

# REPORT ON MACHINERY.

13104

No. 5234

(Received at London Office) Rec'd 19th JULY, 1883.

No. in Survey held at Stockton-on-Tees Date, first Survey 22 February 1883 Last Survey 10 July 1883  
Reg. Book.

on the S.S. "Cairngowan" Tons 1386  
Master John Anderson Built at Sunderland When built 1883  
Engines made at Stockton-on-Tees By whom made Hair-Co (Lanc) when made 1883  
Boilers made at do By whom made do when made do

Registered Horse Power 99 Owners Thomas Cairns Port belonging to Newcastle  
Manufacturers Horse Power 110

## ENGINES, &c.—

Description of Engines Compound. Inverted. Surface Condensing  
Diameter of Cylinders 28 1/2 x 53 Length of Stroke 33 No. of Rev. per mi 65 Point of Cut off, High Pressure 7/25ths Low Pressure 7/25ths  
Diameter of Screw shaft 10 Diameter of Tunnel shaft 9 3/8 Diameter of Crank shaft journals 9 3/4 Diameter of Crank pin 10 1/4 size of Crank webs 13 1/2 x 4  
Diameter of screw 13.0 Pitch of screw 16.0 No. of blades four state whether moveable No total surface Not ascertained

No. of Feed pumps Two diameter of ditto 3 1/2 Stroke 24 Can one be overhauled while the other is at work Yes  
No. of Bilge pumps Two diameter of ditto 3 1/2 Stroke 24 Can one be overhauled while the other is at work Yes

Where do they pump from one pump from ballast tanks engine room after well. Other pump from engine room after well  
No. of Donkey Engines Two Size of Pumps 1/2 dia x 9 stroke Where do they pump from large donkey from ballast tanks

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 6 Are they connected to condenser, or to circulating pump circulating pumps

Are the pumps worked By hand worked from overhead on low pressure piston rod  
Are all connections with the sea direct on the skin of the ship Yes Are they Valves or Cocks Stop valves & cocks  
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 Below

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  
Are all pipes carried through the bunkers None How are they protected Yes

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

Were stern tube, propeller, screw shaft, and all connections examined in dry dock Yes  
Is the screw shaft tunnel watertight Said to be and fitted with a sluice door Yes worked from top platform in engine room

## BOILERS, &c.—

No. of Boilers One Description Cylindrical. Multitubular  
Working Pressure 80 lbs Tested by hydraulic pressure to 160 lbs Date of test 5.5.83 Certificate No. 935

Description of superheating apparatus or steam chest Horizontal steam receiver  
Can each boiler be worked separately Yes Can the superheater be shut off and the boiler worked separately No Super-heater Yes

Area of square feet of fire grate surface in each boiler 60 Description of safety valves Spring. Made by Hair-Co (Lanc)  
No. of safety valves to each boiler Two area of each valve 19.63 sq in Are they fitted with easing gear Yes

Area of safety valves to superheater Yes area of each valve Yes are they fitted with easing gear Yes  
Greatest distance between boilers and bunkers or woodwork about 18"

Diameter of boilers 15.378 Length of boilers 10.9 description of riveting of shell long. seams held except seams of one plate in main corner of cover. seams with double butt straps  
Thickness of shell plates 1 3/16 diameter of rivet holes 1 3/16 whether punched or drilled Drilled pitch of rivets 4 1/8

Thickness of plating Straps 1 1/2 per centage of strength of longitudinal joint 40.9 working pressure of shell by rules 91.4 lbs  
Diameter of manholes in shell 16 x 12 size of compensating rings Rectangular plate 28 x 24 x 1 1/8

No. of Furnaces in each boiler Four outside diameter 3.5 length, top 6.9 bottom 9.5  
Thickness of plates 1/2 description of joints Double strap. Single joint Are rings fitted No greatest length between rings Yes

Working pressure of furnace by the rules top 102.4 lbs bottom 89.8 lbs  
Question chamber plating, thickness, sides 1/2 back 1/2 top 1/2

Pitch of stays to ditto sides 8 x 8 back 8 1/2 x 8 top 1/2  
Are stays fitted with nuts or riveted heads Part nuts - part riveted working pressure of plating by rules 88.5

