

REPORT ON MACHINERY.

Port of Belfast

Received at London Office MON. 22 OCT 1894

No. in Survey held at Belfast Date, first Survey 26th Feby '94 Last Survey 18th Octbr. 1894
 Reg. Book. 4 sup. on the Steel Screw Steamer "Copack" (Number of Visits 26)
 Master C. M. de la Roche Built at Belfast By whom built Workman Clark & Co. Lim. Tons { Gross 3883
 Engines made at Belfast By whom made Workman Clark & Co. Lim. when made 1894 Net 2517
 Boilers made at Belfast By whom made Workman Clark & Co. Lim. when made 1894
 Registered Horse Power 500 Owners China Mutual S. Nav. Co. Lim. Port belonging to London
 Nom. Horse Power as per Section 28 345

ENGINES, &c. — Description of Engines Triple Expansion No. of Cylinders Three
 Diameter of Cylinders 26:42:71 Length of Stroke 48 Revolutions per minute 70 Diameter of Screw shaft as per rule 13
 Diameter of Tunnel shaft as per rule 12.35 Diameter of Crank shaft journals 13 1/2 Diameter of Crank pin 13 1/2 Size of Crank webs 9 1/4 x 18 1/4
 Diameter of screw 17'-6" Pitch of screw 19'-0" No. of blades 4 State whether moveable yes Total surface 84'
 No. of Feed pumps 2 Diameter of ditto 4" Stroke 27" Can one be overhauled while the other is at work yes
 No. of Bilge pumps 2 Diameter of ditto 4 1/2" Stroke 27" Can one be overhauled while the other is at work yes
 No. of Donkey Engines Three Sizes of Pumps Wain dup. 7 x 9 x 21 feet No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room Three 3 1/2" " 4 1/2 x 6 x 6 S.R. 9 " 7 x 9 x 9 Recast In Holds, &c. No 1 hold, two 3 1/2" No 2 hold, two 3 1/2"
 No. of bilge injections 1 sizes 7 1/4" Connected to condenser, or to circulating pump dis. p. Is a separate donkey suction fitted in Engine room & size yes 3 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 none
 Are all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks larger, valves; smaller, 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 none How are they protected ✓
 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 upper 2. R. platform.

BOILERS, &c. — (Letter for record S) Total Heating Surface of Boilers 5112'
 No. and Description of Boilers Two single ended Working Pressure 180 lb. Tested by hydraulic pressure to 360 lb.
 Date of test 10-4-94 Can each boiler be worked separately yes Area of fire grate in each boiler 61.8' No. and Description of safety valves to each boiler Two Adams patent. Area of each valve 12.56' Pressure to which they are adjusted 185 lb. Are they fitted with easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 9 ins Mean diameter of boilers 15'-0"
 Length 11'-6" Material of shell plates steel Thickness 1 1/16" Description of riveting: circum. seams ends double middle triple long. seams double straps
 Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 10" Lap of plates or width of butt straps 21 1/4 x 1 1/8"
 Per centages of strength of longitudinal joint rivets 91.6 plate 85.0 Working pressure of shell by rules 198 lb. Size of manhole in shell 16" x 12"
 Size of compensating ring 2'-4" x 2'-0" x 1 1/16" No. and Description of Furnaces in each boiler 3 "Morison" Material steel Outside diameter 49"
 Length of plain part top ✓ Thickness of plates bottom 5/8" Description of longitudinal joint welded No. of strengthening rings ✓
 Working pressure of furnace by the rules 205 Combustion chamber plates: Material steel Thickness: Sides 9/16 Back 9/16 Top 9/16 Bottom 3/4"
 Pitch of stays to ditto: Sides 7 3/4" Back 7 3/4" Top 7 3/4" If stays are fitted with nuts or riveted heads nuts inside Working pressure by rules 182
 Material of stays steel Diameter at smallest part 1 3/8" Area supported by each stay 60' Working pressure by rules 197 End plates in steam space: Material steel Thickness 1 1/8" Pitch of stays 16" x 16" How are stays secured doub. nut washers Working pressure by rules 234 Material of stays steel
 Diameter at smallest part 2 1/2" Area supported by each stay 256' Working pressure by rules 177 Material of Front plates at bottom steel Thickness 7/8" Material of Lower back plate steel Thickness 1 1/16" Greatest pitch of stays as appx Working pressure of plate by rules 180
 Diameter of tubes 2 1/2" Pitch of tubes 3 5/8" x 3 7/8" Material of tube plates steel Thickness: Front 13/16 Back 3/4" Mean pitch of stays 7 1/2"
 Pitch across wide water spaces 13 1/2" Working pressures by rules 180 lb. Girders to Chamber tops: Material steel Depth and thickness of girder at centre doubled 10 x 5/8" Length as per rule 27" Distance apart 7 3/4" Number and pitch of Stays in each two at 7 3/4"
 Working pressure by rules 180 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 rivets
 Pitch of rivets - Working pressure of shell by rules - Diameter of flue - Material of flue plates - Thickness
 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

