

REPORT ON MACHINERY.

Received at London Office

TUE APR 30 1912

Date of writing Report 29th April 1912 When handed in at Local Office 29th April 1912 Port of Belfast
 No. in Survey held at Belfast Date, First Survey Mar 28th 1912 Last Survey 23rd April 1912
 Reg. Book. on the T. S. S. Makarini (Number of Visits 62)
 Master Built at Belfast By whom built Worsman Clark & Co Ltd When built 1912
 Engines made at Belfast By whom made Worsman Clark & Co Ltd (No 310) when made 1912
 Boilers made at Do By whom made Do (No 310) when made 1912
 Registered Horse Power Owners Imper Line Ltd Port belonging to London
 Nom. Horse Power as per Section 28 804 Is Refrigerating Machinery fitted for cargo purposes yes Is Electric Light fitted yes

ENGINES, &c.—Description of Engines Two Triple Expansion No. of Cylinders 6 No. of Cranks 6
 Dia. of Cylinders 23" 38 1/2" 64 1/2" Length of Stroke 45" Revs. per minute 80 Dia. of Screw shaft as per rule 13 1/8" Material of screw shaft 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 and non-corrosive yes If two
 liners are fitted, is the shaft lapped or protected between the liners yes Length of stern bush 5'-0"

Dia. of Tunnel shaft as per rule 12.23" Dia. of Crank shaft journals as per rule 12.84" Dia. of Crank pin 13 1/8" Size of Crank webs 9 1/2" x 18 1/2" Dia. of thrust shaft under
 collars 13 1/8" Dia. of screw 16'-6" Pitch of Screw 18'-3" No. of Blades 3 State whether moveable yes Total surface 78.5 sq ft
 No. of Feed pumps 4 Diameter of ditto 4" Stroke 24" Can one be overhauled while the other is at work yes
 No. of Bilge pumps 2 Diameter of ditto 5 1/2" Stroke 24" Can one be overhauled while the other is at work yes
 No. of Donkey Engines 7 Sizes of Pumps Various sizes No. and size of Suctions connected to both Bilge and Donkey pumps
 in Engine Room 5-3 1/2" In Holds, &c. No 1-2-3 1/2" : No 2-2-3 1/2" : No 3-2-3 1/2"
Bunker 2-3 1/2" : No 4-2-3 1/2" : No 5-2-3 1/2" : Tunnel well 1-2 1/2"

No. of Bilge Injections 2 sizes 8" Connected to condenser, or to circulating pump yes 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 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 bilge & ballast 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 24.1.12 of Stern Tube 24.1.12. Screw shaft and Propeller 1.2.12
 Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from upper deck

OILERS, &c.—(Letter for record S.) Manufacturers of Steel Wm Beardmore & Co & Steel Co of Scotland
 Total Heating Surface of Boilers 11628 sq ft Is Forced Draft fitted yes No. and Description of Boilers 4 single ended
 Working Pressure 200 lbs Tested by hydraulic pressure to 400 lbs Date of test 5.1.12 No. of Certificate 447

Can each boiler be worked separately yes Area of fire grate in each boiler 68.33 sq ft No. and Description of Safety Valves to
 each boiler double spring loaded Area of each valve 11.04 sq in Pressure to which they are adjusted 205 lbs Are they fitted with easing gear yes
 Smallest distance between boilers or uptakes and bunkers or woodwork 19" Mean dia. of boilers 16.42" Length 12.0" Material of shell plates Steel
 Thickness 1 5/8" Range of tensile strength 29/32.4 tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams D.T.R.
 long. seams T.R.D.B.S. Diameter of rivet holes in long. seams 1 5/8" Pitch of rivets 10 1/2" Lap of plates or width of butt straps 23 15/16"
 Per centages of strength of longitudinal joint rivets 87 Working pressure of shell by rules 235 lbs Size of manhole in shell 16" x 12"
 plate 84.5

Size of compensating ring Mc Nichol No. and Description of Furnaces in each boiler 4 Dighton Material Steel Outside diameter 3.9 3/4"
 Length of plain part top 4.1" Thickness of plates bottom 6.4" Description of longitudinal joint weld No. of strengthening rings yes
 Working pressure of furnace by the rules 226 Combustion chamber plates: Material Steel Thickness: Sides 4 1/4" Back 2 1/32" Top 4 1/64" Bottom 2 9/32"
 Pitch of stays to ditto: Sides 8 1/2" x 8 1/4" Back 9 3/8" x 7 5/8" Top 8" x 8 1/4" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 203

