

# REPORT ON MACHINERY

No. 1900

Received at London Office 17 MAY 1921

Date of writing Report 9th May 1921 When handed in at Local Office 14th May 1921 Port of Barrow-in-Furness

No. in Survey held at Barrow-in-Furness Date, First Survey 19th Sept 1919 Last Survey 6th May 1921

Reg. Book. on the T.S.S. "Manuel Arnus" (Number of Visits 131.)

Tons { Gross Net

Master Built at Cadiz By whom built Sociedad Espanola de Construcción Naval When built

Engines made at Barrow-in-Furness By whom made Vickers Ltd (Eng No 572) (Except as below) when made 1921

Boilers made at Barrow-in-Furness By whom made Vickers Ltd when made 1921

Registered Horse Power 1173 (Total) Owners Port belonging to

Net Horse Power at Full Power 6250 Is Refrigerating Machinery fitted for cargo purposes Is Electric Light fitted

**TURBINE ENGINES, &c.**—Description of Engines *Parsons Impulse-Reaction Double Reduction Geared Turbines*  
Diameter of Rotor Shaft Journals, H.P. 4" L.P. 5 1/2" Diameter of Pinion Shaft H.P. pinion 6" L.P. pinion 9 1/2"  
Diameter of Journals 4 3/4" Distance between Centres of Bearings 25 1/2" Diameter of Pitch Circle H.P. 7.029" L.P. 10.438"  
Diameter of Wheel Shaft 14 1/2" Distance between Centres of Bearings 4'-10 1/2" Diameter of Pitch Circle of Wheel 51.336" 1st Red 79.408" 2nd  
Diameter of Thrust Shaft under Collars 6'-2" Diameter of Tunnel Shaft as per rule 12.10" as fitted 12 3/4"  
Pitch of Propeller 15'-0"  
Diameter of Rotor Drum, H.P. 15" L.P. 26 3/8" Astern 30"  
Revs. per Minute at Full Power, Turbine H.P. 4040 Propeller 113.  
H.P. 2710

## Particulars of Blading.

	H.P.			L.P.			ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
EXPANSION	2 Rows Impulse Wheel	2'-0" mean	5	2'-0 1/7"	2'-5.784"	4	3 Rows Impulse Wheel 3'-1"		
	17"	17"	5	2 9/16"	2'-7 1/8"	4	Mean diam. of Blading		
	1 7/16"	17 3/8"	5	3 1/4"	2'-8 1/2"	4	Re- 7/8"	2'-7 3/4"	2
	1 1/16"	18 3/8"	5	2 1/4"	3'-4 1/2"	2	action 2 1/4"	2'-9 1/4"	2
	2 1/8"	19 1/4"	5	2 7/8"	3'-5 1/4"	2	2 1/4"	2'-10 1/2"	1
	2 1/16"	20 3/8"	5	3 3/8"	3'-7 1/4"	2	2 1/4"	2'-10 1/2"	1
				4 1/8"	3'-8 1/4"	1			
				4 3/4"	3'-9 3/4"	1			
				5 1/4"	3'-11 1/2"	1			
				5 3/4"	3'-11 1/2"	1			

and size of Feed pumps Two Weirs 12" dia cyls. x 21" stroke, 9" dia pump x 21" stroke.

and size of Bilge pumps Two Duplex 7" x 8" x 8" x 8"

and size of Bilge suction in Engine Room

In Holds, &c.

of Bilge Injections sizes Connected to condenser, or to circulating pump Is a separate Donkey Suction fitted in Engine Room & size

all the bilge suction pipes fitted with roses Are the roses in Engine room always accessible

all connections with the sea direct on the skin of the ship Are they Valves or Cocks

they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates Are the Discharge Pipes above or below the deep water line

they each fitted with a Discharge Valve always accessible on the plating of the vessel Are the Blow Off Cocks fitted with a spigot and brass covering plate

pipes are carried through the bunks How are they protected

all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times.

the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges

Screw Shaft Tunnel watertight Is it fitted with a watertight door worked from

**BOILERS, &c.**—(Letter for record (+) Manufacturers of Steel Messrs Spencers & Co, Beardmore & Co, Bessemer & Co, Leeds

Heating Surface of Boilers 14,945 sq ft Is Forced Draft fitted Yes No. and Description of Boilers Five Single Ended, Multitubular

Working Pressure 180 lbs sq in Tested by hydraulic pressure to 360 lbs Date of test 28/6/20, 5/7/20, 13/7/20 Nos of Certificates 302, 303, 304, 305, 306.

each boiler be worked separately Yes Area of fire grate in each boiler 69 sq ft. Not and Description of Safety Valves to

boiler Two-Spring-loaded Area of each valve 9.62 sq in Pressure to which they are adjusted Are they fitted with easing gear

least distance between boilers or uptakes and bunks or woodwork Mean dia. of boilers 16'-3" Length 11'-6" Material of shell plates Steel

thickness 1 1/32" Range of tensile strength 28/32 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams & R. Lap.

