

Record in file up Mr. Ref. Mr. C. No. 68527

R. M. C. No. 68527

No. 96891

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

Date of writing Report 10th Nov 1938 When handed in at Local Office 11th Nov. 38 Port of NEWCASTLE-ON-TYNE

pp. 87009

No. in Reg. Book. 87009 Survey held at Newcastle Date: First Survey 22 Aug/1937 Last Survey 11/11/1938 (No. of Visits 15)

on the Refrigerating Machinery and Appliances of the "AMRA" Tons { Gross 8314 Net 3993

Vessel built at Walker-on-Tyne By whom built Swan Hunter & Wigham Richardson Ltd Yard No. 1570 When built 10. 38

Owners British India S. N. Co. Ltd. Port belonging to London Voyage Indian Coast. Refrigerating Machinery made by J & S. Hall Ltd. Machine Nos. 9890, 9891, 10052, 10053 When made 1938

Insulation fitted by Newalls Insulation Co When fitted 10. 38 System of Refrigeration CO₂ + Brine Method of cooling Cargo Chambers Brine grids. Insulating Material used Slab cork.

Number of Cargo Chambers insulated 3 1 on upper deck Total refrigerated cargo capacity 4500 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed SEE ALSO LONDON RPT of 18th Oct 1938 on tank top aft of Main E.R

Refrigerating Units, No. of 4. No. of machines 4. Is each machine independent Yes Total refrigeration or ice-melting capacity in tons per 24 hours 11. Are all the units connected to all the refrigerated chambers Yes

Compressors, driven direct through single reduction gearing. Compressors, single or double acting single If multiple effect compression No. are relief valves or safety discs fitted Yes No. of cylinders to each unit one Diameter of cylinders 1 1/2

Diameter of piston rod 7/8" Length of stroke 6" No. of revolutions per minute 500 Motive Power supplied from direct coupled motors. (State number of boilers, oil engines or electric generators supplying the motive power.)

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders ✓ Diameter ✓ Length of stroke ✓ Working pressure ✓ Diameter of crank shaft journals and pins ✓

Breadth and thickness of crank webs ✓ No. of sections in crank shaft one Revolutions of engine per minute 500. Oil Engines, type 2 or 4 stroke cycle Single or double acting B.H.P.



No. of cylinders ✓ Length of stroke ✓ Span of bearings as per Rule ✓ Maximum pressure in cylinders ✓ Diameter of crank shaft journals and pins ✓

Breadth and thickness of crank webs ✓ No. of sections in crank shaft ✓ Revolutions of engine per minute ✓ AIR RECEIVERS:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule

Can the internal surfaces of the receivers be examined ✓ What means are provided for cleansing their inner surfaces ✓ Is there a drain arrangement fitted at the lowest part of each receiver ✓ If made under survey ✓

No. of Receivers ✓ Cubic capacity of each ✓ Internal diameter ✓ thickness ✓ Seamless, ✓ welded or riveted longitudinal joint ✓ Material ✓ Range of tensile strength ✓ Working pressure by Rules ✓

Electric Motors, type Enclosed ventilated No. of 4 Rated 10 BHP Kilowatts ✓ Volts at 220 @ 500 rpm. revolutions per minute. Diameter of motor shafts at bearings ✓

Reduction Gearing ✓ Pitch circle diameter, pinion ✓ Main wheel ✓ Width of face ✓ Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, pinion ✓ Main wheel ✓

Pinion shafts, diameter at bearings ✓ Main wheel shaft, diameter at bearings ✓ Gas Condensers, No. of 2 each with 2 gas circuits Cast iron or steel casings Cast iron Cylindrical or rectangular Cylindrical Are safety valves fitted ✓

to casings Yes No. of coils in each 4 Material of coils SD. Copper 3/4" x 1" Can each coil be readily shut off or disconnected Yes Water Circulating Pumps, No. and size of 2 of 1 1/2" Centrifugal how worked electrically Gas Separators, No. of 8.

Gas Evaporators, No. of 2 each with 2 gas circuits Cast iron or steel casings Steel Pressure or gravity type gravity If pressure type, are safety valves fitted ✓ No. of coils in each casing 2. Material of coils S.D. Steel 1" x 1 1/2" Can each coil be readily shut off or disconnected Yes

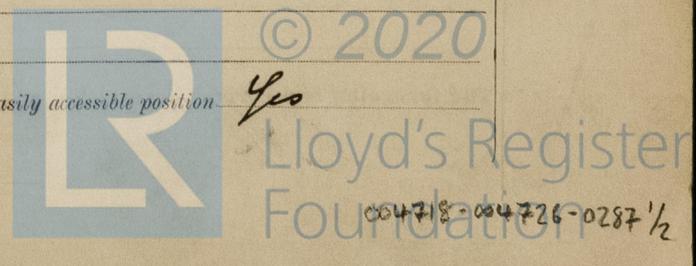
Direct Expansion or Brine Cooled Batteries, No. of ✓ Are there two separate systems, so that one may be in use while the other is being cleared of snow ✓ No. of coils in each battery ✓ Material of coils ✓ Can each coil be readily shut off or disconnected ✓ Total cooling surface of battery coils ✓ Is a watertight tray fitted under each battery ✓

