

# REPORT ON MACHINERY.

No. 2743

(Received in London Office)

21/8/81

No. in Survey held at *Glasgow & Belfast*

Date, first Survey *June 22<sup>nd</sup> 1880* Last Survey *March 14 1881*

Reg. Book.

on the *Screw Steamer "Ethelbert"*

Tons *322.56 R*  
*373.25 G*

Master *Walker* Built at *Belfast* When built *1881*

Engines made at *Glasgow* By whom made *Muir & Houston* when made *1881*

Boilers made at *- - -* By whom made *Muir & Houston* when made *1881*

Registered Horse Power *40* Owners *A. C. Colvill* Port belonging to *Glasgow*

**ENGINES, &c.—**

Description of Engines *C. S. I. A*  
 Diameter of Cylinders *22" + 40"* Length of Stroke *30"* No. of Rev. per minute *90* Point of Cut off, High Pressure *19"* Low Pressure *16 1/2"*  
 Diameter of Screw shaft *4 1/2"* Diameter of Tunnel shaft *4"* Diameter of Crank shaft journals *4 1/2"* Diameter of Crank pin *4 1/2"* size of Crank webs *5 1/2" x 4"*  
 Diameter of screw *11 1/2"* Pitch of screw *14:6"* No. of blades *Four* state whether moveable *Yes* total surface  
 No. of Feed pumps *One* diameter of ditto *3 1/2"* Stroke *18"* Can one be overhauled while the other is at work   
 No. of Bilge pumps *One* diameter of ditto *3 1/2"* Stroke *18"* Can one be overhauled while the other is at work   
 Where do they pump from *The holds & Engine room*  
 No. of Donkey Engines *One* Size of Pumps *6 1/2" Cyl. 4" x 8"* Where do they pump from *The Sea, Bilge, Hotwell & Ballast Tank*  
 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 *2 1/4"* Are they connected to condenser, or to circulating pump *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 stowchold 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 Ship before being launched*  
 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*  
 Working Pressure *80 lbs* Tested by hydraulic pressure to *160* Date of test *21.2.81*  
 Description of superheating apparatus or steam chest *Round longitudinal Receiver*  
 Can each boiler be worked separately  Can the ~~superheater~~ *Receiver* be shut off and the boiler worked separately *no*  
 No. of square feet of fire grate surface in each boiler *52 ft<sup>2</sup>* Description of safety valves *Direct Spring*  
 No. to each boiler *Two* area of each valve *14.18"* Are they fitted with casing gear *Yes*  
 No. of safety valves to superheater  area of each valve  are they fitted with casing gear   
 Smallest distance between boilers and bunkers *6"*  
 Diameter of boilers *12 ft* Length of boilers *10 ft* description of riveting of shell long. seams *Double riveted* circum. seams *Double riveted*  
 Thickness of shell plates *29 1/2"* diameter of rivet holes *1 1/4"* whether punched or drilled *Drilled* pitch of rivets *5 1/4"*  
 Thickness of plating *8"* per centage of strength of longitudinal joint *1/4.2* working pressure of shell by rules *79.2*  
 Size of manholes in shell *16 1/2" x 11 1/2"* size of compensating rings *5 1/2" x 9"*  
 No. of Furnaces in each boiler *Three* outside diameter *2:11"* length, top *6:6"* bottom *9 ft 1/4"*  
 Thickness of plates *15 1/2" + 7/16" bottom* description of joint *double straps* if rings are fitted *Half riveted* greatest length between rings  
 Working pressure of furnace by the rules *83 lbs*  
 Combustion chamber plating, thickness, sides *7/16"* back *7/16"* top *7/16"*  
 Thickness of stays to ditto sides *8" x 7 1/2"* back *8" x 8"* top *9" x 8 1/2" (stud 1 1/2")*  
 Are stays fitted with nuts or riveted heads *Nuts* working pressure of plating by rules *91 lbs*  
 Diameter of stays at smallest part *1 1/2" + 1 1/2"* working pressure of ditto by rules *106 lbs*  
 Thickness of plates in steam space, thickness *12/16"* pitch of stays to ditto *15" x 15"* how stays are secured *By double nuts*  
 Working pressure by rules *89 lbs* diameter of stays at smallest part *2 5/8"* working pressure by rules *93 lbs*  
 Thickness of plates at bottom, thickness *9/16"* Back plates, thickness *9/16"* greatest pitch of stays *12" x 8"* working pressure by rules *Lloyd's Register*



