

REPORT ON MACHINERY.

No. *74485*

Date of writing Report *20 June 1921* When handed in at Local Office *27 June 1921* Port of *NEWCASTLE-ON-TYNE*
 No. in Survey held at *Walker on Tyne* Date, First Survey *20 June 1919* Last Survey *20 June 1921*
 Reg. Book. *742* on the *Steel, Screw Steamer "MIDDLESEX"* (Number of Visits *23*)

Master *Walker on Tyne* Built at *Walker on Tyne* By whom built *Swan Hunter & Higham Richardson Ltd* Tons { Gross *9750* Net *6190*
 Engines made at *Walker on Tyne* By whom made *Swan Hunter & Higham Richardson Ltd* When built *1921*
 Boilers made at *Walker on Tyne* By whom made *Swan Hunter & Higham Richardson Ltd* when made *1921-6*
 Registered Horse Power *1258 NHP* Owners *Federal Steam Nav. Co Ltd* when made *1921-6*
 Shaft Horse Power at Full Power *6350* Is Refrigerating Machinery fitted for cargo purposes *yes* Port belonging to
 Is Electric Light fitted *yes*

TURBINE ENGINES, &c. Description of Engines *Metropolitan Vickers Ltd (M'Chatter) Patent Impulse Turbines - HP LP - No 1750/1781*
 Diameter of Rotor Shaft Journals, H.P. *6"* L.P. *6"* Diameter of Pinion Shaft *8 1/2" at Gap, 1st Red - 20 1/2" at Gap, 2nd Red*
 Diameter of Journals *2nd Red 14" 2nd Red 14"* Distance between Centres of Bearings *4'-0" 2nd Red 4'-0"* Diameter of Pitch Circle *9'-269-1st Red 21'-495-2nd Red*
 Diameter of Wheel Shaft *18 1/2"* Distance between Centres of Bearings *6'-8"* Diameter of Pitch Circle of Wheel *62'-729-1st Red 103'-435-2nd Red*
 Width of Face *32"-1st Red 37"-2nd Red* Diameter of Thrust Shaft under Collars *18" (Single Collar)* Diameter of Tunnel Shaft as per rule *16'-88"*
 No. of Screw Shafts *one* Diameter of same as per rule *18'-06"* Diameter of Propeller *18'-6"* Pitch of Propeller *14'-0"*
 Diameter of Propeller *18'-6"* as fitted *18'-8"* BLADES
 No. of Blades *4* State whether Moveable *yes* Total Surface *100 sq meaw* Diameter of Rotor Drum, H.P. *3'-2"* L.P. *3'-6"* Astern *3'-2" HP 3'-2" LP*
 Thickness at Bottom of Groove, H.P. *-* L.P. *-* Astern *-* Revs. per Minute at Full Power, Turbine *3004* Propeller *93*

PARTICULARS OF BLADING. Please see *monograph report 4657* appended for these particulars

H.P.				L.P.				ASTERN.			
STAGE (VEL)	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.	HEIGHT OF BLADES.	DIAMETER AT TIP.
EXPANSION	13" - 1 1/2"	3'-2 1/2"	2 (VEL)	3 3/4"	3'-8 3/4"	1 (IMPULSE)	2'-3"	3 1/2"	2 VEL 1 IMP	3'-2 1/2"	3'-2 1/2"
"	1 1/2"	3'-3 3/4"	1 "	4 1/2"	3'-9 3/4"	1 "	6 1/2"	3 1/2"	1 "	3'-2 1/2"	3'-2 1/2"
"	1 1/2"	3'-3 3/4"	1 "	5 3/4"	3'-10 3/4"	1 "					
"	1 1/2"	3'-3 3/4"	1 "	7 3/8"	3'-11 3/4"	1 "					
"	2 1/2"	3'-4 1/2"	1 "	10"	4'-1 3/8"	1 "					
"	2 1/2"	3'-4 1/2"	1 "	12"	4'-4"	1 "					
"					4'-6"	1 "					

and size of Feed pumps *One pair Weir's Main Feed Pumps. 13 1/2" x 10" x 24"* *Shrouding to thick*
 and size of Bilge pumps *Two - 8" x 8"* *one Weir's Auxiliary Feed pump. 9 1/2" x 7" x 18"* *Shrouding to thick*

