

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

Date of writing Report 13th May 1925 When handed in at Local Office 13th May Port of NEWCASTLE-ON-TYNE
 No. in Reg. Book. 63594 Survey held at Newcastle on Tyne Date: First Survey 10th Sept. 1924 Last Survey 4th May 1925
 (No. of Visits)

on the Refrigerating Machinery and Appliances of the S.S. Ascania Tons { Gross 13960 Net 14013
 Vessel built at Newcastle By whom built Sir W. G. Armstrong Whitworth & Co. Ltd. Ward No. 971 When built 1925
 Owners Cunard S.S. Co. Ltd. Port belonging to Liverpool Voyage Southampton to Lond.
 Refrigerating Machinery made J. & C. Hall Ltd Machine No. 6149-6150 When made 1925
 Insulation fitted by Armstrong Whitworth & Co. When fitted 1925 System of Refrigeration CO₂ & Brine
 Method of cooling Cargo Chambers Sir Blomley's brine grids Insulating Material used Granulated cork
 Number of Cargo Chambers insulated 4 in No 6 hold Total refrigerated cargo capacity 73928 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY Where placed Halls. D deck at No 2 Hatch
 Refrigerating Units, No. of 2 Single, double, or triple Single Cubic feet of air delivered per hour ✓

Total refrigeration or ice-melting capacity in tons per 24 hours 24 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 1 to each

Diameter of cylinders 3 1/4" Diameter of piston rod 1 3/4" Length of stroke 12" No. of strokes per minute 140

Motive Power supplied from Main dynamos through motors.

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders None Diameter ✓

Length of stroke ✓ Working pressure ✓ Diameter of crank shaft journals and pins ✓

Breadth and thickness of crank webs ✓ No. of sections in crank shaft ✓ Revolutions of engines per minute ✓

Oil Engines, type None 2 or 4 stroke cycle ✓ Single or double acting ✓

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 Compound Wound Protected No. of one to each machine Rated 40 B.H.P. Kilowatts ✓

Volts at 240 at 70 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 not

1st reduction wheel ✓ Main wheel ✓ Width of face, 1st reduction wheel ✓ Main wheel Constructed

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion ✓ 2nd pinion under

1st reduction wheel ✓ Main wheel ✓ Flexible pinion shafts, diameter 1st ✓ 2nd ✓ Service

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 Stul Cylindrical or rectangular Rectangular

No. of coils in each 2 Material of coils Copper Can each coil be readily shut off or disconnected yes

Water Circulating Pumps, No. and size of 2 Rotor how worked Elec. motor Gas Separators, No. of 2

Gas Evaporators, No. of 2 Cast iron or steel casings Stul Pressure or gravity type Pressure

No. of coils in each casing 2 Material of coils S & S Stul Can each coil be readily shut off or disconnected yes

Direct Expansion or Brine Cooled Batteries, No. of None Are there two separate systems, so that one may be in use while the other is being

cleared of snow ✓ No. of coils in each battery ✓ Material of coils ✓ Can each coil be readily shut off or

disconnected ✓ Total cooling surface of battery coils ✓ Is a watertight tray fitted under each battery ✓

Air Circulating Fans, Total No. of one Sirocco each of 7000 cubic feet capacity, at ✓ revolutions per minute ✓

Steam or electrically driven Electric motor Where spare fans are supplied are these fitted in position ready for coupling up spare

Brine Circulating Pumps, No. and size of, including the additional pump Two 6x6x6" how worked Steam yes

Brine Cooling System, closed or open Closed Are the pipes and tanks galvanised on the inside No

No. of brine sections in each chamber No 2 hold (8) { No 2 inner ducts forward (5) {

No 6 hold 6 sections { No 2 " " { aft ports (2) {

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.

Are thermometers fitted to the outflow and to each return brine pipe *yes* Where the tanks are closed are they ventilated as per Rules *Halls open*
Where the tanks are not closed is the compartment in which they are situated efficiently ventilated *ventilation by door only*
Steam Condensing Plant. State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14 *Crane pumps*
Steam exhaust led to auxiliary condenser.

