

REPORT ON MACHINERY.

Port of Glasgow Received at London Office FRI. 19 FEB 1897
 No. in Survey held at Glasgow Date, first Survey 8 May 1896 Last Survey FRI 19 FEB 1897
 Reg. Book. "Indra" (Number of Visits 61)
 on the S.S. "Indra" Tons (Gross 6054) (Net 3925)
 Master F.L. Burkill Built at Glasgow By whom built C. Connell & Coy When built 1897
 Engines made at Glasgow By whom made D. Rowan & Son when made 1897
 Boilers made at Glasgow By whom made D. Rowan & Son when made 1897
 Registered Horse Power _____ Owners Indra Steam Ship Co. Ltd Port belonging to Liverpool
 Nom. Horse Power as per Section 28 476 Is Electric Light fitted No

ENGINES, &c. — Description of Engines Triple Expansion, Direct Acting of Cylinders Three No. of Cranks Three
 Diameter of Cylinders 26" - 44" - 18" Length of Stroke 48" Revolutions per minute 40 Diameter of Screw shaft as per rule 13 1/2"
 Diameter of Tunnel shaft as fitted 13 1/2" Diameter of Crank shaft journals 14" Diameter of Crank pin 14" Size of Crank webs 27 1/2" x 9 1/2"
 Diameter of screw 14" - 6" Pitch of screw 14" - 6" No. of blades Four State whether moveable Yes Total surface 84 sq ft.
 No. of Feed pumps Two Diameter of ditto 7" Stroke 21" Can one be overhauled while the other is at work Yes
 No. of Bilge pumps Two Diameter of ditto 4 1/2" Stroke 24" Can one be overhauled while the other is at work Yes
 No. of Donkey Engines Two Sizes of Pumps 8" x 8" x 8" & 9" x 10" x 10" No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room Five - 3 1/2" In Holds, &c. Eight - 3 1/2"
 No. of bilge injections One sizes 5" Connected to condenser, or to circulating pump Pumps a separate donkey suction fitted in Engine room & size Yes - 3 1/2"
 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 fitted
 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 Before leaving ship the screw shaft tunnel watertight Stated to be
 Is it fitted with a watertight door Yes worked from Engine Room Platform

BOILERS, &c. — (Letter for record S.) Total Heating Surface of Boilers 6439 sq ft Is forced draft fitted Yes
 No. and Description of Boilers Three - Single Ended, Horizontal Working Pressure 20 lbs. Tested by hydraulic pressure to 400 lbs.
 Dates of test 20th & 27th 96 Can each boiler be worked separately Yes Area of fire grate in each boiler 36 1/2 sq ft No. and Description of safety valves to
 each boiler Two - Spring Loaded Area of each valve 7.06 sq Pressure to which they are adjusted 200 lbs. Are they fitted
 with easing gear Yes Smallest distance between boilers plates and bunkers or woodwork 15" Mean diameter of boilers 13' - 3"
 Length 11' - 6" Material of shell plates Steel Thickness 1 5/16" Description of riveting: circum. seams Lap Seams & Rivets Long. seams Rivets Seams
 Diameter of rivet holes in long. seams 1 5/16" Pitch of rivets 8 1/4" Lap of plates or width of butt straps 19 1/4"
 Per centages of strength of longitudinal joint rivets 84.0 plate 85.0 Working pressure of shell by rules 20 lbs. Size of manhole in shell 16" x 12"
 Size of compensating ring No. Nails No. and Description of Furnaces in each boiler Two - Morrison's Material Steel Outside diameter 50 1/2"
 Length of plain part top ✓ Thickness of plates crown 5" bottom 3 5/8" Description of longitudinal joint Weld No. of strengthening rings Two Top & Bottom
 Working pressure of furnace by the rules 20 lbs. Combustion chamber plates: Material Steel Thickness: Sides 9 1/2" Back 9 1/2" Top 4" Bottom 1 1/2"
 Pitch of stays to ditto: Sides 1 1/2" x 1 1/2" Back 1 1/2" x 1 1/2" Top 1 1/2" x 1 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 203 lbs.
 Material of stays Steel Diameter at smallest part 1 3/8" Area supported by each stay 58 sq Working pressure by rules 202 lbs. End plates in steam space:
 Material Steel Thickness 2 3/32" Pitch of stays 1 1/2" x 1 1/2" How are stays secured Rivets Working pressure by rules 200 lbs. Material of stays Steel
 Diameter at smallest part 2 1/16" Area supported by each stay 2322 sq Working pressure by rules 204 lbs. Material of Front plates at bottom Steel
 Thickness 2 3/32" Material of Lower back plate Steel Thickness 3" Greatest pitch of stays 14 1/2" Working pressure of plate by rules 216 lbs.
 Diameter of tubes 2 1/2" Pitch of tubes 3 1/2" x 3 5/8" Material of tube plates Steel Thickness: Front 2 3/32" Back 1/16" Mean pitch of stays 1 1/2" x 1 1/2"
 Pitch across wide water spaces 13 1/2" Working pressures by rules 243 lbs. Girders of Chamber tops: Material Iron Depth and
 thickness of girder at centre 8 1/2" x 1 1/4" Length as per rule 30 3/4" Distance apart 7 1/2" Number and pitch of Stays in each Three - 1 1/2"
 Working pressure by rules 219 lbs. Superheater or Steam chest; how connected to boiler ✓ 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 _____

