

REPORT ON MACHINERY.

No. 14783

Received at London Office

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Date of writing Report 4 Nov 1913 When handed in at Local Office 6 Nov 1913 Port of West Hartlepool

No. in Survey held at West Hartlepool Date, First Survey 13th Jan^y 1913 Last Survey 5 Nov 1913
Reg. Book. on the Steel Steamer Orna (Number of Visits 97)

Master P. E. Lyne Built at West Hartlepool By whom built W. Gray & Co. Ltd. When built 1903

Engines made at West Hartlepool By whom made Central Marine & Works when made 1913

Boilers made at West Hartlepool By whom made Central Marine & Works when made 1913

Registered Horse Power Owners British India Steam Nav. Co. Ltd. Port belonging to London

Nom. Horse Power as per Section 28 588 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

ENGINES, &c.—Description of Engines Triple Compound No. of Cylinders Three No. of Cranks Three
Dia. of Cylinders 28" 46" 77" Length of Stroke 48" Revs. per minute 65 Dia. of Screw shaft as per rule 15.08" Material of screw shaft as fitted 16" 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 Yes If two liners are fitted, is the shaft lapped or protected between the liners Length of stern bush 64"
Dia. of Tunnel shaft as per rule 13.69" Dia. of Crank shaft journals as per rule 14.38" Dia. of Crank pin 14 1/2" Size of Crank webs 21.85" Dia. of thrust shaft under collars 14 1/2" Dia. of screw 18.0" Pitch of Screw 17.0" No. of Blades 4 State whether moveable Yes Total surface 104 sq ft
No. of Feed pumps Two Diameter of ditto 4 1/2" Stroke 32" Can one be overhauled while the other is at work Yes
No. of Bilge pumps Two Diameter of ditto 4 1/2" Stroke 32" Can one be overhauled while the other is at work Yes
No. of Donkey Engines Four Sizes of Pumps 5" 6" 7" 11 1/2" 10" No. and size of Suctions connected to both Bilge and Donkey pumps In Engine Room Three 3 1/2" In Holds, &c. Light 3 1/2" Tunnel 3 1/2"
The main feed pump 8" x 24"
No. of Bilge Injections six sizes 10 Connected to condenser, or to circulating pump 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 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 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 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 15/9/13 of Stern Tube 23/9/13 Screw shaft and Propeller 7/10/13
Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from top head room.

BOILERS, &c.—(Letter for record S) Manufacturers of Steel J. Hancock & Sons
Total Heating Surface of Boilers 8813 sq ft Is Forced Draft fitted Yes No. and Description of Boilers Three single ended.
Working Pressure 180 lb Tested by hydraulic pressure to 360 lb Date of test 24 & 26/9/13 No. of Certificate 3341
Can each boiler be worked separately Yes Area of fire grate in each boiler 71 sq ft No. and Description of Safety Valves to each boiler Two Spring Area of each valve 12.56" Pressure to which they are adjusted 183 lb Are they fitted with easing gear Yes
Smallest distance between boilers or uptakes and bunkers or woodwork F 28" A 22" Mean dia. of boilers 16.0" Length 12.0" Material of shell plates Mild Thickness 1 1/2" Range of tensile strength 27-30 Are the shell plates welded or flanged Both Descrip. of riveting: cir. seams 3/16" in lap long, seams all chain Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 10" Lap of plates or width of butt straps 22 1/8" Per centages of strength of longitudinal joint rivets 89.3% plate 84.6% Working pressure of shell by rules 210 lb Size of manhole in shell 16" x 12" End 41" in long
Size of compensating ring 34" x 30" x 1 1/2" No. and Description of Furnaces in each boiler 4 single Material Mild Outside diameter 43 1/8" Length of plain part top — bottom — Thickness of plates crown 19/32 Description of longitudinal joint welded No. of strengthening rings four Working pressure of furnace by the rules 218 lb Combustion chamber plates: Material Mild Thickness: Sides 2 1/2" Back 2 1/2" Top 2 1/2" Bottom 1 1/2" Pitch of stays to ditto: Sides 9" x 8 1/4" Back 9 1/2" x 8" Top 9" x 8 1/4" If stays are fitted with nuts or riveted heads Both Working pressure by rules 183 lb Material of stays Mild Diameter at smallest part 1 1/2" Area supported by each stay 9" x 8 1/4" Working pressure by rules 183 lb End plates in steam space: Material Mild Thickness 1 1/2" Pitch of stays 19 1/2" x 16" How are stays secured All nut Working pressure by rules 191 lb Material of stays Mild Diameter at smallest part 2" x 11" Area supported by each stay 19 1/2" x 16" Working pressure by rules 224 lb Material of Front plates at bottom Mild Thickness 3 1/2" Material of Lower back plate Mild Thickness 3 1/2" Greatest pitch of stays 17" Working pressure of plate by rules 180 lb Diameter of tubes 2 1/2" Pitch of tubes 4 1/2" Material of tube plates Mild Thickness: Front 3 1/2" Back 2 1/2" Mean pitch of stays 11 1/2" Pitch across wide water spaces 13 1/2" Working pressures by rules 190 lb Girders to Chamber tops: Material Mild Depth and thickness of girder at centre 10 1/2" x 1 1/2" Length as per rule 34 1/2" Distance apart 8 1/2" Number and pitch of stays in each Three 9" Working pressure by rules 181 lb 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

