

No. 1531

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. 1524 No. in Register Book 2728

S.S. PEAR BRANCH, NOW ARGOLIKOS

Makers of Engines PALMERS S. & I. CO. LD JARROW.

Works No. 915

Makers of Main Boilers PALMERS S. & I. CO. LD JARROW

Works No. 915

Makers of Donkey Boiler

Works No.

MACHINERY.



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013356-013364-0098

No.

THE BRITISH CORPORATION FOR THE SURVEY

AND

REGISTRY OF SHIPPING.

Report No. 15211 No. in Register Book 2728

Received at Head Office 18th November 1921

Surveyor's Report on the New Engines, Boilers, and Auxiliary
Machinery of the ^{Single Triple}
~~Twin~~ ^{Quadruple} Screw TURBINE STEAMER.

PEAR BRANCH.

Official No. 144835 Port of Registry SUNDERLAND

Registered Owners NAUTILUS STEAM SHIPPING CO LD

Engines Built by PALMERS, S & J. CO LD

at JARROW ON TYNE.

Main Boilers Built by PALMERS S & J. CO LD

at JARROW ON TYNE

Donkey " "

at

Date of Completion 26th September 1921

First Visit Last Visit 26th September 1921 Total Visits

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

Cooling Surface

sq. ft.

Diameter of Piston Rods (plain part)

Screw part (bottom of thread)

Material

Diar. of Connecting Rods (smallest part)

Material

" Crosshead Gudgeons

Length of Bearing

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

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?

Connecting Rods, Forged by

Piston " "

Crossheads, "

Connecting Rods, Finished by

Piston " "

Crossheads, "

Date of Harbour Trial

" Trial Trip

Trials run at

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

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

Revs. 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:—

Builders' estimated I.H.P.

Revs. per min.

Estimated Speed



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TURBINE ENGINES.

Works No. **915** Type of Turbines **HP Turbine Impulse + L.P. Reaction**

No. of H.P. Turbines No. of L.P. No. of L.P. No. of Astern

1 **—** **1** **2**Are the Propeller Shafts driven direct by the Turbines or through Gearing? **Through Gearing**Is Single or Double Reduction Gear employed? **Double**Revs. per min. of H.P. Turbines at Full Power **3479**" " L.P. " " **3479**" " 1st Reduction Shaft **440.6**" " 2nd " **77.64**" " Propeller Shaft **2.700**Total Shaft Horse Power **2.700**Date of Harbour Trial **14/7/21**" Trial Trip **26th September 1921**Trials run at **Between the River Tyne & Yeas.**Speed on Trial **12 Knots**Turbine Spindles forged by **The Fife Forge Co Ltd**

" Wheels forged or cast by

1st	Pinions	Charles Grange & Co	} Wheels cast iron by Messrs Palmers, S. & Co Ltd
2nd	Reduction Gear Shafts forged by	Cammell Laird	
1st	Wheels forged by	John Brown & Co	
2nd	Wheels forged by	Cammell Laird	

DESCRIPTION OF INSTALLATION.

Parsons Impulse + Reaction Turbines consisting of
 One H.P. Ahead with H.P. Astern in same casing
 One L.P. Ahead with L.P. Astern in same casing
 driving through double reduction gearing the 1st
 reduction gearing being contained in separate gear
 cases coupled to 2nd reduction case.

TURBINE ENGINE

The main Thrust Block is of the Mitchell
Type with two Collars.

TURBO-ELECTRIC PROPELLING MACHINERY



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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

Revs. per min. of Generators at Full Power

" " Motors "

" " Propellers "

Total Shaft Horse Power "

Date of Harbour Trial

" Trial Trip

Trials run at

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



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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

*Mitchell*No. " Rings **2.** (*one working, one in reserve*)

Diar. of Thrust Shafts at bottom of Collars

*14 1/4"*No. of Collars **2**

" " Forward Coupling

*14 1/4"*At Aft Coupling *14 1/4"*

Diar. of Intermediate Shafting by Rule

13.12
~~13.103~~Actual *13 7/8*No. of Lengths **6**No. of Bolts, each Coupling **6**Diar. at Mid Length *3 5/8"*Diar. of Pitch Circle *20 3/4"*Diar. of Propeller Shafts by Rule *14.42*Actual *15 1/4"*At Couplings *15 1/4"*

Are Propeller Shafts fitted with Continuous Brass Liners?

yes

Diar. over Liners

*16 5/8"*Length of After Bearings *5'-1"*

Of what Material are the After Bearings composed?

