

REPORT ON MACHINERY.

Port of Belfast

Received at London Office WED. 14 JUN 1893

No. in Survey held at Belfast Date, first Survey July 25th 1892 Last Survey June 6th 1893
 Reg. Book. 57 Sup. on the Steel Screw Steamer "Ardandhu" (Number of Visits 40)
 Master J. Walker Built at Belfast By whom built Workman Clark & Co. Ltd When built 1893
 Engines made at Belfast By whom made Workman Clark & Co. Ltd when made 1893
 Boilers made at Belfast By whom made Workman Clark & Co. Ltd when made 1893
 Registered Horse Power 250 Owners Clark & Service Port belonging to Glasgow
 Nom. Horse Power as per Section 28 236

Gross 2091.28
 Net 1334.15
 Tons

ENGINES, &c. — Description of Engines Triple Expansion No. of Cylinders Three
 Diameter of Cylinders 22, 36, 60 Length of Stroke 42 Revolutions per minute 75 Diameter of Screw shaft as per rule 11.13
 Diameter of Tunnel shaft as per rule 10.57 Diameter of Crank shaft journals 11 3/4 Diameter of Crank pin 11 3/4 Size of Crank webs 8" x 16 1/4
 Diameter of screw 15" 0" Pitch of screw 16" 0" No. of blades 4 State whether moveable no Total surface 66
 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 Stroke 21 Can one be overhauled while the other is at work yes
 No. of Donkey Engines four Sizes of Pumps See's feed 8" x 6" x 21" sing. Cameron's duplex 5 1/2" x 3 1/2" No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room 3" Centre 4 2 3/4" each wing Cameron's sing acting 6 1/4" x 4" In Holds, &c. No 1 hold, one 2 1/2" No 2 hold, two 2 3/4"
 No 3 hold, two 2 3/4" No 4 hold, one 2 3/4" Tunnel suction 2"
 No. of bilge injections one sizes 4 1/2 Connected to condenser, or to circulating pump See's Is a separate donkey suction fitted in Engine room & size yes, 3"
 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 bulkhead 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 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 Fore well suction pipe How are they protected wood casing
 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 launching the screw shaft tunnel watertight yes
 Is it fitted with a watertight door yes worked from top engine room platform.

