

No. 2220

THE BRITISH CORPORATION FOR THE SURVEY
AND

REGISTRY OF SHIPPING.

Report No. 2235 No. in Register Book 3618

"EMPIRE ROTHER"

"DELAWARE"
EX
"IMARI"

N/V

MANITOULIN

S.S.

Makers of Engines MacColl & Pollock

Works No. 365

Makers of Main Boilers MacColl & Pollock

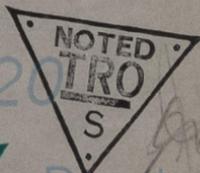
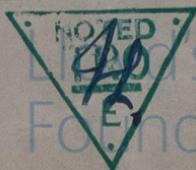
Works No. 365

Makers of Donkey Boiler NONE

Works No. ✓



MACHINERY.



No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. No. in Register Book

Received at Head Office

4th June 1929

Surveyor's Report on the NEW ENGINES, BOILERS, and AUXILIARY
Machinery of the ~~Single Screw~~ ~~Steam~~ ~~Quadruple~~ Screw STEAMER.

"IMARI"

Official No. 149497 Port of Registry Newcastle

Registered Owners Inland Steamship Coy. Limited

Winnipeg Canada.

Engines Built by Wacoll & Pollock,

at Sunderland.

Main Boilers Built by Wacoll & Pollock.

at Sunderland.

Donkey " " None.

at

Date of Completion

27.3.29

First Visit 24.7.28

Last Visit 27.3.29

Total Visits 26.



TURBINE ENGINES.

Works No.	Type of Turbines		
No. of H.P. Turbines	No. of I.P.	No. of L.P.	No. of Astern
Are the Propeller Shafts driven direct by the Turbines or through Gearing?			
Is Single or Double Reduction Gear employed?			
Diam. of 1st Reduction Pinion	} Width	} Pitch of Teeth	
" 1st " Wheel			
Estimated Pressure per lineal inch			
Diam. of 2nd Reduction Pinion	} Width	} Pitch of Teeth	
" 2nd " Wheel			
Estimated Pressure per lineal inch			
Revs. per min. of H.P. Turbines at Full Power			S.H.P.
" " " " " " " "	I.P.	" " " " " " " "	
" " " " " " " "	L.P.	" " " " " " " "	
" " " " " " " "	1st Reduction Shaft		
" " " " " " " "	2nd " " "		
" " " " " " " "	Propeller Shaft		
Total Shaft Horse Power			
Date of Harbour Trial			
" " " " " " " "	Trial Trip		
Trials run at			
Speed on Trial	Knots.	Propeller Revs. per min.	S.H.P.
Turbine Spindles forged by			
" " " " " " " "	Wheels forged or cast by		
Reduction Gear Shafts forged by			
" " " " " " " "	Wheels forged or cast by		

DESCRIPTION OF INSTALLATION.

Engine Stop valve plugged at base with $\frac{3}{4}$ " gas
brass plug securely fitted.

Tested 2 Aux^y N.R. valves. 360 lbs □ 5-11-78.
Condensers. Tested 5-11-78.

Tested 2 main boiler stop valves. 15-11-78.

" " Whistle " " " " 15-11-78.

" " Main + Donkey check valves 15-11-78.

" C.S. Water gauge standards. 4-11-78.



© 2020

Lloyd's Register
Foundation

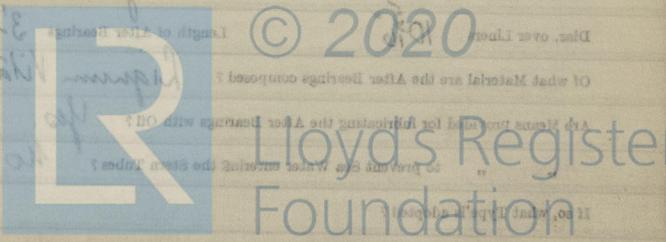
TURBO-ELECTRIC PROPELLING MACHINERY.

