

# REPORT ON MACHINERY.

No. 106

(Received in London Office 12/8/80)

No. in Survey held at Zeith Date, first Survey \_\_\_\_\_ Last Survey 21<sup>st</sup> June 1880  
 Reg. Book. \_\_\_\_\_ Tons 443.

504 on the I.S.S. "Ella"  
 Master G. Wilkie Built at Inverkeithing When built 1870  
 Engines made at Inverkeithing By whom made J. Scott & Sons when made 1870  
 Boilers made at Zeith By whom made Hawthornes & Co when made 1880  
 Registered Horse Power 65 Owners James Cormack Port belonging to Zeith

## ENGINES, &c.—

Description of Engines Compound Int Cyls Surface Condensing  
 Diameter of Cylinders 20" 36" Length of Stroke 27 No. of Rev. per minute 80 Point of Cut off, High Pressure — Low Pressure —  
 Diameter of Screw shaft 8" Diameter of Tunnel shaft 8" Diameter of Crank shaft journals 8 1/8" Diameter of Crank pin 8 1/8" size of Crank webs 6 x 9 1/2"  
 Diameter of screw 9 1/8" Pitch of screw 14 1/6" No. of blades 4 state whether moveable Solid total surface 29 feet  
 No. of Feed pumps two diameter of ditto 3 1/2" Stroke 16" Can one be overhauled while the other is at work yes  
 No. of Bilge pumps two diameter of ditto 3 7/8" Stroke 16" Can one be overhauled while the other is at work yes  
 Where do they pump from Engine room and after hold  
 No. of Donkey Engines two Size of Pumps 8" x 9" x 4 1/2" Where do they pump from Tanks. Sea engine room. on deck. from sea to boiler  
 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 1/4" Are they connected to condenser, or to circulating pump 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 only blow off cock below fitted with lock key 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 seen on beach 15.5.80  
 Is the screw shaft tunnel watertight covered and fitted with a sluice door yes 15 hold worked from Cylinder platform

## BOILERS, &c.—

Number of Boilers one Description Circular Tubular  
 Working Pressure 70 lbs Tested by hydraulic pressure to 140 lbs Date of test 27.1.80  
 Description of superheating apparatus on steam chest Horizontal dumb used on former boiler but has been tested at this time by hydraulic pressure to 140 lbs per square inch  
 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 28 feet Description of safety valves direct spring load  
 No. to each boiler two area of each valve 9.62" Are they fitted with easing gear yes  
 No. of safety valves to superheater — area of each valve 9.62" are they fitted with easing gear yes  
 Smallest distance between boilers and bunkers or woodwork 6"  
 Diameter of boilers 10 1/2" Length of boilers 9 1/6" description of riveting of shell long. seams butt D.R. circum. seams lap D.R.  
 Thickness of shell plates 7/8" diameter of rivet holes 1 1/8" whether punched or drilled drilled pitch of rivets 4 1/2"  
 Lap of plating 12 3/4" x 6 3/8" per centage of strength of longitudinal joint 72 rivets 79 working pressure of shell by rules 98 lbs  
 Size of manholes in shell 17" x 11" size of compensating rings 5 1/2" x 7 1/8"  
 No. of Furnaces in each boiler three outside diameter 2 1/2" length, top 6 1/2" bottom 8 1/2"  
 Thickness of plates top 7/16 bottom 9/16 description of joint butt S.R. if rings are fitted no greatest length between rings —  
 Working pressure of furnace by the rules top 83 lbs bottom 137 lbs  
 Combustion chamber plating, thickness, sides 1/2" back 1/2" top 1/2"  
 Pitch of stays to ditto sides 9" x 7" back 8" x 8" top 9" x 8 1/2"  
 If stays are fitted with nuts or riveted heads rivets working pressure of plating by rules 79 lbs  
 Diameter of stays at smallest part 1 1/4" B.I. working pressure of ditto by rules 4609 lbs  
 End plates in steam space, thickness 1/16 and 1/2" lining inside pitch of stays to ditto 17" x 12" how stays are secured the plates nuts  
 Working pressure by rules 83 lbs diameter of stays at smallest part 2 1/2" working pressure by rules 2914 lbs  
 Front plates at bottom, thickness 5/8" Back plates, thickness 1/16" greatest pitch of stays 13" x 8" working pressure by rules 5918 lbs

