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GRK. REPORT NO. 20248

No. 5958

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

28 APR 1936

Date of writing Report 28 APR 1936 When handed in at Local Office 28 APR 1936 Port of London. Greenock

No. in Reg. Book. Survey held at Greenock Date: First Survey 7. 2. 36 East Survey 20. 4. 1936

73221. GRK. D.O. 22nd MAY. 1936. Do 19/03/36 No. of Visits 11

on the Refrigerating Machinery and Appliances of the S.S. PERTSHIRE Tons 25

Vessel built at Greenock By whom built Greenock Dry Dock Co. Ltd. Yard No. 425 When built 1936

Owners The Clan Line Steamers Ltd. Port belonging to Glasgow Voyage 1

Refrigerating Machinery made by J. E. Hall Ltd. Machine No. 9446 When made 1936

Insulation fitted by The Greenock Dock Co. Ltd. When fitted 1936 System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers Brine + Air Insulating Material used GRAN. CORR. SLAB CORR. & SILICATE COTTON.

Number of Cargo Chambers insulated # 12 Total refrigerated cargo capacity 445,000 cubic feet. 393730.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Main dk. aft main E.R.

Refrigerating Units, No. of 2 Single, double, or triple — Cubic feet of air delivered per hour 16,920,000

Total refrigeration or ice-melting capacity in tons per 24 hours 135 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 No. of cylinders 2

Diameter of cylinders 6 1/8" Diameter of piston rod 2 3/4" Length of stroke 18" No. of strokes per minute 240 each

Motive Power supplied from Direct acting tandem compound engine

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders 4 Diameter 2 - H.P. 12"

Length of stroke 18" Working pressure 120 lb. sq. in. Diameter of crank shaft journals and pins 7 1/2" journals, 8" pins

Breadth and thickness of crank webs 11" x 6" No. of sections in crank shaft one each machine. Revolutions of engines per minute 135.

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 cylindrical

No. of coils in each 16 Material of coils S.D. Copper 3/4" b. x 1' 0" Can each coil be readily shut off or disconnected yes.

Water Circulating Pumps, No. and size of 2 - 6" centrifugal how worked Steam Gas Separators, No. of —

Gas Evaporators, No. of 2 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" b. x 1 5/16" od. Can each coil be readily shut off or disconnected yes.

Direct Expansion or Brine Cooled Batteries, No. of 9 twin Are there two separate systems, so that one may be in use while the other is being cleared of snow yes

No. of coils in each battery See below Material of coils S.D. Steel 1 1/2" b. x 4 1/4" Can each coil be readily shut off or disconnected yes.

Total cooling surface of battery coils 14,800 sq. ft. Is a watertight tray fitted under each battery yes

Air Circulating Fans, Total No. of 18 each of See separate list 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 - 8" x 11" x 10" V.D. how worked Steam direct

2 - 6" x 4" x 10" V.D. Brine Cooling System, closed or open closed Are the pipes and tanks galvanised on the inside no

* No. of brine sections in each chamber 1 Tw. dk. Port = 2G, 1 Tw. dk. Starb = 2G, 2 UTw. dk. {5G, 2 LTw. dk. {5G, 2 Hold {4G

3 UTw. dk. {4G, 3 LTw. dk. {4G, 4 UTw. dk. {4G, 4 LTw. dk. {4G, 4 Hold {4G, 3 Hold {4G

Can each section be readily shut off or disconnected yes. Are the control valves situated in an easily accessible position yes.

* G indicates grid sections
C " Cooler "

NOTE - THE WORDS WHICH DO NOT APPLY SHOULD BE DELETED.

Im. 6.31.-T.

Steam Condensing Plant. *State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14.*

HYDRAULIC AND OTHER TESTS.

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory *Yes*

Dates of test *15-16-10-36* Density of Brine *48°* by *Snodgrass* 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 *3°F.* & *5°F.*, outflow and return brine *-8°F.* & *-6°F.*
atmosphere *58°F.* cooling water inlet and discharge *53°F.* & *59°F.* gas in condensers *78°F.* and evaporators *-10°F.*
the average temperature of the refrigerated chambers *4°F.* and the rise of temperature in these chambers upon the expiration of *12* hours
time after the machinery and cooling appliances have been shut off *10 Fahrenheit degrees.*

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.

ELECTRICAL SPARES for FAN MOTORS

Motors are interchangeable for either internal or external type of fan motor, for each of their respective sizes.

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL, LTD.

Manufacturer.

Chick 104821
for DIRECTOR

IN LOWER HOLD CHAMBERS.

IN 'TWEEN DECK CHAMBERS.

FRAMES OR REVERSE FRAMES, FACE UNDER INSULATION.

BULKHEAD STIFFENERS, TOP UNDER INSULATION. BOTTOM UNDER INSULATION. AND FACE UNDER INSULATION.

RIBBAND ON TOP OF DECKS 5" x 2 1/2" R. P. BEDDED IN NAVALOID.

SIDE STRINGERS, TOP ✓ BOTTOM ✓ AND FACE ✓

WEB FRAMES, SIDES ✓ AND FACE ✓

BRACKETS, TOP ✓ BOTTOM ✓ AND FACE ✓

INSULATED HATCHES, MAIN 6" SLAB CORN. 1" T. O. G. 8" PLUG. BILGE 6" SLAB CORN. 20 1/2" TOP } 9 1/2" 10 1" BOT. MISC. MANHOLE 6" SLAB CORN. 20 1/2" TOP } 9 1/2" 10 1" BOT. } PLUG.

