

# REPORT ON MACHINERY.

No. 6636

Port of Belfast Date, first Survey 1<sup>st</sup> Sept 1908 Last Survey 8<sup>th</sup> July 1909  
 No. in Survey held at Belfast Reg. Book. L.S. Carroll on the "L.S. Carroll"  
 Received at London Office 12 JUL 1909

Master Belfast Built at Belfast By whom built Harland & Wolff Ltd Tons Gross 1391 Net 1324  
 Engines made at Belfast By whom made " when made "  
 Boilers made at " By whom made " when made "

Registered Horse Power 1140 Owners M. Elworthy & Co. Ltd Port belonging to Melbourn  
 Nom. Horse Power as per Section 28 1140 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

Engines, &c.—Description of Engines Two Low Pressure Quadruple Expansion Cylinders No. of Cranks 8  
 Dia. of Cylinder 23-33 1/2 - 48 - 69 Length of Stroke 54 Revs. per minute 75 Dia. of Screw shaft 14 1/2 as per rule 14 1/2 Material of Steel  
 as fitted 14 1/2 screw shaft

Is the screw shaft fitted with a continuous liner the whole length of the stern tube Yes Is the after end of the liner made water tight  
 in the propeller boss Yes If the liner is in more than one length are the joints burned Yes If the liner does not fit tightly at the part  
 between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive Yes If two  
 liners are fitted, is the shaft lapped or protected between the liners Yes Length of stern bush 62

Dia. of Tunnel shaft 13 1/2 as per rule 13 1/2 Dia. of Crank shaft journals 13 1/2 as per rule 13 1/2 Dia. of Crank pin 14 1/2 Size of Crank webs 26 1/2 x 10 1/2 of thrust shaft under  
 collars 14 1/2 Dia. of screw 14 1/2 Pitch of Screw 24 - 9 No. of Blades 8 State whether moveable Yes Total surface 66 sq ft.

No. of Feed pumps 2 Diameter of ditto 5 1/2 Stroke 30 Can one be overhauled while the other is at work Yes  
 No. of Bilge pumps 1 Diameter of ditto 5 Stroke 30 Can one be overhauled while the other is at work Yes

No. of Donkey Engines 2 No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 4 - 3 1/2" & 4 - 2 1/2" In Holds, &c. 10 - 3 1/2" & 4 - 2 1/2"

No. of Bilge Injections 2 sizes 9" Connected to condenser, or to circulating pump Yes Is a separate Donkey Suction fitted in Engine room & size Yes - 4"  
 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 Both  
 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 Both  
 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 Four cold suction How are they protected 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

Dates of examination of completion of fitting of Sea Connections 26/2/09 of Stern Tube 4/3/09 Screw shaft and Propeller 4/3/09  
 Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from top platform E. Room

BOILERS, &c.—(Letter for record S) Manufacturers of Steel J. & C. Williams & Sons Ltd  
 Total Heating Surface of Boilers 11250 sq ft Forced Draft fitted Yes No. and Description of Boilers 2 - A. and B. Cylindrical  
 Working Pressure 215 lbs Tested by hydraulic pressure to 430 lbs Date of test 10-2-09 No. of Certificate 416

Can each boiler be worked separately Yes Area of fire grate in each boiler 131 sq ft No. and Description of Safety Valves to  
 each boiler 2 - Safety Valves Area of each valve 11.046 Pressure to which they are adjusted 215 lbs Are they fitted with easing gear Yes

Smallest distance between boilers or uptakes and bunkers or woodwork About 6 ft Mean dia. of boilers 15 - 9 Length 20 Material of shell plates Steel  
 Thickness 1 1/4 Range of tensile strength 29 - 33 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams Lap Rivet  
 long. seams Butt Rivet Diameter of rivet holes in long. seams 1 1/4 Pitch of rivets 10 Lap of plates or width of butt straps 23 1/2

Per centages of strength of longitudinal joint rivets 98.7 Working pressure of shell by rules 250 lbs Size of manhole in shell 17 x 13  
 plate 98.7 Material Steel Outside diameter 49 1/2

Size of compensating ring 12 - 1/2 No. and Description of Furnaces in each boiler 6 - Horizontal Material Steel Outside diameter 49 1/2  
 Length of plain part 6 Thickness of plates 3 1/2 Description of longitudinal joint Weld No. of strengthening rings 3  
 top 6 bottom 10 crown 3 1/2 bottom 3 1/2 Thickness: Sides 5 Back 5 Top 5 Bottom 5 1/2

Working pressure of furnace by the rules 240 lbs Combustion chamber plates: Material Steel Thickness: Sides 5 Back 5 Top 5 Bottom 5 1/2  
 Pitch of stays to ditto: Sides 7 1/2 x 8 1/2 Back 7 1/2 x 8 1/2 Top 7 1/2 x 8 1/2 Bottom 7 1/2 x 8 1/2 If stays are fitted with nuts or riveted heads Yes Working pressure by rules 241 lbs End plates in steam space: Yes

