

# REPORT ON MACHINERY.

28350

No. 27267

(Received in London Office 18/11/80)

No. in Survey held at Liverpool Date, first Survey 2<sup>nd</sup> January Last Survey 28<sup>th</sup> Sep<sup>r</sup> 1880.  
 Reg. Book. 358 on the Screw Steamer "Heptarchy" Tons 500  
 Master J. Protheroe Built at London When built 1871  
 Engines made at Liverpool By whom made Messrs J. & C. Walker when made 1871  
 Boilers made at Liverpool By whom made Messrs J. & C. Walker when made 1880  
 Registered Horse Power 90 Owners Messrs J. Bacon & Co Port belonging to London

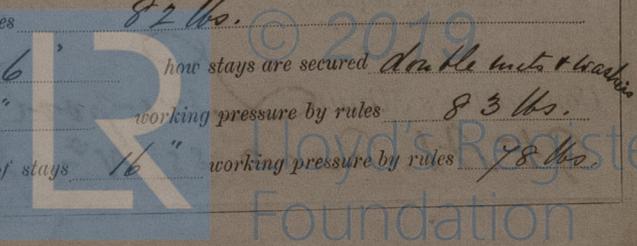
**ENGINES, &c.—**

Description of Engines Compound Inverted 2 Cylinders  
 Diameter of Cylinders 26" x 45" Length of Stroke 26" No. of Rev. per minute 14 Point of Cut off, High Pressure 1/4 Low Pressure 1/4  
 Diameter of Screw shaft 7 1/2" Diameter of Tunnel shaft 7 1/2" Diameter of Crank shaft journals 7 1/2" Diameter of Crank pin 7 1/2" size of Crank webs 10 x 5"  
 Diameter of screw 10.11" Pitch of screw 15.6" No. of blades 4 state whether moveable immovable total surface 30 sq. ft.  
 No. of Feed pumps 1 diameter of ditto 3 1/4" Stroke 2.0" Can one be overhauled while the other is at work —  
 No. of Bilge pumps 1 diameter of ditto 3 1/4" Stroke 2.0" Can one be overhauled while the other is at work —  
 Where do they pump from Engine room and Stokehole  
 No. of Donkey Engines 2 Size of Pumps 8" x 10" (3 1/2" x 6") Where do they pump from Ballast donkey, from the tanks and bilges, & smaller donkey from sea, hotwell, after tank & bilges.  
 Are all the bilge suction pipes fitted with roses yes Are the roses always accessible yes Are the sluices on Engine room bulkheads always accessible no  
 No. of bilge injections one and sizes 3" Are they connected to condenser, or to circulating pump Condenser  
 How are the pumps worked by levers from the piston rod crosshead  
 Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks valves and cocks  
 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 donkey bilge discharge & sea discharge How are they protected by wood casing  
 Are all pipes, cocks, valves, and pumps in connection with the machinery accessible at all times yes  
 Are the pipes, cocks, and valves arranged so as to prevent an unintentional connection between the sea and the bilges yes  
 When were stern tube, propeller, screw shaft, and all connections examined in dry dock 16<sup>th</sup> September 1880.  
 Is the screw shaft tunnel watertight no tunnel and fitted with a sluice door — worked from —

**BOILERS, &c.—**

Number of Boilers one Description Cylindrical multitubular Steel { Furnaces, combustion chambers, lower part end plate and back tank plate  
 Working Pressure 65 lbs Tested by hydraulic pressure to 130 Date of test 22<sup>nd</sup> July 1880.  
 Description of ~~superheating apparatus~~ or steam chest Cylindrical, Horizontal.  
 Can each boiler be worked separately — Can the superheater be shut off and the boiler worked separately —  
 No. of square feet of fire grate surface in each boiler 36 Description of safety valves Spring  
 No. to each boiler 2 area of each valve 9.62" Are they fitted with casing gear yes  
 No. of safety valves to superheater — area of each valve — are they fitted with casing gear —  
 Smallest distance between boilers and bunkers or ~~woodwork~~ 6 inches  
 Diameter of boilers 12.6" Length of boilers 9.3" description of riveting of shell long. seams double riv? butt straps circum. seams double riv? lap joint  
 Thickness of shell plates 3/4" diameter of rivet holes 15/16" whether punched or drilled drilled pitch of rivets 4 1/8"  
 Lap of plating 5 1/2" per centage of strength of longitudinal joint 70 working pressure of shell by rules 66 lbs.  
 Size of manholes in shell 15 1/2" x 12" size of compensating rings 6" x 3/4"  
 No. of Furnaces in each boiler 3 outside diameter 36.87" length, top 6.0" bottom 8.2" two ft. of which is 1/2" thick  
 Thickness of plates 7/16" description of joint butt straps if rings are fitted no greatest length between rings —  
 Working pressure of furnace by the rules 77 lbs.  
 Combustion chamber plating, thickness, sides 7/16" back 7/16" top 7/16"  
 Pitch of stays to ditto — sides 9 x 8" back 9 x 8" top 9 x 8"  
 If stays are fitted with nuts or riveted heads nuts working pressure of plating by rules 67 lbs.  
 Diameter of stays at smallest part 1 1/8" working pressure of ditto by rules 82 lbs.  
 End plates in steam space, thickness 3/4" pitch of stays to ditto 16" x 16" how stays are secured double nuts & washers  
 Working pressure by rules 78 lbs. diameter of stays at smallest part 2 1/8" working pressure by rules 83 lbs.  
 Front plates at bottom, thickness 5/8" Back plates, thickness 5/8" greatest pitch of stays 16" working pressure by rules 78 lbs.

