

No.

THE BRITISH CORPORATION FOR THE SURVEY  
AND  
REGISTRY OF SHIPPING.

Report No. 1592 No. in Register Book 2229

Received at Head Office 25<sup>th</sup> October 1922

NEW YORK.

Surveyor's Report on the New Engines, Boilers, and Auxiliary  
Machinery of the <sup>Single Triple</sup> ~~Clin Quaduple~~ Screw TURBINE STEAMER

— "TUSCANIA" —

Official No.

Port of Registry GLASGOW.

Registered Owners THE ANCHOR LINE [HENDERSON BROS.] LT<sup>o</sup>

Engines Built by THE FAIRFIELD S. & E. CO. LT<sup>o</sup>

at GOVAN, GLASGOW.

Main Boilers Built by THE FAIRFIELD S. & E. CO. LT<sup>o</sup>

at GOVAN, GLASGOW.

Donkey " " NONE

at

Date of Completion

11-9-22

First Visit 2-6-19

Last Visit 11-9-22

Total Visits 250

12-12-22

20-3-23

25

NOTES IN RED REFER TO ALTERATIONS CARRIED OUT.

003175-003180-0002



## RECIPROCATING ENGINES.

Works No.

No. of Sets

Description

No. of Cylinders each Engine

No. of Cranks

Diars. of Cylinders

Stroke

Cubic feet in each L.P. Cylinder

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 &amp;

BUILT Cooling Surface 6700 sq. ft. ea.

Diameter of Piston Rods (plain part)

Screwed part (bottom of thread)

Material

Diar. of Connecting Rods (smallest part)

Material

" Crosshead Gudgeons

Length of Bearing

Material

No. of Crosshead Bolts (each)

Diar. over Thrd.

Thrds. per inch

Material

" Crank Pin " "

" Main Bearings

Lengths

" Bolts in each

Diar. over Thread

Threads per inch

Material

" Holding Down Bolts, each Engine SEE P. 3 Diar.

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?

{ BOLTED TO STOOLS BUILT  
FROM TANK TOP

Connecting Rods, Forged by

Piston

Crossheads,

Connecting Rods, Finished by

Piston

Crossheads,

Date of Harbour Trial

4-9-22

" Trial Trip

7-9-22 &amp; 8-9-22

Trials run at

FIRTH OF CLYDE

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

NO

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

Revol. per min.

Pressure in 1st I.P. Receiver,

lbs., 2nd I.P.,

lbs., L.P.,

lbs., Vacuum,

ins.

Speed on Trial

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

data:—

3215

Builders' estimated I.H.P.

Revol. per min.

Estimated Speed

17 KNOTS @ 13,500 S.H.P. &amp; 93 R.P.M.

RAN AT VARIOUS SPEEDS DURING TRIALS FROM

9 1/2 KNOTS UP TO 15 1/2 KNOTS

THRUST BLOCK 40 H.D. BOLTS, 1 5/8" DIA.

H.P. CASING 6 " 1 1/4" "

I.P. D<sup>o</sup> 16 " 1 1/2" "L.P. D<sup>o</sup> 8 " 1 1/2" "

" 8 " 1 3/4" "

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## TURBINE ENGINES.

Works No. 595 Type of Turbines BROWN - CURTISS  
 No. of H.P. Turbines No. of I.P. No. of L.P. No. of Astern

ONE EACH ENGINE. ONE EACH ENGINE. ONE EACH ENGINE. TEACH I.P. & L.P.

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

Is Single or Double Reduction Gear employed?

DOUBLE

H.P. & I.P. L.P.  
 Diam. of 1st Reduction Pinion 10.4979 .162825 } Width 26" Pitch of Teeth .673064"  
 " 1st " Wheel 77.7702"

Estimated Pressure per lineal inch @  $\frac{12500 \text{ S.H.P.}}{90 \text{ R.P.M.}} = 525 \text{ Lbs.}$

Diam. of 2nd Reduction Pinion 29.994" } Width 60" Pitch of Teeth .673064"  
 " 2nd " Wheel 123.618"

Estimated Pressure per lineal inch 590 Lbs.

Revs. per min. of H.P. Turbines at Full Power	2750	S.H.P. 15625	2nd H.P. TURBINE
I.P. " "	2750	15625	" I.P. "
" " L.P. " "	1770	3125	" L.P. "
" " 1st Reduction Shaft	371	6250	" SET
" " 2nd " "	90		
" " Propeller Shaft	90		

Total Shaft Horse Power 12,500 NORMAL 13,500 MAXIMUM

Date of Harbour Trial 4-9-22

" Trial Trip 7-9-22 & 8-9-22.

Trials run at FIRTH OF CLYDE

Speed on Trial 15.73 Knots. Propeller Revs. per min. 83.5 S.H.P. 9480

Turbine Spindles forged by CAMMELL, LAIRD & G. & FAIRFIELD S. & E. C. L<sup>ts</sup>

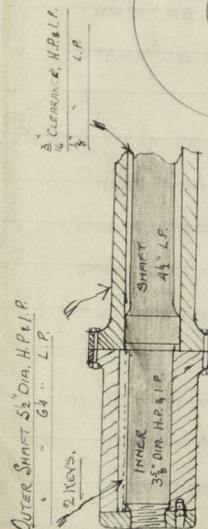
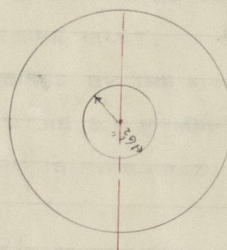
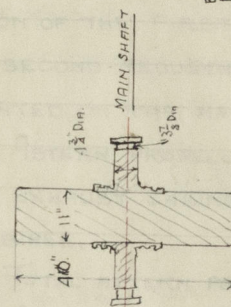
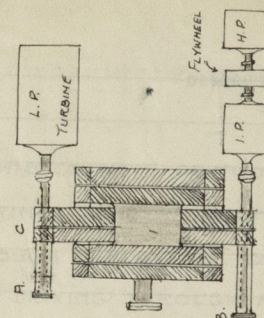
" Wheels forged or cast by Do.

Reduction Gear Shafts forged by CAMMELL, LAIRD & G. L<sup>ts</sup>

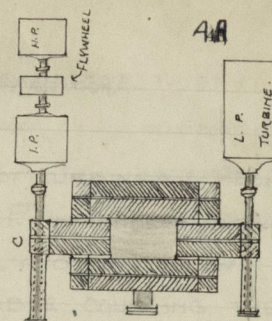
" Wheels forged or cast by A. F. CRAIG & C.

MODAL DRIVE SHAFTING BY THE FAIRFIELD C. FLYWHEELS BY McNEILS FORGE.  
 NEW PINIONS, SLEEVES & 2 GEAR WHEEL RIMS BY THE DARLINGTON FORGE, L<sup>ts</sup>

PORT ENGINE



SECTION AT 'A' & 'B'

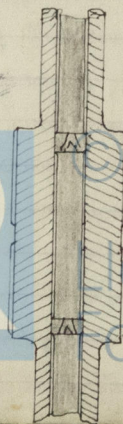


MAIN SHAFT

ARRANGEMENT OF

MODAL DRIVE -

S.S. TURBINE - No. 595



SECTION AT 'C' -  
 PINION & INNER SHAFT

STARBOARD ENGINE

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## DESCRIPTION OF INSTALLATION.

THIS CONSISTS OF TWO SETS OF TURBINES & MECHANICAL GEARING, ONE AHEAD H.P. & L.P. IN TANDEM, DRIVING THROUGH A FLEXIBLE COUPLING AND ONE PINION, AND ONE L.P. DRIVING THROUGH A FLEXIBLE COUPLING THE OTHER PINION OF THE FIRST REDUCTION GEARING, AND THROUGH THE SECOND REDUCTION PINIONS TO THE GEAR WHEEL MOUNTED ON THE MAIN SHAFT.

ASTERN PROPELLING TURBINES ARE INCORPORATED IN THE EXHAUST CASINGS OF THE H.P. AND L.P. AHEAD TURBINES.

