

Rpt. 17.

No. 10,359

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office

10 FEB 1930)

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on the Refrigerating Machinery and Appliances of the Steamer "CEFALU." Tons {Gross... Net...}

Vessel built at Belfast By whom built Workman Clark & Co. Ltd Yard No. 514 When built 1930

Owners Standard Fruit & S.S. Corp. Port belonging to Leiba Voyage

Refrigerating Machinery made by Haslam & Newton Ltd Machine No. 1218 When made 1930

Insulation fitted by Gregson & Co. Ltd London When fitted While building System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers Air circulation Insulating Material used Granulated cork

Number of Cargo Chambers insulated 4 Total refrigerated cargo capacity 188500 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Yank top

Refrigerating Units, No. of 2 Single, double, or triple Double Cubic feet of air delivered per hour 6,840,000

Total refrigeration or ice-melting capacity in tons per 24 hours 119.5 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 2 (per unit)

Diameter of cylinders 5 1/2" Diameter of piston rod 2 1/2" Length of stroke 18" No. of strokes per minute 190

Motive Power supplied from Cross compound steam engine

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders 2 Diameter 16 1/2" + 31"

Length of stroke 18" Working pressure 150 lbs Diameter of crank shaft journals and pins 4 1/4"

Breadth and thickness of crank webs 8 3/4" x 4 3/4" No. of sections in crank shaft 2 Revolutions of engines per minute 95

Oil Engines, type 2 or 4 stroke cycle Single or double acting Single B.H.P.

No. of cylinders 2 Diameter 16 1/2" Length of stroke 18" Span of bearings as per Rule

Maximum pressure in cylinders 150 lbs Diameter of crank shaft journals and pins 4 1/4"

Breadth and thickness of crank webs 8 3/4" x 4 3/4" No. of sections in crank shaft 2 Revolutions of engine per minute 95

Electric Motors, type None No. of None Rated None Kilowatts

Volts at None revolutions per minute None Diameter of motor shafts at bearings None

Reduction Gearing, maximum shaft horse power at 1st pinion None Revolutions per minute at full power at 1st pinion None

2nd pinion None 1st reduction wheel None main shaft None Pitch circle diameter, 1st pinion None 2nd pinion None

1st reduction wheel None Main wheel None Width of face, 1st reduction wheel None Main wheel None

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion None 2nd pinion None

1st reduction wheel None Main wheel None Flexible pinion shafts, diameter 1st None 2nd None

Pinion shafts, diameter at bearings, External, 1st None 2nd None Internal, 1st None 2nd None

Diameter at bottom of teeth of pinion, 1st None 2nd None Wheel shafts, diameter at bearings, 1st None

Main None Diameter at wheel shroud, 1st None Main None

Gas Condensers, No. of 2 Cast iron or steel casings cast iron Cylindrical or rectangular cylindrical

No. of coils in each 11 Material of coils S.D. copper 3/4" x 1" o.d. Can each coil be readily shut off or disconnected yes

Water Circulating Pumps, No. and size of Two 10" x 10" x 10" how worked Steam independent as Separators, No. of 2

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

No. of coils in each casing 8 Material of coils S.D. steel 1" x 1 5/8" o.d. Can each coil be readily shut off or disconnected yes

Direct Expansion or Brine Cooled Batteries, No. of 4 Are there two separate systems, so that one may be in use while the other is being cleared of snow no snow

No. of coils in each battery 14, 13, 12 + 9 Material of coils steel Can each coil be readily shut off or disconnected yes

Total cooling surface of battery coils 12,000 sq. feet Is a watertight tray fitted under each battery yes

Air Circulating Fans, Total No. of 4 each of 3-32,000 cubic feet capacity, at 600 revolutions per minute

Steam or electrically driven Electrically Where spare fans are supplied are these fitted in position ready for coupling up none

Brine Circulating Pumps, No. and size of, including the additional pump Two 10" x 10" x 10" how worked Steam independent

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

No. of brine sections in each chamber cooler 4, Ford upper 14, Ford lower 13, Aft lower 12, Aft upper 9

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 Rule yes

Where the tanks are not closed is the compartment in which they are situated efficiently ventilated

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

Steam condenser fitted in bedplate. Air + Feed Pumps fitted.