Material of stays Steel Diameter at smallest part 1 1/2 x 1 1/2 Area supported by stay 65 1/2 Working pressure by rules 219 lbs Material of stays Steel  
 Material Steel Thickness 1 1/2 Pitch of stays 18 1/2 x 15 1/2 How are stays secured Weld Working pressure by rules 219 lbs Material of Front plates at bottom Steel  
 Diameter at smallest part 3 1/2 x 2 1/2 Area supported by each stay 286 1/2 Working pressure by rules 256 lbs Material of Front plates at bottom Steel

Thickness 7 Material of Lower back plate Steel Thickness 7 Greatest pitch of stays 7 1/2 Working pressure of plate by rules 219 lbs  
 Diameter of tubes 2 1/2 Pitch of tube 3 1/2 x 3 1/2 Material of tube plates Steel Thickness: Front 7 Back 1 1/2 Mean pitch of stays 7 1/2 x 7 1/2  
 Pitch across wide water spaces 13 1/2 Working pressures by rules 248 lbs Girders to Chamber tops: Material Iron Depth and  
 thickness of girder at centre 10 x (7 1/2 x 2) Length as per rule 4 - 4 1/2 Distance apart 8 1/2 Number and pitch of stays in each 6 - 7 1/2

Working pressure by rules 373 lbs 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 "



VERTICAL DONKEY BOILER— *Manufacturers of Steel*

No.	Description									
Made at	By whom made				When made		Where fixed			
Working pressure	tested by hydraulic pressure to			Date of test		No. of Certificate		Fire grate area		Description of S
Valves	No. of Safety Valves		Area of each		Pressure to which they are adjusted			Date of adjustment		
If fitted with easing gear	If steam from main boilers can enter the donkey boiler				Dia. of donkey boiler			Length		
Material of shell plates	Thickness		Range of tensile strength			Descrip. of riveting long. seams				
Dia. of rivet holes	Whether punched or drilled			Pitch of rivets		Lap of plating		Per centage of strength of joint		Rivets Plates
Working pressure of shell by rules	Thickness of shell crown plates			Radius of do.		No. of stays to do.		Dia. of stays		
Diameter of furnace	Top	Bottom	Length of furnace		Thickness of furnace plates			Description of joint		
Working pressure of furnace by rules	Thickness of furnace crown plates			Stayed by						
Diameter of uptake	Thickness of uptake plates			Thickness of water tubes			Dates of survey			

SPARE GEAR. State the articles supplied:—4 M.V. pupellen blades; pupellen shaft; 2 pupellen spindles; 2 sets piston valves pump. same top end & same bottom end and over twice trap; 2 sets piston valves; 2 set air pump work. Inlet & head valves; 2 sets & spindles centrif. pump; 1 case supply gear for all auxiliaries, 1 pupellen, 1 sandhouse etc. & all gear to 2 layers rubber ex.

The foregoing is a correct description,

*For Highland & Loch Ltd* Manufacturer.

Dates of Survey while building	During progress of work in shops - -	1908, Sept <sup>r</sup> 1, 4, 7, 9, 10, 17, 21, 23, Oct <sup>r</sup> 5, 7, 15, 21, 27, 30. - Nov <sup>r</sup> 4, 11, 13.
	During erection on board vessel - -	22, 23, 25, 27. Dec <sup>r</sup> 7, 4, 8, 11, 16, 18, 22. 1909, Jan <sup>r</sup> 5, 11, up to 8 <sup>th</sup> July
	Total No. of visits	79

Is the approved plan of main boiler forwarded herewith Yes

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Dates of Examination of principal parts—Cylinders 21-2 Slides 8 Covers 5 Pistons Rods  
Connecting rods 1-4-04 Crank shaft 21-1 Thrust shaft 5 Tunnel shafts Screw shaft 22-1 Propellers 22-1

Stern tube 29-1-04 Steam pipes tested 24-2-04 Engines and boiler seatings 28-4-04 Engines holding down bolts 23-4-

Completion of pumping arrangements 2-6-09 Boilers fixed 6-4-09 Engines tried under steam 19-5-09

Main boiler safety valves adjusted 19-5-09 Thickness of adjusting washers  $\frac{1}{12}$

Material of Crank shaft Steel Identification Mark on Do. 7.5.13 Material of Thrust shaft 410 Identification Mark on Do. 410

Material of Tunnel shafts also Identification Marks on Do. 20 Material of Screw shafts 20 Identification Marks on Do. 20

Material of Steam Pipes 17. Iron Test pressure 845 lb

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

The machinery of this vessel has been constructed under Special License, and in accordance with the Rules. The main and the auxiliary engines are of good description thorough hand work and the workmanship is of good class. The machinery worked satisfactorily in Belfast Lough. The machinery worked satisfactorily in my opinion, it is eligible for vessels + L.M.C. 4-0 in the notation Electric Light & Forced Draft, also Refrigerating Machine.

It is submitted that  
this vessel is eligible for  
THE RECORD, + LMC 7, 09  
Elec. light. F.D.

F.D.

975

12.7.09

The amount of Entry Fee	£	3	:	0	:	When applied for,
Special	£	44	:	0	:	5.7.1909
Donkey Boiler Fee	£	:	:	:	:	When received,
Travelling Expenses (if any)	£	:	:	:	:	10.7.09

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

## Committee's Minute

WES. 13 JUL 1909

*Assigned*

+ Lmb 7.09  
F.D. Elec. lights

MACHINERY CERTIFICATE  
WRITTEN.

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Foundation