

R. M. C. No. 36075

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 21 MAR 1930)

7 AUG 1930

Date of writing Report 21 MAR 1930

When handed in at Local Office 21 MAR 1930

Port of London

No. in

Reg. Book.

Survey held at Belfast.

Date: First Survey 15th November 1929Last Survey 16th June 1930

1930

(No. of Vessels 549)

on the Refrigerating Machinery and Appliances of the MV "TAYBANK."

Tons { Gross. Net.

Vessel built at

Belfast

By whom built

Horkman Clark & Co.

Yard No.

512

When built

1930

Owners

Andrew Weir & Co. Ltd.

Port belonging to

Belfast.

Voyage

Refrigerating Machinery made by

J. E. Hall Ltd.

Machine No.

8122.

When made

1930

Insulation fitted by

Gregson & Co. Ltd.

When fitted

1930.

System of Refrigeration

CO₂ + Brine

Method of cooling Cargo Chambers

air cooled.

Insulating Material used

Granulated & slab cork.

Number of Cargo Chambers insulated

2

Total refrigerated cargo capacity

15,450 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Main deck, aft.

Refrigerating Units, No. of one

Single, double, or triple

Cubic feet of air delivered per hour

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

12

Are all the units connected to all the refrigerated chambers

yes.

Compressors, driven direct or through

reduction gearing.

Compressors, single or double acting

single

No. of cylinders

two

Diameter of cylinders

2 1/8"

Diameter of piston rod

1"

Length of stroke

6"

No. of strokes per minute

400 each

Motive Power supplied from

Electric motor direct coupled.

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 journals, 3 1/2" pins

Breadth and thickness of crank webs

x 1 3/4"

No. of sections in crank shaft

one

Revolutions of engine per minute

400

Oil Engines, type

✓

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

✓

Electric Motors, type

EVDP

Supplied by shipbuilder

No. of

One.

Rated

26 1/2 H.P.

Kilowatts

220

Volts at

400

revolutions per minute.

Diameter of motor shafts at bearings

3 1/4"

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

1st reduction wheel

Main wheel

Width of face, 1st reduction wheel

Main wheel

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion

2nd pinion

1st reduction wheel

Main wheel

Flexible pinion shafts, diameter 1st

2nd

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

1

Cast iron or steel casings

cast iron

Cylindrical or rectangular

cylindrical

No. of coils in each

3

Material of coils

S.D. copper 3/4" b. x 1 1/2" d.

Can each coil be readily shut off or disconnected

yes.

Water Circulating Pumps, No. and size of

1 - 1 1/2" centrifugal

how worked

electrically

Gas Separators, No. of

2

Gas Evaporators, No. of

1

Cast iron or steel casings

steel

Pressure or gravity type

gravity

No. of coils in each casing

2

Material of coils

S.D. steel 1 1/2" b. x 1 5/8" d.

Can each coil be readily shut off or disconnected

yes

Direct Expansion or Brine Cooled Batteries, No. of

2

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

2

Material of coils

S.D. steel 1 1/2" b. x 1 5/8" d.

Can each coil be readily shut off or

disconnected

yes

Total cooling surface of battery coils

825 sq. feet

Is a watertight tray fitted under each battery

yes

Air Circulating Fans, Total No. of

1 - 14 1/2"

each of

5500

cubic feet capacity, at

900

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

2 - 2" centrifugal

how worked

electrically

Brine Cooling System, closed or open

open

Are the pipes and tanks galvanised on the inside

no

No. of brine sections in each chamber

air cooled.

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.

Im. 12.28 - T.



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Are thermometers fitted to the outflow and to each return brine pipe 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.

Steam Condensing Plant. State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14 ✓

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)						
GAS COMPRESSORS	6-12-29	1000 lbs. □	3000 lbs. □	1500 lbs. □	OK	
" SEPARATORS	18-11-29	do.	do.	do.	OK	
" CONDENSER COILS	6-12-29	do.	do.	do.	OK	
" EVAPORATOR COILS	10-12-29	do.	do.	do.	OK	
" CONDENSER HEADERS AND CONNECTIONS	11-11-29	do.	do.	do.	OK	
" CONDENSER CASINGS	18-11-29	do.	do.	do.	OK	
" EVAPORATOR CASINGS	4-1-30	10 to 15 lbs. □	30 lbs. □	✓	OK	
NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE		open top				
BRINE PIPING AFTER ERECTION IN PLACE...						

Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory yes.

Dates of test 546 Aug 1930. Density of Brine 49. by T. Waddell's 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 ✓ & ✓

or, delivery and return air at direct expansion or brine cooled batteries 21°F & 16°F, outflow and return brine -2°F & 3°F.

atmosphere 65°F cooling water inlet and discharge 54°F & 62°F gas in condensers 68°F and evaporators -5°F.

the average temperature of the refrigerated chambers 21°F and the rise of temperature in these chambers upon the expiration of 12 hours

time after the machinery and cooling appliances have been shut off Fore Chamber 11°F Aft Chamber 14°F = .92 + 1.17°F per hour.

SPARE GEAR.

Are the machines in accordance with Section 4, Clause 2 of the Rules ✓

Are the working parts of the machines, pumps and motors respectively, interchangeable ✓

ARTICLES SUPPLIED AS PER RULE.

