

AMC R.M.C. new entry  
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ISIPINGO

R.M.C. No.

49106

No. 11.214

# REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 27 OCT 1933 24 JAN 1934)

Date of writing Report 27 OCT 1933 When landed in at Local Office 27 OCT 1933

No. in Reg. Book. Survey held at Belfast. Date: First Survey 10 May 1933 Last Survey 16 June 1933  
28071 (No. of Visits +11)

on the Refrigerating Machinery and Appliances of the T.S.M.V. "ISIPINGO" Tons {Gross 4069 Net 3958}

Vessel built at Belfast. By whom built Workman Clark (1928) Ltd. Yard No. 530 When built 1933

Owners Andrew Weir & Co. Port belonging to Belfast Voyage

Refrigerating Machinery made by J. E. Hall Ltd. Machine No. 884 When made 1933

Insulation fitted by Glasgow Ice Ltd. When fitted January 1934 System of Refrigeration CO<sub>2</sub> + Brine

Method of cooling Cargo Chambers Air Cooled. Insulating Material used 5" thick + granulated cork.

Number of Cargo Chambers insulated 2 Total refrigerated cargo capacity 19,500 cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Main deck, port.

Refrigerating Units, No. of one Single, double, or triple Cubic feet of air delivered per hour

Total refrigeration or ice-melting capacity in tons per 24 hours 4 1/2 tons Are all the units connected to all the refrigerated chambers. yes

Compressors, driven direct or through <sup>single</sup> ~~double~~ reduction gearing. Compressors, single or double acting single No. of cylinders two

Diameter of cylinders 2 1/8" Diameter of piston rod 1" Length of stroke 6" No. of strokes per minute 400 each.

Motive Power supplied from Electric Motor direct coupled.

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders 1 Diameter 10"

Length of stroke 60" Working pressure 2 1/2" Diameter of crank shaft journals and pins 3" journals, 3 1/2" pins

Breadth and thickness of crank webs 7" x 1 3/4" No. of sections in crank shaft one Revolutions of engines per minute 1400

Oil Engines, type 8" RAD 2 or 4 stroke cycle Single or double acting B.H.P. 25 1/2

No. of cylinders 2 Diameter 8" Length of stroke 10" Span of bearings as per Rule

Maximum pressure in cylinders 150 lb. Diameter of crank shaft journals and pins 3" Revolutions of engine per minute 1400

Breadth and thickness of crank webs 7" No. of sections in crank shaft one Revolutions of engine per minute 1400

Electric Motors, type Enclosed ventilated No. of one Rated 25 1/2 H.P. Kilowatts

Volts 220 at 400/265 revolutions per minute. Diameter of motor shafts at bearings

Reduction Gearing, maximum shaft horse power at 1st pinion 2500 Revolutions per minute at full power at 1st pinion

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 one Cast iron or steel casings Cast iron Cylindrical or rectangular cylindrical

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

Water Circulating Pumps, No. and size of 1 - 1 1/2" centrifugal how worked electrically Gas Separators, No. of 2

Gas Evaporators, No. of one Cast iron or steel casings Steel Pressure or gravity type gravity

No. of coils in each casing two Material of coils S.D. Steel 1 1/2" x 1 1/2" o.d. Can each coil be readily shut off or disconnected yes

Direct Expansion or Brine Cooled Batteries, No. of one 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 4 Material of coils S.D. Steel 1 1/2" bore. Can each coil be readily shut off or

disconnected yes Total cooling surface of battery coils 920 sq. ft. Is a watertight tray fitted under each battery yes

Air Circulating Fans, Total No. of one - 25" each of 13,000 cubic feet capacity, at 670 revolutions per minute

Steam or electrically driven electrically Where spare fans are supplied are these fitted in position ready for coupling up no

Brine Circulating Pumps, No. and size of, including the additional pump 2 - 2" centrifugal how worked Elec. direct coupled.

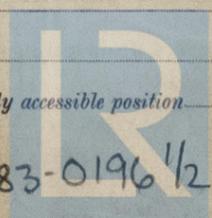
Brine Cooling System, closed or open open Are the pipes and tanks galvanised on the inside no

No. of brine sections in each chamber Air Cooled.

