

No. 1784

Rapier & Miller Ltd.
237

THE BRITISH CORPORATION FOR THE SURVEY
AND
REGISTRY OF SHIPPING.

Report No. *1653* No. in Register Book *2912*

S.S. *"Cardena"*

Makers of Engines *D. Rowan & Co. Ltd*

Works No. *441*

Makers of Main Boilers *Babcock & Wilcox, Ltd*

Works No. *6/1149*

Makers of Donkey Boiler

Works No.

MACHINERY.



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Report No. 1653 No. in Register Book 2912

Received at Head Office June 1923

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

"Cardena"

Official No. Port of Registry Vancouver, B.C. Ltd.

Registered Owners Union S. S. Co. of British Columbia, Vancouver.

Engines Built by David Rowan & Co. Ltd.

at Elliot St. Glasgow.

Main Boilers Built by Babcock & Wilcox, Ltd.

at Renfrew.

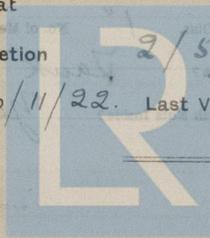
Donkey " " (none.)

at ✓

Date of Completion 2/5/23

First Visit 6/11/22 Last Visit 2/5/23 Total Visits 36

Captain



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SHAFTING.

Are the Crank Shafts Built or Solid? *Built*

No. of Lengths in each *3* Angle of Cranks *120°* **BALANCED WEBS.**

Diar. by Rule *8.28"* Actual *8 1/2"* In Way of Webs *8 3/4"*

„ of Crank Pins *8 1/2"* Length between Webs *8 1/2"*

Greatest Width of Crank Webs *1'-8 1/2"* Thickness *5 1/2"*

Least „ „ *1'-0 3/4"* „ „ „ „

Dowels
Diar. of ~~Keys~~ in Crank Webs *1 1/2"* Length *3 1/2"*

„ Dowels in Crank Pins *1"* Length *2 1/2"* Screwed or Plain

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

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

Type of Thrust Blocks *Horse shoe.*

No. „ *Shoes* *4*

Diar. of Thrust Shafts at bottom of Collars *8 3/4"* No. of Collars *4*

„ „ Forward Coupling *8 1/2"* At Aft Coupling *8 1/8"*

Diar. of Intermediate Shafting by Rule *7.86"* Actual *8 1/8"* No. of Lengths *3 aside*

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

Diar. of Propeller Shafts by Rule *8.4"* Actual *9 1/2"* At Couplings *8 1/2"*

Are Propeller Shafts fitted with Continuous Brass Liners? *Yes.*

Diar. over Liners *10 5/8"* Length of After Bearings *3'-0"*

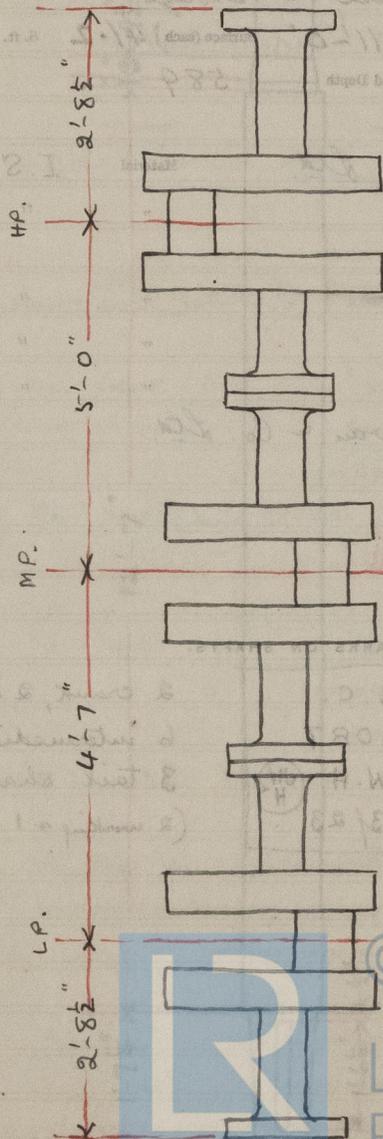
Of what Material are the After Bearings composed? *Lignum Vitae.*

Are Means provided for lubricating the After Bearings with Oil? *No.*

„ „ to prevent Sea Water entering the Stern Tubes? *„*

If so, what Type is adopted? *✓*

SKETCH OF CRANK SHAFT.