Diameter of stays at smallest part 1 5/16 working pressure of ditto by rules 119.3  
Thickness of plates in steam space, thickness 1/8 pitch of stays to ditto 15 x 14 1/2 how stays are secured Stub - house

Working pressure by rules 121.9 lbs diameter of stays at smallest part 2 1/2 working pressure by rules 135.3 lbs  
Thickness of plates at bottom, thickness 1/8 Back plates, thickness 1/8 greatest pitch of stays 1 1/2 x 8 1/2 working pressure by rules 72



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Diameter of tubes  $3\frac{3}{4}$  pitch of tubes  $5 \times 5\frac{1}{8}$  thickness of tube plates, front  $\frac{1}{8}$  back  $\frac{1}{8}$   
 How stayed *Stay tubes* pitch of stays  $15 \times 10\frac{1}{4}$  width of water spaces  $1\frac{1}{4}$  between tubes  $4\frac{1}{2}$  between furnace  
 Diameter of ~~Superheater or~~ Steam chest  $3.4$  length  $5.0$   
 Thickness of plates  $\frac{1}{2}$  description of longitudinal joint *Lap double rivet* diameter of rivet holes  $\frac{3}{16}$  pitch of rivets  $3\frac{1}{8}$   
 Working pressure of shell by rules  $126$  lbs Diameter of flue  $\frac{1}{2}$  thickness of plates  $\frac{1}{2}$   
 If stiffened with rings  distance between rings  Working pressure by rules   
 End plates of superheater, or steam chest; thickness  $5\frac{1}{8}$  How stayed *Four stays  $2\frac{1}{4}$  dia*  
 Superheater or steam chest; how connected to boiler *By small diameter rivet pipe to boiler*

**DONKEY BOILER**— Description *Vertical water tubes in furnace*  
 Made at *Luffield* By whom made *Clarke Chapman & Co* when made *1883*  
 Where fixed *Holehole* working pressure  $60$  lbs Tested by hydraulic pressure to  $120$  lbs No. of Certificate *1115*  
 Fire grate area  $15.9$  sq ft Description of safety valves *Spring* No. of safety valves *One* area of each  $9.62$  sq  
 If fitted with easing gear *Yes* If steam from main boilers can enter the donkey boiler *No*  
 Diameter of donkey boiler  $6.6$  length  $12.0$  description of riveting *Lap Double*  
 thickness of shell plates  $\frac{3}{8}$  diameter of rivet holes  $\frac{3}{4}$  whether punched or drilled *Punched*  
 pitch of rivets  $3$  lap of plating  $3\frac{1}{8}$  per centage of strength of joint  $75$   
 thickness of crown plates  $\frac{1}{16}$  stayed by *Five stays  $1\frac{3}{8}$  dia*  
 Diameter of furnace, top  $4.2\frac{1}{4}$  bottom  $4.4\frac{1}{8}$  length of furnace  $4.4$   
 thickness of plates  $\frac{1}{16}$  description of joint *Lap single riveted*  
 thickness of furnace crown plates  $\frac{1}{16}$  stayed by *as above*  
 Working pressure of shell by rules  $66$  lbs working pressure of furnace by rules  $62$  lbs  
 diameter of uptake  $14$  thickness of plates  $\frac{3}{8}$  thickness of water tubes  $\frac{3}{8}$

The foregoing is a correct description,  
*Robt Blair & Co* Manufacturers of Engines & Boilers only  
*James Blair*  
 The above particulars of donkey boiler are correct as a report herewith attached received from the Surveyor of the Port of Newcastle under whose survey the boiler was examined.

**General Remarks** (State quality of workmanship, opinions as to class, &c.)  
*Natural workmanship good*  
 The furnace crown plates, back tube plates & combustion chamber plating of main boiler are of steel manufactured by J. & W. Beardmore Glasgow  
 The Engines & Boilers have been constructed under special survey and are in good order & safe working condition and in my opinion eligible for the notification *1115* in the Register Book

*It is only a copy of the original which has been recorded. No. 197/83*

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

The amount of Entry Fee .. £ 1 : : : received by me,  
 Special .. £ 14 : 19 :  
 Certificate (if required) .. £ : : : 17 July 1883  
 To be sent as per margin.  
 (Travelling Expenses, if any, £ 1.10 : :)

Committee's Minute FRIDAY 20 JULY 1883 18  
*+ Blair*

