

# REPORT ON MACHINERY

No. 11594  
W.F.D. 6.11.1923

Received at London Office

Date of writing Report 19 When handed in at Local Office 2.6.23 19 Port of MIDDLESBROUGH

No. in Survey held at South Bank, Middlesbrough Date, First Survey 20th February Last Survey 24th May 1923  
Reg. Book. on the Single Screw Steel S.S. "DONALD STEWART" (Number of Visits 28)

Master Built at South Bank, Middlesbrough. By whom built Smith's Dock Co. Ltd. (Ship No 779) Tons Gross Net When built 1923.

Engines made at South Bank, Middlesbrough. By whom made Smith's Dock Co. Ltd. (Eng. No 235) when made 1923.

Boilers made at Newcastle-on-Tyne By whom made R & W. Hawthorn Leslie & Co when made 1923.

Registered Horse Power 179 Owners J. F. M. Stewart Port belonging to Middlesbrough

Nom. Horse Power as per Section 28 179 Is Refrigerating Machinery fitted for cargo purposes No. Is Electric Light fitted Yes.

**ENGINES, &c.**—Description of Engines Inverted Triple Expansion No. of Cylinders 3 No. of Cranks 3

Dia. of Cylinders 16", 26", 44" Length of Stroke 33" Revs. per minute 85 Dia. of Screw shaft as per rule 9.55" Material of screw shaft S.M.I. Steel as fitted 9.7" Dia. of Crank pin 8 13/16" Size of Crank webs 5 1/2" x 4 1/2" Dia. of thrust shaft under collars 8 13/16" Dia. of screw 12'-0" Pitch of Screw 11'-6" No. of Blades 4 State whether moveable Yes Total surface 55 sq ft

Is the 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 in the propeller boss Yes If the liner is in more than one length are the joints burned Yes 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 Yes If two liners are fitted, is the shaft lapped or protected between the liners Yes Length of stern bush 3'-7"

Dia. of Tunnel shaft as per rule 8.35" Dia. of Crank shaft journals as per rule 8.741" Dia. of Crank pin 8 13/16" Size of Crank webs 5 1/2" x 4 1/2" Dia. of thrust shaft under collars 8 13/16" Dia. of screw 12'-0" Pitch of Screw 11'-6" No. of Blades 4 State whether moveable Yes Total surface 55 sq ft

No. of Feed pumps 2 Diameter of ditto 2 3/4" Stroke 1'-4 1/2" Can one be overhauled while the other is at work Yes

No. of Bilge pumps 2 Diameter of ditto 2 3/4" Stroke 1'-4 1/2" Can one be overhauled while the other is at work Yes

No. of Donkey Engines 2 Sizes of Pumps FEED 6" x 4" x 6" VERT. No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room 3 @ 4" each. In Holds, &c. Nos Hold, 4" to each of Port and Starbd.

No. 2 Hold, 4" to each of Port and Starbd.: No 3 Hold, 4" to each of Port and Starbd.

No. of Bilge Injections 1 sizes 6" Connected to condenser, or to circulating pump No. Is a separate Donkey Suction fitted in Engine room & size Yes - 4"

Are 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 Yes

Are all connections with the sea direct on the skin of the ship Yes Are they Valves or Cocks Both

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

What pipes are carried through the bunkers None How are they protected Yes

Are 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

Is the Screw Shaft Tunnel watertight Mch. Aft Is it fitted with a watertight door worked from Yes

SEE NEWCASTLE REPORT No 76529.

**BOILERS, &c.**—(Letter for record S.) Manufacturers of Steel John Spencers & Co.

Total Heating Surface of Boilers 2850 sq ft Is Forced Draft fitted Yes No. and Description of Boilers 2-cylindrical, Multitubular, Single-ended, 21-2-23. 9730.

Working Pressure 180 lbs/in<sup>2</sup> Tested by hydraulic pressure to 320 lbs/in<sup>2</sup> Date of test 26-2-23 No. of Certificate 9732.

