

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

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 (No. of Visits) 10

on the Refrigerating Machinery and Appliances of the S. S. N. Y. "Port-almu" Tons { Gross
 Net
 Vessel built at Waltham By whom built Swan Hunter & Wigham Yard No. 1341 When built 1928
 Owners Commonwealth & Dominion Port belonging to Richardson Ltd. Voyage
 Refrigerating Machinery made by J. & E. Hall Ltd. Machine No. 4349 When made 1928
 Insulation fitted by J. & E. Hall, Ltd. When fitted 1928 System of Refrigeration CO₂ + Brine
 Method of cooling Cargo Chambers Brine grids Insulating Material used See attached report.
 Number of Cargo Chambers insulated 8 Total refrigerated cargo capacity 335,000 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed on 2nd deck aft Eng. Room.

Refrigerating Units, No. of two Single, double, or triple double Cubic feet of air delivered per hour
 Total refrigeration or ice-melting capacity in tons per 24 hours 144 Are all the units connected to all the refrigerated chambers yes.

Compressors, driven direct ~~through~~ reduction gearing Compressors, single or double acting Double acting No. of cylinders 2 per mach.
 Diameter of cylinders 4 1/8" Diameter of piston rod 3" Length of stroke 15" No. of strokes per minute 240 each.

Motive Power supplied from Direct Coupled - electric motors.

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 5 1/2"
 Breadth and thickness of crank webs 8" x 3 1/2" No. of sections in crank shaft one Revolutions of CO₂ machines per minute 135

Oil Engines, type ✓ 2 or 4 stroke cycle ✓ Single or double acting ✓
 No. of cylinders ✓ Diameter ✓ 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 ✓

Electric Motors, type open No. of one per mach. Rated 130 H.P. Kilowatts
 Volts 220 at 135 revolutions per minute. Diameter of motor shafts at bearings 5 1/2"

Reduction Gearing, maximum shaft horse power at 1st pinion ✓ 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 2 per mach. Cast iron or steel casings cast iron Cylindrical or rectangular cylindrical.

No. of coils in each 8 Material of coils S.D. Copper 3/4" x 10" d. Can each coil be readily shut off or disconnected yes
 Water Circulating Pumps, No. and size of Supplied by shipbuilder how worked ✓ Gas Separators, No. of 1 delivery
1 suction

Gas Evaporators, No. of 2 per mach. Cast iron or steel casings Steel Pressure or gravity type pressure.
 No. of coils in each casing 6 Material of coils S.D. Steel 1" x 1 1/8" d. 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 3 each 20" Sirocco for blowing air over side grids cubic feet capacity, at ✓ 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 3-5" vertical centrifugal how worked elec. motor direct coupled
1-3 1/4" 3VD ram elec. motor thro' worm
gearing

Brine Cooling System, closed or open open Are the pipes and tanks galvanised on the inside no.
 No. of brine sections in each chamber N^o1 hold = 10, N^o2 hold = 12, N^o4 hold = 12.
N^o1 tw. dk. = 9, N^o2 tw. dk. = 12, N^o4 tw. dk. = 10, Post chill = 3, Start. Cheese = 2

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

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)	4-9-28					
GAS COMPRESSORS	13-9-28	1000 lbs. a"	3000 lbs. a"	1500 lbs. a"	SH	
SEPARATORS	5-9-28	do.	do.	do.	SH	
CONDENSER COILS	31-8-28 16-8-28 24-8-28	do.	do.	do.	SH	
EVAPORATOR COILS	25-9-28 14-9-28 21-9-28	do.	do.	do.	SH	
CONDENSER HEADERS AND CONNECTIONS	18-4-28	do.	do.	do.	C.N.H.	
CONDENSER CASINGS	5-9-28 7-9-28	10 to 15 lbs. a"	30 lbs. a"	-	SH	
EVAPORATOR CASINGS	28-9-28	20 to 25 lbs. a"	50 lbs. a"	-	C.N.H.	
NH ₃ 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

Dates of test _____ Density of Brine _____ by _____ 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 &

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.

