

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

Date of writing Report 4 NOV 1926

When handed in at Local Office 24 NOV 1926

Port of London

No. in

Reg. Book.

90511

Survey held at Belfast

Date: First Survey 30 June 1926

Last Survey 24 Sept 1926

(No. of Visits)

81X

on the Refrigerating Machinery and Appliances of the *Steel Trawler* "H.V. Port Fremantle"

Tons

Gross 807.2

Net 484.7

Vessel built at

Belfast

By whom built

Workman Clark & Co. Yard No. 489

When built

1926

Owners

Commonwealth & Dominion Line

Port belonging to

London

Voyage

✓

Refrigerating Machinery made by

J. E. Hall Ltd.

Machine No. 6594

When made

1926

Insulation fitted by

Gregson

When fitted 1927

System of Refrigeration *Carb. Anhyd.*

Method of cooling Cargo Chambers

Prime Grids

Air blown over

Side grids in tween decks.

Insulating Material used

Granulated Cork

Number of Cargo Chambers insulated

8

Total refrigerated cargo capacity 354,890 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed on 2nd deck, aft of Eng. RoomRefrigerating Units, No. of *Two* Single, double, or triple *Single* Cubic feet of air delivered per hourTotal refrigeration or ice-melting capacity in tons per 24 hours *132 tons* Are all the units connected to all the refrigerated chambers *yes*Compressors, driven direct or through *single* 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 *2"* Length of stroke *12"* No. of strokes per minute *300 each* motive Power supplied from *Electric motor direct coupled to each machine*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" journals + pins.*Breadth and thickness of crank webs *CO₂ machines 8" x 3 1/2"* No. of sections in crank shaft *one* Revolutions of engines per minute *CO₂ machines 150*Oil Engines, type *2 or 4 stroke cycle* Single or double actingNo. of cylinders *✓* Diameter *✓* Length of stroke *✓* Span of bearings as per RuleMaximum 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 minuteElectric Motors, type *open* No. of *1 per machine* Rated *120 H.P.* KilowattsVolts *220 at 150* 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 pinion2nd pinion *✓* 1st reduction wheel *✓* main shaft *✓* Pitch circle diameter, 1st pinion *✓* 2nd pinion1st reduction wheel *✓* Main wheel *✓* Width of face, 1st reduction wheel *✓* Main wheelDistance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion *✓* 2nd pinion1st reduction wheel *✓* Main wheel *✓* Flexible pinion shafts, diameter 1st *✓* 2ndPinion shafts, diameter at bearings, External, 1st *✓* 2nd *✓* Internal, 1st *✓* 2ndDiameter at bottom of teeth of pinion, 1st *✓* 2nd *✓* Wheel shafts, diameter at bearings, 1stMain *✓* Diameter at wheel shroud, 1st *✓* MainGas Condensers, No. of *1 per mach.* 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 12" x 12" duplex* how worked *Electric motor* Gas Separators, No. of *2 section*Gas Evaporators, No. of *1 per machine* Cast iron or steel casings *steel* Pressure or gravity type *pressure*No. of coils in each casing *8* 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 *✓* Are there two separate systems, so that one may be in use while the other is beingcleared of snow *✓* No. of coils in each battery *✓* Material of coils *✓* Can each coil be readily shut off ordisconnected *✓* Total cooling surface of battery coils *✓* Is a watertight tray fitted under each batteryAir Circulating Fans, Total No. of *3 - 20" dia* each of *8400* cubic feet capacity, at *830* revolutions per minute *maximum*Steam or electrically driven *electrically.* Where spare fans are supplied are these fitted in position ready for coupling upBrine Circulating Pumps, No. and size of, including the additional pump *1 - 9 1/2" x 8" V.D.* how worked *electrically thro' worm gear*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°1 hold = 10, N°2 hold = 12, N°4 hold = 12.**N°1 tween deck = 9, N°2 tween deck = 12, N°4 tween deck = 10, chere Port = 2, chere Star = 2*Can each section be readily shut off or disconnected *yes.* Are the control valves situated in an easily accessible position *yes.*

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
yes

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS	10-9-26	1000 lbs. □	3000 lbs. □	1500 lbs. □	D.G.	
" SEPARATORS	10-9-26	1000 lbs. □	3000 lbs. □	1500 lbs. □	D.G.	
" CONDENSER COILS	30-6-26 13-7-26	1000 lbs. □	3000 lbs. □	1500 lbs. □	D.G.	
" EVAPORATOR COILS	13-7-26 21-9-26	1000 lbs. □	3000 lbs. □	1500 lbs. □	D.G.	
" CONDENSER HEADERS AND CONNECTIONS	24-9-26	1000 lbs. □	3000 lbs. □	1500 lbs. □	D.G.	
" CONDENSER CASINGS	3-9-26	5 to 10 lbs. □	25 lbs. □		D.G.	
" EVAPORATOR CASINGS	24-9-26	20 to 25 lbs. □	50 lbs. □		D.G.	
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
BRINE PIPING AFTER ERECTION IN PLACE	25-1-27 to 26-3-27			90 lbs. □		

