

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

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19

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5th January

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10th July

1940

(No. of Visits)

7

on the Refrigerating Machinery and Appliances of the *Swan & 1/2 ARONDA*

Tons

Gross 9031
Net 4463Vessel built at *Newcastle*By whom built *Swan Hunter & Wigham*Yard No. *1640*When built *1940*Owners *British India Steam Nav. Co. Ltd.*

Port belonging to

Richmond Ltd.

Voyage

Refrigerating Machinery made by *J. E. Hall Ltd.*Machine Nos. *10561*When made *1940*

Insulation fitted by

When fitted

System of Refrigeration *CO₂ + brine*Method of cooling Cargo Chambers *Brine grids*

Insulating Material used

Number of Cargo Chambers insulated

*4*Total refrigerated cargo capacity *4490* cubic feet.DESCRIPTION OF REFRIGERATING MACHINERY. Where placed *on two deck aft main eng. 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 *15*Are all the units connected to all the refrigerated chambers *yes*Compressors, driven direct or through *single* reduction gearing.Compressors, single or double acting *single*If multiple effect compression *no*are relief valves or safety discs fitted *safety discs*No. of cylinders to each unit *2*Diameter of cylinders *2 1/2"*Diameter of piston rod *1"*Length of stroke *6"*No. of revolutions per minute *400 max.*Motive Power supplied from *2*

(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 *✓*Diameter *✓*Length of stroke *✓*Working pressure *✓*Diameter of crank shaft journals and pins *3 1/2", 3 1/2" pins.*Breadth and thickness of crank webs *60" x 1 3/4"*No. of sections in crank shaft *one*Revolutions of engine per minute *400 max.*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 *Enclosed ventilated*No. of *2*

Rated

25 H.P.

Kilowatts

Volts *220 at 300/400* revolutions per minute. Diameter of motor shafts at bearingsReduction 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 *4*Material of coils *S.D. Copper 3/4" x 10d.*Can each coil be readily shut off or disconnected *yes*Water Circulating Pumps, No. and size of *one 2" horizontal centrifugal* how worked *electrically*Gas Separators, No. of *4*Gas Evaporators, No. of *2*Cast iron or steel casings *Steel*Pressure or gravity type *gravity*

If pressure type, are safety

valves fitted *✓*No. of coils in each *3*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 being

cleared of snow *✓*No. of coils in each battery *✓*Material of coils *✓*

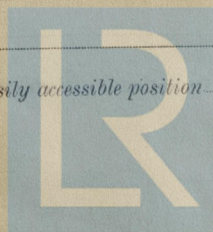
Can each coil be readily shut off or

disconnected *✓*Total cooling surface of battery coils *✓*Is a watertight tray fitted under each battery *✓*Air Circulating Fans, Total No. of *✓*each of *✓*cubic feet capacity, at *✓*revolutions per minute *✓*Steam or electrically driven *✓*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 *two 2" horiz. centrifugal* how worked *electrically*

Brine Cooling System, closed or open

Are the pipes and tanks galvanised on the inside

No. of brine sections in each chamber

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

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Common
Are thermometers fitted to the outflow and to each return brine pipe yes. 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 yes.
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)	12-6-40					
GAS COMPRESSORS	25-6-40	1000 lbs. □	3000 lbs. □	1500 lbs. □	OK	
SEPARATORS	12-6-40	do.	do.	do.	OK	
MULTIPLE EFFECT RECEIVERS	12-6-40	do.	do.	do.	OK	
CONDENSER COILS	5-1-40	do.	do.	do.	OK	
EVAPORATOR COILS	28-5-40	do.	do.	do.	OK	
CONDENSER HEADERS AND CONNECTIONS	4-6-40	do.	do.	do.	OK	
CONDENSER CASINGS	12-6-40	10-15 lbs. □	30 lbs. □	✓	OK	
EVAPORATOR CASINGS	open top					
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
BRINE PIPING AFTER ERECTION IN PLACE						

Have important steel castings and forgings been tested in accordance with the Rules

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)

or, 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:-

12 lubricator piston leather 2 springs for CO₂ safety valves, 2 springs for water relief valves
12 " gland " 2 bolts + nuts for crosshead, 1 CO₂ gauge, 1 hydrometer.
1 set of 2 leather moulds 1 pair main bearing brasses with bolts + nuts
12 addl. valve springs for Comps 1 pair big end " " "
2 sets copper joint rings for Comp joints, 1 set for other joints, 1 CO₂ gauge + 3 spare pipes.
2 brass cased thermometers, 12 safety discs, 1 set screwing dies for 1 1/4" + 1 1/2" pipes
2 pair CO₂ pipe flanges, fitted box for Comp pistons, valves etc.
1 impeller for circulating water pump, 1 impeller for brine pump, 1 hand pump for press. lubricator
1 spindle for " " " 1 spindle for " " "
1 bearing assembly " " " 1 bearing assembly " " "

ELECTRICAL SPARES.

one Amaturese
one set of bearings
one field coil
one interpole coil
one line of brushholders
one set of brushes
one set controller spares
machine motors
pump motors, each size

The foregoing is a correct description of the Refrigerating Machinery.

J. E. HALL
J. Wells
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. (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.	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 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 fun 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 3, 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 and Insulation
(If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case 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, &c.) The refrigerating machinery was constructed under special survey and the materials and workmanships are good and it will be eligible for the notation + Lloyds R.M.C. (with date) when the installation and testing have been satisfactorily completed.

These 2 Sets of CO₂ Refrig machines have been satisfactorily fitted on board the Tm Lc Ss ARONDA, SHWR Yards 16440
For further particulars see Nwc RMC Rpt

Adalatt
Newcastle on Tyne
11/3/41

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 Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity, Cubic ft.
2	4	Carl Anky	J. E. Hall Ltd.	1940	(1) Prime	15		34	4880

Fee London..... £ 2 : - : - (Fee applied for, 19
Travelling Expenses £ charges in Newcastle report (Received by me, 19

D. Gemmell
Surveyor to Lloyd's Register.

Committee's Minute

Assigned

See Nwc 99306



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