

# REPORT ON MACHINERY.

Port of Belfast

1 MAY 94

Received at London Office 18

No. in Survey held at Belfast Date, first Survey 19 Sept 1893 Last Survey 28 April 1894  
 Reg. Book. on the Steel screw steamer "Phoeny" (Number of Visits 35)  
 Master Samuel Bell Built at Belfast By whom built Mac Ilwain & Mac Call Ltd When built 1894  
 Engines made at Belfast By whom made Mac Ilwain & Mac Call Ltd when made 1894  
 Boilers made at Belfast By whom made " when made 1894  
 Registered Horse Power 88 Owners W. A. Grainger Port belonging to Belfast  
 Nom. Horse Power as per Section 28 88

**ENGINES, &c.** — Description of Engines Triple Expansion No. of Cylinders 3  
 Diameter of Cylinders 13; 23; 38 Length of Stroke 33 Revolutions per minute 80 Diameter of Screw shaft 7.6  
 Diameter of Tunnel shaft 7.25 Diameter of Crank shaft journals 7 3/4 Diameter of Crank pin 7 3/4 Size of Crank webs 9 1/2 x 4 1/2  
 Diameter of screw 10' 3" Pitch of screw 14' 6" No. of blades 4 State whether moveable yes Total surface 32 f  
 No. of Feed pumps 2 Diameter 2 1/2" Stroke 16 1/2" Can one be overhauled while the other is at work yes  
 No. of Bilge pumps 2 Diameter of ditto 3" Stroke 16 1/2" Can one be overhauled while the other is at work yes  
 No. of Donkey Engines Two Sizes of Pumps Horizontal duplex 3 1/2 x 5 1/2 x 5 etc. No. and size of Suctions connected to both Bilge and Donkey pumps  
 Engine Room Two 2" wings, & one 2 1/4" centre In Holds, &c. Forehold 2 1/4" centre & two 2" wings.  
 After hold well, one 2 1/4"  
 No. of bilge injections 1 sizes 4" Connected to condenser, or to circulating pump Yes Is a separate donkey suction fitted in Engine room & size yes 2 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 yes  
 Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks Valves & Cocks  
 Are they 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 Forward bilge & tank suction How are they protected strong wood casings  
 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 launch Is the screw shaft tunnel watertight yes  
 Is it fitted with a watertight door yes worked from deck level

**OILERS, &c.** — (Letter for record S) Total Heating Surface of Boilers 1382  
 No. and Description of Boilers One single ended. Two flues. Working Pressure 200 Tested by hydraulic pressure to 400  
 Date of test 10/3/94 Can each boiler be worked separately yes Area of fire grate in each boiler 41 f No. and Description of safety valves to  
 each boiler Two. Adam's design Area of each valve 4.9" Pressure to which they are adjusted 200 lbs Are they fitted  
 with easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 3 feet Mean diameter of boilers 12' 7"  
 Length 10' 3 7/8" Material of shell plates steel Thickness 1 3/16" Description of riveting: circum. seams treble round bottom long. seams double butt  
 Diameter of rivet holes in long. seams 1 3/16" Pitch of rivets 10.895 seven rivets per pitch Top of plates or width of butt straps 19 1/2 x 1 3/16"  
 Percentages of strength of longitudinal joint 89.3 Working pressure of shell by rules 200 lb Size of manhole in shell 16" x 12"  
 Diameter of compensating ring 27 1/2 x 23 1/2 x 1 3/16" No. and Description of Furnaces in each boiler Two 'Morison' Material steel Outside diameter 45"  
 Length of plain part 19' 3/32" Thickness of plates 19/32" Description of longitudinal joint welded No. of strengthening rings ✓  
 Working pressure of furnace by the rules 210 Combustion chamber plates: Material steel Thickness: Sides 11/16" Back 19/32" Top 47/64" Bottom 11/16"  
 Pitch of stays to ditto: Sides 8 1/2" Back 7 3/4" Top 8 x 9 1/2" If stays are fitted with nuts or riveted heads nuts inside Working pressure by rules 203  
 Material of stays steel Diameter at smallest part 1 1/8" sides & top Area supported by each stay 72.2 sides Working pressure by rules 229 End plates in steam space:  
 Material steel Thickness 7/8" x 7/8" Pitch of stays 19 x 19 1/2" How are stays secured double nuts Working pressure by rules 202 Material of stays steel  
 Diameter at smallest part 3 3/8" Area supported by each stay 19 x 17" Working pressure by rules 249 Material of Front plates at bottom steel  
 Thickness 3/4" Material of Lower back plate steel Thickness 11/16" Greatest pitch of stays as approved Working pressure of plate by rules 200  
 Diameter of tubes 3 1/2" Pitch of tubes 4 3/4" Material of tube plates steel Thickness: Front 23/32" Back 23/32" Mean pitch of stays 9 1/2"  
 Pitch across wide water spaces 14 1/2" Working pressures by rules 200 Girders to Chamber tops: Material steel Depth and  
 Thickness of girder at centre two 9 1/4 x 3/4" Length as per rule 27 1/2" Distance apart 9 1/2" Number and pitch of Stays in each two at 8"  
 Working pressure by rules 250 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  
 Pitch of rivets - Working pressure of shell by rules - Diameter of flue - Material of flue plates - Thickness -  
 Fitted 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 -