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory *yes*
Dates of test 3-11-27 to 4-11-27 Density of Brine 50 by Swadlow 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 *-8°* & *-3°*
or, delivery and return air at direct expansion or brine cooled batteries & outflow and return brine *-8°* & *-3°*
atmosphere *49°* F cooling water inlet and discharge *45°* F & *50°* F gas in condensers *62°* F and evaporators *19°* F
NH₃ Hold. 6° F TP. 6.25° F No. 2 Hold. 4.75° F TP. 9° F No. 4 Hold. 4.75° F TD. 5.25° F Charge Centre 5° 56m. 5°
the average temperature of the refrigerated chambers *12 1/2* hours
time after the machinery and cooling appliances have been shut off *5.9°* F = *17.2°* F per hour

SPARE GEAR.

ARTICLES SUPPLIED AS PER RULE.	ADDITIONAL SPARE GEAR SUPPLIED.
1 crankshaft 4 pistons & rods complete for compressors. 1 additional brine pump in engine room. 2 bolts and nuts for main bearings. 2 bolts and nuts for connecting rod crank pin end. 2 bolts and nuts for crosshead bearings. 1 set of two leather moulds. 3 lengths of 1 1/2" x 1 1/2" W.I. pipe. 3 W.I. bends each 1 1/2" x 1 1/2" bore. 12 W.I. sockets & backnuts each 1 1/2" x 1 1/2" 2 pairs of CO ₂ pipe flanges. 1 set of ratchet screwing dies to screw 1 1/2" x 1 1/2" pipe. 2 regulator valve spindles. Sundry brine cocks & valves. assorted both studs and nuts. 24 lubricator piston leathers. 24 lubricator gland leathers. 2 sets of copper joint rings for compressor. 1 set of copper joint rings for other joints. 8 sets of special metal rings for compressor glands. 2 sets of rings for compressor pistons. 1 set of valves for vertical duplex brine pumps. 1 plunger sleeve ring for vertical duplex brine pumps. 1 spindle and impeller for centrifugal brine pump. 1 spindle and impeller for water circulating pump.	4 sets of 14 valves seats & springs for compressors. 24 additional valve springs for compressors. 1 guide for grinding in comp. valves. 2 springs for water relief valve. 2 springs for brine relief valve. 2 springs for CO ₂ safety valve. 1 pair main bearing shells lined W.M. 1 pair crankpin shells lined W.M. 1 pair X head bearings with caps. 1 pump for pressure lubricator. 2 CO ₂ gauges. 6 wood cased thermometers. 1 separator drain plug with pip. 24 copper safety discs. 2 1/2" CO ₂ gauge valves & 6 spare pins. 1 fitted box for holding comp. parts. Set of springs for V.D. Brine pump valves.

ELECTRICAL SPARES.

	motor for Refrig. machs.	motor for Cent. Brine pump	motor for V.D. Brine pump	motor for fans.
Armature in zinc line case	1	1	1	1
Set of field coils.	1	1	1	1
Brush holder.	1	1	1	1
Set of brushes	1	1	1	1
Set of brushes	1	1	1	1
Set of Starter spares	1	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
Chichester
DIRECTOR
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. 173 A (Fore Peak)	✓	✓	G. Cork	1 1/2	1 1/4	✓	✓	G. Cork	1 1/2	1 1/4
FRAME No. 137 F	✓	✓	"	12 1/2	"	✓	✓	"	8 1/2	1 1/4
A	✓	✓	"	4	"	✓	✓	"	4	1 1/4
FRAME No. 107 F	✓	✓	"	11 1/2	1 1/4	✓	✓	"	11	1 1/4
A										
FRAME No. F										
A										
FRAME No. (Boiler Room) F										
A										
FRAME No. (Engine Room) F	✓	✓	G. Cork	11"	1 1/4	✓	✓	Cork slabs & cement	11	Cement
A	✓	✓	"	12	"	✓	✓	G. Cork	11	1 1/4
FRAME No. F										
A										
FRAME No. F										
A										
FRAME No. (After Peak) F										
SIDES	✓	✓	G. Cork	11 1/2-10 1/2	1 1/4	✓	✓	G. Cork	10 1/2	1 1/4
OVERHEADING	✓	✓	"	10 1/2	3/4 x 1"			"	10	3/4 x 1"
FLOORS OF CHAMBERS	✓	✓	"	7	2 1/2	✓	✓	✓	✓	✓
TRUNK HATCHWAYS						None				
THRUST RECESS, SIDES AND TOP						✓	✓	G. Cork	10	3" P.P.
TUNNEL SIDES AND TOP						✓	✓	"	10	"
TUNNEL RECESS, FRONT AND TOP						✓	✓	✓	✓	✓