Can each boiler be worked separately Yes Area of fire grate in each boiler 39 sq ft approx No. and Description of Safety Valves to each boiler 2 - Direct Acting Spring Loaded Area of each valve 4.9 in<sup>2</sup> Pressure to which they are adjusted 184 lbs/in<sup>2</sup> Are they fitted with easing gear Yes

Smallest distance between boilers or uptakes and bunkers or woodwork 12" approx. Mean dia. of boilers 12'-6" Length 10'-6" Material of shell plates Steel

Thickness 1 1/2" Range of tensile strength 28-32 tons/in<sup>2</sup> Are the shell plates welded or flanged No Descrip. of riveting: cir. seams D.R. lap. long. seams D.B.S.T.R. Diameter of rivet holes in long. seams 1 1/8" Pitch of rivets 2 13/16" Temp. of plates or Width of butt straps 16 5/8"

Per centages of strength of longitudinal joint rivets 94.7 plate 85.6 Working pressure of shell by rules 180 lbs/in<sup>2</sup> Size of manhole in shell 16" x 20"

Size of compensating ring 7 1/4" x 1 1/8" No. and Description of Furnaces in each boiler 2 - Dighton Material Steel Outside diameter 42 5/8"

Length of plain part top bottom Thickness of plates crown bottom Description of longitudinal joint Welded No. of strengthening rings

Working pressure of furnace by the rules 191 lbs/in<sup>2</sup> Combustion chamber plates: Material Steel Thickness: Sides 3/32" Back 2/32" Top 2/32" Bottom 1"

Pitch of stays to ditto: Sides 9 1/4" x 8 1/2" Back 9" x 9" Top 9 1/4" x 8 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 190 lbs/in<sup>2</sup>

Material of stays Steel Area at smallest part 2.03 in<sup>2</sup> Area supported by each stay 81 in<sup>2</sup> Working pressure by rules 212 lbs/in<sup>2</sup> End plates in steam space:

Material Steel Thickness 3/32" Pitch of stays 17" x 16 1/2" How are stays secured Double Nuts Working pressure by rules 197 lbs/in<sup>2</sup> Material of stays Steel

Diam at smallest part 2 3/4" Area supported by each stay 280 in<sup>2</sup> Working pressure by rules 197 lbs/in<sup>2</sup> Material of Front plates at bottom Steel

Thickness 1 1/2" Material of Lower back plate Steel Thickness 7/8" Greatest pitch of stays 13 1/2" x 9" Working pressure of plate by rules 238 lbs/in<sup>2</sup>

Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates Steel Thickness: Front 1 1/32" Back 3/4" Mean pitch of stays 9"

Pitch across wide water spaces 14 1/2" Working pressures by rules Back - 247 lbs/in<sup>2</sup> Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 6 1/2" x 1 1/2" Length as per rule 31.59" Distance apart 8 1/2" Number and pitch of stays in each 2 @ 9 1/4"

Working pressure by rules 200 lbs/in<sup>2</sup> Steam dome: description of joint to shell % of strength of joint

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

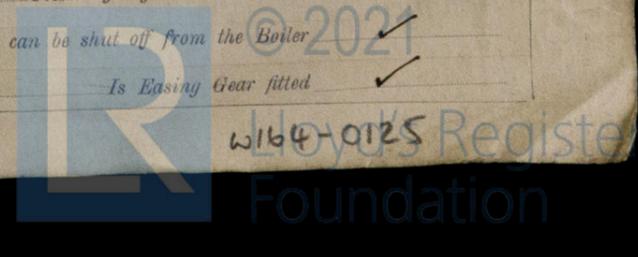
Pitch of rivets Working pressure of shell by rules Crown plates Thickness How stayed

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

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

Diameter of Safety Valve Pressure to which each is adjusted Is Easing Gear fitted

If not, state whether, and when, one will be sent



IS A DONKEY BOILER FITTED?

