

No. 1793

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. *1665* No. in Register Book *2925*

S.S. *ALBERT C. FIELD.*

Makers of Engines *MESSRS MACCOLL & POLLOCK LTD.*

Works No. *326.*

Makers of Main Boilers *MESSRS MACCOLL & POLLOCK LTD.*

Works No. *326.*

Makers of Donkey Boiler *—*

Works No. *—*

MACHINERY



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2, 28

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No.

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. *1665* No. in Register Book *2925*

Received at Head Office *24/8/23*

Surveyor's Report on the New Engines, Boilers, and Auxiliary
Machinery of the ^{Single Triple} ~~Coin~~ ^{Quadruple} Screw Steamer

"*Albert C Field*"

Official No.

Port of Registry *Middlebrough.*

Registered Owners

*The Eastern Steamship Co Ltd.
(A. B. Mackay, Mgr)*

Engines Built by

Messrs MacColl & Pollock Ltd.

at

Sunderland

Main Boilers Built by

Messrs MacColl & Pollock Ltd.

at

Sunderland.

Donkey " "

at

Date of Completion

15th June 1923

First Visit

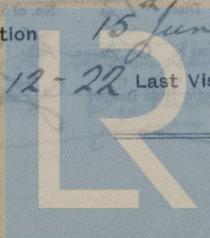
1-12-22

Last Visit

15-6-23

Total Visits

64.



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RECIPROCATING ENGINES.

Works No. 326 No. of Sets One Description Triple Expansion
Surface Condensing.

No. of Cylinders each Engine Three No. of Cranks Three

Diars. of Cylinders 16" - 27" - 44" Stroke 33"

Cubic feet in each L.P. Cylinder 29

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

" " " each Receiver? No

Type of H.P. Valves, Piston Valve (Inside Admission)

" 1st L.P. " Trick Valve "D" Type.

" 2nd L.P. " ———

" L.P. " Ordinary "D" Valve.

" Valve Gear Stephenson's Link Gear.

" Condenser Circular four flow Cooling Surface 782. sq. ft.

Diameter of Piston Rods (plain part) 4 1/4" Screwed part (bottom of thread) 3.036"

Material " Ingot Steel.

Diar. of Connecting Rods (smallest part) 4 1/4" Material Scrap Iron

" Crosshead Gudgeons 4 7/8" Length of Bearing 4" Material Scrap Iron

No. of Crosshead Bolts (each) 4 Diar. over Thrd. 1 7/8" Thrds. per inch 6 Material Steel

" Crank Pin " " 2 " 2 1/4" " " 6 " "

" Main Bearings 6 Lengths 8 3/8" x 8 3/4" dia

" Bolts in each 2 Diar. over Thread 2 1/4" Threads per inch 6 Material Steel

" Holding Down Bolts, each Engine 39 Diar. 1 1/4" No. of Metal Checks 39.

Are the Engines bolted to the Tank Top or to a 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 Reay & Mather Ltd Hyllton.

Piston " " J. Spencer & Sons, Newburn

Crossheads, " " Reay & Mather Ltd.

Connecting Rods, Finished by Mac Coll & Pollock Ltd.

Piston " " " " " "

Crossheads, " " " " " "

Date of Harbour Trial 13th June 1923.

" Trial Trip 15th June 1923.

Trials run at Whitley

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

If so, what was the I.H.P.? 921 Revols. per min. 113.5.

Pressure in 1st L.P. Receiver, 62 lbs., 2nd L.P., — lbs., L.P., 14 lbs., Vacuum, 24 1/2 ins.

Speed on Trial 7.27.

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

Builders' estimated I.H.P. Revols. per min. —

Estimated Speed —

B.C.
2019.
270 lbs
B.H.
17-4-23.

Test mark stamped
on A.P. Cylinders.

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TURBINE ENGINES.

Works No. Type of Turbines

No. of H.P. Turbines No. of I.P. No. of L.P. No. of Stern

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

Is Single or Double Reduction Gear employed?

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 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 Revols. per min. S.H.P.

Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by

B.C.
 2010
 2010
 2010
 2010
 S.H.P.

TURBO-ELECTRIC MACHINERY. DESCRIPTION OF INSTALLATION.

No. of Turbo-Generating Sets

Type of Turbines employed

Description of Generators

No. of Motors driving Propeller Shafts

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

Is Single or Double Reduction Gear employed?

Description of Motors

Line of 1st Reduction Pinion

Line of 2nd Reduction Pinion

Estimated Pressure per lineal inch

Revs. per min. of Generators at Full Power

Total Shaft Horse Power

Date of Harbour Trial

Trials run at

Speed on Trial Knots. Propeller Revols. per min. S.H.P.