seams T.R. Double Butt Diameter of rivet holes in long seams 1 3/8" Pitch of rivets 9/2" Lap of plates or width of butt straps 20 1/8"

percentages of strength of longitudinal joint plates 86.6% Working pressure of shell by rules 185 lbs. Size of manhole in shell 21 1/8" x 17 1/8"

f compensating ring 40" x 32" x 1 1/32" No. and Description of Furnaces in each Boiler 3-Monson's Material Steel Outside diameter 4'-4 1/4"

h of plain part top Thickness of plates crown 5/8" Description of longitudinal joint Weld No. of strengthening rings

ing pressure of furnace by the rules 185 lbs. Combustion chamber plates: Material Steel Thickness: Sides 2 1/32" Back 2 1/32" Top 2 1/32" Bottom 1 3/16"

of stays to ditto: Sides 9 1/4" x 8 1/2" Back 9 x 8 7/16" Top 9 1/4" x 8 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 195 lbs

ial of stays Iron Diameter at smallest part 1.606" Area supported by each stay 76.25 sq in Working pressure by rules 239 lbs. End plates in steam space

ial Steel Thickness 1 9/32" Pitch of stays 23" x 16 1/4" How are stays secured Double Nuts Working pressure by rules 193 lbs. Material of stays Steel

ter at smallest part 2 7/8" Area supported by each stay 343.75 sq in Working pressure by rules 192 lbs. Material of Front plates at bottom Steel

ness 1" Material of Lower back plate Steel Thickness 7/8" Greatest pitch of stays 13 1/2" x 9" Working pressure of plate by rules 266 lbs.

eter of tubes 2 1/2" Pitch of tubes 3 3/4" x 3 3/4" Material of tube plates Steel Thickness: Front 1" Back 2 1/32" Mean pitch of stays 9.345"

across wide water spaces 13 1/2" Working pressures by rules 193 lbs. Girders to Chamber tops: Material Steel Depth and

thickness of girder at centre 8 1/2" x 1 1/2" Length as per rule 32 1/2" Distance apart 8 1/4" Number and pitch of stays in each 3 - 9 1/4"

Working pressure by rules 207 lbs. Steam dome: description of joint to shell None 10 of strength of joint Diameter

Thickness of shell plates Material Description of longitudinal joint Diameter of rivet holes Pitch of rivets

Working pressure of shell by rules Crown plates: Thickness How stayed



## IS A DONKEY BOILER FITTED?

No

If so, is a report now forwarded?

*The foregoing is a correct description,*

FOR VICKERS LIMITED,

*Manufacturer.*

Mr. B. Minister

Is the approved plan of main boiler forwarded herewith

yes

Rotor shaft 25/2/20, 30/8/20 Thrust shaft Inc Report Tunnel shafts 26/3/20, 13/4/20, 7/5/20 Screw shaft 19/4/20, 23/5/20, 28/5/20 Propellers 28/8/20

Stern tube 5 10/8/20, 20/8/20 Steam pipes tested 18/1/20, 1/2/20, 1/4/20, 1/4/20 Engine and boiler seatings \_\_\_\_\_ Engines holding down bolts \_\_\_\_\_

Completion of pumping arrangements..... Boilers fixed..... Engines tried under steam *on ship 7/4/21.*

Main boiler safety valves adjusted ..... Thickness of adjusting washers ..... LLOYD'S

Material and tensile strength of Rotor shaft 24/38 ton Steel Identification Mark on Do. 11 104  
5H  
LLORIN

Material and tensile strength of Pinion shaft Secondary  $34/38$  ton Steel Primary 40 ton Nickel Steel Identification Mark on Do. 1714  
J.W.

Material of Wheel shaft	31/35 in. Steel	Identification Mark on Do.	K 354	Material of Thrust shaft	Turn Report	Identification Mark on Do.	
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Material of Tunnel shafts 28/32 ton steel Identification Marks on Do. LLOYD'S  
No 14 Material of Screw shafts 28/32 ton steel Identification Marks on Do. No 14  
JL

Material of Steam Pipes Steel Test pressure 540 lbs sq. in.

Is an installation fitted for burning oil fuel.....No..... 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 a duplicate of a previous case No. If so, state name of vessel ☒

General Remarks (State quality of workmanship, opinions as to class, &c. *The Machinery of this Vessel has been tried*

under special survey, in accordance with the Rules & the approved plans, & the materials & workmanship are sound & good. The boilers have been tested by hydraulic pressure to 360 lbs. & were tight at that pressure. Finished lengths of steam pipes were tested as noted above. The port turbine on completion of erection in shops were subjected to steam trials & were found satisfactory.

In my opinion this Machinery will be eligible to be classed + L.M.C. with date, as it is efficiently fitted on board, when all safety valves are adjusted under steam, the main steam feed discharge pipes tested as required, & all spare gear checked on board.

The Machinery has been despatched to Spain.

The amount of Entry Fee	£	6	:	0	:	0	When applied for,
Donkey Boiler Fee	£	12	:	9	:	6	14th May 1921
Special	£	12	:	9	:	6	
Donkey Boiler Fee	£		:		:		When received,
Travelling Expenses (if any)	£		:		:		21. 7. 21

When applied for,

When received.

## Committee's Minute

*Assigned*

FRI MAY 11 1923

John Houston  
Engineer Surveyor to Lloyd's Register of Shipping.

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Foundation