HYDRAULIC AND OTHER TESTS.

| DESCRIPTION. | Date of Test. | Working Pressure. | Hydraulic Test Pressure. | Air Test Pressure. | Stamped. | REMARKS. |
|--|---|-------------------|--------------------------|--------------------|----------|----------|
| ENGINE CYLINDERS (IF TESTED) | H.P. 4-12-29 L.P. 13-12-29 | 150 lbs. | 350 lbs. □ 250 lbs. □ | - | OK | |
| GAS COMPRESSORS | 2-1-30 | 1200 lbs. □ | 3000 lbs. □ | 1500 lbs. □ | OK | |
| SEPARATORS | 13-12-29 | do. | do. | do. | OK | |
| CONDENSER COILS | 4-12-29 | do. | do. | do. | OK | |
| EVAPORATOR COILS | 13-12-29 | do. | do. | do. | OK | |
| M.E. RECEIVERS | 19-12-29 | do. | do. | do. | OK | |
| CONDENSER HEADERS AND CONNECTIONS | 5-2-30 | do. | do. | do. | OK | |
| SCALE TRAPS | 2-1-30 | do. | do. | do. | OK | |
| CONDENSER CASINGS | 19-12-29 | 10 to 15 lbs. □ | 30 lbs. □ | ✓ | OK | |
| EVAPORATOR CASINGS | Tested at Birkenhead by Lewis Surveyors | | | | | |
| NH ₃ CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE | | | | | | |
| 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 21/4/30 28/4/30 Density of Brine 12.7 by 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 19°F & 22°F, outflow and return brine 11°F & 16°F

atmosphere 70°F, cooling water inlet and discharge 47°F & 57°F gas in condensers 63°F and evaporators 5°F

the average temperature of the refrigerated chambers 20.6°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 29.5°F Rise of 7.42°F per hr.

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

ADDITIONAL SPARE GEAR SUPPLIED.

- 1 half crankshaft.
 - 1 steam piston rod + nuts.
 - 1 H.P. steam piston
 - 1 set piston rings each steam cylinder
 - 2 compressor piston rods + half couplings with bolts.
 - 1 air pump bucket + plunger complete with rod.
 - 1 circulating pump bucket + rod.
 - 1 H.P. steam piston valve
 - 1 L.P. steam slide valve
 - 1 slide valve spindle + nuts
 - 1 H.P. eccentric shaft strap + rod.
 - 1 L.P. do.
 - 2 main bearing bolts + nuts
 - 1/2 set connecting rod + piston rod bolts + nuts.
 - 2 compressor suction valves seats + springs
 - 4 compressor delivery valves seats + springs
 - 12 additional springs
 - 1 set valves for air pump
 - 1 do do feed pump
 - 1 set valves rings + springs for brine pump
 - 1 do do do for water pump.
 - 6 tubes + 24 ferrules for condensers
 - 3 lengths each 1 1/2" + 1 1/4" piping
 - 3 each 1 1/2" + 1 1/4" bends
 - 12 each 1 1/2" + 1 1/4" sockets + backnuts.
 - 1 set ratchet screwing dies 1 1/2" + 1 1/4"
 - 1 regulator valve spindle
 - 1 set copper joint rings throughout.
 - 2 sets patent metallic packing for compressor gland.
 - 2 sets N.M. rubbing blocks for metallic packed steam cylinder.
 - 12 lubricator piston leathers.
 - 12 do gland do
 - 12 safety valve discs.
 - 1 CO₂ gauge
 - 1 CO₂ gauge valve
- 2 hydrometers
 - 6 brine return thermometer
 - 1 special key tested thermometer
 - 1 escape valve spring for feed pump
 - 2 springs for CO₂ safety valve
 - 2 springs for brine relief valve
 - 1 spring for relief valve on heater
 - 2 springs for cylinder relief valves
 - 1 length copper gauge pipe
 - 1 guide for grinding in valves
 - 1 brine gauge
 - 1 lubricating hand pump
 - 1 special fitted box for spare parts
 - 1 separator blow out valve
 - 1 spare apparatus for fan motor
 - 1 set brushes
 - 1 brush bag complete with holders
 - 1 set inter-pole coils
 - 1 set main field coils
 - 1 set controller spares.
 - 1 spring for water relief.
 - fan motor spares.
 - 1 spare armature complete in frame case.
 - 1 set of brushes
 - 1 brush bag complete with brush holders.
 - 1 set inter-pole coils
 - 1 " main field coils.
 - 1 controller spares.
 - 1 set of drum segments + finger contacts with spring screws + iron completed auxiliary fingers.
 - 1 set of contacts for controller.
 - 1 set of spacers.
 - 1 spare handle box 1 set of miscellaneous accessories.

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

FOR AND ON BEHALF OF

HASLAM & NEWTON LTD.

Manufacturer.

ASSISTANT SECRETARY.