Logum vital.

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?

SKETCH OF CRANK SHAFT.



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No. of Blades each Propeller *4* Fitted or Solid *Fitted*
 Material of Blades *Manganese Bronze* Boss *Cast iron*
 Diam. of Propellers *17'-6"* Pitch *17'-6"* Surface (each) *86 sq* S. ft.
 Coefficient of Displacement of Vessel at $\frac{1}{2}$ Moulded Depth *.75*

Crank Shafts Forged by		Material
" Pins	"	"
" Webs	"	"
Thrust Shafts	<i>J. Spencer & Sons</i>	<i>Ingot Steel</i>
Intermed.,	<i>Armstrong Whitworth 5 lengths</i>	"
Propeller	<i>J. Spencer & Sons</i>	"
Crank	<i>Darlington Forge</i>	<i>Nickel Steel</i>
Thrust	<i>Palmer's Shipbuilding & Iron Co Ltd</i>	
Intermed.,	"	"
Propeller	"	"

STAMP MARKS ON SHAFTS.

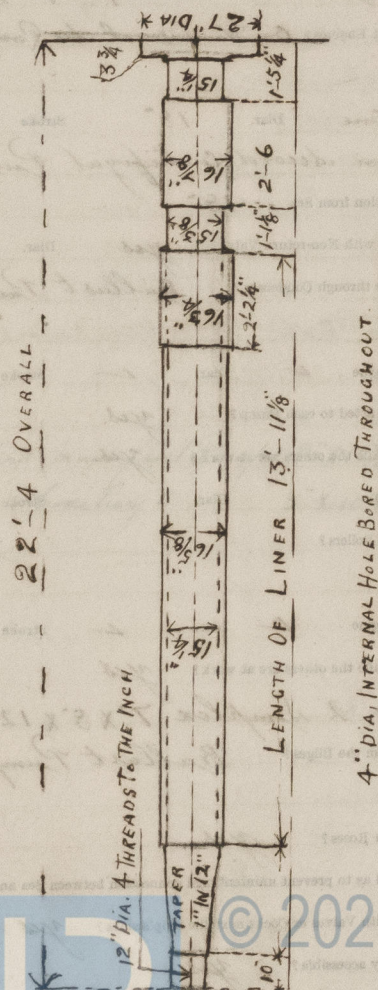
Propeller & Intermediate Shafts.

B.C.
 No 5739
 J.L.
 11/2/21

Thrust Shaft

B.C.
 No 10387
 C.H.B.
 26/3/20

SKETCH OF PROPELLER SHAFT.



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PUMPS, ETC.

No. of Air Pumps 12" Cyl. 22" Pump Stroke 15"

Worked by Main or Independent Engines? One Wind Dual Air Pump.

No. of Circulating Pumps One Diar. 18" Stroke —

Type of " Bon Accord Centrifugal Pump.

Diar. of " Suction from Sea 18"

Has each Pump a Bilge Suction with Non-return Valve? yes Diar. 12"

What other Pumps can circulate through Condenser? Ballast Pump

No. of Feed Pumps on Main Engine ✓ Diar. ✓ Stroke ✓

Are Spring-loaded Relief Valves fitted to each Pump? yes.

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

No. of Independent Feed Pumps Diar. Stroke

What other Pumps can feed the Boilers?

No. of Bilge Pumps on Main Engine ✓ Diar. ✓ Stroke ✓

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

No. of Independent Bilge Pumps 2 Simplex 7" X 5" X 12"

What other Pumps can draw from the Bilges? Ballast Pump

Are all Bilge Suctions fitted with Roses? yes

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

Are all Sea Connections made with Valves or Cocks next the ship's sides? yes valves & cocks.

Are they placed so as to be easily accessible? yes

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

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

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

on the Outside? yes

1 Pair of Wears main feed Pumps 8" X 10½" X 24"
1 Single - Auxiliary - 5" X 10½" X 24"



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BOILERS.

