

REPORT ON MACHINERY.

Port of *Greenock*Received at London Office *18.31 MAY 1894*No. in Survey held at *Port Glasgow & Greenock* Date, first Survey *June 7. 1893* Last Survey *13. May 1894*
Reg. Book. *Supplement* (Number of Visits *109*)45. on the *Screw Steamer "Strathgairn"*Gross *4142.03*
Tons Net *2678.41*
When built *1894*Master *Robert Kenzie* Built at *Greenock* By whom built *Russell & Co.*Engines made at *Port Glasgow* By whom made *Blackwood & Gordon* when made *1894*Boilers made at *do* By whom made *do* when made *1894*Registered Horse Power *353* Owners *Burrell & Son* Port belonging to *Glasgow*Nom. Horse Power as per Section 28 *347*

ENGINES, &c.— Description of Engines *Inverted Direct Acting Triple Expansion* No. of Cylinders *Three*
 Diameter of Cylinders *26.42 & 69* Length of Stroke *48* Revolutions per minute *70* Diameter of Screw shaft *as per rule 12.6*
 Diameter of Tunnel shaft *as fitted 13* Diameter of Crank shaft journals *13 1/2* Diameter of Crank pins *13 1/2* Size of Crank webs *18 x 8 1/2*
 Diameter of screw *17.6* Pitch of screw *18.3* No. of blades *4* State whether moveable *yes* Total surface *76 projected*
 No. of Feed pumps *Two* Diameter of ditto *4 1/2* Stroke *30* Can one be overhauled while the other is at work *yes*
 No. of Bilge pumps *Two* Diameter of ditto *4 1/2* Stroke *30* Can one be overhauled while the other is at work *yes*
 No. of Donkey Engines *Three* Sizes of Pumps *2 x 14, 1 1/2 x 14, 1 1/2 x 14* No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room *Three 3 1/2* In Holds, &c. *Eight 3 1/2 in holds & cross beams and one in tunnel well*
 No. of bilge injections *one* sizes *6"* Connected to condenser, or to circulating pump *circ pump* a separate donkey suction fitted in Engine room & size *yes 3 1/2*
 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 *none fitted*
 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 *Hold bilge pipes* How are they protected *wood casing*
 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 *on ship before launching* Is the screw shaft tunnel watertight *yes*
 Is it fitted with a watertight door *yes* worked from *2nd platform*

BOILERS, &c.— (Letter for record *S*) Total Heating Surface of Boilers *5500 square feet*
 No. and Description of Boilers *Three Round Horizontal Iron Horizontal* Working Pressure *170 lbs* Tested by hydraulic pressure to *340 lbs*
 Date of test *26.3.94* Can each boiler be worked separately *yes* Area of fire grate in each boiler *42.74 sq ft* No. and Description of safety valves to
 each boiler *Two Direct Spring* Area of each valve *5.94 sq in* Pressure to which they are adjusted *174 lbs* Are they fitted
 with easing gear *yes* Smallest distance between boilers or uptakes and bunkers or woodwork *3.0* Mean diameter of boilers *13.6*
 Length *11.6* Material of shell plates *Steel* Thickness *1 1/2* Description of riveting: circum. seams *Lap double* long. seams *Double strap treble*
 Diameter of rivet holes in long. seams *1 1/2* Pitch of rivets *7 1/2 & 3 3/8* Lap of plates or width of butt straps *16 1/2 straps*
 Per centages of strength of longitudinal joint *87.5* Working pressure of shell by rules *170 lbs* Size of manhole in shell *16 x 12*
 Size of compensating ring *28 1/2 x 23 1/2 x 1 1/2* No. and Description of Furnaces in each boiler *Three ribbed* Material *Steel* Outside diameter *39*
 Length of plain part *9* Thickness of plates *1 1/2* Description of longitudinal joint *welded* No. of strengthening rings *—*
 Working pressure of furnace by the rules *178 lbs* Combustion chamber plates: Material *Steel* Thickness: Sides *9/16* Back *19/32* Top *9/16* Bottom *7/8*
 Pitch of stays to ditto: Sides *7 3/4 x 7 3/4* Back *8 1/4 x 8 1/4* Top *7 3/4 x 7 3/4* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *174 lbs*
 Material of stays *Steel* Diameter at smallest part *1 3/8* Area supported by each stay *60.68 sq in* Working pressure by rules *174 lbs* End plates in steam space:
 Material *Steel* Thickness *3/32* Pitch of stays *15 5/8 x 15 1/2* How are stays secured *double nut* Working pressure by rules *172 lbs* Material of stays *Steel*
 Diameter at smallest part *2 1/4* Area supported by each stay *242.6* Working pressure by rules *173 lbs* Material of Front plates at bottom *Steel*
 Thickness *3/4* Material of Lower back plate *Steel* Thickness *23/32* Greatest pitch of stays *13 3/4* Working pressure of plate by rules *182 lbs*
 Diameter of tubes *2 1/2* Pitch of tubes *3 3/8* Material of tube plates *Steel* Thickness: Front *3/16* Back *3/16* Mean pitch of stays *9.68*
 Pitch across wide water spaces *14* Working pressures by rules *194 lbs* Girders to Chamber tops: Material *Steel* Depth and
 thickness of girder at centre *7 3/4 x 7/8 double* Length as per rule *32* Distance apart *7 1/2* Number and pitch of Stays in each *Three 7 3/4*
 Working pressure by rules *173 lbs* Superheater or Steam chest; how connected to boiler *—* Can the superheater be shut off and the boiler worked
 separately *—* 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— Description *See attached Report*