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No. of Blades each Propeller 4 Fitted or Solid? Solid.
 Material of Blades " Manganese ~~Iron~~ Bronze
 Diam. of Propellers 10'-0" Pitch 11'-0" Surface (each) 41.2 S. ft.
 Coefficient of Displacement of Vessel at $\frac{1}{2}$ Moulded Depth .589

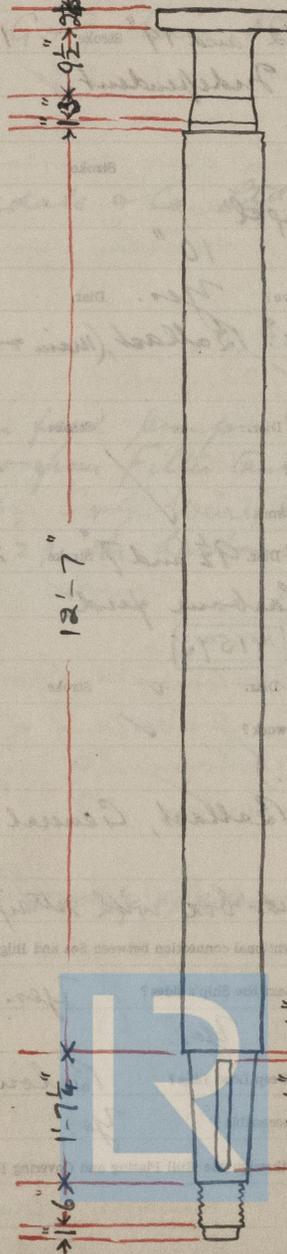
Crank Shafts Forged by	Material	I. S.
" Pins "	"	"
" Webs "	"	"
Thrust Shafts "	"	"
Intermed. "	"	"
Propeller "	"	"
Crank " Finished by	<u>D. Rowan & Co. Ltd.</u>	
Thrust " "	"	"
Intermed. "	"	"
Propeller " "	"	"

STAMP MARKS ON SHAFTS.

B. C.
 No: 6087
 J.W.H. JW
H
 14/3/23

2 crank, 2 thrust,
 6 intermediate, 2
 3 tail shafts;
 (2 working & 1 spare).

SKETCH OF PROPELLER SHAFT.



PUMPS, ETC.

No. of Air Pumps *One* ✓ Diar. *12" and 19"* Stroke *1-3"*
 Worked by Main or Independent Engines? *Independent.* ✓

No. of Circulating Pumps *One* ✓ Diar. _____ Stroke _____
 Type of " *Centrifugal*
 Diar. of " *Suction from Sea* *10"*

Has each Pump a Bilge Suction with Non-return Valve? *Yes.* Diar. _____
 What other Pumps can circulate through Condensers? *Ballast, (main + aux.) G.S.*
(aux. only)

No. of Feed Pumps on Main Engine *(none)* Diar. ✓ Stroke ✓
 Are Spring-loaded Relief Valves fitted to each Pump? ✓
 Can one Pump be overhauled while the others are at work? ✓

No. of Independent Feed Pumps *2* Diar. *9½" and 7"* Stroke *21"*
 What other Pumps can feed the Boilers? *Harbour feed,*
G. & J. Weir, Ltd. 41545

No. of Bilge Pumps on Main Engine *(none)* Diar. ✓ Stroke ✓
 Can one Pump be overhauled while the others are at work? ✓

No. of Independent Bilge Pumps *(none.)* ✓
 What other Pumps can draw from the Bilges? *Ballast, General Service,*

Are all Bilge Suctions fitted with Roses? *Mud-box with straight-thro'*
 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.*
 Are they placed so as to be easily accessible? *Yes.*
 Are the Discharge Chests placed above or below the Deep Load Line? *Below*
 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.*

G. & J. Weir, Ltd. 41540

Drysdale & Co. Ltd.