No. of Turbo-Generating Sets *2* Capacity of each *1000 H.P.*
 Type of Turbines employed *Vertical*
 Description of Generators *Vertical, 2000 V, 1000 H.P.*
 No. of Motors driving Propeller Shafting *2*
 Are the Propeller Shafts driven direct by the Motors or through Gearing? *Through Gearing*
 Is Single or Double Reduction Gear employed? *Double*
 Description of Motors
 Diam. of 1st Reduction Pinion } Width Pitch of Teeth
 " 1st " Wheel }
 Estimated Pressure per lineal inch
 Diam. of 2nd Reduction Pinion } Width Pitch of Teeth
 " 2nd " Wheel }
 Estimated Pressure per lineal inch
 Revols. per min. of Generators at Full Power
 " " Motors " "
 " " 1st Reduction Shaft " "
 " " 2nd " " "
 " " Propellers at Full Power " "
 Total Shaft Horse Power
 Date of Harbour Trial
 " Trial Trip
 Trials run at
 Speed on Trial Knots. Propeller Revols. per min. S.H.P.

Makers of Turbines *W. G. BARKER & CO. LTD.*
 " Generators *W. G. BARKER & CO. LTD.*
 " Motors *W. G. BARKER & CO. LTD.*
 " Reduction Gear *W. G. BARKER & CO. LTD.*
 Turbine Spindles forged by *W. G. BARKER & CO. LTD.*
 " Wheels forged or cast by *W. G. BARKER & CO. LTD.*
 Reduction Gear Shafts forged by *W. G. BARKER & CO. LTD.*
 " Wheels forged or cast by *W. G. BARKER & CO. LTD.*

DESCRIPTION OF INSTALLATION.

Are the Propeller Shafts fitted with Continuous Brass Liners? *Yes*
 Diam. over Liner *12 1/2"* Length of Liner *3'-0"*
 Of what Material are the After Bearings composed? *Cast Iron*
 Are the Bearings provided for lubricating the After Bearings with Oil?
 Do the Bearings receive the sea water?
 Diam. of Propeller shafts by Rule *12 1/2"* Actual *12 1/2"*
 No. of Bolts each Coupling *8* Diam. at Mid Length *3"* Actual *3"*
 Diam. of Intermediate Shafts by Rule *12 1/2"* Actual *12 1/2"*
 No. of Bolts each Coupling *8* Diam. of Pinion Circle *12 1/2"* Actual *12 1/2"*
 Forward Coupling *8* At All Couplings *8*
 Diam. of Turbine Shafts at bottom of Collars *12 1/2"* No. of Collars *8*
 Type of Turbine Blocks *Vertical - Collar*
 No. of Rings *4*



PUMPS, ETC.

No. of Air Pumps *One.* Diar. *13"* Stroke *16"*
 Worked by Main or Independent Engines? *Main.*

No. of Circulating Pumps *One* Diar. *10"* Stroke *10"*
 Type of *Independent duplex. 9" x 10" x 10"*
 Diar. of *Suction from Sea 6½"*

Has each Pump a Bilge Suction with Non-return Valve? *Yes.* Diar. *2"*
 What other Pumps can circulate through Condenser? *Ballast pump.*

No. of Feed Pumps on Main Engine *2.* Diar. *2½"* Stroke *16"*
 Are Spring-loaded Relief Valves fitted to each Pump? *Yes*
 Can one Pump be overhauled while the others are at work? *Yes*

No. of Independent Feed Pumps Diar. Stroke
 What other Pumps can feed the Boilers? *General Service donkey 6" x 4" x 6"*

No. of Bilge Pumps on Main Engine *2.* Diar. *2½"* Stroke *16"*
 Can one Pump be overhauled while the others are at work? *Yes.*

No. of Independent Bilge Pumps
 What other Pumps can draw from the Bilges? *Ballast Pump.*

Are all Bilge Suctions fitted with Roses? *Mud boxes.*

Are the Valves, etc., so arranged as to prevent unintentional connection between Sea and Bilges? *Yes.*

Are all Sea Connections made with Valves or Cocks next the Ship's sides? *Yes*
 Are they placed so as to be easily accessible? *Yes.*

Are the Discharge Chests placed above or below the Deep Load Line? *Above.*

Are they fitted direct to the Hull Plating and easily accessible? *Yes.*

Are all Blow-off Cocks or Valves fitted with Spigots through the Hull Plating and Covering Plates or Flanges on the Outside? *Blow off Cocks.*

One 6" hold suction additional
 in this vessel from hat in tank top
 forward of after bulkhead in hold
 in centre and through a N.R. valve
 on tank box in engine room.



