

REPORT ON MACHINERY

Sld. Rpt. 25941

No. 8213

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Date of writing Report 1. 12. 1913 When handed in at Local Office 1. 12. 1913 Port of **MIDDLESBRO'**

No. in Survey held at **Stockton-on-Tees** Date, First Survey **27th June** Last Survey **26th Nov** 1913

Reg. Book. **46** Suff. on the **Steel Screw Steamer Bertrand** (Number of Visits **(S.S.N. 281)**)

Master **Jenkins** Built at **Sunderland** By whom built **R. Thompson & Sons** Tons Gross **3613** Net **2282** When built **1913**

Engines made at **Stockton** By whom made **Messrs Blair & Co Ltd (N. 1779)** when made **1913**

Boilers made at **Stockton** By whom made **Messrs Blair & Co Lim.** when made **1913**

Registered Horse Power _____ Owners **Turnbull Bros** Port belonging to **Leardiffs**

Nom. Horse Power as per Section 28 **337** Is Refrigerating Machinery fitted for cargo purposes **no** Is Electric Light fitted **no**

ENGINES, &c.—Description of Engines **Tri-compound** No. of Cylinders **3** No. of Cranks **3**

Dia. of Cylinders **25-41-67** Length of Stroke **45** Revs. per minute **58** Dia. of Screw shaft as per rule **14.63** Material of screw shaft **Ing steel**

Is the screw shaft fitted with a continuous liner the whole length of the stern tube **no** 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 lapped 12" at liner ends** Length of stern bush **5'-3"**

Dia. of Tunnel shaft as per rule **12.4** Dia. of Crank shaft journals as per rule **13.02** Dia. of Crank pin **14** Size of Crank webs **27x9** Dia. of thrust shaft under collars **14** Dia. of screw **17'-0"** Pitch of Screw **17'-6"** No. of Blades **4** State whether moveable **no** Total surface **92 sq ft**

No. of Feed pumps **2** Diameter of ditto **3 1/4** Stroke **33** Can one be overhauled while the other is at work **yes**

No. of Bilge pumps **2** Diameter of ditto **4 3/4** Stroke **33** Can one be overhauled while the other is at work **yes**

No. of Donkey Engines **2** Sizes of Pumps **Ballast 9x10; feed 4x8** No. and size of Suctions connected to both Bilge and Donkey pumps In Engine Room **2 @ 3 1/2" in wings & one @ 3 1/2" in dry tank** In Holds, &c. **2 @ 3 1/2" in each hold; one at 3 1/2" tunnel well and one @ 3" to fore peak**

No. of Bilge Injections **1** sizes **6 1/4** Connected to condenser, or to circulating pump **yes** Is a separate Donkey Suction fitted in Engine room of 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 **none**

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 **suctions to forward holds** How are they protected **wood ceiling**

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**

Dates of examination of completion of fitting of Sea Connections **11-11-13** of Stern Tube **13-11-13** Screw shaft and Propeller **20-11-13**

Is the Screw Shaft Tunnel watertight **yes** Is it fitted with a watertight door **yes** worked from **Top platform**

BOILERS, &c.—(Letter for record **(S)**) Manufacturers of Steel **Messrs John Spencer & Sons Ltd**

Total Heating Surface of Boilers **5330** Is Forced Draft fitted **no** No. and Description of Boilers **2 single ended**

Working Pressure **180** Tested by hydraulic pressure to **360** Date of test **30.9.13** No. of Certificate **5765**

Can each boiler be worked separately **yes** Area of fire grate in each boiler **63 sq ft** No. and Description of Safety Valves to each boiler **2 direct spring** Area of each valve **8.29** Pressure to which they are adjusted **185** Are they fitted with easing gear **yes**

Smallest distance between boilers or uptakes and bunkers or woodwork **2'-6"** Mean dia. of boilers **16'-3"** Length **11'-0"** Material of shell plates **steel**

