

REPORT ON MACHINERY. 6791

No. 6791 Port of West Hartlepool
 No. in Survey held at Hartlepool Date, first Survey 14th June 1887 Last Survey 24th Feb 1888
 Reg. Book. 109 on the Iron Steamer "Garth Castle" (Number of Visits 32)
 Master J. Jeffries Built at Glasgow By whom built J. Elder & Co Tons 2381
 Engines made at Glasgow By whom made J. Elder & Co When built 1880
 Boilers made at Hartlepool By whom made J. Richardson & Sons when made 1880
 Registered Horse Power 500 Owners D. Currie & Co when made 1888
 Port belonging to London

ENGINES, &c.—

Description of Engines Inverted, Triple Expansion, 3 Cylinders & 3 Cranks
 Diameter of Cylinders 33", 55", 88" Length of Stroke 57" No. of Rev. per minute 67 Point of Cut off, High Pressure 5 strokes Low Pressure 6 strokes
 Diameter of Screw shaft Original Diam. of Tunnel shaft 8 1/2" Diam. of Crank shaft journals 1 1/2" Diam. of Crank pin 18" size of Crank webs 24" x 11 7/8"
 Diameter of screw Original Pitch of screw Original No. of blades 4 state whether moveable Original total surface Original
 No. of Feed pumps two diameter of ditto 5 1/2" Stroke 25 1/2" Can one be overhauled while the other is at work yes
 No. of Bilge pumps two diameter of ditto 5 1/2" Stroke 25 1/2" Can one be overhauled while the other is at work yes
 Where do they pump from Sea, main, & After holds After well, Engine room & Stokehold
 No. of Donkey Engines 5, two of them new Size of Pumps (6" x 11") (2 3/4" x 4") Where do they pump from (Centrifugal from Sea, ballast tanks, & main hold) (new donkey, Sea, hotwell & main boilers) (Sea & bilges) (New donkey, Sea) (Fresh water tanks)
 Are all the bilge suction pipes fitted with roses yes Are the roses always accessible yes Are the sluices on Engine room bulkheads always accessible Original
 No. of bilge injections one and sizes Original Are they connected to condenser, or to circulating pump Circulating pump
 How are the pumps worked By levers from the piston rod crossheads of after engines
 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 Original
 What pipes are carried through the bunkers bilge suction to main hold How are they protected By wood casing
 Are all pipes, cocks, valves, and pumps in connection with the machinery accessible at all times yes
 Are the pipes, cocks, and valves arranged so as to prevent an unintentional connection between the sea and the bilges yes
 Then were stern tube, propeller, screw shaft, and all connections examined in dry dock yes
 the screw shaft tunnel watertight yes and fitted with a sluice door yes worked from Top platform of engine room

BOILERS, &c.—

Number of Boilers Three Description Cyl. built & double ended Whether Steel or Iron Steel
 Working Pressure 150 lbs. Tested by hydraulic pressure to 300 lbs. Date of test 23rd Dec. 1887
 Description of superheating apparatus or steam chest none
 Can each boiler be worked separately yes Can the superheater be shut off and the boiler worked separately no
 of square feet of fire grate surface in each boiler 78 Description of safety valves Spring No. Superheater no
 of each valve 11.04 Are they fitted with easing gear yes No. of safety valves to superheater 2
 they fitted with easing gear yes Smallest distance between boilers and bunkers or woodwork 10" area of each valve —
 h of boilers 14' 6" description of riveting of shell long. seams Double butt straps circum. seams tieble in lap Diameter of boilers 12' 9"
 ter of rivet holes 1 3/32" whether punched or drilled drilled pitch of rivets 7 7/8" Thickness of shell plates 1 1/16"
 tage of strength of longitudinal joint 85.3 working pressure of shell by rules 154 lbs. size of manholes in shell 16 3/4" x 18"
 compensating rings 2' 6" x 2' 3" x 1 1/16" No. of Furnaces in each boiler 4
 diameter 3' 8" length, top 6' 6" bottom 7' 0" thickness of plates 9/16" description of joint welded if rings are fitted no
 length between rings — working pressure of furnace by the rules 159 lbs. combustion chamber plating, thickness, sides 9/16" back — top 9/16"
 stays to ditto, sides 8' x 7 3/4" back top 8' x 8" If stays are fitted with nuts or riveted heads nuts working pressure of plating by
151 lbs. Diameter of stays at smallest part 1 3/8" working pressure of ditto by rules 185 lbs. end plates in steam space, thickness 1"
 stays to ditto 16 1/2" x 15 1/2" how stays are secured double nuts & washers working pressure by rules 150 lbs. diameter of stays at
 st part 2 3/4" working pressure by rules 174 lbs. Front plates at bottom, thickness 3/4" Back plates, thickness —
 pitch of stays — working pressure by rules — Diameter of tubes 3 1/2" pitch of tubes 4' 8" x 4' 8" thickness of tube
 front 3/4" back 15/16" how stayed stay tubes pitch of stays 9 3/4" x 9 1/4" length of water spaces 1 3/8"
 of Superheater or Steam chest — length — thickness of plates — description of longitudinal joint — diam. of rivet holes —
 rivets — working pressure of shell by rules — diameter of flue — thickness of plates — If stiffened with rings —
 tween rings — working pressure by rules — end plates of superheater, or steam chest; thickness — how stayed —
 Superheater or steam chest; how connected to boiler —

