

## REPORT ON MACHINERY.

Port of *Belfast*

Received at London Office

THURS. 10 MAR 1892

No. in Survey held at *Belfast*Date, first Survey *September 10* Last Survey *March 5* 1892

Reg. Book:

(Number of Visits *31*)on the *Steel Twin Screw Steamer "Massachusetts"*Tons { Gross *5590*  
Net *3600*  
When built *1892*Master *A. Williams* Built at *Belfast*By whom built *Harland & Wolff Ltd.*Engines made at *Belfast*By whom made *Harland & Wolff Ltd.*when made *1892*Boilers made at *Belfast*By whom made *Harland & Wolff Ltd.*when made *1892*Registered Horse Power *600*Owners *Williams, Torrey & Field, Ltd.* Port belonging to *London*Nom. Horse Power as per Section 28 *599-5*

**ENGINES, &c.—** Description of Engines *Triple Expansion. Twin Screws* No. of Cylinders *Six*

Diameter of Cylinders *22 1/2"; 36 1/2"; 60"* Length of Stroke *48"* Revolutions per minute *72* Diameter of Screw shaft *as per rule 11 7/8 ins*  
*as fitted 13 ins*

Diameter of Tunnel shaft *as fitted 12 1/4"* Diameter of Crank shaft journals *12 3/4"* Diameter of Crank pin *12 3/4"* Size of Crank webs *9" x 16" shaped*

Diameter of screw *15" 4 1/2"* Pitch of screw *21 ft* No. of blades *3* State whether moveable *yes* Total surface *60 sq ft each screw*

No. of Feed pumps *two* Diameter of ditto *3 1/2"* Stroke *24"* Can one be overhauled while the other is at work *One pump on each engine*

No. of Bilge pumps *two* Diameter of ditto *5"* Stroke *24"* Can one be overhauled while the other is at work *" " " "*

No. of Donkey Engines *Four* Sizes of Pumps *Working low 9" x 6" duplex  
Watson's Westminster 10" x 10" ballast  
Weirs 10" x 8" 2 1/2" feed In Holds, &c.* No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room *Three 3" both bilge & Weirs 10" x 8" 2 1/2" feed In Holds, &c.* No. 1 Hold *two 2 1/2"* No. 2 Hold *two 2 1/2"*

Donkey pumps: *One 2 1/2" separate donkey suction.* No. 3 Hold *two 2 1/2" ins.* No. 4 Hold *one 3"* No. 5 Hold *two 2 1/2"*

No. of bilge injections *2 sizes 6 ins.* Connected to condenser, or to circulating pump *See p. 8* Is a separate donkey suction fitted in Engine room & size *yes*

Are all the bilge suction pipes fitted with roses *except 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 & Cocks*

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 *below*

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 *lead bilge pipes* How are they protected *Strong 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 *examined before launching* Is the screw shaft tunnel watertight *yes*

Is it fitted with a watertight door *yes* worked from *level of upper deck*

**BOILERS, &c.—** (Letter for record *3*) Total Heating Surface of Boilers *10500 sq ft*

No. and Description of Boilers *Two double ended, 4 two single ended* Working Pressure *175 lbs* Tested by hydraulic pressure to *350 lbs*

Date of test *3.12.91* Can each boiler be worked separately *yes* Area of fire grate in each boiler *109 double 54 single* No. and Description of safety valves to

each boiler *Cockburn's, two each boiler* Area of each valve *17 7/8" diam. 8-95 lbs.* Pressure to which they are adjusted *175 lbs* Are they fitted

with easing gear *yes* Smallest distance between boilers or uptakes and bunkers or woodwork *5' 6" to corner Mean diameter of boilers 14' 1"*

Length *17' 6" diam. 9" 9" rivets* Material of shell plates *Steel* Thickness *1 1/2"* Description of riveting: circum. seams *treb.; ends double long. seams treb. riv. doub. butt*

Diameter of rivet holes in long. seams *1 3/8"* Pitch of rivets *9 ins & 4 1/2" ins* Lap of plates or width of butt straps *Straps 20 1/2" x 1 1/16"*

Percentage of strength of longitudinal joint *88.40* Working pressure of shell by rules *175.1 lbs* Size of manhole in shell *16" x 12"*

Size of compensating ring *2' 7" x 2' 3" x 1 1/32"* No. and Description of Furnaces in each boiler *6 in double end 3" single* Material *Steel* Outside diameter *3' 4 1/2"*

Length of plain part *top ribs spaced 9" bottom 9"* Thickness of plates *17/32"* Description of longitudinal joint *Weld; patent ribbed flues* No. of strengthening rings *9 ribs*

