

REPORT ON MACHINERY.

Port of Belfast

MUN. 12 DEC 1904

Received at London Office

Survey held at Belfast
Book.

Date, first Survey 15 Feb.

Last Survey 8 Dec 1904

(Number of Visits 57)

on the

S.S. Otaro

Tons

Gross 4374
Net 2793

er

Built at Belfast

By whom built Harland & Wolff L^{td}

When built 1904

nes made at Belfast

By whom made Harland & Wolff L^{td}

when made 1904

ers made at

By whom made

when made

istered Horse Power

Owner The Royal Mail L^{td} Ex. Coy. Ltd

belonging to London

Horse Power as per Section 28 378

Is Refrigerating Machinery fitted Yes

Is Electric Light fitted Yes

INES, &c.—Description of Engines

Triple Expansion

No. of Cylinders 3

No. of Cranks 3

of Cylinders 23"-39"-64"

Length of Stroke 51"

Revs. per minute 68

Dia. of Screw shaft as per rule 14.22"

as fitted 14.37" Lgth. of stern bush 57"

of Tunnel shaft as per rule 12.19"

as fitted 13.2"

Dia. of Crank shaft journals as per rule 13.5"

as fitted 14.0"

Dia. of Crank pin 14 1/2"

Size of Crank webs 26 1/2" x 10"

Dia. of thrust shaft under

ers 14"

Dia. of screw 17'-0"

Pitch of screw 17'-6"

No. of blades 4

State whether moceable Yes

Total surface 75 sq ft.

of Feed pumps 2

Diameter of ditto 4"

Stroke 28"

Can one be overhauled while the other is at work Yes

of Bilge pumps 2

Diameter of ditto 4"

Stroke 28"

Can one be overhauled while the other is at work Yes

of Donkey Engines

See other sheet

No. and size of Suctions connected to both Bilge and Donkey pumps

Engine Room 5-32"

In Holds, &c. 7-32"

of bilge injections / sizes 8"

Connected to condenser, or to circulating pump Pumps a separate donkey suction fitted in Engine room & size Yes-4"

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

all connections with the sea direct on the skin of the ship Yes

Are they Valves or Cocks Both

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

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

hat pipes are carried through the bunkers Fore hold suction

How are they protected Wood casings

all pipes, cocks, valves, and pumps in connection with the machinery and all boiler mountings accessible at all times Yes

the bilge suction pipes, cocks, and valves arranged so as to prevent any communication between the sea and the bilges Yes

hen were stern tube, propeller, screw shaft, and all connections examined in dry dock Before launching

screw shaft tunnel watertight Stated to be

it fitted with a watertight door Yes

worked from Upper Deck

ILERS, &c.—

(Letter for record 5)

Total Heating Surface of Boilers 6309 sq ft.

Is forced draft fitted No

o. and Description of Boilers 3- Single End, Cylind^r

Working Pressure 205 lbs

tested by hydraulic pressure to 410 lbs

ate of test 26 1/2-1/4" Can each boiler be worked separately Yes

Area of fire grate in each boiler 54 1/2 sq ft

Description of safety valves to 410 lbs

ch boiler 2- Direct Spring

Area of each valve 8.29 sq in

Pressure to which they are adjusted 205 lbs

Are they fitted with easing gear Yes

smallest distance between boilers comptaken and bunkers on woodwork

about 16"

Mean dia. of boilers 14'-5"

Length 11'-3"

Material of shell plates Steel

Thickness 1 1/8"

Range of tensile strength 29-32 tons

Are they welded or flanged No

Descrip. of riveting: cir. seams Lap & double

long. seams Butt & double

diameter of rivet holes in long. seams 1 1/2"

Pitch of rivets 10"

Lap of plates or width of butt straps 22 1/2"

er centages of strength of longitudinal joint

rivets 92.0%

plate 85.0%

Working pressure of shell by rules 231 lbs

Size of manhole in shell 16" x 12"

ize of compensating ring M. Keils

No. and Description of Furnaces in each boiler 3- Morrison

Material Steel

Outside diameter 45"

length of plain part

top 3"

Thickness of plates

crown 5/8"

Description of longitudinal joint Weld

No. of strengthening rings 2 on C.S. bottom

Working pressure of furnace by the rules 223 lbs

Combustion chamber plates: Material Steel

Thickness: Sides 1 1/2"

Back 1 1/2"

Top 1 1/2"

Bottom 1 1/2"

Pitch of stays to ditto: Sides 7 1/2 x 7 1/2"

Back 8 1/2 x 6 1/2"

Top 8" x 7"

If stays are fitted with nuts or riveted heads Nuts incite

Working pressure by rules 211 lbs

Material of stays Steel

Diameter at smallest part 1 1/2"

Area supported by each stay 588 sq in

Working pressure by rules 211 lbs

and plates in steam space:

Material Steel

Thickness 3/4"

Pitch of stays 16 1/2" x 15"

How are stays secured Nuts & Riv Nuts

Working pressure by rules 213 lbs

Material of stays Steel

Diameter at smallest part 2 1/4"

Area supported by each stay 247 1/2 sq in

Working pressure by rules 240 lbs

Material of Front plates at bottom Steel

Thickness 1 1/8"

Material of Lower back plate Steel

Thickness 1 1/8"

