

No. 1766

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. *1609* No. in Register Book *2852*

S.S. "CARLGARTH"

Makers of Engines

Smiths Dock Co. Ltd.

Works No. *225*

Makers of Main Boilers

Newthorn Leslie Co. Ltd.

Works No. *8649 no. 1.*

Makers of Donkey Boiler

Works No. ✓

MACHINERY.



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010428-010439-0035

No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. *1609* No. in Register Book *2852*

Received at Head Office *10th January 1923*

Surveyor's Report on the New Engines, Boilers, and Auxiliary Machinery of the ~~Single Triple~~ ~~Coin Quadruple~~ Screw "Carlgarth" Tug.

Official No.

Port of Registry *Liverpool*

Registered Owners

Rea & Living Ltd.

Engines Built by

Smiths Dock Co. Ltd.

at

South Bank-on-Tees

Main Boilers Built by

Hawthornes Leslie Co.

at

Newcastle-on-Tyne.

Donkey " "

at

Date of Completion

12-22

First Visit *8-8-22*

Last Visit *5-12-22*

Total Visits *36*



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TURBO-ELECTRIC PROPELLING MACHINERY.

No. of Turbo-Generating Sets Capacity of each

Type of Turbines employed

Description of Generators

No. of Motors driving Propeller Shafting

Are the Propeller Shafts driven direct by the Motors or through Gearing?

Is Single or Double Reduction Gear employed?

Description of Motors

Diar. of 1st Reduction Pinion } Width Pitch of Teeth
 ,, 1st ,, Wheel }

Estimated Pressure per lineal inch

Diar. of 2nd Reduction Pinion } Width Pitch of Teeth
 ,, 2nd ,, Wheel }

Estimated Pressure per lineal inch

Revs. 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 Revs. per min. S.H.P.

Makers of Turbines

Generators

Motors

Reduction Gear

Turbine Spindles forged by

Wheels forged or cast by

Reduction Gear Shafts forged by

Wheels forged or cast by

DESCRIPTION OF INSTALLATION.

Are the Crank Shafts built or Solid?

No. of Lengths in each

Diar. by Base

Length between Webs

Greatest Width of Crank Webs

Least

Diar. of Keys in Crank Webs

Howels in Crank Pins

No. of Holes each Coupling

Greatest Distance from Holes to

Type of Thrust Blocks

No. of Rings

Diar. of Thrust Shafts at bottom of Collars

Forward Coupling

No. of Collars

At All Couplings

No. of Lengths

Diar. at Mid Length

Diar. of Intermediate Shafts by Base

No. of Holes each Coupling

Diar. at Mid Length

Diar. of Propeller Shafts by Base

Are Propeller Shafts fitted with Combination Brass Liners?

Dist. over Liners

Length of After Bearings

Of what Material are the After Bearings composed?

Are Liners provided for protecting the After Bearings with Oil?

Is the After Bearings the same as the Main Bearings?



BOILERS.

Works No. 8649 No. 1.

No. of Boilers 1 Type Cylindrical multitubular.
Single

Single or Double-ended Single

No. of Furnaces in each 3

Type of Furnaces Morrison's

Date when Plan approved 3-8-22

Approved Working Pressure 200 lbs.

Hydraulic Test Pressure 350 lbs.

Date of Hydraulic Test 10-10-22

„ when Safety Valves set 10-11-22

Pressure at which Valves were set 206 lbs.

Date of Accumulation Test 10-11-22

Maximum Pressure under Accumulation Test 215 lbs.

System of Draught natural

Can Boilers be worked separately? y/s.

Makers of Plates Messrs John Spener, Newbarn
do do

„ Stay Bars do

„ Rivets Messrs The Rivet Nut & Bolt Co. Glasgow.

„ Furnaces Marshall - Coatbridge

Greatest Internal Diam. of Boilers 14-0 $\frac{13}{32}$

„ „ Length „ 11-9

Square Feet of Heating Surface each Boiler 2126 ft²

„ „ Grate „ „ 60 ft²

No. of Safety Valves each Boiler 2 Rule Diam. Actual 3"

Are the Safety Valves fitted with Easing Gear? Yes

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

„ Test Cocks Three „ Salinometer Cocks One

Are the Water Ganges fitted direct to the Boiler Shells or mounted on Flanges?
By Pipes

Are these Pipes connected to Boilers by Hooks or Valves?

