

## REPORT ON MACHINERY.

Port of MiddlesbroughReceived at London Office WED. 4 JUN 1902No. in Survey held at Hockton  
Reg. Book.Date, first Survey Oct 11<sup>th</sup> 1901 Last Survey May 30<sup>th</sup> 1902(Number of Visits 37)

71 in Sup. on the

S. S. Broomfield.Tons { Gross 2385.67  
Net 1526.34Master A. HewsonBuilt at WhitbyBy whom built J Turnbull & SonWhen built 1902Engines made at StocktonBy whom made Blair & Co Ld.when made 1902.Boilers made at StocktonBy whom made Blair & Co Ld.when made 1902.

Registered Horse Power

Owners T. Turnbull & SonPort belonging to WhitbyNom. Horse Power as per Section 28 224Is Refrigerating Machinery fitted NoIs Electric Light fitted No

ENGINES, &c.—Description of Engines Triple Expansion No. of Cylinders 3. No. of Cranks 3.  
 Dia. of Cylinders 22 1/2, 36 1/2 & 60" Length of Stroke 39" Revs. per minute 54 Dia. of Screw shaft 13 1/4" as per rule 13.03 as fitted 13 1/4" Lgth. of stern bush 56"  
 Dia. of Tunnel shaft 11 1/2" as per rule 10.56 as fitted 11 1/2" Dia. of Crank shaft journals 11 3/4" as per rule 11.09 as fitted 11 3/4" Dia. of Crank pin 12 1/4" Size of Crank webs 19 1/2 x 8 3/8" Dia. of thrust shaft under collars 12 1/4" Dia. of screw 16.0" Pitch of screw 16.0" No. of blades 4. State whether moveable sol. Total surface 70 1/2 sq. ft.  
 No. of Feed pumps 2. Diameter of ditto 3" Stroke 28" Can one be overhauled while the other is at work yes  
 No. of Bilge pumps 2. Diameter of ditto 4 1/2" Stroke 28" Can one be overhauled while the other is at work yes  
 No. of Donkey Engines 2. Sizes of Pumps B. 7 1/2 x 9" F. 4 x 8" No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room three of 3" In Holds, &c. No 1 & 2 holds 2 of 3" each  
No 3 & 4 holds 2 of 3" each Tunnel well 1 of 2 1/2"  
 No. of bilge injections 1 sizes 6" Connected to condenser, or to circulating pump yes 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 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 None How are they protected ✓  
 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  
 When were stern tube, propeller, screw shaft, and all connections examined in dry dock on stocks Is the screw shaft tunnel watertight see ship Rep<sup>t</sup>  
 Is it fitted with a watertight door yes worked from upper platform.

BOILERS, &c.—(Letter for record (S) Total Heating Surface of Boilers 3350 sq. ft. Is forced draft fitted No  
 No. and Description of Boilers 2 S. & E. Multitubular Working Pressure 160 lb Tested by hydraulic pressure to 320 lb  
 Date of test Feb 23<sup>rd</sup> 1902 Can each boiler be worked separately yes Area of fire grate in each boiler 48 1/2 sq. ft. No. and Description of safety valves to each boiler 2 d. Act. Spring Area of each valve 7.06" Pressure to which they are adjusted 165 lb Are they fitted with easing gear yes  
 Smallest distance between boilers or uptakes and bunkers or woodwork No side bunkers Dia. of boilers 14.0" Length 10.0" Material of shell plates S.  
 Thickness 1 1/2" Range of tensile strength 27.32 Are they welded or flanged No Descrip. of riveting: cir. seams d. r. l. long. seams d. butt str.  
 Diameter of rivet holes in long. seams 1 3/16" Pitch of rivets 8" x 4" Lap of plates 8" width of butt straps 6 1/4" x 17 7/8"  
 Per centages of strength of longitudinal joint 85.4 Working pressure of shell by rules 176 lb Size of manhole in shell 17 x 13"  
 Size of compensating ring 31 x 24 x 1 1/2" No. and Description of Furnaces in each boiler 3 Corrugated Material S. Outside diameter 41"  
 Length of plain part 6.4" Thickness of plates 1 1/2" Description of longitudinal joint weld No. of strengthening rings —  
 Working pressure of furnace by the rules 184 lb Combustion chamber plates: Material S. Thickness: Sides 1 1/2" Back 1 1/2" Top 1 1/2" Bottom 7/8"  
 Pitch of stays to ditto: Sides 9 x 9 3/4" Back 9 x 9 3/4" Top 9 1/2 x 9 1/2" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 181 lb  
 Material of stays S. Diameter at smallest part 1 9/16" Area supported by each stay 90.2" Working pressure by rules 191 lb End plates in steam space:  
 Material S. Thickness 1 1/2" Pitch of stays 9 x 18 1/2" How are stays secured d. nuts Working pressure by rules 190 lb Material of stays S.  
 Diameter at smallest part 2 3/4" Area supported by each stay 351.5" Working pressure by rules 169 lb Material of Front plates at bottom S.  
 Thickness 1" Material of Lower back plate S. Thickness 1 1/2" Greatest pitch of stays 14" Working pressure of plate by rules 194 lb  
 Diameter of tubes 3 1/4" Pitch of tube 4 1/2 x 4 5/8" Material of tube plates S. Thickness: Front 1" Back 1 3/16" Mean pitch of stays 9 1/8"  
 Pitch across wide water spaces 14 1/4" Working pressures by rules 189 lb Girders to Chamber tops: Material S. Depth and thickness of girder at centre 7 x 1 1/2" Length as per rule 26 1/2" Distance apart 8 1/2" Number and pitch of Stays in each 2. 9 1/2"  
 Working pressure by rules 190 lb 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 —