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. 147 (Fore Peak) | ✓ | ✓ | green cork | 6 1/2" | 7/8" T+G | | | green cork | 6 1/2" | 7/8" |
| FRAME No. 103 | | | | | | 1 st Upper Tw. Decks | 1 + 3/4" | green cork | 10" | 7/8" |
| FRAME No. 99 | | | | | | 2 nd Tw. Decks | 1 + 3/4" | green cork | 9" | 7/8" |
| FRAME No. 98 (Boiler Room) | | | silicate cotton | 10" | 7/8" T+G | | | silicate cotton | 10" | 7/8" T+G |
| FRAME No. 57 (Engine Room) | | | | | | | | green cork | 8" | 7/8" T+G |
| FRAME No. 46+8 (After Peak) | | | green cork | 8 1/2" | 7/8" T+G | | | green cork | 6 1/2" | 7/8" T+G |
| SIDES | | | green cork | 8 1/2" | 7/8" T+G | | | green cork | 6 1/2" | 7/8" T+G |
| OVERHEADING | | | - do - | 7" | 7/8" T+G | | | green cork | 7" | 7/8" T+G |
| FLOORS OF CHAMBERS | 1 1/2" | 2 3/4" T+G | - do - | 5" | 7/8" T+G | | | green cork | 7" | 2 3/4" T+G |
| TRUNK HATCHWAYS | | | | | | | | bronze | 4" | 1 1/2" |
| THRUST RECESS, SIDES AND TOP | | | | | | | | green cork | 8" | 7/8" T+G |
| TUNNEL SIDES AND TOP | | | | | | | | see above for top | | |
| TUNNEL RECESS, FRONT AND TOP | | | | | | | | - do - | | |

FRAMES OR REVERSE FRAMES, FACE

BULKHEAD STIFFENERS, TOP 1 1/2" silicate cotton where old bolts protrude BOTTOM AND FACE

RIBBAND ON TOP OF DECKS two 1" liquor cork 3/4" regalite

SIDE STRINGERS, TOP BOTTOM AND FACE

WEB FRAMES, SIDES AND FACE

BRACKETS, TOP BOTTOM AND FACE

INSULATED HATCHES, MAIN Plugs 4 3/4" in thickness. BILGE Liner hatches fitted to MANHOLE Plugs of frames fitted

HATCHWAY COAMINGS, MAIN BILGE

HOLD PILLARS Roped 1 1/2" jute rope where unprotected.

MASTS as tunnel escape. VENTILATORS as tunnel escape.

Are insulated plugs fitted to provide easy access to bilge suction roses Yes tank, air, and sounding pipes. Portable insulation heels of pillars. Port. insulation and manhole doors of tanks. Plugs of frames. Are insulated plugs fitted to ventilators No. vents. cargo ports. Yes and side lights.

Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected Yes if so, how double + grating.

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 5-1 1/4" at abt. 14" spacing, floors. None - grating tunnel top None - grating

fixed or portable Both Are screens fitted over the brine grids at chamber sides Yes, where hinged or permanently fixed Portable

Thermometer Tubes, No. and position in each chamber None in fruit chambers. 1 to meat space, 2 to provision rooms

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 fitted 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 In mec. sp.

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 Yes, over double beam tank.



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Sounding Pipes, No. and position in each chamber situated below the load water line *P+S. Fore end of After Hold, P+S. after end of fore hold.*

Diameter *2 1/2"* 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 *Bedded in Bitumastic solution skinned together.*

Air Trunkways in Chambers, inside dimensions, main *Full height of tween decks + hold space. Two feet approx.* and branch *✓*

Are they permanently fixed or collapsible, or portable *Permanent* State position in chambers *F+A. each side.*

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 *1 1/2" bore* Are they galvanised externally *Yes.*

How are they arranged in the chambers *In grids at fore end of Upper + 2nd Tw. Decks aft., and at after end of Upper and 3rd Tw. Deck fore, + around sides of meat room.*

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers *Air changing to atmosphere, or brine heating.*

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

FED WORKMAN CLAY (1928) LIMITED.
F. Cunningham
SECRETARY
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 *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.) *The refrigerating machinery has been constructed under special survey and the materials and workmanships are good.*

The machinery has been satisfactorily installed and fastened in the aft tunnel recess. The hold's insulated spaces have been cooled down by engine working, in 14 hrs from 58°F to 20.6°F.

In my opinion the vessel is now eligible for record + LLOYD'S R.M.C. 4, 30 for a temperature of 20°F.

John K. Williams
Belfast. 26/4/30.

It is submitted that this vessel is eligible for THE RECORD.

+ Lloyd's R.M.C. 4-30 for temp 20°F.

27/4/30.

AW

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

CERTIFICATE WRITTEN *29.4.30*

| 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. |
| <i>(one double)</i> 2 | 2 | <i>Cash. Anby</i> | <i>Haslam's horizontal</i> | 1930 | (1) Air (2) <i>look + Silicate cotton.</i> | 6,840,000 | 119.5 | 4 | 133500 |

Lloyd's R.M.C. 4-30
Fee BEL 14.0.0
Travelling Expenses £ 8 : 16 : 9
Bel of Special Attendance £ 2.2/-
Committee's Minute
FRI. 3 MAY 1930

John K. Williams
Surveyor to Lloyd's Register.

Assigned *+ Lloyd's R.M.C. 4.30*
for Temp. 20°F.



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