

# REPORT ON MACHINERY.

No. 28484

Date of writing Report 24<sup>th</sup> of 1915 - When handed in at Local Office 6.5 1915 Port of Hull.  
 Received at London Office WED. MAY. 12. 1915  
 No. in Survey held at Hull. Date, First Survey Nov 7/14 Last Survey 17.4. 1915  
 Reg. Book 748 on the SS. "Arbino" (Number of Visits 48)

Master          Built at Hull. By whom built Barlis Co. Ltd Tons { Gross 6651  
 Engines made at Hull. By whom made Barlis Co. Ltd Net 4240  
 Boilers made at Hull. By whom made Barlis Co. Ltd When built 1915  
 Registered Horse Power          Owners J. Wilson Sons & Co when made 1915  
 Nom. Horse Power as per Section 28 645 Is Refrigerating Machinery fitted for cargo purposes no. Is Electric Light fitted yes.  
 Port belonging to Hull.

**ENGINES, &c.**—Description of Engines Triple expansion No. of Cylinders 3 No. of Cranks 3  
 Dia. of Cylinders 28.46.79 Length of Stroke 54 Revs. per minute as per rule 16.3 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 ✓ 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 ✓ If two  
 liners are fitted, is the shaft lapped or protected between the liners ✓ Length of stern bush 5-9"  
 Dia. of Tunnel shaft as per rule 14.8" Dia. of Crank shaft journals as per rule 15.52" Dia. of Crank pin 16 1/4" Size of Crank webs 25x10 1/4" Dia. of thrust shaft under  
 collars 16" Dia. of screw 19.0 Pitch of Screw 17.6" No. of Blades 4 State whether moccable yes. Total surface 101.78  
 No. of Feed pumps ✓ Diameter of ditto ✓ Stroke ✓ Can one be overhauled while the other is at work ✓  
 No. of Bilge pumps 2 Diameter of ditto 4 1/2" Stroke 30" Can one be overhauled while the other is at work yes.  
 No. of Donkey Engines Three Sizes of Pumps Feed 10 1/2 x 8 x 24" No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 4 of 3 1/2" dia. Ballast 10 1/2 x 12 x 10" Donkey 7 1/2 x 5 x 8" In Holds, &c. No 1 Hold 2 of 3 1/2" dia. No 2 Hold 2 of 3 1/2" dia.  
No 3 Hold 2 of 3 1/2" dia. No 4 Hold 2 of 3 1/2" dia. No 5 Hold 2 of 3 1/2" dia. Tunnel well one 2 1/2" dia.  
 No. of Bilge Injections 1 sizes 9 1/2" Connected to condenser, or to circulating pump ✓ 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  
 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 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.  
 Dates of examination of completion of fitting of Sea Connections 24.2.15. of Stern Tube 24.2.15. Screw shaft and Propeller 24.2.15.  
 Is the Screw Shaft Tunnel watertight yes. Is it fitted with a watertight door yes. worked from top platform.

**BOILERS, &c.**—(Letter for record S) Manufacturers of Steel Steel Co of Scotland.  
 Total Heating Surface of Boilers 9180 Is Forced Draft fitted yes. No. and Description of Boilers 3 Single-ended.  
 Working Pressure 200lbs. Tested by hydraulic pressure to 400lbs. Date of test 26.2.15 No. of Certificate 3062 P+S.  
 Can each boiler be worked separately yes. Area of fire grate in each boiler 75.9 No. and Description of Safety Valves to  
 each boiler 2 Spring loaded Area of each valve 8.29" 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 4-0" Mean dia. of boilers 16.3. Length 12-1 1/8" Material of shell plates S.  
 Thickness 1 3/2" Range of tensile strength 30-34. Are the shell plates welded or flanged ✓ Descrip. of riveting: cir. seams DR.  
 long. seams VRDB. Diameter of rivet holes in long. seams 1 3/8" Pitch of rivets 9 1/6" Lap of plates or width of butt straps 1.8"  
 Per centages of strength of longitudinal joint 85.9 Working pressure of shell by rules 201. Size of manhole in shell 16" x 12"  
 Size of compensating ring 40 x 32 1/2 x 3 1/2" and Description of Furnaces in each boiler 4 Neightons Material S. Outside diameter 45 1/4"  
 Length of plain part top 24" Thickness of plates bottom 37" Description of longitudinal joint welded. No. of strengthening rings ✓  
 Working pressure of furnace by the rules 236 Combustion chamber plates: Material S. Thickness: Sides 3/4" Back 23" Top 11" Bottom 3/4"  
 Pitch of stays to ditto: Sides 8 1/4 x 10 3/4" Back 9 1/4 x 9" Top 8 x 9 1/2" If stays are fitted with nuts or riveted heads nuts. Working pressure by rules 213  
 Material of stays S. Diameter at smallest part 2.07 Area supported by each stay 88.6" Working pressure by rules 209. End plates in steam space:  
 Material S. Thickness 1 3/2" Pitch of stays 18 1/4 x 14 1/2" How are stays secured DN+WS Working pressure by rules 208 Material of stays S.  
 Diameter at smallest part 5.18" Area supported by each stay 265" Working pressure by rules 203. Material of Front plates at bottom S.  
 Thickness 15" Material of Lower back plate S. Thickness 15" Greatest pitch of stays 14 1/4 x 9" Working pressure of plate by rules 203.  
 Diameter of tube 2 1/2" Pitch of tubes 3 1/4 x 3 1/4" Material of tube plates S. Thickness: Front 15" Back 7" Mean pitch of stays 9 1/8"  
 Pitch across wide water spaces 13 1/2" Working pressures by rules 209. Girders to Chamber tops: Material S. Depth and  
 thickness of girder at centre 9 1/2 x 1 1/8" Length as per rule 32 5/16" Distance apart 9 1/2" Number and pitch of stays in each 3 at 8"  
 Working pressure by rules 211. Superheater or Steam chest; how connected to boiler Tubes Can the superheater be shut off and the boiler worked  
 separately yes. 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 6.28" Are they fitted with easing gear yes.