Works No. *915*

No. of Boilers *Three* Type *Cylindrical*

Single or Double-ended *Single Ended*

No. of Furnaces in each *Three*

Type of Furnaces *Leighton*

Date when Plan approved *September 1919*

Approved Working Pressure *200 lbs per sq"*

Hydraulic Test Pressure *350 lbs per sq"*

Date of Hydraulic Test *Starboard Boiler 9/11/20 Centre Boilers 17/1/21 Port B. 8/2/21*

„ when Safety Valves set *14/7/21*

Pressure at which Valves were set *205 lbs sq"*

Date of Accumulation Test *14/7/21*

Maximum Pressure under Accumulation Test *211 lbs sq"*

System of Draught *Howdons Forced*

Can Boilers be worked separately? *yes*

Makers of Plates *J. Spencer Newbarn*

„ Stay Bars „

„ Rivets *Rivet Bolt + Nut Co*

„ Furnaces *Brown & Co Ltd*

Greatest Internal Diam. of Boilers *15' 6"*

„ „ Length „ *11' 11 3/32*

Square Feet of Heating Surface each Boiler *2673 sq ft*

„ „ Grate „ „ *64 sq ft*

No. of Safety Valves each Boiler *2* Diam. *3 1/4"*

Are the Safety Valves fitted with Easing Gear? *yes*

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

„ Test Cocks „ *Nil* „ Sallinometer Cocks *One.*

STARBOARD BOILER

B.C. TEST
No 2671
W.T. 350 lbs sq"
W.P. 200 lbs sq"
J.L.
9/11/20

CENTRE BOILER

B.C. TEST
No 2672
W.T. 350 lbs sq"
W.P. 200 lbs sq"
J.L.
17/1/21

PORT BOILER

B.C. TEST
No 2673
W.T. 350 lbs sq"
W.P. 200 lbs sq"
J.M.S.
8/2/21.



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

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

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

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

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

Plates in each Strake *Two*

Thickness of Shell Plates Approved *1 15/32"*

" " in Boilers *1 15/32"*

Are the Rivets Iron or Steel? *Steel*

Are the Longitudinal Seams Butt or Lap Joints? *Double butt straps*

Are the Butt Straps Single or Double? *Double*

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

Thickness of outside Butt Straps *1 1/4"*

" inside " *1 7/8"*

Are Longitudinal Seams Hand or Machine Riveted? *Machine*

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

No. of Rivets in a Pitch *5*

Diam. of Rivet Holes *1 1/2"* Pitch *10 1/4"*

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

Are these Seams Hand or Machine Riveted? *✓*

Diam. of Rivet Holes *✓* Pitch *✓*

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

Are these Seams Hand or Machine riveted? *Hand*

Diam. of Rivet Holes *1 5/8"* Pitch *5"*

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

Are these Seams Hand or Machine Riveted? *Machine*

Diam. of Rivet Holes *1 5/8"* Pitch *5"*

Size of Manholes in Shell *16" X 12"*

Dimensions of Compensating Rings *3'-11 1/2" X 3'-1 1/2" X 1 15/32"*



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Thickness of End Plates in Steam Space Approved

 $1\frac{11}{32}$

" " " " " in Boilers

 $1\frac{11}{32}$

Pitch of Steam Space Stays

 $1'-5" \times 1'-11\frac{3}{8}"$ Diar. " " " " Approved $3\frac{1}{2}$ Threads per Inch 6" " " " " in Boilers $3\frac{1}{2}$ " 6

Material of " " "

*Steel*How are Stays Secured? *Screwed through end plates & caulked*Diar. and Thickness of Loose Washers on End Plates $10\frac{3}{4} \times \frac{15}{16}$

" " Riveted " " "

Width " " Doubling Strips " "

Thickness of Middle Back End Plates Approved

 $\frac{29}{32}$

" " " " " in Boilers

 $\frac{29}{32}$

Thickness of Doublings in Wide Spaces between Fireboxes

none

Pitch of Stays at

" " " "

 $1'-2" \times 8\frac{3}{4}$ Diar. of Stays Approved $1\frac{7}{8}$ Threads per Inch 9" " in Boilers $1\frac{7}{8}$ " 9

Material "

Steel

Are Stays fitted with Nuts outside?

yes

Thickness of Back End Plates at Bottom Approved

 $\frac{29}{32}$

" " " " " in Boilers

 $\frac{29}{32}$

Pitch of Stays at Wide Spaces between Fireboxes

 $1'-2" \times 8\frac{3}{4}$

Thickness of Doublings in

none

Thickness of Front End Plates at Bottom Approved

 $1\frac{1}{16}$

" " " " " in Boilers

 $1\frac{1}{16}$ No. of Longitudinal Stays in Spaces between Furnaces *3 in way of each manhole = 6**6 4 portable stays between tube plates*