If not, state whether, and when, one will be sent? Is a ... sent on the hull of the ship?



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DONKEY BOILER— Description *Cylind. Single Ended*
 Made at *Glasgow* By whom made *D. Rowan & Co.* When made *1897* Where fixed *Stockholm*
 Working pressure *100 lbs* tested by hydraulic pressure to *100 lbs* No. of Certificate *4119* Fire grate area *292 sq ft* description of safety valves *Two - Direct*
 No. of safety valves *Two* Area of each *7 sq ft* Pressure to which they are adjusted *100 lbs* If fitted with easing gear *Yes* If steam from main boilers can enter the donkey boiler *No* Diameter of donkey boiler *10'-9"* Length *9'-6"* Material of shell plates *Steel* Thickness *3/4"*
 Description of riveting long seams *Lap Table* Diameter of rivet holes *1 1/16"* Whether punched or drilled *Drilled* Pitch of rivets *4 3/8"*
 Lay of plating *1/4"* Per centage of strength of joint Rivets *13.5* Thickness of shell plates *3/4"* Radius of do. *1/2"* Description of stays to do. *16 x 16*
 Dist. of stays *2"* Diameter of furnace Top *36 1/2"* Bottom *36"* Length of furnace *6'-0"* Thickness of furnace plates *3/8"* Description of joint *Weld* Thickness of furnace crown plates *1 1/2" x 1 1/2"* Stayed by *Screwed Stay 1 1/2" x 1 1/2"* Working pressure of shell by rules *116 lbs*
 Working pressure of furnace by rules *117 lbs* Diameter of uptake *12"* Thickness of uptake plates *3/8"* Thickness of tubes *1 1/2" x 4 1/2"*

SPARE GEAR. State the articles supplied: *Set crank pin brasses; H.P. piston valve; two propeller brasses; set piston rings for each engine; two slide valves; spindles; air pump rod; circulating pump rod; other gear to our requirements.*

The foregoing is a correct description,
David Rowan & Co. Manufacturer.

Dates of Survey while building
 During progress of work in shops - *1896: May 8, 15, 20, 26 June 3, 10, 16, 22 July 2, 6, 10, 29, 30 Aug 5, 10, 11, 18, 21, 28 Sept 9, 14, 18, 24, 29 Oct 8, 12, 21*
 During erection on board vessel - *Nov 2, 3, 5, 12, 16, 20, 23, 25 Dec 2, 5, 7, 8, 10, 12, 14, 16, 17, 21, 22, 23, 1897 Jan 4, 15, 16, 20, 22, 29, 29 Feb 1, 4, 6, 8, 15, 16*
 Total No. of visits *61*

General Remarks (State quality of workmanship, opinions as to class, &c. *The machinery of this vessel has been constructed under Special Survey, and is of good workmanship and material. It has been securely fitted on board, and worked satisfactorily under steam. The boilers are fitted with Howden's system of forced draft. In my opinion, it is eligible to have record of + L.M.C. 2.97 F.D.*

Appended are the Fitting Report, and the approved photo prints of boilers

Boat

It is submitted that this vessel is eligible for THE RECORD. + L.M.C. 2.97. F.D

R.S. 19.2.97
R.B. 19/2/97

The amount of Entry Fee. . . £ 3 : " : " When applied for,
 Special £ 43 : 16 : " 14/21 94
 Donkey Boiler Fee £ " : " : " When received,
 Travelling Expenses (if any) £ " : " : " 18/21 94
 TUES 23 FEB 1897

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

Committee's Minute
 Assigned

+ L.M.C. 2.97 F.D



Certificate (if required) to be sent to the Surveyors and requested not to write on or before the space for Committee's Minute.