

Rpt. 17.

R. M. C. No. 49820

No. 103638.

## REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 7- APR 1934)

Date of writing Report

19

When handed in at Local Office

-5 APR. 1934

Port of

LIVERPOOL

No. in

Reg. Book

Survey held at

Date: First Survey

24/1/34

Last Survey

26/3/

1934.

(No. of Visits)

7

on the Refrigerating Machinery and Appliances of the **PRODUCER JAMAICA PERSEVERANCE**. Tons { Gross: Net: }

Vessel built at

Greenock

By whom built

Lithgow's Ltd

Yard No. 868

When built 1924.

Owners

Jamaica Banana Producers Ltd

Port belonging to

Kingston Jamaica.

Voyage Kingston.

Refrigerating Machinery made by

Liverpool Refrigerating Co Ltd

Machine No. 1539

When made

1934.

Insulation fitted by

Liverpool Refrigerating Co Ltd

When fitted

1934

System of Refrigeration

Ammonia.

Method of cooling Cargo Chambers

Air

Insulating Material used

Cork

Number of Cargo Chambers insulated

# 6

Total refrigerated cargo capacity 260000

cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed on Awaiting deck

Refrigerating Units, No. of

2

Single, double, or triple

Single

Cubic feet of air delivered per hour 13920000

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

150

Are all the units connected to all the refrigerated chambers

Yes

Compressors, driven direct or through

single

reduction gearing.

Compressors, single or double acting

Yes

No. of cylinders

2

Diameter of cylinders

14"

Diameter of piston rod

3 1/2"

Length of stroke

21"

No. of strokes per minute

200

ive Power supplied from

Main Boilers.

um Engines, high pressure, compound, or triple expansion, surface condensing.

No. of cylinders

2

Diameter

16" x 28"

th of stroke

21

Working pressure

150 lb

Diameter of crank shaft journals and pins

7 1/2"

width and thickness of crank webs

10" x 4 1/4"

No. of sections in crank shaft

2

Revolutions of engines per minute

100

Engines, type

2 or 4 stroke cycle

Single or double acting

of cylinders

Diameter

Length of stroke

Span of bearings as per Rule

imum pressure in cylinders

Diameter of crank shaft journals and pins

width and thickness of crank webs

No. of sections in crank shaft

Revolutions of engine per minute

etric Motors, type

No. of

Rated

Kilowatts

As at

revolutions per minute.

Diameter of motor shafts at bearings

duction Gearing, maximum shaft horse power at 1st pinion

Revolutions per minute at full power at 1st pinion

pinion

1st reduction wheel

main shaft

Pitch circle diameter, 1st pinion

2nd pinion

reduction wheel

Main wheel

Width of face, 1st reduction wheel

Main wheel

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

2nd pinion

reduction wheel

Main wheel

Flexible pinion shafts, diameter 1st

2nd

ion shafts, diameter at bearings, External, 1st

2nd

Internal, 1st

2nd

meter at bottom of teeth of pinion, 1st

2nd

Wheel shafts, diameter at bearings, 1st

n

Diameter at wheel shroud, 1st

Main

s Condensers, No. of

2

Cast iron or steel casings

Steel

Cylindrical or rectangular

Rectangular

of coils in each

7

Material of coils Solid drawn M. Steel

Can each coil be readily shut off or disconnected

Yes

ter Circulating Pumps, No. and size of

2- 9x10x24 simplex

how worked

Steam

Gas Separators, No. of

2

s Evaporators, No. of

2

Cast iron or steel casings

Steel

Pressure or gravity type

Gravity

of coils in each casing

7

Material of coils Solid drawn M Steel

Can each coil be readily shut off or disconnected

Yes

Direct Expansion or Brine Cooled Batteries, No. of

8

Are there two separate systems, so that one may be in use while the other is being

cleared of snow

Yes

No. of coils in each battery

4-4"

Material of coils

S. D Steel

Can each coil be readily shut off or

disconnected

Yes

Total cooling surface of battery coils

13350 sq ft

Is a watertight tray filled under each battery

Yes

Air Circulating Fans, Total No. of

8

each of

29000

cubic feet capacity, at

600

revolutions per minute

Steam or electrically driven

25 HP Motor

Where spare fans are supplied are these fitted in position ready for coupling up

Yes

Brine Circulating Pumps, No. and size of, including the additional pump

3. 10x12x12 duplex

how worked

Steam

Brine Cooling System, closed or open

Are the pipes and tanks galvanised on the inside

No. of brine sections in each chamber

Can each section be readily shut off or disconnected

Are the control valves situated in an easily accessible position



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

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

Separate Steam Condenser for Refrigerating Plant with Connections to Main or Auxil Condensers.

### HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED) ...	12/3/34	150.	HP 350 lb. LP 250 lb.	—		
GAS COMPRESSORS ...	24/1/34	160	600 lb.	—	"	
" SEPARATORS ...	9/2/34	160	1000 lb.	—	"	
" CONDENSER COILS ...	5-6-7-9/2/34	160	1500 lb.	500 lb.	"	
" EVAPORATOR COILS ...	5-6-7-9/2/34	160	1500 lb.	500 lb.	"	
" CONDENSER HEADERS AND CONNECTIONS ...	5-6-7-9/2/34	160	1500 lb.	500 lb.	—	
" CONDENSER CASINGS ...	12/3/34	15	25 lb.	—	"	
" EVAPORATOR CASINGS ...	12/3/34	15	25 lb.	—	"	
NH <sub>3</sub> 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

Dates of test ————— Density of Brine ————— 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 ————— & —————, 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.

ARTICLES SUPPLIED AS PER RULE.

ADDITIONAL SPARE GEAR SUPPLIED.

1-1" Regulating Valve complete and spindle. 1-1" Stop valve complete and chest. 1 each 2 1/2" & 3 1/2" stop valves complete and 3 1/2" chest. 1-1/4" gauge valve, 1 set each 1" 2 1/2" & 3 1/2" T & G flanges. 12-1 1/2" brine pipe couplings. 6 brine thermometers. 3-1 1/2" brine gate valves, 1 comp cylinder cover, 1 stuffing box for front cover and 1 plug for back cover. 2 sets of metallic packing, 1 lantern ring and neck bush for compressor gland. 18 compressor valves with 36 springs, 6 seats, 6 guards and 3 cages, 1 compressor piston, 1 HP steam piston & set of HP's & rings, 2 sets compressor stuffing rings, one compressor piston rod with nuts etc. 1 steam piston rod with nuts etc. 2 crosshead pin bolts & nuts, 1 set crank pin bolts & nuts. 1 Half Crankshaft, 2 main bearing studs & nuts, 16" NH<sub>3</sub> gauge, 1 pair crosshead brasses. 1 complete set of compressor joints, assorted bolts & nuts, 1 set 1" dies. 1 HP eccentric sheave. 1 HP eccentric sheave. 1 eccentric rod strap. 1 Steam Cylinder valve spindle complete. HP. Piston Valve, 1 air pump bucket & rod, set of valves for air pump. 6 condenser tubes with ferrules, 1 spring for each cylinder relief valve, 3 lengths 1/2" tube, 30 G Bends for air cooler, 3-1" bore NH<sub>3</sub> bends; 1 each steam piston with rods & rings, pump bucket with rod & springs and suction & delivery valves & pump for Brine & Circulating water Pump. For fans & Motors: 2 grease guns. 1 set springs for couplings, 1 D.I. fan runner. 1 bearing, 1 Armature, 1 set brushes & holders, 1 set bearing brushes, 1 set contacts. Springs & coils, 2 Pilot lamp fuses.

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

The foregoing is a correct description of the Refrigerating Machinery.

For THE LIVERPOOL REFRIGERATION CO. L.

Managing 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.

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

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

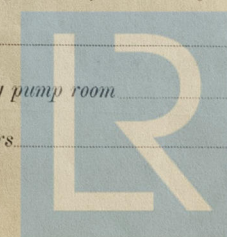
Draining Arrangements. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers

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.



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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

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, inside dimensions, main

and branch

Are they permanently fixed or collapsible, or portable

State position in chambers

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

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

Yes

and Insulation

No

Is the Refrigerating Machinery and Appliances duplicate of a previous case

Yes

If so, state name of vessel

Jamaica Pioneer

If the survey is not complete, state what arrangements have been made for its completion and what remains to be done

To complete the survey the Machinery and auxiliaries are being dispatched to Port Glasgow to be fitted on board, insulation be fitted, spare gear checked and a cooling down test applied on completion, also a test on the system after fitting in place.

General Remarks (State quality of workmanship, opinions as to class, &c.) The Refrigerating Machinery and Appliances of this Vessel have been built under Special Survey, the materials and workmanship are good, After erection in the shop the Machine and Auxiliaries are being sent to Port Glasgow to be fitted on board.

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.
2 Units Liverpool Refrigeration 2 Compressors Co. Ltd.		1934	Ammonia	—	Air lock	13920000	150	4	260000

Fee £ 24 : 0 : 0 { Fee applied for, 6 APR 1934  
Travelling Expenses £ 1 : 3 : 0 { Received by me, 14th May 1934

Committee's Minute

LIVERPOOL - 6 APR 1934

Assigned

Transmit to London

H. B. Murray.

S. Townend.

Surveyor to Lloyd's Register.

TUE 5 JUN 1934

See Rmb 50413

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