

No. 1821

THE BRITISH CORPORATION FOR THE SURVEY  
AND  
REGISTRY OF SHIPPING.

ACROPOLES  
Report No. 2181 No. in Register Book 3545

EX LEANDROS  
" " "

S.S. CRAGPOOL

Makers of Engines Blain & Co (1926) Ltd.

Works No. 1926

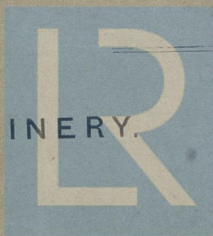
Makers of Main Boilers Blain & Co (1926) Ltd.

Works No. 1926

Makers of Donkey Boiler

Works No.

MACHINERY



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00401-00409-0145



Shibby R. Shipley Limited  
Gullport

No.

THE BRITISH CORPORATION FOR THE SURVEY  
AND  
REGISTRY OF SHIPPING.

Report No. .... No. in Register Book .....

Received at Head Office *23<sup>rd</sup> November 1928*

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

Official No. ....

Port of Registry *West-Wharfedale*

Registered Owners

*Paal Shipping Co Ltd*

Engines Built by

*Blair & Co (1926) Ltd*

at

*Stockton-on-Tees*

Main Boilers Built by

*Blair & Co (1926) Ltd*

at

*Stockton-on-Tees*

Donkey ..

at

Date of Completion

*4-28*

First Visit *19-3-28*

Last Visit

*21-7-28*

Total Visits

*40*



## RECIPROCATING ENGINES

Works No. *1946* No. of Sets *1* Description *Triple expansion. S.P. Berks.*

No. of Cylinders each Engine *3* No. of Cranks *3*  
 Diars. of Cylinders *26 1/2" - 44" - 73"* Stroke *48"*

Cubic feet in each L.P. Cylinder *116.2*

Are Spring-loaded Relief Valves fitted to Top and Bottom of each Cyl.? *H.P. only.*

" " " each Receiver? *J.R. + L.P.*

Type of H.P. Valves, *histon. slide.* *N.E.M. Eng. Co. POPPET TYPE*

" 1st I.P. "

" 2nd I.P. "

" L.P. "

" Valve Gear *stephenson link.*

" Condenser *Surface.*

Cooling Surface *3076* sq. ft.

Diameter of Piston Rods (plain part) *7 1/4"* Screwed part (bottom of thread) *5.68"*

Material " *Iron.*

Diar. of Connecting Rods (smallest part) *7 1/4"* Material *I.S.P.*

" Crosshead Gudgeons *7 1/2"* Length of Bearing *8"* Material *I.S.P.*

No. of Crosshead Bolts (each) *4* Diar. over Thrd. *3 1/4"* Thrd. per inch *6* Material *I.S.P.*

" Crank Pin " *2* " *4 5/8"* *4* " *I.S.P.*

" Main Bearings *6* Lengths *4 at 16 1/4, 2 at 14 1/2"*

" Bolts in each *2* Diar. over Thread *4"* Threads per inch *5* Material *I.S.P.*

" Holding Down Bolts, each Engine *85* Diar. *1 3/8"* No. of Metal Chocks *85*

Are the Engines bolted to the Tank Top or to a Built Seat? *Built seat. Tank top.*

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

If not, how are they fitted?

Connecting Rods, Forged by *Blair Co (1926) Ltd.*

Piston " "

Crossheads, " "

Connecting Rods, Finished by *Hadfields Ltd. Blair Co Ltd.*

Piston " "

Crossheads, " "

Date of Harbour Trial *6-7-28*

" Trial Trip *21-7-28.*

Trials run at *In North Sea.*

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

If so, what was the I.H.P.? *2442*

Revs. per min. *77*

Pressure in 1st I.P. Receiver, *65* lbs., 2nd I.P., *11.25* lbs., L.P., *26.5* ins.

Speed on Trial *11.93 knots.*

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

data:—

Builders' estimated I.H.P.

Revs. per min.

Estimated Speed



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## SHAFTING

Are the Crank Shafts Built or Solid?

