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R. M. C. U. 22521  
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# REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 12 MAR 1925)

Date of writing Report 12 MAR 1925 When handed in at Local Office 12 MAR 1925 Port of London & Belfast

No. in Reg. Book. 90331 Survey held at Dartford & Belfast Date: First Survey 10<sup>th</sup> November 1924 Last Survey 6 February 1925  
(No. of Visits) NINE  
Gross 746 3/4 Tons Net 445 3/4 Tons

on the Refrigerating Machinery and Appliances of the "Port-Dunedin"

Vessel built at Belfast By whom built Workman, Clark & Co. Yard No. 477 When built 1925

Owned by Commonwealth & Dominion Line Port belonging to London Voyage Australia

Refrigerating Machinery made by J. G. Hall & Co. Dartford Machine No. 6019 When made 1925

Insulation fitted by Workman, Clark & Co. Ltd. When fitted 1925 System of Refrigeration C. Wet Brine

Method of cooling Cargo Chambers Brine Grids, Air blown over side grids in tween decks Insulating Material used Granulated Cork

Number of Cargo Chambers insulated 8 Total refrigerated cargo capacity 328,000 cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed 2<sup>nd</sup> Deck Aft main Eng Room

Refrigerating Units, No. of 2 Single, double, or triple Single Twin Compressor Cubic feet of air delivered per hour 14,400

Total refrigeration or ice-melting capacity in tons per 24 hours 120 tons Are all the units connected to all the refrigerated chambers? Yes

Compressors, driven direct or through ~~single~~ double reduction gearing Compressors, single or double acting Double Acting No. of cylinders 2 per machine

Diameter of cylinders 4" Diameter of piston rod 2" Length of stroke 12 No. of strokes per minute 300

Motive Power supplied from Three (Diesel) oil engines direct coupled to D.C. generators.

Steam Engines, high pressure, compound, or triple expansion, surface-condensing. No. of cylinders 2 Diameter of crank shaft journals and pins 5 1/2 dia journals & pins

Length of stroke 8 x 3 1/2" Working pressure of C.O.2 machines 150 lbs No. of sections in crank shaft one Revolutions of engines per minute 150

Breadth and thickness of crank webs 8 x 3 1/2" No. of sections in crank shaft one Revolutions of engines per minute 150

Oil Engines, type 2 or 4 stroke cycle Single or double acting

No. of cylinders 2 Diameter 4" Length of stroke 12" Span of bearings as per Rule

Maximum pressure in cylinders 150 lbs Diameter of crank shaft journals and pins 5 1/2"

Breadth and thickness of crank webs 8 x 3 1/2" No. of sections in crank shaft one Revolutions of engine per minute 150

Electric Motors, type Open Type No. of 1 per machine Rated 110 B.H.P. Kilowatts

Volts at 220 Volts & 150 revolutions per minute. Diameter of motor shafts at bearings 5 1/2"

Reduction Gearing, maximum shaft horse power at 1st pinion 110 B.H.P. Revolutions per minute at full power at 1st pinion 150

2nd pinion 1st reduction wheel main shaft Pitch circle diameter, 1st pinion 2nd pinion

1st reduction wheel Main wheel Width of face, 1st reduction wheel Main wheel

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion 2nd pinion

1st reduction wheel Main wheel Flexible pinion shafts, diameter 1st 2nd

Pinion shafts, diameter at bearings, External, 1st 2nd Internal, 1st 2nd

Diameter at bottom of teeth of pinion, 1st 2nd Wheel shafts, diameter at bearings, 1st

Main Diameter at wheel shroud, 1st Main

Gas Condensers, No. of 1 per machine Cast iron or steel casings Cast Iron Cylindrical or rectangular Rectangular

No. of coils in each 15 Material of coils 3/4" x 1" S.D. Copper Can each coil be readily shut off or disconnected? Yes

Water Circulating Pumps, No. and size of one vertical centrifugal 2" dia how worked Electric motors Gas Separators, No. of 1 per machine

Gas Evaporators, No. of 1 per machine Cast iron or steel casings Steel Circular Pressure or gravity type Pressure

No. of coils in each casing 8 Material of coils 1" x 1 1/2" S.D. Steel 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 20 dia 4900 cubic feet capacity, at 550 revolutions per minute