TOTAL ASTERN POWER = 70% OF THE AHEAD POWER

STEAM TO BE SUPERHEATED TO 200° F. AT H.P. TURBINE INLET. PROVISION IS MADE ON THE H.P. TURBINES BY THE FITTING OF AN ADDITIONAL NOZZLE, SO THAT THE S.H.P. MAY BE INCREASED TO 13,500. IF THE STEAM IS AVAILABLE.

NOTE:— IN CONSEQUENCE OF TEETH BREAKING IN THE PORT 2<sup>ND</sup> RED<sup>U</sup> PINION AND THE STARBOARD 1<sup>ST</sup> REDUCTION PINION, THE PORT MAIN GEAR WHEEL AND THE STARBOARD 1<sup>ST</sup> REDUCTION WHEEL WERE DAMAGED IN NOV. 1922. THE FOLLOWING REPAIRS AND ALTERATIONS WERE THEN CARRIED OUT BY THE FAIRFIELD CO.

ONE NEW PORT MAIN GEAR WHEEL WAS FITTED  
ALL 2<sup>ND</sup> REDUCTION PINIONS WERE TURNED DOWN SLEEVES  
SHRUNK ON & PINNED AND NEW TEETH CUT.

THE NODAL DRIVE WAS FITTED. (SEE SKETCH, FAR.) THIS INVOLVED MOVING THE H.P. TURBINES 3' 0" FORWARD, THE FITTING



## 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. CONTD.

OF A FLYWHEEL BETWEEN EACH H.R. & I.P. TURBINE, FITTING EXTENSION SPINDLES & 1<sup>st</sup> REDUCTION PINIONS, ALTERING THE EXISTING LINE OF STEAM PIPES AT THE TURBINES, BORING OUT THE 2<sup>nd</sup> REDUCTION PINIONS, EXTENDING THE SEATINGS, ETC.

TRIALS WERE RUN ON THE FATH OF CLYDE ON THE 16<sup>th</sup> & 17<sup>th</sup> MARCH, 1923. WHEN THE MACHINERY WORKED SATISFACTORILY. THE FOLLOWING ARE THE PARTICULARS:-

STEAM:- B.R. ER. H.P. CONTROL. H.P. 1<sup>st</sup> STAGE. M.P. REC. L.P. REC.

220	214	186	160	89	15.7
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VACUUM 28.5" SUPERHEAT 184°F REVS. 90.4. H.P. 12630

F.L.O.

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No. of Blades each Propeller **4** Fitted or Solid? **FITTED**  
 Material of Blades **MANGANESE BRONZE** <sup>BOSS</sup> **CAST STEEL**  
 19'-0" TO 21'-0"  
 Diam. of Propellers **20'-0"** Pitch **SET AT 20'-6"** Surface (each) **125** S. ft.  
 Coefficient of Displacement of Vessel at  $\frac{1}{2}$  Moulded Depth **694**

## Crank Shafts Forged by

## Material

" Pins	"	"	"
" Webs	"	"	"
Thrust Shafts	"	<b>CAMMELL, LAIRD &amp; CO. LTD</b>	" <b>INGOT STEEL</b>
Intermed. "	"	<b>Do.</b>	" <b>Do.</b>
Propeller "	"	<b>Do.</b>	" <b>Do.</b>
Crank "	Finished by	<b>✓</b>	
Thrust "	"	<b>THE FAIRFIELD S. &amp; E. CO. LTD</b>	
Intermed. "	"	<b>Do.</b>	
Propeller "	"	<b>Do.</b>	

## STAMP MARKS ON SHAFTS.

## 2 THRUST SHAFTS

B. C.  
 No 595  
 G. S. M.  
 1/2/21

(No 6948)

15 INTER SHAFTS  
(14 WORKING - 1 SPARE)

B. C.  
 No 595  
 G. S. M.  
 8/4/20

(No 6913)

## 2 PROPELLER SHAFTS

B. C.  
 No 595  
 G. S. M.  
 8/4/20

(No 6913)

## ROTOR &amp; GEAR WHEEL SPINDLES

B. C.  
 No 595  
 G. S. M.  
 27/4/20

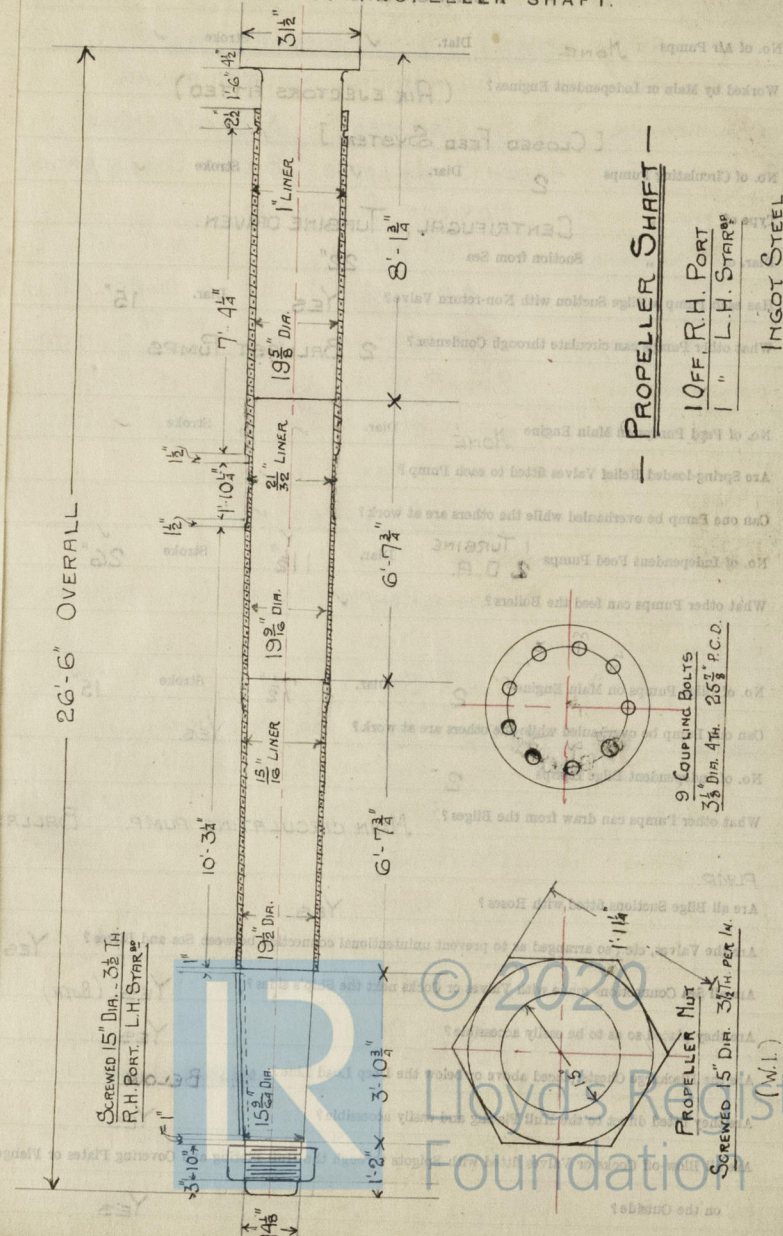
(No 6917)

REPLACE MAIN GEAR WHEEL  
 COMPLETE [EX No 600] MARKED

B. C.  
 S.O. 1944  
 G. S. M.  
 16/1/23  
 No 6496

NOVAL DRIVE SHAFTS  
 PINIONS & FLY WHEELS MARKED  
 B.C. S.O. 1945, 1944 G.S.M.  
 5/2/23. 16/2/23. 22/2/23  
 2/3/23. No 6497, 6499, 6500, 6001.

## SKETCH OF PROPELLER SHAFT.





Prope

Yes

PUMPS, ETC. 70, ROT342

SPENCER

Spence Best of Interest

Unit 10

# Podic

1950 1951

510

6-20-79 30 pages 13 Jan 8

ation

4/5/25-







No. of

Material

Diar. of

Coefficient

Crank

Thrust

Intern

Propell

Crank

Thrust

Intern

Propel

Are the Water Gauges fitted direct to the Boiler Shells or mounted on Pillars? MOUNTED ON PILLARSAre the Water Gauge Pillars fitted direct to the Boiler Shells or connected by Pipes? CONNECTED BY PIPESAre these Pipes connected to Boilers by Cocks or Valves? COCKS

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

No. of Strakes of Shell Plating in each Boiler

SINGLE END.