**DONKEY BOILER**— Description *Vertical.*  
 Made at *Belfast* By whom made *William McCallum & Workman Clark & Co. Ltd* When made *1894* Where fixed *In store*  
 Working pressure *75* tested by hydraulic pressure to *150* No. of Certificate *189* Fire grate area *15* Description of safety valves *Adam's*  
 No. of safety valves *one* Area of each *7* Pressure to which they are adjusted *75* If fitted with casing gear *yes* If steam from *main boiler's casing*  
 enter the donkey boiler *no* Diameter of donkey boiler *4' 9"* Length *9' 9"* Material of shell plates *steel*  
 Description of riveting long. seams *lap double riveted* Diameter of rivet holes *3/4* Whether punched or drilled *drilled*  
 Lap of plating *3 5/8"* Per centage of strength of joint Rivets *79* Thickness of shell crown plates *7/16* Radius of do. *4' 9"* No. of  
 Plates *70* Dia. of stays *2 1/4* Diameter of furnace Top *45* Bottom *52* Length of furnace *6' 3"* Thickness of furnace plates *15/32*  
 joint *lap riveted* Thickness of furnace crown plates *7/16* Stayed by *four 2 1/4" stays* Working pressure of shell by rules *90*  
 Working pressure of furnace by rules *77* Diameter of uptake *14" ex.* Thickness of uptake plates *7/16* Thickness of water tubes *3/8" x 10 in. dia.*

**SPARE GEAR.** State the articles supplied:— *2 main bearing bolts & nuts. 2 connecting rod bolts & nuts.*  
*2 crosshead bolts & nuts. 5 coupling bolts & nuts. 6 funk ring bolts.*  
*24 assorted bolts. 2 feed pump valves. 2 bilge pump valves. 3 air pump valves.*  
*3 propeller studs & nuts. Eccentric strap complete.*

The foregoing is a correct description,  
**THE WORKMAN, CLARK & Co., LIMITED;** Manufacturer.  
*M. H. Bell.*

**General Remarks** (State quality of workmanship, opinions as to class, &c.) *The machinery has been constructed & fitted under special survey & the workmanship is good.*  
*The vessel run a trial trip under full steam on the 24" mast tall parts worked well. The slide valves are worked by 'Wachworth' gear.*  
*A separate centrifugal circulating pump is fitted.*  
*The main steam pipe has been tested to double the working pressure.*  
*The pumping arrangements are fitted in accordance with approved tracings.*

*The stern tube is of MacCall & Marton's patent design.*  
*The following drawings accompany this report. Photoprint main boiler.*  
*Photoprint donkey boiler. Tracings pumping arrangements.*

*The machinery in my opinion renders the vessel eligible for the record + LMC 4.94 in the Register Book.*

*It is submitted that this vessel is eligible for THE RECORD + L.M.C. 4-94*  
*1-5-94*

Certificate (if required) to be sent to

The amount of Entry Fee.. £ 1-0-0 :  
 Special .. .. . £ 13-4-0 :  
 Donkey Boiler Fee .. . £ :  
 Travelling Expenses (if any) £ :  
 When applied for, 30<sup>th</sup> Apr 1894  
 When received, 2.5.1894

*A. L. Jones*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute **FRI 4 MAY 1894**

Assigned

*+ LMC 4, 94*



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