 208 Size of manhole in shell 12" x 16"

Compensating ring FLANGED No. and Description of Furnaces in each boiler THREE. CORR. Material STEEL. Outside diameter 3'-10 1/4"

Thickness of plain part top — bottom — Thickness of plates crown 5" bottom 3 1/8" Description of longitudinal joint WELDED. No. of strengthening rings —

Working pressure of furnace by the rules 197 Combustion chamber plates: Material STEEL Thickness: Sides 11/16" Back 11/16" Top 11/16" Bottom 7/8"

Pitch of stays to ditto: Sides 8" x 7" Back 7 1/2" x 7 1/2" Top 8 3/4" x 8 3/4" If stays are fitted with nuts or riveted heads RIVETED. Working pressure by rules 195

Material of stays IRON Area at smallest part 15 1/8" Area supported by each stay 64 Working pressure by rules 239 End plates in steam space:

Material STEEL Thickness 1 3/16" Pitch of stays 17 3/4" x 17 1/2" How are stays secured DO. NUTS. Working pressure by rules 227. Material of stays STEEL

Area at smallest part 3 1/8" Area supported by each stay 311 Working pressure by rules 225 Material of Front plates at bottom STEEL

Material of Lower back plate STEEL Thickness 3/4" Greatest pitch of stays 16" x 15" Working pressure of plate by rules 200

Pitch of tubes 3" Pitch of tubes 4 1/4" x 4" Material of tube plates STEEL Thickness: Front 3/4" Back 3/4" Mean pitch of stays 8 1/2" x 8"

Working pressures by rules 295 Girders to Chamber tops: Material STEEL Depth and

Pitch of girder at centre 10" x 1 3/4" Length as per rule 34" Distance apart 8 3/4" Number and pitch of stays in each 3-8"

Working pressure by rules 191 Steam dome: description of joint to shell NONE. % of strength of joint —

Thickness of shell plates — Material — Description of longitudinal joint — Diam. of rivet holes —

Working pressure of shell by rules — Crown plates — Thickness — How stayed —

SUPERHEATER. Type FOSTER. Date of Approval of Plan — Tested by Hydraulic Pressure to —

Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler YES.

Pressure to which each is adjusted 210 lbs. Is Easing Gear fitted YES.

IS A DONKEY BOILER FITTED? No.

If so, is a report now forwarded? —

SPARE GEAR. State the articles supplied:—

TWO TOP END BOLTS & NUTS. TWO BOTTOM END BOLTS & NUTS. CRANK SHAFT COUPLING BOLTS & NUTS. TWO MAIN BEARING BOLTS & NUTS. SET OF RINGS & SPRINGS FOR H.P. I.P. & L.P. PISTONS. SET OF VALVES FOR AIR & BILGE PUMPS. CRANK PIN & CROSSHEAD BUSHES. PISTON FOLLOWER STUDS. CYLINDER COVER & VALVE CHEST COVER STUDS. RELIEF VALVE SPRINGS. SPARE PARTS FOR FEED PUMPS. ETC. IRON OF VARIOUS SIZES. ASSORTED BOLTS & NUTS.

The foregoing is a correct description,

(Sgd.) *Hooven Ruess & Rentschler.*

Manufacturer.

Dates of Survey while building
During progress of work in shops -- 1923. FEB. 19, 20, APR. 3, 4.
During erection on board vessel -- 1925. FEB. 9, 12, 20, 27, MAR. 3, 5, 6, 17, 19, 21, 24, 26, 27, 31.
Total No. of visits 18.

Is the approved plan of main boiler forwarded herewith YES.

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Dates of Examination of principal parts—Cylinders 3-4-4-23 Slides 3-4-4-23 Covers 3-4-4-23 Pistons 3-4-4-23 Rods 2-4-4-23
Connecting rods 3-4-4-23 Crank shaft 19-20-2-23 Thrust shaft 26-3-25 ^{INT.} Tunnel shafts 26-3-25 Screw shaft 6-3-25 Propeller 19-3-25
Stern tube — Steam pipes tested 17-3-25 Engine and boiler seatings 9-2-25 Engines holding down bolts 20-2-25
Completion of pumping arrangements — Boilers fixed — Engines tried under steam 26-3-25
Completion of fitting sea connections — Stern tube — Screw shaft and propeller 19-3-25
Main boiler safety valves adjusted 27-3-25 Thickness of adjusting washers — (A.B.S. NOS)
Material of Crank shaft STEEL Identification Mark on Do. S. Material of Thrust shaft STEEL Identification Mark on Do. H.G. 1-4
Material of ^{INT.} Tunnel shaft STEEL Identification Marks on Do. 3-4-25 (A.B.S.) Material of Screw shafts STEEL Identification Marks on Do. 4708-3
Material of Steam Pipes STEEL. Test pressure 600 lbs.

Is an installation fitted for burning oil fuel YES.

Is the flash point of the oil to be used over 150°F. YES.

Have the requirements of Section 49 of the Rules been complied with YES.

Is this machinery duplicate of a previous case YES. If so, state name of vessel (No 4516) *Bidwell*.

General Remarks (State quality of workmanship, opinions as to class, &c.)

"THESE ENGINES WERE ORIGINALLY BUILT UNDER THE SUPERVISION OF THE AMERICAN BUREAU OF SHIPPING FOR THE U.S. EMERGENCY FLEET CORP. SUBSEQUENTLY BEING PLACED IN STORAGE."
"THEY HAVE BEEN NOW PARTLY RECONSTRUCTED AND REASSEMBLED, THE MATERIALS AND WORKMANSHIP, SO FAR AS CAN BE SEEN ARE SOUND AND EFFICIENT. WHEN THE ENGINES HAVE BEEN SATISFACTORILY FITTED IN THE VESSEL, PROVED TO BE IN ORDER WHEN TRIED OUT UNDER WORKING CONDITIONS & SPARE GEAR SUPPLIED TO RULE REQUIREMENTS; THIS VESSEL WILL BE ELIGIBLE, IN MY OPINION FOR RECORD OF LMC (WITH DATE THE MACHINERY HAS BEEN FITTED ON BOARD IN A SATISFACTORY MANNER. THE BOILERS WERE EXAMINED THROUGHOUT TOGETHER WITH THEIR SAFETY VALVES & OTHER MOUNTINGS AND SAFETY VALVES ADJUSTED UNDER STEAM. ALL SEA CONNECTIONS & FASTENINGS, PROPELLER & STERN BUSH FASTENINGS EXAMINED & FOUND GOOD. THE ENGINES WERE TRIED UNDER FULL WORKING CONDITIONS AND FOUND SATISFACTORY IN OUR OPINION, IT IS ELIGIBLE FOR THE RECORD N.E. 3-25 and LMC 3-25 AND TAIL SHAFT NEW 3-25

Sec Cleveland Rpt. W. 294.

The amount of Entry Fee ... £ : :
Special ... \$ 300.00 : :
Donkey Boiler Fee ... £ : :
Travelling Expenses (if any) \$ 15.00 : :
When applied for, 19
When received, 19

(Sgd.) *J. G. Drummond.*

Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute NEW YORK APR 2 1 1925

Assigned

+N.E. 25. LMC 3-25. T.S. N. 3-25 (C.L.)

CERTIFICATE WRITTEN
16.10.25

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Foundation