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Diar. of Stays Approved $1\frac{7}{8}$ " Threads per Inch 9

" " in Boilers $1\frac{7}{8}$ " 9

Material " *steel*

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 $1'-2"$

Thickness of Doublings in " " " *none*

" Stay Tubes at " " " *L*

Are Stay Tubes fitted with Nuts at Front End? *nuts + washers both ends*

Thickness of Back Tube Plates Approved $\frac{25}{32}$ "

" " " in Boilers $\frac{25}{32}$ "

Pitch of Stay Tubes in Back Tube Plates $11\frac{1}{4}" \times 7\frac{1}{2}"$

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

Thickness of Stay Tubes $\frac{7}{16} + \frac{3}{8} + \frac{5}{16}$ "

" Plain " 8 W.G.

External Diar. of Tubes $2\frac{1}{2}"$

Material " *iron*

Thickness of Furnace Plates Approved $\frac{11}{16}$ "

" " " in Boilers $\frac{11}{16}$ "

Smallest outside Diar. of Furnaces $3'-10\frac{2}{16}"$

Length between Tube Plates $7'-11"$

Width of Combustion Chambers (Front to Back) $3'-0\frac{3}{32}"$ *over plates*

Thickness of " " Tops Approved $\frac{23}{32}"$

" " " in Boilers $\frac{23}{32}"$

Pitch of Screwed Stays in O.O. Tops $9\frac{1}{2}" \times 8\frac{1}{2}"$



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Diar. of Screwed Stays Approved $1\frac{3}{4}$ Threads per Inch 9

" " " in Boilers $1\frac{3}{4}$ 9

Material " " *Steel*

Thickness of Combustion Chamber Sides Approved $\frac{23}{32}$

" " " in Boilers $\frac{23}{32}$

Pitch of Screwed Stays in C.O. Sides $7\frac{1}{2}$ X $10\frac{1}{4}$ "

Diar. " " Approved $1\frac{3}{4}$ Threads per Inch 9

" " " in Boilers $1\frac{3}{4}$ 9

Material " " *Steel*

Thickness of Combustion Chamber Backs Approved $\frac{11}{16}$

" " " in Boilers $\frac{11}{16}$

Pitch of Screwed Stays in C.O. Backs $8\frac{5}{8}$ X $8\frac{3}{4}$ "

Diar. " " Approved $2\frac{1}{8}$ $17\frac{1}{8}$ + $1\frac{3}{4}$ Threads per Inch 9

" " " in Boilers $2\frac{1}{8}$ $17\frac{1}{8}$ + $1\frac{3}{4}$ 9

Material " " *Steel*

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

Thickness of Combustion Chamber Bottoms $1\frac{1}{8}$ "

No. of Girders over each Wing Chamber *Five*

" " " Centre " *Four*

Depth and Thickness of Girders 10 " X $\frac{7}{8}$ "

Material of Girders *Steel*

No. of Stays in each *Three*

No. of Tubes, each Boiler *294 Plain 127 Stay Total 421*

Size of Lower Manholes 16 " X 12 "

VERTICAL DONKEY BOILERS



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VERTICAL DONKEY BOILERS.

No. of Boilers Type *how fitted*
 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 *Foster Waste Heat*
 Where situated? *Between Smoke Boxes & Forced draught heater tubes*
 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. *3"*
 Are " " fitted with Easing Gear? *yes*
 Date of Hydraulic Test *7/3/21* Test Pressure *600 lbs. sq. in.*
 Date when Safety Valves set *14/7/21* Pressure on Valves *210 lbs. sq. in.*

MAIN STEAM PIPES

No. of Pipes
 Material
 Internal Diameter
 Thickness
 Date of Hydraulic Test
 Test Pressure

AUXILIARY STEAM PIPES

No. of Pipes
 Material
 Internal Diameter
 Thickness
 Date of Hydraulic Test
 Test Pressure

MAIN FEED PIPES

No. of Pipes
 Material
 Internal Diameter
 Thickness
 Date of Hydraulic Test
 Test Pressure



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Safety Valves changed & set 16/9/21

MAIN STEAM PIPES.