OILERS, &c. — (Letter for record S) Total Heating Surface of Boilers 3580 sq ft
 No. and Description of Boilers Two single ended (2-flue) Working Pressure 180 Tested by hydraulic pressure to 360
 Date of test 17.3.93 Can each boiler be worked separately yes Area of fire grate in each boiler 36.6 No. and Description of safety valves to each boiler Two, Turnbull's patent Area of each valve 8.29 Pressure to which they are adjusted 180 Are they fitted with easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 12" Mean diameter of boilers 43" 0"
 Length 11" 6" Material of shell plates steel Thickness 1 1/4 Description of riveting: circum. seams ends double riv, long. seams double butt strap middle triple riv.
 Diameter of rivet holes in long. seams 1 5/16 Pitch of rivets 9" Lap of plates or width of butt straps 19 3/8 x 15/16 thick
 Per centages of strength of longitudinal joint 88.2 Working pressure of shell by rules 199 Size of manhole in shell 16 x 12
 Size of compensating ring 2" 7" x 2" 3" No. and Description of Furnaces in each boiler Two ribbed Material steel Outside diameter 45 3/16
 Length of plain part top 19/32 Thickness of plates bottom 19/32 Description of longitudinal joint welded No. of strengthening rings 10 ribs
 Working pressure of furnace by the rules 192 Combustion chamber plates: Material steel Thickness: Sides 9/16 Back 9/16 Top 9/16 Bottom 27/32
 Pitch of stays to ditto: Sides 7 x 8 1/4 Back 7 3/8 x 7 3/8 Top 7 3/8 x 7 If stays are fitted with nuts or riveted heads nuts Working pressure by rules 180
 Material of stays Steel Diameter at smallest part 1 3/8 Area supported by each stay 58 Working pressure by rules 204 End plates in steam space: Material Steel Thickness 1 1/8 Pitch of stays 17 x 14 How are stays secured double nuts & washers Working pressure by rules 207 Material of stays Steel
 Diameter at smallest part 2 1/2 Area supported by each stay 238 Working pressure by rules 190 Material of Front plates at bottom steel
 Thickness 15/16 Material of Lower back plate steel Thickness 15/16 Greatest pitch of stays as approved Working pressure of plate by rules 180
 Diameter of tubes 2 1/2 Pitch of tubes 3 7/8 hor 3 3/4 vert Material of tube plates steel Thickness: Front 7/8 Back 3/4 Mean pitch of stays 7 3/4 x 7 1/2
 Pitch across wide water spaces 1 1/4 Working pressures by rules 180 Girders to Chamber tops: Material steel Depth and thickness of girder at centre two 8 1/2 x 3/4 Length as per rule 28" Distance apart 7 5/8 Number and pitch of Stays in each 3 at 7"
 Working pressure by rules 239 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 holes Pitch of rivets Working pressure of shell by rules Diameter of flue Material of flue plates Thickness
 If stiffened 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, with four cross tubes in the furnace*
 Made at *Beaufort* By whom made *Workman Clark & Co. Ltd* When made *1893* Where fixed *In stockhold*
 Working pressure *80* tested by hydraulic pressure to *160* No. of Certificate *163* Fire grate area *28* Description of safety valves *Turnbull's*
 No. of safety valves *2* Area of each *7.07* Pressure to which they are adjusted *80* If fitted with casing gear *yes* If steam from main boilers can enter the donkey boiler *no* Diameter of donkey boiler *4' 3"* Length *12' 6"* Material of shell plates *steel* Thickness *1/2"*
 Description of riveting long seams *double riveted lap* Diameter of rivet holes *7/8"* Whether punched or drilled *drilled* Pitch of rivets *2 7/8"*
 Lap of plating *4 1/8"* Per centage of strength of joint Rivets *7'* Thickness of shell crown plates *9/16"* Radius of do. *flat* No. of Stays to do. *9*
 Dia. of stays *2" iron* Diameter of furnace Top *5' 2"* Bottom *6' 9"* Length of furnace *6' 6"* Thickness of furnace plates *2 1/32"* Description of joint *single lap* Thickness of furnace crown plates *9/16"* Stayed by *nine 2" iron stays* Working pressure of shell by rules *88.75*
 Working pressure of furnace by rules *80* Diameter of uptake *19"* Thickness of uptake plates *1/2"* Thickness of water tubes *3/8" iron*

SPARE GEAR. State the articles supplied:— *Interchangeable length crank shaft. Propeller shaft. 2 top end & 2 bottom end connecting rod bolts & nuts. 2 main bearing bolts: set coupling bolts: set feed & helge pump valves & seat: air pump rod: eccentric strap complete: set crank pin brasses: set valves for air & circulating pumps: set boiler check valves: cylinder escape valve & spring: safety valve & spring: feed escape valve & spring: crosshead brasses: propeller: fire bars: boiler tubes: condenser tubes: assorted iron bolts & nuts etc.*
 The foregoing is a correct description.
 Manufacturer. **WORKMAN, CLARK & CO., LIMITED,**
Chas. Allan DIRECTOR.

General Remarks (State quality of workmanship, opinions as to class, &c. *The machinery has been built under special survey throughout. Each length of main steam pipe, & the main & donkey boilers have been tested by water pressure to double the respective working pressures with good results.*

The approved tracings of the main & donkey boilers, the tracings of the pumping arrangements, & the forging certificates for the shafting are herewith returned.

A satisfactory full steam trial of the engine in the Beaufort Lough was made on the 7th inst. The safety valves of main & donkey boilers are adjusted to 180 lbs & 80 lbs respectively.

The boilers are fitted with Howden's system for forced draught.

The machinery in my opinion renders the vessel eligible for the record of +LMC 6.93

It is submitted that this vessel is eligible for THE RECORD + LMC 6-93

The surveyors attention should be called to the diameter of the tunnel machinery, which is slightly under the rule size - or 2 in of 24 inches
 14 6-93

Certificate (if required) to be sent to

The amount of Entry Fee..	£ 2 : 00	When applied for,	10 June 1893
Special	£ 31 : 16 0	When received,	17/6/93
Donkey Boiler Fee .. .	£ : : :		
Travelling Expenses (if any)	£ : : :		

Committee's Minute **FRI 16 JUN 1893**
 Assigned **+LMC 6,93**

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

