

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 ARGOLIKOS⁵

Makers of Engines PALMERS, S. & I. C^o L^o JARROW.

Works No. 915

Makers of Main Boilers PALMERS, S. & I. C^o L^o JARROW

Works No. 915

Makers of Donkey Boiler

Works No.

MACHINERY.



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013356-013364-0098

No.

REPROCATING ENGINES
THE BRITISH CORPORATION FOR THE SURVEY

AND

REGISTRY OF SHIPPING.

Report No. *1521* 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 " " ✓

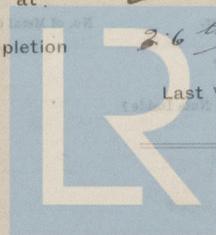
at ✓

Date of Completion

26th September 1921

First Visit

Last Visit *26th September 1921* Total Visits



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RECIPROCATING ENGINES.

Works No. No. of Sets Description

No. of Cylinders each Engine
Diars. of Cylinders
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

Diameter of Piston Rods (plain part)
Material
Diar. of Connecting Rods (smallest part)
" Crosshead Gudgeons
No. of Crosshead Bolts (each)
" Crank Pin " "
" Main Bearings
" Bolts in each
" Holding Down Bolts, each Engine

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?

No. of Cranks

Stroke

Cooling Surface sq. ft.

Screwed part (bottom of thread)

Material

Material

Length of Bearing

Material

Lengths

Diar. over Thrd.

Threads per Inch

Material

Diar.

No. of Metal Chocks

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 I.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

" " I.P. " "

" " L.P. " "

3479

" " 1st Reduction Shaft

440.6

" " 2nd "

" " Propeller Shaft

77.64

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* *Clarke Crank & Forge Co**2nd* *Reduction Gear Shafts* *forged by* *Cammell Laird**1st* *Wheels* *forged* *by* *SHRCCOS* *John Brown & Co* } *Wheels cast iron by**2nd* *Wheels* *forged* *by* *Cammell Laird* } *Messrs Palmers, S.A. Co Ltd*

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.

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

Revol. 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?

Lognum 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>Ingot Steel</i>
Intermed. " "	" " "
Propeller " "	" <i>Nickel Steel</i>
Crank " Finished by	" "
Thrust " "	" <i>Palmers Shipbuilding & Iron Co Ltd</i>
Intermed. " "	" " "
Propeller " "	" " "

STAMP MARKS ON SHAFTS.

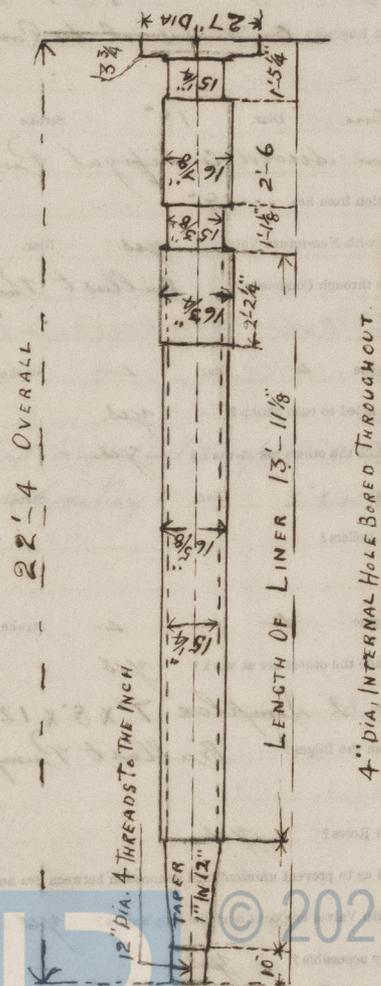
Propeller & Intermediate Shafts.

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

Thrust Shaft

B.C.
 No 10287
 G.H.B.
 20/3/20

SKETCH OF PROPELLER SHAFT.



PUMPS, ETC.