In a Report also sent on the Hull of the Ship

IS A DONKEY BOILER FITTED? *No.* If so, is a report now forwarded?

SPARE GEAR. State the articles supplied:—

2 Coa rod top end bolts nuts 2 bottom end bolts nuts 2 main bearing bolts nuts  
 1 set coupling bolts 1 set feed pump valves 1 set bilge pump valves 20 Cochran tubes  
 24 Condenser ferrules 6 pump ring studs 1 set air pump valves.  
 1 set fire bars 1 main feed check 1 bilge feed check 6 Boiler tubes  
 1 Safety valve spring 6 cyl. cover studs 1 set HP piston rings 2 propeller blades.  
 Iron of various sizes, a quantity of assorted bolts nuts.

The foregoing is a correct description,

*W. Hutchinson* Manufacturer.

Dates of Survey while building  
 During progress of work in shops -- 1914: - Nov 7. 13. 17. 26. 30 Dec 1. 7. 9. 11. 15. 16. 22. 30. 31. 1915: Jan 4. 12. 13. 19. 20. 21. 25. 27. Feb  
 During erection on board vessel --- 1. 3. 18. 22. 24. 26 Mar 1. 4. 5. 9. 10. 12. 15. 17. 22. 29. 26. 27. 30. 31. Apr 4. 10. 12. 13. 14. 17.  
 Total No. of visits 48. Is the approved plan of main boiler forwarded herewith *yes*

Dates of Examination of principal parts—Cylinders 1. 2. 15. Slides 1. 2. 15. Covers 4. 4. 15. Pistons 4. 4. 15. Rods 18. 2. 15.  
 Connecting rods 18. 2. 15. Crank shaft 18. 2. 15. Thrust shaft 4. 4. 15. Tunnel shafts *see foregoing reports* Screw shaft 1. 3. 15. Propeller 1. 3. 15.  
 Stern tube 18. 2. 15. Steam pipes tested 12. 4. 15. Engine and boiler seatings 1. 3. 15. Engines holding down bolts 17. 3. 15.  
 Completion of pumping arrangements 17. 4. 15. Boilers fixed 17. 3. 15. Engines tried under steam 13. 4. 15.  
 Main boiler safety valves adjusted 14. 4. 15. Thickness of adjusting washers PBs  $\frac{3}{8}$ " P  $\frac{11}{32}$ " CBS  $\frac{13}{32}$ " P  $\frac{1}{2}$ " SBS  $\frac{3}{8}$ " P  $\frac{3}{8}$ "  
 Material of Crank shaft *Steel* Identification Mark on Do. 4129. Material of Thrust shaft *S.* Identification Mark on Do. 4084.  
 Material of Tunnel shafts *S.* Identification Marks on Do. *see foregoing reports* Material of Screw shafts *S.* Identification Marks on Do. 4121.  
 Material of Steam Pipes *Steel* Test pressure 600 lbs hyd. press.  
 Is an installation fitted for burning oil fuel  Is the flash point of the oil to be used over 150° F.

Have the requirements of Section 49 of the Rules been complied with   
 Is this machinery duplicate of a previous case *No.* If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c.) *The engines & boilers of this vessel have been constructed under special survey in accordance with the Rules. The materials and workmanship are sound and good. The Boiler tested by hydraulic pressure and with the engines secured on board and tested under steam they are now in good order and safe working condition and respectfully submitted as being eligible in my opinion to be classed with the notation of + LMC 4-15 in the Register book.*

It is submitted that this vessel is eligible for THE RECORD + LMC 4.15. F.D.

*JWD* 13/5/15  
*WPR*

The amount of Entry Fee ... £ 30 0 0 When applied for.  
 Special ... £ 52 5 0 7-5-1915  
 Donkey Boiler Fee ... £ : : : When received.  
 Travelling Expenses (if any) £ : : : 15/5/1915 17/5/15  
 Committee's Minute TUE. MAY 18. 1915  
 Assigned + LMC 4.15

*J. G. Mackillop*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.



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

MACHINERY ESTIMATE  
 1915