

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

- 1 DEC 1933

(Received at London Office

- 1 DEC 1933

Date of writing Report

19

When handed in at Local Office

- 1 DEC 1933

Port of London.

No. in

Reg. Book. Survey held at Dartford

Date: First Survey 22nd JuneLast Survey 13th October 1933

(No. of Visits

14

on the Refrigerating Machinery and Appliances of the S.S. PORT CHALMERS.

Tons

Gross

Net

Vessel built at

By whom built Swan Hunter & Wigan Yard No. 1483 When built 1933

Owners Commonwealth & Dominion Line Port belonging to Richardson

Refrigerating Machinery made by

J. & E. Hall Ltd.

Machine No. 8841

Voyage

When made 1933

Insulation fitted by

When fitted

System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers

Brine grids + Air

Insulating Material used

Number of Cargo Chambers insulated

19

Total refrigerated cargo capacity 495,000 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed 2nd Deck aft E.R. casing

Refrigerating Units, No. of

3

Single, double, or triple

Cubic feet of air delivered per hour

Total refrigeration or ice-melting capacity in tons per 24 hours

168

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

single

No. of cylinders 2 per mach

Diameter of cylinders

5"

Diameter of piston rod

2 1/4"

Length of stroke

10"

No. of strokes per minute 300 each

Motive Power supplied from

Direct coupled electric motor.

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders

Diameter

Length of stroke

Working pressure

CO₂ machine

Diameter of crank shaft journals and pins 6 1/2" - 4" pins

Breadth and thickness of crank webs

9" x 4 1/2"

No. of sections in crank shaft

one

Revolutions of engines per minute

300

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

open - pedestal bearings

No. of

3

Rated 160 H.P.

Kilowatts

Volts at 220 at 300/200 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

3

Cast iron or steel casings

cast iron

Cylindrical or rectangular

cylindrical

No. of coils in each

14

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

Supplied by Owners

how worked

Gas Separators, No. of 6

Gas Evaporators, No. of

3

Cast iron or steel casings

steel

Pressure or gravity type

pressure

No. of coils in each casing

14

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

5 auxil. coolers in place of hatch grids

cleared of snow

no

No. of coils in each battery

Material of coils S.D. Steel 1" bore Can each coil be readily shut off or

disconnected

yes

Total cooling surface of battery coils

160 sq. feet

Is a watertight tray fitted under each battery

Air Circulating Fans, Total No. of

5

each of

18000 C.F./min

cubic feet capacity, at

1800 R.M.P.

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

4 - 5" vert. centrihow worked

electrically

Brine Cooling System, closed or open

closed

1 - 4" x 4 1/2" V.D. ram pump, worm driven.

Are the pipes and tanks galvanised on the inside

no

No. of brine sections in each chamber

see separate sheet attached

Can each section be readily shut off or disconnected

yes

Are the control valves situated in an easily accessible position

yes

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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)						
GAS COMPRESSORS	28-9-33 4-9-33	1000 lb. □	3000 lb. □	1500 lb. □	PL	
SEPARATORS	13-9-33 13-10-33	do.	do.	do.	PL	
CONDENSER COILS	4-4-33 26-6-33 19-9-33	do.	do.	do.	PL	
EVAPORATOR COILS	4-4-33 15-8-33 26-9-33	do.	do.	do.	PL	
CONDENSER HEADERS AND CONNECTIONS	31-8-33 13-9-33 19-9-33	do.	do.	do.	PL	
CONDENSER CASINGS	31-8-33 4-10-33	do.	do.	do.	PL	
EVAPORATOR CASINGS	28-9-33 4-10-33	do.	do.	do.	PL	
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 snout 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.

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.
6 pistons + rods for compr. complete with rings
1 spindle + impeller for centr. brine pump.
1 pair main bearings shells lined with V.M.
2 main bearing bolts + nuts
1 pair crankpin shells lined V.M. with bolts + nuts
1 pair crosshead bearings with cap bolts + nuts
1 set valves + springs for V.D. brine pump
1 bucket for pump.
36 lubricator piston leather
36 do. gland do.
1 set of 2 leather moulds
3 lengths each 1 1/2" + 1 1/2" piping
3 V.L. heads each 1 1/2" + 1 1/2"
12 V.L. sockets + backnuts each 1 1/2" + 1 1/2"
1 set ratchet screwing dies 1 1/2" + 1 1/4"
2 pr. CO₂ pipe flanges
2 regulator spindles.
2 sets copper joint rings for compr.
1 set do. do. for other joints
Assorted bolts + nuts
Sundry brine cocks
12 sets special metal rings for compr. glands.

6 sets of 4 valves, seats + springs for compr.
1 guide for grinding in compr. valves
2 springs for water relief valve
2 do. brine do. do.
2 do. CO₂ safety valve
1 pump for pressure lubricator
3 CO₂ gauges.
1 hydrometer.
12 wood cased thermometers
1 separator drain plug with pipe
36 safety valve discs
3-6 CO₂ valves + 9 spare pipe
1 fitted box for compr. parts.
6 bolts + 6 sets of leather washers for machine couplings.

ELECTRICAL SPARES.

1 Armature-packed } Motor for machines
1 Set of field coils }
1 Set of interpole coils } Centr. brine pump
1 Porous holder } V.D. brine pump
1 Set of brushes }
1 Set of brushes } 35", 12 1/2", fans.
1 Set of starter spares }
1 Spare motor + 1 set of brushes for 18" + 12" fans

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL, Manufacturer.

Chickson
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.	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.	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 gutterways of the respective chambers



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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

(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

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.*

This Machinery has been installed in the vessel, Examined under working conditions, and found satisfactory. Please see Rwe Report for Insulation, particulars of Cooling down tests etc.

*H. B. Forster
Newcastle-on-Tyne
21st Decr. 1933.*

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.
3	6	Cash. Aubrey	J. E. Hall Ltd	1933	Brine + Air		168	19	

For Rwe 1/12/33

Fee £ 19 0 0 { Fee applied for, 19
Travelling Expenses £ : : { Received by me, 19

*D. Gemmell
Surveyor to Lloyd's Register.*

Committee's Minute **FRI. 29 DEC 1933**

Assigned

See Rwe 48784



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