BOILERS.

Works No. **365.**

No. of Boilers **Two** Type **Cylindrical multitubular.**

Single or Double-ended **Single**

No. of Furnaces in each **Two**

Type of Furnaces **Dayton**

Date when Plan approved **25.7.28.**

Approved Working Pressure **180 lbs.**

Hydraulic Test Pressure **320 lbs.**

Date of Hydraulic Test **26.10.28**

„ when Safety Valves set **23.1.29**

Pressure at which Valves were set **180 lbs.**

Date of Accumulation Test **23.1.29**

Maximum Pressure under Accumulation Test **187 lbs.**

System of Draught **Howdson Forced**

Can Boilers be worked separately? **Yes**

Makers of Plates **James Dunlop Glasgow.**

„ Stay Bars **„**

„ Rivets **Rivet Bolt Nut Co.**

„ Furnaces **Dayton.**

Greatest Internal Diam. of Boilers **10'-1 $\frac{3}{16}$ \"**

„ „ Length „ **10'-9 $\frac{5}{16}$ \"**

Square Feet of Heating Surface each Boiler **1068.43**

„ „ Grate „ „ **32.34**

No. of Safety Valves each Boiler **1. Double** Rule Diam. **2 $\frac{1}{2}$ \"** ordinary

Are the Safety Valves fitted with Easing Gear? **Yes**

No. of Pressure Gauges, each Boiler **Two** No. of Water Gauges **One**

„ Test Cocks **Three.** „ Salinometer Cocks **One**

B.C. TEST.

4630
T.P. 320
W.P. 180
JL
26.10.28

Boiler Test Mark
on each boiler.



© 2020

Lloyd's Register
Foundation

Are the Water Gauges fitted direct to the Boiler Shells or mounted on Pillars? Pillars (C. Steel).

Are the Water Gauge Pillars fitted direct to the Boiler Shells or connected by Pipes? direct.

Are these Pipes connected to Boilers by Cocks or Valves? ✓

Are Blow-off Cocks or Valves fitted on Boiler Shells? Yes. Valves with double

No. of Strakes of Shell Plating in each Boiler Same as S/S Rachine doc.

Plates in each Strake "Hamildoc"

Thickness of Shell Plates Approved "Wellandoc."

" " in Boilers

Are the Rivets Iron or Steel?

Are the Longitudinal Seams Butt or Lap Joints?

Are the Butt Straps Single or Double?

Are the Double Butt Straps of equal width?

Thickness of outside Butt Straps

" inside "

Are Longitudinal Seams Hand or Machine Riveted?

Are they Single, Double, or Treble Riveted?

No. of Rivets in a Pitch

Diar. of Rivet Holes Pitch

No. of Rows of Rivets in Centre Circumferential Seams

Are these Seams Hand or Machine Riveted?

Diar. of Rivet Holes Pitch

No. of Rows of Rivets in Front End Circumferential Seams

Are these Seams Hand or Machine riveted?

Diar. of Rivet Holes Pitch

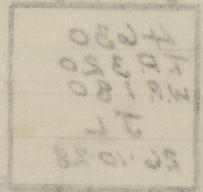
No. of Rows of Rivets in Back End Circumferential Seams

Are these Seams Hand or Machine Riveted?

Diar. of Rivet Holes Pitch

Size of Manholes in Shell

Dimensions of Compensating Rings



shut off S.L. valve additional.



Thickness of End Plates in Steam Space Approved

" " " " " in Boilers

Pitch of Steam Space Stays

Diar. " " " " Approved Threads per Inch

" " " " " in Boilers "

Material of " " "

How are Stays Secured?

Diar. and Thickness of Loose Washers on End Plates

" " Riveted " "

Width " " Doubling Strips "

Thickness of Middle Back End Plates Approved

" " " " " in Boilers

Thickness of Doublings in Wide Spaces between Fireboxes

Pitch of Stays at " " " "

Diar. of Stays Approved Threads per Inch

" " in Boilers "

Material "

Are Stays fitted with Nuts outside?

