

REPORT ON MACHINERY.

Port of *Barrow.*

Received at London Office **THURS. 17th NOV 1892.**

No. in Survey held at *Barrow in Furness* Date, first Survey *8th Dec 91* Last Survey *10th Nov 1892*
 Reg. Book. *586* on the *S.S. "Clan Macintosh"* (Number of Visits *89*)
 Master *W. Allister* Built at *Greenock* By whom built *Scott & Co*
 Engines made at *Greenock* By whom made *Naval Construction Co Ltd* when made *End. 1892*
 Boilers made at *Barrow* By whom made *Naval Construction Co Ltd* when made *1892*
 Registered Horse Power *600* Owners *Cayzer Irvine & Co* Port belonging to *Glasgow*
 Nom. Horse Power as per Section 28 *474* class *100A 15-91, S.S. Glasgow 1891, T.M.C. 5-91.*

Gross *3978 3994*
 Net *2636 2619*
 When built *1883*

ENGINES, &c.— Description of Engines *Triple Expansion Three Cranks.* No. of Cylinders *Three*
 Diameter of Cylinders *30 1/2 H 8, 8 7/8* Length of Stroke *60* Revolutions per minute *60* Diameter of Screw shaft *as per rule 14 7/8*
 Diameter of Tunnel shaft *as per rule 14 7/8* Diameter of Crank shaft journals *16 1/2* Diameter of Crank pin *17* Size of Crank webs *37 x 17*
 Diameter of screw *19 0* Pitch of screw *about 25 ft* No. of blades *4* State whether moveable *Yes* Total surface *about 95 ft*
 No. of Feed pumps *2* Diameter of ditto *8 1/2* Stroke *21* Can one be overhauled while the other is at work *Yes*
 No. of Bilge pumps *2* Diameter of ditto *7* Stroke *30* Can one be overhauled while the other is at work *Yes*
 No. of Donkey Engines *2* Sizes of Pumps *6 x 12 Stroke* No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room *Five Suctions each 3" diam* In Holds, &c. *1st Hold 2 Suctions 3" diam Mainst. 2 Suctions 3" diam 2nd Hold 2 Suctions 3" diam 3rd Hold 2 Suctions 3" diam 4th Hold 2 Suctions 3" diam 5th Hold 2 Suctions 3" diam*
 No. of bilge injections *2* sizes *6 dia* Connected to condenser, or to circulating pump *Yes* Is a separate donkey suction fitted in Engine room & size *2 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 *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 *Suctions 6" bore complete* How are they protected *Strong wood casings*
 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 *23rd June 92* Is the screw shaft tunnel watertight *Yes*
 Is it fitted with a watertight door *Yes* worked from *Mid Platform*

OILERS, &c.— (Letter for record *S.*) Total Heating Surface of Boilers *6411 sq ft.*
 No. and Description of Boilers *Two Tubular* Working Pressure *160 lbs* Tested by hydraulic pressure to *370 lbs*
 Date of test *14/7/92* Can each boiler be worked separately *Yes* Area of fire grate in each boiler *80 sq ft* No. and Description of safety valves to each boiler *Two Leach's Spring* Area of each valve *14 1/4* Pressure to which they are adjusted *160 lbs* Are they fitted with easing gear *Yes* Smallest distance between boilers or uptakes and bunkers or woodwork *14"* Mean diameter of boilers *16'-6"*
 Length *12-0* Material of shell plates *Steel* Thickness *29/64* Description of riveting: circum. seams *lap, 1 reb. 1 Dnd. by seams* D.B.S. 5 Rows
 Diameter of rivet holes in long. seams *1 7/16* Pitch of rivets *9 x 4 1/2* Lap of plates or width of butt straps *20 3/8*
 Per centages of strength of longitudinal joint *86* Working pressure of shell by rules *160 lbs* Size of manhole in shell *16 x 12*
 Size of compensating ring *35 1/2 x 27 x 1 29/64* No. and Description of Furnaces in each boiler *Two Peap's* Material *Steel* Outside diameter *3.10 13/16*
 Length of plain part *9* Thickness of plates *17/32* Description of longitudinal joint *Ribbed Furnace welded* No. of strengthening rings *1*
 Working pressure of furnace by the rules *170 lbs* Combustion chamber plates: Material *Steel* Thickness: Sides *5/8* Back *9/16* Top *9/16* Bottom *5/8*
 Pitch of stays to ditto: Sides *9 x 8 1/4* Back *7 1/2 x 7 1/2* Top *7 1/2 x 7 1/2* If stays are fitted with nuts or riveted heads *Nuts* Working pressure by rules *167 lbs*
 Material of stays *Steel* Diameter at smallest part *1 1/4* Area supported by each stay *56 1/4* Working pressure by rules *177 lbs* End plates in steam space:
 Material *Steel* Thickness *1 5/32* Pitch of stays *16 1/2 x 16 3/8* How are stays secured *By Nuts* Working pressure by rules *176 1/2 lbs* Material of stays *Steel*
 Diameter at smallest part *2 1/2* Area supported by each stay *290* Working pressure by rules *161 3/8* Material of Front plates at bottom *Steel*
 Thickness *3/4* Material of Lower back plate *Steel* Thickness *1 3/16* Greatest pitch of stays *about 12"* Working pressure of plate by rules *164 3/8*
 Diameter of tubes *2 1/2* Pitch of tubes *3 3/4 x 3 5/8* Material of tube plates *Steel* Thickness: Front *25/32* Back *7/4* Mean pitch of stays *7 1/2*
 Pitch across wide water spaces *14"* Working pressures by rules *185 1/2 lbs* Girders to Chamber tops: Material *Steel* Depth and thickness of girder at centre *7 1/2 x 1 3/4* Length as per rule *30 7* Distance apart *7 1/2* Number and pitch of Stays in each *3 x 9 1/2*
 Working pressure by rules *187 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 *✓*
 Stays *✓* 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 *The old donkey boiler has been re-fitted to vessel.*
 Made at *In Stockholm* By whom made *In Stockholm* When made *In Stockholm* Where fixed *In Stockholm*
 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:—

