

## REPORT ON MACHINERY.

Port of *Sunderland*

Received at London Office

WED. JAN 1 1902

No. in Survey held at *Sunderland* Date, first Survey *21<sup>st</sup> June* Last Survey *10<sup>th</sup> Dec 1901*  
 Reg. Book. on the *Screw steamer "Morana"* (Number of Visits *29*) Tons { Gross *3807* Net *2437*  
 Master *Volazio* Built at *Sunderland* By whom built *John Priestman & Co* When built *1901*  
 Engines made at *Sunderland* By whom made *Richardson Westgarth & Co Ltd* when made *1901*  
 Boilers made at *Sunderland* By whom made *Richardson Westgarth & Co Ltd* when made *1901*  
 Registered Horse Power *312* Owners *Societa in Azioni Ungaro* Port belonging to *Trieste*  
 Nom. Horse Power as per Section 28 *312* Is Refrigerating Machinery fitted *No* Is Electric Light fitted *No*

ENGINES, &c.—Description of Engines *Triple Expansion* No. of Cylinders *3* No. of Cranks *3*  
 Dia. of Cylinders *25" - 41" - 67"* Length of Stroke *45"* Revs. per minute *65* Dia. of Screw shaft *as per rule 12.5"* Lgth. of stern bush *4'-6"*  
 Dia. of Tunnel shaft *as per rule 11.32"* Dia. of Crank shaft journals *as per rule 11.92"* Dia. of Crank pin *12 1/2"* Size of Crank webs *18 x 8 3/8"* Dia. of thrust shaft under collars *13 1/2"* Dia. of screw *16'-6"* Pitch of screw *16'-0"* No. of blades *4* State whether moveable *No* Total surface *770 ft*  
 No. of Feed pumps *2* Diameter of ditto *3"* Stroke *30"* Can one be overhauled while the other is at work *Yes*  
 No. of Bilge pumps *2* Diameter of ditto *3"* Stroke *30"* Can one be overhauled while the other is at work *Yes*  
 No. of Donkey Engines *Two* Sizes of Pumps *11 x 10 + 5 1/2 x 3 1/2 x 5"* No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room *Three of 3 1/2"* In Holds, &c.

No. of bilge injections *1* sizes *5"* Connected to condenser, or to circulating pump *OP* Is a separate donkey suction fitted in Engine room & size *Yes 4"*  
 Are all the bilge suction pipes fitted with roses *Yes* Are the roses in Engine room always accessible *Yes* Are the sluices on Engine room bulkheads always accessible *Yes*  
 Are all connections with the sea direct on the skin of the ship *Yes* Are they Valves or Cocks *Both*  
 Are they fixed 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*  
 Are 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*  
 What pipes are carried through the bunkers *None* How are they protected *Yes*  
 Are all pipes, cocks, valves, and pumps in connection with the machinery and all boiler mountings accessible at all times *Yes*  
 Are the bilge suction pipes, cocks, and valves arranged so as to prevent any communication between the sea and the bilges *Yes*  
 When were stern tube, propeller, screw shaft, and all connections examined in dry dock *New Vessel* Is the screw shaft tunnel watertight *Yes*  
 Is it fitted with a watertight door *Yes* worked from *Top Platform*

BOILERS, &c.—(Letter for record *S*) Total Heating Surface of Boilers *4840 sq ft* Is forced draft fitted *No*  
 No. and Description of Boilers *3 E. Cyl. Multitubular* Working Pressure *160 lbs* Tested by hydraulic pressure to *320 lbs*  
 Date of test *19.9.01* Can each boiler be worked separately *Yes* Area of fire grate in each boiler *57.5 sq ft* No. and Description of safety valves to each boiler *Two direct Spring* Area of each valve *8.3"* Pressure to which they are adjusted *165 lbs* Are they fitted with easing gear *Yes*  
 Smallest distance between boilers or uptakes and bunkers or woodwork *5'-9"* Mean dia. of boilers *15'-9 5/8"* Length *10'-6"* Material of shell plates *S*  
 Thickness *1 3/16"* Range of tensile strength *28/22* Are they welded or flanged *No* Descrip. of riveting: cir. seams *DR Cap* long. seams *DR. S. B. S*  
 Diameter of rivet holes in long. seams *1 1/32"* Pitch of rivets *8 1/4"* Lap of plates on width of butt straps *16 1/2"*  
 Per centages of strength of longitudinal joint rivets *86.11%* Working pressure of shell by rules *163.4 lbs* Size of manhole in shell *16" x 12"*  
 Size of compensating ring *Hanged* No. and Description of Furnaces in each boiler *3 Morrison* Material *S* Outside diameter *49 1/4"*  
 Length of plain part top *12"* Thickness of plates crown *3/32"* Description of longitudinal joint *Weld* No. of strengthening rings *Yes*  
 Working pressure of furnace by the rules *166.5* Combustion chamber plates: Material *S* Thickness: Sides *11/16"* Back *11/16"* Top *11/16"* Bottom *3/32"*  
 Pitch of stays to ditto: Sides *11 x 8 1/2"* Back *11 1/2 x 8 1/2"* Top *11 x 8 1/2"* If stays are fitted with nuts or riveted heads *Nuts* Working pressure by rules *160 lbs*  
 Material of stays *S* Diameter at smallest part *1.788"* Area supported by each stay *98 sq in* Working pressure by rules *165 lbs* End plates in steam space:  
 Material *Steel* Thickness *1 5/32"* Pitch of stays *21 x 17"* How are stays secured *2.4 x 10* Working pressure by rules *164 lbs* Material of stays *Steel*  
 Diameter at smallest part *6.1"* Area supported by each stay *357 sq in* Working pressure by rules *170* Material of Front plates at bottom *Steel*  
 Thickness *3/4"* Material of Lower back plate *Steel* Thickness *3/4"* Greatest pitch of stays *18 x 8 1/2"* Working pressure of plate by rules *197 lbs*  
 Diameter of tubes *3 1/4"* Pitch of tubes *4 1/2 x 4 1/2"* Material of tube plates *S* Thickness: Front *3/4"* Back *3/4"* Mean pitch of stays *11 1/4"*  
 Pitch across wide water spaces *14 1/2"* Working pressures by rules *192 lbs* Girders to Chamber tops: Material *Steel* Depth and thickness of girder at centre *8 3/4 x 1 1/2"* Length as per rule *29.6"* Distance apart *11"* Number and pitch of Stays in each *2 of 8 1/2"*  
 Working pressure by rules *165 lbs* Superheater or Steam chest; how connected to boiler *None* Can the superheater be shut off and the boiler worked separately *Yes*  
 Diameter *Yes* Length *Yes* Thickness of shell plates *Yes* Material *Yes* Description of longitudinal joint *Yes* Diam. of rivet holes *Yes* Pitch of rivets *Yes* Working pressure of shell by rules *Yes* Diameter of flue *Yes* Material of flue plates *Yes* Thickness *Yes*  
 If stiffened with rings *Yes* Distance between rings *Yes* Working pressure by rules *Yes* End plates: Thickness *Yes* How stayed *Yes*  
 Working pressure of end plates *Yes* Area of safety valves to superheater *Yes* Are they fitted with easing gear *Yes*