Air Circulating Fans, Total No. of ✓ each of ✓ cubic feet capacity, at ✓ revolutions per minute ✓ Steam or electrically driven ✓ Where spare fans are supplied are these fitted in position ready for coupling up ✓

Brine Circulating Pumps, No. and size of, including the additional pump 4-1 1/2" Centrifugal how worked electrically. Brine Cooling System, closed or open Open Are the pipes and tanks galvanised on the inside No

No. of brine sections in each chamber one to each chamber Can each section be readily shut off or disconnected Yes Are the control valves situated in an easily accessible position Yes

NOTE.—THE WORDS WHICH DO NOT APPLY SHOULD BE DELETED.



Common
 Are thermometers fitted to the hull and to each return brine pipe. *Yes* Where the tanks are closed are they ventilated as per Rule *✓*
 Where the tanks are not closed is the compartment in which they are situated efficiently ventilated *Yes*
 Are the number and capacity of the machines and the number of pumps and sea connections in accordance with Section 2, Clause 1 of the Rules *Yes*
 Is the exhaust steam led to the main and auxiliary condensers *✓*

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)	11-3-38					
GAS COMPRESSORS	13-7-38	1000 lbs	3000 lbs	1500 lbs	DG.	
SEPARATORS	11-3-38	do	do	do	DG.	
MULTIPLE EFFECT RECEIVERS	28-1-38	do	do	do	DG.	
CONDENSER COILS	13-7-38	do	do	do	DG.	
EVAPORATOR COILS	15-2-38	do	do	do	DG.	
CONDENSER HEADERS AND CONNECTIONS	16-3-38	do	do	do	DG.	
CONDENSER CASINGS	11-3-38	10 to 15 lbs	30 lbs		DG.	
EVAPORATOR CASINGS		open top				
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	10/10/38	10 to 15 lbs		90 lbs		

Have important steel castings and forgings been tested in accordance with the Rules

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory *Yes*
 Dates of test *20/10/38* Density of Brine *40°* by *Swaddell* hydrometer
 Temperatures (when the refrigerating chambers are cooled down to the required test temperatures)
 or, delivery and return to direct expansion or brine cooled batteries & ✓ outflow and return brine *-11° & -9°*
 atmosphere *50°* cooling water inlet and discharge *51° & 56°* gas in condensers *63°* and evaporators *-15°*
 the average temperature of the refrigerated chambers *8°* and the rise of temperature in these chambers upon the expiration of *twelve* hours
 time after the machinery and cooling appliances have been shut off *13 1/4 degrees Fah.*

SPARE GEAR.

Are the working parts of the machines, pumps and motors respectively, interchangeable *Yes*
 Has the spare gear required by the Rules been supplied *Yes*

Additional Spare Gear Supplied:

*12 lbs. piston leathers, 2 sets of leather moulds, 4 springs for CO₂ safety valves
 12 do gland do, 4 do water relief valves
 4 bolts & nuts for X-head, 2 pro. main bearing brasses with bolts & nuts
 2 pro. crank pin brasses with bolts & nuts, 2 hand pumps for lubr, 2 CO₂ gauges,
 2 hydrometers, 4 brass cased thermometers, 24 safety discs, 4 pro CO₂ pipe flanges,
 2 sets coupling bolts for machines, 4 sets leather couplings for machines,
 2 fitted boxes for compressor parts
 For Pumps: 1 impeller, 1 spindle, 1 bearing assembly for Brine & Water Pumps.
 Electrical Spares
 2 Armatures
 2 sets of bearings
 2 Field Coils
 2 Interpole Coils
 2 lines of Brush Holders
 2 sets of Brushes
 2 sets of Controller Spares*

*For Machine Motors,
 and Pump Motors (interchangeable)*

The foregoing is a correct description of the Refrigerating Machinery.

Signed for *J & E HALL LTD*
 BY *F. WELLS* Manufacturer.
 For DIRECTOR.

DESCRIPTION OF INSULATION.

	TWEEN DECK CHAMBERS. (3 CHAMBERS)					UPPER IN TWEEN DECK CHAMBERS. (CHAMBER)					
	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.	
FRAME NO. (Fore Peak)	A										
FRAME NO.	F										
FRAME NO.	A										
FRAME NO.	F										
FRAME NO.	A										
FRAME NO.	F										
FRAME NO. (Boiler Room)	A										
FRAME NO. (Engine Room)	A										
FRAME NO.	F	Frame 56	3/4 asbestos com. sheet	slab cork	12"	✓	Frame 55	3/4 asbestos com. sheet	slab cork	6"	3/4 asbestos com. sheet
FRAME NO.	A	Frame 49	3/4 asbestos com. sheet	slab cork	12"	✓	Frame 51	"	"	12"	✓
FRAME NO.	F	Slab side	"	"	12"	✓	Side out-board	"	"	12"	✓
FRAME NO.	A	Port side shell	"	"	12"	✓	Side in-board	"	"	6"	3/4 asbestos com. sheet
FRAME NO.	F	Intermediate	"	"	6"	3/4 asbestos com. sheet					
FRAME NO.	A	Division	"	"	6"	3/4 asbestos com. sheet					
FRAME NO. (After Peak)	F										
SIDES			3/4 asbestos com. sheet	slab cork	10"	✓		3/4 asbestos com. sheet	slab cork	10"	✓
OVERHEADING			1 1/2" denim	slab cork	8"	✓		1 1/2" asphalt	slab cork	10"	✓
FLOORS OF CHAMBERS											
TRUNK HATCHWAYS											
THRUST RECESS, SIDES AND TOP											
TUNNEL SIDES AND TOP											
TUNNEL RECESS, FRONT AND TOP											