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

Worked by *Main* or Independent Engines? *One Wheel 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 *a* 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 Wheel Main feed Pumps 8" X 10 1/2" X 24"
1 Single - Auxiliary - 5" X 10 1/2" 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 *Howdous 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' - 11³/₂*

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

„ „ Grate „ „ *64 sq ft*

No. of Safety Valves each Boiler *2* Diam. *3¹/₄"*

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 3/8"*

Are Longitudinal Seams Hand or Machine Riveted? *Machine*

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

No. of Rivets in a Pitch *5*

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

No. of Rows of Rivets in Centre Circumferential Seams

Are these Seams Hand or Machine Riveted?

Diar. of Rivet Holes Pitch

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

Are these Seams Hand or Machine riveted? *Hand*

Diar. 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*

Diar. 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 $3\frac{1}{2}$ " 6Material of " " " *Steel*How are Stays Secured? *Screwed through end plate & 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 $1\frac{7}{8}$ " 9Material " *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 $3'-10\frac{7}{16}"$
 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 C.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 $2\frac{1}{8}$ " $1\frac{7}{8}$ " + $1\frac{3}{4}$ " Threads per Inch 9
 " " " in Boilers $2\frac{1}{8}$ " $1\frac{7}{8}$ " + $1\frac{3}{4}$ " 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 *none 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 Manholes 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	Length	Internal Diar.	External Diar.	Thickness	Date of Hydraulic Test	Test Pressure
18	Steel	100	12	14	1/2	1911	150
4	Steel	100	12	14	1/2	1911	150
2	Steel	100	12	14	1/2	1911	150
18	Steel	100	12	14	1/2	1911	150

Additional Steam Pipes

No. of Pipes	Material	Length	Internal Diar.	External Diar.	Thickness	Date of Hydraulic Test	Test Pressure
2	Steel	100	12	14	1/2	1911	150
2	Steel	100	12	14	1/2	1911	150

MAIN FEED PIPES

No. of Pipes	Material	Length	Internal Diar.	External Diar.	Thickness	Date of Hydraulic Test	Test Pressure
8	Steel	100	12	14	1/2	1911	150
17	Steel	100	12	14	1/2	1911	150

Safety Valves changed & set 16/9/21



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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 Diar.	4½"	6"	3½"	2"
Thickness	5/16"	5/16"	¼"	3/16"
How are Flanges secured?	Screwed	Screwed	Screwed	Screwed
Date of Hydraulic Test	Various dates between April & July 1921			
Test Pressure	600 lbs ^{sq}	600 lbs ^{sq}	600 lbs ^{sq}	600 lbs ^{sq}

AUXILIARY STEAM PIPES.

No. of Lengths	6
Material	Copper
Brazed, Welded or Seamless	Seamless
Internal Diar.	5¾"
Thickness	3. B.W.G.
How are Flanges secured?	Brazed
Date of Hydraulic Test	Various dates between April & July 1921
Test Pressure	420 lbs ^{sq}

MAIN FEED PIPES

No. of Lengths	7	8
Material	Copper	Copper
Brazed, Welded or Seamless	Seamless	Seamless
Internal Diar.	3½"	2¼"
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 ^{sq}	500 lbs ^{sq}



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EVAPORATORS.

No. **2** Type *Compactum.* Tons per Day **25**
 Makers *Kirkaldys.*
 Working Pressure **15 lbs** Test Pressure *Coils 400 lbs Shell 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 *Multiflow 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. (*Lamont's*)
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	" L.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
" Cir. "	" Cir. "	" Cir. "
" Crank Shafts	" Crank Pin Bushes	" Crosshead Bushes
" Propeller Shafts 1	" Propellers	" Propeller Blades 2. C. 141 BROWN
" 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 Gages, etc.



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Installation Fitted by *Messrs Palmers, S & F. Co Ltd.*

No. and Description of Dynamoes *One Multipolar Compound Wound*

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

Total No. of Lights *215* No. of Motors driving Fans, &c. *1* No. of Heaters *None*

+ 1 Morse light of 7.5 C.P. Lamps
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 when 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 Slots*

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. *Pear Branch*

as ascertained by ^{me} from personal examination

James Matthew Scott

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

Fees—

	£	s.	d.
MAIN BOILERS.			
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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