

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 30 OCT 1935)

Date of writing Report 19 When handed in at Local Office Port of London.

No. in Reg. Book. Survey held at 38108 Date: First Survey 11th SEPT. 1935 Last Survey 18th OCTOBER 1935 (No. of Visits 51)

on the Refrigerating Machinery and Appliances of the S/S 'FORT AMHERST' Tons {Gross... Net...}

Vessel built at Glasgow By whom built Blythwood S.B. Co. (Ld) Yard No. 39 When built 1935

Owners Manchester Liners Ltd Port belonging to Voyage

Refrigerating Machinery made by G.E. Hall Ltd. Machine Nos 9324 9328 When made 1935

Insulation fitted by When fitted System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers Brine Grids Insulating Material used

Number of Cargo Chambers insulated 3 Total refrigerated cargo capacity 12,600 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Tank top, - Starboard E.R.

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

Total refrigeration or ice-melting capacity in tons per 24 hours 13. 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 No. of cylinders 2

Diameter of cylinders 2 13/16" Diameter of piston rod 1 1/4" Length of stroke 8" No. of strokes per minute 300 each

Motive Power supplied from Steam engine thro' two throw crankshaft.

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

Length of stroke 8" Working pressure Diameter of crank shaft journals and pins 4 1/2"

Breadth and thickness of crank webs 6 1/2" x 2 3/8" 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 B.H.P.

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 No. of Rated Kilowatts

Volts at revolutions per minute. Diameter of motor shafts at bearings

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 Cast iron or steel casings cast iron Cylindrical or rectangular rectangular

No. of coils in each 3 Material of coils S.D. Copper 3/4" b. x 10" d. Can each coil be readily shut off or disconnected yes

Water Circulating Pumps, No. and size of 2 - 6" x 4 1/2" S.A. how worked off crankshaft Gas Separators, No. of 4

Gas Evaporators, No. of 2 Cast iron or steel casings steel Pressure or gravity type gravity

No. of coils in each casing 2 Material of coils S.D. Steel 1" b. 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 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

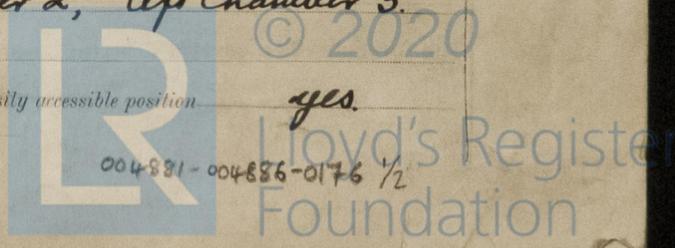
Brine Circulating Pumps, No. and size of, including the additional pump 3 - 4 1/2" x 5" x 6" V.D. how worked direct - steam

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

No. of brine sections in each chamber Port Chamber 2, Starboard Chamber 2, Aft Chamber 3.

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.



Are thermometers fitted to the outflow and to each return brine pipe. 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)	11-9-35 14-9-35		3500 lbs. sq. in.			
GAS COMPRESSORS	24-9-35	1000 lbs. sq. in.	3000 lbs. sq. in.	1500 lbs. sq. in.	Sh.	
SEPARATORS	24-9-35	do.	do.	do.	Sh.	
CONDENSER COILS	13-9-35 14-9-35	do.	do.	do.	Sh.	
EVAPORATOR COILS	17-9-35	do.	do.	do.	Sh.	
CONDENSER HEADERS AND CONNECTIONS I.L.C. RECEIVERS	24-9-35	do.	do.	do.	Sh.	
CONDENSER CASINGS	13-9-35 14-9-35	5 to 10 lbs. sq. in.	20 lbs. sq. in.		Sh.	
EVAPORATOR CASINGS		open top				
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

