

# REPORT ON MACHINERY.

Port of Belfast

Received at London Office FRI 20 OCT 1893

No. in Survey held at Belfast  
eg. Book.

Date, first Survey March 10<sup>th</sup> Last Survey October 13<sup>th</sup> 1893

(Number of Visits 20)

148 on the Iron screw steamer "Ardanbhan"

Tons { Gross 1132  
Net 718

Master R. Smith Built at W. Glasgow By whom built H. Murray & Co

When built 1880-6

Engines made at Glasgow By whom made W. King & Co when made 1880

Machinery made at Belfast By whom made Mac Swaine & Mac Coll. Lim. when made 1893-10

Registered Horse Power 98 Owners Ardan S.S. Co, Lim. Port belonging to Glasgow

Actual Horse Power as per Section 28 148 (by Rule for triple expansion)

**ENGINES, &c.—** Description of Engines Compound. No. of Cylinders Two

Diameter of Cylinders 25 & 50 Length of Stroke 36" Revolutions per minute \_\_\_\_\_ Diameter of Screw shaft \_\_\_\_\_  
as per rule \_\_\_\_\_ as fitted \_\_\_\_\_

Diameter of Tunnel shaft \_\_\_\_\_ Diameter of Crank shaft journals \_\_\_\_\_ Diameter of Crank pin \_\_\_\_\_ Size of Crank webs \_\_\_\_\_  
as fitted \_\_\_\_\_

Diameter of screw \_\_\_\_\_ Pitch of screw \_\_\_\_\_ No. of blades \_\_\_\_\_ State whether moveable \_\_\_\_\_ Total surface \_\_\_\_\_

Diameter of Feed pumps \_\_\_\_\_ Diameter of ditto \_\_\_\_\_ Stroke \_\_\_\_\_ Can one be overhauled while the other is at work \_\_\_\_\_

Diameter of Bilge pumps \_\_\_\_\_ Diameter of ditto \_\_\_\_\_ Stroke \_\_\_\_\_ Can one be overhauled while the other is at work \_\_\_\_\_

Diameter of Donkey Engines \_\_\_\_\_ Sizes of Pumps \_\_\_\_\_ No. and size of Suctions connected to both Bilge and Donkey pumps \_\_\_\_\_

Engine Room \_\_\_\_\_ In Holds, &c. \_\_\_\_\_

Diameter of bilge injections \_\_\_\_\_ sizes \_\_\_\_\_ Connected to condenser, or to circulating pump \_\_\_\_\_ Is a separate donkey suction fitted in Engine room & size \_\_\_\_\_

Are all the bilge suction pipes fitted with roses \_\_\_\_\_ Are the roses in Engine room always accessible \_\_\_\_\_ Are the sluices on Engine room bulkheads always accessible \_\_\_\_\_

Are all connections with the sea direct on the skin of the ship \_\_\_\_\_ Are they Valves or Cocks \_\_\_\_\_

Are they fixed sufficiently high on the ship's side to be seen without lifting the stokehold plates \_\_\_\_\_ Are the discharge pipes above or below the deep water line \_\_\_\_\_

Are they each fitted with a discharge valve always accessible on the plating of the vessel \_\_\_\_\_ Are the blow off cocks fitted with a spigot and brass covering plate \_\_\_\_\_

How are the pipes at pipes are carried through the bunkers \_\_\_\_\_ How are they protected \_\_\_\_\_

Are all pipes, cocks, valves, and pumps in connection with the machinery and all boiler mountings accessible at all times \_\_\_\_\_

Are the bilge suction pipes, cocks, and valves arranged so as to prevent any communication between the sea and the bilges \_\_\_\_\_

Were stern tube, propeller, screw shaft, and all connections examined in dry dock \_\_\_\_\_ Is the screw shaft tunnel watertight \_\_\_\_\_

Is it fitted with a watertight door \_\_\_\_\_ worked from \_\_\_\_\_

**BOILERS, &c.—** (Letter for record S) Total Heating Surface of Boilers 2118.5

Number and Description of Boilers One single-ended 3-flue Working Pressure 100 Tested by hydraulic pressure to 200

Date of test 4.9.93 Can each boiler be worked separately \_\_\_\_\_ Area of fire grate in each boiler 64 1/2 No. and Description of safety valves to boiler Two, Cornbells pat. Area of each valve 12.56 Pressure to which they are adjusted 105 lbs Are they fitted with easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork \_\_\_\_\_ Mean diameter of boilers 15" 0

Thickness of shell plates 10" 6 Material of shell plates steel Thickness 7/8" Description of riveting: circum. seams doub. riv. long. seams doub. straps

Diameter of rivet holes in long. seams 1" Pitch of rivets 6" Length of plates or width of butt straps 15 1/2" x 3/4"

Percentages of strength of longitudinal joint \_\_\_\_\_ rivets 89.0 Working pressure of shell by rules 111 lbs Size of manhole in shell 16" x 12"

Diameter of compensating ring 27 1/2" x 23 1/2" x 1 1/2" No. and Description of Furnaces in each boiler 3 ribbed Material steel Outside diameter 43 7/8"

Thickness of plain part \_\_\_\_\_ top \_\_\_\_\_ bottom \_\_\_\_\_ Thickness of plates \_\_\_\_\_ crown 7/16" Description of longitudinal joint welded No. of strengthening rings 9 ribs

Working pressure of furnace by the rules 132 Combustion chamber plates: Material steel Thickness: Sides 1/2" Back 1/2" Top 1/2" Bottom 9/16"