Thickness of Back End Plates at Bottom Approved

" " " " " in Boilers

Pitch of Stays at Wide Spaces between Fireboxes

Thickness of Doublings in " "

Thickness of Front End Plates at Bottom Approved

" " " " " in Boilers

No. of Longitudinal Stays in Spaces between Furnaces

Pillars (C. Steel)
ditto

Welded
Same as back boiler
Hamildor
Welded



© 2020

Lloyd's Register
Foundation

Diar. of Stays Approved Threads per Inch

„ „ in Boilers

Material „

Thickness of Front Tube Plates Approved

„ „ „ „ in Boilers

Pitch of Stay Tubes at Spaces between Stacks of Tubes

Thickness of Doublings in „ „ „

„ Stay Tubes at „ „ „

Are Stay Tubes fitted with Nuts at Front End ?

Thickness of Back Tube Plates Approved

„ „ „ in Boilers

Pitch of Stay Tubes in Back Tube Plates

„ Plain „

Thickness of Stay Tubes

„ Plain „

External Diar. of Tubes

Material „

Thickness of Furnace Plates Approved

„ „ „ in Boilers

Smallest outside Diar. of Furnaces

Length between Tube Plates

Width of Combustion Chambers (Front to Back)

Thickness of „ „ Tops Approved

„ „ „ „ in Boilers

Pitch of Screwed Stays in C.C. Tops

Diar. of Screwed Stays Approved Threads per Inch

„ „ „ in Boilers

Material „

Thickness of Combustion Chamber Sides Approved

„ „ „ in Boilers

Pitch of Screwed Stays in C.C. Sides

Diar. „ „ „ Approved Threads per Inch

„ „ „ in Boilers

Material „

Thickness of Combustion Chamber Heads Approved

„ „ „ in Boilers

Pitch of Screwed Stays in C.C. Heads

Diar. „ „ „ Approved Threads per Inch

„ „ „ in Boilers

Material „

Are all Screwed Stays fitted with Nuts inside C.C. ?

Thickness of Combustion Chamber Bottoms

No. of Girders over each Wing Chamber

Centre „ „

Depth and Thickness of Girders

Material of Girders

No. of Stays in each

No. of Lower Manholes



© 2020

Lloyd's Register Foundation

VERTICAL DONKEY BOILERS

Diar. of Screwed Stays Approved Threads per Inch

" " " in Boilers

Material " "

Thickness of Combustion Chamber Sides Approved

" " " " in Boilers

Pitch of Screwed Stays in C.O. Sides

Diar. " " Approved Threads per Inch

" " " in Boilers

Material " "

Thickness of Combustion Chamber Backs Approved

" " " " in Boilers

Pitch of Screwed Stays in C.O. Backs

Diar. " " Approved Threads per Inch

" " " in Boilers

Material " "

Are all Screwed Stays fitted with Nuts inside C.O.?

Thickness of Combustion Chamber Bottoms

No. of Girders over each Wing Chamber

" " " Centre "

Depth and Thickness of Girders

Material of Girders

No. of Stays in each

No. of Tubes, each Boiler

Size of Lower Manholes

SUPERHEATERS



© 2020

Lloyd's Register Foundation

MAIN STEAM PIPES.

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

4
Copenhagen
S. D.
3 1/2"
7 W.G.
Brazed.
13.11.28
360
J.L.

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

SUPERHEATERS

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

ballast donkey, 2 1/2" dia. 11" high
G. S. pump, 6" x 6" x 6" - do -
Sanitary 3 1/2" x 3 1/2" x 1/2" - do -
Fresh Water do - do -
Lubricating Pump 2 1/2" x 1 1/2" x 1/2" - do -
C.M. Tap 1 1/2" x 8"
Hobson & Partners

FEED WATER FILTERS

180 lbs. 8 1/2" dia. 1 1/2" high
H.P. & L.P. 1 1/2" x 1 1/2" x 1 1/2" - do -
8/1/28 G.H.



© 2020

Lloyd's Register
Foundation

EVAPORATORS.

