

REPORT ON MACHINERY

No. 33278

Received at London Office 3 MAR 1922

4a.

of writing Report 19 When handed in at Local Office 7/3/22 Port of Hull.
 in Survey held at Hull Date, First Survey 26-4-20 Last Survey Mar 1 1922
 g. Book. on the S.S. "TEKOA" (Number of Visits 154)
 Tons { Gross 8526
 Net 5699.
 Built at Hull By whom built Carter & Co. Ltd. When built 1922.
 Engines made at Hull By whom made do when made 1922.
 Milers made at do By whom made do when made 1922.
 Registered Horse Power 1230 N.H.P. Owners Federal Steam Navigation Co. Ltd. Port belonging to London.
 Shaft Horse Power at Full Power 5500 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes.

TURBINE ENGINES, &c.—Description of Engines DOUBLE REDUCTION GEARING PARSONS REACTION TURBINE. No. of Turbines 1-HP, 1-MP, 1-LP.
 Diameter of Rotor Shaft Journals, H.P. 8 MP 4 1/2 L.P. 8 Diameter of Pinion Shaft HP 8 MP 7 1/2 LP 13 1/2
 Diameter of Journals HP 8 MP 5 LP 7 Distance between Centres of Bearings HP 8 MP 2-4 Diameter of Pitch Circle HP 8 MP 8.884 LP 14.701
 Diameter of Wheel Shaft 1 1/2 Distance between Centres of Bearings 8-0 Diameter of Pitch Circle of Wheel 140.318
 Width of Face 2-0 LP Diameter of Thrust Shaft under Collars 1 1/2 Diameter of Tunnel Shaft as per rule 16.07
 as fitted 16.5
 No. of Screw Shafts ONE Diameter of same as fitted 17.2 Diameter of Propeller 19-5 Pitch of Propeller 17-7 1/2
 No. of Blades 4 State whether Moveable YES Total Surface 125 sq ft Diameter of Rotor Drum, H.P. 13 L.P. 3-8
 Thickness at Bottom of Groove, H.P. SOLID L.P. DISCS Astern DISCS. Revs. per Minute at Full Power, Turbine HP 1800 MP 1853 LP 1800 Propeller 85

PARTICULARS OF BLADING.

EXPANSION	H.P. & MP.			L.P. AND			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	2 3/8"	1-5 1/2"	10	3"	3-6"	4	HP	2-9" MEAN DIA IMPULSE WHEEL		
2nd	2 1/2"	1-6 1/2"	10	3 1/8"	3-7 1/2"	4	ASTERN	2 ROWS ON ROTOR 1 IN CYL.		
3rd	2 1/8"	1-9 1/2"	4	5"	3-10"	4	1st LP	3-9 1/4"	1	
4th	3 1/8"	1-11 1/2"	6	3 1/2"	4-11"	2	2nd	2 1/2"	3-10 1/2"	1
5th	3 3/8"	2-1 1/2"	5	4 1/2"	5-1"	2	3rd	3 1/2"	4-0 1/2"	1
6th	3 1/2"	2-4 1/2"	4	5 1/2"	5-2 1/2"	1	4th	"	"	1
	ROTORS IN TANDEM.			7th	6 1/2"	5-4 1/2"	5th	"	"	1
				8th	7 3/8"	5-6 3/4"				
				9th	10 1/2"	8 1/2"	5-9 1/2"			

and size of Feed pumps 2 CLARK CHAPMAN 14" x 24" x 10 1/2" ONE HARBOUR FEED PUMP 12" x 24" x 9"
 and size of Bilge pumps ONE DUPLEX PUMP 8" x 18" x 8"
 and size of Bilge suction in Engine Room TWO @ 3 1/2" IN ENGINE ROOM TWO @ 3 1/2" IN STOKEHOLD.
 SINKER 2 @ 3 1/2" N. TUNNEL WELL 1 @ 3 1/2" In Holds, &c. No 1 HOLD 2 @ 3 1/2" No 2 HOLD 2 @ 3 1/2" No 3 HOLD 2 @ 3 1/2" OIL
 No 4 HOLD 2 @ 3 1/2" No 5, HOLD 2 @ 3 1/2"
 No. of Bilge Injections 1 sizes 15" Connected to condenser, or to circulating pump Circ. Pump Is a separate Donkey Suction fitted in Engine Room & size YES 8" BORE.
 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 BELOW.
 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
 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 YES Is it fitted with a watertight door YES worked from ENG ROOM GRATING.

