

REPORT ON MACHINERY.

Port of MIDDLESBROUGH-ON-TEES.Received at London Office MUN 9 JAN 1899

No. in Survey held at Middlesbrough-on-tees. Date, first Survey 11th May 1898 Last Survey 24th Nov 1898
 Reg. Book. 1111 on the Steel screw steamer "Candlehoe" (Number of Visits 11)
 Master Chamberlain Built at W. Hartlepool By whom built Furness, Withy & Co. Ltd When built 1898
 Engines made at Middlesbrough By whom made Furness, Westgarth & Co. when made 1898
 Boilers made at 6 By whom made 6 when made 1898
 Registered Horse Power 304 Owners Bennetts & Co. Port belonging to Grimsby
 Nom. Horse Power as per Section 28 304 Is Electric Light fitted No

ENGINES, &c.—Description of Engines Inverted Triple expansion No. of Cylinders 3 No. of Cranks 3
 Diameter of Cylinders 25", 40", 66" Length of Stroke 45 Revolutions per minute 60 Diameter of Screw shaft 13.5"
 Diameter of Tunnel shaft 11.26" Diameter of Crank shaft journals 13.4" Diameter of Crank pin 13.4" Size of Crank webs 18x8.5 built.
 Diameter of screw 14.6" Pitch of screw 16.3" No. of blades 4 State whether moveable Solid Total surface 85 sq feet.
 No. of Feed pumps 2 Diameter of ditto 3.4" Stroke 25.5" Can one be overhauled while the other is at work Yes.
 No. of Bilge pumps 2 Diameter of ditto 4" Stroke 25.5" Can one be overhauled while the other is at work Yes.
 No. of Donkey Engines 2 Sizes of Pumps Feed 4.5x5x6 Duplex Ballast 8x4x10 No. and size of Suctions connected to both Bilge and Donkey pumps
 In Engine Room 3 One centre 3.5 dia, 2 wings 3.5 dia. In Holds, &c. Sip. One 2.5 dia to Fore Peak, One 3.5 dia to Well in fore hold, One 3.5 dia to Well in No. 2 hold, One 3.5 dia to Well in No. 3 hold, One 3.5 dia to Well in No. 4 hold, One 2.5 dia to off peak with con. to well
 No. of bilge injections 1 sizes 6" Connected to condenser, or to circulating pump C. P. Is a separate donkey suction fitted in Engine room of size Yes: 5"
 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
 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
 What pipes are carried through the bunkers none. How are they protected ✓
 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 Yes Is the screw shaft tunnel watertight Yes
 Is it fitted with a watertight door Yes worked from Upper platform