DOUBLE END.

ONE

3

Plates in each Strake

2

2

Thickness of Shell Plates Approved

 $1\frac{21}{32}$ " $1\frac{21}{32}$ "

" " in Boilers

 $1\frac{21}{32}$ " $1\frac{21}{32}$ "

Are the Rivets Iron or Steel?

STEEL

STEEL

Are the Longitudinal Seams Butt or Lap Joints?

BUTT

BUTT

Are the Butt Straps Single or Double?

DOUBLE

DOUBLE

Are the Double Butt Straps of equal width?

No.

No.

Thickness of outside Butt Straps

 $1\frac{9}{32}$ " $1\frac{9}{32}$ "

" inside "

 $1\frac{15}{32}$ " $1\frac{15}{32}$ "

Are Longitudinal Seams Hand or Machine Riveted?

MACHINE

MACHINE

Are they Single, Double, or Treble Riveted?

TREBLE

TREBLE

No. of Rivets in a Pitch

5

5

Diar. of Rivet Holes

 $1\frac{21}{32}$ "

Pitch

10 $\frac{1}{2}$ " $1\frac{21}{32}$ "10 $\frac{1}{2}$ "

No. of Rows of Rivets in Centre Circumferential Seams

✓

3

Are these Seams Hand or Machine Riveted?

✓

MACHINE

Diar. of Rivet Holes

Pitch

✓

 $1\frac{3}{4}$ "

5'0"

No. of Rows of Rivets in Front End Circumferential Seams

2

2

Are these Seams Hand or Machine riveted?

HAND

HAND

Diar. of Rivet Holes

 $1\frac{3}{4}$ "

Pitch

5'038"

 $1\frac{3}{4}$ "

5'0"

No. of Rows of Rivets in Back End Circumferential Seams

2

2

Are these Seams Hand or Machine Riveted?

MACHINE

MACHINE

Diar. of Rivet Holes

 $1\frac{3}{4}$ "

Pitch

5'038"

 $1\frac{3}{4}$ "

5'0"

Size of Manholes in Shell

16" x 12"

16" x 12"

Dimensions of Compensating Rings BOTH BOILERS = 2'-11 $\frac{3}{4}$ " x 3'-7" x 1 $\frac{21}{32}$ " THICK

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No. of 1	Thickness of End Plates in Steam Space Approved		SINGLE END	DOUBLE END
	" " " " " in Boilers		$1\frac{21}{64}"$	$1\frac{21}{64}"$
Material	Pitch of Steam Space Stays		$20\frac{3}{4} \times 17"$	$20\frac{3}{4} \times 17"$
Diar. of	Diar. " " " " Approved		$21\frac{1}{2} \times 17"$	$21\frac{1}{2} \times 17"$
Coeffici	3 $\frac{3}{8}$ Threads per Inch		6	3 $\frac{3}{8}$ Dia. x 6
	" " " " " in Boilers		Do.	Do.
	Material of " " "		Do.	Do.
Crank	How are Stays Secured?		STEEL	STEEL
"	Diar. and Thickness of Loose Washers on End Plates		DBL. NUTS	DBL. NUTS
"	" " Riveted " " "		NONE	NONE
Thrust	Width " " Doubling Strips		"	"
Interm	Thickness of Middle Back End Plates Approved		$\frac{15}{16}"$	✓
Propel	" " " " " in Boilers		Do.	Do.
Crank	Thickness of Doublings in Wide Spaces between Fireboxes		✓	✓
Thrust	Pitch of Stays at " " " "		$8\frac{1}{8}, 8\frac{3}{16}, 8\frac{1}{2} \times 8\frac{1}{4}"$	$8\frac{1}{8}, 8\frac{3}{16}, 8\frac{1}{2} \times 8\frac{1}{4}"$
Interm	Diar. of Stays Approved		$1\frac{5}{8}"$ Threads per Inch	$1\frac{5}{8}$ Dia. 9 Th.
Propel	" " in Boilers		Do.	Do.
	Material "		IRON	IRON
2	Are Stays fitted with Nuts outside?		YES	YES
	Thickness of Back End Plates at Bottom Approved		$\frac{15}{16}"$	$1"$
N	" " " " " in Boilers		Do.	Do.
1	Pitch of Stays at Wide Spaces between Fireboxes		$8\frac{1}{8}, 8\frac{1}{16}, 8\frac{1}{4} \times 8\frac{1}{8}"$	$8\frac{1}{8}, 8\frac{1}{16} \times 8\frac{1}{8}"$
(	Thickness of Doublings in " "		$\frac{11}{16}"$	$\frac{11}{16}"$
	Thickness of Front End Plates at Bottom Approved		$1"$	$1"$
	" " " " " in Boilers		$1"$	$1"$
	No. of Longitudinal Stays in Spaces between Furnaces		3	3



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No. 10

P. 10

B.C. 8.0

5/2/23.

2/3/23.







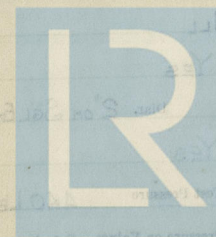
		SINGLE END°	DOUBLE END°
Diam. of Screwed Stays Approved	$\frac{5}{8}$ "	Threads per Inch 9	$\frac{5}{8}$ " 9 Th.
" " " in Boilers	Do.	Do.	Do.
Material " "		IRON	IRON
Thickness of Combustion Chamber Sides Approved		$\frac{21}{32}$ "	$\frac{21}{32}$ "
" " " " in Boilers		Do.	Do.
Pitch of Screwed Stays in C.C. Sides		$8" \text{ TO } 8\frac{1}{4}" \times 8\frac{1}{4}"$	$8" \text{ TO } 8\frac{1}{4}" \times 8\frac{1}{4}"$
Diam. " " Approved	$\frac{5}{8}$ "	Threads per Inch 9	$\frac{5}{8}$ " 9 Th.
" " " in Boilers	Do.	Do.	Do.
Material " "		IRON	IRON
Thickness of Combustion Chamber Backs Approved		$\frac{11}{16}$ "	$\checkmark \frac{11}{16}$ "
" " " " in Boilers		Do.	$\checkmark \frac{11}{16}$ "
Pitch of Screwed Stays in C.C. Backs		$8" \times 9"$	$\checkmark 8\frac{1}{2}" \times 9"$
Diam. " " Approved	$1\frac{3}{4}, 2", 2\frac{1}{8}"$	Threads per Inch 9	$\checkmark$
" " " in Boilers	Do.	Do.	Do.
Material " "		IRON	IRON
Are all Screwed Stays fitted with Nuts inside C.C.?		YES	YES
Thickness of Combustion Chamber Bottoms		$\frac{13}{16}$ "	$\frac{13}{16}$ "
No. of Girders over each Wing Chamber		5	5
" " " Centre "		3	3
Depth and Thickness of Girders		$8\frac{1}{2}" \times \frac{3}{4}"$	$8\frac{1}{2}" \times \frac{3}{4}"$
Material of Girders		STEEL	STEEL
No. of Stays in each		3	3
No. of Tubes, each Boiler		298 R. 174 STAY 472 TOTAL	592 PL. 352 STAY 944 TOTAL
Size of Lower Manholes		$16" \times 12"$	$16" \times 12"$

## VERTICAL DONKEY BOILERS.

No. of Boilers	Type
Vertical Donkey	Vertical
Height of Boiler Crown above Fire Grate	Height
Are Boiler Crown Flat or Dish?	Are Boiler Crown Flat or Dish?
Internal Radius of Dish?	Internal Radius of Dish?
Description of Stays in Boiler Crown	Description of Stays in Boiler Crown
Diam. of Stays	Diam. of Stays
Height of Firebox Crown above Fire Grate	Height of Firebox Crown above Fire Grate
Are Firebox Crown Flat or Dish?	Are Firebox Crown Flat or Dish?
Internal Radius of Dish?	Internal Radius of Dish?
Thickness of Plates	Thickness of Plates
Diam. of Crown Stays	Diam. of Crown Stays
External Diam. of Firebox at Top	External Diam. of Firebox at Top
No. of Water Tubes	No. of Water Tubes
Material of Water Tubes	Material of Water Tubes
Size of Manhole in Shell	Size of Manhole in Shell
Thickness of Combustion Ring	Thickness of Combustion Ring
Weight of each Boiler	Weight of each Boiler

## SUPERHEATERS.

Description of Superheater	Description of Superheater
Boiler Patent Superheater	Boiler Patent Superheater
Boiler Patent Superheater	Boiler Patent Superheater
Boiler Patent Superheater	Boiler Patent Superheater
Boiler Patent Superheater	Boiler Patent Superheater



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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. (SINCE REMOVED)

Description of Superheaters SCHMIDT'S PATENT SMOKE TUBE.  
 SUPERHEATING SURFACE. 1310 SQ. FT. ER. D.E. B.L.R.

