

# REPORT ON MACHINERY.

9415

No. 9415 Port of Glasgow Received at London Office 1484  
 No. in Survey held at Glasgow Date, first Survey 22<sup>nd</sup> Sept. 1888 Last Survey Oct 7<sup>th</sup> 1889  
 Reg. Book. on the S. S. "Mangara" (Number of Visits 44) Tons 1154  
 Master A. Albrechtson Built at Glasgow By whom built A. Stephen & Sons When built 1889  
 Engines made at Glasgow By whom made " " " " when made 1889  
 Boilers made at " " By whom made " " " " when made 1889  
 Registered Horse Power 170 Owners Maclay & McIntyre Port belonging to Glasgow

ENGINES, &c.—  
 Description of Engines Triple Expansion (3 Cranks)  
 Diameter of Cylinders 18" 29" 16" Length of Stroke 39" No. of Rev. per minute 40 Point of Cut off, High Pressure Variable Low Pressure —  
 Diameter of Screw shaft 10" Diam. of Tunnel shaft 9 1/2" Diam. of Crank shaft journals 10" Diam. of Crank pin 10 1/4" size of Crank webs 7 x 1 1/4 built  
 Diameter of screw Pitch of screw No. of blades 4 state whether moveable Yes flat surface  
 No. of Feed pumps Two diameter of ditto 3 1/2" 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 21" Can one be overhauled while the other is at work Yes  
 Where do they pump from all Compartments  
 No. of Donkey Engines Two Size of Pumps 4" x 4 1/2" x 4" 8" x 8" x 8" Where do they pump from Sea Trilges & Hotwell  
 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 One and sizes 4 1/2" Are they connected to condensers, or to circulating pumps To circulating  
 How are the pumps worked by Levers  
 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 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 slip before launching  
 Is the screw shaft tunnel watertight Yes and fitted with a sluice door Yes worked from Upper platform

BOILERS, &c.—  
 Number of Boilers One Description Round Horizontal Whether Steel or Iron Steel  
 Working Pressure 160 lbs Tested by hydraulic pressure to 320 lbs Date of test 21<sup>st</sup> March 1889  
 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 54 1/2 Description of safety valves Direct Spring No. to each boiler Two  
 Area of each valve 4" 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 about 76" Diameter of boilers 14.6  
 Length of boilers 11' 9" description of riveting of shell long. seams double riveted circum. seams Double riveted thickness of shell plates 10/16  
 Diameter of rivet holes 1 7/16" whether punched or drilled Drilled pitch of rivets 8 3/8" Lap of plating Straps  
 Per centage of strength of longitudinal joint 84% working pressure of shell by rules 166 lbs size of manholes in shell 12" x 16"  
 Size of compensating rings double pieces fitted No. of Furnaces in each boiler Three  
 Outside diameter 3.6" length, top 8 1/4" bottom — thickness of plates 9/16" description of joint — if rings are fitted —  
 Greatest length between rings — working pressure of furnace by the rules 166 lbs combustion chamber plating, thickness, sides 1 1/32" back 1 7/32" top 1 7/32"  
 Pitch of stays to ditto, sides 3/4" x 3/4" back 3/4" x 3/4" stays are fitted with nuts or riveted heads Nuts working pressure of plating by rules 160 lbs  
 Diameter of stays at smallest part 1 3/8" x 1 1/2" working pressure of ditto by rules 175 lbs plates in steam space, thickness 16/16"  
 Pitch of stays to ditto 15" x 15" how stays are secured by double nuts working pressure by rules — diameter of stays at smallest part 2 7/8" = 4.5" area working pressure by rules 180 lbs Front plates at bottom, thickness 14/16" Back plates, thickness 14/16"  
 Greatest pitch of stays — working pressure by rules — Diameter of tubes 3 1/2" pitch of tubes 4 3/4" x 4 5/8" thickness of tube plates, front 14/16" back 14/16" how stayed by tubes pitch of stay 9 1/2" x 9 1/2" x 10 1/2" width of water spaces about 6"  
 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 —

[Form No. 8-2000-5/6/38-T.S.S.-Copyable Ink.]

Description Furnaces

9415 g/s

**DONKEY BOILER**— Description *Round Vertical (cross tubes)*  
 Made at *Glasgow* by whom made *A. Stephenson* when made *1889* where fixed *In Stephens*  
 Working pressure *140 lbs* tested by hydraulic pressure to *140 lbs* No. of Certificate *2303* fire grate area *24* description of safety valves *Direct Spring* No. of safety valves *Two* area of each *4"* if fitted with easing gear *yes* if steam from main boilers can enter the donkey boiler  
 diameter of donkey boiler *6'-6"* length *11'-8"* description of riveting *Double + Single*  
 Thickness of shell plates *13/32"* diameter of rivet holes *7/8"* whether punched or drilled *Drilled* each of rivets *3/4"* lap of plating *15°*  
 per centage of strength of joint *65%* thickness of crown plates *17/16"* stayed by *Wire stays 1 3/4" dia + uptake*  
 Diameter of furnace, top *5'-11"* bottom *5'-10"* length of furnace *5'-8"* thickness of plates *9/16"* description of joint *Lap*  
 Thickness of furnace crown plates *9/16"* stayed by *As above rows of screw stays* working pressure of shell by rules *44 lbs*  
 Furnace fitted with *3 cross tubes 4"* diameter of uptake *10"* thickness of plates *9/16" iron* thickness of water tubes *11" dia x 7/16"*  
 Working pressure of furnace by rules *—*

**SPARE GEAR.** State the articles supplied: *Two connecting rod bolts for top & bottom ends, 2 main bearing bolts, 1 set coupling bolts, one feed & bridge pump valve, also one set of rubber valves, assortment of bolt nuts, iron boiler & condenser tubes, pumps, metallic valves &c*  
*The foregoing is a correct description, also 2 speller blades*  
*Alex. Stephenson & Sons. Manufacturer.*

**General Remarks** (State quality of workmanship, opinions as to class, &c. *These Engines & Boilers are of good workmanship and materials and are now in good order & safe working condition and eligible in my opinion to be noted in the Register Book* *Lloyds. M. C. 10/89*

*It is submitted that this vessel is eligible to have + L.M.C. 10.89 recorded*  
*M.A.*  
*9-10-89*

*James Morrison*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.  
 Clyde District

The amount of Entry Fee .. £ *2* : - : - received by me,  
 Special .. £ *25* : *10* : -  
 Donkey Boiler Fee .. £ - : - : -  
 Certificate (if required) .. £ - : - : - *4/10/1889*  
 To be sent as per margin.  
 (Travelling Expenses, if any, £ ..)

Committee's Minute **FRIDAY 11 OCT 1889**  
*+ Rmb 10/89*