Electrically driven Electrically Direct Coupled Where spare fans are supplied are these fitted in position ready for coupling up? 2 per machine

Brine Circulating Pumps, No. and size of, including the additional pump 2 - 4 1/2" centrifugal 1 - 9" x 8" V.D. Ram how worked D.C. to electric motor motor driven thru worm gearing

Brine Cooling System, closed or open Open Are the pipes and tanks galvanized on the inside? No

No. of brine sections in each chamber 8 = 2° 1 T.D. 9 = 2° 1 Hold, 11 = 2° 2 T.D., 11 = 2° 2 Hold 2020  
9 = 2° 4 T.D. 11 = 2° 4 Hold 2 = Wheel Room Port, 2 = Wheel Room Starboard  
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.

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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

Steam Condensing Plant. State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14.

Electric Motor Driven Plant

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS	28-1-25	1000 lbs	3000 lbs	1500 lbs		
SEPARATORS	6-2-25	do	do	do		
CONDENSER COILS	10-11-24	do	do	do		
EVAPORATOR COILS	14-11-24	do	do	do		
CONDENSER HEADERS AND CONNECTIONS	18-12-24	do	do	do		
CONDENSER CASINGS	1-1-25	do	do	do		
EVAPORATOR CASINGS	6-1-25	5 to 10 lbs	25 lbs			
NH <sub>3</sub> CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	8-1-25	20 to 25 lbs	50 lbs			
BRINE PIPING AFTER ERECTION IN PLACE	April 14 <sup>th</sup> 5 May 20	18 lbs		90 lbs		also examined fitted

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory Yes

Dates of test May 21<sup>st</sup> & 25<sup>th</sup> 1925 Density of Brine 50. by W. Adde. hydrometer

Temperatures (when the cargo chambers are cooled down to the required test temperatures) of air at the snow box and of the return air ✓ & ✓

or, delivery and return air at direct expansion or brine cooled batteries ✓ & ✓, outflow and return brine -9° F & -5° F

atmosphere 62° F, cooling water inlet and discharge 53° F & 54° F gas in condensers 68° F and evaporators -19° F

the average temperature of the refrigerated chambers 65° F, and the rise of temperature in these chambers upon the expiration of 2 hours

time after the machinery and cooling appliances have been shut off 10° F

SPARE GEAR.

ARTICLES SUPPLIED AS PER RULE

- 1- Crank shaft
- 2- Sets of rings for compressor pistons
- 4- Pistons & rods for compressor complete
- 1- Additional brine pump fitted in Engine Room
- 2- Bolts & nuts for main bearings
- 2- " " connecting rod big end
- 2- " " crosshead bearings
- 1- Impeller & spindle for water circulating pump (see spec. list of values for Ballast per circulator) pp
- 1- Set of valves for V.D. Brine Pump
- 1- Plugger & valve for do do
- 1- Set of 2 leather moulds
- 3- Lengths each of 1/4", 9/16", 1/2" N.I. Piping
- 3- N.I. bends each 1/4", 9/16", 1/2" bore
- 12- N.I. sockets & backnuts each 1/4", 9/16", 1/2" pipe
- 1- Set ratchet screwing disc 1/4", 9/16", 1/2" pipe
- 2- Regulator valve spindle
- 2- Glands for valve cocks
- 24- Gaskets bolts & nuts
- 24- Lubricator piston leathers
- 24- " " gland
- 2- Sets of copper joint rings for compressor joints
- 1- " " other joints
- 8- Sets of special metal packing rings for compressor glands
- 2- pairs of C.I. 2 paper flanges
- 4- Sets of 1/4" valves, seats & gaskets for compressors

ADDITIONAL SPARE GEAR SUPPLIED.

- 24- Additional springs for compressor valves
- 1- Guide for guiding in tank valves
- 2- Springs for water relief valve
- 2- " " C.I. 2 safety
- 1- Big main bearing shell lined with D.M.T.
- 1- " " main bearing shell lined with D.M.T.
- 1- For crosshead bearing with cap
- 1- " " for pressure tubercles
- 2- C.I. 2 gaskets
- 1- Thermometer
- 8- Rings with wood case thermometers
- 1- Separator drain plug with pipe
- 24- Safety valve discs
- 2- 1/8" C.I. 2 Yokes & 6 brass pipe
- 1- Stuffed box

Electrical Spares	Motor	Y.D. Brine Pump	Jan. Motors
Armature in fine lined case	1	1	1
Set of field coils	1	1	1
Brush holder	1	1	1
Set of brushes	1	1	1
Set of spacers	1	1	1
Set of starter spares	1	1	1

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

FOR J. & E. HALL LTD Manufacturer.  
*Chiefton*  
 DIRECTOR

DESCRIPTION OF INSULATION.