Greatest pitch of stays 12"

Working pressure of plate by rules 1 1/2 lbs

with 1/2" double

Diameter of tubes 3"

Pitch of tubes 4 1/2" x 4 1/2"

Material of tube plate Steel

Thickness: Front 7/8"

Back 3/4"

Mean pitch of stays 8 1/2" x 8 1/2"

Pitch across wide water spaces 14"

Working pressures by rules 235 lbs with 1/2" double

Girders to Chamber tops: Material Iron

Thickness of girder at centre 9" (7+2)

Length as per rule 30"

Distance apart 8"

Number and pitch of Stays in each 3-7"

Working pressure by rules 231 lbs

superheater or Steam chest; how connected to boiler v

Can the superheater be shut off and the boiler worked separately

holes

Diameter

Length

Thickness of shell plates

Material

Description of longitudinal joint

Diam. of rivet

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

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W845-0102(1/2)

DONKEY BOILER— *None* Description

Made at _____ By whom made _____ When made _____ Where fixed _____
 Working pressure tested by hydraulic pressure to _____ No. of Certificate _____ Fire grate area _____ Description of safety valves _____
 No. of safety valves _____ Area of each _____ Pressure to which they are adjusted _____ If fitted with easing gear _____ If steam from main boiler _____
 enter the donkey boiler _____ Dia. of donkey boiler _____ Length _____ Material of shell plates _____ Thickness _____ Range of _____
 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 _____ 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 _____ Descrip. _____
 joint _____ Thickness of furnace crown plates _____ Stayed by _____ Working pressure of shell by rules _____
 Working pressure of furnace by rules _____ Diameter of uptake _____ Thickness of uptake plates _____ Thickness of water tubes _____

SPARE GEAR. State the articles supplied:— *See other sheet.*

The foregoing is a correct description,

M. Harland & Wolff Manufacturer.

Dates of Survey while building
 During progress of work in shops— Feb 15, 19, 25, 29, March 8, 7, 12, 16, 18, 24, 31, April 7, 14, 18, 22, 28, May 3, 4, 9
 During erection on board vessel— 17, 20, 25, 27, June 3, 7, 9, 13, 20, 27 and up to 8th Dec^r 1904
 Total No. of visits *57*

Is the approved plan of main boiler forwarded herewith *Yes*

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

Material of screw shaft *Ingot Steel* 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 non-corrosive *Yes*
 If two liners are fitted, is the shaft lapped or protected between the liners *Yes*

The machinery of this vessel has been constructed and installed in accordance with the Rules. The material and the workmanship used in the construction, are of first description throughout, and are such as to be worked satisfactorily.

In my opinion, it is eligible for record + L.M.C. 12-04.

The engine and boilers are duplicates of those fitted in the S.S. "Cerberus". Report No. 115. Reports on the Electric Light Refracting Installations, will be forwarded later.

It is submitted that this vessel is eligible for THE RECORD. + L.M.C. 12.04 ELEC LIGHT. REF McH.

The amount of Entry Fee £ 3 : - :
 Special .. £ 38 - 18 :
 Donkey Boiler Fee .. £ : :
 Travelling Expenses (if any) £ : :
 When applied for, 9-12-04
 When received, 17/12/04

R. J. Pennington
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping
 12.12.04

Committee's Minute

Assigned

TUES. 13 DEC 1904

+ L.M.C. 12.04.
 Elec Light.

MACHINERY CERTIFICATE WRITTEN.



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STRAK
 FLAT PLATE KEEL
 (If Bar Keel, state GARBOARD OR L
 State actual thickness in way of Double Bottom.
 DOUBLING of Length and thickness of POOP SIDES BRIDGE SIDING FORECASTLE
 Manufacture of Plates, Plating
 Has the St
 FRAMES REVERSED
 LOWER BOWSPRIT TOPMAST RIGGING SALES
 EQUIPMENT
 Number of Certificate
 5202
 5202
 5202
 5204
 5206
 Number of Certificate
 364
 364
 Boat Pumps Wind Engines
 What Coal
 Number of Cells
 State of Hull
 Number of Hull
 The Hull

Write 'sheer' opposite its corresponding letter.

Certificate (if required) to be sent to this office

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

Belfast

J.S. Peters

Donkey Pumps

Woods Feed. Wauble 9 $\frac{1}{2}$ " x 4" x 21"

Donkey Feed Pump 7" x 5" x 15" Woodburns Single

Ballast Donkey - 10" x 10 $\frac{1}{2}$ " x 10" Duplex

General - - 8" x 4" x 8" -

Spare Gear

Set H.P. & L.P. piston packing rings

- H.P. & M.P. piston valve - -

 $\frac{1}{2}$ Crank Shaft

1 Propeller Shaft

1 - Blade & set studs & nuts

Set top & bottom end brasses.

Eccentric rod & strap complete

- pulley.

2 - bolts & 2 studs

Set main bearing bushes

Slide valve rod complete

Centrifugal Pump, impeller, piston rod, cross head with
brasses & bolts complete.

- valve spindle, piston & crank pin traces

Air pump bucket, rod, head & foot valves set?

I have escape valve springs for all sizes req^d and spare

Safety valve springs

50 Condenser tubes, boiler tubes set^d, and all spare gear
as per Rule additional.R. J. Jennings