and size of Bilge suction in Engine Room *one port - one Starboard each 3 1/2" dia - one port and one Starboard 3 1/2" dia in Storehold*
direct suction - port & starboard 3 1/2" In Holds, &c. *no 1 hold - no 2 hold - no 3 hold (from Pump) no 4 hold*

of Bilge Injections *one* sizes *15"* Connected to *condenser* to circulating pump *C.P.* Is a separate Donkey Suction fitted in Engine Room & size *1.5-1.5-3 1/2"*

all the bilge suction pipes fitted with roses *yes* Are the roses in Engine room always accessible *yes*
 all connections with the sea direct on the skin of the ship *yes* Are they Valves or Cocks *Both*

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*
 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*

that pipes are carried through the bunks *none - (Bilge Suction only fitted)* How are they protected *Strong wood Casing*
 all Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times *yes*

the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges *yes*
 the Screw Shaft Tunnel watertight *yes - see ship report* Is it fitted with a watertight door *yes* worked from *deck level*

ILERS, &c. (Letter for record *S*) Manufacturers of Steel *John Spencer & Sons Ltd - Newburn*
 Heating Surface of Boilers *16575* Is Forced Draft fitted *yes* No. and Description of Boilers *5 - S.E. Cyl. Multitubular*

Working Pressure *180 lbs* Tested by hydraulic pressure to *360 lbs* Date of test *23.4.20* No. of Certificate *9390-9399*

each boiler be worked separately *yes* Area of fire grate in each boiler *80 1/4 sq ft* No. and Description of Safety Valves to *yes*
 boiler *two - direct spring* Area of each valve *14-18"* Pressure to which they are adjusted *185 lbs* Are they fitted with easing gear *yes*

allest distance between boilers or uptakes and bunks or woodwork *18"* Mean dia. of boilers *17'-7 1/8"* Length *12'-0"* Material of shell plates *Steel*
 thickness *1 1/8"* Range of tensile strength *29 3/4/34 tons* Are the shell plates welded or flanged *no* Descrip. of riveting: cir. seams *D.R. Lap*

g. seams *D.B.S.-T.R.* Diameter of rivet holes in long. seams *1 1/8"* Pitch of rivets *8 1/2"* Top of plates or width of butt straps *19 3/8"*
 percentages of strength of longitudinal joint *85-78%* Working pressure of shell by rules *180 lbs* Size of manhole in shell *16" x 12"*

Hanged of compensating ring *39" x 35"* No. and Description of Furnaces in each Boiler *Four Brighton* Material *Steel* Outside diameter *3'-11 3/8"*
 length of *8' 1 1/2"* Thickness of plates *5"* Description of longitudinal joint *weld*

working pressure of furnace by the rules *2124 lbs* Combustion chamber plates: Material *Steel* Thickness: Sides *1 1/2"* Back *3 1/2"* Top *1 1/2"* Bottom *1 1/2"*
 ch of stays to ditto: Sides *9 1/2" x 9 1/2"* Back *9 1/2" x 9 1/2"* Top *10" x 8"* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *183 lbs*

terial of stays *Steel* Diameter at smallest part *2.03"* Area supported by each stay *83.25"* Working pressure by rules *219 lbs* End plates in steam space
 terial *Steel* Thickness *1 1/2"* Pitch of stays *22" x 17"* How are stays secured *D NUTS* Working pressure by rules *180 lbs* Material of stays *Steel*

ickness *3 1/2"* Material of Lower back plate *Steel* Thickness *3 3/4"* Greatest pitch of stays *15" x 9"* Working pressure of plate by rules *185 lbs*
 diameter of tubes *3 1/4"* Pitch of tubes *4 1/2" x 4 1/2"* Material of tube plates *Steel* Thickness: Front *3 1/2"* Back *1 1/2"* Mean pitch of stays *11 1/4"*

ch across wide water spaces *14 1/2"* Working pressures by rules *186 lbs* Girders to Chamber tops: Material *Steel* Depth and
 thickness of girder at centre *9" x 1 1/2"* Length as per rule *31 7/8"* Distance apart *8"* Number and pitch of stays in each *2 of 10" pitch*

working pressure by rules *184 lbs* Steam dome: description of joint to shell *none* % of strength of joint
 thickness of shell plates *Material* Description of longitudinal joint
 working pressure of shell by rules *Crown plates: Thickness* How stayed