Thickness of stays to ditto: Sides 8 3/4" x 7/4" Back 8 1/2" x 8 3/4" Top 7" x 8 1/2" If stays are fitted with nuts or riveted heads \_\_\_\_\_ Working pressure by rules 100

Material of stays steel Diameter at smallest part 1 1/8" Area supported by each stay 76 1/2 Working pressure by rules 103 End plates in steam space: \_\_\_\_\_

Material steel Thickness 13/16" Pitch of stays 16 x 16 How are stays secured doub. nuts Working pressure by rules 122 Material of stays steel

Diameter at smallest part 2 1/4" Area supported by each stay 256 Working pressure by rules 106 Material of Front plates at bottom steel

Thickness 1/16" Material of Lower back plate steel Thickness 1/16" Greatest pitch of stays as approx Working pressure of plate by rules 100

Diameter of tubes 3 3/4" Pitch of tubes 4 3/4" x 4 1/2" Material of tube plates steel Thickness: Front 1/16" Back 3/8" Mean pitch of stays 9 1/8"

Distance across wide water spaces 14" Working pressures by rules 100 + Girders to Chamber tops: Material steel Depth and thickness of girder at centre 6" x 3/4" (two) Length as per rule 29 7/8" Distance apart 8 1/2" wings Number and pitch of Stays in each three at 7"

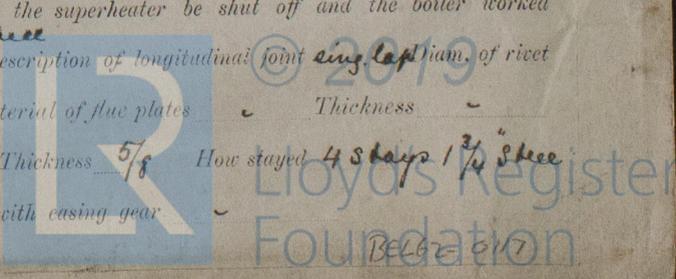
Working pressure by rules \_\_\_\_\_ Superheater or Steam chest; how connected to boiler 15 1/2" neck Can the superheater be shut off and the boiler worked \_\_\_\_\_

Material no Diameter 3" 6" Length 4" 0" Thickness of shell plates 1/2" Material steel Description of longitudinal joint \_\_\_\_\_ of rivet \_\_\_\_\_

Pitch of rivets 15/16" Working pressure of shell by rules 138 Diameter of flue \_\_\_\_\_ Material of flue plates \_\_\_\_\_ Thickness \_\_\_\_\_

Are they fitted with rings \_\_\_\_\_ Distance between rings \_\_\_\_\_ Working pressure by rules \_\_\_\_\_ End plates: Thickness 5/8" How stayed 4 stays 1 3/4" steel

Working pressure of end plates 100 lbs Area of safety valves to superheater \_\_\_\_\_ Are they fitted with easing gear \_\_\_\_\_



**DONKEY BOILER**— Description *Vertical boiler, stamped No 690 Lloyd's test 160 lbs 31.7.93*  
 Made at \_\_\_\_\_ By whom made \_\_\_\_\_ When made *7.93* Where fixed *In stockhoed*  
 Working pressure *80* tested by hydraulic pressure to *160* No. of Certificate *690* Fire grate area \_\_\_\_\_ Description of safety valves *Iron balls*  
 No. of safety valves *2* Area of each *5.94* Pressure to which they are adjusted *85 lbs* If fitted with casing gear *yes* If steam from main boilers can enter the donkey boiler *no.* 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.)

A new steel main boiler with all valves, cocks & connections has been fitted on board. The boiler & main steam pipe were tested to double the working pressure, & the safety valves are adjusted to blow under steam at 105 lbs per sq in. The approved photograph of the boiler is forwarded with this report.

A new donkey boiler has been placed on board & properly fitted with all required connections & valves. The safety valves are adjusted to blow at 85 lbs per sq in. The boiler was made by Riley Bros of Stockton & a print & particulars are given on the attached forms.

A new liner has been fitted in the N. P. cylinders of the reduced diam of 25"; a new H.P. piston, slide valve & valve casing cover have been fitted. The crank shaft was found cracked in the forward fillet of the after journal; this is stated to have been caused by undue straining when the vessel was aground off Pillarsene France in July. See copy of damage report attached. A new crank shaft has been fitted, together with new main bearing brasses & new top-end brasses.

The L.P. cylinders & piston & slide valve overhauled.

In dry dock the propeller & outer fastenings of sea connections were found good.

The machinery is as far as seen in good order & in my opinion renders the vessel eligible for the record + N.B. 10.93. The altered boiler pressure & diam. of N.P. cylinders to be noted in the Register book.

HP Cyl = 25 inch  
100 pressure

It is submitted that this vessel is eligible for THE RECORD B.S. 10-93 + N.B. 93.

on acct of ten year new main & donkey boiler were fitted, also on acct of damage - a new crank shaft was fitted, also the brasses for it.  
N.A. 25-10-93

A. Jones

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

Certificate (if required) to be sent to

The amount of Entry Fee... £ : :  
 Special & repair. £ 10-10-0 }  
 Donkey Boiler Fee £ 1-1-0 }  
 Travelling Expenses (if any) £ : :  
 19th Oct 1893  
 When received, 1893

Committee's Minute

TUES. 24 OCT 1893

Assigned

+ N.B. 10.93  
B.S. 10.93



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