Main feed pumps
 draw from Filter tank, Main Condenser, No. 4
 tank, G. & J. Weir, Ltd. 41542 (1) and (2)
 (see p. 29 for harbour feed pump.)

pipe in machinery space. Roses in holds.



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BOILERS.

Works No. 6/1149

No. of Boilers 2 Type Marine water-tube of
Babcock & Wilcox type.

Single or Double ended

No. of Furnaces in each Combustion space common to

Type of Furnaces 4 Oil fuel sprayers.

Date when Plan approved ← (Taken from Stock)

Approved Working Pressure 180 lbs/□

Hydraulic Test Pressure 320 "

Date of Hydraulic Test 19/3/23.

" when Safety Valves set 23/4/23.

Pressure at which Valves were set 185 lbs/□

Date of Accumulation Test 23/4/23 (Boilers coupled) →

Maximum Pressure under Accumulation Test 192 lbs/□

System of Draught Forced. (Howden's.) →

Can Boilers be worked separately? Yes.

Makers of Plates (Shells) Stewart & Lloyd's Ltd (Drum ends &
mud drums) Steel Co. of Scotland Ltd.
" (Header) D. Colville & Sons, Ltd.
" Rivets Babcock & Wilcox Ltd.
" (Sprayers) " "
" Furnaces " "

Greatest Internal Diam. of Boilers Steam drum 4'-0" mud drum 6" sq.

" " Length " " 11'-7³/₄" " " 13'-5"

Square Feet of Heating Surface each Boiler 2763 #.

Grate " " 7'-5" x 12'-6¹/₂"

No. of Safety Valves each Boiler One pr. Rule Diam. 3¹/₁₆" Actual 3³/₈"

Are the Safety Valves fitted with Easing Gear? Yes.

No. of Pressure Gauges, each Boiler One No. of Water Gauges 2

" Test Cocks " (none) " Salinometer Cocks One

(previously passed by Lloyd's Register)

Rings

Port boiler. Starbd boiler.

Port, 1/2" Starbd, 14/32" Port, 5/16" Starbd, 7/16"

← Closed (Port) 143 lbs. (Starbd) 145 lbs.

Lost 3" water in 9 mins.

Exp. 9393

← 1/32" thick Siemens-Martin lapwelded steel.

T. Adams, West Barton
Stop valves & feed check valves
A. Turball & Co.

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

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

Are these Pipes connected to Boilers by Cocks or Valves?

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

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

Plates in each Strake *2*

Thickness of Shell Plates Approved *$\frac{14}{32}$ " and 1" (latter in way of tubes.)*

" " in Boilers *" "*

Are the Rivets Iron or Steel? *Steel.*

Are the Longitudinal Seams Butt or Lap Joints? *Lap, with inner butt-strap - Single.*

Are the Butt Straps Single or Double? *Single.*

Are the Double Butt Straps of equal width?

Thickness of outside Butt Straps

" inside " *$\frac{7}{16}$ "*

Are Longitudinal Seams Hand or Machine Riveted?

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

No. of Rivets in a Pitch *3*

Diar. of Rivet Holes *$\frac{27}{32}$ "* Pitch *$3\frac{3}{16}$ "*

No. of Rows of Rivets in Centre Circumferential Seams

Are these Seams Hand or Machine Riveted?

Diar. of Rivet Holes Pitch

No. of Rows of Rivets in Front End Circumferential Seams *2*

Are these Seams Hand or Machine riveted?