BULKHEADS.	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. 168 (Fore Peak)	A	✓	✓	Granulated Cork	11"	1 1/4"	✓	✓	Granulated Cork	11"	1 1/4"
FRAME No. 134	F	✓	✓	do	12 1/2"	1 1/4"	✓	✓	do	6"	1 1/4"
	A	✓	✓	do	4"	1 1/4"	✓	✓	do	6"	1 1/4"
FRAME No. 106	F	✓	✓	do	11 1/2"	1 1/4"	✓	✓	do	11"	1 1/4"
	A	None									
FRAME No. (Boiler Room)	F	✓	✓								
	A	✓	✓								
FRAME No. 161 (Engine Room)	A	✓	✓	do	11"	1 1/4"	✓	✓	Cork slabs Cement	11"	Cement
FRAME No. 31	F	✓	✓	do	12 1/2"-11"	1 1/4"	✓	✓	Granulated Cork	11"	1 1/4"
	A	None									
FRAME No.	F	✓	✓								
	A	✓	✓								
FRAME No.	F	✓	✓								
	A	✓	✓								
FRAME No. (After Peak)	F	✓	✓	do	11 1/2" x 10 1/2"	1 1/4"	✓	✓	Granulated Cork	10 1/2"	1 1/4"
SIDES		✓	✓	do	10 1/2"	3/4" x 1"	✓	✓	do	10"	3/4" x 1"
OVERHEADING		✓	✓	do	7"	2 1/2"	✓	✓			
FLOORS OF CHAMBERS	N <sup>o</sup> 1 and 2	None	✓	do	5 1/2"	2 1/2"	✓	✓			
	N <sup>o</sup> 4	2"	1 1/2" x 1/2" zinc				✓	✓			
TRUNK HATCHWAYS											None
THRUST RECESS, SIDES AND TOP		✓	✓	do	10"	3" P.P.					
TUNNEL SIDES AND TOP		✓	✓	do	10"	3" P.P.					
TUNNEL RECESS, FRONT AND TOP											None

FRAMES OR REVERSE FRAMES, FACE 1/2 granules

BULKHEAD STIFFENERS, TOP enclosed by insulation BOTTOM do AND FACE do

RIBBAND ON TOP OF DECKS 3" P.P. 3-8 4-3-0"

SIDE STRINGERS, TOP 3" Gran. Cork BOTTOM 3" Gran. Cork AND FACE 2" Gran. Cork

WEB FRAMES, SIDES None AND FACE

BRACKETS, TOP enclosed by insulation BOTTOM do AND FACE do

INSULATED HATCHES, MAIN 6" Cork slabs BILGE 4 1/2" slab cork MANHOLE 4" in NE 1 x 2, 6" in NE 4.

HATCHWAY COAMINGS, MAIN P. Pine & steel BILGE Pitch pine

HOLD PILLARS 4" x 2" P. Pine

MASTS None in chambers VENTILATORS None in chambers, sparsel below.

Are insulated plugs fitted to provide easy access to bilge suction roses yes tank, air, and sounding pipes yes heels of pillars with spaced.

and manhole doors of tanks yes Are insulated plugs fitted to ventilators yes cargo ports yes and side lights None

Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected yes if so, how 1/2 Elm in hold. 3" P.P. tunnel.

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 not adjacent

Coal Bunker Bulkheads, and Brine Outflow and Return Pipes passing through coal bunkers. Is the insulation, so far as practicable, fireproof None.

