

REPORT ON MACHINERY.

Port of Glasgow

Received at London Office FRI. 19 FEB 1897

No. in Survey held at Reg. Book.

Date, first Survey 8 May 1896 Last Survey 10 Feb 1897

on the

Master F. L. Burkhill Built at Glasgow By whom built C. Connell & Co

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 70 Diameter of Screw shaft as per rule 1 1/2" as fitted 1 1/2"  
Diameter of Tunnel shaft as per rule 1 1/2" as fitted 1 1/2" Diameter of Crank shaft journals 1 1/4" Diameter of Crank pin 1 1/4" Size of Crank webs 2 1/2" x 9 1/2"  
Diameter of screw 1 1/4"-6" Pitch of screw 1 1/4"-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" 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, & Stays Working Pressure 200 lbs Tested by hydraulic pressure to 400 lbs  
Dates of test 20th & 21st Nov 1896 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 15" and bunkers or woodwork 15" Mean diameter of boilers 13'-3"  
Length 11'-6" Material of shell plates Steel Thickness 1 1/16" Description of riveting: circum. seams Lap Seams & Stays Rivet Seams  
Diameter of rivet holes in long. seams 1 1/16" 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 201 lbs Size of manhole in shell 16" x 12"  
Size of compensating ring No. 2 Nails No. and Description of Furnaces in each boiler Two - Normal Material Steel Outside diameter 50 1/2"  
Length of plain part top 15" bottom 15" Thickness of plates crown 5/8" bottom 3/8" Description of longitudinal joint Weld No. of strengthening rings Two Top & Bottom  
Working pressure of furnace by the rules 201 lbs Combustion chamber plates: Material Steel Thickness: Sides 9/32" Back 1/2" Top 1/2" Bottom 1/2"  
Pitch of stays to ditto: Sides 1 1/2" x 1/2" Back 1 1/2" x 1/2" Top 1 1/2" x 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 1/8" Area supported by each stay 58 sq Working pressure by rules 202 lbs End plates in steam space:  
Material Steel Thickness 3/32" Pitch of stays 1 1/2" x 1 1/2" How are stays secured Nuts Working pressure by rules 200 lbs Material of stays Steel  
Diameter at smallest part 2 1/16" Area supported by stays 232 1/2 sq Working pressure by rules 204 lbs Material of Front plates at bottom Steel  
Thickness 3/32" Material of Lower back plate Steel Thickness 3/4" Greatest pitch of stays 1 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 1/6" 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 1/4" 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



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DONKEY BOILER— Description *Cylind. Single Ended*  
 Made at *Glasgow* By whom made *D. Rowan & Son* 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 *70 sq in* 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 *75%* Rivets *13.5"* Thickness of shell *and* plates *3/4"* Radius of do. *✓* *Pitch* of stays to do. *16" x 16"*  
 No. of stays *2* Diameter of furnace Top *36 1/2"* Bottom *✓* Length of furnace *6'-0"* Thickness of furnace plates *3/8"* Description of joint *Weld* Thickness of furnace crown plates *1 1/2" x 1/2"* 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 *✓* Thickness of uptake plates *✓* Thickness of ~~main~~ tubes *1 1/2" x 4 1/2"*

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

The foregoing is a correct description,  
*David Rowan & Son* 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 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*

*Rowan*

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, *14/2/94*  
 Special .. .. £ *43* : *16* : " *18/2/94*  
 Donkey Boiler Fee .. .. £ " : " : " When received, *18/2/94*  
 Travelling Expenses (if any) £ " : " : " *18/2/94*

Committee's Minute  
 Assigned

TUES 23 FEB 1897  
*+ L.M.C. 2.97 F.D*

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

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