Diar. of Rivet Holes *$\frac{27}{32}$ "* Pitch *2*

No. of Rows of Rivets in Back End Circumferential Seams *2*

Are these Seams Hand or Machine Riveted?

Diar. of Rivet Holes *$\frac{27}{32}$ "* Pitch *2*

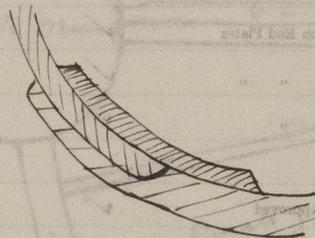
Size of Manholes in Shell *15" x 11"*

Dimensions of Compensating Rings *2-4 $\frac{3}{4}$ " x 1'-10"*

Dewrance & Co.

Dewrance & Co.

of tubes.)



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Thickness of End Plates in Steam Space Approved $\frac{13}{16}$ "

" " " " " in Boilers "

Pitch of Steam Space Stays ✓

Diar. " " " " Approved ✓ Threads per Inch ✓

" " " " " in Boilers ✓ " ✓

Material of " " " ✓

How are Stays Secured? ✓

Diar. and Thickness of Loose Washers on End Plates ✓

" " " Riveted " " ✓

Width " " Doubling Strips " ✓

Thickness of Middle Back End Plates Approved ✓

" " " " " in Boilers ✓

Thickness of Doublings in Wide Spaces between Fireboxes ✓

Pitch of Stays at " " " " ✓

Diar. of Stays Approved ✓ Threads per Inch ✓

" " in Boilers ✓ " ✓

Material " ✓

Are Stays fitted with Nuts outside? ✓

Thickness of Back End Plates at Bottom Approved ✓

" " " " " in Boilers ✓

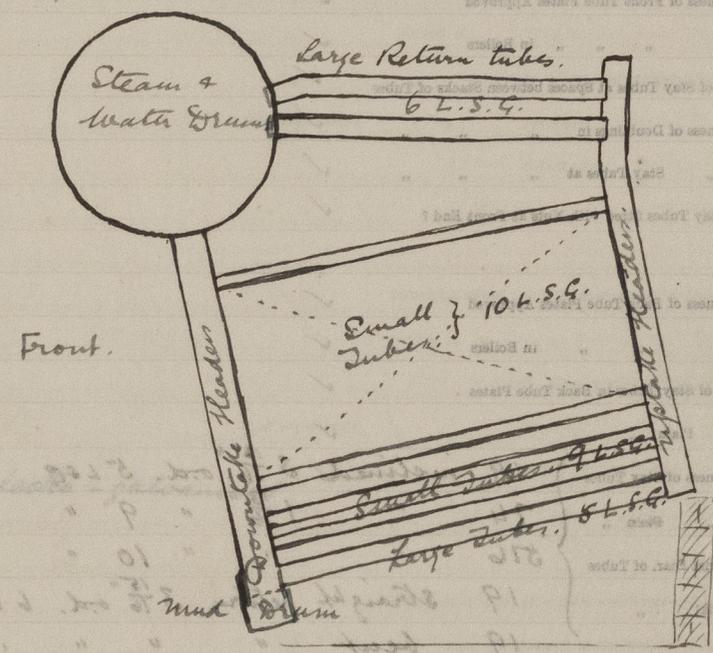
Pitch of Stays at Wide Spaces between Fireboxes ✓

Thickness of Doublings in " " ✓

Thickness of Front End Plates at Bottom Approved ✓

" " " " " in Boilers ✓

No. of Longitudinal Stays in Spaces between Furnaces ✓



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Diar. of Stays Approved ✓ Threads per Inch ✓
 " " in Boilers ✓
 Material " ✓