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 yes  
 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

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS	6-6-33	1000 lb sq	3000 lb sq	1500 lb sq		
SEPARATORS	7-6-33	do.	do.	do.		
CONDENSER COILS	10-5-33 15-5-33	do.	do.	do.		
EVAPORATOR COILS	31-5-33 2-6-33	do.	do.	do.		
CONDENSER HEADERS AND CONNECTIONS	7-6-33	do.	do.	do.		
CONDENSER CASINGS	16-6-33	15 lb sq	30 lb sq	-		
EVAPORATOR CASINGS	(open top)					
NH <sub>3</sub> CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
BRINE PIPING AFTER ERECTION IN PLACE						

**Cooling Test.** Has the refrigerating machinery been examined under full working conditions, and found satisfactory Yes  
 Dates of test 17<sup>th</sup> & 18<sup>th</sup> January 1934. Density of Brine 48 by Turdittells. hydrometer  
 Temperatures (which the cargo chambers are cooled down to the required test temperatures) of air at the snow box and of the return air &  
 of delivery and return air at direct expansion or brine cooled batteries 10°F & 16°F, outflow and return brine 0°F & 3°F  
 atmosphere 48°F cooling water inlet and discharge 44°F & 48°F gas in condensers 72°F and evaporators -10°F  
 the average temperature of the refrigerated chambers 14.75°F and the rise of temperature in these chambers upon the expiration of 72 hours  
 time after the machinery and cooling appliances have been shut off 9.25°F

SPARE GEAR.

Are the machines in accordance with Section 4, Clause 2 of the Rules ✓  
 Are the working parts of the machines, pumps and motors respectively, interchangeable ✓

ARTICLES SUPPLIED AS PER RULE.	ADDITIONAL SPARE GEAR SUPPLIED.
1 Crankshaft. 1 piston + rod for each compressor. 1 set rings for each compressor piston. 1 Spindell + impeller for brine pump. 1 do. do. water pump. 1 Spare brine pump in engine room. 2 bolts + nuts for conn. rod big end. 2 do. do. crosshead. 2 do. do. main bearings 1 set of 2 leather moulds. 1 pair main bearings 1 pair crosshead brasses. 1 pair conn. rod bearings 1 set of 2 valves, seats + springs for Compr. 6 lubricator piston leathers. 2 sets copper joint rings for Compr. joints 1 set do. do. do. other joints. Assorted lengths brine piping + fittings. 1 set dies for screwing above. 2 sets special metal rings for each Compr. gland. 2 pair CO <sub>2</sub> pipe flanges. Assorted bolts + nuts, sundry brine cocks. 1 regulator valve spindle.	12 addl. springs for Compr. valves. 2 springs for water relief valve. 2 do. CO <sub>2</sub> relief valve. 1 oil pump for press. lubricator 1 CO <sub>2</sub> gauge - 1 hydrometer 2 brass cased thermometers 12 safety discs. 1-1/8" CO <sub>2</sub> gauge valve, 3 spare pipe 1 fitted box for compr. parts. 3 bolts + 3 sets of washers for flexible coupling on machine.

ELECTRICAL SPARES.

1 Armature 1 set of field coils 1 set of interpole coils 1 set of bearings 1 line of brush holders 1 set of carbon brushes 1 set of control spares.	Machine Motor + Each size Pump Motor	1 complete spare motor 1 line brush holders } Fan 1 set carbon brushes } Motor. 1 set control spares
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ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

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.	
<b>BULKHEADS.</b>	FRAME No. (Fore Peak) A										
	FRAME No. {	F									
		A									
	FRAME No. {	F									
		A									
	FRAME No. {	F									
		A									
	FRAME No. (Boiler Room) {	F									
		A									
	FRAME No. 55 (Engine Room) A						✓	✓	Gran. lark	11"	1" Trg.
	FRAME No. 45 {	F					✓	✓	do	4"	1" Trg.
		A					✓	✓	do	4"	do
	FRAME No. 33 {	F					✓	✓	do	9"	do
		A					✓	✓			
	FRAME No. {	F									
A											
FRAME No. (After Peak) F											
SIDES ...						✓	✓	Gran. lark	12"	1" Trg.	
OVERHEADING ...						✓	✓	do	11"	do	
FLOORS OF CHAMBERS ...						✓	✓	Slab. lark	102" x 203"	1 1/2" aggregate	
TRUNK HATCHWAYS ...						✓	✓	Slab. lark	9"	1" Trg.	
THRUST RECESS, SIDES AND TOP ...											
TUNNEL SIDES AND TOP ...											
TUNNEL RECESS, FRONT AND TOP ...											