1 Crankshaft.
1 Compressor piston & rod for each compressor.
1 Set rings for each compressor piston.
1 Spindle & impeller for circulating water pump.
1 do. do. for brine pump.
1 spare brine pump in engine room.
1 pair main bearing shells lined with W. M.
1 pair connecting rod brasses lined with W. M.
1 pair crosshead brasses.
2 Bolts & nuts for cone rod big end.
2 Studs & nuts for crosshead.
2 Collar nuts for main bearing.
1 regulator spindle.
1 set of two leather mauls.
1 set of valves & springs for each compressor.
6 lubricator piston leather.
6 do. gland leather.
2 sets of copper joint rings for compressor joints.
1 set of do. do. for other joints.
1 set of special metal rings for each compressor gland.
3 lengths of each size pipe for brine mains.
3 bends do. do. do.
12 sockets & 12 backnuts do. do.
1 set of gas screwing dies for above.
24 assorted bolts & nuts.

Electrical spare gear.

1 Armature.
2 Field coils.
2 Inter pole coils.
1 Line brush holder.
1 set brushes.
1 set bearings.

Electric spares 1 Armature with its shaft & bearing bushes.
supplied for fan motor, idler.
Main motor.
1 Brine pump together with its electric motor.
(See London letter dated 14th & 26th Nov 1929.)

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

J. & E. HALL, LTD
Chichester
SUSSEX

Manufacturer.

DESCRIPTION OF INSULATION.

IN LOWER HOLD CHAMBERS.					IN 'TWEEN DECK CHAMBERS.					
	Side 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			End Bld. Fr 77	✓	✓	Green cork	9"	2 3/4" T. & G.	
	F			" " 102	✓	✓	-do-	9"	-do-	
FRAME No.	A	Forward Chamber (Fruit)		Sides	✓	✓	-do-	9"	-do-	
	F		Overheading	✓	✓	-do-	10"	-do-		
FRAME No.	A		Floor	✓	✓	Slab cork	8" in three layers	1 1/2" requisite on exp. metal.		
FRAME No.	F			End. Bld. Fr 78	✓	✓	Green cork	9"	2 3/4" T. & G.	
	A			" " 71+2	✓	✓	-do-	11" & 12"	-do-	
FRAME No. (Boiler Room)	F	After Chamber (Egg smiths)		Sides	✓	✓	Green cork	9"	-do-	
	A		Overheading	✓	✓	-do-	11"	-do-		
FRAME No. (Engine Room)	F		Floor	✓	✓	Slab cork	9" in three layers	1 1/2" requisite on exp. metal.		
FRAME No.	A									
	F									
FRAME No.	A									
	F									
FRAME No.	A									
	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	...									
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						
MAST PILLARS Roped 1 1/2" jute rope										
MASTS				VENTILATORS	4" silicate cotton	1 1/4" lining				
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				No air spaces						
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 & ends 2x2 approx. 16 sp. floors								tunnel top		
fixed or portable	fixed			Are screens fitted over the brine grids at chamber sides				hinged or permanently fixed		
Thermometer Tubes, No. and position in each chamber	2			through deck above						
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									None	
Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers									Yes	
Where scupper, 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				By scupper to bilge in E. 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										

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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 Yes Are cement facings reinforced with expanded steel lattice None

How is the expanded metal secured in place By 3 staples

How are the cork slabs secured to the steel structure of the vessel on floor laid in bituminous enamel.

Air Trunkways in Chambers, inside dimensions, main 5' 4" wide and branch

Are they permanently fixed or collapsible, or portable permanently fixed State position in chambers Sides and

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors Are the door frames efficiently insulated Yes

Are insulated plugs supplied for the doorways Yes Where are the doors worked from Both sides.

Cooling Pipes in Chambers, diameter 1/2" bore in air coolers Are they galvanised externally Yes.

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.

WORKMAN CLARK (1928) LIMITED.

F. Cunningham

Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery and Insulation

Is the Refrigerating Machinery and Appliances duplicate of a previous case Yes. If so, state name of vessel LOSSIEBANK.

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, etc.) The refrigerating machinery has been constructed under special survey and the materials and workmanship are good.

The machinery has been satisfactorily installed & fastened in the machinery space the insulated spaces have been cooled down by the engine working for 13 1/2 hours from 60°F to 21°F.

In my opinion the vessel is now eligible for record + Lloyd's R.M.C. 8.30 for a temperature of 20°F.

John K. Williams.

Belfast 6/8/30.

+ Lloyd's R.M.C. 8.30.

For temp 20°F.

D.M. 7/8/30

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity. Cubic ft.
one	2	Carb. Ammonia	J. E. Hall Ltd	1930	(1) Air & Brine (2) Liquid carb. ammonia		12	2	13,900

Certificate to be sent to

Unpaid 42:0:0 } Fee Bel 20/30. } Fee applied for, 19
Special Attendance 1:1:0 } Received by me, 14.8.1930
Travelling Expenses £ 4:7.
Committee's Minute 15:0. FRI. 8 AUG 1930

D. Gemmell.

Surveyor to Lloyd's Register.

L. R. 14/8

Assigned + Lloyd's R.M.C. 8.30
For temp 20°F.

CERTIFICATE WRITTEN.



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