

REPORT ON MACHINERY.

Port of *Sunderland*

WED. 6 AUG 1902

Received at London Office 19

No. in Survey held at *Sunderland* Date, first Survey *10th April* Last Survey *17th July, 1902.*
 Reg. Book. *474* on the *Steam Screw Ship "Bia"* (Number of Visits *12+2=14* July 31/02)
 Master *Goolle* Built at *Goolle* By whom built *Goolle Shipbuilding Co (47)* Tons } Gross *888*
 Net *528* When built *1902*
 Engines made at *Sunderland* By whom made *Mac Coll & Pollock (100)* when made *1902*
 Boilers made at *Sunderland* By whom made *Mac Coll & Pollock (100)* when made *1902*
 Registered Horse Power *104* Owners *Admiral Akhiev Niks* Port belonging to *Sothemburg*
 Nom. Horse Power as per Section 28 *104* 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 *15 - 25 - 41* Length of Stroke *27* Revs. per minute *70* Dia. of Screw shaft as per rule *8.97* Lgth. of stern bush *3'-1 1/2*
 as per rule *7.46* Dia. of Tunnel shaft as fitted *8 1/2* Dia. of Crank shaft journals as per rule *7.84* as fitted *8 1/2* Dia. of Crank pin *8 1/2* Size of Crank webs *1 1/4 x 5 3/8* Dia. of thrust shaft under collars *8 1/2* Dia. of screw *10'-9"* Pitch of screw *12'-6"* No. of blades *4* State whether moveable *no* Total surface *47 sq ft*
 No. of Feed pumps *2* Diameter of ditto *3 1/2* Stroke *16* Can one be overhauled while the other is at work *yes*
 No. of Bilge pumps *2* Diameter of ditto *3 1/2* Stroke *16* Can one be overhauled while the other is at work *yes*
 No. of Donkey Engines *2* Sizes of Pumps *Feed 5 1/4 x 3 1/2 x 5 - Duplex* No. and size of Suctions connected to both Bilge and Donkey pumps
Ballast 6 x 7 1/2 x 6 In Engine Room In Holds, &c. *2 of 3" hold suction 3" fore peak*
3" Engine Room Bilge - 1 of 3" Bilge pump direct - aft peak - 3"
 No. of bilge injections *1* sizes *3* Connected to condenser, or to circulating pump *C-P* Is a separate donkey suction fitted in Engine room & size *yes 3*
 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 *Valves*
 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 *yes*

BOILERS, &c.— (Letter for record *S*) Total Heating Surface of Boilers *1750 sq ft* Is forced draft fitted *no*
 No. and Description of Boilers *one S.E. Q.L. Multitubular* Working Pressure *180 lbs* Tested by hydraulic pressure to *360 lbs*
 Date of test *23.6.02* Can each boiler be worked separately *yes* Area of fire grate in each boiler *53.6* No. and Description of safety valves to each boiler *two direct Spring* Area of each valve *5.94* Pressure to which they are adjusted *185 lbs* Are they fitted with easing gear *yes*
 Smallest distance between boilers or uptakes and bunkers or woodwork *2'-0"* Mean dia. of boilers *13'-9"* Length *10'-3"* Material of shell plates *Steel*
 Thickness *1 3/32* Range of tensile strength *28 1/2 tons* Are they welded or flanged *no* Descrip. of riveting: cir. seams *D.R. Lap* long. seams *Ch. R. D. A. S*
 Diameter of rivet holes in long. seams *1 1/8* Pitch of rivets *8.375* Lap of plates or width of butt straps *16 1/2*
 Per centages of strength of longitudinal joint rivets *96.8%* Working pressure of shell by rules *180.1 lbs* Size of manhole in shell *16" x 12"*
 plate *86.54%* Size of compensating ring *27 1/4 x 28 x 1 3/32* No. and Description of Furnaces in each boiler *three plain* Material *Steel* Outside diameter *3'-4 1/2*
 Length of plain part top *6'-5"* Thickness of plates crown *3"* Description of longitudinal joint *welded* No. of strengthening rings *13 1/2 x 3 x 3/4*
 bottom *4"* Working pressure of furnace by the rules *180.2* Combustion chamber plates: Material *Steel* Thickness: Sides *19/32* Back *19/32* Top *19/32* Bottom *7/8*
 Pitch of stays to ditto: Sides *8 x 8 1/4* Back *7 1/4 x 9* Top *8 x 6* If stays are fitted with nuts or riveted heads *nut in C. ch* Working pressure by rules *182*
 Material of stays *Steel* Diameter at smallest part *1.5* Area supported by each stay *7 1/2 x 9* Working pressure by rules *183 lbs* End plates in steam space:
 Material *Steel* Thickness *6 1/4* Pitch of stays *14.5 x 15.5* How are stays secured *S. N + W* Working pressure by rules *180 lbs* Material of stays *Steel*
 Diameter at smallest part *2.5* Area supported by each stay *14.5 x 15.5* Working pressure by rules *180 lbs* Material of Front plates at bottom *Steel*
 Thickness *13/16* Material of Lower back plate *Steel* Thickness *5 1/4* Greatest pitch of stays *1-0 1/8* Working pressure of plate by rules *204*
 Diameter of tubes *3 1/4* Pitch of tubes *4 1/2 x 4 1/2* Material of tube plates *Steel* Thickness: Front *13/16* Back *13/16* Mean pitch of stays *13 1/2 x 9*
 Pitch across wide water spaces *14 1/2* Working pressures by rules *187 lbs* Girders to Chamber, tops: Material *Steel* Depth and
 thickness of girder at centre *6 3/4 x 11 x (2)* Length as per rule *23 3/8* Distance apart *8* Number and pitch of Stays in each *2 of 6" pitch*
 Working pressure by rules *185 lbs* Superheater or Steam chest; how connected to boiler *none* Can the superheater be shut off and the boiler worked
 separately *yes* Diameter Length Thickness of shell plates Material Description of longitudinal joint Diam. of rivet
 holes Pitch of rivets Working pressure of shell by rules Diameter of flue Material of flue plates Thickness
 If stiffened with rings Distance between rings Working pressure by rules End plates: Thickness How stayed
 Working pressure of end plates Area of safety valves to superheater Are they fitted with easing gear

