

No. 2264



THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. 2262 No. in Register Book 3646

GRAY BEAVER

" " S.S. SOUTHERN

Makers of Engines Smiths Dock Co Ltd

Works No. 341

Makers of Main Boilers Blair & Co (1926) Ltd

Works No. C. 207

Makers of Donkey Boiler ✓

Works No. ✓

MACHINERY.



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No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. No. in Register Book

Received at Head Office. *8th November 1929.*

Surveyor's Report on the New Engines, Boilers, and Auxiliary
Machinery of the ~~Single Triple~~ *Single Triple* Screw *Meques*
~~Twin Quadruple~~ *"Southon"*

Official No. *160722* Port of Registry *Middleburgh*

Registered Owners *Matthews Steamship Co. Ltd. Toronto*

Engines Built by *Clyde Dock Co. Ltd.*

at *South Bank-on-Sea.*

Main Boilers Built by *Blair & Co. (1926) Ltd.*

at *Stockton-on-Tees.*

Donkey " " ✓

at

Date of Completion *5-29*

First Visit *19-4-28* Last Visit *1-5-29* Total Visits *140*

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RECIPROCATING ENGINES.

Works No. **341** No. of Sets **1** Description **Lighter & heavier. 3 Cyls.**

No. of Cylinders each Engine **3** No. of Cranks **3**
 Diars. of Cylinders **15"-25"-40"** Stroke **33"**

Cubic feet in each L.P. Cylinder **24.**

Are Spring-loaded Relief Valves fitted to Top and Bottom of each Cylr.?

" " each Receiver?

Type of H.P. Valves,

1st I.P. "

2nd I.P.,

L.P. "

" Valve Gear

" Condenser

Cooling Surface sq. ft.

Diameter of Piston Rods (plain part)

Screwed part (bottom of thread)

Material "

Diam. of Connecting Rods (smallest part)

Material

" Crosshead Gudgeons

Length of Bearing

Material

No. of Crosshead Bolts (each)

Diam. over Thrd.

Thrds. per inch

Material

" Crank Pin " "

"

"

"

" Main Bearings

Lengths

" Bolts in each

Diam. over Thread

Threads per inch

Material

" Holding Down Bolts, each Engine

Diam.

No. of Metal Chocks

Are the Engines bolted to the Tank Top or to a Built Seat?

Are the Bolts tapped through the Tank Top and fitted with Nuts Inside?

If not, how are they fitted?

Connecting Rods, Forged by **Brown & Bros.**

Piston " "

Crossheads,

Connecting Rods, Finished by **Smith & Dk Co.**

Piston " "

Crossheads,

Date of Harbour Trial **26-4-29.**

" Trial Trip **1-5-29.**

Trials run at **In Vles Bay.**

Were the Engines tested to full power under Sea-going conditions? **Yks.**

If so, what was the I.H.P.?

830

Revol. per min. **120**

Pressure in 1st I.P. Receiver, **58** lbs., 2nd I.P.,

lbs., L.P., **11** lbs., Vacuum, **25** ins.

Speed on Trial **No speed taken**

If the Conditions on Trial were such that full power records were not obtained give the following estimated

data:—

Builders' estimated I.H.P.

Revol. per min.

Estimated Speed



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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

Diam. of 1st Reduction Pinion

" 1st " Wheel

} Width

Pitch of Teeth

Estimated Pressure per lineal inch

Diam. of 2nd Reduction Pinion

" 2nd " Wheel

} Width

Pitch of Teeth

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 Revols. per min. S.H.P.

Makers of Turbines 3 KINOSHETA OFF SHAFT

" 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.



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SHAFTING.

Are the Crank Shafts Built or Solid ?

No. of Lengths in each Angle of Cranks

Diar. by Rule Actual In Way of Webs

„ of Crank Pins Length between Webs

Greatest Width of Crank Webs Thickness

Least „ „ „

Diar. of Keys in Crank Webs Length

„ Dowels in Crank Pins Length Screwed or Plain

No. of Bolts each Coupling Diar. at Mid Length Diar. of Pitch Circle

Greatest Distance from Edge of Main Bearing to Crank Web

Type of Thrust Blocks

No. „ Rings

Diar. of Thrust Shafts at bottom of Collars No. of Collars

„ „ Forward Coupling At Aft Coupling

Diar. of Intermediate Shafting by Rule Actual No. of Lengths

No. of Bolts, each Coupling Diar. at Mid Length Diar. of Pitch Circle

Diar. of Propeller Shafts by Rule Actual At Couplings

Are Propeller Shafts fitted with Continuous Brass Liners ?

Diar. over Liners Length of After Bearings

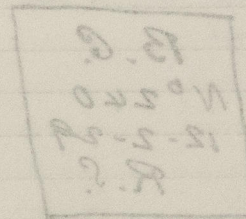
Of what Material are the After Bearings composed ?

Are Means provided for lubricating the After Bearings with Oil ?

„ „ to prevent Sea Water entering the Stern Tubes ?

If so, what Type is adopted ?

SKETCH OF CRANK SHAFT.



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No. of Blades each Propeller

Fitted or Solid?