Where situated? IN BOILER TUBES & SMOKEBOXES

Which Boilers are connected to Superheaters? ALL.

Can Superheaters be shut off while Boilers are working? YES

No. of Safety Valves on each Superheater ONE Diar. 2" ON SGL. END. 2½" ON DBL. END

Are " " fitted with Basing Gear? YES

Date of Hydraulic Test SEE OPPOSITE PAGE Test Pressure 440 LBS. PER SQ.

Date when Safety Valves set 5-9-22 Pressure on Valves 225 " " "

## MAIN STEAM PIPES

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	

## HYD. TESTS OF SUPERHEATERS.

SINGL. END. BOILERS DBL. END. BOILERS

PORT. 2/11/21. CENTRE 4/11/21. ST. 8/11/21. PORT 14/11/21. CENTRE 17/11/21. ST. 23/11/21



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## MAIN STEAM PIPES.

No. of Lengths	11	11	4	3
Material	STEEL	STEEL	STEEL	STEEL
Brazed, Welded or Seamless	SEAMLESS	SEAMLESS	SEAMLESS	SEAMLESS
Internal Diam.	5 $\frac{1}{2}$ "	3 $\frac{3}{4}$ "	7 $\frac{1}{2}$ "	9"
Thickness	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{5}{16}$ "	$\frac{3}{8}$ "
How are Flanges secured?	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?	
Date of Hydraulic Test	18-12-19	9-3-20	28-5-20	29-7-20
Test Pressure	660 LBS.	660 LBS.	660 LBS.	660 LBS.

No. of Lengths	2	6	3	4
Material	STEEL	STEEL	STEEL, WITH M.S. BUTT STRAPS RIVETED OVER WELD.	STEEL
Brazed, Welded or Seamless	SEAMLESS	SEAMLESS		SEAMLESS
Internal Diam.	7 $\frac{1}{2}$ "	3 $\frac{3}{4}$ "	11"	7 $\frac{1}{2}$ "
Thickness	$\frac{5}{16}$ "	$\frac{1}{4}$ "	$\frac{13}{32}$ "	$\frac{5}{16}$ "
How are Flanges secured?	SCREWED & EXP?	SCREWED & EXP?	RIVETED.	SCREWED & EXP?
Date of Hydraulic Test	27-1-20	23-3-20	6-5-20	30-7-20
Test Pressure	660 LBS.	660 LBS.	660 LBS.	660 LBS.

No. of Lengths	2	6	1	4
Material	STEEL	STEEL	STEEL, WITH M.S. BUTT STRAPS RIVETED OVER WELD.	STEEL
Brazed, Welded or Seamless	SEAMLESS	SEAMLESS		SEAMLESS
Internal Diam.	5 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	10 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "
Thickness	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{13}{32}$ "	$\frac{1}{4}$ "
How are Flanges secured?	SCREWED & EXP?	RIVETED.	RIVETED	SCREWED & EXP?
Date of Hydraulic Test	27-1-20	29-4-20	6-5-20	4-4-21
Test Pressure	660 LBS.	660 LBS.	660 LBS.	660 LBS.

## MAIN STEAM PIPES contd

No. of Lengths	13	4	12	2	1
Material	STEEL	STEEL	STEEL	STEEL	STEEL
Brazed, Welded or Seamless	SEAMLESS	SEAMLESS	SEAMLESS	SEAMLESS	SEAMLESS
Int. dia.	3 $\frac{3}{4}$ "	5 $\frac{1}{2}$ "	3 $\frac{3}{4}$ "	7 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "
Thickness	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{5}{16}$ "	$\frac{5}{16}$ "
Flanges	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?
Date of Hydraulic Test	4-4-21	25-4-21	5-5-21	16-5-22	3-8-22
Test Pressure	660 LBS.	660 LBS.	660 LBS.	660 LBS.	660 LBS.

No. of Lengths	4	2	4	3	1
Material	STEEL	STEEL	STEEL	STEEL	STEEL
Brazed, Welded or Seamless	SEAMLESS	SEAMLESS	SEAMLESS	SEAMLESS	SEAMLESS
Int. dia.	5 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "
Thickness	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{5}{16}$ "
Flanges	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?
Date of Hydraulic Test	14-4-21	28-4-21	12-5-21	31-7-22	7-8-22
Test Pressure	660 LBS.	660 LBS.	660 LBS.	660 LBS.	660 LBS.

No. of Lengths	12	12	6	2	2
Material	STEEL	STEEL	STEEL	STEEL	STEEL
Brazed, Welded or Seamless	SEAMLESS	SEAMLESS	SEAMLESS	SEAMLESS	SEAMLESS
Int. dia.	3 $\frac{3}{4}$ "	3 $\frac{3}{4}$ "	3 $\frac{3}{4}$ "	9 $\frac{1}{2}$ "	6"
Thickness	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{1}{4}$ "	$\frac{3}{8}$ "	$\frac{5}{16}$ "
Flanges	SCREWED & EXP?	SCREWED & EXP?	SCREWED & EXP?	RIVETED	SCREWED & EXP?
Date of Hydraulic Test	21-4-21	28-4-21	12-5-21	1-8-22	7-8-22
Test Pressure	660 LBS.	660 LBS.	660 LBS.	660 LBS.	660 LBS.

CONTINUED ON PAGE 43



EVAPORATORS. ~~MAIN~~

No. 2 Type VERTICAL Tons per Day 50 EACH.  
 Makers G. & J. WEIR L<sup>ts</sup> CATHCART, GLASGOW  
 Working Pressure Test Pressure SHELL 30 Date of Test 26-10-21  
 Date of Test of Safety Valves under Steam 5-9-22 [B.O.T.]  
 EVAP<sup>rs</sup> Nos 6197, 6198.

## FEED WATER HEATERS.

No. 2 Type MULTIFLOW SURFACE  
 Makers G. & J. WEIR L<sup>ts</sup>  
 Working Pressure Test Pressure SHELL 30 Date of Test \*SEE BELOW.  
 \* 10 380 f HEATING SURFACE [No 59719] TESTED 7-3-21 }  
 10 50 f " " [No 60465] " { 1-12-20 } B.O.T.  
 { 21-12-20 }

## FEED WATER FILTERS.

No. Type GRAVITATION Size  
 Makers  
 Working Pressure Test Pressure Date of Test