*built.*

No. of Lengths in each

3

Angle of Cranks

120°

Diar. by Rule

13.72

Actual

14 1/2"

In Way of Webs

15"

" of Crank Pins

15"

Length between Webs

15"

Greatest Width of Crank Webs

28 3/4"

Thickness

9 3/4"

Least

" "

24 1/2"

"

9 3/4"

Diar. of Keys in Crank Webs

2 1/2"

Length

8 3/4"

" Dowels in Crank Pins

2 1/2"

Length

8 3/4"

Screwed or Plain

Plain

No. of Bolts each Coupling

9

Diar. at Mid Length

3"

Diar. of Pitch Circle

1-8 1/8"

Greatest Distance from Edge of Main Bearing to Crank Web

1/8"

Type of Thrust Blocks

*Kourschae.*

No.

" Rings

6

Diar. of Thrust Shafts at bottom of Collars

15"

No. of Collars

6

"

"

Forward Coupling

15"

At Aft Coupling

15"

Diar. of Intermediate Shafting by Rule

13.07

Actual

13 3/4"

No. of Lengths

7

No. of Bolts, each Coupling

8

Diar. at Mid Length

3"

Diar. of Pitch Circle

1-8 1/8"

Diar. of Propeller Shafts by Rule

14.57

Actual

16"

At Couplings

15"

Are Propeller Shafts fitted with Continuous Brass Liners?

*yes.*

Diar. over Liners

17 9/16" + 1 1/2"

Length of After Bearings

5' 8"

Of what Material are the After Bearings composed?

*gunn.**Vilas.*

Are Means provided for lubricating the After Bearings with Oil?

*no.*

"

"

to prevent Sea Water entering the Stern Tubes?

*no*

If so, what Type is adopted?

*open to sea.*Lloyd's Register  
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No. of Blades each Propeller

4

Fitted or Solid?

solid fitted.

Material of Blades

brass

Boas

brass C.S.

Diam. of Propellers

18'0"

Pitch

17'9"

Surface (each

104

S. ft.

Coefficient of Displacement of Vessel at  $\frac{3}{4}$  Moulded Depth

Crank Shafts Forged by

Burlington Forge &amp; Co.

Material

I.S.

" Pins "

" Webs "

Thrust Shafts

Intermed. "

Propeller "

Crank " Finished by

Thrust "

Intermed. "

Propeller "

Blair &amp; Co. Ltd.

Burlington Forge

Blair &amp; Co. Ltd.

I.S.

I.S.

I.S.

}

## STAMP MARKS ON SHAFTS.

Crank Shaft:

B.C.  
N<sup>o</sup>10540  
20-6-28

Thrust Shaft:-

B.C.  
N<sup>o</sup>10541  
20-6-28  
J.D.S.

7. Tunnel Shafts:-

B.C.  
N<sup>o</sup>10542  
20-6-28  
J.D.S.

Tail Shaft (working)

B.C.  
N<sup>o</sup>10539  
18-6-28  
J.D.S.

Tail Shaft (chase)

B.C.  
N<sup>o</sup>10543  
20-6-28  
J.D.S.

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## PUMPS, ETC.

No. of Air Pumps

Diar.

24"

Stroke

34"

Worked by Main or Independent Engines?

main.

No. of Circulating Pumps

Diar.

14"

Stroke

34"

Type of

"

Double-acting, worked by main engine.

Diar. of

"

Suction from Sea

10 1/2

Has each Pump a Bilge Suction with Non-return Valve?

y/s.

Diar.

7"

What other Pumps can circulate through Condenser?

Ballast donkey.

No. of Feed Pumps on Main Engine

Diar.

Stroke

Are Spring-loaded Relief Valves fitted to each Pump?

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

No. of Independent Feed Pumps

Diar.

7"

Stroke

21"

What other Pumps can feed the Boilers?

Auxiliary Feed pump.

No. of Bilge Pumps on Main Engine

Diar.

5"

Stroke

34"

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

y/s.

No. of Independent Bilge Pumps

What other Pumps can draw from the Bilges?

Ballast donkey.

Are all Bilge Suctions fitted with Roses?

y/s.

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

y/s.

