

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

13 JAN 1944

Date of writing Report **13 JAN 1944** When handed in at Local Office **13 JAN 1944** Port of **London**
No. in Reg. Book. Survey held at **London**. Date: First Survey **14th Sept.** Last Survey **7th January 1944**
(No. of Visits **11**)

on the Refrigerating Machinery and Appliances of the **"EMPIRE TALISMAN"** Tons {Gross.....
Net.....
Vessel built at **Port Glasgow** By whom built **Lithgows Ltd** Yard No. **997** When built **1943**.
Owners **Ministry of War Transport** Port belonging to Voyage
Refrigerating Machinery made by **J. E. Hall Ltd.** Machine Nos. **11356** When made **1943**
Insulation fitted by When fitted **240** System of Refrigeration **NH₃ + Air**.
Method of cooling Cargo Chambers **air cooled** Insulating Material used
Number of Cargo Chambers insulated **3** Total refrigerated cargo capacity **300,310** cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed **Aft of main engine room.**

Refrigerating Units, No. of **2** No. of machines **2** Is each machine independent **yes**

Total refrigeration or ice-melting capacity in tons per 24 hours **72** Are all the units connected to all the refrigerated chambers **yes**

Compressors, driven ~~directly~~ through **single** **Vee belts** reduction gearing. Compressors, single or double acting **single** If multiple effect compression **no**

Are relief valves or safety discs fitted **yes** No. of cylinders to each unit **2** Diameter of cylinders **8"**

Diameter of piston rod **trunk pistons** Length of stroke **8"** No. of revolutions per minute **400**

Motive Power supplied from (State number of boilers, oil engines or electric generators supplying the motive power.)

Steam Engines, ~~high pressure, compound, or triple expansion,~~ surface condensing. No. of cylinders **2** Diameter **H.P.=7" L.P.=11"**

Length of stroke **5"** Working pressure **180 lb. sq. in.** Diameter of crank shaft journals and pins **NH₃ Compr: 4 9/16" fls - 4 1/2" pins**

Breadth and thickness of crank webs **NH₃ Compr: 4 1/8" x 5 7/8" oval** Engines **3 3/4" x 2 1/8" x 1 7/8"** No. of sections in crank shaft **one - each cell** Revolutions of engines per minute **700/350**

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

AIR RECEIVERS:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule

Can the internal surfaces of the receivers be examined What means are provided for cleansing their inner surfaces

Is there a drain arrangement fitted at the lowest part of each receiver If made under survey

No. of Receivers Cubic capacity of each Internal diameter thickness

Seamless, lap welded or riveted longitudinal joint Material Range of tensile strength Working pressure by Rules

Electric Motors, type No. of Rated Kilowatts

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

Reduction Gearing Pitch circle diameter, pinion Main wheel Width of face

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, pinion Main wheel

Pinion shafts, diameter at bearings Main wheel shaft, diameter at bearings

Gas Condensers, No. of **2** Cast iron or steel casings **cast iron** Cylindrical or rectangular **cylindrical** Are safety valves fitted

to casings **yes** No. of coils in each **9** Material of coils **S.D. Steel 1 1/2" x 1 1/2"** Can each coil be readily ~~shut off or~~ disconnected **yes**

Water Circulating Pumps, No. and size of pumps available **1-4" horiz. centrif. how worked electrically** Gas Separators, No. of **3**

Gas Evaporators, No. of Cast iron or steel casings Pressure or gravity type If pressure type, are safety

valves fitted No. of coils in each casing Material of coils Can each coil be readily shut off or disconnected

Direct Expansion or Brine Cooled Batteries, No. of **6 in 3 groups of 2 each** Are there two separate systems, so that one may be in use while the other is being

cleared of snow **no** No. of coils in each battery **5** Material of coils **S.D. Steel 1 1/2" bore.** Can each coil be readily ~~shut off or~~

disconnected **yes** Total cooling surface of battery coils **12,100 sq. ft.** Is a watertight tray fitted under each battery **yes.**

Air Circulating Fans, Total No. of **6-35"** each of **19,000** cubic feet capacity, at **1320** 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 how worked

Brine Cooling System, closed or open Are the pipes and tanks galvanised on the inside

No. of ~~coolers~~ **direct expansion** in each chamber **2 coolers in each space, each cooler with 5 sections.**

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 pipe ^{NH₃} 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.
 Are the number and capacity of the machines and the number of pumps and sea connections in accordance with Section 2, Clause 1 of the Rules yes.
 Is the exhaust steam led to the main and auxiliary condensers yes. M.C.