Diameter of tubes  $3\frac{1}{2}$ " pitch of tubes  $4\frac{3}{4}$ " thickness of tube plates, front  $\frac{1}{16}$ " back  $\frac{10}{16}$ "  
 How stayed *by tubes* pitch of stays  $9\frac{1}{2} \times 9\frac{1}{2}$ " width of water spaces  $5$ "  
 Diameter of ~~superheater~~ Steam chest  $2'6"$  length  $6'6"$   
 Thickness of plates  $\frac{6}{16}$ " description of longitudinal joint  $\frac{1}{16}$ " diameter of rivet holes  $\frac{13}{16}$ " pitch of rivets  $3\frac{1}{2}$ "  
 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~~ steam chest; thickness  $\frac{1}{16}$ " How stayed *by one bar stay  $2\frac{1}{8}$ " dia*  
~~Superheater or steam chest~~; how connected to boiler *by one neck  $4\frac{1}{2}$ " dia x  $\frac{1}{16}$ " thick*

**DONKEY BOILER**— Description *Round vertical*  
 Made at *Glasgow* By whom made *Muir & Houston* when made *1881*  
 Where fixed *in Scotchold* working pressure *60 lbs* Tested by hydraulic pressure to *120 lbs* No. of Certificate *477*  
 Fire grate area *10 ft<sup>2</sup>* Description of safety valves *Direct Spring* No. of safety valves *One* area of each *7" dia*  
 If fitted with easing gear *Yes* If steam from main boilers can enter the donkey boiler *No*  
 Diameter of donkey boiler *4'3"* length *9'0" high* description of riveting *Double & Single*  
 thickness of shell plates  $\frac{6}{16}$ " diameter of rivet holes  $\frac{13}{16}$ " whether punched or drilled *punched*  
 pitch of rivets  $3\frac{1}{2}$ " lap of plating  $4$ " per centage of strength of joint  $70\%$   
 thickness of crown plates  $\frac{7}{16}$ " stayed by *Uplate & palm stays*  
 Diameter of furnace, top  $3'5"$  bottom  $3'10"$  length of furnace *4 ft<sup>2</sup>*  
 thickness of plates  $\frac{9}{16}$ " description of joint *Lap*  
 thickness of furnace crown plates  $\frac{9}{16}$ " stayed by *Uplate*  
 Working pressure of shell by rules *80 lbs* working pressure of furnace by rules *Stayed by two cross tubes*  
 diameter of uptake  $10$ " thickness of plates  $\frac{9}{16}$ " thickness of water tubes  $\frac{9}{16} \times 1\frac{1}{4}$ " dia

The foregoing is a correct description,  
*Muir & Houston* Manufacturer.

General Remarks (State quality of workmanship, opinions as to class, &c. *The Engines & Boilers are of good workmanship and now in good order & safe working condition and eligible in my opinion to be noted in the Register Book.*  
*Lloyd M.C. 3.81*

*It is submitted that this result is desirable to be recorded in the Register Book*  
*M 27/3/81*

The amount of Entry Fee .. £ 2 : " : " received by me,  
*Muir & Houston* .. £ 10 : 10 : " Paid in Glasgow  
 Certificate (if required) .. £ " : " : " March 1881  
 To be sent as per margin.  
 (Travelling Expenses, if any, £ 3 : 3 : 0)

Committee's Minute Tuesday March, 22nd, 1881.  
 + *Lloyd*

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