Are all Sea Connections made with Valves or Cocks next the Ship's sides?

y/s.

Are they placed so as to be easily accessible?

y/s.

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

above.

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

y/s.

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

y/s.



## BOILERS.

Works No.

No. of Boilers *3*

Type

*1946  
Cylindrical multitubular  
single.*

Single or Double-ended

No. of Furnaces in each

Type of Furnaces

Date when Plan approved

Approved Working Pressure

Hydraulic Test Pressure

Date of Hydraulic Test

„ when Safety Valves set

Pressure at which Valves were set

Date of Accumulation Test

Maximum Pressure under Accumulation Test

System of Draught

Can Boilers be worked separately?

Makers of Plates

„ Stay Bars

„ Rivets

„ Furnaces

Greatest Internal Diam. of Boilers

„ „ Length „

Square Feet of Heating Surface each Boiler

„ „ Grate „ „

No. of Safety Valves each Boiler

Are the Safety Valves fitted with Easing Gear?

No. of Pressure Gauges, each Boiler

„ Test Cocks

Rule Diam.

No. of Water Gauges

„ Salinometer Cocks

*3  
Mighton.**9-2-28**180 lbs.**320 "**20-6-28**6-7-28**185 lbs.**6-7-28**185 lbs.**C.A.**W. Calville Sons Ltd.**Blair Co Ltd.  
Leeds Forge Co.**15'-9"**11'-5"**2631 sq**55.9 sq**2.32"*

Actual

*2 1/2" high**yes.**2**2**1*Lloyd's Register  
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Are the Water Gauges fitted direct to the Boiler Shells or mounted on Pillars?

*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?

*values.*

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

No. of Strakes of Shell Plating in each Boiler

*one.*

Plates in each Strake

*2*

Thickness of Shell Plates Approved

*1 1/4"*

" " in Boilers

*1 1/4"*

Are the Rivets Iron or Steel?

*steel.*

Are the Longitudinal Seams Butt or Lap Joints?

*butt.*

Are the Butt Straps Single or Double?

*double.*

Are the Double Butt Straps of equal width?

*yes.*

Thickness of outside Butt Straps

*3/32"*

" inside "

*1 3/32"*

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 5/16"*

Pitch

*9/8"*

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

*2*

Are these Seams Hand or Machine riveted?

*machine. hand.*

Diar. of Rivet Holes

*1 3/8"*

Pitch

*4 3/8"*

No. of Rows of Rivets in Back End Circumferential Seams

*2*

Are these Seams Hand or Machine Riveted?

*hand. machine.*

Diar. of Rivet Holes

*1 3/8"*

Pitch

*4 3/8"*

Size of Manholes in Shell

*16" x 12"*

Dimensions of Compensating Rings

*2'-8" x 2'-4" x 1 1/4"*



Thickness of End Plates in Steam Space Approved

 $1\frac{1}{32}$ "  
 $1\frac{1}{32}$ "

" " " " " in Boilers

Pitch of Steam Space Stays

 $19" \times 21\frac{1}{2}"$ 

Diar. " " " " Approved

 $3\frac{3}{8}"$  Threads per Inch 6

" " " " " in Boilers

 $3\frac{3}{8}"$  6

Material of " " "

steel.  
double-nuts & washers.

How are Stays Secured?

 $12" \times 1"$ 

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

 ~~$14" \times 9"$~~   
 $14" \times 9"$ 

Pitch of Stays at

" " " "

Diar. of Stays Approved

 $1\frac{7}{8}"$   
 $1\frac{7}{8}"$ 

Threads per Inch

8  
8

" " in Boilers

Material "

steel.

Are Stays fitted with Nuts outside?

y/s.

Thickness of Back End Plates at Bottom Approved

 $3\frac{1}{32}"$   
 $3\frac{1}{32}"$ 

" " " " " in Boilers

Pitch of Stays at Wide Spaces between Fireboxes

 $14" \times 9"$ 

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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 $15/16"$   
 $15/16"$ Lloyd's Register  
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Diar. of Stays Approved

 $2\frac{3}{4}"$ 

Threads per Inch

6

" " in Boilers

 $2\frac{3}{4}"$ 

6

Material "

stab.

