



# Report on Refrigerating Machinery and Appliances.

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50458 (Number of Visits 6)

on the Refrigerating Machinery and Appliances of the Steel Twin Screw M.V. "AJAX" Tons Gross 7540 Net 4628

Vessel built at Greenock By whom built Scotts SB & E Co. Yard No. When built 1931

Owners Ocean S.S. Co. Ltd. Port belonging to Liverpool Voyage

Refrigerating Machinery made by J. & E. Hall, Ltd. Machine Nos. & 8264 8352 When made 1931

Insulation fitted by J. & E. Hall, Ltd. When fitted 1931 System of Refrigeration CO2

Method of cooling Cargo Chambers Brine & Air Insulating Material used Gran. & Slab Cork

Number of Cargo Chambers insulated No. 4 Lower Hold & Tween Deck Total refrigerated cargo capacity 44,880 cubic feet

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Ford. end No. 4 Hatch U.T.D.s

Refrigerating Units, No. of 2 No. of machines 2 Is each machine independent Yes

Total refrigeration or ice-melting capacity in tons per 24 hours 23 Are all the units connected to all the refrigerated chambers Yes

Compressors, driven direct or through <sup>single</sup> <sub>double</sub> reduction gearing. Compressors, single or double acting Single multiple effect compression Yes

Are relief valves or safety discs fitted Yes No. of cylinders to each unit 2 Diameter of cylinders 2-3/4"

Diameter of piston rod 1-3/4" Length of stroke 7" No. of revolutions per minute 230/350

Motive Power supplied from Three Aux. Diesel Generators (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 - Revolutions of engines per minute -

Oil Engines, type Airless inj. trunk piston 2 or 4 stroke cycle 4 Single or double acting Single B.H.P. 235

No. of cylinders 3 Diameter 330 m/m Length of stroke 600 m/m Span of bearings as per Rule 22"

Maximum pressure in cylinders 540 lbs. Diameter of crank shaft journals and pins 8" and 8-5/8"

Breadth and thickness of crank webs 16" & 4-3/4" No. of sections in crank shaft Solid Revolutions of engine per minute 300

Air Receivers:—Have they been made under survey No State No. of Report or Certificate -

Is each receiver, which can be isolated, fitted with a safety valve as per Rule Yes

Can the internal surfaces of the receivers be examined and cleaned Yes Is a drain fitted at the lowest part of each receiver Yes

No. of Receivers 3 Main 1 Aux. Cubic capacity of each 422 cuft. 10.65 cuft. Internal diameter 5'-0" 1'-4-3/4" thickness 1" 7/8"

Seamless, lap welded or riveted longitudinal joint Yes Material Steel Range of tensile strength - Working pressure by Rules 576 587

Electric Motors, type Open - 2 pedestal No. of 2 Rated Cont 18.7/55 BHP 220 Volts

at 230/350 revolutions per minute. Diameter of motor shafts at bearings 3-7/8"

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 Cast iron or steel casings C.I. Cylindrical or rectangular Cyl. Are safety valves fitted

to casings Yes No. of coils in each 4 Material of coils Copper Can each coil be readily shut off or disconnected Yes

Water Circulating Pumps, No. and size of pumps available 2/13020 Gal/Hr. how worked Elec. Motor Gas Separators, No. of 2

Gas Evaporators, No. of 2 Cast iron or steel casings Steel Pressure or gravity type Pressure If pressure type, are safety

valves fitted Yes No. of coils in each casing 3 Material of coils S.D. Steel Can each coil be readily shut off or disconnected Yes

Direct Expansion or Brine Cooled Batteries, No. of 1 Are there two separate systems, so that one may be in use while the other is being

cleared of snow No No. of coils in each battery 8 Material of coils Galv. iron Can each coil be readily shut off or

disconnected Yes Total cooling surface of battery coils 2500 sq ft Is a watertight tray fitted under each battery Yes

Air Circulating Fans, Total No. of 2 each of 12,700 cubic feet capacity, at 700 revolutions per minute

