

REPORT ON MACHINERY.

No. 91583.

Received at London Office 5 MAR 1927

4a. *4a.*
 Date of writing Report 19 *3 MAR 1927* When handed in at Local Office *3 MAR 1927* Port of *Liverpool*
 in Survey held at *Birkenhead* Date, First Survey *Novr 17th 1925* Last Survey *March 1st 1927*
 Reg. Book *1947* on the *Twin Screw Steamer "Andalusia"* (Number of Visits *174*) Gross *12838*
 Tons Net *7850*
 Master *Birkenhead* Built at *Birkenhead* By whom built *Cammell, Laird & Co. Ltd.* When built *1927*
 Engines made at *Birkenhead* By whom made *Cammell, Laird & Co. Ltd.* when made *1927*
 Milers made at *Birkenhead* By whom made *Cammell, Laird & Co. Ltd.* when made *1927*
 Registered Horse Power *Blue Star Line (1920) Ltd.* Port belonging to *London*
 Shaft Horse Power at Full Power *8400* Is Refrigerating Machinery fitted for cargo purposes *Yes* Is Electric Light fitted *Yes*

STEAM ENGINES, &c.—Description of Engines *Twin Screw Single Reduction Turbine* No. of Turbines *6* Including astern
 Diameter of Rotor Shaft Journals, H.P. *5 1/2"* L.P. *7"* Diameter of Pinion Shaft *6 1/2"*
 Diameter of Journals *6 1/2"* Distance between Centres of Bearings *2' 5 1/2"* Diameter of Pitch Circle *7' 4 1/2"*
 Diameter of Wheel Shaft *16"* Distance between Centres of Bearings *5' 1 1/2"* Diameter of Pitch Circle of Wheel *133' 7 1/2"*
 Thickness of Face *36"* Diameter of Thrust Shaft under Collars *14"* Diameter of Tunnel Shaft as per rule *12' 9 1/2"*
 as fitted *13 1/2"*
 Diameter of Screw Shafts *2 CL* Diameter of same as per rule *14' 2 1/4"* Diameter of Propellers *15' 6"* Pitch of Propellers *14' 0"*
 as fitted *15"*
 Number of Blades *4* State whether Moveable *Yes* Total Surface *86 sq. ft.* Diameter of Rotor Drum, H.P. *19 1/2"* L.P. *3' 4"* Astern *2' 8"*
 Thickness at Bottom of Groove, H.P. *Solid* L.P. *Solid* Astern *Solid* Revs. per Minute at Full Power, Turbine *2220* Propeller *124*

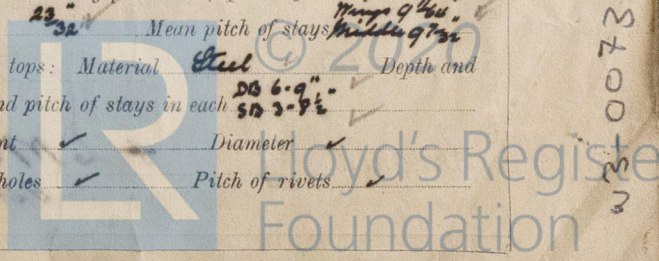
PARTICULARS OF BLADING.

	H. P.			L. P.			ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
Impeller Wheel	1 3/4" effective	22 1/2"	8	2 3/4"	3' 0 3/4"	3	1 1/4"	2' 10 1/2"	2
"	1 3/4"	23 3/4"	8	3"	3' 2"	3	2 3/4"	3' 0 3/4"	2
"	2 1/4"	20"	7	3 3/4"	3' 2 3/4"	2	3 1/2"	3' 2 1/2"	1
"	2 3/4"	2' 1"	7	3 1/2"	3' 10 1/2"	2	3 3/4"	3' 3 1/2"	2
"	3 3/4"	2' 3 1/4"	7	3 3/4"	3' 11 3/4"	1			
"				4 1/4"	4' 1/4"	1			
"				5 1/4"	4' 3"	1			
"				6 1/4"	4' 5 1/2"	1			
"				7 3/4"	4' 7 1/2"	3			

and size of Feed pumps *2-17" x 12" x 28"* *1-12" x 9" x 24"*
 and size of Bilge pumps *1-7" x 8" x 18"* *1 Emergency 5"* *Ballast 10 1/2" x 12" x 24"* *G.S. 10 1/2" x 18"* *2-Sanitary 7 1/2" x 18"*
 and size of Bilge suction in Engine Room *5-3"* *6-2 1/2" cofferdam suction* *1-6" x 1-5" direct suction* *2-4" hose suction*
 In Holds, &c. *12-3"* *3-3" in tunnels* *1-2" cofferdam suction in tunnel*
 - *2 1/2" in dust keel*
 of Bilge Injections *2* sizes *14"* Connected to condenser, or to circulating pump *Yes* Is a separate Donkey Suction fitted in Engine Room & size *Yes - 4 1/2"*
 All the bilge suction pipes fitted with roses *Yes* Are the roses in Engine room always accessible *Yes*
 All connections with the sea direct on the skin of the ship *Yes* Are they Valves or Cocks *Valves & Cocks*
 They fired sufficiently high on the ship's side to be seen without lifting the stokehold plates *Yes* Are the Discharge Pipes above or below the deep water line *Above & below*
 They each fitted with a Discharge Valve always accessible on the plating of the vessel *Yes* Are the Blow Off Cocks fitted with a spigot and brass covering plate *Yes*
 Pipes are carried through the bunkers *Refrigerator discharge pipe* How are they protected *Yes*
 All Pipes, Cocks, Valves, and Pumps in connection with the machinery and all boiler mountings accessible at all times *Yes*
 The Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges *Yes*
 Screw Shaft Tunnel watertight *Yes* Is it fitted with a watertight door *Yes* worked from *Upper deck*

