

REPORT ON MACHINERY.

9614
THURS 6 DEC 1888

No. 9614 Port of Greenock
No. in Survey held at Greenock & Port Glasgow Date, first Survey 5th June 1888 Last Survey 1st Decr. 1888
Reg. Book. on the Steam S.S. "Rio Branco" (Number of Visits 60) Tons 556.28
Master W. Boulton Built at Port Glasgow By whom built Russell & Co. When built 1888
Engines made at Greenock By whom made Rankin & Blackmore when made 1888
Boilers made at do By whom made do when made 1888
Registered Horse Power 150 Owners Amazon S. M. Co. (Lim^d) Port belonging to Para

ENGINES, &c.—

Description of Engines Compound Inverted Direct Acting Triple Expansion
Diameter of Cylinders 13.20 & 32 Length of Stroke 24 No. of Rev. per minute 136 Point of Cut off, High Pressure 1/3 Low Pressure 1/3
Diameter of Screw shafts 6 1/2 Diam. of Tunnel shafts 6 Diam. of Crank shaft journals 6 1/2 Diam. of Crank pins 6 1/2 size of Crank webs 9 1/2 x 4 1/2
Diameter of screws 7.6 Pitch of screws 11.0 No. of blades four state whether moveable yes total surface 18 square feet in each
No. of Feed pumps one on each engine diameter of ditto 2 1/2 Stroke 11 1/2 Can one be overhauled while the other is at work yes
No. of Bilge pumps one on each engine diameter of ditto 2 1/2 Stroke 11 1/2 Can one be overhauled while the other is at work yes
Where do they pump from Star pump from engine room. Hot water from end of tunnel. Port pump from all bilges & sea.
No. of Donkey Engines Two Size of Pumps 4 1/2 x 7 & 3 1/2 x 6 Where do they pump from Large from sea. Bilges
Hot well & ballast tank in after peak. Small size from 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 Two and sizes 2 1/2 Are they connected to condenser, or to circulating pump Circulating pumps
How are the pumps worked By hand
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 marked
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 Bilge pipes How are they protected 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 On ship before launch was launched & 20th October in Glasgow
Is the screw shaft tunnel watertight yes and fitted with a sluice doors yes worked from Engine Room top platform

BOILERS, &c.—

Number of Boilers One Description Round Horizontal Multitubular Whether Steel or Iron Steel
Working Pressure 160 lbs Tested by hydraulic pressure to 320 lbs Date of test 2nd October 1888
Description of superheating apparatus or steam chest None
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 75.5 Description of safety valves Direct spring No. to each boiler Two
Area of each valve 9.62 sq 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 on woodwork 9" Diameter of boilers 12.0
Length of boilers 15.6 description of riveting of shell long. seams Double butt strap circum. seams Double Thickness of shell plates 1 1/2
Diameter of rivet holes 1 3/16 whether punched or drilled Drilled pitch of rivets 8 1/8 & 4 1/2 Lap of plating 1 1/4 outside strap
Per centage of strength of longitudinal joint 85.4 working pressure of shell by rules 163 lbs size of manholes in shell 16" x 12"
Size of compensating rings 6 x 1 1/2 No. of Furnaces in each boiler Four
Outside diameter 46 length, top 6.3 bottom through thickness of plates 1 3/32 description of joint Welded if rings are fitted Welded
Greatest length between rings — working pressure of furnace by the rules 163 lbs combustion chamber plating, thickness, sides 9/16 back 9/16 top 3/16
Pitch of stays to ditto, sides 7 3/4 x 7 3/4 back — top 7 3/4 x 7 3/4 if stays are fitted with nuts or riveted heads nuts working pressure of plating by rules 162 lbs Diameter of stays at smallest part 1 1/2 working pressure of ditto by rules 164 lbs end plates in steam space, thickness 1 1/2
Pitch of stays to ditto 16 1/2 x 16 1/2 how stays are secured Double nuts & rivets working pressure by rules 169 lbs diameter of stays at smallest part 2 1/2 working pressure by rules 160 lbs Front plates at bottom, thickness 1 1/2 Back plates, thickness —
Greatest pitch of stays — working pressure by rules — Diameter of tubes — pitch of tubes 4 3/8 x 4 3/8 thickness of tube plates, front 1 1/2 back 1 1/2 how stayed Stay tubes pitch of stays 8 3/4 x 8 3/4 width of water spaces 4 to 6 inches
Diameter of Superheater or Steam chest — length — thickness of plates — description of longitudinal joint — diam. of rivet holes —
Pitch of rivets — working pressure of shell by rules — 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 — how stayed —
Superheater or steam chest; how connected to boiler —