Working pressure of furnace by the rules *185 lbs* Combustion chamber plates: Material *Steel* Thickness: Sides *19/32"* Back *19/32"* Top *5/8"* Bottom *3/4"*

Pitch of stays to ditto: Sides *7 7/8" x 7 7/8"* Back *7 1/2" x 7 7/8"* Top *8" x 8 1/4"* If stays are fitted with nuts or riveted heads *nuts inside, riveted outside.* Working pressure by rules *196 lbs*

Material of stays *Steel* Diameter at smallest part *1 3/8"* Area supported by each stay *62 sides 66 top* Working pressure by rules *191 sides 179 top* End plates in steam space:

Material *Steel* Thickness *31/32"* Pitch of stays *16 3/4" x 17 1/4"* How are stays secured *Double nuts & largest washers* Working pressure by rules *177 lbs* Material of stays *Steel*

Diameter at smallest part *2 5/8"* Area supported by each stay *278"* Working pressure by rules *178 lbs* Material of Front plates at bottom *Steel*

Thickness *13/16"* Material of Lower back plate *Steel* Thickness *29/32"* Greatest pitch of stays *as approx* Working pressure of plate by rules *175*

Diameter of tubes *3 1/4"* Pitch of tubes *4 1/2"* Material of tube plates *Steel* Thickness: Front *7/8"* Back *3/4"* Mean pitch of stays *9 ins*

Pitch across wide water spaces *1' 2 1/2"* Working pressures by rules *175 lbs +* Girders to Chamber tops: Material *W. Iron* Depth and

Thickness of girder at centre *10" x 5 1/4"* Length as per rule *37 1/2" doub.* Distance apart *8 1/4"* Number and pitch of Stays in each *four pit. 8" doub. 2. two 8" sing. 2.*

Working pressure by rules *220 lbs* Superheater or Steam chest; how connected to boiler *none* Can the superheater be shut off and the boiler worked

separately *yes* Diameter *2' 2" Sing.* Length *2' 2" Sing.* Thickness of shell plates *1 1/2"* Material *Steel* Description of longitudinal joint *Weld* Diam. of rivet

Pitch of rivets *1 1/2"* Working pressure of shell by rules *175 lbs* Diameter of flue *10"* Material of flue plates *Steel* Thickness *1 1/2"*

Stays *yes* Distance between rings *12"* Working pressure by rules *175 lbs* End plates: Thickness *1 1/2"* How stayed *Weld*

Working pressure of end plates *175 lbs* Area of safety valves to superheater *175 lbs* Are they fitted with easing gear *yes*



# DONKEY BOILER— Description

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 J.P. valve spindle. 1 pair con<sup>d</sup> rod braces. Air pump bucket, rod, head valve, seat & guard. Centrifugal spindle & impeller. Set air pump valves. 2 main bearing bolts & nuts. 2 con<sup>d</sup> rod top end bolts & nuts & 2 bottom end. Set coupling bolts. 2 propeller blades. Set cross head braces. Set pump head braces. Cyl. escape valve & spring. Eccentric strap. Set piston springs. 6 pump r. bolts. 6 cyl. cov. bolts. The foregoing is a correct description, 4 valve chest bolts. Set feed & bilge pump valves & seats. Set springs for safety & escape valves. 8 propeller studs & nuts. Set feed chest valves. 10 boiler tubes. Assorted bolts & nuts.

*Horland & Co. Ltd. Manufacturer.*

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

The engines & boilers of this vessel have been constructed under special survey & in accordance with the enclosed drawings of the boilers.

The workmanship is throughout good. The steel has been tested as required by the Rules. Each of the boilers & each separate length of the main steam pipes have been tested by water to double the working pressure with good result.

The safety valves have been adjusted to blow off at 175 lbs per sq. in. & the engines have been worked satisfactorily for several hours under full steam.

The vessel is lighted throughout by electricity; & the particulars of the installation will be forwarded shortly.

The machinery, in my opinion, renders the vessel eligible for the record of + ~~LMC~~ 3.92 in the Society's Register Book.

It is submitted that this vessel is eligible for THE RECORD + LMC 3.92

*M.A. 10-3-92*

Certificate (if required) to be sent to

The amount of Entry Fee... £ 3 : 0 : 0 When applied for, \_\_\_\_\_

Special ... £ 50 : 0 : 0 \_\_\_\_\_

Donkey Boiler Fee ... £ \_\_\_\_\_

Travelling Expenses (if any) £ \_\_\_\_\_

MACHINERY CERTIFICATE WRITTEN

When received \_\_\_\_\_

Committee's Minute

FRI 11 MAR 1892

Assigned

*LMC 3.92*

*A. L. Jones*

Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.



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