The foregoing is a correct description,

Manufacturer.

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

The Machinery of this vessel has now been converted to the Triple Expansion type by the Naval Constructors Company, Ltd. Now done. New Main Boilers with new smoke boxes, Flues, and Mountings complete fitted to the vessel. The Auxiliary Boiler taken to shop & examined and repaired as follows:— 37 new sheet screwed stays fitted, a riveted patch put on bottom of shell. Lower portion of back plating of Combustion chamber renewed. Four new stays each 1 1/2 effective diam fitted to support tube plates in wide space. Boiler re-fitted in vessel and tested by water pressure to 160 lbs per square inch. Main Engine removed to shop & new HP Engine fitted complete. New HP cylinder with new piston rings and slide valve fitted. Old LP cylinder bored out and a Liner and new piston and slide valve fitted. Piston Rods and Slide Spindles of HP & LP engine turned and new bushes fitted. All slide valve gear overhauled and put in good order. New metal put in Main bearings and a new Crank Shaft fitted. All Pumps overhauled and put in good working order. Weir, Pump with Evaporator and Heater now fitted. Tubes removed from Condenser same cleaned and examined. Condenser re-tubed about 540 new tubes being put in. Tail Shaft drawn in and examined and found satisfactory. Propeller Box re-fitted & shaft in place. New wood lining fitted in stern-bulk. New blades fitted to Propeller. Shafting examined. Stern Shaft found to be flawed & new Stern Shaft now fitted. All Sea Connections overhauled and examined and

Certificate (if required) to be sent to
 The amount of Entry Fee £ : : When applied for, *1892*
 Special *15 0* : : : :
 Donkey Boiler Fee £ : : : :
 Travelling Expenses (if any) £ : : : : *22/11/1892*

J. P. Ritchie, Gas Engineer
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute *FR! 18 NOV 1892*
 Assigned *+ LMC 11, 92 + NB 11, 92*
Tpd. 92
and + LMC 11, 92. Estimate repairs have been carried out on the engine.
FR! 2 DEC 1892
17 11

Port of *Barrow*

Continuation of Report No. 473 dated 16th Nov 1892 on the

Machinery of this "Clau Macintosh" and part-re-fitted. Bridge Motion pipes and roses part-revised and now in good order. Engine, re-fitted into vessel and thick under steam. Safety valves of main Boiler adjusted to admit of a working pressure of 160 lbs per square inch and the safety valves of Auxiliary Boiler loaded under steam to 85 lbs per square inch. The Main Boilers of this vessel are fitted with Woodcock's System of Forced Draught. The electric light installation overhauled and repaired.

The Machinery of this vessel is in good order and safe working condition and it is recommended that the notification *NB 11-92* and *LMC 11-92* be assigned.