Turbine Spindles forged by

" Wheels forged or cast by

Reduction Gear Shafts forged by

" Wheels forged or cast by



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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	} 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 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.

Sketch of Turbine Shafting

Diagram showing the arrangement of the turbine shafting, including the propeller shaft, reduction gear shafts, and turbine spindles. The diagram includes dimensions and labels for various components.

SHAFTING.

Are the Crank Shafts Built or Solid? *Built*

No. of Lengths in each *In one length* Angle of Cranks *120°*

Diar. by Rule *8.59"* Actual *8 ³/₄"* In Way of Webs *8 ⁷/₈"*

" of Crank Pins *8 ³/₄"* Length between Webs *8 ³/₄"*

Greatest Width of Crank Webs *16 ¹/₄"* Thickness *5 ¹/₂"*

Least " " *12 ¹/₂"* " " *5 ¹/₂"*

Diar. of Keys in Crank Webs *1 ¹/₄"* Length *4"*

" Dowels in Crank Pins *⁷/₈"* Length *3 ¹/₂"* Screwed or Plain *Screwed*

No. of Bolts each Coupling *6* Diar. at Mid Length *2"* Diar. of Pitch Circle *12 ¹/₄"*

Greatest Distance from Edge of Main Bearing to Crank Web *1 ¹/₄"*

Type of Thrust Blocks

Horse Shoe Type.

No. " Rings

4

Diar. of Thrust Shafts at bottom of Collars

8 ³/₄"

No. of Collars

4

" " Forward Coupling

8 ³/₈"

At Aft Coupling

8 ³/₈"

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

9.8"

Actual

10"

At Couplings

8 ¹/₂"

Are Propeller Shafts fitted with Continuous Brass Liners?

Yes.

Diar. over Liners

11"

Length of After Bearings

3'-4"

Of what Material are the After Bearings composed?

Lignum Vital

Are Means provided for lubricating the After Bearings with Oil?

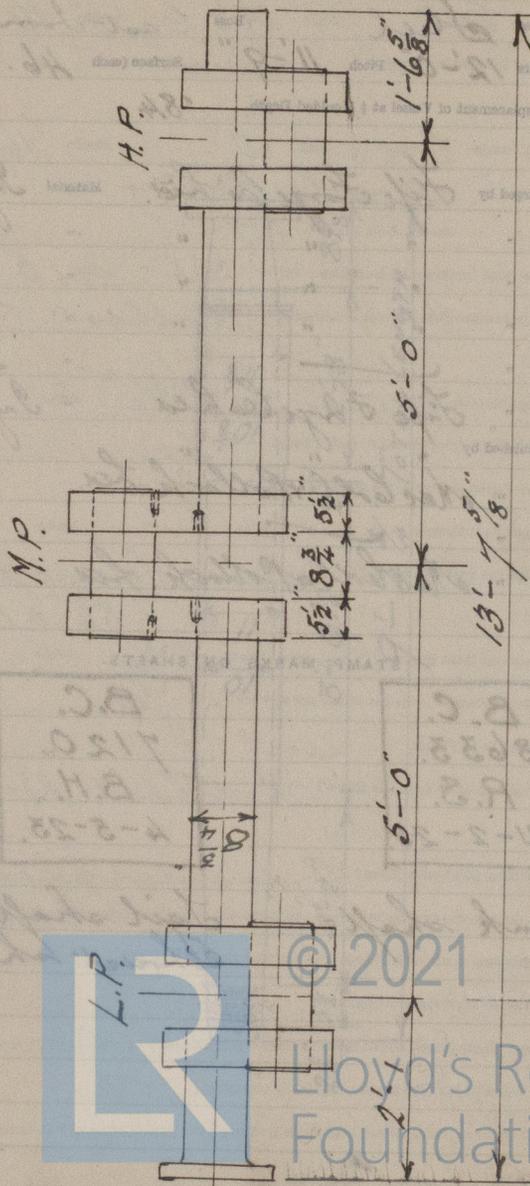
No

" " to prevent Sea Water entering the Stern Tubes?

If so, what Type is adopted?

—

SKETCH OF CRANK SHAFT.