Material of Blades

Boss

Diam. of Propellers

Pitch

Surface (each

S. ft.)

Coefficient of Displacement of Vessel at $\frac{1}{2}$ Moulded Depth

Crank Shafts Forged by

Material

Pins

Webs

Thrust Shafts

Intermed.,

Propeller

Crank Finished by

Thrust

Intermed.,

Propeller

STAMP MARKS ON SHAFTS.

*Crank, Thrust &
Tail Shafts: -*

B.C.
No 240
12-2-29
R.S.

SKETCH OF PROPELLER SHAFT.

Stops

Diam.

No. of Air Turbines

Worked by Main or Independent Engines?

Stops

Diam.

No. of Connecting Rods

Type of

Diam. of

Position from Sea

Diam.

Has each Pump a High Position with Non return Valve?

What other Pumps can circulate through Condenser?

Stops

Diam.

No. of Feed Pumps on Main Engines

Are Spring-loaded Relief Valves fitted to each Pump?

Can one Pump be overhauled while the others are at work?

Stops

Diam.

No. of Independent Feed Pumps

What other Pumps can feed the boilers?

Stops

Diam.

No. of High Pumps on Main Engines

Can one Pump be overhauled while the others are at work?

No. of Independent High Pumps

What other Pumps can draw from the bilges?

Are all High Positions fitted with Valves?

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

Are all Sea Connections fitted with Valves?

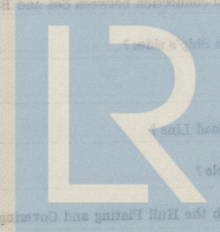
Are they placed so as to be easily accessible?

Are the Discharge Pipes placed so as to keep the Sea Level?

Are they fitted with the Ball Valve and easily accessible?

Are all Discharge Pipes fitted with Valves through the Hull Fitting and Covering Plates or Flanges

on the Outside?



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BOILERS

Works No.

No. of Boilers

2

Type

C. 207.
Cylindrical multitubular
single.

Single or Double-ended

No. of Furnaces in each

2
High-ton.

Type of Furnaces

Date when Plan approved

Approved Working Pressure

180 lbs.

Hydraulic Test Pressure

320 "

Date of Hydraulic Test

28-3-29.

" when Safety Valves set

26-4-29.

Pressure at which Valves were set

185 lbs.

Date of Accumulation Test

26-4-29.

Maximum Pressure under Accumulation Test

185 lbs.

System of Draught

C.A.

Can Boilers be worked separately?

Yls.

Makers of Plates

James Dunlop & Co.

" Stay Bars

The Steel Co of Scotland Ltd.

" Rivets

Blair & Co. Ltd.

" Furnaces

Broomfield & Co. @

Greatest Internal Diam. of Boilers

10'-4 3/8"

" " Length "

10'-9 1/16"

Square Feet of Heating Surface each Boiler

1128 sq

" " Grate "

33.8 sq

No. of Safety Valves each Boiler

2

Rule Diam.

Actual

2 1/2"

Are the Safety Valves fitted with Easing Gear?

Yls.

No. of Pressure Gauges, each Boiler

2

No. of Water Gauges

1

" Test Cocks

3

" " Salinometer Cocks

1

Are the Water Gauges fitted direct to the Boiler Shell or mounted on Pillars?

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

Are there Pipes connected to Boilers by Cocks or Valves?

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

No. of Stations of Blow-off in each Boiler

" " " in each Boiler

Thickness of Shell Plates Approved

" " " in Boilers

Are the Rivets from one Stock?

Are the longitudinal seams butt or lap joints?

Are the Joint Stacks Single or Double?

Are the Double Joint Stacks of equal width?

Thickness of outside Joint Stacks

" " " inside

Are longitudinal seams Hand or Machine Riveted?

Are they Single, Double or Triple Riveted?

No. of Rivets in a Pitch

Pitch of Rivets

No. of Rows of Rivets in Centre Circumferential Seams

Are these Seams Hand or Machine Riveted?

Pitch of Rivets

No. of Rows of Rivets in Round End Circumferential Seams

Are these Seams Hand or Machine Riveted?

Pitch of Rivets

No. of Rows of Rivets in Neck End Circumferential Seams

Are these Seams Hand or Machine Riveted?

Pitch of Rivets



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

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

Are these Pipes connected to Boilers by Cocks or Valves?

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

No. of Strakes of Shell Plating in each Boiler

„ Plates in each Strake

Thickness of Shell Plates Approved

„ „ 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



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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



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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.O. Tops

Diar. of Screwed Stays Approved

" " " in Boilers

Material "

Thickness of Combustion Chamber Walls Approved

" " " in Boilers

Pitch of Screwed Stays in C.O. Sides

Diar. " " Approved

" " " in Boilers

Material "

Thickness of Combustion Chamber Ends Approved

" " " in Boilers

Pitch of Screwed Stays in C.O. Backs

Diar. " " Approved

" " " in Boilers

Material "

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

Thickness of Combustion Chamber

No. of Girders over each Wing

" " " " " " "

Depth and Thickness of

Material of Girders

No. of Ribs in each

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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