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS	24-9-43	185 lb. □	600 lb. □	350 lb. □	OK	
SEPARATORS	29-9-43	do.	500 lb. □	250 lb. □	OK	
CRANKCASES	21-9-43	32 lb. □	300 lb. □	175 lb. □	OK	
MULTIPLE EFFECT RECEIVERS	22-10-43					
CONDENSER COILS	2-11-43	185 lb. □	1500 lb. □	500 lb. □	OK	
EVAPORATOR COILS	5-11-43	do.	do.	do.	OK	
CONDENSER HEADERS AND CONNECTIONS	7-1-44	do.	do.	do.	OK	
CONDENSER CASINGS	3-12-43	10-15 lb. □	30 lb. □		OK	
EVAPORATOR CASINGS	none.					
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	16.6.44			200 lbs.	M.C.	
BRINE PIPING AFTER ERECTION IN PLACE						

Have important steel castings and forgings been tested in accordance with the Rules yes.
Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory yes. M.C.
 Dates of test 20.6.44 M.C. Density of Brine — by — hydrometer
 Temperatures (when the cargo chambers are cooled down to the required test temperatures) of 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 working parts of the machines, pumps and motors respectively, interchangeable yes
 Has the spare gear required by the Rules been supplied yes
Additional Spare Gear Supplied: 3 main bearings for Comps, 1 complete Cyl's cover, 3 sets gland packing, 2 oil sight glasses, 2 drip feed sight glasses, 1/2 doz. safety valve discs, NH₃ gauge, 1 gauge valve, 1 set dies for 1" x 2" pipe, 1 set Vee belts, 1 set comp. joints, 2 sets other joints for NH₃ pipes etc., 2 springs for water relief valves, 2 thermometers, 1 plunger for forced lub. pump, 2 pr. NH₃ flanges, 1 impeller + shaft for cooling water pump, 1 fitted box for parts.
FOR STEAM ENGINES. **ELECTRICAL SPARES.**
 2 sets H.P. piston rings Water pump motor.
 2 " L.P. " " 1 armature (packed)
 2 " Governor Springs 1 set bearings
 2 " Springs for piston rings 1 set field coils
 Sundry springs, 2 oil pump strainers & gauges 1 set interpole coils
 2 sets metallic wearing parts H.P. piston rod 1 line brush holder
 2 " " " " L.P. " " 1 set carbon brushes
 2 " " " " value rod 1 set controller spares
 2 " of Centre points **FAN MOTORS.**
 1 pair crankpin bearings 1 complete motor
 1 " crosshead bearings 6 sets carbon brushes
 1 set main bearings 2 sets controller spares
 1 Storage case for above.

The foregoing is a correct description of the Refrigerating Machinery.

Robert
 J. & R. HALL, LTD
 Manufacturer.
 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. 98 F						NONE	NONE	SLAB CORK	10"	2 THK'S OF 1" HOOD.
FRAME No. 81 F						NONE	NONE	SLAB CORK	10"	2 THK'S OF 1" HOOD.
FRAME No. 51250 (Boiler Room) A						NONE	NONE	SLAB CORK	10"	2 THK'S OF 1" HOOD.
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 YES. 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
 and for draining the tank top

Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat 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 Battens, Dimensions and spacing, sides floors tunnel top
 fixed or portable Are screens fitted over the brine grids at chamber sides NO hinged or permanently fixed

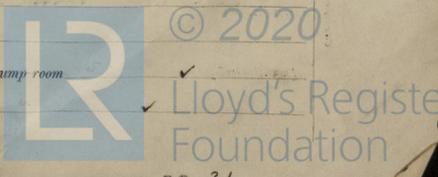
Thermometer Tubes, No. and position in each chamber 6 IN N°2 HOLD 6 IN N°3 HOLD 6 IN N°4 HOLD
6 IN " TWIN DKS. 4 " " TWIN DKS 4 " " TWIN DKS.
 diameter 2 1/2" BORE. are they fitted in accordance with Section 3, Clause 8 YES.

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

Draining Arrangements. 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 SCUPPERS TO BILGE
 brine return room SCUPPERS TO BILGE. fan room SCUPPERS TO BILGE. 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 *ONE P&S IN EACH HOLD.*

Diameter *2 1/2" BORE.* 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 *NONE.*

How is the expanded metal secured in place *NONE.*

How are the cork slabs secured to the steel structure of the vessel *NO.*

Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans *YES (COOLER SPACES ONLY)*

Are they permanently fixed or collapsible, or portable *PERMANENTLY FIXED.*

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 *NONE.* Minimum thickness 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.

For LITHGOWS LIMITED *Builders.*

For Cooler Room only

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery and Insulation *NO PLAN APPROVED.*

Is the Refrigerating Machinery and Appliances duplicate of a previous case *NO* 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, etc.) *The refrigerating machinery was constructed under special survey and the materials and workmanship are good and it will be eligible for the notation + Lloyd's R.M.C. (with date) when the installation and testing have been satisfactorily completed*

The insulation of refrigerated holds is to be carried out at a berth American port. The machinery was run for 12 hours and batteries cooled down satisfactorily. M. Caldwell. Japanson

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours. Tons.	Is Refrigerating Machinery properly Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
2	4	Ammonia	J. E. Hall & Co.	1943	(1) Air	72	3	300,310	

Fee *Low 1/2 1/8* £ 16 : 0 : 0 (See br 522/1104) Fee applied for, 14/11 144.
Travelling Expenses £ : : (Received by me, 19)

D. Gemmell.
Surveyor to Lloyd's Register.

Committee's Minute **FRI. 8 DEC 1944**

Assigned *See Mtbl. 6365*



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