No. of Lengths	18	5	4	3
Material	Steel	Steel	Steel	Steel
Brazed, Welded or Seamless	Solid drawn	Solid drawn	Solid drawn	Solid drawn
Internal Diam.	4½"	6"	3½"	2"
Thickness	5/16"	5/16"	1/4"	3/16"
How are Flanges secured?	Screwed	Screwed	Screwed	Screwed
Date of Hydraulic Test	Various dates between April & July 1921			
Test Pressure	600 lbs.	600 lbs.	600 lbs.	600 lbs.

AUXILIARY STEAM PIPES.

No. of Lengths	6
Material	Copper
Brazed, Welded or Seamless	Seamless
Internal Diam.	5 3/4"
Thickness	3. B.W.G.
How are Flanges secured?	Brazed
Date of Hydraulic Test	Various dates between April & July 1921
Test Pressure	420 lbs.

MAIN FEED PIPES

No. of Lengths	7	8
Material	Copper	Copper
Brazed, Welded or Seamless	Seamless	Seamless
Internal Diam.	3½"	2 1/4"
Thickness	6. B.W.G.	8. B.W.G.
How are Flanges secured?	Brazed	Brazed
Date of Hydraulic Test	Various dates between April & July 1921	
Test Pressure	500 lbs.	500 lbs.



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EVAPORATORS.

No. **2** Type **Compactum.** Tons per Day **25**
 Makers **Kirkaldys.**
 Working Pressure **15 lbs** Test Pressure **30 lbs.** Date of Test **22/11/20**
 Date of Test of Safety Valves under Steam **14/7/21.**

FEED WATER HEATERS.

No. **1** Type **Multipflow Surface.**
 Makers **Weirs**
 Working Pressure **200** Test Pressure **480 lbs** Date of Test **16/2/1920**

FEED WATER FILTERS.

No. **1** Type **Gravitation.** Size
 Makers **Palmer's Shipbuilding & Iron Co Ltd**
 Working Pressure Test Pressure Date of Test

LIST OF DONKEY PUMPS.

1 Pair of Main Feed Pumps (Weirs)
 1 Single Auxiliary " (Weirs)
 1 Air Pump. (Weirs)
 1 Centrifugal Pump. (Drysdale)
 1 Ballast Pump, Duplex (Dawson & Downie)
 2 Bilge & Sanitary Pumps, Simplex (Warner & Co)
 3 Forced Lubrication Pumps. (Weirs)
 2 Water Service Pumps, Duplex. (Lamonts)
 1 Fresh Water Pump, Duplex. Watsons



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SPARE GEAR.

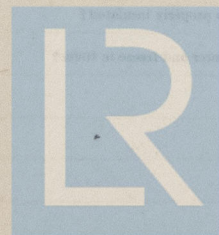
No. of Top End Bolts.	No. of Bot. End Bolts.	No. of Cylinder Cover Studs
" Coupling Bolts 6	" Main Bearing Bolts	" Valve Chest "
" Junk Ring Bolts	" Feed Pump Valves	" Bilge Pump Valves 1 SET
" H.P. Piston Rings	" I.P. Piston Rings	" L.P. Piston Rings
" " Springs	" " Springs	" " Springs
" Safety Valve 2	" Fire Bars $\frac{1}{3}$ SET EACH BOILER	" Feed Check Valves 1 SET
" Piston Rods	" Connecting Rods	" Valve Spindles
" Air Pump Rods 1	" Air Pump Buckets 1	" Air Pump Valves 1 SET
" Crk. "	" Crk. "	" Crk. "
" Crank Shafts	" Crank Pin Bushes	" Crosshead Bushes
" Propeller Shafts 1	" Propellers	" Propeller Blades 2 C.I. / BRONZE
" Boiler Tubes 12	" Condenser Tubes 50	" Condenser Ferrules 100

OTHER ARTICLES OF SPARE GEAR:—

Bushes for main Wheel 2
 " " Pinions 2
 " " 1st Reduction Wheel 2
 " " Pinions 1
 " " Turbine Rotors 1
 Flexible Coupling Bolts 8
 Coupling Bolts for Gearing 6
 Liners for main Thrust Block 6 halves.
 Pads " " " 6 halves.
 Liners for H.P. Turbine adjusting block 8 halves.
 " " L.P. " " 8 halves.
 Pads for Turbine adjusting Block 4 halves
 Studs & nuts for bearings 2% each kind & size
 Bolts Studs & nuts for gear case joint 5%
 Gland strips 50%

Relief Valve Springs 1 for each size fitted.
 Forced Lubrication Filter Grids 4

Main Feed Pumps, one steam valve chest & valves complete
 one set water valves & springs
 Auxiliary Feed Pump one steam valve chest & valves complete
 one set of water valves & springs
 Circulating Pump one gun metal Impeller & shaft.
 Forced Lubrication Pumps, one set of suction &
 Discharge valves & seats & one bucket & one rod
 Blading tools, Spanners Bridge Gauges, etc.