Thickness of Front Tube Plates Approved ✓
 " " " " in Boilers ✓
 Pitch of Stay Tubes at Spaces between Stacks of Tubes ✓
 Thickness of Doublings in " " " ✓
 " Stay Tubes at " " " ✓
 Are Stay Tubes fitted with Nuts at Front End? ✓

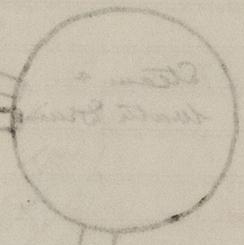
Thickness of Back Tube Plates Approved ✓
 " " " in Boilers ✓
 Pitch of Stay Tubes in Back Tube Plates ✓
 " Plain " ✓

Thickness of Stay Tubes	}	19 inclined	$3\frac{15}{16}$ "	o.d.	5 L.S.G.
" Plain "		74	"	$1\frac{13}{16}$ "	" 9 "
External Diar. of Tubes	}	576	"	"	10 "
Material "		19	straight return	$3\frac{15}{16}$ "	o.d.
		19	bent	"	" " "

} electro-galvanised.

Thickness of Furnace Plates Approved ✓
 " " " in Boilers ✓
 Smallest outside Diar. of Furnaces ✓
 Headers
 Length between Tube Plates 8'-4"

Width of Combustion Chambers (Front to Back) (see under "Grate" p. 14)
 Thickness of " " Tops Approved ✓
 " " " in Boilers ✓
 Pitch of Screwed Stays in C.C. Tops ✓



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Diar. of Screwed Stays Approved ✓ Threads per Inch ✓

" " " in Boilers ✓

Material " " ✓

Thickness of Combustion Chamber Sides Approved ✓

" " " " in Boilers ✓

Pitch of Screwed Stays in C.C. Sides ✓

Diar. " " Approved ✓ Threads per Inch ✓

" " " in Boilers ✓

Material " " ✓

Thickness of Combustion Chamber Backs Approved

" " " " in Boilers

Pitch of Screwed Stays in C.O. Backs

Diar. " " Approved Threads per Inch

" " " in Boilers

Material " "

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

Thickness of Combustion Chamber Bottoms ✓

No. of Girders over each Wing Chamber

" " " Centre "

Depth and Thickness of Girders

Material of Girders

No. of Stays in each

No. of Tubes, each Boiler

Size of Lower Manholes

647 ✓

VERTICAL DONKEY BOILERS

No. of Boilers	Type
Greatest Int. Diam.	Height
Height of Boiler Crown above Fire Grate	Are Boiler Crown Flat or Dished?
Internal Radius of Dished Ends	Thickness of Plates
Description of Seams in Boiler Crown	Width of Girders
Diam. of Rivet Holes	Height of Ribbed Crown above Fire Grate
Height of Ribbed Crown above Fire Grate	Are Ribbed Crown Flat or Dished?
Internal Radius of Ribbed Crown	Thickness of Plates
No. of Crown Stays	Diam.
Internal Diam. of Ribbed at Top	Bottom
No. of Water Tubes	Thickness
Material of Water Tubes	
Size of Manhole in Shell	
Dimensions of Compressing Ring	
Number sections, each Boiler	Water Section

SUPERHEATERS

Description of Superheaters	When situated?
Which Boilers are connected to Superheaters?	Can Superheaters be shut off while Boilers are working?
No. of Safety Valves on each Superheater	Date when Safety Valves set
Date when Safety Valves set	Pressure on Valves



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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.

Description of Superheaters *Incorporated in main boiler.*

Where situated? *(None)*

Which Boilers are connected to Superheaters? *210.*

Can Superheaters be shut off while Boilers are working? *Yes.*

No. of Safety Valves on each Superheater _____ Diar. _____

Are " " fitted with Easing Gear? *Yes*

Date of Hydraulic Test *19/3/23* Test Pressure *320 lbs/sq"*

Date when Safety Valves set _____ Pressure on Valves _____

MAIN STEAM PIPES.