## LIST OF DONKEY PUMPS.

1 TURBINE. G. & J. WEIR L<sup>ts</sup>.  
 2 DIRECT ACTING. G. & J. WEIR L<sup>ts</sup>. 11½" x 15½" x 26"  
 MAIN FEED PUMPS. SUCTIONS:- RESERVE F.W. TANKS, M. CONDENSERS, AUX. CLOSED SYSTEM.  
 DISCHARGE:- BOILERS  
 MAIN CIRCULATING P/PS. 2 TURBINE. G. & J. WEIR L<sup>ts</sup>. 22" SUCT.  
 SUCTIONS:- SEA, BILGES  
 DISCHARGE:- MAIN CONDENSERS  
 AUX. DO. 2 IN No. MATTHEW PAUL & CO L<sup>ts</sup>  
 SUCTION:- SEA  
 DISCHARGE:- AUX. CONDENSER 12" x 12"  
 1 MOTOR DRIVEN. J.H. CARRUTHERS & CO L<sup>ts</sup>. 10" x 12" x 10"  
 BALLAST PUMPS. 1 DUPLEX  
 SUCTIONS:- BALLAST TANKS, BILGES, SEA  
 DISCHARGES:- OVERBOARD, WASH DECK MAIN, SANITARY MAIN,  
 DISTILLER, MAIN CONDENSER  
 BILGE PUMPS. 1 DUPLEX. CUNARD ENGINE WORKS. 8" x 9" x 9"  
 SUCTIONS:- E.R. BILGES, S.H. BILGES, TUNNELS, HOLDS.  
 DISCHARGE:- OVERBOARD  
 2 OPERATED BY MAIN GEAR WHEEL SHAFTS 7½" x 15"  
 SUCTION:- E.R. BILGES. DISCHARGE:- OVERBOARD.  
 EMERGENCY DO. 1 MOTOR DRIVEN. J.H. CARRUTHERS & CO L<sup>ts</sup>. 9" x 9"  
 SUCTION:- BILGES. DISCHARGE:- OVERBOARD.  
 FIRE PUMP 1 DUPLEX. CUNARD ENGINE WORKS 8" x 9" x 9"  
 SUCTION:- SEA. DISCHARGES:- FIRE MAIN, SANITARY MAIN.  
 FORCED LUB<sup>g</sup> PUMPS. 3 DUPLEX. G. & J. WEIR L<sup>ts</sup>. 8" x 7" x 18"  
 SUCTION:-  
 OIL FUEL TRANSFER PUMP. 1 DUPLEX. G. & J. WEIR L<sup>ts</sup>. 8" x 7" x 18"  
 SUCTION:- DOUBLE BOTTOM TANKS. DISCHARGE:- SETTLING TANKS.  
 OIL BILGE WELL PUMP. 1 DUPLEX. G. & J. WEIR L<sup>ts</sup>. 8" x 7" x 18"  
 SUCTIONS:- D.B. TANKS, OIL BILGES. DISCHARGES:- SETTLING TANKS, O'BOARD  
 [CONTINUED ON PAGE 41.]



## SPARE GEAR

No. of Top End Bolts.	No. of Bot. End Bolts.	No. of Cylinder Cover Studs
" Coupling Bolts 1 SET	" Main Bearing Bolts	" Valve Chest "
" Junk Ring Bolts	" Feed Pump Valves	" Bilge Pump Valves
" H.P. Piston Rings	" L.P. Piston Rings	" L.P. Piston Rings
" " Springs	" " Springs	" " Springs
" Safety Valve "	" Fire Bars	" Feed Check Valves
" Piston Rods	" Connecting Rods	" Valve Spindles
" Air Pump Rods	" Air Pump Buckets	" Air Pump Valves
" Cir. "	" Cir. "	" Cir. "
" Crank Shafts	" Crank Pin Bushes	" Crosshead Bushes
" Propeller Shafts	" Propellers	" A Propeller Blades WITH STUDS & NUTS FOR 1 BLADE
" Boiler Tubes	" Condenser Tubes 50	" Condenser Ferrules 50

## OTHER ARTICLES OF SPARE GEAR:—

- 1 SET BEARING BUSHES, M. GEAR WH. SPINDLES FOR ONE GEAR CASE.
- 1 " H.P. I.P. L.P. BUSHES FOR TURBINES.
- 1 " CARBON SEGMENTS FOR H.P. I.P. L.P. GLANDS.
- 5% BLADING WITH PACKING & SHROUDDING.
- 50 OIL COOLER TUBES
- 2 BOLTS & NUTS FOR EA. SIDE OF ROTOR, MAIN GEAR WHEEL & PINION BEARINGS
- 1 ESCAPE VALVE SPRING FOR EACH SIZE FITTED.
- 12 STUDS & NUTS FOR CONDENSER DOORS.
- MAIN THRUST BLOCK PAD PIECES SUFFICIENT FOR ONE AHEAD SURFACE.
- 2 " " ADJUSTING LINERS FOR EACH LINER FITTED.
- 1 SET PAD PIECES FOR TURBINE THRUST BLOCKS
- 10 TOTAL NO. OF STUDS, BOLTS & NUTS FOR TURBINE CASINGS & COVERS.
- 1 SET OF SPRINGS FOR TURBINE GLANDS COMPLETE FOR H.P. I.P. & L.P.

## SPARE GEAR

- TURBO FEED PUMP.
- 1 IMPELLER
- 1 SET P/P PACKING RINGS
- 1 " BEARINGS COMPLETE
- 1 " CARBON PACKING SEGMENTS COMPLETE.
- 2 " PACKING FOR STUFFING BOXES.
- 1 NON CORRODIBLE SHAFT SLEEVE
- 1 STEAM VALVE & SEAT
- 1 SPRING FOR EACH FITTED.
- D. A. FEED PUMPS
- 1 SET SUCT<sup>n</sup> VALVES & SPRINGS
- 1 " DISC<sup>n</sup> " " "
- 3 EBON. PUMP BUCKET RINGS.
- 1 SET SYM PISTON RINGS
- FORCED LUB<sup>n</sup> PUMPS.
- 2 SETS SUCT<sup>n</sup> & DISC<sup>n</sup> VALVES & SPRINGS.
- 2 " ST<sup>n</sup> PISTON RINGS
- MAIN CIRC. PUMPS [TURBO]
- 2 IMPELLERS
- 2 SETS OF BEARINGS COMPLETE
- 2 " " SHAFT SLEEVES
- 1 STEAM VALVE & SEAT.
- 2 SETS OF SOFT PACKING
- 1 " " CARBON PKG. SEGMENTS
- 2 " " SPRINGS
- 2 " " COPPER WASHERS.
- BALLAST PUMPS [SYM. & MOTOR DRIVEN]
- 1 SET OF RUBBER VALVES.
- 1 " " BRASS VALVE GUARDS & STUDS
- EMERGENCY BILGE PUMPS
- 1 SET OF PUMP VALVES & GUARDS COMPLETE
- FR. WATER & WASHING WATER PUMPS
- 1 SET OF RUBBER VALVES & G.M. VALVE GUARDS.
- AUX. CIRCULATING PUMP.
- 1 PR. CROSSHEAD BRASSES WITH BOLTS & NUTS.
- 1 CRANK PIN " " "
- EVAPORATORS.
- 1 SET COILS COMPLETE
- 1/20 NO. DIST<sup>n</sup> TUBES, FERRULES & GROMMETS
- CLOSED FEED SYSTEM.
- 2 NOZZLES, 1 VALVE SEAT WITH STUD, NUT & GUARD FOR AIR EJECTORS.
- 1 IMPELLER, 2 SETS OF BALL BEARINGS
- 1 ST<sup>n</sup> VALVE & SEAT, 2 SETS SHAFT SLEEVES
- 1 SET CARB<sup>n</sup> PACKING BEG<sup>n</sup>s & SPRINGS
- 2 SETS SPRINGS FOR ALL PARTS FOR WATER
- EXTRACTION PUMPS.
- 1/2 TOTAL NO. FERRULES & TUBES FOR HEATER COND<sup>SR</sup>
- LEATHERS & SPRINGS FOR SUP. FEED VALVES
- 1/2 NO. TUBES, 1/4 NO. FERRULES & 1/2 NO. GROMMETS FOR MAIN SURFACE FEED WATER HEATER.



## REFRIGERATORS.

No. of Machines 2 Capacity of each 9090 Cuft &amp; 2 Cold UPWARDS

Makers J. &amp; E. HALL

Description No 3 SIZE VERTICAL, COMPRESSORS 2 3/4" 9" STROKE

EACH DRIVEN THROUGH SPUR GEARING BY A 20 B.H.P. MOTOR.

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

INDEPENDENTLY - SEE BRINE PUMPS. P. 408

System of Refrigeration C.O.<sub>2</sub>

Insulation GRANULATED CORK.