Form No. 8, 2000 8/1/80

IRON 494-0303  
 Lloyd's Register Foundation

Diameter of tubes  $3\frac{1}{4}$ " pitch of tubes  $4\frac{1}{2}$ " thickness of tube plates, front  $\frac{4}{16}$ " back  $\frac{10}{16}$ "  
 How stayed *tubes & nuts* pitch of stays  $13\frac{1}{2} \times 13\frac{1}{2}$ " width of water spaces  $1\frac{1}{4}$ "  
 Diameter of Superheater or Steam chest  $3\frac{1}{2}$ " length  $8\frac{3}{8}$ " 27502 Jan.  
 Thickness of plates  $\frac{7}{16}$ " description of longitudinal joint *butt D.R.* diameter of rivet holes  $\frac{11}{16}$ " pitch of rivets  $\frac{1}{2}$ "  
 Working pressure of shell by rules  $\frac{1}{2}$ " Diameter of flue  $\frac{1}{2}$ " thickness of plates  $\frac{1}{2}$ "  
 If stiffened with rings  $\frac{1}{2}$ " distance between rings  $\frac{1}{2}$ " Working pressure by rules  $\frac{1}{2}$ "  
 End plates of superheater or steam chest; thickness  $\frac{9}{16}$ " How stayed *dished and one bolt stay in center  $2\frac{1}{2}$ " dia*  
 Superheater or steam chest; how connected to boiler *malleable neck riveted to shell*

**DONKEY BOILER**— Description *Round Multitubular*  
 Made at *Birkenhead* By whom made *Cochran & Co* when made *1880*  
 Where fixed *Stokehold* working pressure *45 lbs* Tested by hydraulic pressure to  $\frac{1}{2}$ " No. of Certificate  $\frac{1}{2}$ "  
 Fire grate area *10 feet* Description of safety valves *Tenon height* No. of safety valves *one* area of each  $7\frac{1}{4}$ "  
 If fitted with easing gear *can be eased by hand* If steam from main boilers can enter the donkey boiler *no*  
 Diameter of donkey boiler  $4\frac{1}{2}$ " length  $7\frac{1}{2}$ " description of riveting *lap and butt*  
 thickness of shell plates  $\frac{3}{8}$ " diameter of rivet holes  $\frac{11}{16}$ " whether punched or drilled *punched*  
 pitch of rivets  $2\frac{1}{2}$ " lap of plating  $2\frac{1}{2} + 4\frac{1}{2}$ " per centage of strength of joint *Seam 66. Rivets 87*  
 thickness of crown plates  $\frac{7}{16}$ " stayed by *dished and three  $1\frac{1}{2}$ " diagonal stays to shell*  
 Diameter of furnace, top *round* bottom  $3\frac{1}{2}$ " length of furnace  $1\frac{1}{2}$ "  
 thickness of plates  $\frac{3}{8}$ " description of joint *lap*  
 thickness of furnace crown plates  $\frac{3}{8}$ " stayed by *round*  
 Working pressure of shell by rules *74 lbs* working pressure of furnace by rules  $\frac{1}{2}$ "  
 diameter of uptake  $11\frac{1}{2}$ " thickness of plates  $\frac{3}{8}$ " thickness of water tubes *2" diameter*

The foregoing is a correct description,  
 Manufacturer *A. Hawthorn & Co*

**General Remarks** (State quality of workmanship, opinions as to class, &c. *New boilers have been fitted on board of this vessel at this time; agreeable to tracing submitted for the Committee's approval dated 19<sup>th</sup> September 1879, and in accordance with the requirements of the Rules. The engines have received a general overhaul the machinery have been seen at work under steam, and the safety valves set to a working pressure of 70 lbs per square inch, and in my opinion all is now in satisfactory working order and eligible to be entered into the Register Books Lloyd's M.C. in need 21.6.80.*)

*This submitted that this vessel is eligible to have the registration in Lloyd's M.C. Register Books. J.M. 12/8/80*

The amount of Entry Fee £  $3 : 3 : 0$  received by me, J.P.  
 Special .. .. £  $3 : 3 : 0$   
 Certificate (if required) .. £ .. .. *7<sup>th</sup> August 1880*  
 To be sent as per margin.

(Travelling Expenses, if any, £  $4 : 13 : 0$ )  
 Committee's Minute *Friday, August 13<sup>th</sup>, 1880*

*John Starrook*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.  
*Dundee & District*