DONKEY BOILER— No. *one* Description *Cochran's Patent, vertical*
 Made at *Annan* By whom made *Cochran & Co* When made *4.4.02* Where fixed *Stobekhold*
 Working pressure *90* tested by hydraulic pressure to *180* lbs No. of Certificate *6030* Fire grate area *20 1/4* Description of safety valves *Direct spring*
 No. of safety valves *2* Area of each *7* Pressure to which they are adjusted *90* lbs If fitted with easing gear *Yes* If steam from main boilers can enter the donkey boiler *No* Dia. of donkey boiler *6'-6"* Length *14'-6"* Material of shell plates *Steel* Thickness *1/2"* Range of tensile strength *24/32* Descrip. of riveting long. seams *double* Dia. of rivet holes *24/32* Whether punched or drilled *drilled* Pitch of rivets *2 3/4"*
 Lap of plating *4 1/2"* Per centage of strength of joint Rivets *69.1%* Thickness of shell crown plates *7/16* Radius of do. *3'-3"* No. of Stays to do. *none*
 Dia. of stays *1/2"* Diameter of furnace Top *2'-7 1/2"* Bottom *2'-7 1/2"* Length of furnace *14'-6"* Thickness of furnace plates *19/32* Description of joint *Riveted* Thickness of furnace crown plates *19/32* Stayed by *None* Working pressure of shell by rules *103 1/4*
 Working pressure of furnace by rules *113 1/2* Diameter of uptake tubes *3 1/2"* Thickness of uptake plates *13/16 - 13 2/32* Thickness of water tubes *1/4*

SPARE GEAR. State the articles supplied: *Two top end bolts and nuts, two bottom end bolts and nuts, two main bearing bolts & nuts, spare coupling bolts and nuts, spare feed and bilge pump valves, assorted iron bolts and nuts,*

The foregoing is a correct description,
Maclean & Pollock Manufacturer.

Dates of Survey while building: During progress of work in shops - *1902 - April 10, 13, 14, 17, 24 June 13, 18, 23 July 2, 12, 14, 17.*
 During erection on board vessel - *July - July 30, 31*
 Total No. of visits *12 + 2 = 14* Is the approved plan of main boiler forwarded herewith *Yes*
 " " " donkey " " " *Yes*

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

Material of screw shaft *Woot Iron* Is the screw shaft fitted with a continuous liner the whole length of the stern tube *no liners*
 Is the after end of the liner made water tight in the propeller boss 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 *Shaft fitted with oil lubricator. (Caedonool Bush)*

The machinery built under Special Survey, the material and workmanship found good and efficient.
The main boiler and steam pipe tested under hydraulic pressure to 360 lbs. and found sound and efficient in every respect at that pressure.
The engine tried under steam at their working pressures and found Satisfactory.
In my opinion this vessel is worthy of the certification of R.M.C. 7.02 to be made in the Register Book.

It is submitted that this vessel is eligible for THE RECORD. + LMC 7.02.

The amount of Entry Fee... £ 2 : : When applied for, 28.7.02
 Special... £ 15 : 12 : :
 Donkey Boiler Fee... £ : : :
 Travelling Expenses (if any) £ : : :
 When received, 14.8.02

Leonard's Shalloross J. Kerr
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute *FRI. 8 AUG 1902*
 Assigned *+ LMC 7.02*

Gunderland

Certificate (if required) to be sent to the Registrar (The Surveyors are requested not to write on or below the space for Committee's Minute.)