Thickness **1 5/16** Range of tensile strength **28-32** Are the shell plates welded or flanged **no** Descrip. of riveting: cir. seams **2-R-lap** long. seams **2B-3 Riv** Diameter of rivet holes in long. seams **1 5/16** Pitch of rivets **8 3/4** Lap of plates or width of butt straps **19 1/4 x 1 1/4**

Per centages of strength of longitudinal joint rivets **87.5** Working pressure of shell by rules **182** Size of manhole in shell **16" x 12"**

Size of compensating ring **7 5/8 x 1 5/16** No. and Description of Furnaces in each boiler **3 Morrison** Material **steel** Outside diameter **48.65**

Length of plain part top **37** Thickness of plates crown **37** Description of longitudinal joint **Weld** No. of strengthening rings _____ bottom **64**

Working pressure of furnace by the rules **188** Combustion chamber plates: Material **steel** Thickness: Sides **23/32** Back **21/32** Top **23/32** Bottom **27/32**

Pitch of stays to ditto: Sides **9x10 1/2** Back **9x9** Top **10 1/2 x 9 1/4** stays are fitted with nuts or riveted heads **nuts** Working pressure by rules **183**

Material of stays **steel** Diameter at smallest part **1.99** Area supported by each stay **94.5** Working pressure by rules **189** End plates in steam space: _____

Material **steel** Thickness **1 3/8** Pitch of stays **22 1/2** How are stays secured **nuts & washers** Working pressure by rules **193** Material of stays **steel**

Diameter at smallest part **8.48** Area supported by each stay **462** Working pressure by rules **191** Material of Front plates at bottom **steel**

Thickness **1"** Material of Lower back plate **steel** Thickness **1 1/16** Greatest pitch of stays **17" x 9"** Working pressure of plate by rules **230**

Diameter of tubes **3 1/2** Pitch of tubes **4 3/4 x 4 3/8** Material of tube plates **steel** Thickness: Front **1 1/2** Back **1 3/8** Mean pitch of stays **9 3/4**

Pitch across wide water spaces **14 1/2** Working pressures by rules **181** Girders to Chamber tops: Material **steel** Depth and thickness of girder at centre **7 3/4 x 1 7/8** Length as per rule **30** Distance apart **10 1/2** Number and pitch of stays in each **2 @ 9 1/4**

Working pressure by rules **184** Superheater or Steam chest; how connected to boiler **none** Can the superheater be shut off and the boiler worked separately _____

Diameter _____ Length _____ Thickness of shell plates _____ Material _____ Description of longitudinal joint _____ Diam. of rivet holes _____ Pitch of rivets _____ Working pressure of shell by rules _____ Diameter of flue _____ Material of flue plates _____ Thickness _____

If stiffened with rings _____ Distance between rings _____ Working pressure by rules _____ End plates: Thickness _____ How stayed _____

Working pressure of end plates _____ Area of safety valves to superheater _____ Are they fitted with easing gear _____

VERTICAL DONKEY BOILER

Manufacturers of Steel

See Middlesbrough Report No. 8117

No. _____ Description _____

Made at _____ By whom made _____ When made _____ Where fired _____

Working pressure tested by hydraulic pressure to _____ Date of test _____ No. of Certificate _____ Fire grate area _____ Description of Safety _____

Valves _____ No. of Safety Valves _____ Area of each _____ Pressure to which they are adjusted _____ Date of adjustment _____

If fitted with casing gear _____ If steam from main boilers can enter the donkey boiler _____ Dia. of donkey boiler _____ Length _____

Material of shell plates _____ Thickness _____ Range of tensile strength _____ Descrip. of riveting long. seams _____

Dia. of rivet holes _____ Whether punched or drilled _____ Pitch of rivets _____ Lap of plating _____ Per centage of strength of joint _____ Rivets _____ Plates _____

Working pressure of shell by rules _____ Thickness of shell crown plates _____ Radius of do. _____ No. of stays to do. _____ Dia. of stays _____

Diameter of furnace Top _____ Bottom _____ Length of furnace _____ Thickness of furnace plates _____ Description of joint _____

Working pressure of furnace by rules _____ Thickness of furnace crown plates _____ Radius of do. _____ Stayed by _____

Diameter of uptake _____ Thickness of uptake plates _____ Thickness of water tubes _____ Dates of survey _____

SPARE GEAR. State the articles supplied:— Two connecting rod top & bottom end bolts and nuts two main bearing bolts, one set of coupling bolts, one set of feed and lift pump valves, iron and bolts of various sizes, one screw shaft and one propeller.