FRAMES OR REVERSE FRAMES, FACE *1/2" gran. lark & 1" Trg. lining*

BULKHEAD STIFFENERS, TOP *1" gran. lark & 1" Trg. lining* BOTTOM *1" gran. lark & 1" Trg. lining* AND FACE *3" x 12" gran. lark & 1" Trg.*

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 ✓ 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 ✓

Coal Bunker Bulkheads, and Brine Outflow and Return Pipes passing through coal bunkers. Is the insulation, so far as practicable, fireproof ✓

Where Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof ✓

Cargo Battens, Dimensions and spacing, sides *2" x 2" about 12" apart* floors *3" x 3" about 12" apart* tunnel top ✓

fixed or portable *fixed on side* Are screens fitted over the brine grids at chamber sides ✓ hinged or permanently fixed ✓

Thermometer Tubes, No. and position in each chamber *1 in aft. chamber, 2 in forward chamber*

diameter *2 1/2"* are they fitted in accordance with Section 3, Clause 8 ✓

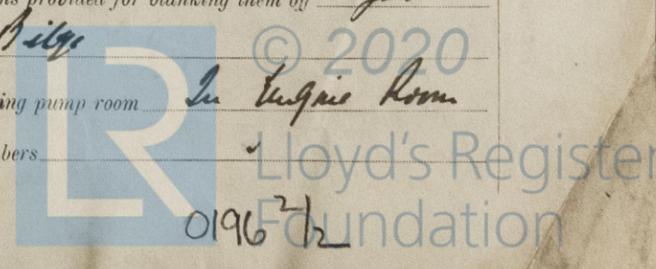
Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated ✓

Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers *2-2 1/2" wrapped Scupper in each chamber led to Bilge* Where strices, scupper pipes, and drain pipes are fitted are means provided for blanking them off ✓

What provision is made for draining the refrigerating machinery room *2" Scupper led to Bilge*

brine return room *in Refrig. machy Rm* No. room *2-2" wrapped scupper led to Bilge* water circulating pump room *In Vapour Room*

Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers ✓



**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  *bedded in bitumen.*

**Air Trunkways in Chambers, inside dimensions, main** *2'6" x 2'0" in fore chamber* and branch *2'0" x 2'0" in aft chamber*

Are they permanently fixed or collapsible, or portable  State position in chambers

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**  Are they galvanised externally

How are they arranged in the chambers

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

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

*F. Cunningham* Builders. Secretary

**Plans.** Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery  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 refrigerating machinery has been constructed under special survey and the materials and workmanship are good.*

*The construction of the refrigerated spaces has been carried out under special survey the materials & workmanship are good.*

*This refrigerating machinery has been efficiently installed in the vessel and tried out under working conditions. The chambers were cooled down to an average temperature of 14.75°F. The refrigerating machinery and fans were stopped and over a period of 12 hours the average temperature rise in the Chambers was 9.25°F.*

*In our opinion the vessel is now eligible for notation + LLOYD'S R.M.C. 1,34 for temperature of 20°F.*

*J.K.W.*

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

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity. Cubic ft.
<i>one</i>	<i>2</i>	<i>Carb. Amby</i>	<i>J. E. Hall Ltd.</i>	<i>1933</i>	<i>(1) Air (2) Hydrochloric</i>	<i>780000 43000</i>	<i>4 1/2</i>	<i>2</i>	<i>19800</i>

Fee applied for, *23/11/1934* £ 6 : 0 : 0  
 Received by me, *21.2.1934* £ / : / : 0

*Rhu. K. Williams, D. Gemmell, A. Alton*  
 Surveyor to Lloyd's Register

Committee's Minute **FRI. 26 JAN 1934**

Assigned *+ Lloyd's R.M.C. 1.34*

*White Bfl*

*For Temp. 33°F*

*Mh*



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