BOILERS, &c.—(Letter for record *1*) Manufacturers of Steel Plates *Friedrich A.G., Stays - D. Colville & Sons, Ltd. & Earl of Dudley*
 Heating Surface of Boilers *30600 sq. ft.* Forced Draft fitted *Yes* No. and Description of Boilers *3DB & 2SB* *3DB & 2SB*
 Working Pressure *200 lb* Tested by hydraulic pressure to *350 lb* Date of test *22/7/26, 10/9/26, 24/9/26* Nos. of Certificates *2290, 2291, 2292, 2293, 2294*
 Each boiler be worked separately *Yes* Area of fire grate in each boiler *DB 140 sq. ft., SB 70 sq. ft.* No. and Description of Safety Valves to *DB 1, SB 1*
 boiler *Spring loaded DB 3, SB 2* Area of each valve *SB 7.07"* Pressure to which they are adjusted *205 lb* Are they fitted with easing gear *Yes*
 Test distance between boilers or uptakes and bunkers or woodwork *2' 9"* Mean dia. of boilers *17' 6"* Length *22' 3" x 12' 4"* Material of shell plates *Steel*
 Thickness *1' 9/32"* Range of tensile strength *29/33 Tons* Are the shell plates welded or flanged *No.* Descrip. of riveting: cir. seams *T.R.L. & D.R.L.*
 seams *T.R. & Double Strap* Diameter of rivet holes in long. seams *1 1/8"* Pitch of rivets *10 1/2"* Lap of plates or width of butt straps *23"*
 rivets *92-18* Working pressure of shell by rules *207.8 lb* Size of manhole in shell *22" x 18"*
 plates *84-52*
 of compensating ring *22" x 35 1/2" x 1 1/2"* No. and Description of Furnaces in each Boiler *8 & 4 Corrugated* Material *Steel* Outside diameter *3' 10 1/2"*
 Thickness of plates *5"* Description of longitudinal joint *Weld* No. of strengthening rings *None*
 Working pressure of furnace by the rules *210 lb* Combustion chamber plates: Material *Steel* Thickness: Sides *DB 1/4"* Back *1/4"* Top *DB 1/4"* Bottom *1/4"*
 of stays to ditto: Sides *DB 9" x 5 1/2"* Back *DB 9" x 5 1/2"* Top *DB 9" x 5 1/2"* Bottom *DB 9" x 5 1/2"* If stays are fitted with nuts or riveted heads *Yes* Working pressure by rules *204 lb*
 Material of stays *Iron* Diameter of stays *1 1/2"* Area supported by each stay *74.375 sq. in.* Working pressure by rules *204 lb* End plates in steam space *Yes*
 Material *Steel* Thickness *1 1/2"* Pitch of stays *22 1/2" x 17 1/2"* How are stays secured *Double Nuts* Working pressure by rules *208 lb* Material of stays *Steel*
 Diameter of smallest part *3 1/4"* Area supported by each stay *293.75 sq. in.* Working pressure by rules *204 lb* Material of Front plates at bottom *Steel*
 Thickness *1"* Material of Lower back plate *Steel* Thickness *1 1/2"* Greatest pitch of stays *14" x 9"* Working pressure of plate by rules *210 lb*
 Diameter of tubes *2 1/2" but.* Pitch of tubes *11 1/2" x 3 1/2"* Material of tube plates *Steel* Thickness: Front *1"* Back *2 1/2"* Mean pitch of stays *11 1/2" x 9 1/2"*
 across wide water spaces *13 1/2"* Working pressures by rules *210 lb* Girders to Chamber tops: Material *Steel* Depth and *DB 6-9"*
 Thickness of girder at centre *DB 2-11 1/2" x 2 1/2"* Length as per rule *5' 2' 10 1/2"* Distance apart *8 1/2"* Number and pitch of stays in each *DB 3-9"*
 Working pressure by rules *DB 204 lb* Steam dome: description of joint to shell *None* No. of strength of joint *Yes* Diameter *DB 6-9"*
 Thickness of shell plates *Yes* Material *Yes* Description of longitudinal joint *Yes* Diameter of rivet holes *Yes* Pitch of rivets *Yes*
 Working pressure of shell by rules *Yes* Crown plates: Thickness *Yes* How stayed *Yes*

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SUPERHEATER. Type *None* Date of Approval of Plan *✓* Tested by Hydraulic Pressure to *✓*
Date of Test *✓* Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler *✓*
Diameter of Safety Valve *✓* Pressure to which each is adjusted *✓* Is Easing Gear fitted *✓*

IS A DONKEY BOILER FITTED? *No* If so, is a report now forwarded? *✓*

SPARE GEAR. State the articles supplied:—
In excess of Rule. See List forwarded herewith.

