

Rpt. 4.

REPORT ON MACHINERY.

No. 31511

Received at London Office

WED JUN 5 - 1912

Date of writing Report

19

When handed in at Local Office

1/6/1912 Port of Glasgow

No. in Survey held at
Reg. Book.

Glasgow

Date, First Survey 6th October 1911 Last Survey 23rd May 1912

on the

1/2 Benefactor

(Number of Visits 34)

Gross 5511

Net 3499

When built 1912

Master J. P. Atkinson Built at Glasgow

By whom built D. W. Henderson & Co. Ltd.

Engines made at Glasgow

By whom made

do

when made 1912

Boilers made at do

By whom made

do

when made 1912

Registered Horse Power 536

Owners J. & J. Harrison

Port belonging to Liverpool

Nom. Horse Power as per Section 28 536

Is Refrigerating Machinery fitted for cargo purposes no

Is Electric Light fitted yes

ENGINES, &c.—Description of Engines

Triple expansion

No. of Cylinders 3

No. of Cranks 3

Dia. of Cylinders 24 $\frac{1}{2}$ - 42 $\frac{1}{2}$ - 42

Length of Stroke 54

Revs. per minute 80

Dia. of Screw shaft

as per rule 15.33

Material of 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

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 close fit

If two

liners are fitted, is the shaft lapped or protected between the liners

Length of stern bush 5'-10"

Dia. of Tunnel shaft

as per rule 14.06

Dia. of Crank shaft journals

as per rule 14.4

Dia. of Crank pin 15 $\frac{1}{4}$

Size of Crank webs 22x10

Dia. of thrust shaft under

collars 15 $\frac{1}{4}$

Dia. of screw 18'-0"

Pitch of Screw 19'-0"

No. of Blades 4

State whether moveable yes

Total surface 105 $\frac{1}{2}$

No. of Feed pumps 2

Diameter of ditto 4 $\frac{1}{4}$ Stroke 2 $\frac{1}{2}$

Can one be overhauled while the other is at work yes

No. of Bilge pumps 2

Diameter of ditto 4 $\frac{3}{4}$ Stroke 2 $\frac{1}{2}$

Can one be overhauled while the other is at work yes

No. of Donkey Engines 4

2 Weir fed 10 $\frac{1}{2}$ - 8x21

1 duplex 8-6x8

9-10x10

3-8x6

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

In Engine Room 2 of 3 $\frac{1}{2}$ " Stokehold 2 of 3 $\frac{1}{2}$ "In Holds, &c. No 1 - 2 of 3 $\frac{1}{2}$ " - No 2 - 2 of 3 $\frac{1}{2}$ " - No 3 - 2 of 3 $\frac{1}{2}$ "No 4 (dup tank) 2 of 3 $\frac{1}{2}$ " No 5 2 of 3 $\frac{1}{2}$ " No 6 - 1 of 3 $\frac{1}{2}$ " Tunnel 1 of 3 $\frac{1}{2}$ "

No. of Bilge Injections 1 sizes 9"

Connected to condenser, or to circulating pump cinel pp Is a separate Donkey Suction fitted in Engine room & size yes 3 $\frac{1}{2}$ "

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 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 Bilge

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

Dates of examination of completion of fitting of Sea Connections 23.3.12 of Stern Tube 23.3.12 Screw shaft and Propeller 23.3.12

Is the Screw Shaft Tunnel watertight yes

Is it fitted with a watertight door yes

worked from upper deck

BOILERS, &c.—(Letter for record 5)

Manufacturers of Steel Steel Co. of Scotland - D. Colville & Sons - W. Beadmore & Co.

Total Heating Surface of Boilers 7845 $\frac{1}{2}$ Is Forced Draft fitted no

No. and Description of Boilers Two - Double ended

Working Pressure 215 lbs

Tested by hydraulic pressure to 430 lbs

Date of test 13.3.12

No. of Certificate 11446

Can each boiler be worked separately yes

Area of fire grate in each boiler 114.8 $\frac{1}{2}$

No. and Description of Safety Valves to

each boiler 2 spring loaded

Area of each valve 9.62

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 24"

Mean dia. of boilers 15'-0"

Length 17'-8 $\frac{3}{4}$ "

Material of shell plates steel

Thickness 1 $\frac{1}{32}$

Range of tensile strength 29/32 tons

Are the shell plates welded or flanged no

Descrip. of riveting: cir. seams DBS-TR lap

long. seams DBS-TR

Diameter of rivet holes in long. seams 1 $\frac{1}{32}$ Pitch of rivets 10 $\frac{1}{2}$ "Lap of plates or width of butt straps 24 $\frac{3}{8}$ "

Per centages of strength of longitudinal joint

rivets 88.6

Working pressure of shell by rules 251

Size of manhole in shell 20x16

Size of compensating ring 31x27x1 $\frac{1}{32}$

No. and Description of Furnaces in each boiler 6 Morrison bulb

Material steel

Outside diameter 45 $\frac{1}{16}$ "

Length of plain part

Thickness of plates

crown 1 $\frac{1}{32}$ bottom 3 $\frac{1}{32}$

Description of longitudinal joint welded

No. of strengthening rings

Working pressure of furnace by the rules 229 $\frac{1}{4}$ Combustion chamber plates: Material steel Thickness: Sides $\frac{1}{16}$ Back — Top $\frac{1}{16}$ Bottom $\frac{1}{8}$ Pitch of stays to ditto: Sides 8 $\frac{1}{2}$ x8 $\frac{1}{2}$ Back — Top 8x9