DONKEY BOILER—

Description *Cyl. multitubular, single ended (Steel)*

Made at *Handford* by whom made *J. Richardson & Sons* when made *23.12.87* where fixed *On deck*

Working pressure *80 lb.* tested by hydraulic pressure to *160 lb.* No. of Certificate *1503* fire grate area *27.5 sq. ft.* description of safety valves *Spring* No. of safety valves *2* area of each *5.94* if fitted with easing gear *yes* if steam from main boilers can enter the donkey boiler *no* diameter of donkey boiler *8.6* length *9.0* description of riveting *double lap*

Thickness of shell plates *1/2"* diameter of rivet holes *7/8"* whether punched or drilled *drilled* pitch of rivets *3 3/4"* lap of plating *6 1/4"*

per centage of strength of joint *76.6* thickness of ^{rod} crown plates *1/16"* stayed by *stays 1 1/2" x 12" + riveted washers*

Diameter of furnace, top *2.10"* bottom *—* length of furnace ^{top, bottom} *6.5, 8.5* thickness of plates ^{top, bottom} *1/32, 1/32* description of joint *double butt strap*

Thickness of furnace crown plates *1/16"* stayed by *girders 7 3/4" pitch* working pressure of shell by rules *80 lb.*

Working pressure of furnace by rules *87 lb.* diameter of uptake *—* thickness of plates *—* thickness of water tubes *—*

new SPARE GEAR. State the articles supplied:— *One valve spindle (One screw shaft, One*

propeller boss + three blades. Crank shaft for after engine. original spare gear)

new spare gear, 2 main feed pump valves, 2 boiler check valves, 1 donkey feed valve, 1 feed pump plunger. A set of springs for each piston, One set of braces for connecting rod.

The foregoing is a correct description,

J. Richardson & Sons Manufacturers of *Two cylinders, for engine + all boilers.*

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

Tested the main steam pipes by hydraulic pressure to 300 lb. and found them tight. The original cylinders also the main and donkey

boilers have been removed from this vessel. The forward end of the foundation plate of the engines has been extended to form an additional plummer block

and two guide columns have been erected on the extended foundation

The original low pressure cylinder, piston, and valve motion have been overhauled and refitted, and the low pressure piston packing, and

piston rings, have been renewed. Two new cylinders, pistons, and valves, also two new feed, bilge, and donkey pumps have been fitted.

A new double throw built crank shaft has been fitted to the forward engines, and the spare crank shaft, which was examined

and found in good condition, has been fitted to the after engine.

Shafting, Condenser, piping arrangement, air and circulating pumps overhauled, examined, and found in good condition.

Three new main boilers, and one new donkey boiler, have been fitted on board this vessel and the whole of the work, of renewal

and alteration, has been executed under Special Survey and of a good quality of workmanship.

The machinery and boilers have been tried under steam, the safety valves adjusted

*and found to well, and will, in my opinion, be eligible to have the notifications *✠ L.M.C. 2.88. ✠ H.B. 88.* recorded*

in the Register Book when the propeller, stern bush, and sea-connections have been examined by a Surveyor of this Society

and found satisfactory. The vessel has proceeded to London

where she will be docked.

The amount of Entry Fee £ : : *not received by me, applied for*

Special £ 34 : 0 : 0 *E.M.*

Donkey Boiler Fee £ : : *6/3/88*

Certificate (if required) £ : : *5/3/18 88*

To be sent as per margin.

(Travelling Expenses, if any, £) *It is submitted that this vessel should have + L.M.C. 2.88*

Committee's Minute *+ H.B. 88 recorded when the propeller + L.M.C. 2/88*

stern bush sea connections have been examined. H.B. 5.3.88

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

J. Stoddart