No

If so, is a report now forwarded? ✓

SPARE GEAR. State the articles supplied:— 2 Bottom End Bolts and Nuts; 2 Top End Bolts and Nuts; 2 Main Bearing Bolts and Nuts; 1 Set Coupling Bolts and Nuts; 2 Feed Pump Valves for each of main and auxiliary pumps; 2 Bilge Pump Valves; 6 Condenser Tubes; 50 Condenser Ferrules; 1 Set Air Pump Valves; 1 Set Ballast Pump Valves; 2 Main and Donkey Check Valve Lids; 1 Set Sanitary Pump Valves; 50 lbs Iron Plate 1/8" and 1/4" thick; Assorted Lengths of Iron Bars; 4 Propeller Blades and one set studs and nuts for one blade; 1 Set Rambottom Rings for H.P. Piston.

The foregoing is a correct description,

FOR SMITH'S DOCK COMPANY

Manufacturer.

Engine Works Limited 28/5/23.

Dates of Survey while building: During progress of work in shops - - 12/23, 14/23, 20/23, 21/23, 22/23, 24/23, 25/23, 26/23, 27/23, 28/23, 29/23, 30/23, 31/23, 1/24, 2/24, 3/24, 4/24, 5/24, 6/24, 7/24, 8/24, 9/24, 10/24, 11/24, 12/24, 13/24, 14/24, 15/24, 16/24, 17/24, 18/24, 19/24, 20/24, 21/24, 22/24, 23/24, 24/24, 25/24, 26/24, 27/24, 28/24, 29/24, 30/24, 31/24. Total No. of visits 28. Is the approved plan of main boiler forwarded herewith? ✓

Dates of Examination of principal parts: Cylinders 27/3/23, Slides 11/4/23, Covers 27/3/23, Pistons 11/4/23, Rods 23/2/23, Connecting rods 23/3/23, Crank shaft Dundee, Thrust shaft Dundee, Tunnel shafts ✓, Screw shaft Dundee, Propeller 29/3/23, Stern tube 14/4/23, Steam pipes tested 30/4/23, Engine and boiler seatings 14/4/23, Engines holding down bolts 2/5/23, Completion of pumping arrangements 16/5/23, Boilers fixed 2/5/23, Engines tried under steam 16/5/23, Completion of fitting sea connections 14/4/23, Stern tube 14/4/23, Screw shaft and propeller 23/4/23, Main boiler safety valves adjusted 15/5/23, Thickness of adjusting washers: Both Boilers 5 = 5/8", Stand Boilers 5 = 15/32", Material of Crank shaft S.M.I. Steel, Identification Mark on Do. J.E.S., Material of Thrust shaft S.M.I. Steel, Identification Mark on Do. J.E.S., Material of Tunnel shafts None, Identification Marks on Do. ✓, Material of Screw shaft S.M.I. Steel, Identification Marks on Do. J.E.S., Material of Steam Pipes Copper ✓, Test pressure 360 lbs/in².

Is an installation fitted for burning oil fuel? No. Is the flash point of the oil to be used over 150°F. ✓. Have the requirements of Section 49 of the Rules been complied with? ✓. Is this machinery duplicate of a previous case? Yes. If so, state name of vessel S.S. 'KEY STATE' and 'KEY BAR' (Nos 11539 and 11562).

General Remarks (State quality of workmanship, opinions as to class, &c. The machinery of this vessel has been built under special survey. The materials and workmanship are sound and good. The Engines and Boilers have been satisfactorily secured on board, examined under steam, the safety valves adjusted and all found satisfactory.

The machinery is now in a good and safe working condition and renders the vessel eligible in our opinion to have the notation of + LMC-5-23 in the Register Book.

It is submitted that this vessel is eligible for THE RECORD. + LMC 5. 23 FD. CL.

Handwritten signatures and dates: J.W.D. 7/6/23, C.W.D.

D.S. Whiteford & Wm Morrison, Engineer Surveyor to Lloyd's Register of Shipping.

The amount of Entry Fee ... £ 3 - 0 - 0, Special ... £ 25 - 15 - 0, Donkey Boiler Fee ... £ 17 - 0 - 0, Travelling Expenses (if any) £ :

Committee's Minute TUE. 12 JUN. 1923, Assigned + LMC 5. 23 FD. CL.