Steam or electrically driven Elec. Where spare fans are supplied are these fitted in position ready for coupling up Yes

Brine Circulating Pumps, No. and size of, including the additional pump 3 each 6540 gal/hr. how worked Elec. Motor

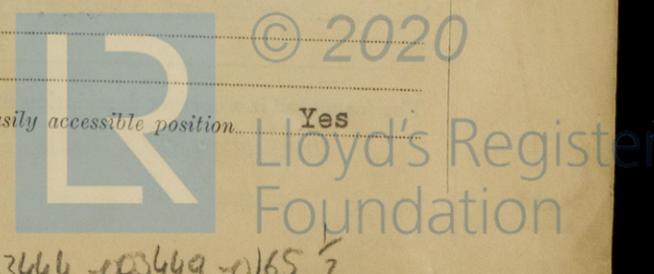
Brine Cooling System, closed or open Closed Are the pipes and tanks galvanised on the inside Pipes, Yes, Tank, No

No. of brine sections in each chamber 10 in lower hold & 7 in tween deck 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.

Vertical text on the left margin, including "CERTIFICATE" and "LLOYD'S REGISTER FOUNDATION".



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Are thermometers fitted to the outflow 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 3, Clause 1 of the Rules.~~ B.C. 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) ...						
Gas Compressors ...						
„ Separators ...						
„ Multiple Effect Receivers ...						
„ Condenser Coils ...						
„ Evaporator Coils ...						
„ Condenser Headers and Connections						
„ Condenser Casings ...						
„ Evaporator Casings ...						
NH <sub>3</sub> Condenser, Evaporator and Air Cooler Coils after erection in place						
Brine Piping after erection in place...						

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. Not yet tested  
 Dates of test - Density of Brine - by - hydrometer  
 Temperatures (when the cargo chambers are cooled down to the required test temperatures) of delivery and return air at ~~XXXXXX~~ brine cooled batteries - & -, outflow and return brine - & - atmosphere - cooling water inlet and discharge - & - gas in condensers - and evaporators -  
 the average temperature of the refrigerated chambers - and the rise of temperature in these chambers upon the expiration of - hours time after the machinery and cooling appliances have been shut off -

**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: 2 Brine pump impellers, and one shaft; 1 pair each X head and crank pin brasses; 1 circ. pump impeller & shaft; Fan armature.

Aux. Generator Engines: Crankshaft; 6 main bearings; 2 cyl. covers; 6 pistons; 3 cyl. liners; 2 jackets; 2 sets each of head & compressor valves; 6 gudgeon bushes; 1 oil cooler; 2 cam shaft chains; 1 armature; 6 fuel pumps.

The foregoing is a correct description of the Refrigerating Machinery.

*B. Ritchie*  
 Surveyor.

**DESCRIPTION OF INSULATION.**

	IN LOWER HOLD CHAMBERS.					IN 'TWEEN DECK CHAMBERS.				
	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. (Boiler Room) F										
Frame No. (Boiler Room) A										
Frame No. (Engine Room) F										
Frame No. (Engine Room) A										
Frame No. 62 F										
Frame No. 62 A										
Frame No. 55 F										
Frame No. 55 A										
Frame No. F										
Frame No. A										
Frame No. (After Peak) F										
Sides ...										
Overheading ...										
Floors of Chambers ...										
Trunk Hatchways ...										
Thrust Recess, Sides and Top ...										
Tunnel Sides and Top ...										
Tunnel Recess, Front and Top ...										
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. <u>Yes</u> tank, air, and sounding pipes. <u>Yes</u> heels of pillars. <u>Yes</u> and manhole doors of tanks. <u>Yes</u> Are insulated plugs fitted to ventilators. <u>Yes</u> cargo ports. <u>-</u> and side lights. <u>-</u> Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected. <u>Yes</u> if so, how <u>Wood &amp; dunnage battens</u> 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. <u>Not applicable.</u> and for draining the tank top. <u>Ditto.</u> Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat. <u>-</u> Where Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof. <u>-</u> Cargo Battens, Dimensions and spacing, sides. <u>3" x 3" x 13"</u> floors. <u>3" x 3" x 13"</u> tunnel top. <u>3" x 3" x 15"</u> fixed or portable. <u>Fixed</u> Are screens fitted over the brine grids at chamber sides. <u>No</u> hinged or permanently fixed. <u>-</u> Thermometer Tubes, No. and position in each chamber. <u>4 in each (P. &amp; S. fwd. &amp; aft)</u> diameter. <u>3"</u> are they fitted in accordance with Section 3, Clause 8. <u>Yes</u> Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated. <u>Yes</u> Draining Arrangements. What provision is made for draining the inside of the chambers. <u>Scupper &amp; brine seal to bilges</u> Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off. <u>Yes</u> What provision is made for draining the refrigerating machinery room. <u>tunnel bilges</u> brine return room. <u>Screwed plug</u> fan room. <u>Scupper &amp; trap</u> water circulating pump room. <u>E.R. bilges</u> Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers. <u>No spaces</u>										

