

REPORT ON MACHINERY

12772

No. 644
 No. in Survey held at Sunderland Date, first Survey July 27/81 Last Survey Jan 2nd 1882
 Reg. Book. on the Iron Screw Steamer "LAJU"
 Master Man Built at Sunderland When built 1881
 Engines made at Sunderland By whom made Geo Clark when made 1881
 Boilers made at do By whom made " when made "
 Registered Horse Power 200 Owners Wright Bros & Co Port belonging to London

ENGINES, &c.—

Description of Engines Direct acting compound surface condensing
 Diameter of Cylinders 33 x 62 Length of Stroke 42 No. of Rev. per minute 60 Point of Cut off, High Pressure 1/2 Low Pressure 1/2
 Diameter of Screw shaft 11 1/8 Diameter of Tunnel shaft 10 1/2 Diameter of Crank shaft journals 11 1/8 Diameter of Crank pin 11 1/8 size of Crank webs 14 x 8
 Diameter of screw 14 x 9 Pitch of screw 16 x 6 No. of blades 4 state whether moveable Yes total surface 66 ft
 No. of Feed pumps 2 diameter of ditto 4 1/4 Stroke 21 Can one be overhauled while the other is at work Yes
 No. of Bilge pumps 2 diameter of ditto 4 1/4 Stroke 21 Can one be overhauled while the other is at work Yes
 Where do they pump from Engine Room bilges Condenser Sea & Ballast Tanks Main Hold & App. Will
 No. of Donkey Engines 2 Size of Pumps 8 x 10 x 4 x 7 Where do they pump from Ballast Tanks Main
Hold & Bilge After Well Condenser Hot well & Sea
 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 Yes
 No. of bilge injections 1 and sizes 4" Are they connected to condenser, or to circulating pump Circulating Pump
 How are the pumps worked Levers from after engine
 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 Below
 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 None to protect
 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 Sea
 When were stern tube, propeller, screw shaft, and all connections examined in dry dock New Vessel
 Is the screw shaft tunnel watertight Yes and fitted with a sluice door Yes worked from Top Platform

BOILERS, &c.—

Number of Boilers Two Description Cylindrical Multitubular single ended
 Working Pressure 80 lb Tested by hydraulic pressure to 160 lb Date of test 15.9.81 T.S.
 Description of superheating apparatus or steam chest Horizontal dome spherical ended
 Can each boiler be worked separately Yes Can the superheater be shut off and the boiler worked separately No superheater
 No. of square feet of fire grate surface in each boiler 45.27 ft Description of safety valves Spring direct
 No. to each boiler 2 area of each valve 12.5 sq in Are they fitted with easing gear Yes
 No. of safety valves to superheater — area of each valve — are they fitted with easing gear —
 Smallest distance between boilers and bunkers or woodwork Eight inches
 Diameter of boilers 12 - 10 Length of boilers 10 - 6 description of riveting of shell long. seams Lap butt riv circum. seams Lap double riv
 Thickness of shell plates 15/16 diameter of rivet holes 1 9/32 whether punched or drilled Drilled pitch of rivets 5 3/16
 Lap of plating 8 1/4 per centage of strength of longitudinal joint 71% working pressure of shell by rules 82 lb
 Size of manholes in shell 16 x 13 size of compensating rings 7 x 7 1/8
 No. of Furnaces in each boiler 3 outside diameter 3 - 1 length, top 7 - 6 bottom 7 - 6
 Thickness of plates 1/2 description of joint double butt straps if rings are fitted Yes greatest length between rings 7 - 6
 Working pressure of furnace by the rules 80 lb single riveted
 Combustion chamber plating, thickness, sides 1/2" back 1/2" top 1/2"
 Pitch of stays to ditto sides 9 3/8 x 9 1/4 back 9 1/4 x 9 1/4 top 9 1/4 x 9 1/4
 If stays are fitted with nuts or riveted heads Nuts working pressure of plating by rules 90 lb
 Diameter of stays at smallest part 1 3/8 working pressure of ditto by rules 138 lb
 End plates in steam space, thickness 1/16 x 1/2 coverin plate pitch of stays to ditto 15 3/4 x 15 how stays are secured Double nuts
 Working pressure by rules 90 lb diameter of stays at smallest part 2 1/4 working pressure by rules 97 lb
 Front plates at bottom, thickness 5/8 Back plates, thickness 5/8 greatest pitch of stays 9 1/4 working pressure by rules 90 lb

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Diameter of tubes $3\frac{3}{4}$ pitch of tubes $5\frac{1}{4} \times 5$ thickness of tube plates, front $\frac{5}{8}$ back $\frac{5}{8}$
How stayed *Stay Tubes* pitch of stays $10\frac{1}{2} \times 10$ width of water spaces $1\frac{1}{2}$ $1\frac{3}{4}$ 6
Diameter of Superheater or Steam chest $4\frac{1}{2}$ length $11\frac{1}{2}$
Thickness of plates $\frac{7}{16}$ description of longitudinal joint *lap joint in* diameter of rivet holes $\frac{3}{4}$ pitch of rivets $2\frac{1}{2}$
Working pressure of shell by rules $98\frac{1}{2}$ 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 $\frac{7}{16}$ How stayed *Spherical ended*
Superheater or steam chest; how connected to boiler *Hanged neck*

DONKEY BOILER— Description *Vertical Water tubes in furnace*
Made at *Middlebro* By whom made *J. Robinson* when made *1881* *Entered 23.9.81*
Where fixed *Stoke hole* working pressure *Certified 60 lbs* Tested by hydraulic pressure to *120 lbs* No. of Certificate *594*
Fire grate area *20.07 ft* Description of safety valves *Dead weight* No. of safety valves *1* area of each *10.8 sq ft*
If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *No*
Diameter of donkey boiler *5.9* length *13.0* description of riveting *Long seams lap double punched*
thickness of shell plates $\frac{7}{16}$ diameter of rivet holes $\frac{13}{16}$ whether punched or drilled *Punched*
pitch of rivets $2\frac{3}{4}$ lap of plating $\frac{4}{4}$ per centage of strength of joint $\frac{4}{10}$
thickness of crown plates $\frac{1}{3}$ stayed by *Six stays $1\frac{1}{4}$ dia*
Diameter of furnace, top $4\frac{10}{16}$ bottom $5\frac{2}{8}$ length of furnace $5\frac{1}{2}$
thickness of plates $\frac{5}{32}$ description of joint *Lap single punched*
thickness of furnace crown plates $\frac{7}{16}$ stayed by *Six stays $1\frac{1}{4}$ dia*
Working pressure of shell by rules *68 lbs* working pressure of furnace by rules *63*
diameter of uptake 14 thickness of plates $\frac{7}{16}$ thickness of water tubes $\frac{3}{8}$ *J. Robinson*

The foregoing is a correct description,
W. B. Black *W. B. Black* Manufacturer.

Receipt of Donkey B.

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

The engines and boilers of this vessel have been constructed under ordinary survey. The material and workmanship are good and efficient and when tried under steam found satisfactory.

In my opinion the above machinery is in good order and safe working condition and eligible for the notification in the Register Book of Lloyd's M.C. 182

The amount of Entry Fee *£ 3 : 0 : 0* received by me, *Geo A. Milner*

Ordinary Special *£ 20 : 0 : 0*

Certificate (if required) *£ 0 : 5 : 06* *Jan 1882*

To be sent as per margin.

(Travelling Expenses, if any, £ *—*)

Committee's Minute

Tuesday, January, 10th, 1882.

Geo A. Milner
Engineer/Surveyor to Lloyd's Register of British & Foreign Shipping.