No. of Blades each Propeller *4* Fitted or Solid? *Fitted*
 Material of Blades *Steel* Boss *Cast Iron*
 Diam. of Propellers *12'-0"* Pitch *11'-9"* Surface (each) *46.* S. ft.
 Coefficient of Displacement of Vessel at $\frac{2}{3}$ Moulded Depth *.84*

Crank Shafts Forged by *Fife Forge Co. Ltd.* Material *Ingot Steel*
 " Pins " " " " " "
 " Webs " " " " " " "
 Thrust Shafts " " " " " " "
 Intermed. " " " " " " "
 Propeller " " *Fife Forge Co. Ltd.* " *Ingot Steel*
 Crank " Finished by " "
 Thrust " " *MacCall & Pollock Ltd.*
 Intermed. " " "
 Propeller " " *MacCall & Pollock Ltd.*

STAMP MARKS ON SHAFTS.

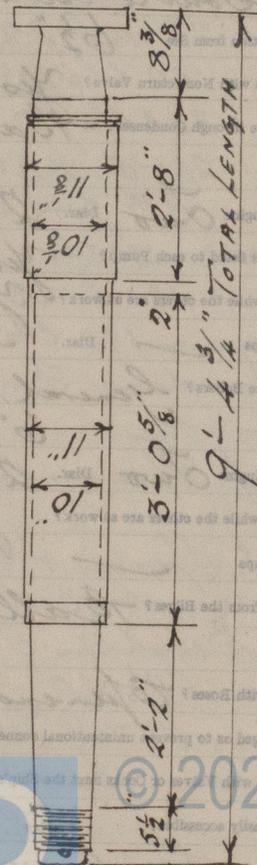
B.C.
8633.
R.S.
21-2-23.

B.C.
7120.
B.H.
4-5-23.

Crank shaft:

Tail shaft &
Thrust shaft:

SKETCH OF PROPELLER SHAFT.



BOILERS.

Works No. *326.*

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

Single or Double-ended *Single*

No. of Furnaces in each *Two*

Type of Furnaces *Deighton's Corrugation Withdrawable*

Date when Plan approved *23-12-22.*

Approved Working Pressure *180 lbs/10"*

Hydraulic Test Pressure *320 lbs/10"*

Date of Hydraulic Test *28-5-23.*

„ when Safety Valves set *13th June 1923.*

Pressure at which Valves were set *180 lbs.*

Date of Accumulation Test *18-5-23.*

Maximum Pressure under Accumulation Test *190 lbs.*

System of Draught *Howden's Forced Draught (C.A.)*

Can Boilers be worked separately? *Yes.*

Makers of Plates *J. Spencer & Sons Newburn*

„ Stay Bars *J. Spencer & Sons*

„ Rivets *Rivet-Bolt-90 Nut Co.*

„ Furnaces *Deighton Tube Co.*

Greatest Internal Diam. of Boilers *11'-10"*

„ „ Length „ *10'-9²⁵/₃₂"*

Square Feet of Heating Surface each Boiler *1346.3* $\frac{1}{2}$

„ „ Grate „ „ *38.09* $\frac{1}{2}$

No. of Safety Valves each Boiler *1 Pair* Rule Diam. *2.56* Actual *2³/₄"*

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

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

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

B.C. TEST.
3095.
320 LBS.
W.P. 180 "
B.H.
28-5-23.

Mark stamped on 2 Main Boilers



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Thickness of End Plates in Steam Space Approved $1\frac{7}{16}$ "

" " " " " in Boilers $1\frac{7}{16}$ "

Pitch of Steam Space Stays $1'-6" \times 1'-8" \text{ Horiz} \times 1'-2\frac{3}{4}" \text{ Vert}$

Diar. " " " " Approved $6-2\frac{3}{4}"$ Threads per Inch 6.

" " " " " in Boilers $4-2\frac{3}{8}"$ " 6.

Material of " " " *Steel Bar.*

How are Stays Secured? *Nuts (Outside & Inside)*

Diar. and Thickness of Loose Washers on End Plates *Ordinary washers.*

" " " Riveted " " "

Width " " Doubling Strips "

Thickness of Middle Back End Plates Approved $1\frac{3}{16}$ "

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

Thickness of Doublings in Wide Spaces between Fireboxes —

Pitch of Stays at " " " " $6\frac{3}{8}" \text{ Horiz} \times 8\frac{3}{8}" \text{ Vert.}$

Diar. of Stays Approved $1\frac{3}{4}" (1-2)"$ Threads per Inch 9

" " in Boilers $1\frac{3}{4}" (1-2)"$ " 9.