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Diameter of tubes  $3\frac{1}{4}$ " pitch of tubes  $4\frac{1}{2}$ " thickness of tube plates, front  $\frac{5}{8}$ " back  $\frac{5}{8}$ "  
 How stayed Stay tubes pitch of stays  $13\frac{1}{2} \times 9$ " width of water spaces  $1\frac{1}{4}$ "  
 Diameter of ~~Superheater~~ Steam chest  $3\cdot0$ " length  $10\cdot6$ "  
 Thickness of plates  $\frac{7}{16}$ " description of longitudinal joint lap double riv diameter of rivet holes  $13\frac{1}{16}$ " pitch of rivets  $2\frac{3}{4}$ "  
 Working pressure of shell by rules  $13\frac{1}{2}$  lbs. Diameter of flue \_\_\_\_\_ thickness of plates \_\_\_\_\_  
 If stiffened with rings \_\_\_\_\_ distance between rings \_\_\_\_\_ Working pressure by rules \_\_\_\_\_  
 End plates of ~~superheater~~ or steam chest; thickness  $\frac{1}{2}$ " How stayed one  $2\frac{1}{8}$ " stay in the centre.  
~~Superheater~~ or steam chest; how connected to boiler By wrought iron tube  $18 \times 14 \times \frac{5}{8}$ " thick

**DONKEY BOILER—** Description Cylindrical, Vertical, 4 Horizontal water tubes  
 Made at Liverpool By whom made Messrs. D. Rollo & Sons when made 22<sup>nd</sup> July 1880.  
 Where fixed on deck working pressure 60 lbs Tested by hydraulic pressure to 120 lbs No. of Certificate 63  
 Fire grate area 11 sq. ft. Description of safety valves Spring No. of safety valves one area of each 7.06  
 If fitted with easing gear Yes If steam from main boilers can enter the donkey boiler No  
 Diameter of donkey boiler  $4\cdot6$ " height  $10\cdot4$ " description of riveting double riveted lap joint  
 thickness of shell plates  $\frac{7}{16}$ " diameter of rivet holes  $13\frac{1}{16}$ " whether punched or drilled punched  
 pitch of rivets  $2\frac{3}{4}$ " lap of plating  $3\frac{3}{4}$ " per centage of strength of joint 70  
 thickness of crown plates  $\frac{9}{16}$ " stayed by 4 Vertical stays  $1\frac{1}{2}$ " dia.  
 Diameter of furnace, top  $3\cdot3\frac{1}{4}$ " bottom  $3\cdot11\frac{1}{8}$ " height  $5\cdot25$   
 thickness of plates  $\frac{7}{16}$ " description of joint single riveted lap joint  
 thickness of furnace crown plates  $\frac{7}{16}$ " stayed by 4 Vertical stays  $1\frac{1}{2}$ " dia.  
 Working pressure of shell by rules 87 lbs. working pressure of furnace by rules 76 lbs.  
 diameter of uptake  $15$ " thickness of plates  $\frac{7}{16}$ " thickness of water tubes  $\frac{3}{8}$ "

No. submitted for this vessel eligible to have the notification N.B. 80 and Lloyd's 137th recorded in the Register 9/11/18

The foregoing is a correct description,  
 David Rollo & Sons Manufacturer.

**General Remarks** (State quality of workmanship, opinions as to class, &c. A new main boiler and a new donkey boiler have been constructed, under my survey, and fitted on board this vessel, the workmanship is of good quality. The vessel was placed in Sandon graving docks, the screw shaft and stem tube drawn and found in good condition. Stern bush found cracked a new one fitted in its place. A new propeller fitted. Sea connections fitted in accordance with the Rules. Cranks and thrust shafts found in good condition. Cylinders, pistons, slide valves and pumps overhauled. Engines and boilers tried under steam and found to work well. Safety valves set to blow off at the working pressure. The machinery and boilers of this vessel are now in good order and safe working condition and are eligible, in my opinion, to have the notification N.B. 9.80. Lloyd's M.C. 9.80 recorded in the Register of this Society.

Expenses for testing steel 96 Mr. Kendall said to have been paid direct to him viz £ 8. 10/-  
 The amount of Entry Fee .. £ 1 : 0 : received by me,  
 Special .. .. £ 7 : 7 : J.F.L.  
 Certificate (if required) .. £ : : 11/11/1880  
 To be sent as per margin.  
 (Travelling Expenses, if any, £)

Committee's Minute Liverpool Nov-12-1880  
 95 A1. Record ss N<sup>o</sup> 2/80 N.B. and Lloyd's M.C. 9.80  
 J. Stoddart 2010  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