Made at _____ By whom made _____ When made _____ Where fixed _____

Working pressure _____ tested by hydraulic pressure to _____ No. of Certificate _____ Fire grate area _____ Description of safety valves _____

No. of safety valves _____ Area of each _____ Pressure to which they are adjusted _____ If fitted with easing gear _____ If steam from main boilers can enter the donkey boiler _____

Diameter of donkey boiler _____ Length _____ Material of shell plates _____ Thickness _____

Description of riveting long. seams _____ Diameter of rivet holes _____ Whether punched or drilled _____ Pitch of rivets _____

Lap of plating _____ Per centage of strength of joint _____ Rivets _____ Thickness of shell crown plates _____ Radius of do. _____ No. of Stays to do. _____

Dia. of stays _____ Diameter of furnace Top _____ Bottom _____ Length of furnace _____ Thickness of furnace plates _____ Description of joint _____

Thickness of furnace crown plates _____ Stayed by _____ Working pressure of shell by rules _____

Working pressure of furnace by rules _____ Diameter of uptake _____ Thickness of uptake plates _____ Thickness of water tubes _____

SPARE GEAR. State the articles supplied:— *1 length crank shaft, 1 propeller shaft complete, 1 H.P. valve spindle, 1 I.P. & 1 E.P. do., 4 propeller blades & studs & nuts for same, 12 pin & ring pins, 1 set of springs for each piston, 12 studs for Cylinder Covers, 1 set valves & seats for bilge & feed pumps, 2 bottom end & 4 top end bolts & nuts, 2 main*

The foregoing is a correct description,

Blackburn & Sons Manufacturer.

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

*These Engines and Boilers have been specially examined during construction, quality of workmanship good. Shafts examined when being turned & found apparently sound. Main Steam pipes tested by hydraulic pressure to 320 lbs per sq. inch, tests satisfactory. The Machinery and Boilers are satisfactorily fitted in board and have been tested under full steam. They are now in good order and safe working condition and are in my opinion eligible to be noted in Register Book. **LMC. 5.94.***

Spare gear Continued

heating bolts & nuts, 2 sets coupling bolts & nuts, 2 eccentric bolts & 2 studs for eccentric rod bottom end, 12 Quantity Metal studs for pumps, 2 springs for safety valve, 1 spring for feed relief, 24 tubes for Main boiler (18 plain & 6 stay), 12 tubes for Donkey boiler (10 plain & 2 stay), 36 tubes for Condenser, & 50 screws & ferrules, 2 check valves for Main Boilers, 2 glands & 4 bolts for boiler doors, 1/2 set furnace bars for Main boiler, 1/2 set for Donkey boiler, 1 set valves for air pump, 1 do for circulating pumps, 1 do for ballast pump, fine plates for boiler, a quantity of bolts & nuts & iron assorted.

This vessel's Main boilers are fitted with forced draught, Howard's system.

It is submitted that
this vessel is eligible for
THE RECORD + **LMC. 5-94**

H.A.
31-5-94

Certificate (if required) to be sent to *Greenock Office*

The amount of Entry Fee..	£	3	:	:	When applied for,
Special	£	37	:	7	25.5.18.94
Donkey Boiler Fee	£	:	:	:	When received,
Travelling Expenses (if any) £	:	:	:	:	18.

C.A.B. Merriam
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.
Greenock District.

Committee's Minute

FRI. 1 JUN 1894

Assigned

+ LMC 5.94



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Foundation