No. *None.* Type *None.* Tons per Day *0*
 Makers *None.*
 Working Pressure *5* Test Pressure *5* Date of Test *None.*
 Date of Test of Safety Valves under Steam *None.*

Exhaust FEED WATER HEATERS.

No. *1* Type *C. M. Type 1798*
 Makers *Holden & Brooke Ltd.*
 Working Pressure *-* Test Pressure *-* Date of Test *-*

FEED WATER FILTERS.

No. *One* Type *High Pressure* Size *al.*
 Makers *Walsall & Collock.*
 Working Pressure *180 lbs.* Test Pressure *450 lbs.* Date of Test *8/1/29 G.H.B.*

LIST OF DONKEY PUMPS.

Ballast donkey *9 1/2 x 11 1/2 x 11 MacColl & Pollock*
 G. S. pump. *6 x 4 x 6 - do -*
 Sanitary *3 1/2 x 3 1/2 x 4 Mumford*
 Fresh Water *- do - do -*
 Circulating Pump. *9 x 10 x 10 MacColl & Pollock.*
 Injector *1 1/2 N° 9 Fresham & Coates.*

OTHER ARTICLES ON STEAM ENGINE
 1 set feed pump valves
 1 ballast
 1 circulating
 1 set of boiler
 1 boiler
 1 set of boiler
 1 boiler



REFRIGERATORS.

No. of Machines *2* Capacity of each *2*
 Makers *1 set*
 Description *3*

No. of Steam Cylinders, each Machine No. of Compressors No. of Cranks

Particulars of Pumps in connection with Refrigerating Plant and whether worked by Refrigerating Machines

or Independently

2 set
1 set
2
3

OTHER ARTICLES OF SPARE GEAR:

24 assorted bolts nuts
1 set feed donkey valves
1 ballast

System of Refrigeration

Insulation

Are Brine and other Regulating Valves placed so as to be accessible without entering the Insulated

Spaces?

Are all Pipes, Air Trunks, &c., well secured and protected from risk of damage?

Are all Bilge, Sounding, and Air Pipes in Insulated Spaces properly insulated?

Are Thermometer Tubes so arranged that Water cannot enter and freeze in them?

Date of Test under Working Conditions

RESULTS OF TRIALS.

COMPARTMENT.	Temp. at beginning of Trial.	Temp. at end of Trial.	Time required to obtain this Result.	Rise of Temp. after hours.
<i>Navigation</i>	<i>60°</i>	<i>3</i>	<i>7/22</i>	<i>98% 600</i>
<i>2d. Deck</i>	<i>20</i>	<i>1</i>	<i>7/22</i>	<i>98% 600</i>
<i>1st. Deck</i>	<i>20</i>	<i>1</i>	<i>7/22</i>	<i>98% 600</i>
<i>2d. Deck</i>	<i>20</i>	<i>1</i>	<i>7/22</i>	<i>98% 600</i>
<i>2d. Deck</i>	<i>20</i>	<i>1</i>	<i>7/22</i>	<i>98% 600</i>
<i>2d. Deck</i>	<i>20</i>	<i>1</i>	<i>7/22</i>	<i>98% 600</i>

Articles of Spare Gear for Refrigerating Plant carried on board:—



© 2020

Lloyd's Register
Foundation

No. of Machines
 in each
 Description

Time required
 to obtain
 this service

Capacity of each
 Lamp as
 furnished

Temp. as
 furnished
 in Lamp

TEMPERATURE

Description

No. of Steam Cylinders, and Valves

No. of Compressors

No. of Drives

Particulars of Pumps in connection with Independent Fans and other machinery worked by Independent Motors

or Independently

Method of Refrigeration

Method

Articles of Spare Gear for Refrigerating Plant carried on board:

Is there any special Air Purifier, Air Filter, etc. carried on board?

Is there any special Ventilation, and Air Pipes in connection with special machinery carried on board?

Are there any special arrangements for the use of Water in connection with special machinery carried on board?

Date of Test under Working Conditions

ELECTRIC LIGHTING.

Installation Fitted by

Swan Hunter & W.R. Ltd.

No. and Description of Dynamos

One comp., wound

Makers of Dynamos

Sunderland Forge & Eng Co Ltd.