Thickness of Front Tube Plates Approved

 $1\frac{1}{16}"$ 

" " " " in Boilers

 $1\frac{1}{16}"$ 

Pitch of Stay Tubes at Spaces between Stacks of Tubes

 $14\frac{1}{2}" \times 9\frac{1}{2}"$ 

Thickness of Doublings in

" " "

 $5\frac{1}{16}" \times 3\frac{1}{8}"$ 

" Stay Tubes at

" " "

Are Stay Tubes fitted with Nuts at Front End?

no.

Thickness of Back Tube Plates Approved

 $1\frac{3}{16}"$ 

" " " in Boilers

 $1\frac{3}{16}"$ 

Pitch of Stay Tubes in Back Tube Plates

 $9\frac{1}{2}" \times 9\frac{3}{4}"$ 

" Plain "

 $4\frac{3}{4}" \times 4\frac{7}{8}"$ 

Thickness of Stay Tubes

 $5\frac{1}{16}" \times 3\frac{1}{8}"$ 

" Plain "

S.W.L.

External Diar. of Tubes

 $3\frac{1}{2}"$ 

Material "

Iron.

Thickness of Furnace Plates Approved

 $19\frac{1}{32}"$ 

" " " in Boilers

 $19\frac{1}{32}"$ 

Smallest outside Diar. of Furnaces

 $3'-9\frac{3}{16}"$ 

Length between Tube Plates

 $7'-7\frac{5}{8}"$ 

Width of Combustion Chambers (Front to Back)

 $2'-11\frac{1}{8}"$ 

Thickness of " " Tops Approved

 $2\frac{1}{32}"$ 

" " " in Boilers

 $2\frac{1}{32}"$ 

Pitch of Screwed Stays in C.C. Tops

 $9\frac{1}{2}" \times 8\frac{1}{4}"$



Diar. of Screwed Stays Approved

 $1\frac{3}{4}"$   
 Threads per Inch 8  
 $1\frac{3}{4}"$   
 in Boilers  
 Material " " *stab.*

Thickness of Combustion Chamber Sides Approved

" " " " in Boilers

Pitch of Screwed Stays in C.O. Sides

Diar. " " Approved

" " " in Boilers

Material " "

 $2\frac{1}{32}"$   
 $2\frac{1}{32}"$   
 $9\frac{1}{2}" \times 8\frac{1}{2}"$   
 $1\frac{3}{4}"$   
 Threads per Inch 8  
 $1\frac{3}{4}"$   
*stab.*

Thickness of Combustion Chamber Backs Approved

" " " " in Boilers

Pitch of Screwed Stays in C.O. Backs

Diar. " " Approved

" " " in Boilers

Material " "

 $2\frac{1}{32}"$   
 $2\frac{1}{32}"$   
 $9\frac{1}{8}" \times 9"$   
 $1\frac{7}{8}" \times 1\frac{3}{4}"$   
 Threads per Inch 8  
 $1\frac{7}{8}" \times 1\frac{3}{4}"$   
*stab.*

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

Thickness of Combustion Chamber Bottoms

 yes.  
 $1\frac{3}{16}"$   $1\frac{3}{16}"$ 

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

 4  
 $8\frac{3}{8}" \times 1\frac{3}{4}"$   
*stab.*  
 3  
 918 *Total in 3 boilers.*  
 $16" \times 12"$



## MAIN STEAM PIPES.

No. of Lengths

Material

Brazed, Welded or Seamless

Internal Diam.

Thickness

How are Flanges secured?

Date of Hydraulic Test

Test Pressure

5  
Stub.

S.D.

5"

1/4"

Screwed.

9/5/28

540 lbs.

Made by Scottish Tube Co.

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

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## EVAPORATORS.