* deduct area of stay J.M.

DONKEY BOILER— Description *Horizontal Multitubular. Two flues*
 Made at *Belfast* By whom made *Workman Clark & Co. Ltd* When made *1894* Where fixed *On deck amidships*
 Working pressure *180* tested by hydraulic pressure to *360* No. of Certificate *195* Fire grate area *24 3/4* Description of safety valves *Adam's patent*
 No. of safety valves *two* Area of each *3 1/4* Pressure to which they are adjusted *180* If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no* Diameter of donkey boiler *9' 0"* Length *8' 0"* Material of shell plates *steel* Thickness *15/16*
 Description of riveting long seams *double butt straps* Diameter of rivet holes *1"* Whether punched or drilled *drilled* Pitch of rivets *7/8*
 Straps *1 1/2" x 2 3/32* Per centage of strength of joint Rivets *8 5/8* Thickness of shell plates *15/16* Radius of do. *29 3/4* Pitch of Stays to do. *1 3/4*
 Dia. of stays *2 1/4* area *3 4/32* Diameter of furnace Top *3 1/4* Bottom *3 1/4* Length of furnace *5' 9"* Thickness of furnace plates *19/32* Description of joint *double straps* Thickness of furnace crown plates *9/16* Stayed by *1 1/2" stays 7 3/4" pitch* Working pressure of shell by rules *206*
 Working pressure of furnace by rules *181* Diameter of tubes *3 1/4"* Thickness of tubes plates *29 3/32* Pitch *7/8* Thickness of water tubes *9" x 8 1/2"*

SPARE GEAR. State the articles supplied:— *Propeller shaft. 1/3 crank shaft. Thrust shaft. 2 blades*
2 top end & two bot. end con. rod bolts. 2 main bearing bolts. 2 eccentric strap bolts. 6 coupling bolts. 6 propeller studs. Air & circulating pump rod. Pair crank pin braces. Pair top end braces
2 slide valve spindles. 2 feed & two bilge pump valves. 2 circulating pump guards & studs.
 The foregoing is a correct description, 2 air pump ditto. 15 condenser tubes. Assorted iron, brass, &c.
MR. WORKMAN, CLARK & CO., LIMITED. Manufacturer. *nuts etc.*
McCall

General Remarks (State quality of workmanship, opinions as to class, &c.)

The machinery has been constructed under special survey, & the workmanship is good.

On the 18th inst the vessel ran a satisfactory trial & the safety valves of main & donkey boilers were found correctly adjusted.

The boilers are fitted with Howden's arrangement for forced draught. The fan being driven by Chawaler's patent vertical engines, one engine being in reserve.

Maxton & McCall's patent short steam tube is fitted

The electric lighting installation is by Messrs Paterson & Cooper. A report on the usual form will be forwarded.

The photoprints of boilers & plans of pumping arrangements are the same as for the sister vessel "Ching Wo" & were forwarded with the report upon that vessel.

Certificates for the propeller shaft & for the furnace flues are enclosed.

The machinery in my opinion renders the vessel eligible for the record of *+ LMC 10.94* in the Register Book.

It is submitted that this vessel is eligible for THE RECORD + LMC 10-94
W.A. 22-10-94

Certificate (if required) to be sent to

The amount of Entry Fee..	£ 3 : 0 :	When applied for, <i>18th Sep. 1894</i>
Special	£ 37 : 5 :	
Donkey Boiler Fee .. .	£ : :	When received, <i>H.C.C. 23.10.1894 24</i>
Travelling Expenses (if any) £	: 5 :	

A. L. Jones

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

Committee's Minute

TUES. 23 OCT 1894

Assigned

+ LMC 10.94



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The Surveyors are requested not to write on or below the space for Committee's Minute.