Material " *Steel.*

Are Stays fitted with Nuts outside? *Nuts (Outside & Inside)*

Thickness of Back End Plates at Bottom Approved $1\frac{3}{16}$ "

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

Pitch of Stays at Wide Spaces between Fireboxes $12\frac{3}{4}" \times 8\frac{3}{8}"$

Thickness of Doublings in " " "

Thickness of Doubling at bottom back = $\frac{7}{16}$ "

Thickness of Front End Plates at Bottom Approved $2\frac{1}{32}$ "

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

No. of Longitudinal Stays in Spaces between Furnaces *One*

Disc of Stays Approved

Thickness of Front Tube Plates Approved

Thickness of Back Tube Plates Approved

Pitch of Stays in Back Tube Plates

Thickness of Stay Tubes

External Disc of Tubes

Thickness of Furnace Plates Approved

Smallest outside Diam of Furnaces

Length between Tube Plates

Thickness of Compressing Rings (front to back)

Pitch of Stays in C.C. Tube



Diar. of Stays Approved $2\frac{3}{4}$ " Threads per Inch 6
 " " in Boilers $2\frac{3}{4}$ "
 Material " Steel
 Thickness of Front Tube Plates Approved $27/32$ "
 " " " in Boilers $27/32$ "
 Pitch of Stay Tubes at Spaces between Stacks of Tubes $8\frac{3}{4}$ " Vert \times $13\frac{1}{2}$ " Horiz
 Thickness of Doublings in " " "
 " Stay Tubes at " " " $5/16$ "
 Are Stay Tubes fitted with Nuts at Front End? Yes.
 Thickness of Back Tube Plates Approved $5/16$ "
 " " " in Boilers $5/16$ "
 Pitch of Stay Tubes in Back Tube Plates $8\frac{3}{4}$ " \times 9 "
 " Plain " $4\frac{3}{8}$ " \times $4\frac{1}{2}$ "
 Thickness of Stay Tubes $7/16$ " (Top Row $3/8$)
 " Plain " 8 WG.
 External Diar. of Tubes $3\frac{1}{4}$ "
 Material " Lapwelded - iron.
 Thickness of Furnace Plates Approved $7/32$ "
 " " " in Boilers $7/32$ "
 Smallest outside Diar. of Furnaces $3\frac{1}{4}$ " \times $4\frac{13}{16}$ "
 Length between Tube Plates $7\frac{1}{2}$ "
 Width of Combustion Chambers (Front to Back) $2\frac{1}{2}$ " \times $9\frac{3}{32}$ "
 Thickness of " " Tops Approved $23/32$ "
 " " " in Boilers $23/32$ "
 Pitch of Screwed Stays in C.C. Tops $9\frac{7}{8}$ " \times $10\frac{1}{8}$ "



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Diar. of Screwed Stays Approved $1\frac{3}{4}$ " Threads per Inch 9
 " " " in Boilers $1\frac{3}{4}$ "
 Material " " Steel Bar.

Thickness of Combustion Chamber Sides Approved $\frac{1}{16}$ "
 " " " " in Boilers $\frac{1}{16}$ "
 Pitch of Screwed Stays in C.C. Sides $9" \times 9\frac{7}{8}"$
 Diar. " " Approved $1\frac{3}{4}$ " Threads per Inch 9
 " " " in Boilers do do.
 Material " " Steel.

Thickness of Combustion Chamber Backs Approved $4\frac{3}{64}"$
 " " " " in Boilers $4\frac{3}{64}"$
 Pitch of Screwed Stays in C.O. Backs $10" \times 8\frac{3}{8}"$
 Diar. " " Approved $1\frac{7}{8}$ & $1\frac{3}{4}$ " Threads per Inch 9
 " " " in Boilers do do.
 Material " " Steel.

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

Thickness of Combustion Chamber Bottoms $1\frac{5}{16}"$

No. of Girders over each Wing Chamber 4.
 " " " Centre "
 Depth and Thickness of Girders $2\frac{7}{8}"$ Plates $\times 4\frac{7}{8}"$ Deep.
 Material of Girders Steel
 No. of Stays in each Two.

No. of Tubes, each Boiler 178.
 Size of Lower Manholes $16" \times 12"$

VERTICAL DONKEY BOILERS.

No. of Boilers
 Type
 Greatest Int. Diar.
 Height of Boiler Crown above Fire Grate
 Are Boiler Crowns Flat or Dished?
 Internal Radius of Dished Boilers
 Thickness of Plates
 Description of Beams in Boiler Crowns
 Diar. of Horse Holets
 Type
 Height of Firebox Crown above Fire Grate
 Are Firebox Crowns Flat or Dished?
 External Radius of Dished Crowns
 No. of Crown Stays
 Diar.
 Material
 Thickness of Plates
 Bottom
 External Diar. of Firebox at Top
 Thickness
 No. of Water Tubes
 External Diar.
 Material of Water Tubes
 No. of Manholes in Shell
 Dimensions of Connecting Ring
 Height outside each Boiler
 Type

SUPERHEATERS.