Fitted to Ant+St off. Pat+St Howard Boilers
SUPERHEATER. Type ROBINSON Date of Approval of Plan Y. 11. 19. Tested by Hydraulic Pressure to 600lb - 4 1/2 4a.
Date of Test 14/3/21 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 190lb Is Easing Gear fitted yes

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

SPARE GEAR. State the articles supplied: Two bolts & nuts for each side of Turbine pinions and gear wheel bearings respectively
2 Coupling Bolts - 5% of total wt bolts, Studs, nuts in gear case and Turbine joints, 2 Thermometers for lubricating system
2 Turbine Bearings, 2 Bearings for 2nd Red Gear wheels - 2 bearings for 1st Red gear wheels, 2 bearings for 1st Red
1 Diaphragm Gland Ring Complete - 1 Gland Sealing box Complete - 6 Thrust Pads Complete for Main (Mitchell) Thrust
12 Thrust Pads Complete for Turbine (Mitchell) Thrust Block - 1 Set of Red Pump Valves - half set of Valves for
Lubricating Oil Pump - 1 Set of Piston Rings for lubricating oil pump - 1 Escape Valve Spring for each side, Spare
for propeller - one Spare Propeller Shaft - Spare Coupling bolts - Spare Air pump, bucket Rod, and Set of Valves
Spare Impeller Shaft for Circulating Pump - one Spare 1st Reduction Pinion. half flexible Coupling, one Spare
rest of oil Cooler Tubes - a number of Condenser Tubes and ferrules, 4 feed check Valves, Spare Bolt
tubes, assorted iron bolts & nuts, Studs, nuts, bars, 2 plates - Spare pipes, various spare gears for auxiliary
Machinery - and General Engine Room Stores and equipment -

The foregoing is a correct description,

SWAN, HUNTER & WIGMAN RICHARDSON, LTD.

Manufacturer.

1919 1920
Dates of Survey while building
During progress of work in shops - Jun 20, Jul 10, Jan 19, 26, 27, 29, Feb 2, 5, 6, 9, 13, 16, 19, 27, Mar 4, 8, 10, 12, 15, 16, 17, 18, 19, 22, 25, Apr 2, 8, 13, 15, 20, 23, 28, May 5, 6, 11, 14, 21, 27, Jun 2, 8, 15, 22, 29, Jul 6, 13, 20, 27, Aug 3, 10, 17, 24, 31, Sep 7, 14, 21, 28, Oct 5, 12, 19, 26, Nov 2, 9, 16, 23, 30, Dec 7, 14, 21, 28, Jan 4, 11, 18, 25, Feb 1, 8, 15, 22, 29, Mar 6, 13, 20, 27, Apr 3, 10, 17, 24, 31, May 8, 15, 22, 29, Jun 5, 12, 19, 26, Jul 3, 10, 17, 24, 31, Aug 7, 14, 21, 28, Sep 4, 11, 18, 25, Oct 2, 9, 16, 23, 30, Nov 6, 13, 20, 27, Dec 4, 11, 18, 25, Jan 1, 8, 15, 22, 29, Feb 5, 12, 19, 26, Mar 3, 10, 17, 24, 31, Apr 7, 14, 21, 28, May 5, 12, 19, 26, Jun 2, 9, 16, 23, 30, Jul 7, 14, 21, 28, Aug 4, 11, 18, 25, Sep 1, 8, 15, 22, 29, Oct 6, 13, 20, 27, Nov 3, 10, 17, 24, 31, Dec 1, 8, 15, 22, 29, Jan 5, 12, 19, 26, Feb 2, 9, 16, 23, 30, Mar 7, 14, 21, 28, Apr 4, 11, 18, 25, May 2, 9, 16, 23, 30, Jun 6, 13, 20, 27, Jul 4, 11, 18, 25, Aug 1, 8, 15, 22, 29, 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