MANUFACTURERS, &c.—(Letter for record 5) Manufacturers of Steel J. SPENCER & SONS LTD.
 Total Heating Surface of Boilers 17375 sq ft Forced Draft fitted YES No. and Description of Boilers 5 SINGLE ENDED MULTIPLE
 Working Pressure 190 LBS. Tested by hydraulic pressure to 335 Date of test 19/10/21, 10/11/21, 14/11/21 No. of Certificate 3199, 3191, 3192, 3193.
 Can each boiler be worked separately YES Area of fire grate in each boiler 48 sq ft No. and Description of Safety Valves to
 each boiler TWO SPRING LOADED Area of each valve 13.3 sq ft Pressure to which they are adjusted 195 lbs. Are they fitted with easing gear YES.
 Greatest distance between boilers or uptakes and bunkers or woodwork 24" Mean dia. of boilers 14-6 Length 12-0 Material of shell plates Steel.
 Thickness 1 1/8" Range of tensile strength 31.9 to 35 TONS. Are the shell plates welded or flanged NO Descrip. of riveting: cir. seams D.R.L.
 7. seams T.R.I.B.S. Diameter of rivet holes in long. seams 1 1/8" Pitch of rivets 9 1/2" Lap of plates or width of butt straps 1-9
 Percentages of strength of longitudinal joint rivets 94% Working pressure of shell by rules 190.5 LBS. Size of manhole in shell 16" x 12"
 plates 85.3%
 No. and Description of Furnaces in each Boiler 4 DEIGHTONS Material STEEL Outside diameter 3-10 3/4
 Length of plain part top Thickness of plates crown 5" Description of longitudinal joint WELDED No. of strengthening rings
 bottom 1 1/8" bottom 1 1/8"
 Working pressure of furnace by the rules 215 Combustion chamber plates: Material STEEL Thickness: Sides 1/2" Back 1/2" Top 1/2" Bottom 1"
 Pitch of stays to ditto: Sides 9" x 8 1/2" Back 9 1/2" x 8" Top 8 1/2" x 9 1/2" If stays are fitted with nuts or riveted heads NUTS Working pressure by rules 218 lbs.
 Material of stays Steel Diameter at smallest part 2.04" Area supported by each stay 1/4" Working pressure by rules 250 lbs. End plates in steam space
 Material Steel Thickness 1 1/2" Pitch of stays 20 1/2" x 1 1/8" How are stays secured IN & W. Working pressure by rules 198 lbs. Material of stays Steel.
 Diameter at smallest part 7.24" Area supported by each stay 368" Working pressure by rules 204.5 lbs. Material of Front plates at bottom Steel.
 Thickness 1" Material of Lower back plate Steel Thickness 3/8" Greatest pitch of stays 14 1/2" x 8 1/2" Working pressure of plate by rules 200 lbs.
 Diameter of tubes Pitch of tubes 4 3/8" x 4 3/8" Material of tube plates Steel Thickness: Front 1" Back 7/8" Mean pitch of stays 10.56"
 Pitch across wide water spaces 14" Working pressures by rules 196 LBS. Girders to Chamber tops: Material Steel Depth and
 thickness of girder at centre 10 3/4" x 1 1/2" Length as per rule 2-11" Distance apart 9 1/2" Number and pitch of stays in each 3 @ 8 1/4"
 Working pressure by rules 218 LBS. Steam dome: description of joint to shell % 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

SUPERHEATER. Type *SCHMITS* Date of Approval of Plan *GENERAL 28/11/21* Tested by Hydraulic Pressure to *570 lbs*

Date of Test *31/1/21* Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler *YES*

Diameter of Safety Valve *2" DIA.* Pressure to which each is adjusted *210 lbs* Is Easing Gear fitted *YES*