If stays are fitted with nuts or riveted heads nuts

Working pressure by rules 226 lbs

Material of stays steel

Diameter at smallest part 1.99" Area supported by each stay 42"

Working pressure by rules 250

End plates in steam space:

Material steel

Thickness 1 $\frac{3}{8}$ Pitch of stays 19 $\frac{1}{2}$ x21

How are stays secured DN+W

Working pressure by rules 218 lbs

Material of stays steel

Diameter at smallest part 10.12

Area supported by each stay 410"

Working pressure by rules 256

Material of Front plates at bottom steel

Thickness 1"

Material of Lower back plate —

Thickness —

Greatest pitch of stays —

Working pressure of plate by rules —

Diameter of tubes 3 $\frac{1}{4}$ Pitch of tubes 4 $\frac{1}{2}$ x4 $\frac{1}{2}$

Material of tube plates steel

Thickness: Front 1 $\frac{1}{8}$ -1" Back 1"

Mean pitch of stays 9"

Pitch across wide water spaces 14 $\frac{1}{2}$

Working pressures by rules 220 lbs

Girders to Chamber tops: Material steel

Depth and

thickness of girder at centre 2 plates 11x1

Length as per rule 40"

Distance apart 9"

Number and pitch of stays in each 4 of 8"

Working pressure by rules 245

Superheater or Steam chest; how connected to boiler none

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

Lloyd's Register

Foundation

W485.6667

VERTICAL DONKEY BOILER—

Manufacturers of Steel

No.	Description	When made	Where fixed
Made at	By whom made	No. of Certificate	Fire grate area
Working pressure	tested by hydraulic pressure to	Date of test	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 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
Working pressure of shell by rules	Thickness of shell crown plates	Radius of do.	No. of stays to do.
Diameter of furnace Top	Bottom	Length of furnace	Thickness of furnace plates
Working pressure of furnace by rules	Thickness of furnace crown plates	Radius of do.	Stayed by
Diameter of uptake	Thickness of uptake plates	Thickness of water tubes	Dates of survey

SPARE GEAR. State the articles supplied:— 4 top end, 2 bottom end, 2 main bearing and 3 sets of coupling bolts & nuts. Set of top end brasses. 1 eccentric sheave & strap. 1 valve spindle. 1 pair bottom end brasses. Air pump head valve seating rod. Set of feed & bilge pump valves. Propeller shaft. Propeller boss & 2 blades. Set of piston springs. Assorted iron & bolts & nuts.

The foregoing is a correct description,

FOR DAVID & WILLIAM HENDERSON & CO. LIMITED

Manufacturer.

Dates of Survey while building: During progress of work in shops -- 1911. Oct. 6. 13. 18. 21. 24. Nov. 7. 14. 22. 28. Dec. 4. 12. 18. 28. 1912. Jan. 2. 25. 31. Feb. 7. 12. 16. 21. During erection on board vessel -- 23. March 1. 18. 19. 23. Apr. 1. 12. 19. 25. 30. May 4. 7. 13. 23. Total No. of visits 34.

Is the approved plan of main boiler forwarded herewith yes auxiliary donkey " " " yes

Dates of Examination of principal parts—Cylinders 27.2.12 Slides 27.2.12 Covers 27.2.12 Pistons 25.1.12 Rods 27.2.12 Connecting rods 25.1.12 Crank shaft 25.1.12 Thrust shaft 25.1.12 Tunnel shafts 1.3.12 Screw shaft 13.3.12 Propeller 1.3.12 Stern tube 27.2.12 Steam pipes tested 1.3.12 Engine and boiler seatings 23.3.12 Engines holding down bolts 13.5.12 Completion of pumping arrangements 13.5.12 Boilers fixed 13.5.12 Engines tried under steam 23.5.12 Main boiler safety valves adjusted 13.5.12 Thickness of adjusting washers SB PV $\frac{3}{8}$ SV $\frac{3}{8}$ PB PV $\frac{3}{8}$ SV $\frac{5}{16}$ full Material of Crank shaft steel Identification Mark on Do. 478 H.C. Material of Thrust shaft steel Identification Mark on Do. 478 H.C. Material of Tunnel shafts steel Identification Marks on Do. 478 H.C. Material of Screw shafts steel Identification Marks on Do. 478 H.C. Material of Steam Pipes Iron & Copper Test pressure 645 + 430 lbs.

General Remarks (State quality of workmanship, opinions as to class, &c. The machinery of this vessel has been constructed under special survey in accordance with the rules and plans enclosed and has been seen working under steam satisfactorily.

An amended plan of main boilers is enclosed with the approved plan, the former shewing minor alterations which have been made in these boilers.

This machinery is eligible in my opinion to be classed +LMC 5.12

It is submitted that this vessel is eligible for THE RECORD +LMC 5.12

The amount of Entry Fee .. £ 3 : 0 : When applied for, 3/6/12 Special .. £ 46.16 : When received, 22/6/12 Donkey Boiler Fee .. £ : Travelling Expenses (if any) £ :

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

Committee's Minute GLASGOW 4 - JUN. 1912

Assigned + LMC 5.12