Are Hooks or Valves fitted on Boiler Shells?

No. of Strains of Shell Plates in each Boiler

Plates in each Strain

Thickness of Shell Plates (approx)

in Boilers

Are the Rivets Iron or Steel?

Are the Longitudinal Seams Joint or Lap Joints?

Are the Joint 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 Triple Riveted?

No. of Rivets in a Pitch

Dist. of Rivet Holes

No. of Rows of Rivets in Circumferential Seams

Are these Seams Hand or Machine Riveted?

Dist. of Rivet Holes

No. of Rows of Rivets in Circumferential Seams

Are these Seams Hand or Machine Riveted?

Dist. of Rivet Holes

No. of Rows of Rivets in Back End Circumferential Seams

Are these Seams Hand or Machine Riveted?

Dist. of Rivet Holes

Dist. of Rivet Holes

Dimensions of Compensating Rings

Mark on Boiler.

B. C.
No 3909
3.50 lbs.
W.P. 200 lbs.
H. N.
10-10-22

Line of Compensation Ring.

Starbd $\frac{1}{32}$ " Port $\frac{25}{64}$ "



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Are the Water Gauges fitted direct to the Boiler Shells or mounted on Pillars? *on Pillar*

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

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

Are Blow-off Cocks or Valves fitted on Boiler Shells? *Valve*

No. of Strakes of Shell Plating in each Boiler *1*

Plates in each Strake *2*

Thickness of Shell Plates Approved *1 3/32 1/4"*

" " in Boilers *1 3/32 + 1/64*

Are the Rivets Iron or Steel? *Steel*

Are the Longitudinal Seams Butt or Lap Joints? *Butts*

Are the Butt Straps Single or Double? *Double*

Are the Double Butt Straps of equal width? *Yes*

Thickness of outside Butt Straps *1"*

" inside " *1 1/8"*

Are Longitudinal Seams Hand or Machine Riveted? *Machine*

Are they Single, Double, or Treble Riveted? *Treble*

No. of Rivets in a Pitch *5*

Diar. of Rivet Holes *1 3/8"* Pitch *9 3/8"*

No. of Rows of Rivets in Centre Circumferential Seams *No Centre Seams*

Are these Seams Hand or Machine Riveted? *✓*

Diar. of Rivet Holes Pitch *✓*

No. of Rows of Rivets in Front End Circumferential Seams *2*

Are these Seams Hand or Machine riveted? *Hand*

Diar. of Rivet Holes *1 3/8"* Pitch *3.98"*

No. of Rows of Rivets in Back End Circumferential Seams *2*

Are these Seams Hand or Machine Riveted? *Machine*

Diar. of Rivet Holes *1 3/8"* Pitch *3.98"*

Size of Manholes in Shell *17x13*

Dimensions of Compensating Rings *2-9 1/2 long x 2-7" Broad*

132

532 x 17

3 1/4"

Steel

Double butt Straps

1 1/4" dia of the

None

1 1/8"

None

12 x 1 3/8"

1 1/8"

12 x 1 1/8"

1 1/8"

12 x 1 1/8"



Thickness of End Plates in Steam Space Approved

1 3/32

" " " " " in Boilers

" " "

Pitch of Steam Space Stays

23 1/2 x 17

Diar. " " " " Approved 3 3/4" Threads per Inch 6

" " " " " in Boilers

Material of " " "

Steel
Double nuts & washers

How are Stays Secured?

6 1/4" dia x 1/4 TRse

Diar. and Thickness of Loose Washers on End Plates

None

" " Riveted " " "

Width " " Doubling Strips "

Thickness of Middle Back End Plates Approved

1/8"

" " " " " in Boilers

Thickness of Doublings in Wide Spaces between Fireboxes

None

Pitch of Stays at

15" x 7 7/8"

Diar. of Stays Approved 1 7/8" Threads per Inch 9

" " " " " in Boilers

Material "

Steel

Are Stays fitted with Nuts outside?

nuts both ends.

