

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

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Date of writing Report 19 When handed in at Local Office 29.7.44 Port of GLASGOW.
No. in Reg. Book. Survey held at GLASGOW. Date: First Survey 24-2-44 Last Survey 26-6-1944 (No. of Visits 22.)

on the Refrigerating Machinery and Appliances of the ^{3/4}EMPIRE LADY. Tons { Gross... Net...
Vessel built at NEWCASTLE-ON-TYNE By whom built Sir W.G. Armstrong Whitworth & Co. Ltd., Yard No. 8 When built 1944
Owners Port belonging to Voyage
Refrigerating Machinery made by L. STERNE & CO. LTD., Machine Nos. 2576 2577 When made 1944
Insulation fitted by When fitted System of Refrigeration N.H.3
Method of cooling Cargo Chambers Insulating Material used
Number of Cargo Chambers insulated Total refrigerated cargo capacity cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed

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 64 Are all the units connected to all the refrigerated chambers YES
Compressors, driven ~~direct~~ ^{single} ~~through~~ ^{Vee Belt} ~~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 4 Diameter of cylinders 7 1/2"
Diameter of piston rod TRUNK PISTONS Length of stroke 6" No. of revolutions per minute 410
Motive Power supplied from 3 Boilers (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 7" + 11"
Length of stroke Working pressure 180 lbs. Diameter of crank shaft journals and pins Belliss & Morcom by nos 10129 & 10130
Breadth and thickness of crank webs No. of sections in crank shaft See Birmingham Certs C. 3132 of 7/19/44
Revolutions of engines per minute

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 ~~Cylindrical~~ steel casings LAP WELDED Cylindrical or rectangular CYLINDRICAL Are safety valves fitted
to casings NO No. of tubes in each 80 Material of tubes SOLID DRAWN/STEEL Can each coil be readily shut off or disconnected
1 1 1/16" O.D. x 10 W.G.T.H. 2 Delivery
how worked Gas Separators, No. of 1 Suction

Water Circulating Pumps, No. and size of pumps available Pressure or gravity type If pressure type, are safety valves fitted
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 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 5 Material of coils HOT ROLLED WELDLESS STEEL Can each coil be readily shut off or disconnected YES Total cooling surface of battery coils 12000 sq. Ft. Is a watertight tray fitted under each battery YES
1 29/32 O.D. x 7 W.G.

Air Circulating Fans, Total No. of 6 each of 17,500 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

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 brine sections in each chamber
Can each section be readily shut off or disconnected Are the control valves situated in an easily accessible position

NOTE: THE WORDS WHICH DO NOT APPEAR IN BRACKETED TYPE ARE NOT TO BE REPRODUCED IN THE REPORT.



Are thermometers fitted to the outside 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

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

Is the exhaust steam led to the main and auxiliary condensers

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)	6-4-44	200 lbs/	600 lbs/	300 lbs/		
GAS COMPRESSORS	19-6-44	sq. in.	sq. in.	sq. in.	W.A.L.	
" SEPARATORS	31-3-44	200 lbs/	600 lbs/	300 lbs/	W.A.L.	
" CONDENSER RECEIVERS	17-4-44	sq. in.	sq. in.	sq. in.	H.C.	
" SHELL & TUBE	30-3-44	200 lbs/	600 lbs/	300 lbs/	W.A.L.	
" CONDENSER COILS	24-2-44	sq. in.	sq. in.	sq. in.	W.A.L.	
" AIR COOLER	20-6-44	200 lbs/	1500 lbs/	500 lbs/	W.A.L.	
" CONDENSER COILS	18-5-44	sq. in.	sq. in.	sq. in.	W.A.L.	
" CONDENSER HEADERS AND CONNECTIONS	14-6-44	200 lbs/	1000 lbs/	500 lbs/	W.A.L.	
" CRANK CASES	15-6-44	sq. in.	sq. in.	sq. in.	W.A.L.	
" LIQUID TRAP COIL	23-5-44	40 lbs/	300 lbs/	150 lbs/	W.A.L.	
" LIQUID TRAP	25-5-44	sq. in.	sq. in.	sq. in.	F.D.	
NH CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	29-3-44	200 lbs/	1500 lbs/sq.in	500 lbs/sq.in	W.A.L.	
BRINE PIPING AFTER ERECTION IN PLACE	22/8/44			200 lbs/10		

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

Dates of test _____ 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

atm sphere _____ cooling water inlet and discharge _____ & _____ outflow and return brine _____ & _____

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: **SEE ATTACHED LIST.**

The foregoing is a correct description of the Refrigerating Machinery.

For L. Stern & Co. Ltd. *P.B.A. Brown* 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. (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. (After Peak)	F									
SIDES										
OVERHEADING										
FLOORS OF CHAMBERS										
TRUNK HATCHWAYS										
THRUST RECESS, SIDES AND TOP										
TUNNEL SIDES AND TOP										
TUNNEL RECESS, FRONT AND TOP										

BULKHEADS.

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 _____

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 _____

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. 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 _____

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 5, 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. Are the arrangements satisfactory and in accordance with the approved plans

Are they permanently fixed or collapsible, or portable _____

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 _____ 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.

Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery No 30-3-42 and Insulation No 18-8-42
(If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case YES If so, state name of vessel S.S. "EMPIRE GERANT" Glasgow Report No. 66404.

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 built under special survey, in accordance with the rules and approved plans, and the material and workmanship are good.

The refrigerating machinery has been despatched to Messrs. Sir W. G. Armstrong Whitworth for installation in their Yard No. 8 and will be eligible, in our opinion, to have record **LLOYDS R.M.C.** with date on completion.

The Refrigerating machinery driven by two Steam Engines by Belliss & Morcom (no 10129 & 10130) as per Birmingham Cert/C. 3138 have been satisfactorily fitted on board the S.S. EMPIRE LADY. The machinery was run at full revs. for about 12 hours and found satisfactory.

A Watt
Newcastle on Tyne
Sept 1944.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours.	Is Refrigerating Machinery Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
2	8	N.H.3	L. STERNE & CO. LTD.	1944	1) AIR	Tons. 64	No	-	-

Carriage to be sent to

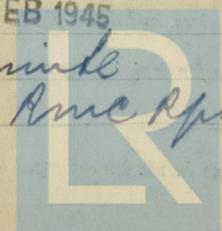
2/3 Fee GLASGOW..... £ 16 : 0 : 0 } Fee applied for, 1 AUG 1944
Travelling Expenses £ : : } Received by me, 19

Committee's Minute GLASGOW 1 AUG 1944

Assigned Deposed for
Completion

W. A. Suggat M. Deh
Surveyor to Lloyd's Register.

FRI, 9 FEB 1945
see minute
on J.G. Amc Rpt.



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Foundation