

SAT. 4 NOV. 1922 No. 28450

Rpt. 4a.

# REPORT ON MACHINERY

No. 4945

Received at London Office SAT. 22 APR. 1922

Date of writing Report 19 When handed in at Local Office 21<sup>st</sup> April 1922 Port of Manchester

No. in Survey held at Manchester Date, First Survey 12-8-21 Last Survey 10<sup>th</sup> April 1922

Reg. Book. on the Steam Turbines Nos 1970/1 and Double Reduction Gear No 1974 for S. I. British Lord

Master Built at Sunderland By whom built J. L. Thompson & Sons (Spence) When built 1922

Engines made at Manchester By whom made Metropolitan Vickers E. Co. Ltd. when made 1922

Boilers made at Sunderland By whom made J. Dickinson & Sons Ltd. (No. 860) when made 1922

Registered Horse Power 644 N.H.P. Owners British Tankers Co. Ltd. Port belonging to London

Shaft Horse Power at Full Power 3200 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted yes

**TURBINE ENGINES, &c.**—Description of Engines *Ration Impulse H.P. & L.P.* No. of Turbines *Two*

Diameter of Rotor Shaft Journals H.P. 5" L.P. 5" Diameter of Pinion Shaft *Flexible* 1<sup>st</sup> Reduction 3 3/8" 2<sup>nd</sup> Reduction 5 3/4" dia.

Diameter of Journals (1<sup>st</sup> Red) 6" (2<sup>nd</sup> Red) 10" Distance between Centres of Bearings (1<sup>st</sup> Red) 1-7 1/2" Diameter of Pitch Circle (1<sup>st</sup> Red) 6.79411" (2<sup>nd</sup> Red) 11.6491"

Diameter of Wheel Shaft (1<sup>st</sup> Red) 10" (2<sup>nd</sup> Red) 19" Distance between Centres of Bearings (1<sup>st</sup> Red) 2-9 1/2" Diameter of Pitch Circle of Wheel (1<sup>st</sup> Red) 43.10012" (2<sup>nd</sup> Red) 78.3677"

Width of Face (1<sup>st</sup> Red) 10" (2<sup>nd</sup> Red) 14" Diameter of Thrust Shaft under Collars 14.8" Diameter of Tunnel Shaft as per rule 14.1" as fitted 19"

No. of Screw Shafts *one* Diameter of same as per rule 16.5" Diameter of Propeller 18-3" Pitch of Propeller 17-9"

No. of Blades *4* State whether Moveable *yes* Total Surface 110 sq ft Diameter of Rotor Drum, H.P. L.P. astern

Thickness at Bottom of Groove, H.P. L.P. Astern Revs. per Minute at Full Power, Turbine 3125 Propeller 72.9

## 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.
1ST EXPANSION	1/2"	3 1/2"	2	1 3/8"	3-3 5/8"	1	H.P.	H.P.	H.P.
2ND	4/6"	3-2 1/2"	1	1 7/8"	3-3 1/2"	1	1"	3-2 3/4"	2
3RD	7/8"	3-2 3/4"	1	2 1/8"	3-4 1/2"	1	2 1/2"	3-3 3/8"	2
4TH	7/8"	3-2 1/8"	1	4 3/8"	3-6 3/8"	1			
5TH	1"	3-3"	1	6 1/8"	3-8 3/8"	1	L.P.	L.P.	L.P.
6TH				8 1/4"	3-10 1/4"	1	2 1/2"	3-0 1/2"	1
7TH				10 3/16"	4-0 3/16"	1	6 3/16"	3-4 3/16"	1
8TH									

No. and size of Feed pumps 1 Weir's 9 1/2 x 7 x 21 1-2 1/2" Drysdale Electric centrifugal

No. and size of Bilge pumps 2 @ 6 x 12

No. and size of Bilge suction in Engine Room 3 @ 3 1/2" 1 @ 3" in each oil well

In Holds, &c. Forward hold - cargo flab - 2 @ 2"

## OIL TANK STEAMER

No. of Bilge Injections 1 sizes 11" Connected to condenser, or to circulating pump 6 P 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 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 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