FRAMES OR REVERSE FRAMES, FACE *1 1/2* grounds
BULKHEAD STIFFENERS, TOP *boxed in 1 1/2" insulated* BOTTOM *boxed in 1 1/2"* AND FACE *boxed in 1 1/2"*
RIBBAND ON TOP OF DECKS *3" P.P. x 3-8" to 3-0*
SIDE STRINGERS, TOP *3" G. Cork* BOTTOM *3" G. Cork* AND FACE *2" G. Cork*
WEB FRAMES, SIDES *None* AND FACE *✓*
BRACKETS, TOP *Inside insulation* BOTTOM *boxed in 1 1/2"* AND FACE *boxed in 1 1/2"*
INSULATED HATCHES, MAIN *6" G. Cork* BILGE *4 1/2" G. Cork* MANHOLE *4" in holds.*
HATCHWAY COAMINGS, MAIN *Both angles & P. Pine* BILGE *P. Pine*
HOLD PILLARS *2" P.P. & felt*
MASTS *None in chambers* VENTILATORS *no steel vents in chambers*
Are insulated plugs fitted to provide easy access to bilge suction roses *yes* tank, air, and sounding pipes *yes* heels of pillars *no* side lights *no*
and manhole doors of tanks *yes* Are insulated plugs fitted to ventilators *yes* cargo ports *yes* and side lights *no*
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected *yes* if so, how *1 1/2" clm in holds, 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 *Steel over oil tanks*
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 *clm 3 x 3 x 12" space*
fixed or portable *fixed sides bottom portable* Are screens fitted over the brine grids at chamber sides *yes, tunnel hinged or permanently fixed permanent*
Thermometer Tubes, No. and position in each chamber *Nº 1. H.T. wings 7. Nº 2 H.T. wings 4. Nº 4 holds 8. Total 6 wings*
diameter *2 1/2" inside* are they fitted in accordance with Section 3, Clause 8 *yes*
Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated *yes, felt, shot 2"*
Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers
Siphon scuppers to bilge Where *scuppers*, scupper pipes, and drain pipes are fitted are means provided for blanking them off *Screw plugs*
What provision is made for draining the refrigerating machinery room *Overboard scuppers*
brine return room *overboard scuppers* fan room *✓* water circulating pump room *overboard scuppers*
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers. *yes*

Sounding Pipes, No. and position in each chamber situated below the load water line *one to each bilge at aft end of hold.*

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 provision rooms*

How is the expanded metal secured in place *lugs*

How are the cork slabs secured to the steel structure of the vessel *Bitumastic in provision 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 *ships sides & bulkheads.*
Portable runs in front of side grids in trunk only.

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, & at B.H. etc.*

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

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

PRO WORKMAN, CLARK & CO., LIMITED,
W. St. K. Mable
ASSISTANT SECRETARY Builders.

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

Is the Refrigerating Machinery and Appliances duplicate of a previous case *yes* If so, state name of vessel *"Port-Dunedin"*

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. Insulation fitted in accordance with the Rules & Approved Specification. The prime pipes were tested to 40 lbs. The machinery was satisfactorily installed and tested under working conditions. The vessel is now eligible, in my opinion, to be classed and have record.*
LLOYD'S R.M.C. 4. 27.

It is submitted that
this vessel is eligible for
THE RECORD. + LLOYD'S RMC 4. 27.

W.D.
7/4/27
Jy

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. Tons.	No.	Capacity.
<i>2 Single</i>	<i>J. E. Hall Ltd.</i>	<i>1927</i>	<i>carb. anhyd.</i>	<i>Hall. Cork granulated.</i>	<i>Prime circulation</i>	<i>132.</i>	<i>132.</i>	<i>8</i>	<i>354890</i>

Fee *£30:* *Inv Bel 25/11/26*
Travelling Expenses £ *19: 4* *Fee applied for, 6-4-1927*

Bel. of Special Committee's Minute *Received by me, 1. 6. 1927*
8 APR 1927

Assigned *+ Lloyd's Rmb 4. 27*
Wly

D. Gemmell *G. D. Cusker*
Surveyor to Lloyd's Register.
R. Lee Ames.



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Foundation