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

Spaces? YES

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

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

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

Date of Test under Working Conditions

(SHIP'S USE)

## 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.
2 Cargo w/c - Size 10.7 Installation 1928 - 1st report see 17-3-28 10/4/31				
Construction at J. E. Hall see report 21-12-37 No 4697				

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

GLUBRICATOR GLAND LEATHERS

1 PISTON &amp; ROD WITH RINGS FOR COMPS

2 DEL' VALVES, SEATS &amp; SPRINGS FOR DO

2 SUCT' " " " " " "

6 ADDITIONAL SPRINGS FOR DO

2 C.O.<sub>2</sub> STOP VALVES

1 " REGULATING VALVE SPINDLE

1 " PRESSURE GAUGE

1 PR. CRANK PIN BOLTS &amp; NUTS.

1 MAIN BEARING " " "

1 CRANKSHAFT

6 SAFETY DISCS.

2 SETS OF COPPER JOINT RINGS FOR COMPS

1- 3/8" CONTROL VALVE

3 SPARE PIPS FOR DO

1 SPRING BALANCE.

OVER



## SPARE GEAR CONT.

## REFRIGERATING MACHINERY (CONT.)

4 COMPRESSOR PISTON RINGS

48 SPECIAL METAL RINGS FOR COMPRESSOR GLANDS

1 ARMATURE, 1 SET OF BEARING BUSHES,

1 LINE OF BRUSH HOLDERS &amp; 1 SET OF CARBON

BRUSHES FOR EACH MOTOR.

## OIL FUEL INSTALLATION

1 SET STRAINER BASSES FOR EACH SUCT<sup>n</sup> STRAINER.

1 THERMOMETERS

36 BURNER BODIES. 36 CAPS. 180 NOZZLES.

180 DIAPHRAGMS

3 AUX. OIL HEATERS WITH ST<sup>n</sup> RAISING BURNER,THER<sup>m</sup> HOLDERS & BRASS CASED THER<sup>m</sup> & THE

NECESSARY FLEXIBLE TUBING FOR CONNECTING

TO THE DISTRIBUTING VALVE BOXES.

## OIL FUEL TRANSFER PUMP

1 SET SUCT<sup>n</sup> & DISC<sup>n</sup> V's & SPRINGS.

1 " STEAM PISTON RINGS.

## FORCED DRAUGHT FANS

1 ARMATURE FOR MOTOR.

## ELECTRIC LIGHTING

## AUXILIARY SWITCHBOARD "A"

CIRCUIT	No of Lights	Candle power or Watts.	Current required. Amps.	Size of Conductor	Current Density.	Conductivity of Conductor.	Insulation Resistance per mile.
A.D.1. F. DECK. SECTION "K"	13	40 W.	4.7	7/064"	209	22.5	600 MEGOHMS.
A.S.2. CREWS QRS. D & E DKS.	64	40 W.	23.3	7/064"	1036	22.5	D°
A.S.3. CARGO CLUSTERS. 1, 2, 3 & 4.	24	32 c.p.	24.4	7/064"	1084	22.5	D°
A.S.4. 3 <sup>rd</sup> CL. DINING SPACE, LAV <sup>s</sup> & STEWARDS QRS. DASH WASHER	53	40 W. }	26.1	19/052"	653	40	D°
A.S.5. D.D. & STAIR <sup>s</sup> LAV <sup>s</sup> & PRINTING " " " "	44	40 W.	16	19/052"	400	40	D°
A.S.6. E. & F. DKS. SECS. G & L.	63	40 W.	22.9	7/064"	1018	22.5	D°
A.S.7. D° "H & M"	72	40 W.	26.2	19/052"	655	400	D°
A.S.8. D° "I & N"	43	40 W.	15.6	7/064"	693	22.5	D°
A.E.1. SEC. K & STEWARDS QRS.	6 1	40 W. 32 c.p. }	2.2	7/036"	314	7	D°
A.E.2. CREWS QRS. C, D & E DKS.	10	40 W. }	4.7	7/064"	209	22.5	D°
A.E.3. 3 <sup>rd</sup> CL. DINING SPACE & ENTRANCE.	27	40 W.	9.8	7/064"	436	22.5	D°
A.E.4. SECTION G & L.	10	40 W.	3.6	7/036"	514	7	D°
A.E.5. " H & M.	12	40 W.	4.4	7/036"	629	7	D°
A.E.6. " I & N	6	40 W.	2.2	7/036"	314	7.	D°

## AUXILIARY SWITCHBOARD "B"

B.S.1. 1 <sup>st</sup> CL. DINING SALOON	42 1	16 c.p. 40 W. }	43.2	19/064"	720	60	600 MEGOHMS.
B.S.2. 1 <sup>st</sup> CL. ACOM. "D" DECK.	7 54	FAN SOCKETS 40 W. }	25	19/052"	625	40	D°
B.S.3. P.O.s ACOM. & NAV <sup>s</sup> LIT.	5 38	32 c.p. 60 W. }	20	19/052"	500	40	D°
B.S.4. CARGO CLUSTERS. 5, 6, 7 & 8	24 1	32 c.p. 16 c.p. }	24.4	7/064"	1084	22.5	D°
B.S.5. 1 <sup>st</sup> CL. ACOM. "C" DECK	90 3	40 W. 60 W. }	34.9	19/064"	582	60	D°
B.S.6. D° PORT & CAPT <sup>n</sup> P.O.s	1 1	16 c.p. 40 W. }	47	19/064"	783	60	D°
B.S.7. D° S <sup>st</sup> B D° & 1 <sup>st</sup> CL. LOUNGE	4 42	16 c.p. 40 W. }	31.5	19/052"	788	40	D°
B.S.8. D° P <sup>st</sup> & 1 <sup>st</sup> CL. WRITING ROOM	17 42	16 c.p. 40 W. }	28.8	19/052"	720	40	D°
B.E.1. 1 <sup>st</sup> SALOON & D° D <sup>st</sup> P. & S <sup>st</sup>	12 10	40 W. 60 W. }	9.8	7/064"	436	22.5	D°

LOVER



## ELECTRIC LIGHTING

## AUXILIARY SWITCHBOARD "B" Continued.

Circuit	No of Lights	Candle power or Watts	Current required Amps.	Size of Conductor	Current Density 1000"	Conductivity of Conductor	Insulation Resistance per Mile.
BED 2. NAY. BGS. GPT & OFFICERS ROOM	60 32 c.p. 40 W.	32 c.p. 40 W.	51.8	19/072"	691	75	600 MEGOHMS.
BED 3. 1 <sup>st</sup> CL. ACOM. C DECK	8 4 40 W. 60 W.	40 W. 60 W.	5.1	7/036"	729	7	D°
BED 4. DR "B" DECK	10 4 40 W. 60 W.	40 W. 60 W.	5.8	7/036"	829	7	D°
BED 5. PUBLIC ROOMS 4 DECK & BOAT DECK STE	35 3 40 W. 60 W.	40 W. 60 W.	3.5	7/036"	500	7	D°
BED 6. DR PORT	33 3 40 W. 60 W.	40 W. 60 W.	2.7	7/036"	386	7	D°
BED 7. NAVIGATION LIGHTS.	5 32 c.p.	32 c.p.	5.1	7/036"	729	7	D°