**DONKEY BOILER—** No. *One* Description *Cyl. Multar 2 plain furnaces*  
 Made at *Stockton* By whom made *Riley Bros.* When made *23.1.02* Where fixed *deckhouse*  
 Working pressure *90 lb* tested by hydraulic pressure to *180 lb* No. of Certificate *2669* Fire grate area *23.75* Description of safety valves *d. a. spring*  
 No. of safety valves *2* Area of each *7.06* Pressure to which they are adjusted *90 lb* If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no* Dia. of donkey boiler *9'-0"* Length *9'-0"* Material of shell plates *S.* Thickness *9/16"* Range of tensile strength *27-32* Descrip. of riveting long. seams *treb. riv. lap* Dia. of rivet holes *15/16"* Whether punched or drilled *dr.* Pitch of rivets *4"*  
 Lap of plating *6 1/2"* Per centage of strength of joint *78* Rivets *78* Thickness of shell plates *32* Radius of do. *Pitch* of Stays to do. *16 1/2" x 1 1/2"*  
 Dia. of stays *2 1/4"* Diameter of furnace Top *31"* Bottom *26"* Length of furnace *5'-11 1/2"* Thickness of furnace plates *7/16"* Description of joint *weld* Thickness of furnace crown plates *7/16" to 1/2"* Stayed by *18" x 5.3 8" pitch riv.* Working pressure of shell by rules *96 lb*  
 Working pressure of furnace by rules *91 lb* Diameter of tubes *3 1/2"* Thickness of tubes *32* Thickness of water tubes *5/16"*

**SPARE GEAR.** State the articles supplied:— *Propeller and tail shaft complete. —*  
*Main bearing coupling bolts and nuts. Fred and donkey pump valves*  
*Air pump valves & studs, Set Piston Springs. Set Piston bolts, Assorted*  
*bolts & nuts, iron various sizes.*

The foregoing is a correct description,  
**FOR BLAIR & CO., LIMITED.**

Manufacturers of Engines and main boilers

**SECRETARY,**  
 Dates { During progress of work in shops - 1901 Oct 11, 22, 29, Nov. 6, 13, 15, 18, 21, 26, 28, 13, 19, 30. 1902 Jan 8, 14, 31, Feb 4, 11, 20, 24, 25, Mar 6, 10, 14, 19, 27  
 of Survey { During erection on board vessel - Apr 4, 8, 28, May 14, 15, 22, 23, 24, 28, 29, 30  
 while building { Total No. of visits *Ind 637 3 w/ffle* 1902 March 19 April 9, 24

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

Material of screw shaft *W. iron* Is the screw shaft fitted with a continuous liner the whole length of the stern tube —  
 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 —  
 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 liners are fitted, is the shaft lapped or protected between the liners *yes*.

These engines and boilers have been built and tested as required by the Society's Rules for Special Survey and are of good workmanship and materials, they have been well fitted and secured on board, and on completion tried under steam at moorings with satisfactory results.

This vessel's machinery is now in our opinion in a good and efficient working condition and eligible to the notation of: **L.M.C. 5-02**

It is submitted that  
 this vessel is eligible for  
**THE RECORD - L.M.C. 5-02**

The amount of Entry Fee. £ 2 : 0 : - When applied for,  
 Special .. .. £ 31 : 4 : - 3-6-1902  
 Donkey Boiler Fee .. .. £ : : -  
 Travelling Expenses (if any) £ 2 : 16 : 6 5-6-02

Committee's Minute

FRI. 6 JUN 1902

Assigned

+ L.M.C. 5-02

Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.



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 Foundation