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 2 1/2 x 2 1/2 x 12" space. floors 3 x 3 x 12" space tunnel top 3 x 3 Elm 15" space

fixed or portable fixed bottom portable Are screens fitted over the brine grids at chamber sides tunnel only hinged or permanently fixed fixed

Thermometer Tubes, No. and position in each chamber N<sup>o</sup> 1 hold. tube No 7 in N<sup>o</sup> 2 hold. tube No 4 in N<sup>o</sup> 4 hold. tube No 6 in N<sup>o</sup> 4 hold. tube No 8 in N<sup>o</sup> 4 hold. tube No 10 in N<sup>o</sup> 4 hold. tube No 12 in N<sup>o</sup> 4 hold. tube No 14 in N<sup>o</sup> 4 hold. tube No 16 in N<sup>o</sup> 4 hold. tube No 18 in N<sup>o</sup> 4 hold. tube No 20 in N<sup>o</sup> 4 hold. tube No 22 in N<sup>o</sup> 4 hold. tube No 24 in N<sup>o</sup> 4 hold. tube No 26 in N<sup>o</sup> 4 hold. tube No 28 in N<sup>o</sup> 4 hold. tube No 30 in N<sup>o</sup> 4 hold. tube No 32 in N<sup>o</sup> 4 hold. tube No 34 in N<sup>o</sup> 4 hold. tube No 36 in N<sup>o</sup> 4 hold. tube No 38 in N<sup>o</sup> 4 hold. tube No 40 in N<sup>o</sup> 4 hold. tube No 42 in N<sup>o</sup> 4 hold. tube No 44 in N<sup>o</sup> 4 hold. tube No 46 in N<sup>o</sup> 4 hold. tube No 48 in N<sup>o</sup> 4 hold. tube No 50 in N<sup>o</sup> 4 hold. tube No 52 in N<sup>o</sup> 4 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N<sup>o</sup> 4 hold. tube No 596 in N<sup>o</sup>

**Sounding Pipes, No. and position in each chamber situated below the load water line 1/4 each ledge at aft end of holds.**

Diameter 1 1/4" 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 yes in chere rooms

How is the expanded metal secured in place screws

How are the cork slabs secured to the steel structure of the vessel bituminastic in position & chere rooms

**Air Trunkways in Chambers, inside dimensions, main** 10" **and branch** none

Are they permanently fixed or collapsible, or portable Portable State position in chambers run to the sides & tops  
Portable screws in front of side grids in turn & stowage

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 1/2 Are they galvanised externally no

How are they arranged in the chambers Grids sides overhead & BK

**Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers** Lead lined troughs to support

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

PRO WORKMAN, CLARK & CO., LIMITED,  
*W. H. Scumble*  
 ASSISTANT SECRETARY, Builders.

**Plans, Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery**  **and Insulation** Plan & Specification  
(If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case Similar If so, state name of vessel Port Brisbane

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

Port Bel  
 2/3/27

**General Remarks** (State quality of workmanship, opinions as to class, &c.) These Refrigerating machines were built under Special Survey, the materials and workmanship are good.

Insulation fitted in accordance with the Rules & approved specification.  
Pipe Pipes toted \$ 90 lbs per square inch.  
Machinery satisfactorily installed & toted under working conditions.  
The Refrigerating Machinery & Appliances of this vessel are in good & efficient condition & eligible in our opinion to be classed & have record. ✠ LLOYD'S R.M.C. 5-25.

It is submitted that  
 this vessel is eligible for  
 THE RECORD + Lloyd's RMC 5. 25.

CERTIFICATE WRITTEN  
 2.6.25

*J.W.D.* 2/6/25 *APK* *My*

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

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. and whether Single or Duplex.	Makers.	Date of Construction.	System.	Type.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours.	No.	Capacity.
<u>2 Single</u>	<u>J &amp; Hall</u>	<u>1925</u>	<u>Carl</u>	<u>Anty</u>	<u>Brine</u>	<input checked="" type="checkbox"/>	<u>120</u>	<u>8'</u>	<u>328,000</u>
					<u>Granulated cork.</u>				

to Bel 12/25 (LON 9c \$0) (Bel 9c \$16) 24: 0 0 (Fee applied for, 29-5-1925)  
 Exp. 2-2-0 14: 7 (Received by me, 25-6-1925)

*John S Gordon* G. D. Aisher  
 Surveyor to Lloyd's Register.  
*William Butler*

Committee's Minute WED. 3 JUN 1925

Assigned + Lloyd's Rmb 5.25

*My*



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 Lloyd's Register  
 Foundation

Certificate to be sent to Owners.