Capacity

91 Amperes, at 110 Volts, 380 Revols. per Min.

Current Alternating or Continuous

Continuous

Single or Double Wire System

Double.

Position of Dynamos

In engine room on lower platform

Main Switch Board

near dynamo.

No. of Circuits to which Switches are provided on Main Switch Board

4.

Particulars of these Circuits:—

Circuit.	Number of Lights.	Candle Power.	Current Required. Amps.	Size of Conductor.	Current Density.	Conductivity of Conductor.	Insulation Resistance per Mile.
					1 EE.	Megohms.	
Navigation.	4	60 W.	3	7/029	Rule	98%	600
	2	30	3	7/029	"	98%	600
Ed., Accom.,	19	30	14	7/044	"	98%	600
	13	16 CP.					
Aft., Accom.,	19	30 W.	14	7/044	"	98%	600.
	26	16 CP.					
Eng + Bls rooms.	13	30 W.	5	7/029	"	98%	600
	3	16 CP.					

Total No. of Lights

99

No. of Motors driving Fans, &c.

None

No. of Heaters

None

Current required for Motors and Heaters

None



© 2020

Lloyd's Register
Foundation

Positions of Auxiliary Switch Boards, with No. of Switches on each

None

*Insulation Resistance of
Main Switch Board
No. and Description of Dynamos
Makers of Dynamos
Capacity
Current Alternating or Continuous
Single or Double Wire System
Position of Dynamos
Main Switch Board
No. of Circuits to which switches are provided on Main Switch Board*

Circuit	No. of Lamps	Watts	Volts	Current (Amps)	Capacity of Battery	Current (Amps)	Capacity of Battery	Insulation Resistance per Mile

Are Out-outs fitted as follows?—

On Main Switch Board, to Cables of Main Circuits

yes

On Aux. " " each Auxiliary Circuit

None

Wherever a Cable is reduced in size

yes

To each Lamp Circuit

yes

To both Flow and Return Wires of all Circuits when the Double-Wire System is adopted

yes

Are the Fuses of Standard Sizes?

yes

Are all Switches and Out-outs constructed of Non-inflammable Material?

yes

Are they placed so as to be always and easily accessible?

yes

Smallest Single Wire used, No. *3/029* S.W.G., Largest, No. *19/72* S.W.G.

How are Conductors in Engine and Boiler Spaces protected? *Lead Covered & Braided*

" " Saloons, State Rooms, &c. *Lead Wires clipped to Structure*

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp *Lead Covered & Braided*

(2) " " passing through Bunkers or Cargo Spaces *Lead Covered in Telegraph Rooms*

(3) " " Deck Beams or Bulkheads *Rubber Lenses & Wt. Glands*

Are all Joints in Cables properly soldered and thoroughly Insulated so that the efficiency of the Cables is unimpaired? *None*

Are all Joints in accessible positions, none being made in Bunkers or Cargo Spaces? *None*

Are all Hull Connections for Single-Wire Systems made with Screws of large Surface? *None*

Are the Dynamos, Motors, Main and Branch Cables, so placed that the Compasses are not injuriously affected by them? *yes*

Have Tests been made to prove that this condition has been satisfactorily fulfilled? *yes*

Has the Insulation Resistance over the whole system been tested? *yes*

What does the Resistance amount to? *100,000 Ohms* Ohms.

Is the Installation supplied with a Voltmeter? *yes*
" " " an Ampere Meter *yes*

Date of Trial of complete Installation *27.3.29* Duration of Trial *8 hours*.

Have all the requirements of Section 42 been satisfactorily carried out? *yes*

J. Lauric



© 2020
Lloyd's Register
Foundation

GENERAL CONSTRUCTION

MAIN BOLLERS	
H.S.	Sd. R.
G.S.	
DOCKET BOLLERS	
H.S.	Sd. R.
G.S.	
L.F.O.	
Testing fee	
Expenses	
Total	

It is submitted that this Report be approved.

W. J. ...

Approved by the Committee for the Class of MEMBERS on the ...

IMARI

Fee paid
Fee advised

W. J. ...



© 2020

Lloyd's Register Foundation



© 2020

Lloyd's Register
Foundation



© 2020

Lloyd's Register
Foundation