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

SPARE GEAR. State the articles supplied: *(TURBINES) (Set of valves) HP bearing bushes do for MP & LP 4 each HP MP & LP adjusting block pads 4 each HP MP & LP adjusting block liners 6 bolts & nuts for turbine bearings 12 do for main joint 1 complete set of lat. packing for each gland. 2 no fitted of carbon gland rings & springs 8 bolts for each flexible coupling fitted one escape valve for each size fitted, 1 low reaction bladed & packing piece for each expansion of HP and casing & rotor. 4 row do for MP & LP and 4 row do for LP rotor. 4 set of impulse bladed & packing piece for HP ahead casing & rotor. 4 set do for HP & LP rotor do. Also several brass fitting nuts & 3 bolts. BEARINGS. one each (2 halves) each for the following: 1st HP pinion MP & LP do. Face Pin & 1st and 2nd reduction pinion aft, do. 1st & 2nd main wheel. 1 HP pinion 1st reduction. 1 LP pinion 1st reduction. 2 bolts & nuts a times joint for pinion, intermediate & main wheel bearings, 8 bolts & nuts a times joint for main joint. FORCED LUBRICATION SYSTEM. one half set valves & seats & piston rings for the pump, 10 tubes & glands for boiler. 2 thermometers. THRUST BLOCK 1 set of ahead & 1 set of astern pads. 1 set complete bolts & nuts for main shafting. 116 condenser fanules 58 tubes 116 packings, 1 main feed & 1 double feed check valves. 8 bolts tubes & 6 steam tubes. 1 basket valve spring. 2 pistons two bucket rings, 1 motion & 1 discharge valve for the following pumps: Ballast, Sanitary, Harbour feed General Service, Fresh Water, Ridge Tank & Air pumps, one lubricating oil pump complete. A quantity of assorted bolts nuts & washers of various sizes. 1 spare tail end shaft.*

The foregoing is a correct description,

W. J. MITCHELL MANUFACTURER

ASSISTANT MANAGER

Dates of Survey while building
During progress of work in shops --
During erection on board vessel --
Total No. of visits

April 26/1920 to Mar. 1/1922

154

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

Is the approved plan of donkey boiler forwarded herewith *YES*

Dates of Examination of principal parts - Casings *14/5/20 & 26/4/21* Rotors *30/4/20 & 2/3/21* Blading *11/1/22* Gearing *28/1/21 & 2/12/21*

Rotor shaft *21/3/21 & 2/6/21* Thrust shaft *28/11/21* Tunnel shafts *13/1/22* Screw shaft *2/2/22* Propeller *2/2/22*

Stern tube *24/5/21 SHOP* Steam pipes tested *21/10/21* Engine and boiler seatings *17/1/22 & 27/2/22* Engines holding down bolts *17/1/22*

Completion of pumping arrangements *21/2/22* Boilers fired *17/2/22* Engines tried under steam *21/2/22*

Main boiler safety valves adjusted *17/2/22* Thickness of adjusting washers *5/16 5/8 5/16 5/16 5/16 5/16 5/16 5/16 5/16 5/16*

Material and tensile strength of Rotor shaft *SIEMENS MARTIN NICKEL STEEL 38 & 32 & 20 1/2"* Identification Mark on Do. *2566*

Material and tensile strength of Pinion shaft *SIEMENS MARTIN NICKEL STEEL HP 44 4 MP 44 8 SEE LIST ATTACHED* Identification Mark on Do. *2566*

Material of Wheel shaft *W. Steel* Identification Mark on Do. *5174 EEB* Material of Thrust shaft *W. Steel* Identification Mark on Do. *5174 EEB*

Material of Tunnel shafts *W. Steel* Identification Marks on Do. *5174 EEB* Material of Screw shafts *W. Steel* Identification Marks on Do. *5174 EEB*

Material of Steam Pipes *SOLID DRAWN STEEL* Test pressure *570 lbs*

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 engines & boilers of this vessel have been built under special survey and the materials & workmanship are good. On completion they were examined while running full power trials at sea and found satisfactory.*

The machinery throughout is now in good & efficient condition & eligible in my opinion to have the record of L.M.C. - 3-22 marked in Red in the Society's Register Book.

It is submitted that this vessel is eligible for THE RECORD. L.M.C. - 3.22. F.D. C.L. 1230 N.H.P. 2 steam turbines geared to one screw shaft.

The amount of Entry Fee ... £ *6-0-0*
Special ... £ *120-17-0*
Donkey Boiler Fee ... £ *9-18*
Travelling Expenses (if any) £ *24/3/22*

When applied for, *7/3/1922*
When received, *24/3/22*

W. J. MITCHELL
Engineer Surveyor to Lloyd's Register of Shipping.

FRI. AUG. 25 1922

Committee's Minute

Assigned *+ L.M.C. 3.22*