## AUXILIARY SWITCHBOARD "C" —

C.S. 1. 2 <sup>nd</sup> CL. ACOM. 3 <sup>rd</sup> C. DECK	2 108 16 c.p. 40 W.	16 c.p. 40 W.	40.3	19/064"	672	60	600 MEGOHMS.
C.S. 2. DR PT "	2 105 16 c.p. 40 W.	16 c.p. 40 W.	39.2	19/064"	653	60	D°
C.S. 3. 1 <sup>st</sup> CL. SMOKE RM. GYM. & VERANDAH CAFE.	21 64 16 c.p. 40 W.	16 c.p. 40 W.	38.5	19/052"	963	40	D°
C.S. 4. 1 <sup>st</sup> CL. ACOM. 3 <sup>rd</sup> B DECK	35 1 16 c.p. 40 W.	16 c.p. 40 W.	29.2	19/052"	730	40	D°
C.S. 5. DR PORT "	66 1 16 c.p. 40 W.	16 c.p. 40 W.	24.5	19/052"	613	40	D°
C.S. 6. 3 <sup>rd</sup> CL. DINING SALOON FOR	34 1 40 W.	40 W.	12.3	7/064"	547	22.5	D°
C.S. 7. DR. HAY. & SECT. P. & STORE.	108 1 40 W.	40 W.	39.4	19/052"	985	40	D°
C.S. 8. 2 <sup>nd</sup> CL. DINING SALOON E DECK	8 62 16 c.p. 60 W.	16 c.p. 60 W.	37.9	13/052"	948	40	D°
C.S. 10. 2 <sup>nd</sup> CL. ACOM. D DECK	66 1 16 c.p. 40 W.	16 c.p. 40 W.	24.5	19/052"	613	40	D°
C.S. 11. PANTRIES & GALLEYS	115 56 16 c.p. 40 W.	16 c.p. 40 W.	41.9	19/064"	698	60	D°
C.S. 1. ENGINEERS ACOM	56 16 c.p. 40 W.	16 c.p. 40 W.	39.1	19/064"	652	60	D°
CED 2. ENGINE ROOM	10 5 40 W. 100 W. 300 W.	40 W. 100 W. 300 W.	12.9	7/064"	573	22.5	D°
CED 3. 1 <sup>st</sup> CL. ACOM. B DECK P. & S.	13 1 40 W.	40 W.	4.7	7/064"	209	22.5	D°
CED 4. 2 <sup>nd</sup> CL. ACOM. C DECK P. & S.	13 1 40 W.	40 W.	4.7	7/064"	209	22.5	D°
C.E.D.S. 1 <sup>st</sup> CL. SMOKE RM. VERANDAH CAFE, GYM. & BOAT DECK	12 6 40 W. 60 W.	40 W. 60 W.	8.3	7/064"	369	22.5	D°

## ELECTRIC LIGHTING

## AUXILIARY SWITCHBOARD "C" CONTINUED.

Circuit	No of Lights	Candle power or Watts	Current required Amps.	Size of Conductor	Current Density 1000"	Conductivity of Conductor	Insulation Resistance per Mile.
1 <sup>st</sup> CL. SMOKE ROOM.	11 1 40 W.	40 W.	4.6	7/064"	204	22.5	600 MEGOHMS.
VERANDAH CAFE, GYM & BOAT DECK	1 1 60 W.	60 W.	4.6	7/064"	204	22.5	600 MEGOHMS.
CED 7. 2 <sup>nd</sup> CL. SALOONS & STORES	15 8 40 W. 60 W.	40 W. 60 W.	8.7	7/064"	387	22.5	D°
CED 8. BOILER ROOM	17 3 40 W. 100 W.	40 W. 100 W.	10.9	7/064"	484	22.5	D°
1 <sup>st</sup> CL. PANTRIES, GALLEY, & D DECK. P.	17 1 40 W.	40 W.	6.2	7/064"	276	22.5	D°
CED 10. 1 <sup>st</sup> CL. D DECK STE, 2 <sup>nd</sup> CL. PANTRIES & 3 <sup>rd</sup> CL. SALOON.	25 1 40 W.	40 W.	9.1	7/064"	404	22.5	D°

## AUXILIARY SWITCHBOARD "D" —

1 <sup>st</sup> CL. PUBLIC ROOMS, E DECK & SECT. R, F DECK.	56 2 40 W. 16 c.p. 40 W.	40 W. 16 c.p. 40 W.	20.4	19/052"	510	40	600 MEGOHMS.
2 <sup>nd</sup> CL. ACOM. C & E DECKS	74 2 40 W.	40 W.	29.0	19/052"	725	40	D°
CARGO CLUSTERS, 9, 10, 11, 12	24 59 32 c.p. 16 c.p. 40 W.	32 c.p. 16 c.p. 40 W.	24.4	7/064"	1084	22.5	D°
HOSPITALS, P. & S. D DECK.	59 1 40 W.	40 W.	32.0	19/064"	533	60	D°
E. & F. DECKS. SECT. J & Q	70 1 40 W.	40 W.	25.5	19/052"	638	40	D°
CARGO CLUSTERS, 13, 14	12 1 32 c.p.	32 c.p.	12.2	7/064"	542	22.5	D°
STEWARD'S ACOM. E & F DECKS	56 2 40 W. 16 c.p.	40 W. 16 c.p.	20.4	19/052"	510	40	D°
3 <sup>rd</sup> CL. PUBLIC ROOMS D DECK & HOSPITAL. POOR	45 2 40 W. 16 c.p.	40 W. 16 c.p.	17.4	19/052"	435	40	D°
2 <sup>nd</sup> CL. ACOM. C DECK, 2 <sup>nd</sup> CL. LOUNGE & SMOKE RM. STE	84 18 40 W. 60 W.	40 W. 60 W.	41.4	19/064"	690	60	D°
DO. PORT	3 75 19 16 c.p. 40 W. 60 W.	16 c.p. 40 W. 60 W.	52.9	19/064"	882	60	D°
SECT. "R", F DECK	4 1 40 W.	40 W.	1.5	7/036"	214	7	D°
SECT. J & Q. E. & F. DECKS.	9 1 40 W.	40 W.	3.3	7/036"	471	7	D°
D DECK. FOR & HOSPITALS.	23 6 16 c.p. 40 W. 60 W.	16 c.p. 40 W. 60 W.	12.1	7/052"	835	14.5	D°
D DECK & TUNNEL ESCAPE.	31 1 40 W.	40 W.	11.3	7/052"	779	14.5	D°
STEWARD'S STEERING COMP. 3 <sup>rd</sup> CL. PUBLIC RM.	22 1 40 W.	40 W.	8.0	7/064"	356	22.5	D°

[OVER.]



## ELECTRIC LIGHTING

## AUXILIARY SWITCHBOARD "D" Continued

Circuit	No. of Lights.	Candlepower or Watts	Current required. Amps.	Size of Conductor	Current Density	Conductivity of Conductor	Insulation Resistance per Mile.
DOCKING BRIDGE, HOSPITALS & POOP DEK.	24	32 c.p. } 40 W. }	9.7	7/064"	431	22.5	600 MEGOHMS.
2 <sup>nd</sup> CL. PUBLIC R <sup>ms</sup> & ST <sup>rs</sup>	13	40 W. }	8.0	7/064"	356	22.5	D <sup>o</sup>
DECK ACOM. "A", "B" & "C" DECKS.	6	60 W. }					
DECK D <sup>o</sup> PORT.	12	40 W. } 60 W. }	6.0	7/064"	267	22.5	D <sup>o</sup>

## AUXILIARY SWITCHBOARD "F" —

P.S.B. BOAT & FLOOD LIGHTS.	2	500 W. } 1000 W. }	45.5	19/052"	1138	40.0	600 MEGOHMS.
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## AUXILIARY SWITCHBOARD "E"

POWER BOARD ONLY — WINCHES, BOAT HOISTS &amp;c.

## ELECTRIC LIGHTING.

Installation Fitted by THE FAIRFIELD S. &amp; E. CO. LTD.

No. and Description of Dynamos 2 MAIN TURBO GENERATORS &amp; 1 EMERGENCY OIL DRIVEN DITTO.

MAKERS OF DYNAMOS MAIN ENG. &amp; DYCS — METROPOLITAN VICKERS ELECTRIC CO. LTD.

EMERGENCY DYCS — METROPOLITAN CO. — ENGINE J. I. THORNEYCROFT &amp; CO. LTD.

Capacity MAIN — 1700 Amperes, at 22.5 Volts, 1000 Revols. per Min. 375

" EMERGENCY — 160 Amperes, at 22.5 Volts, 740 Revols. per Min. 36

Current Alternating or Continuous

CONTINUOUS.

Single or Double Wire System

THREE WIRE SYSTEM

Position of Dynamos MAIN — BOTTOM PLATFORM OF ENGINE ROOM, AFT

EMERGENCY — IN EMERGENCY DYNAMO ROOM, BRIDGE DECK, AFT

Main Switch Board IN ENGINE ROOM ON LOWER DECK ABOVE GENERATORS.