time after the machinery and cooling appliances have been shut off

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 Set of rings for each comp. piston
 1 Set of steam piston rings for CO₂ machine.
 1 piston and rod for each comp. with rings
 1 C.I. liner for comp.
 1 addl. brine pump fitted in engine room
 2 bolts + nuts for main bearings
 2 do. do. for conn. rod big end.
 2 studs + nuts for comp. crosshead.
 2 studs + nuts for engine do.
 1 set valves for circulating water pump.
 1 do. do. for brine pump.
 1 set of 2 leather moulds.
 3 lengths each of 1 1/2" + 1/4" bore H.I. piping.
 3 H.I. bends each 1 1/2" + 1/4" bore
 12 sockets + 12 backnuts each 1 1/2" + 1/4" bore
 2 pair CO₂ pipe flanges.
 1 setatchet securing dies for 1 1/2" + 1/4" pipe
 1 regulator valve spindle
 1 set of 2 leather moulds.
 Assorted bolts + nuts
 12 lubricator piston leathers
 12 do. gland do.
 2 sets copper joint rings for comp.
 1 do. do. for other joints.
 2 sets special metal rings for each comp. gland.

2 sets each 4 valves + springs for comp.
 8 addl. springs for comp. valves.
 1 set steam piston rings for
 brine pump.
 1 set valve springs for brine pump
 2 springs for water relief valve.
 2 do. do. brine do. do.
 2 do. do. CO₂ safety valve.
 1 pump for lubricator.
 1 CO₂ pressure gauge.
 1 hydrometer
 2 brass cases thermometers
 6 copper safety discs
 1-1/8" CO₂ gauge valve + 3 spare pipe
 1 set brasses for brine pump
 1 fitted box for comp. parts
 1 conn. rod for water pump

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL, LTD
 Manufacturers.
 Nicholson
 DIRECTOR

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. (Engine Room)	A									
FRAME No.	F									
FRAME No.	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 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 sluices, 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 guttersways 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 _____
 How are they arranged in the chambers _____ Are they galvanised externally _____

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.

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 _____

Builders. _____

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 and it will be eligible for the notation + Lloyds R.M.C. (with date) when the installation and cooling tests have been satisfactorily completed.*

Are thermometers fitted
 Where the tanks are
Steam Condensers
 DE
 ENGINE CYLINDER
 GAS COMPRESSOR
 SEPARATORS
 CONDENSER
 EVAPORATOR
 CONDENSER
 I.L.C. RE
 CONDENSER
 EVAPORATOR
 NH₃ CONDENSER
 COOLER COIL
 BRINE PIPING
 Cooling Towers
 Dates of test
 Temperatures
 or, delivery
 atmosphere
 the average
 time after

1 set
 1 set
 1 pie
 1 c.i.
 1 ad.
 2 br.
 2 a.
 2 st.
 2 s.
 1 se.
 1
 1 sc.
 3 br.
 3 H.
 12 s.
 2 p.
 1 s.
 1 m.
 1 s.
 12
 12
 2
 2
 1
 2

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					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.
2	2	Carl. Aubrey	Jr. E. Hall Ltd.	1935				

Fee £ 6.0.0
 Travelling Expenses £ 4.0.0
 Received by me, 31.1.1936
 Committee's Minute GLASGOW 4-FEB 1936

D. Gemmell
 Surveyor to Lloyd's Register.

Assigned *See Glasgow Report No. 56500.*

Rpt.
 RE
 No.
 Reg. E.
 3810
 on t
 Vesse
 Own
 Refri
 Insul
 Meth
 Num
 DES
 Refrig
 Total r
 Comp
 Diamet
 Motive
 Steam
 Length
 Breadth
 Oil En
 No. of
 Maxim
 Breadth
 Electr
 Volts at
 Reduc
 2nd pin
 1st redu
 Distanc
 1st redu
 Pinion
 Diamete
 Main
 Gas Co
 No. of c
 Water
 Gas Ev
 No. of c
 Direct
 cleared o
 disconn
 Air Cir
 Steam or
 Brine C
 Brine C
 No. of br
 Can each