The foregoing is a correct description,
FOR BLAIR & CO. LIMITED.
 See Middlesbrough
 Manufacturer.

Dates of Survey while building

| | |
|-------------------------------------|--|
| During progress of work in shops -- | SECRETARY, Jun. 27, July 3, 9, 14, 16, 17, 22, 24, 28, 30, Aug. 1, 5, 8, 12, 14, 15, 16, 25, 27, 28, 29, Sept. 1, 2, 4, 5, 8, 10, 15, 18, 22, 23 |
| During erection on board vessel -- | 26, 29, 30, 31, Nov. 5, 7, 11, 15, 20, 25, 26, Old. Nov. 11, 13, Dec. 2, 10 |
| Total No. of visits | 42 (46) |

Is the approved plan of main boiler forwarded herewith yes

" " " donkey " " "

Dates of Examination of principal parts—Cylinders 15.8.13 Slides 1.9.13 Covers 14.8.13 Pistons 14.8.13 Rods 1.9.13

Connecting rods 1.9.13 Crank shaft 1.9.13 Thrust shaft 5.8.13 Tunnel shafts 14.8.13 Screw shaft 11.11.13 Propeller 11.11.13

Stern tube 5.11.13 Steam pipes tested 21.11.13 Engine and boiler seatings 11.11.13 Engines holding down bolts 25.11.13

Completion of pumping arrangements 26.11.13 Boilers fixed 25.11.13 Engines tried under steam 26.11.13

Main boiler safety valves adjusted 26.11.13 Thickness of adjusting washers P-Blk 5-5/16; S-Blk 5-3/8

Material of Crank shaft *Ing Steel* Identification Mark on Do. 6852 Material of Thrust shaft *Ing Steel* Identification Mark on Do. 9809

Material of Tunnel shafts *Ing Steel* Identification Marks on Do. 9809 Material of Screw shafts *Ing Steel* Identification Marks on Do. 6852

Material of Steam Pipes *Solid drawn boiler* Test pressure 360 lbs.

General Remarks (State quality of workmanship, opinions as to class, &c. To complete the survey the donkey boiler requires to be secured in place, mountings fitted and safety valves adjusted; spare gear examined and watertight door fitted to tunnel. It is proposed to complete the survey at Sunderland. The surveyors have been advised

The machinery of this vessel has been built under special survey. The materials and workmanship are sound and good. The boilers and main steam pipes were tested by hydraulic pressure and the engines and boilers examined under steam and found satisfactory. In our opinion this vessel will be eligible to have the notation of **L.M.C.** with a date when the survey has been completed **Sunderland, Survey complete.**

Now done:—The donkey boiler fixed (see separate report) the spare gear examined and found in accordance with the rules and a watertight door fitted to the tunnel.

It is submitted that this vessel is eligible for **THE RECORD. + L.M.C. 12.13.** Lewis & Davis, 12.12.13

| | | | |
|------------------------------|-----------|-------------------|----------|
| The amount of Entry Fee | £ 3-0-0 | When applied for, | 13.12.13 |
| Special | £ 36-17-0 | When received, | 20/12/13 |
| Donkey Boiler Fee | £ : | | |
| Travelling Expenses (if any) | £ : | | |

J.W.D. 9.12.13
Wm Morrison & John Robson
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute TUE. DEC. 16, 1913

Assigned *Home 12.13*

MACHINERY CERTIFICATE WRITTEN.