No. of Langes _____

Material _____

Flange, Welded or Bolted _____

Internal Diar. _____

Thickness _____

How are Flanges secured? *2 1/2" x 1 1/2" 20/1/17*

Date of Hydraulic Test _____

Test Pressure _____

No. of Langes _____

Material _____

Flange, Welded or Bolted _____

Internal Diar. _____

Thickness _____

How are Flanges secured? _____

Date of Hydraulic Test _____

Test Pressure _____

No. of Langes _____

Material _____

Flange, Welded or Bolted _____

Internal Diar. _____

Thickness _____

How are Flanges secured? _____

Date of Hydraulic Test _____

Test Pressure _____



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MAIN STEAM PIPES.

No. of Lengths	4		
Material	Wro't iron		
Brazed, Welded or Seamless	Lapwelded		
Internal Diam.	4"		
Thickness	1/4"		
How are Flanges secured?	Sc'd exp'd.		
Date of Hydraulic Test	17/4/23.		
Test Pressure	540 lbs/sq"		
	(JW H)		
No. of Lengths			
Material			
Brazed, Welded or Seamless			
Internal Diam.			
Thickness			
How are Flanges secured?			
Date of Hydraulic Test			
Test Pressure			
No. of Lengths			
Material			
Brazed, Welded or Seamless			
Internal Diam.			
Thickness			
How are Flanges secured?			
Date of Hydraulic Test			
Test Pressure			

STEAM EVAPORATORS TEST

No. of Lengths	1		
Material	Cast Iron		
Brazed, Welded or Seamless	Welded		
Internal Diam.	12"		
Thickness	1/2"		
How are Flanges secured?	Sc'd exp'd.		
Date of Hydraulic Test	17/4/23.		
Test Pressure	540 lbs/sq"		
	(JW H)		
No. of Lengths			
Material			
Brazed, Welded or Seamless			
Internal Diam.			
Thickness			
How are Flanges secured?			
Date of Hydraulic Test			
Test Pressure			
No. of Lengths			
Material			
Brazed, Welded or Seamless			
Internal Diam.			
Thickness			
How are Flanges secured?			
Date of Hydraulic Test			
Test Pressure			



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EVAPORATORS.

No. One Type Vert. merch. Service. Tons per Day 10
 Makers Temporary - for outward voyage only.
 Working Pressure _____ Test Pressure _____ Date of Test _____
 Date of Test of Safety Valves under Steam _____

FEED WATER HEATERS.

No. One Type Multiflow Surface 78 hp.
 Makers G. & J. Weir Ltd
 Working Pressure _____ skell ... 60 lbs/0 Date of Test 21/2/23.
Coils ... 432

FEED WATER FILTERS.

No. One Type Suction Size _____
 Makers Rowan & Co.
 Working Pressure _____ Test Pressure _____ Date of Test _____

STEERING ENGINE.

No. One Type Two-cyl. horizontal.
 Makers J. Hastie & Co. Ltd. Greenock. 2863

OIL FUEL PLANT.

2 vert. pumps; 2 vert. heaters; all in one unit; interchangeable. One pump & heater can be overhauled while the other is at work. Made by Babcock & Wilcox.

6/3/23 for nos.

LIST OF DONKEY PUMPS.

Ballast, 6½" and 7" x 15", G. & J. Weir Ltd. 41546
draws from Tanks, Sea, Special bilge, Main bilge; & discharges to Main & Aux. Condensers, O'board, Deck, Tanks, & E.R. hose.

Gen. Service, 6½" and 4" x 15", Weir 41544
draws from Sea, aft Peak, fore Peak, Main bilge; & disch. to Aux. cond., Deck, O'board, Peaks, & Filter tank.

Harbour feed, 4" and 5" x 12", Weir 41545
draws from Sea, Main Cond., Filter tank, no. 4 tank; & disch. to Boilers.

Sanitary, 3½" and 4" x 9", Weir 41548
draws from Sea; & disch. to Sanitary tank.