Is the Screw Shaft Tunnel watertight none Is it fitted with a watertight door mahy aft worked from

## BOILERS, &c.

(Letter for record S) Manufacturers of Steel John Spence & Sons Ltd

Total Heating Surface of Boilers 8265 sq ft Forced Draft fitted yes No. and Description of Boilers Three single ended marine

Working Pressure 200 Tested by hydraulic pressure to 350 Date of test 13-2-22 No. of Certificate 3791

Can each boiler be worked separately yes Area of fire grate in each boiler (oil fired) No. and Description of Safety Valves to each boiler two direct spring Area of each valve 9.62 sq ft Pressure to which they are adjusted 205 Are they fitted with easing gear yes

Smallest distance between boilers or uptakes and bunkers or woodwork 18" (horiz) dia. of boilers 16-0" Length 12-1 1/2" Material of shell plates steel

Thickness 1 1/2" Range of tensile strength 28 1/2 - 33 tons Are the shell plates welded or flanged no Descrip. of riveting: cir. seams DR

long. seams DBS, TR Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 10 1/8" Lap of plates or width of butt straps 19 1/8"

Per centages of strength of longitudinal joint rivets 95 plates 85 Working pressure of shell by rules 200 Size of manhole in shell 16 x 12

Size of compensating ring 9" x 1 1/2" No. and Description of Furnaces in each Boiler 4 Deighton Material steel Outside diameter 3-5 7/8"

Length of plain part top Thickness of plates crown 9" bottom 10" Description of longitudinal joint welded No. of strengthening rings

Working pressure of furnace by the rules 211 Combustion chamber plates: Material steel Thickness: Sides 3/4" Back 1 1/8" Top 3/4" Bottom 3/4"

Pitch of stays to ditto: Sides 11 1/4" x 8 3/8" Back 9 1/2" x 8" Top 10 3/4" x 8" If stays are fitted with nuts or riveted heads nuts in cres Working pressure by rules 202

Material of stays steel Diameter at smallest part 2 1/2" Area supported by each stay 160" Working pressure by rules 200 End plates in steam space

Material steel Thickness 1 1/2" Pitch of stays 20 1/2" x 1 1/2" How are stays secured DR Working pressure by rules 200 Material of stays steel

Diameter at smallest part 7.07" Area supported by each stay 3490" Working pressure by rules 211 Material of Front plates at bottom steel

Thickness 1 1/8" Material of Lower back plate steel Thickness 3/32" Greatest pitch of stays 13 1/4" x 9 1/2" Working pressure of plate by rules 202

Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates steel Thickness: Front 1 1/8" Back 7/8" Mean pitch of stays 9"

Pitch across wide water spaces 14 1/2" Working pressures by rules 200 Girders to Chamber tops: Material steel Depth and thickness of girder at centre 2 @ 7 1/8" x 1" Length as per rule 33" Distance apart 8" Number and pitch of stays in each 2 @ 10 3/4"

Working pressure by rules 204 Steam dome: description of joint to shell none % 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

W1630-0057

Lloyd's Register Foundation

SUPERHEATER. Type Schmidt Date of Approval of Plan 6-9-21 (Submitted from such) Tested by Hydraulic Pressure to 600 lbs  
 Date of Test 7-12-21 Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler yes  
 Diameter of Safety Valve 1 1/2" Pressure to which each is adjusted 208 Is Easing Gear fitted yes

IS A DONKEY BOILER FITTED? yes If so, is a report now forwarded? yes

SPARE GEAR. State the articles supplied:— Turbines:— 2 sets of bearing bushes for rotor, to the bolts (or studs) & nuts for casing joints  
 1 set of coupling bolts. 1 set of Michell Thrust pads. 2 Bolts & nuts (or studs) for each size fitted to rotor bearings  
 2 for each bearing. 1 gland box complete. Diaphragm gland rings. Gears:— 1 primary pinion & flexible shaft. 1 set of  
 bearing bushes main shaft. 2 ditto for 1st & 2nd Red. pinions. 2 ditto for 1st & 2nd Red. Wheel shafts 2 bolts (or studs) & nuts  
 for each size & for each bearing fitted. 1 set of coupling bolts. to the gear case joint bolts (or studs) nuts.  
 General:— 3 thermocouples. 1 Spring for each size fitted. Lubricating Pumps:— 1 set of valves. 1 Bucket. 1 pump rod. 1 piston  
 rod nut. Roto-plunge Pump:— 1 set plungers. 1 Centre block. 1 Rotor bearing plate. Oil Cooler 1 nest of tubes.

