

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office 7- APR 1934)

Date of writing Report 19 1934 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 Aoning 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 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 1/2 x 28"

th of stroke 21 Working pressure 150 lb Diameter of crank shaft journals and pins 7 1/2"

th 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 2 Diameter Length of stroke Span of bearings as per Rule

imum pressure in cylinders Diameter of crank shaft journals and pins

uth and thickness of crank webs No. of sections in crank shaft Revolutions of engine per minute

etric Motors, type No. of Rated Kilowatts

s 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

ance 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

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 2-9 x 10 x 24 simplex how worked steam Gas Separators, No. of 2

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 4-5 coils 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. 10 x 12 x 12 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 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

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 3/2" chest. 1-1/4" gauge valve, 1 set each 1" 2 1/2" & 3/2" 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 & LP rings, 2 sets compressor gaskets 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" NH₃ gauge, 1 pair crosshead brasses 1 complete set of compressor joints, assorted bolts & nuts, 1 set 1" dies. 1 HP eccentric sheave 1 LP 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, 30G bands for air cooler, 3-1" bore NH₃ bands; 1 each steam piston with rods & rings, pump bucket with rod & springs and suction delivery valves & pump for Brine & Circulating water Pumps. For fans & Motors: 2 grease guns. 1 set springs for couplings, 1 DI 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

For THE LIVERPOOL REFRIGERATION CO. L.

The foregoing is a correct description of the Refrigerating Machinery.

W. H. Russell

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. 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	BOTTOM	AND 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 stices, 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, 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*
(If not, state date of approval)

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.					POWER.		INSULATED CARGO CHAMBERS.		
No. and whether Single or Duplex.	Makers.	Date of Construction.	System.	Type.	System of (1) Refrigerating (2) Insulating the Chambers.	Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours.	No.	Capacity.
2 Units 2 Compressors Co. Ltd.	Liverpool Refrigeration	1934	Ammonia	—	Air lock	13920000	150 Tons.	4	260000

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

H. Murray. *S. Lowndes.*
Surveyor, to Lloyd's Register.

Committee's Minute **LIVERPOOL -6 APR. 1934**

Assigned *Transmit to London*

Certificate to be sent to



NOTE.—THE WORDS WHICH DO NOT APPLY SHOULD BE DELETED.

Rpt.
RE
Date of
No.
Reg. E
400
on t
Vesse
Own
Refr
Insul
Meth
Num
DE
Refr
Total
Comp
Diam
Motiv
Stean
Length
Breath
Oil E
No. of
Maxim
Breath
Electr
Volts
Reduc
2nd pi
1st red
Distan
1st red
Pinion
Diam
Main
Gas C
No. of
Water
Gas E
No. of
Direc
clear
discom
Air C
Steam
Brine
Brine
No. of
H
Can ea