Freshwater, 3½" and 4" x 9", Weir 41544
draws from F.W. tanks; & disch. to F.W. Gravity tank & O'board.

Oil transfer, 5½" x 6" x 1-3", Weir's 41545
also

Oil band, 1" discharge, Babcock & Wilcox.

Downton,

SPARE GEAR

No. of Top End Bolts.	2	No. of Bot. End Bolts.	2	No. of Cylinder Cover Studs	6
" Coupling Bolts	2 sets	" Main Bearing Bolts	2	" Valve Chest "	✓
" Junk Ring Bolts	12	" Feed Pump Valves	{ 1 suction 1 disch. }	" Bilge Pump Valves	{ 1 suction 1 disch. }
" H.P. Piston Rings	1 set	" L.P. Piston Rings	1 set	" L.P. Piston Rings	1 set
" " Springs	for each engine	" " Springs		" " Springs	
" Safety Valve	1 set (for one boiler)	" Fire Bars	✓	" Feed Check Valves	✓
" Piston Rods	✓	" Connecting Rods	✓	" Valve Spindles	✓
" Air Pump Rods	1	" Air Pump Buckets	1	" Air Pump Valves	1 set.
" Cir. "	✓	" Cir. ✓	1 impeller and spindle.		
" Crank Shafts	✓	" Crank Pin Bushes	1	" Crosshead Bushes	1
" Propeller Shafts	1	" Propellers	2 (c.i.)	" Propeller Blades	✓
" Boiler Tubes	* (19)	" Condenser Tubes	50	" Condenser Ferrules	150

OTHER ARTICLES OF SPARE GEAR:

- 100 assorted bolts + nuts.
 5 " bars round iron
 3 " flat "
 3 top " and fillets, iron
 12 bottom " brass bolts
 50 " steel "
 4 glasses for oil level gauge.
 1 guide shoe
 1 H.P. piston valve.
 100 packings for condenser tubes.
 1 head valve, seat + guard for air pump.
- Boilers
 4 air distributing cones.
 4 sets bricks for burner openings.
 4 bricks for closing " "

- * { 6 inclined tubes $3\frac{15}{16}$ " dia
 1 return " " "
 12 inclined " $1\frac{13}{16}$ " "
 12 handhole fittings for headers.
 1 " " " mud drum.
 24 gauge glasses.
 4 gaskets for manhole doors.
 200 " " handhole fittings.
 1 thermometer.
 4 oil fuel sprayers, with
 2 caps for same.
Engine.
 1 set M.P. piston valve packing.
 9 relief valve springs.



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REFRIGERATORS.

No. of Machines Capacity of each
 Makers
 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

4 air distributing covers
 4 sets brinks for burner openings
 4 brinks for closing

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.
Navigation	82	81	1/2	1.5
Eng. room	89	16	12 1/2	1.5
Holds	79	74	5	1.5
Bridge	88	80	7	1.5
Wardroom	84	29	7	1.5
Galley	88	29	7	1.5

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

W/T
 Searchlight



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Direct-coupled to single cyl. steam eng.
 48829 9" x 4", 22 B.H.P. at 400 revs.
 with 100 lbs/□ steam press. (Same makers.)

(2.) Auxiliary set by same makers; -
 One 4.5 Kw. compound wound 48833
 68 amps. at 110 volts, 500 revs./min.
 direct-coupled to single-cyl. steam eng.
 48832 8" x 3", 11 B.H.P. at 500 revs. with
 100 lbs. steam press. (Same makers.)

ELECTRIC LIGHTING.