VERTICAL DONKEY BOILERS

No. of Boilers
Type
Height
Clearance for Diar.
Height of Boiler Crown above Fire Grate
Are Boiler Crowns Flat or Dished?
Internal Radius of Dished Boilers
Description of Beams in Boiler Crowns
Diar. of River Boilers
Pitch
Height of Firebox Crown above Fire Grate
Are Firebox Crowns Flat or Dished?
Internal Radius of Dished Crowns
No. of Crown Stays
Diar.
Material
Thickness of Plates
Internal Diar. of Firebox at Top
Bottom
No. of Water Tubes
Diar. Diar.
Material of Water Tubes
Size of Manhole in Shell
Dimensions of Connecting Ring
Position of Connecting Ring
Position of Water Tubes, each Boiler
Fire Grates

SUPERHEATERS



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VERTICAL DONKEY BOILERS.

No. of Boilers	Type	
Greatest Int. Diar.	Height	
Height of Boiler Crown above Fire Grate		
Are Boiler Crowns Flat or Dished?		
Internal Radius of Dished Ends	Thickness of Plates	
Description of Seams in Boiler Crowns		
Diar. of Rivet Holes	Pitch	Width of Overlap
Height of Firebox Crowns above Fire Grate		
Are Firebox Crowns Flat or Dished?		
External Radius of Dished Crowns	Thickness of Plates	
No. of Crown Stays	Diar.	Material
External Diar. of Firebox at Top	Bottom	Thickness of Plates
No. of Water Tubes	Ext. Diar.	Thickness
Material of Water Tubes		
Size of Manhole in Shell		
Dimensions of Compensating Ring		
Heating Surface, each Boiler	Grate Surface	

SUPERHEATERS.

Description of Superheaters

Where situated?

Which Boilers are connected to Superheaters?

Can Superheaters be shut off while Boilers are working?

No. of Safety Valves on each Superheater

Diar.

Are " " fitted with Easing Gear?

Date of Hydraulic Test

Test Pressure

Date when Safety Valves set

Pressure on Valves

MAIN STEAM PIPES



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MAIN STEAM PIPES.

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

4
Copper.
S.P.
3 1/2"
W.P.
brashed.
24-4-29.
400 lbs.

LIST OF EVAPORATORS.

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

FEED WATER HEATERS

FEED WATER FILTERS



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EVAPORATORS.

No.	Type	Tons per Day
Makers		
Working Pressure	Test Pressure	Date of Test
Date of Test of Safety Valves under Steam		

FEED WATER HEATERS.

No.	Type	Tons per Day
Makers	Walden / Brook	
Working Pressure	Test Pressure	Date of Test

FEED WATER FILTERS.

No.	Type	Tons per Day
Makers	Walden / Ingersoll / Paddock	
Working Pressure	Test Pressure	Date of Test

LIST OF DONKEY PUMPS.

No.	Type	Tons per Day
Makers		
Working Pressure	Test Pressure	Date of Test



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OTHER ARTICLES OF SPARE GEAR:—

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REFRIGERATORS.

No. of Machines

Capacity of each

Makers

Description

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

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.

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

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

Location of Switch Board	No. of Switches	Capacity	Material of Frame	Material of Wires	Material of Connections	Material of Terminals	Material of Insulation
--------------------------	-----------------	----------	-------------------	-------------------	-------------------------	-----------------------	------------------------

Are Cut-outs fitted as follows?—

On Main Switch Board, to Cables of Main Circuits

On Aux. " " each Auxiliary Circuit

Wherever a Cable is reduced in size

To each Lamp Circuit

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

Are the Fuses of Standard Sizes?

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

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

Smallest Single Wire used, No. S.W.G., Largest, No. S.W.G.

How are Conductors in Engine and Boiler Spaces protected?

" " Saloons, State Rooms, &c., " ?

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp

(2) " " passing through Bunkers or Cargo Spaces

(3) " " Deck Beams or Bulkheads

Are all Joints in Cables properly soldered and thoroughly Insulated so that the efficiency of the Cables is unimpaired?

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

Are all Hull Connections for Single-Wire Systems made with Screws of large Surface?

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

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

Has the Insulation Resistance over the whole system been tested?

What does the Resistance amount to?

Ohms.

Is the Installation supplied with a Voltmeter?

" " " an Ampere Meter

Date of Trial of complete Installation 1-5-29.

Duration of Trial

6 hrs.

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

yes.



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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.

Fees—

MAIN BOILERS.

		£	s.	d.
H.S.	<i>2256</i> Sq. ft.	:	:	:
G.S.	<i>64.6</i> "	:	:	:

DONKEY BOILERS.

H.S.	Sq. ft.	:	:	:
G.S.	"	:	:	:
	£	:	:	:

ENGINES.

L.P.C.	<i>24</i> Cub. ft.	:	:	:
	£	:	:	:
Testing, &c. ...		:	:	:
	£	:	:	:
Expenses ...		:	:	:
Total ...	£	:	:	:

It is submitted that this Report be approved,

Jas Barr for Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the *13th November 1929.*

Fees advised

Fees paid



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Secretary.

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 ^{us}_{me} from personal examination

SOUTHON

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



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