HATCHWAY COAMINGS, MAIN P. P. VARIOUS DEPTHS 6" THICK. BILGE 8 1/2" x 5 1/4" TO 2 1/2" R. P.

HOLD PILLARS 2" GRAN. CORN. 1 1/4" CHECK LINING.

MASTS 4" GRAN. CORN. 1" T. O. G. VENTILATORS 4" GRAN. CORN. 1" T. O. G.

Are insulated plugs fitted to provide easy access to bilge suction roses YES. tank, air, and sounding pipes YES. heels of pillars YES.

and manhole doors of tanks YES. Are insulated plugs fitted to ventilators YES. cargo ports ✓ and side lights ✓

Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected YES. if so, how BY 2" ELM.

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 CORRUGAM FILTER.

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

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 Battsens, Dimensions and spacing, sides { HOLD 2 x 2 @ 7" W IN 3" IN. CLEAR OF AIR TRUNNING (FIXED) } floors { 2 x 2 IN WOLDS. 2 x 2 IN WOLDS. } tunnel top 2 x 2 (PORTABLE.)
fixed or portable AS SHOWN. Are screens fitted over the brine grids at chamber sides hinged or permanently fixed

Thermometer Tubes, No. and position in each chamber

	$\left\{ \begin{array}{l} N^{\circ} 1 \text{ H.O.D. } 2 \text{ FOR } 2^{\circ} \text{ CENTRAL } 2 \text{ ART. } 2^{\circ} \text{ D.I.A. } \\ N^{\circ} 2 \text{ H.O.D. } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \end{array} \right\}$	$\left\{ \begin{array}{l} N^{\circ} 3 \text{ H.O.D. } 2 \text{ FOR } 2^{\circ} \text{ ART. } 2^{\circ} \text{ D.I.A. } \\ N^{\circ} 4 \text{ H.O.D. } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \end{array} \right\}$
<i>Simultaneous</i>	$\left\{ \begin{array}{l} N^{\circ} 4 \text{ H.O.D. } 2 \text{ C. } 2 \text{ D. } 2^{\circ} \text{ D.I.A. } \\ N^{\circ} 6 \text{ H.O.D. } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \end{array} \right\}$	$\left\{ \begin{array}{l} N^{\circ} 2 \text{ H.O.D. } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \\ N^{\circ} 5 \text{ H.O.D. } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \text{ } 2^{\circ} \end{array} \right\}$

are they fitted in accordance with Section 9 (C) or not

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

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

TRAMPER SCUPPERS TO AIRGE. Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off. YES.

What provision is made for draining the refrigerating machinery room SCUPPER TO BILGE

brine return room SCUPPER TO RIGGE. fan room SCUPPER TO RIGGE. water circulating pump room IN ENGINE ROOM.

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

ns provided for blanking them off yes.
© 2020
ing pump room IN FINE ROOM.
bers ✓ Lloyd's Register
Foundation

Sounding Pipes, No. and position in each chamber situated below the load water line *1 P.S. N. N. 20 3 HOLS. 1 P.S. & 1 M.T.W. WAINES IN N. 4 HOLS.*

Diameter *2 1/2" & 1 1/2" AS APPROVED*. 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 *✓*

How is the expanded metal secured in place *✓*

How are the cork slabs secured *to the steel structure of the vessel* *FITTED IN SQUARES RAISED BY 6" x 2" WOOD GROUNDERS.*

Air Trunkways in Chambers, inside dimensions, main *VARYING 11'0" x 1'1" TO 8'0" x 2'8"* and branch *21" x 4 1/4" TO 18" x 4"*

Are they permanently fixed or collapsible, or portable *PERMANENT*. State position in chambers *ROUND WALLS.*

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" & 1 1/4"*. Are they galvanised externally *YES*.

How are they arranged in the chambers *ROOF RIDGERS IN ALL SPACES: SIDE & END RIDGERS ALSO IN CHEESE ROOMS.*

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers *BRINE HEATS IN REFRIGERATING ENGINE ROOM.*

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

THE GREENOCK DOCKYARD CO. LTD
K. MacInnes SECRETARY Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *✓* and Insulation *for 7 in W.*

(If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case *NO. 10-36*. If so, state name of vessel *T.S.S. "PERTHSHIRE"*

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 and will be eligible for the notation + Lloyd's R.M.C. (with date) when the installation and testing have been satisfactorily completed.*

These refrigerating appliances have been properly fitted on board, tried under working conditions & found satisfactory — results of insulation test are embodied in this report.

The vessel's refrigerating installation is eligible in my opinion to be classed in the Register Book with record — & Lloyd's R.M.C. — 10-36.

It is submitted that this vessel is eligible for THE RECORD. & Lloyd's R.M.C. 10-36
25/10/36.

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.
2	2	Casblunby	J. E. Hall Ltd.	1936	(CO ₂ + Brine) (1) 4-10-36	16,920,000	135	#	445,000 13. 393,730.

Fee *£24-0-0* Fee applied for *25 APR 1936* (1/2 Grn)
 Travelling Expenses *£12-0-0* Received by me *27.10.36* 29/12
225-1/- pd 28.12.36

Late attendance 21-1/- for 1st
 Committee's Minute *FRI. 28 OCT 1936*

Assigned *+ Lloyd's R.M.C. 10, 36*

D. Geinwell
 Surveyor to Lloyd's Register.
H. J. Swinton
J. Boyle