(1.) Installation Fitted by Claud Hamilton, Ltd.
 No. and Description of Dynamos ^{One} 15 Kw. Compound wound 48830
 Makers of Dynamos W.H. Allen, Son & Co. Ltd. Bedford.
 Capacity " 135 Amperes, at 110 Volts, 400 Revols. per Min.
 Current Alternating or Continuous Continuous.
 Single or Double Wire System Double.
 Position of Dynamos Starbd, bottom platform.
 " Main Switch Board " " "
 No. of Circuits to which Switches are provided on Main Switch Board 10
 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.
Navigation.	{ 4	32	5	3/036	I.E.E.	100 mps, 600 meg.	
Eng. room.	28	16	12.6	7/	Standard	"	"
Holds.	14	"	7.65	7/029	"	"	"
Bridge.	28	30 W.	7.6	7/036	"	"	"
Auxiliary deck, Fan.	84	"	22	7/064	"	"	"
" " Aff.	88	"	24	"	"	"	"
Upper " Forward.	30	"	8.2	7/036	"	"	"
" " Aff.	32	"	8.7	"	"	"	"
W/T.	✓	✓	15	7/064	"	"	"
Searchlight.	✓	✓	40	"	"	"	"

Total No. of Lights

318

No. of Motors driving Fans, &c.

(none)

No. of Heaters (none)

Current required for Motors and Heaters

✓

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

(none)

Handwritten notes and scribbles at the top of page 36, including numbers like 02230 and 45530.

Location of Switch Board	No. of Switches	Location of Switch Board	No. of Switches

Are Out-outs fitted as follows?—

On Main Switch Board, to Cables of Main Circuits *Yes.*

On Aux. " " each Auxiliary Circuit "

Wherever a Cable is reduced in size "

To each Lamp Circuit "

To both Flow and Return Wires of all Circuits when the Double-Wire System is adopted *Yes.*

Are the Fuses of Standard Sizes? "

Are all Switches and Out-outs constructed of Non-inflammable Material? "

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

Smallest Single Wire used, No. *3/029* S.W.G., Largest, No. *34/072* S.W.G.

How are Conductors in Engine and Boiler Spaces protected? *Lead covered, armoured*

" Saloons, State Rooms, &c., " " "

What special protection is provided in the following cases?—

(1) Conductors exposed to Heat or Damp " " "

(2) " " passing through Bunkers or Cargo Spaces " " "

(3) " " Deck Beams or Bulkheads *Lead bushes, W.T. glands.*

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? *Yes.*

What does the Resistance amount to? *.154 meg Ohms.*

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

" " " an Ampere Meter? "

Date of Trial of complete Installation *2/5/23.* Duration of Trial *6 hours.*

Have all the requirements of Section 42 been satisfactorily carried out? *Yes.*

Governor trials.

Small plant, 68 amps. at 110 volts.

Main switch OUT, momentary 114 " } and per-

" " IN " 106 " } sistent 110 v.

Large plant, 78 amps. at 110 volts.

Main switch OUT, momentary 116 volts } do.

" " IN, " 105 " } do.

braided, enclosed in galvanized steel conduit.



Lloyd's Register Foundation

Visits.

23-10-22.

6-11-22.

11-12-22.

19-12-22.

21-12-22.

26-12-22.

12-1-23.

17-1-23.

22-1-23.

29-1-23.

30-1-23.

1-2-23.

15-2-23.

20-2-23.

22-2-23.

2-3-23.

5-3-23.

6-3-23.

7-3-23.

8-3-23.

14-3-23.

15-3-23.

16-3-23.

19-3-23.

20

26

5/4/23

6

Renfrew (R.L.G.)

13-12-22.

(ship)

(W. Macfarlane)

(ship)

(also exp. W. Macfarlane)

Lloyd's Register
Foundation

9-4-23

12 "

(16) "

17 "

23 "

27 "

2/5/23

V. 100

100-100-1

100-100-2

100-100-3

100-100-4

100-100-5

100-100-6

100-100-7

100-100-8

100-100-9

100-100-10

100-100-11

100-100-12

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100-100-29

100-100-30



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Lloyd's Register
Foundation

8-11-23

12

16

17

23

17

27/2/23



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