DONKEY BOILER— No. *one* Description *Vertical with cross stays*  
Made at *Stockton* By whom made *Piley Bros* When made *30-10-01* Where fixed *on deck*  
Working pressure *80 lb.* tested by hydraulic pressure to *160 lb.* No. of Certificate *2617* Fire grate area *28 sq ft* Description of safety valves *direct spring*  
No. of safety valves *2* Area of each *4.9 sq ft* Pressure to which they are adjusted *80 lb.* If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no* Dia. of donkey boiler *7'-9"* Length *16'-0"* Material of shell plates *S* Thickness *15/32"* Range of tensile strength *27/32* Descrip. of riveting long. seams *Hi Riv Lap* Dia. of rivet holes *15/16"* Whether punched or drilled *dr* Pitch of rivets *4/8"*  
Lap of plating *6 1/2"* Per centage of strength of joint *86%* Rivets *27.3%* Thickness of shell crown plates *19/32"* Radius of do. *5 ft* No. of Stays to do. *8*  
Dia. of stays *2" eff* Diameter of furnace Top *6'-1"* Bottom *6'-5"* Length of furnace *5'-3"* Thickness of furnace plates *31/32"* Description of joint *Lap* Thickness of furnace crown plates *19/32"* Stayed by *as above* Working pressure of shell by rules *89 lb.*  
Working pressure of furnace by rules *82 lb.* Diameter of uptake *19"* Thickness of uptake plates *1/2"* Thickness of water tubes *3/8"*

SPARE GEAR. State the articles supplied:— *Two top and bottom end bolts & nuts, two main bearing bolts & nuts, spare coupling bolts and nuts, spare feed & bilge pump valves, assorted iron bolts & nuts. (Spare tail shaft, spare propeller, air & circulating pump valves.)*

The foregoing is a correct description,  
of *Main Engines & Boilers* Manufactured by

RICHARDSONS, WESTGARTH & CO., LTD

*Frederic S. Russell*

CHIEF DRAUGHTSMAN

Dates of Survey while building { During progress of work in shops - 1901. - June 21, July 3, 12, 17, 22, 25, 30. August 18, 16, 21, 28, 29. Sept 4, 12, 18, 19. Oct 10, 14, 28. Nov 10, 17, 24, 28. Dec 2, 9, 16, 23, 30. Total No. of visits *29*

Is the approved plan of main boiler forwarded herewith *yes*  
" " " " " donkey " *no*  
" " " " " retained for duplicate

General Remarks (State quality of workmanship, opinions as to class, &c.)

*Machinery constructed under old rules.*

Material of screw shaft *Wrought Iron* Is the screw shaft fitted with a continuous liner the whole length of the stern tube *no*  
Is the after end of the liner made water tight in the propeller boss *no* If the liner is in more than one length are the joints burned *✓*  
If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive *✓* If two liners are fitted, is the shaft lapped or protected between the liners *✓*

*The machinery built under Special Survey the material and workmanship found good and efficient. The main boilers and steam pipes tested under hydraulic pressure to 320 lb. " and found sound and efficient in every respect at that pressure.*

*The Engine tried under steam at their working pressure and found satisfactory.*

*In our opinion this vessel is worthy of the notation*  
*✱ L M C 12. 01 to be made in the Register Book*

It is submitted that  
this vessel is eligible for  
THE RECORD. + L M C 12. 01

The amount of Entry Fee. £ *3* : : When applied for, *31-12-01*  
Special .. .. £ *35* : *12* : :  
Donkey Boiler Fee .. .. £ : : :  
Travelling Expenses (if any) £ : : :  
When received, *20-1-02*

Committee's Minute *TUES. 7 JAN 1902*

Assigned

*+ L M C 12. 01*

*For F. W. Fillmore and self. F.W.F.*  
*Leonard & Shalleross*  
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.



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Foundation