

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office

Date of writing Report

- 3 DEC 1887

When handed in at Local Office

- 3 DEC 1887

Port of London

No. in

Reg. Book.

Survey held at London

Date: First Survey 25th MayLast Survey 16th Nov. 1934

(No. of Visits

8

on the Refrigerating Machinery and Appliances of the S.S. "CANTON"

Tons { Gross

Net

Vessel built at Linthouse

By whom built

A. Stephen & Sons Ltd

Yard No. 554

When built 1934

Owners Peninsular & Oriental Steam Navigation Co. Ltd

Voyage

Refrigerating Machinery made by

J. E. Hall Ltd.

Machine Nos.

9811
9812

When made

1934

Insulation fitted by

When fitted

System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers Brine grids + air

Insulating Material used

Number of Cargo Chambers insulated

5

Total refrigerated cargo capacity

39,000

cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed Fore. Ok. Midship Port Side

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

54 tons

Are all the units connected to all the refrigerated chambers

yes.

Compressors, driven direct or through

reduction

gearing.

Compressors, single or double acting

Single

If multiple effect compression

no

Are relief valves or safety discs fitted

both.

No. of cylinders to each unit

2

Diameter of cylinders

3 1/8"

Diameter of piston rod

2"

Length of stroke

7"

No. of revolutions per minute

350

Motive Power supplied from

Electric motor direct coupled.

(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

CO₂ machine

5" journals, 5 1/2" pins

Breadth and thickness of crank webs

4" x 3 1/2"

No. of sections in crank shaft

one

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

Open - with canopy.

No. of

2

Rated

85 B.H.P.

Kilowatts

Volts at 220 at 350/240

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

10

Material of coils

SD Copper 3/4" dia.

Can each coil be readily shut off or disconnected

yes.

Water Circulating Pumps, No. and size of

1- 5" centrifugal

how worked

electrically

Gas Separators, No. of

4

Gas Evaporators, No. of

2

Cast iron or steel casings

Steel

Pressure or gravity type

pressure

If pressure type, are safety

valves fitted

air pipe

No. of coils in each casing

9

Material of coils

SD Steel 1 1/2" x 1 5/8" 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

10000

Is a watertight tray fitted under each battery

✓

Air Circulating Fans, Total No. of

2 - 25"

each of

1000

cubic feet capacity, at

2400 max

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 - 4" centrifugal

how worked

electrically

Brine Cooling System, closed or open

closed

Are the pipes and tanks galvanised on the inside

no.

No. of brine sections in each chamber

3 T.D. port for 1 = 2,

3 T.D. port aft = 2,

3 T.D. for 1 stand = 2

3 T.D. aft = 5,

3 LTD = 8 circuits

Can each section be readily shut off or disconnected

yes

Are the control valves situated in an easily accessible position

yes

Common
Are thermometers fitted to the puffers 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
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)						
GAS COMPRESSORS	5-10-37	1000 lb. D	3000 lb. D	1500 lb. D	St.	
" SEPARATORS	16-11-34	do.	do.	do.	St.	
" MULTIPLE EFFECT RECEIVERS	none					
" CONDENSER COILS	25-5-37	do.	do.	do.	St.	
" EVAPORATOR COILS	28-4-37	do.	do.	do.	St.	
" CONDENSER HEADERS AND CONNECTIONS	14-8-34	do.	do.	do.	St.	
" CONDENSER CASINGS	28-9-34	10 to 15 lb. D	30 lb. D	-	St.	
" EVAPORATOR CASINGS	24-8-34	20 to 25 lb. D	50 lb. D	-	St.	
NH, 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

Additional Spare Gear Supplied:-

2 pistons & rods for comp. with rings
1 impeller & spindle for brine pump
1 do do for circ. pump
1 set of 2 leather moults
12 lubricator piston leathers
12 do do gland do
2 bolts & nuts for conn. big end
2 do do head do
2 do do main bearings
1 regulator valve spindle
2 brass CO₂ pipe flanges
2 sundry brass cocks
Assorted bolts & nuts
3 lengths each size brine lead fitted
3 H.V. bends do do
3 H.V. sockets & backnuts
1 set screwing dies
4 sets copper joint rings for comp.
1 set do do other joints
2 sets special metal rings for each comp. gland.

4 sets each of 2 valves seats & springs
24 add. valve springs
2 springs for CO₂ safety valve
2 do do water relief valve
1-4 CO₂ valve with 3 spare pipe
1 hand pump for press. lubricator
1 CO₂ gauge
1 hydrometer
2 brass cased thermometers
12 safety discs
1 set coupling bolts for 1 machine
2 sets leather coupling washers for 1 machine
1 fitted box for comp. parts.

ELECTRICAL SPARES.

one Armature
one line of brush holder
one complete interior of controller

Sets of Brushes
Machine motor 2
Water pump motor 1
Brine pump motor 3
Fan motor each size 1 set to each motor

The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL, LTD.

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 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 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 has been constructed under special survey and the materials and workmanship 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.

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 mechanically driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity.
						Tons.			Cubic ft.
2	4	Carl. Ruby	J. E. Hall & Co.	1934	Brine & Air	54		5	39,000

Fee London..... £ 2/- :- } Fee applied for, 19
Travelling Expenses £ 4/- :- } Received by me, 19

Committee's Minute

Assigned

D. Gemmell.
Surveyor to Lloyd's Register.



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Foundation