No. 1 Type *Blain Co.* 25 Tons per Day  
 Makers *Blain Co (1916) Ltd*  
 Working Pressure *15 lbs.* Test Pressure *50 lbs.* Date of Test *30-5-28*  
 Date of Test of Safety Valves under Steam *6-7-28*

## FEED WATER HEATERS.

No. 1 Type *Surface.*  
 Makers *Kirkaldy*  
 Working Pressure *180 lbs.* Test Pressure *400 lbs.* Date of Test

## FEED WATER FILTERS.

No. 1 Type *Cascade.* Size  
 Makers *Blain Co Ltd.*  
 Working Pressure Test Pressure Date of Test

## LIST OF DONKEY PUMPS.

*Vertical duplex Ballast Skey by Henry Watson & Sons.*  
*Feed Skey by H. J. Wain Ltd*  
*Pump for winch condenser by Henry Watson & Sons.*



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## SPARE GEAR

No. of Top End Bolts. <b>2</b>	No. of Bot. End Bolts. <b>2</b>	No. of Cylinder Cover Studs
" Coupling Bolts <b>8</b>	" Main Bearing Bolts <b>2</b>	" Valve Chest "
" Junk Ring Bolts	" Feed Pump Valves	" Bilge Pump Valves <b>2</b>
" H.P. Piston Rings <b>6</b>	" I.P. Piston Rings	" L.P. Piston Rings <b>1 set.</b>
" " Springs	" " Springs	" " Springs
" Safety Valve " <b>2</b>	" Fire Bars <b>150</b>	" Feed Check Valves
" Piston Rods	" Connecting Rods	" Valve Spindles <b>2 main. 2 Aky.</b>
" Air Pump Rods	" Air Pump Buckets	" Air Pump Valves <b>2</b>
" Cir. "	" Cir. "	" Cir. "
" Crank Shafts	" Crank Pin Bushes	" Crosshead Bushes
" Propeller Shafts <b>1</b>	" Propellers	" Propeller Blades
" Boiler Tubes <b>14</b>	" Condenser Tubes <b>3</b>	" Condenser Ferrules <b>100</b>

OTHER ARTICLES OF SPARE GEAR:—

6 Bars, iron (assorted)  
 3 Plates, iron (assorted)  
 6 sheets tin  
 2 sheets copper, each 12' sq.  
 24 Pricker Blades  
 42 Gauge Glasses  
 12 assorted studs for Glands & Cover  
 6 assorted studs & nuts (brass for pumps etc)  
 8 side bar for main boilers  
 84 Gauge Glass Rings

## REFRIGERATORS

Patterns for Furnace Gear as follows:

Front Bearer

Renewable Back Bridge Plate

Plain Fire-bars

Side Fire-bars

Furnace Front Baffles

Spare Furnace Castings to be supplied

1 Front Bearer

3 Renewable Back Bridge Plates

1 set of Front Baffles for one boiler.



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## ELECTRIC LIGHTING.

Installation Fitted by

No. and Description of Dynamos

Makers of Dynamos

Capacity " 68 Amperes, at 110 Volts, 450 Revols. per Min.

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 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.
----------	-------------------	---------------	-------------------------	--------------------	------------------	----------------------------	---------------------------------

Same as 3/s Ashby

Total No. of Lights

No. of Motors driving Fans, &amp;c.

No. of Heaters

Current required for Motors and Heaters

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

Are Out-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 Out-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 Surfaces 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 21-4-28 Duration of Trial 6 hours.

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,

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.

CRAG POOL

as ascertained by <sup>me</sup> from personal examination

*J. D. Stephenson*

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

Fees—

## MAIN BOILERS.

		£	s.	d.
H.S.	<i>4893</i> Sq. ft.	:	:	:
G.S.	<i>1677</i> "	:	:	:

## DONKEY BOILERS.

H.S.	<i>✓</i> Sq. ft.	:	:	:
G.S.	<i>✓</i> "	:	:	:
		£	:	:

## ENGINES.

L.P.C.	<i>116.2</i> Cub. ft.	:	:	:
		£	:	:
Testing, &c. ...		:	:	:
		£	:	:
Expenses ...		:	:	:
Total ...	£	:	:	:

It is submitted that this Report be approved,

*W. Foster King*  
Chief Surveyor.

Approved by the Committee for the Class of M.B.S.\* on the 12<sup>th</sup> December 1928

Fees advised

Fees paid



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