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)		✓	✓	✓	✓	
GAS COMPRESSORS		✓	✓	✓	✓	
" SEPARATORS		✓	✓	✓	✓	
" CONDENSER COILS		✓	✓	✓	✓	
" EVAPORATOR COILS		✓	✓	✓	✓	
" CONDENSER HEADERS AND CONNECTIONS		✓	✓	✓	✓	
" CONDENSER CASINGS		✓	✓	✓	✓	
" EVAPORATOR CASINGS		✓	✓	✓	✓	
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	27/3, 3/4/25					
BRINE PIPING AFTER ERECTION IN PLACE	20/4, 22/4/25					

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory *yes*
Dates of test *7/5/9 April & 23rd May 1925* by *J. E. Halls* 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, delivery and return air at direct expansion or brine cooled batteries *L.R.C. 50° & 55°*
atmospheric *Halls 45°* cooling water inlet and discharge *45° & 53°* gas in condensers *64 to 72* and evaporators *40 to 16*
the average temperature of the refrigerated chamber *Halls 33 1/2°* and the rise of temperature in these chambers upon the expiration of *L.R.C. 12* hours time after the machinery and cooling appliances have been shut off *10° and after 24 hours 18°*
Halls 4°

Liverpool Refrigerating Co's SPARE GEAR. *For J. E. Halls. See London report in 22183.*

1 Crane shaft, 1 pair crank pin brasses & liners
1 pair crank shaft bolts & nuts
2 main bearing studs & nuts, one compressor piston rod & nuts sundry brine
2 compressor suction & delivery valves & seats, one set
of jointing, 1 CO₂ gauge, 1 Gauge valve, 1 hydrometer
Main Motors.
Motor & armature, one set of field coils, 1 set of brushes, 1 pair main bearing brasses, one spare pinion
and a complete set of starters, one gear wheel & pedestal.
Pump Motors.
One armature, 1 set of field coils, 1 set of brushes, 1 pair
bearing brasses, one impeller & bearing & gland and
a set of starters
fan motor
1 armature, 1 set of field coils, 1 set of brushes & starters.
Water circulating pump
one fabric or composite paper pinion, one impeller & spindle
1 armature & set of field coils
Crane pumps
Complete set of piston rings & pump valves.

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED ✓

The foregoing is a correct description of the Refrigerating Machinery.

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.
N ^o 2 Hold										
FRAME No. (Fore-Peak)	A									
FRAME No. 149-169	F	✓	✓	Lean cork 12"	1" + 3/4"	✓	✓	Lean cork 11"	1" + 1/2"	
	A	✓	✓	" "	11	✓	✓	" "	11	1" + 1/2"
N ^o 6 Hold										
FRAME No. 20-44	F	✓	✓	" "	10 1/2	✓	✓	" "	10 1/2	7/8 + 5/8
	A	✓	✓	" "	9	✓	✓	" "	9	7/8 + 5/8
FRAME No. (Tunnel flat to '6" deck)	F									
	A									
FRAME No. (Boiler Room)	F									
	A									
FRAME No. (Engine Room)	F									
	A									
FRAME No.	F									
	A									
FRAME No.	F									
	A									
FRAME No.	F									
	A									
FRAME No. (After Peak)	F									
SIDES		✓	✓	Lean cork 11 1/2"	1" + 3/4"	✓	✓	Lean cork 11 1/2"	7/8 + 5/8	
OVERHEADING	N ^o 2 H.	✓	✓	" "	10 1/2	✓	✓	" "	10 1/2	7/8 + 5/8
	N ^o 6 H.	✓	✓	" "	10 1/2	✓	✓	" "	10 1/2	7/8 + 5/8
FLOORS OF CHAMBERS	N ^o 2	✓	✓	Lean cork 7"	1" + 1/2"	✓	✓	Lean cork 7"	1" + 1/2"	2" elm under hatched.
TRUNK HATCHWAYS		✓	✓				✓			
THRUST RECESS, SIDES AND TOP		✓	✓				✓			
TUNNEL SIDES AND TOP		✓	✓				✓			
TUNNEL RECESS, FRONT AND TOP		✓	✓				✓			
FRAMES OR REVERSE FRAMES, FACE				4 x 1 1/2" up. g.p. boards						
BULKHEAD STIFFENERS, TOP				as per plan						
BOTTOM										
AND FACE										
RIBBAND ON TOP OF DECKS				N ^o 2 turner decks, 2 1/2" fitted pine						
SIDE STRINGERS, TOP										
BOTTOM										
AND FACE										
WEB FRAMES, SIDES										
AND FACE										
BRACKETS, TOP				4 x 2" up. g.p. boards						
BOTTOM										
AND FACE										
INSULATED HATCHES, MAIN				Lean cork 10" 20" linings						
BILGE				Lean cork 6" lining 1/2" 1"						
HATCHWAY COAMINGS, MAIN				P.P. 14 1/2" x 7 1/2"						
BILGE				P.P. 3"						
HOLD PILLARS				Lean cork + 1 1/2" up.						
MASTS										
VENTILATORS										
Are insulated plugs fitted to provide easy access to bilge suction roses		yes				yes				
Are insulated plugs fitted to ventilators		yes				yes				
Are insulated plugs fitted to cargo ports		yes				yes				
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected		yes				yes				
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		yes								
Cargo Battens, Dimensions and spacing, sides				3 x 3" up 12" floors						
tunnel top				3 x 3" up 12"						
fixed or portable				Are screens fitted over the brine grids at chamber sides						
Thermometer Tubes, No. and position in each chamber				N ^o 2 has 5. N ^o 2 T.O. 8. N ^o 6 has 4 spaced as per plan						
diameter				2 1/2"						
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								
Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers										
Scuppers to bilges.										
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		scuppers								
brine return room		scuppers								
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		yes								