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MAIN STEAM PIPES.

No. of Lengths	One
Material	S.D. Copper
Brazed, Welded or Seamless	Seamless
Internal Diam.	3 3/4"
Thickness	7.5 W.G.
How are Flanges secured?	Brazed.
Date of Hydraulic Test	6-6-23.
Test Pressure	400 lbs.

No. of Lengths	One
Material	S.D. Copper
Brazed, Welded or Seamless	Seamless
Internal Diam.	3 3/4"
Thickness	7.5 W.G.
How are Flanges secured?	Brazed.
Date of Hydraulic Test	6-6-23.
Test Pressure	400 lbs.

No. of Lengths	
Material	
Brazed, Welded or Seamless	
Internal Diam.	
Thickness	
How are Flanges secured?	
Date of Hydraulic Test	
Test Pressure	

LIST OF OPERATORS

FEED WATER HEATERS.

FEED WATER FILTERS.



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Installation Fitted by *The Currier Shipbuilding Co Ltd*
 No. and Description of Dynamos *One 42 H.P. Compound Wound.*
 Makers of Dynamos *Messrs The Strand Forge & Eng Co Ltd*
 Capacity " *45* Amperes, at *100* Volts, *400* Revols. per Min.
 Current Alternating or Continuous *Continuous*
 Single or Double Wire System *Double Wire Insulated System*
 Position of Dynamos *Aft end of E.R. Starboard Side*
 " Main Switch Board *do.*
 No. of Circuits to which Switches are provided on Main Switch Board *Three Lighting Circuits*

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 Engineers & Crew	18	16	15	7/1036	Approx 2000 Amps per sq	100%	600 Meg
	2	32					
	3	120					
② Navigation & Fore & Aft	5	32	16	7/1036	Approx 1700 Amps per sq	100%	600 Meg
	3	8					
	14	16					
③ Engine Room	12	16	10.2	7/1036	Approx 1400 Amps per sq	100%	600 Meg
	3	200					

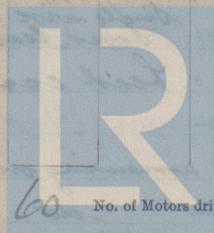
Total No. of Lights

60

No. of Motors driving Fans, &c.

No. of Heaters

Current required for Motors and Heaters



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Fuse

Positions of Auxiliary Switch Boards, with No. of Switches on each "A" Engine Room entrance
 "B" Engineers "C" Crew space forward.

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 Cut-outs constructed of Non-inflammable Material?

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

Smallest Single Wire used, No. 3/029 S.W.G., Largest, No. 7/064 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 *Wire armouring over lead case.*
- (2) " passing through Bunkers or Cargo Spaces *do.*
- (3) " " Deck Beams or Bulkheads *W.T. glands.*

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

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

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

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? *1.5M Ohms.*

Is the Installation supplied with a Voltmeter? *Yes.*

" " " an Ampere Meter? *Yes.*

Date of Trial of complete Installation *15th June 23* Duration of Trial *4 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.

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. *Albert C. Field*

as ascertained by *me* from personal examination

Bryan Hodgson

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

Fees—

MAIN BOILERS.		£	s.	d.
H.S.	<i>2692.6</i> Sq. ft.	<i>20</i>	<i>0</i>	<i>0</i>
G.S.	<i>76.18</i> "			
DONKEY BOILERS.				
H.S.	Sq. ft.			
G.S.	"			
		£	:	:
ENGINES.				
L.P.O.	<i>29</i> Cub. ft.	<i>24</i>	<i>10</i>	<i>0</i>
		£	:	:
Testing, &c.	...			
		£	:	:
Expenses	...			
		£	:	:
Total	...	<i>44</i>	<i>10</i>	<i>0</i>

It is submitted that this Report be approved.

F. J. Adams
Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the

5th Sept 1923

Fees advised

Fees paid



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Secretary.

COLLEGE OF GENERAL CONSTRUCTION

Have the MAN HANDED, been in this course in accordance with the requirements of the

Approved Date: 10/10/19 H.S. 10/10/19

and the COLLEGE of GENERAL CONSTRUCTION in accordance with the requirements of the

General course.

H.S. 10/10/19

H.S. 10/10/19

10/10/19

General course.

L.S.O. 10/10/19 Cap. H. 10/10/19

10/10/19

General course.

10/10/19

General course.

10/10/19

10/10/19

It is submitted that this Report be approved.

and does not of him as an agent in the course of his business.

Approved by the Committee for the Class of M.B.S. of the

10/10/19

10/10/19

10/10/19

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10/10/19



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