ARTICLES SUPPLIED AS PER RULE.	ADDITIONAL SPARE GEAR SUPPLIED.
1 crankshaft	4 sets of 4 valves, seats + springs
2 sets of rings for compressor pistons	24 add. valve springs
4 pistons + rods for compressor	1 guide for grinding the valves
1 additional brine pump for engine room	1 set springs for V.D. brine pump
1 pair main bearings, bolts and nuts	1 plunger sleeve ring for V.D. brine pump
1 pair crank pin bolts and nuts	2 springs for water relief valve
1 pair flyht and nuts for crosshead bearing	2 do CO ₂ safety valve
1 spindle and impeller for centrifugal brine pumps	1 pump for pressure lubricator
1 set valves for vertical duplex brine pump	2 CO ₂ gauges
1 set of 2 leather moulds	1 hydrometer
3 lengths each 1 1/2" + 1 1/4" W.I. piping	8 chambers, thermometer
3 W.I. bends 1 1/2" + 1 1/4"	24 copper safety discs
2 pair CO ₂ pipe flanges	1 separator drain plug + pip.
1 set ratchet screwing dies to screw 1 1/2" + 1 1/4"	2-3/4 CO ₂ gauge valve with 6 span pipe
2 regulator valve spindles	1 fitted box for comp. part.
Subdry brine cocks + valves	1 pair main bearing shells lined W.M.
Assorted bolt, studs and nuts	1 do crank pin shells lined W.M.
24 lubricator piston leather	1 do X head bearings with cap.
24 lubricator gland leather	
2 sets of copper joint rings for compressor	
1 set do do for other joints	
8 sets of special metal packing rings for comp. gland	

ELECTRICAL SPARES.

Armature in zinc lined case	1 of each for Machine motor Centri. Brine Pump motor V.D. Brine Pump motor Fan motor.
Set of field coils	
Brush holder	
Set of brushes	
Set of starter spares	

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

FOR J. & E. HALL, LTD
Clutcholssa
 Manufacturer.

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.	F									
FRAME No. (Boiler Room)	A									
FRAME No. (Engine Room)	A									
FRAME No.	F									
FRAME No.	A									
FRAME No.	F									
FRAME No.	A									
FRAME No.	F									
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	BOTTOM	AND FACE
BULKHEAD STIFFENERS, TOP		
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 _____ floors _____ tunnel top _____

fixed or portable _____ Are screens fitted over the brine grids at chamber sides _____ hinged or permanently fixed _____

Thermometer Tubes, No. and position in each chamber _____

diameter _____ 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 _____

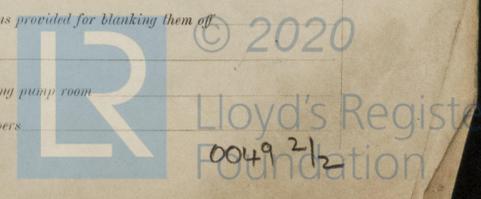
Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers _____

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 _____

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 _____



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

Air Trunkways in Chambers, inside dimensions, main *and branch*

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.

Builders.

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

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

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 Machinery has now been securely fixed on board the vessel, tried under full working conditions + found satisfactory.

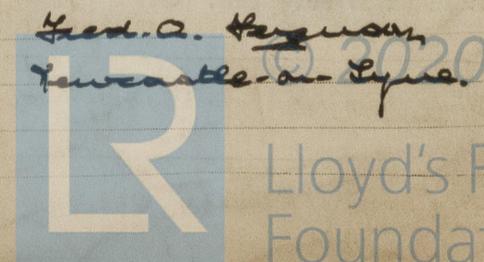
PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					POWER.		INSULATED CARGO CHAMBERS.		
No. and whether Single or Duplex.	Makers.	Date of Construction.	System.	Type.	(1) Refrigerating (2) Insulating the Chambers.	Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity.
2 Single	J. & E. Hall Ltd.	1928	Cathalby Hall	(1) Parine (2) Gran Cork + slab cork.		144	8	335000	

Low 1/2 1/2 p
Fee £30:0:0
Travelling Expenses 19:6
Fee applied for, 19
Received by me, 6-12-1928

D. Gemmell
Surveyor to Lloyd's Register.

Committee's Minute TUE. 4 DEC 1928
Assigned see Minute on
Jwc. Rmc Rpl 3554.



Certificate to be sent to Owner London