Sounding Pipes, No. and position in each chamber situated below the load water line *one each side*
Diameter *2"* 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 *✓*

How are the cork slabs secured to the steel structure of the vessel *✓*
Air Trunkways in Chambers, inside dimensions, main *Nº 2 hold 34" x 25"*
7" D. 18" x 18" + 12" x 12" and branch *✓*
Nº 6 hold 24" x 24"
Are they permanently fixed or collapsible, or portable *fixed* State position in chambers *as per plan.*

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 *2"* Are they galvanised externally *yes.*
How are they arranged in the chambers *on roof, sides & bulkheads*

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers *hot brine circulation*


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

For
SIR W. G. ARMSTRONG, WHITWORTH & CO. LTD.
H. G. Williams
BUILDERS.
GENERAL MANAGER.

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

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 *Complete.*

General Remarks (State quality of workmanship, opinions as to class, &c.) *Messrs J & E Hall's machines for the No 2 hold & chambers, the fitting of same on board and the insulation of the chambers were carried out under special survey.*
The Liverpool Refrigerating Co's machines for the No 6 hold were not constructed under special survey but the examination of the 2 crank shafts, the spare crank shaft, gear wheel & pinion, the 2 compressor cylinders, pistons, rods & valves, the fitting on board of the machines and the insulation were surveyed here.
As all the machines by both makers worked satisfactorily and the insulation throughout the vessel (as per approved plans) and the cooling tests were carried out under the supervision of the Surveyors to this Society, We are of opinion, that the record R. M. & 5-25 with the  be inserted in the register book.
One plan enclosed, others with First Entry Report.

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 Liverpool Refrig Co</i>	<i>1925</i>	<i>✓</i>	<i>Carb Anhy.</i>	<i>✓</i>	<i>(1) Brine & Air.</i>	<i>✓</i>	<i>242 64</i>	<i>51</i>	<i>✓</i>
<i>2 Single J & E Hall</i>	<i>1925</i>	<i>✓</i>	<i>Carb Anhy.</i>	<i>✓</i>	<i>(2) Steam & Air.</i>	<i>✓</i>	<i>11300</i>	<i>40</i>	<i>✓</i>

Fee *Total* £ *9 : 0* Fee applied for, *4/5* 1925
Travelling Expenses £ *1 : 16 : 5* (Received by me, *30/5* 1925)
£ 26 : 0 : 0 *more £ 3 : 0 : 0* *London*
Committee's Minute *PRI. 15 MAY 1925*
R. Langlands & C. Murdoch
Surveyor to Lloyd's Register.

Assigned *Lloyd's Rmb. 5-25*
W. K. K. W.