Thickness of Back End Plates at Bottom Approved

7/8"

" " " " " in Boilers

Pitch of Stays at Wide Spaces between Fireboxes

15" x 7 7/8"

Thickness of Doublings in " "

None fitted

Thickness of Front End Plates at Bottom Approved

1"

" " " " " in Boilers

No. of Longitudinal Stays in Spaces between Furnaces

None

Threads per Inch

Diam. of plate Approved

" " " " " 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

" " " " "

Thickness of Stay Tubes

" " " " "

External Diam. of Tubes

Material

Thickness of Furnace Plates Approved

" " " " " in Boilers

Smallest outside Diam. of Furnaces

Length between Tube Plates

Width of Combustion Chambers (Front to Rear)

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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

1"

14 1/4 x 8 3/4"

None

3/8

Yes.

13/16

9 x 8 3/4"

4 1/2 x 4 3/8"

3/8 15/16"

No 8 L.S.G.

3 1/4

Iron

19/32"

3'-3-11/16"

8'-0"

2-11" outside

21/32"

"

9 3/8 x 7 3/4"

Diar. of Screwed Stays Approved ✓ Threads per Inch ✓

" " in Boilers ✓

Material " ✓

Thickness of Combustion Chamber Plates Approved

" " " " in Boilers

Pitch of Screwed Stays in C.C. Tops

Diar. " " Approved

" " in Boilers

Material " "

Thickness of Combustion Chamber Heads Approved

" " " " in Boilers

Pitch of Screwed Stays in C.C. Heads

Diar. " " Approved

" " in Boilers

Material " "

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

Thickness of Combustion Chamber Bottoms

No. of Girders over each Wire Chamber

" " " " " "

Depth and Thickness of Girders

Material of Girders

No. of stays in each

No. of Tubes, each Boiler

Size of Tubes



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Diar. of Screwed Stays Approved $1\frac{5}{8}$ Threads per Inch 9
 " " " in Boilers " "
 Material " " Steel

Thickness of Combustion Chamber Sides Approved $\frac{21}{32}$ "
 " " " " in Boilers " "
 Pitch of Screwed Stays in C.O. Sides $9" \times 8\frac{7}{8}"$
 Diar. " " Approved $1\frac{5}{8}$ Threads per Inch 9"
 " " " in Boilers " "
 Material " " Steel

Thickness of Combustion Chamber Backs Approved Centre $\frac{23}{32}$ - Sides $\frac{21}{32}$ "
 " " " " in Boilers " "
 Pitch of Screwed Stays in C.O. Backs $9" \times 8"$
 Diar. " " Approved $1\frac{5}{8}$ Threads per Inch 9"
 " " " in Boilers " "
 Material " " Steel

Are all Screwed Stays fitted with Nuts inside C.O.? Yes
 Thickness of Combustion Chamber Bottoms $\frac{1}{8}"$

No. of Girders over each Wing Chamber 4
 " " " Centre " 3
 Depth and Thickness of Girders $9" \times (2) \frac{7}{8}"$ plates
 Material of Girders Steel

No. of Stays in each 3
 No. of Tubes, each Boiler 244
 Size of Lower Manholes $16" \times 12"$

VERTICAL DONKEY BOILERS

No. of Boilers
 Type
 Greatest Int. Diar.
 Height of Boiler above Main Girth
 Are Boiler Covers Flat or Dished?
 External Radius of Dished Boilers
 Description of Beams in Boiler Covers
 Dist. of Rivet Boles
 Width of Girders
 Height of Firebox Covers above Fire Girth
 Are Firebox Covers Flat or Dished?
 External Radius of Dished Covers
 Material
 No. of Crown Stays
 Internal Dist. of Firebox at Top
 Thickness of Plates
 No. of Water Tubes
 External Diar.
 Material of Water Tubes
 Size of Manhole in Shell
 Dimensions of Compensation Valve
 Heating Surface, each Boiler
 (Gross Surface)

SUPERHEATERS



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MAIN STEAM PIPES.