Vertical - chested Patent
DONKEY BOILER Description See Charted Surveyor's report attached hereto. (Steel)
Made at Stockton by whom made Riley Bros. when made 2/10/88 where fixed On dk.
Working pressure 75 lbs tested by hydraulic pressure to 150 lbs No. of Certificate 1661 fire grate area 7.2 sq. ft. description of safety
valves Direct spring No. of safety valves One area of each 7 sq. ins. if fitted with easing gear Yes if steam from main boilers can
enter the donkey boiler No diameter of donkey boiler 4 ft. length 8' 6" description of riveting Single rivet lap
Thickness of shell plates 3/8" diameter of rivet holes 19/16" whether punched or drilled Punched pitch of rivets 2" lap of plating 2 3/8"
percentage of strength of joint 49% thickness of crown plates 3/8" stayed by Hemispherical
Diameter of furnace, top 3' 5" bottom 3' 5" length of furnace 4' 2" thickness of plates 3/8" description of joint Single rivet lap
Thickness of furnace crown plates 3/8" stayed by 2 uptakes + 2 water tubes working pressure of shell by rules 76 lbs
Working pressure of furnace by rules 106 lbs diameter of uptake 9" thickness of plates 3/8" thickness of water tubes 3/8"

SPARE GEAR. State the articles supplied:— 1 piston for each cylinder. 1 Connecting rod. 1 crank shaft
2 tail and screw shafts. 1 stern length of screw shaft. 2 propeller boxes complete
32 propeller blades. 1 thrust shaft. 3 slide valve spindles. 1 plunger & rod for circulating
pump. 1 cover for each cylinder. 1 set of feed & bilge pump valves. 1 set of piston springs. 1 piston rod.
The foregoing is a correct description,
Rantini & Blackmore Manufacturer.

General Remarks (State quality of workmanship, opinions as to class, &c.)
These Engines and Boilers were specially surveyed, during construction
quality of workmanship good. Shafts examined when being turned and found
satisfactory. Main steam pipes tested by hydraulic pressure to 320 lbs per sq. in.
Engines and Boilers satisfactorily fitted on board, and tested under full
steam, they are now in good order and safe working condition, and are
in my opinion eligible to be noted in the Register Book. **LMC 12. 88.**

Spare gear Continued
1 set of crank pin brasses. 1 set of eccentric brasses. 1 set of liners for thrust bearing
1 set of safety valves with springs for main boiler. 1 spring for donkey boiler safety valve.
1 set of springs for relief valves in cylinders and feed pumps. 1 set of check valves
2 main bearing bolts. 1 set of coupling bolts. 1 set of valves for circulating pump.
1 air pump rod with bucket & head & foot valves complete. 1 air pump lower link with
brasses. 1 brass bush with lignum vitae for stern bracket. 1 H.P. slide valve face.
1 set of condenser tubes for one condenser. 50 screw glands for tubes. 20 junk ring bolts
20 cylinder & valve chest cover bolts & studs. 4 bolts for feed pump chest covers. 1/2 set of
tubes for main boiler. 1 set of fire bars & bearers.

It is submitted that these
engines are eligible to have
LMC 12 88 recorded.
A.L.D.

The amount of Entry Fee .. £ 2 : 0 : 0 received by me,
Special .. £ 22 : 10 : 0
Donkey Boiler Fee .. £ : :
Certificate (if required) .. £ gratis: 5/12/1888
To be sent as per margin.
(Travelling Expenses, if any, £ nil) **TUES 11 DEC 1888**
Committee's Minute
+ Lmc 12 1888
A.L.D.
Greenock District
Lloyd's Register Foundation