The foregoing is a correct description.  
 METROPOLITAN-VICKERS ELECTRICAL CO. LTD. Simpson Manufacturer.  
 TRAFFORD PARK, Engine Co.  
 MANCHESTER

Dates of Survey while building  
 During progress of work in shops --- 1921. 12/6. 22/9. 10/10. 19/10. 26/10. 9/11. 16/11. 24/11.  
 During erection on board vessel --- 1922. 3/1. 5/1. 6/1. 11/1. 25/1. 29/1. 7/2. 10/2. 22/2. 27/2. 13/3. 23/3. 28/3. 10/4.  
 Total No. of visits 83 Is the approved plan of main boiler forwarded herewith yes  
 " " " donkey " " " yes

Dates of Examination of principal parts— Casings 25-1-22 Rotor shafts 5-1-22 Thrust shaft 5-4-22 Tunnel shafts 5-4-22 Screw shaft 17-7-22 Propeller 30-5-22  
 Blading 3-1-22 Gearing 7-2-22, 10-2-22  
 Rotor shaft 5-1-22 Thrust shaft 5-4-22 Tunnel shafts 5-4-22 Screw shaft 17-7-22 Propeller 30-5-22  
 Stern tube 30-5-22 Steam pipes tested 30-8-22 Engine and boiler seatings 31-7-22 Engines holding down bolts 30-9-22  
 Completion of pumping arrangements 30-10-22 Boilers fixed 30-8-22 Engines tried under steam 18-10-22  
 Main boiler safety valves adjusted 17-10-22 Thickness of adjusting washers Port hole, P 9" 5 1/2"; Starboard hole, both 1 1/2"; Ford hole P 5" 5 9/16"  
 Material and tensile strength of Rotor shafts Tough Mild Steel 35.3 Identification Mark on Do. H.P.A. L.P.  
 Material and tensile strength of Pinion shaft Tough Nickel Steel 45.0 45.5 Identification Mark on Do. A or DMC  
 Material of Wheel shaft Steel 35.5 Identification Mark on Do. A Material of Thrust shaft Steel Identification Mark on Do. 1012  
 Material of Tunnel shaft Steel Identification Marks on Do. 1017 Material of Screw shafts Steel Identification Marks on Do. 1013 & 1014  
 Material of Steam Pipes Lapwelder steel Test pressure 600 lbs per sq"

Is an installation fitted for burning oil fuel yes Is the flash point of the oil to be used over 150°F. yes  
 Have the requirements of Section 49 of the Rules been complied with yes  
 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. Three turbines and D.R. gear have been built under special survey and the materials tested in accordance with the Rules of this Society, and the approved plans. The materials and workmanship, so far as can be seen are sound and good. The steam trial and subsequent examination proved satisfactory. This machinery is eligible in our opinion to be classed with record of L.M.C. 10, 22

Lloyds  
 No. 13598  
 28-3-22  
 A A

Mark on coupling of main shaft:—

SUNDERLAND 3-11-22. The machinery has been satisfactorily fitted in the vessel, tried and found good.

The amount of Entry Fees 6.0.0 When applied for, 3 NOV 1922  
 Special 107.4.0  
 Donkey Boiler Fee 83.0.0 When received, 17/6/22  
 Travelling Expenses (if any) £ 77

A. Campbell  
 Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute IUE. NOV. 1922

Assigned + L.M.C. 10/22. F.D.  
Fitted for oil fuel 10/22  
F.P. above 150°F.



(The Surveyors are requested not to write on or below the space for Committee's Minute.)  
 in duplicate (if required) to be sent to...  
 If not, state whether, and when, one will be sent?