Material of stays Steel Diameter at smallest part 1.76" Area supported by each stay 66 sq in Working pressure by rules 213 End plates in steam space:
 Material Steel Thickness 1.32" Pitch of stays 17" x 20 1/4" How are stays secured D.N. & nuts Working pressure by rules 201 Material of stays Steel
 Diameter at smallest part 7.85" Area supported by each stay 344.25 sq in Working pressure by rules 237 Material of Front plates at bottom Steel
 Thickness 1" Material of Lower back plate Steel Thickness 3/32" Greatest pitch of stays 13 1/2" x 7 5/8" Working pressure of plate by rules 234
 Diameter of tubes 2 1/2" Pitch of tubes 3 3/4" x 3 5/8" Material of tube plates Steel Thickness: Front 63/64" Back 13/16" Mean pitch of stays 7 3/8"

Pitch across wide water spaces 13 1/2" Working pressures by rules 204 Girders to Chamber tops: Material Steel Depth and
 thickness of girder at centre 9 3/4" x 20 3/4" Length as per rule 34 1/2" Distance apart 8 1/4" Number and pitch of stays in each 3 @ 8"
 Working pressure by rules 200 Superheater or Steam chest; how connected to boiler yes Can the superheater be shut off and the boiler worked
 separately yes Diameter yes Length yes Thickness of shell plates yes Material yes Description of longitudinal joint yes Diam. of rivet
 holes yes Pitch of rivets yes Working pressure of shell by rules yes Diameter of flue yes Material of flue plates yes Thickness yes
 Stiffened with rings yes Distance between rings yes Working pressure by rules yes End plates: Thickness yes How stayed yes
 Working pressure of end plates yes Area of safety valves to superheater yes Are they fitted with easing gear yes

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 Safety 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 _____ 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:— 2 connecting rod top end bolts & nuts; 2 connecting rod bottom end bolts & nuts; 2 main bearing bolts; 1 set of coupling bolts; 1 set of feed & bilge pump valves; a quantity of assorted bolts & nuts; iron of various sizes; 1 propeller shaft; 2 cast iron blades; 1 set of H.O. M.O. & L.O. packing rings & springs etc.

The foregoing is a correct description,
FOR WORKMAN, CLARK & CO., LIMITED
M. W. Bell Manufacturer.

Dates of Survey while building	During progress of work in shops - -	March 28	June 16	19	24	30	July 10	24	August 1	9	15	22	24	30	Sept. 12	20	26	27	29	to Feb. 1	1912					
		During erection on board vessel - -	Feb 5	8	9	12	14	15	19	21	23	24	26	27	Mar. 4	11	13	15	31	36	Apr. 12	13	16	17	20	23
			Total No. of visits	82																						

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

Dates of Examination of principal parts—Cylinders 19.6.11 Slides 30.10.11 Covers 30.10.11 Pistons 24.8.11 Rods 22.8.11

Connecting rods 26.9.11 Crank shaft 10.10.11 Thrust shaft 30.11.11 Tunnel shafts 29.9.11 Screw shaft 30.11.11 Propeller 16.10.11

Stern tube 4.1.12 Steam pipes tested 11.3.12 Engine and boiler seatings 24.1.12 Engines holding down bolts 15.3.12

Completion of pumping arrangements 17.4.12 Boilers fixed 26.3.12 Engines tried under steam 20.4.12

Main boiler safety valves adjusted 16.4.12 Thickness of adjusting washers No. 1 1 1/2 3 1/2 5 7/8 7 3/8 No. 2 3/8 4 3/8 6 13/32 8 13/32

Material of Crank shaft **Steel** Identification Mark on Do. 310 Material of Thrust shaft **Steel** Identification Mark on Do. 310

Material of Tunnel shafts **Steel** Identification Marks on Do. 310 Material of Screw shafts **Steel** Identification Marks on Do. 310

Material of Steam Pipes **Hot iron** Test pressure 650 lbs per sq. in.

General Remarks (State quality of workmanship, opinions as to class, &c. Donkey Engine:— Ballast 10" x 11" x 10"
 Sea service 8 1/2" x 6" x 8"; sanitary 6" x 6" x 6"; Fresh Water 4" x 4" x 5"; 2 Weirs 12 1/2" x 9 1/2" x 26"
 Refrigerator Pump 8" x 10" x 10"

The machinery of this vessel has been built under special survey: the material and workmanship being good and satisfactorily tried under steam
 It is submitted that above vessel is eligible for a record of
 + L. M. C. 4. 12 in the Register Book

It is submitted that this vessel is eligible for THE RECORD + LMC 4.12.

F.D. *J.W.D.* *A.P.R.L.*

The amount of Entry Fee .. £ 3 - 0 - 0	When applied for, 27 th April 1912
Special .. £ 60 - 4 - 0	
Donkey Boiler Fee .. £ :	When received, 27 th April 1912
Travelling Expenses (if any) £ :	

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

Committee's Minute **FRI. MAY 3 - 1912**
 Assigned *thurs 4.12*



Certificate (if required) to be sent to (The Surveyors are requested not to write on or below the space for Committee's Minute.)