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Sounding Pipes, No. and position in each chamber situated below the load water line 4 in each, (P. & S. fwd. & aft)  
 Diameter 3" Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11 Yes  
 Are all wood linings tongued and grooved Yes 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 Bituminous Solution  
 Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans Yes  
 Are they permanently fixed or collapsible, or portable Fixed  
 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 1-29/32 O/D. Minimum thickness 7 WG Are they galvanised externally Yes  
 How are they arranged in the chambers Roof & Side Grids  
 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. has been verified as far as possible.

*Bliechie* <sup>Resides</sup> Surveyor

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery - and Insulation -  
 (If not, state date of approval)  
 Is the Refrigerating Machinery and Appliances duplicate of a previous case - 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 To examine plant under working conditions.

**NOW DONE FOR CLASSIFICATION :-**

Log books inspected and satisfactory working of plant confirmed.  
 All insulated spaces, bilges, bilge suction, sounding pipes, scuppers, air trunks ducts, & plugs etc. examined; and insulation tested for fullness & dryness.  
 Brine pipes tested to 50 lbs./sq. inch.  
 Thermometers checked for accuracy.

**General Remarks**

Hatch plugs & chamber doors examined for tightness.  
 Sea injection valves opened up for survey and overhaul.  
 Covers & inspection doors of evaporators & condensers opened up for survey and coils tested to 3000 lbs./sq. inch.  
 Port After Aux. Generator (No.2) opened up for survey and overhaul.  
 Spare gear checked to B.C. requirements.  
 Interim Certificate "C(RMC)" issued - copy attached.

Note: P. & S. Compressors with circ. pump, & Port, Stbd. & Cr. brine pumps were surveyed at Yokohama (See Interim Certificate No.394, dated 23rd May 1951), whilst elect. equipment was also examined. It was there recommended that the centre brine pump casing & impeller be renewed at first opportunity.

**RECOMMENDED:-**

The Refrigerating Machinery & Appliances of this vessel, so far as now seen, are in good and efficient condition and eligible, in my opinion, to be classed RMC 6,51 "To maintain temp. 10°F. with sea temp. 90°F. max.;" subject to plant being examined under working condition, and to centre brine pump casing and impeller being renewed at first opportunity (as previously recommended).

**PARTICULARS TO BE ENTERED IN REGISTER BOOK.**

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours. Tons.	Is Refrigerating Machinery Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
2	4	CO <sub>2</sub>	J. & E. Hall, Ltd.	1931	Brine & Air Gran. & Slab Cork	23	Yes	2	44,880

Fee ..... HK\$320.00 (Fee applied for, 7 June 1951)  
 Travelling Expenses £ " : 8.00 (Received by me, ..... 19.....)  
 Cable charges TUES. 21 AUG 1951

*Bliechie*  
 Surveyor to Lloyd's Register.

Committee's Minute.....

Assigned.....

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