	BULKHEADS.	FRAMES OR REVERSE FRAMES, FACE
BULKHEAD STIFFENERS, TOP		BOTTOM AND FACE
RIBBAND ON TOP OF DECKS		
SIDE STRINGERS, TOP		BOTTOM AND FACE
WEB FRAMES, SIDES		AND FACE
BRACKETS, TOP		BOTTOM AND FACE
INSULATED HATCHES, MAIN		BILGE MANHOLE
HATCHWAY COAMINGS, MAIN		BILGE
HOLD PILLARS		
MASTS		VENTILATORS ✓

Are insulated plugs fitted to provide easy access to bilge suction roses ✓ tank, air, and sounding pipes ✓ heels of pillars ✓
 and manhole doors of tanks ✓ Are insulated plugs fitted to ventilators. *Yes* cargo ports ✓ and side lights ✓
 Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected ✓ if so, how ✓

Oil Storage Tanks, where adjacent to the insulated chambers, state what provision has been made for ventilating the air space between the insulation and the bulkhead plating ✓
 and for draining the tank top ✓

Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat ✓
 Where Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof *Yes*
 Cargo Battens, Dimensions and spacing, sides *scams fitted over flat surfaces* floors *floor gratings filled out beams* tunnel top ✓
 fixed or portable *portable* Are screens fitted over the brine grids at chamber sides. *Yes* hinged or permanently fixed *Portable*.
 Thermometer Tubes, No. and position in each chamber *Upper Tank 5" one fitted in door leading to insulated steam passage*
Lower Tank 5" one fitted central in each chamber
 diameter *2"* are they fitted in accordance with Section 3, Clause 8 *Yes*

Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated *Yes*.
 Draining Arrangements. What provision is made for draining the inside of the chambers *scuppers with plugs*.
 Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off *Yes*.
 What provision is made for draining the refrigerating machinery room *fitted in tunnel*
 brine return room ✓ fan room ✓ water circulating pump room ✓
 Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers ✓



0297 2/2

Sounding Pipes, No. and position in each chamber situated below the load water line ✓

Diameter ✓ Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11 ✓

Are all wood linings tongued and grooved ✓ Are cement facings reinforced with expanded steel lattice ✓

How is the expanded metal secured in place ✓

How are the cork slabs secured to the steel structure of the vessel *Fitted between frames with pitch.*

Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans ✓

Are they permanently fixed or collapsible, or portable ✓

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors ✓ Are the door frames efficiently insulated ✓

Are insulated plugs supplied for the doorways ✓ Where are the doors worked from ✓

Cooling Pipes in Chambers, diameter *1 7/8" outside* Minimum thickness *3/16"* Are they galvanised externally *Yes*

How are they arranged in the chambers *Sides & roof.*

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers *hot brine*

The foregoing is a correct description of the Insulation and Appliances.

FOR SWAN, HUNTER & CO. BUILDERS, LTD. *[Signature]* Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *Yes* and Insulation *Yes*

Is the Refrigerating Machinery and Appliances duplicate of a previous case *No* If so, state name of vessel ✓

If the survey is not complete, state what arrangements have been made for its completion and what remains to be done *Complete.*

General Remarks (State quality of workmanship, opinions as to class, &c.)

*The materials & workmanship are good
The requirements of the Society's rules have been carried out
and the insulation has been fitted in accordance with the
approved plans & specification
The refrigerating machinery & appliances are eligible in my
opinion to be classed + Lloyd's R.M.C. 11.38*

*Approved plans & Specification attached which kindly
return for use in the sister vessel now building to 1596
It is submitted that
this vessel is eligible for
THE RECORD + Lloyd's R.M.C. 11.38
[Signature] 16/11/38*

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours.	Is Refrigerating Machinery Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
4	4	Carb Anhyd.	J. S. Hall & Co.	1938	(1) Brine grids (2) Slab cork	Tons. 11	✓	4	4500

Fee *£6* - - - - - (Fee applied for, 15 NOV 1938.
Late attendance *£1* - - - - - (Received by me, 19/11 1938.)

W. Craig A. Watt
Surveyor to Lloyd's Register.

Committee's Minute *FRI 18 NOV 1938*

Assigned *+ Lloyd's R.M.C. 11.38*

CERTIFICATE WRITTEN



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Foundation

Certificate to be sent to Newcastle-on-Tyne 16.11.38