W575-0013

VERTICAL DONKEY BOILER—

Manufacturers of Steel

None

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:—*The top end bolts. The bottom end bolts. The main bearing bolts. One set coupling bolts. One set feed pump valves. One set bridge pump valves. One set 150 piston openings. Piston pin shaft. The piston blades. One pump bucket and rod. Circular ring pump bucket and rod & slide. Piston pin & nut.*

The foregoing is a correct description,

FOR THE CENTRAL MARINE ENGINE WORKS,
(W. Gray & Co. Ltd.)

Manufacturer.

James S. Ebb

Dates of Survey while building	During progress of work in shops --	1913 Jan 13. 14. 15. 22. 23. 24. Feb 21. March 4. 5. 6. April 11. 22. 23. 24 May 2	DIRECTOR.
	During erection on board vessel --	5. 6. 19. 20. 21. 22. 26. 27. 28. 30 June 2. 4. 9. 10. 12. 13. 16. 18. 19. 20. 23. 25. 27. 30	
	Total No. of visits	July 1. 2. 3. 4. 7. 8. 9. 14. 15. 16. 17. 18. 22. 31. Aug 12. 13. 14. 15. 18. 19. 20. 22. 25. 26. 27. 29. Sep 1. 3. 4. 5. 8. 9. 10. 11. 12. 15. 16. 17. 19. 22. 23. 24. 25. 26. 29. 30. Oct 1. 3. 6. 7. 8. 17. 20. 22. 24. 31. Nov 3. 5.	

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

" " " donkey " " " "

Dates of Examination of principal parts—Cylinders	17/9/13	Slides	17/9/13	Covers	17/9/13	Pistons	19/9/13	Rods	4/9/13
Connecting rods	17/9/13	Crank shaft	29/8/13	Thrust shaft	29/8/13	Tunnel shafts	29/9/13	Screw shaft	29/8/13
Stern tube	17/9/13	Steam pipes tested	1. 7. 17. 22/10/13	Engine and boiler seatings	22/9/13	Engines holding down bolts	22/10/13		
Completion of pumping arrangements	31/10/13	Boilers fixed	22/10/13	Engines tried under steam	31/10/13				
Main boiler safety valves adjusted	31/10/13	Thickness of adjusting washers	Pat 1/16, 5/16, 7/16, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 2 3/4, 3, 3 1/4, 3 1/2, 3 3/4, 4, 4 1/4, 4 1/2, 4 3/4, 5, 5 1/4, 5 1/2, 5 3/4, 6, 6 1/4, 6 1/2, 6 3/4, 7, 7 1/4, 7 1/2, 7 3/4, 8, 8 1/4, 8 1/2, 8 3/4, 9, 9 1/4, 9 1/2, 9 3/4, 10, 10 1/4, 10 1/2, 10 3/4, 11, 11 1/4, 11 1/2, 11 3/4, 12, 12 1/4, 12 1/2, 12 3/4, 13, 13 1/4, 13 1/2, 13 3/4, 14, 14 1/4, 14 1/2, 14 3/4, 15, 15 1/4, 15 1/2, 15 3/4, 16, 16 1/4, 16 1/2, 16 3/4, 17, 17 1/4, 17 1/2, 17 3/4, 18, 18 1/4, 18 1/2, 18 3/4, 19, 19 1/4, 19 1/2, 19 3/4, 20, 20 1/4, 20 1/2, 20 3/4, 21, 21 1/4, 21 1/2, 21 3/4, 22, 22 1/4, 22 1/2, 22 3/4, 23, 23 1/4, 23 1/2, 23 3/4, 24, 24 1/4, 24 1/2, 24 3/4, 25, 25 1/4, 25 1/2, 25 3/4, 26, 26 1/4, 26 1/2, 26 3/4, 27, 27 1/4, 27 1/2, 27 3/4, 28, 28 1/4, 28 1/2, 28 3/4, 29, 29 1/4, 29 1/2, 29 3/4, 30, 30 1/4, 30 1/2, 30 3/4, 31, 31 1/4, 31 1/2, 31 3/4, 32, 32 1/4, 32 1/2, 32 3/4, 33, 33 1/4, 33 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