MCMILL LAIRD AND COMPANY LIMITED
The foregoing is a correct description,
[Signature] Manufacturer.

Dates of Survey while building
During progress of work in shops -- 1925. Nov 17. Dec 1. 11. 14. 18. 21. 29.
During erection on board vessel -- 1926. Jan 5. 7. 8. 11. 13. 17. 20. 25. 26. 27. Feb 3. 4. 9. 10. 11. 12. 15. 16. 17. 18. 22. 23. 24. Mar 3. 4. 5. 8. 9. 12. 15. 17. 18. 19. 23. 25. 29. Apr 7. 8. 12. 13. 15. 16. 20. 21. 22. 23. 26. 27. 29. May 9. 10. 12. 13. 14. 20. 23. 24. 26. 27. 30. 31. Sept 2. 3. 6. 9. 10. 13. 16. 20. 21. 22. 27. 29. Oct 4. 8. 11. 13. 14. 15. 15. 19. 20. 22. 25. 27. 29. Nov 1. 3. 5. 8. 10. 12. 14. 17. 18. 19. 22. Dec 6. 7. 8. 9. 13. 15. 16. 17. 21. 22. 30.
Total No. of visits *174* Is the approved plan of main boiler forwarded herewith *✓*

Dates of Examination of principal parts—Casings *5/2/25 to 27/7/26* Rotors *5/2/25 to 27/7/26* Blading *26/5/26 to 27/7/26* Gearing *11/1/26 to 27/7/26*
Rotor shafts *17/6/26* Thrust shaft *14/6/26 to 17/6/26* Tunnel shafts *20/4/26 to 17/6/26* Screw shafts *20/4/26 to 17/6/26* Propellers *24/2/26 to 16/9/26*
Stern tubes *3/2/25 to 14/8/26* Steam pipes tested *13/10/26 to 25/10/26* Engine and boiler seatings *14/7/26 to 14/9/26* Engines holding down bolts *7/12/26*
Completion of pumping arrangements *16/12/26* Boilers fixed *7/12/26* Engines tried under steam *1/3/27*
Main boiler safety valves adjusted *21/12/26* Thickness of adjusting washers *SSB-F 1/4 A 2 1/2, PAB-F 3/4 A 2 1/2, MAB-F 1/2 M 1/2 A 2 1/2, PAB-F 3/4 M 1/2*
Material and tensile strength of Rotor shaft *Steel 34/28 tons* Identification Mark on Do. *610, 611, 613, 146, 624*
Material and tensile strength of Pinion shaft *Steel 40/44 tons* Identification Mark on Do. *1100, 1102, 1103, 110*
Material of Wheel shaft *Steel* Identification Mark on Do. *6322* Material of Thrust shaft *Steel* Identification Mark on Do. *6329*
Material of Tunnel shafts *Steel* Identification Marks on Do. *6291, 6319, 6328* Material of Screw shafts *Steel* Identification Marks on Do. *680*
Material of Steam Pipes *Steel* Test pressure *600 lb.*

Is an installation fitted for burning oil fuel *Yes* Is the flash point of the oil to be used over 150°F. *Yes*
Have the requirements of Section 49 of the Rules been complied with *Yes*
Is this machinery a duplicate of a previous case *Yes* If so, state name of vessel *ss "Almeda"*

General Remarks (State quality of workmanship, opinions as to class, &c.) *The Machinery of this vessel has been built under Special Survey in accordance with the Rules, the approved plans & the Secretary's letters (E) of 29/7/25, 5/8/25, 10/11/25, 19/11/25, 20/11/25, 12/1/26, 23/1/26, 11/2/26, 19/3/26, 20/6/26, 18/7/26. The Materials and Workmanship are of good quality. When tried under full working conditions at sea the Machinery was found satisfactory in every respect and, in our opinion, is eligible for the notation LMC 3.27 to be recorded in the Register Book. Also, fitted for oil fuel 3.27, F.P. above 150°F.*

The amount of Entry Fee ... £ *6* : *0* : *0* When applied for, *3 MAR 1927*
Special ... £ *151* : *19* : *0* When received, *31.3.27*
Donkey Boiler Fee ... £ : :
Travelling Expenses (if any) £ : :
Committee's Minute *LIVERPOOL* *4 MAR 1927*
Assigned *+ LMC. 3.27. Fitted for oil fuel 3.27. F.P. above 150°F. Elec. Light*
[Signature] Engineer Surveyor to Lloyd's Register of Shipping.
Lloyd's Register Foundation