No. of Lengths	4		
Material	cupph.		
Brazed, Welded or Seamless	P.D.		
Internal Diar.	4 1/2"		
Thickness	5 wt.		
How are Flanges secured?	braced.		
Date of Hydraulic Test	31-10-22 + 6-11-22		
Test Pressure	400 lbs.		
No. of Lengths			
Material			
Brazed, Welded or Seamless			
Internal Diar.			
Thickness			
How are Flanges secured?			
Date of Hydraulic Test			
Test Pressure			
No. of Lengths			
Material			
Brazed, Welded or Seamless			
Internal Diar.			
Thickness			
How are Flanges secured?			
Date of Hydraulic Test			
Test Pressure			

FEED WATER HEATERS

No.			
Type			
Material	Feed boiler, by Henry Water Co.		
Working Pressure	3 1/2" x 3 1/2" x 5"		
Date of Test of Safety Valve under Steam			
Material	Ballast boiler, by Henry Water Co.		
Working Pressure	6" x 6" x 6"		
Date of Test			
Test Pressure			

FEED WATER FILTERS



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REFRIGERATORS.

No. of Machines *2* Capacity of each *2*Makers *W. G. & Co. Ltd. & J. G. & Co. Ltd.*Description *6" High Pressure Valve 1 set, 6" High Pressure Valve 1 set**H.P. Piston Rings 1 set, L.P. Piston Rings 1 set, L.P. Piston Rings 1 set*No. of Steam Cylinders, each Machine *1* No. of Compressors *1* No. of Cranks *1*

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

or Independently *Air Pump 1 set, Air Pump Valve 1 set**Oil 1 set, Oil 1 set, Oil 1 set**Crank Shaft 1 set, Crank Shaft 1 set, Crank Shaft 1 set**Propeller Shaft 1 set, Propeller Shaft 1 set, Propeller Shaft 1 set**Safety Tubes 3, Condenser Tubes 12, Condenser Tubes 20**6 Gauge Plates & 1 doz Rings
1 set high pressure valve*

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.
No. of Cylinders				
Capacity				
Current Alternating or Continuous				
Speed of Revolutions per Minute				
Position of Dynamometer				
Make British Board				
No. of Cylinders which Pistons are covered on Main British Board				
Particulars of Valves				
Weight of Water				
Current Required				
Speed of Revolutions				
Temperature of Water				
Temperature of Air				
Temperature of Brine				
Temperature of Oil				
Temperature of Steam				
Temperature of Condenser				
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Temperature of Brine				
Temperature of Oil				
Temperature of Steam				

GENERAL CONSTRUCTION

Have the Machinery and Boilers been constructed in accordance with the requirements of the Rules and the

Approved Plans? *yes.*

If not, give details of the points of difference, and state when these were sanctioned by the Chief

Surveyor.

directed by them?

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

Has the Installation Resisted over the whole system been tested?

and

What does the Resistance amount to?

is the Installation supplied with a Voltmeter?

in Amperes Meters?

Date of Trial of complete Installation

Have all the requirements of Section 12 been satisfactorily carried out?

Are the Materials used in the Construction of Engines and Boilers, so far as could be seen, sound and

trustworthy? *yes.*

Is the Workmanship throughout thoroughly satisfactory? *yes.*

The above correctly describes the Machinery of the S.S.

as ascertained by *me* from personal examination

"Carlgarth"

J. D. Stephenson
 Engineer Surveyor to the British Corporation for the
 Survey and Registry of Shipping.

Fees— *2126* *sq ft* [see sheets of particulars]
 MAIN BOILERS. £ s. d.

H.S. *2120* Sq. ft. *14 : 3 : 0*

G.S. *60.5* " : :

DONKEY BOILERS.

H.S. ✓ Sq. ft. : :

G.S. ✓ " : :

£ : :

ENGINES.

L.P.C. *18.6* Cub. ft. *18 : 13 : 0*

£ : :

Testing, &c. ... : :

£ : :

Expenses ... : :

Total ... £ *82 : 16 : 0*

It is submitted that this Report be approved,

Walter King
 Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the *21st February 1923*

Fees advised *17 - 11 - 22*

Fees paid *22 - 11 - 22*



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 Secretary.

Post-
 all the other...
 H.R. 2120
 DOKKEY BOLERS
 H.R. 2120
 EXPENSES
 Total

It is authorized that this Report be approved.
 Approved by the Committee for the Glass of M.E.S. on the 21st of July 1919
 Carl Barth
 Test given
 Test paid
 [Signature]



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