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Capacity of each

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.

[illegible]

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

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ELECTRIC LIGHTING.

Installation Fitted by *Messrs Palmers, S & F. Co. Ltd.*No. and Description of Dynamos *One Multipolar Compound Wound*
Makers of Dynamos *Messrs Sunderland Forge Engineering Co. Ltd.*Capacity *100* Amperes, at *100* Volts, *360* Revols. per Min.Current Alternating or Continuous *Continuous.*Single or Double Wire System *Double Wire*Position of Dynamos *Engine Room Starboard.*Main Switch Board *ditto ditto*No. of Circuits to which Switches are provided on Main Switch Board *5*

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.
Engine + Boiler	9	16	5.04	7.036	2100	MHOS/RR 286.04	600
	27	20 watt	5.4				
	1	600 C.P.	8.0				
Rooms +	6	6	1.26	3.036	3333.3	122.24	600
Oil Purifier Motor	1	1HP	14.70				
			10				
Lighting Circuit for Engineers	12	16	6.72	7.052	1663.4	597	600
	81	20 watt	16.2				
Officers Accom.	1	32	1.2				
			24.12				
Cargo Clusters	64	16	35.84	7.064	1928.8	904.1	600
	2	20 watt	.4				
	1	32	1.2				
	2	600	6.0				
			43.44				
Navigation	4	20 watt	.8	7.064	355.5	904.1	600
	5	32	6.				
	7	5	1.2				
			8.0				
W/T Circuit			15	7.052	1034.5	597	600

Total No. of Lights *215* No. of Motors driving Fans, &c. *1* No. of Heaters *none*
+ 1 more light of 7.5 C.P. Lamp
 Current required for Motors and Heaters *7.46 amps.*

Positions of Auxiliary ^{Fuse} Switch Boards, with No. of ^{WAYS} Switches on each

1. 3 way Section Box in Engineers Passage Starboard
1. 3 way Section Box in Forward Accommodation Bridge Deck.
1. 4 way Section Box in Engineers Passage Starboard
1. 6 way Distribution Box in Crews Accommodation Aft.
1. 7 way Distribution Box in Engine Room.
1. 7 way Distribution Box in Engineers Passage Starboard
1. 9 way Distribution Box in Forward Accommodation on Bridge Deck.
1. 7 way Distribution Box in Chart House

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 Size? *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. *1/044* S.W.G., Largest, No. *19/4* S.W.G.

How are Conductors in Engine and Boiler Spaces protected? *Lead & armour covering + protected by sheet iron casing where necessary.*

" Saloons, State Rooms, &c., " *Lead & armour covering except in Chart House & W/T room which are lead covered*

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp

Lead & Armour covering

(2) " " passing through Bunkers or Cargo Spaces

Lead & Armour covering

(3) " " Deck Beams or Bulkheads

Lead Bushed Slits

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

is unimpaired? *all joints made in Boxes*

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? *—*

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?

Ohms.

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

" " " an Ampere Meter? *yes.*

Date of Trial of complete Installation

21/9/21

Duration of Trial

6 hours



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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.

as ascertained by *me* from personal examination

Pear Branch

James Matthew Scott

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

Fees—

MAIN BOILERS.

	£	s.	d.
H.S.	Sq. ft.	:	:
G.S.	"	:	:

DONKEY BOILERS.

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

£	:	:
---	---	---

ENGINES.

L.P.C.	Cub. ft.	:	:
£	:	:	

Testing, &c. ...	:	:
£	:	:

Expenses ...	:	:
Total ... £	:	:

It is submitted that this Report be approved,

John King
Chief Surveyor.

Approved by the Committee for the Class of M.B.S.* on the *3rd November 1921*

Fees advised

Fees paid



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Secretary.

GENERAL INSTRUCTIONS

—100—



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