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

18

Particulars of these Circuits:—

Circuit.	Number of Lights.	Candle Power. or Watts.	Current Required. Amps.	Size of Conductor.	Current Density.	Conductivity of Conductor.	Insulation Resistance per Mile.
TURNING MOTORS	—	—	—	—	—	—	—
BALLAST PUMP	—	—	—	—	—	—	—
SANITARY PUMP	—	—	—	—	—	—	—
STEERING MOTOR	—	—	—	—	—	—	—
FORCED DRAUGHT FANS	5 <sup>th</sup>	—	—	—	—	—	—
D <sup>o</sup> PI	—	—	—	—	—	—	—
AUX. SWITCHBOARD, FORW.	—	—	—	—	—	—	—
D <sup>o</sup> FORW. MID.	—	—	—	—	—	—	—
D <sup>o</sup> AFT MID.	—	—	—	—	—	—	—
D <sup>o</sup> AFT	—	—	—	—	—	—	—
POWER BOARD "E"	—	—	—	—	—	—	—
EMERGENCY C.O. SWITCHBOARD	—	—	—	—	—	—	—
BRINE & FRESH WATER PUMPS	—	—	—	—	—	—	—
CO <sub>2</sub> MOTOR No 1	—	—	—	—	—	—	—
D <sup>o</sup> 2	—	—	—	—	—	—	—
BOILER R <sup>m</sup> LIGHTS	57	18 c.p. } 40 W. } 100 W. }	29.5	19/064"	492	60	600 MEGOHMS
ENGINE R <sup>m</sup> LIGHTS	21	100 W. } 40 W. }	45.6	19/052"	1140	40	D <sup>o</sup>
WORKSHOP MOTOR & LUMBERLAND ELECTROLYTIC SYSTEM	73	—	—	—	—	—	—

Total No. of Lights 3003  
[8 PILOT LIGHTS]

No. of Motors driving Fans, &amp;c. 103

No. of Heaters 20

Current required for Motors and Heaters 5884 Amps. (93.6 Amps INCLUDED IN LIGHTING CIRCUIT)



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

BOARD A ON SHELTER DECK, FORWARD IN SWITCHBOARD RM. 24 SWITCHES  
 " B " " " B 138 S. " " 18  
 " C " " " " 85 S " " 25  
 " D " " " " AFT " " 26  
 " E " " UP. PROM. " NEAR GYMNASIUM " " 11  
 " F " " " " " " 8

### Fuses

Are Cut-outs fitted as follows?—

On Main Switch Board, to Cables of Main Circuits YES

On Aux. " " each Auxiliary Circuit YES

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 Cut-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. 127/103 S.W.G.

How are Conductors in Engine and Boiler Spaces protected? LEAD COVERED, ARMoured & BRAIDED

" Saloons, State Rooms, &c., " ? VUL. INS. RUBBER IN GALV. S.D. CIRCUIT

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp L.C.A. & B. OR V.I.R. RUN IN CONDUIT TUBING.

(2) " " passing through Bunkers or Cargo Spaces V.I.R. " " " "

(3) " " " Deck Beams or Bulkheads W.T. DECK TUBES & BULKHEAD GLANDS OR TUBING WITH LOCK NUTS.

Are all Joints in Cables properly soldered and thoroughly Insulated so that the efficiency of the Cables is unimpaired? NO JOINTS

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? 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? No.

What does the Resistance amount to? ✓ Ohms.

Is the Installation supplied with a Voltmeter? YES.

" " " an Ampere Meter? YES

Date of Trial of complete Installation 8<sup>TH</sup> SEPT. 1922 Duration of Trial 24 HOURS.

Have all the requirements of Section 42 been satisfactorily carried out? ALL EXCEPT INSULATION TEST.

FURTHER PARTICULARS ON Pps 34 A. B. C. D.



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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.

"TUSCANIA"

as ascertained by me from personal examination

*Geo. Macfarlane*

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

Fees—

## MAIN BOILERS.

£ s. d.

H.S. 32499 Sq. ft. : :

G.S. 74646 " : :

## DONKEY BOILERS.

H.S. ✓ Sq. ft. : :

G.S. ✓ " : :

£ : :

## ENGINES.

L.P.C. 13,500 SHP. Cub. ft. : :

£ : :

Testing, &c. ... : :

£ : :

Expenses ... : :

Total ... £ : :

It is submitted that this Report be approved,

*W. H. King*

Chief Surveyor.

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

22<sup>nd</sup> Nov, 1922

Fees advised

Fees paid



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Secretary.



## GENERAL CONSTRUCTION.

LIST OF DONKEY PUMPS [Cont<sup>d</sup> FROM P. 29]

OIL FUEL PUMPS.	2 SIMPLEX. G. & J. WEIR, L <sup>o</sup> [FOR D.E. BOILERS]	
	2 " " " " S.E. " ]	4" x 8"
	SUCTION:-	SETTLING TANKS.
	DISCHARGE:-	OIL FUEL BURNERS
FRESH WATER PUMP.	1 DUPLEX. THOM. LAMONT & C <sup>o</sup>	7" x 7" x 8"
	SUCTION:-	
WASHING WATER PUMP.	1 DUPLEX. THOM. LAMONT & C <sup>o</sup>	7" x 7" x 8"
	SUCTION:-	CONDENSED WATER RESERVE TANKS.
	DISCHARGE:-	SERVICE TANKS ON DECK.
SANITARY WASH DECK P/P.	2 OPERATED BY MAIN GEAR WHEEL SHAFTS	7½" x 15"
	SUCTION:-	SEA.
	DISCHARGES:-	WASH DECK MAIN. OVERBOARD.
HYDRAULIC PUMP.	1 DOUBLE DUPLEX. G. & J. WEIR, L <sup>o</sup>	
	SUCTION:-	
SANITARY & W.S. PUMP.	1 ELECTRIC ROTARY	
	SUCTION:-	SEA.
	DISCHARGES:-	SANITARY & WATER SERVICE MAINS.
REFRIGERATING CIRC <sup>o</sup> P/P.		
	SUCTION	
BRINE PUMPS.	3 TURBINE. W.H. ALLEN, SONS & C <sup>o</sup> L <sup>o</sup>	2" SUCT <sup>o</sup> 1750/2050 R.P.M.
	SUCTION	
STEAM HEATING CONDENSING PUMP	1. J.H. CARRUTHERS & C <sup>o</sup> L <sup>o</sup>	6" x 18"
	SUCTION	



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List of Donkey Pumps (Cont. from Page 26)

Fuel Pumps 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Suction - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Discharge - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Suction - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Discharge - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Suction - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Discharge - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

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Discharge - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Suction - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

Discharge - 2 1/2 inch 6 1/2 inch 1 1/2 inch 1 1/2 inch 1 1/2 inch

## MAIN STEAM PIPES [CONT. FROM PAGE 27]

No of Lengths	1
Material	STEEL
Brazed, welded or Seamless	SEAMLESS
Internal Diam.	9 1/2"
Thickness	3/8"
Flanges	RIVETED
Date of Hydraulic Test	29-7-20
Test Pressure	660 LBS.

No of Lengths	3
Material	STEEL
Brazed, welded or Seamless	SEAMLESS
Internal Diam.	9 1/2"
Thickness	3/8"
Flanges	RIVETED
Date of Hydraulic Test	11-8-22
Test Pressure	660 LBS.

No of Lengths	1
Material	STEEL
Brazed, welded or Seamless	SEAMLESS
Internal Diam.	9 1/2"
Thickness	3/8"
Flanges	RIVETED
Date of Hydraulic Test	15-8-22
Test Pressure	660 LBS.

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## MAIN STEAM PIPES (Cont. from Page 37)

No. of Lengths	Material	Welded or Seamless	Internal Dia.	Thickness	Flanges	Date of Hydraulic Test	Test Pressure
1	Steel	Seamless	30"	$\frac{3}{8}$ "	Flanged	20-7-20	600 Lbs.

No. of Lengths	Material	Welded or Seamless	Internal Dia.	Thickness	Flanges	Date of Hydraulic Test	Test Pressure
3	Steel	Seamless	30"	$\frac{3}{8}$ "	Flanged	11-8-20	600 Lbs.

No. of Lengths	Material	Welded or Seamless	Internal Dia.	Thickness	Flanges	Date of Hydraulic Test	Test Pressure
1	Steel	Seamless	30"	$\frac{3}{8}$ "	Flanged	20-7-20	600 Lbs.



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