BOILERS, &c.—(Letter for record (r)) Total Heating Surface of Boilers 4833 sq ft. Is forced draft fitted no.
 No. and Description of Boilers Two, cylindrical multi-ported single ended Working Pressure 160. Tested by hydraulic pressure to 320.
 Date of test 20.10.98 Can each boiler be worked separately Yes. Area of fire grate in each boiler 64.14 sq ft. No. and Description of safety valves to
 each boiler Two direct spring. Area of each valve 11.04 sq in. Pressure to which they are adjusted 165 lbs. Are they fitted
 with easing gear Yes. Smallest distance between boilers or uptakes and bunkers or woodwork about 12" Mean diameter of boilers 15.5"
 Length 10.6" Material of shell plates Steel. Thickness 1.76" Description of riveting: circum. seams D.R. lap. long. seams dbl. straps.
 Diameter of rivet holes in long. seams 1.76" Pitch of rivets 8" Lap of plates on width of butt straps 14.5x13.5 thick.
 Per centages of strength of longitudinal joint rivets 86.9 Working pressure of shell by rules 164.1 Size of manhole in shell 16"x12"
 Size of compensating ring 34.5x24.5x1.76" No. and Description of Furnaces in each boiler 1 Adams type Material S. Outside diameter 46.4"
 Length of plain part 42" Thickness of plates 1.76" Description of longitudinal joint welded. No. of strengthening rings one.
 Working pressure of furnace by the rules 184.4 Combustion chamber plates: Material S. Thickness: Sides 1.76" Back 1.76" Top 1.76" Bottom 1.76"
 Pitch of stays to ditto: Sides 8"x8" Back 9.5x9.5" Top 9"x8" If stays are fitted with nuts or riveted heads nuts. Working pressure by rules 162.
 Material of stays Steel Diameter at smallest part 1.76" Area supported by each stay 83.2 sq in. Working pressure by rules 143. End plates in steam space:
 Material S. Thickness 1.76" Pitch of stays 16"x16" How are stays secured d. n. + l. w. Working pressure by rules 162.5 Material of stays S. 24 tons min.
 Diameter at smallest part 2.76" Area supported by each stay 256 sq in. Working pressure by rules 164. Material of Front plates at bottom S.
 Thickness 3.4" Material of Lower back plate S. Thickness 3.4" Greatest pitch of stays 12"x8.5" Working pressure of plate by rules 220.
 Diameter of tubes 3.5" Pitch of tubes 4.4x4.4" Material of tube plates S. Thickness: Front 1.76" Back 1.76" Mean pitch of stays 9.5"
 Pitch across wide water spaces 14.5" Working pressures by rules 141.2-132.33 Girders to Chamber tops: Material S. Depth and
 thickness of girder at centre 8.5x12" Length as per rule 30" Distance apart 9" Number and pitch of Stays in each Two: 8"
 Working pressure by rules 180.4 Superheater or Steam chest; how connected to boiler None 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 *Horizontal multitubular, 2 plain furnaces.*
 Made at *Stockton* By whom made *J. Seddon & Co.* When made *22.4.98* Where fixed *In Stockhold.*
 Working pressure *80* tested by hydraulic pressure to *160* No. of Certificate *1683* Fire grate area *247* Description of safety valves *Spring direct*
 No. of safety valves *2* Area of each *5.94* Pressure to which they are adjusted *82 lb* If fitted with easing gear *Yes* If steam from main boilers can enter the donkey boiler *No* Diameter of donkey boiler *9' 0"* Length *9' 0"* Material of shell plates *steel* Thickness *1/2"*
 Description of riveting long seams *D.B.S. double* Diameter of rivet holes *3/16"* Whether punched or drilled *drilled* Pitch of rivets *3 1/2"*
 Lap of plating *8 1/2"* Per centage of strength of joint Rivets *88%* Thickness of *top end* plates *3/4"* Radius of do. *✓* No. of Stays to do. *14 1/2 x 13*
 Dia. of stays *2" diam.* Diameter of furnace *top 2' 10" Bottom 6' 6"* Length of furnace *6' 0"* Thickness of furnace plates *1/16" + 1/2"* Description of joint *D.B.S. single* Thickness of furnace crown plates *3/32" top 9/16" Stays by 1 1/4" + 1 3/8" stays, nutted pitch 9 x 9"* Working pressure of shell by rules *85 lb*
 Working pressure of furnace by rules *84 lb* Diameter of *tubes 3"* Thickness of *plate plates 5/16" 3/8"* Thickness of *stay tubes 5/16"*

SPARE GEAR. State the articles supplied:— *1 propeller & shaft complete, 2 top & 2 bottom end bolts & nuts, 2 main bearing & 1 set coupling bolts & nuts, 1 set each air & air pump valves, 1 set each feed & bilge pump valves, 1 set donkey pump valves, 1 main & 1 donkey feed check valve, 2 piston valve rings, 1 set springs & P. piston, 1 escape valve spring each size, 1 safety valve spring, bolts & nuts assorted & iron of various sizes.*
 The foregoing is a correct description,

For **SIR CHRISTOPHER FURNESS, WESTGARTH & CO., LD.** Manufacturers of main Engines & Boilers.

H. Jackson
 During progress of work in shop *1898 May 11 14 17 23 26 June 16 18 21 22 24 July 14 17 21 25 26 28 Aug 4 7 11 22 25 29 Sep 1 2 3 7 9 10 12 14 16 21 23 27 29 Oct 3 7 11 14 15 19 20 21 25 27 31 Nov 1 2 9 12 15 17 18 21 24*
 During erection on board vessel *5 7 9 10 12 14 16 21 23 27 29 Oct 3 7 11 14 15 19 20 21 25 27 31 Nov 1 2 9 12 15 17 18 21 24*
 Total No. of visits *Fifty-eight* *10. Apr. 1898 Dec. 1. 21 23. 29. 1899 Jan. 4. - 5 visits*

General Remarks (State quality of workmanship, opinions as to class, &c. *The Engines and Boilers of this vessel, have been built under Special Survey, and in accordance with the Rule requirements. The materials, and workmanship, are good & efficient. When completed, and fitted on board, they were tried under steam at Moorings with satisfactory results, and are now in good working order and in our opinion eligible to have L.M.C. recorded in the Society's Register Book.* *1, 99*

On going through the docks at West Hartlepool on the 28th of Dec. 1898, this vessel collided with the Quay, and broke 3-6" off one propeller blade. Vessel afterwards placed in dry dock, propeller shaft drawn, examined in lathe and found true & sound. Shaft afterwards replaced and spare propeller fitted.

It is submitted that
 this vessel is eligible for
 THE RECORD. *LMC 1.99.*

AS
9.1.99

The amount of Entry Fee... £ *3 : 0* :
 Special ... £ *35 : 4* :
 Donkey Boiler Fee ... £ : :
 Travelling Expenses (if any) £ : :
 When applied for, *4.1.1899*
 When received, *4.1.1899*

Committee's Minute

Assigned

TUES, 10 JAN 1899

+ LMC 1.99

Wm. Dickey-Towell
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

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