

# REPORT ON MACHINERY.

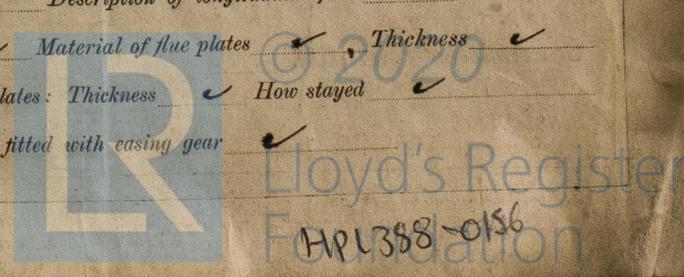
Port of MIDDLESBROUGH-ON-TEES

Received at LONDON OFFICE MAR 29 1900

No. in Survey held at Middlesbro'-on-Tees Date, first Survey 6<sup>th</sup> March 1899 Last Survey 2<sup>nd</sup> Mar. 1900  
 Reg. Book. 15<sup>th</sup> S. on the Spiral Screw Steamer "Freiburg" (Number of Visits 97)  
 Master - Tejens Built at W. Hartlepool By whom built Turner & Witney, Ship. L<sup>ds</sup> When built 1900  
 Engines made at Middlesbro'-on-Tees By whom made Sir C. Furness, Postgate & Co. L<sup>ds</sup> when made 1900  
 Boilers made at " By whom made " when made 1900  
 Registered Horse Power 495 Owners Norddeutscher Lloyd Port belonging to Bremen  
 Nom. Horse Power as per Section 28 495 Is Electric Light fitted Yes

**ENGINES, &c.**—Description of Engines Inverted Triple No. of Cylinders 3 No. of Cranks 3  
 Diameter of Cylinders 28" 44" 75" Length of Stroke 48" Revolutions per minute 80 Diameter of Screw shaft as per rule 14.1/2"  
 Diameter of Tunnel shaft as fitted 13 1/2" Diameter of Crank shaft journals 14 1/2" Diameter of Crank pin 14 1/2" Size of Crank webs 23" x 10"  
 Diameter of screw 18' 6" Pitch of screw 16" 0" No. of blades 4 State whether moveable Yes Total surface 95 #  
 No. of Feed pumps 2 Diameter of ditto 4" Stroke 24" Can one be overhauled while the other is at work Yes  
 No. of Bilge pumps 2 Diameter of ditto 4 1/2" Stroke 24" Can one be overhauled while the other is at work Yes  
 No. of Donkey Engines 2 Sizes of Pumps Ballast 8" x 9" x 10" Feed 7 1/2" x 5" x 6" Duplex No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room Three - 3 1/2' dia. In Holds, &c. Nine, two 3 1/2" in h<sup>o</sup> 1, two 3 1/2" in h<sup>o</sup> 2, one 2 1/2" in after well.  
 No. of bilge injections 1 sizes 8" Connected to condenser, or to circulating pump C.P. Is a separate donkey suction fitted in Engine room & size Yes: 6"  
 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 Yes  
 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 ✓ 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 6902 # Is forced draft fitted Yes: 4 blowers  
 No. and Description of Boilers Two, long. Cyl. Mult'-single ended. Working Pressure 180 lbs tested by hydraulic pressure to 360 lbs.  
 Date of test 3. 8. 99 Can each boiler be worked separately Yes Area of fire grate in each boiler 54.3 # No. and Description of safety valves to each boiler 2. Direct Spring Area of each valve 9.62 # Pressure to which they are adjusted 185 lbs. Are they fitted with easing gear Yes Smallest distance between boilers or uptakes and bunkers or woodwork Side bunkers Mean diameter of boilers 14' 0"  
 Length 12' 0" Material of shell plates S. Thickness 1 5/16" Description of riveting: circum. seams D. P. lap. long. seams Stb. straps.  
 Diameter of rivet holes in long. seams 1 3/8" Pitch of rivets low 9 1/2" 4 3/4" Lap of plates or width of butt straps 21 3/4" x 1 5/16" thick.  
 Percentages of strength of longitudinal joint 88.3 Working pressure of shell by rules 203 lbs. Size of manhole in shell 16" x 12"  
 Size of compensating ring 3 1/2" x 27 1/2" x 1 5/16" No. and Description of Furnaces in each boiler 3: Morrison. Material S. Outside diameter 44 1/2"  
 Length of plain part top 8' 3" bottom 8' 3" Thickness of plates top 9 1/16" bottom 9 1/16" Description of longitudinal joint Weld. No. of strengthening rings ✓  
 Working pressure of furnace by the rules 198 lbs. Combustion chamber plates: Material S. Thickness: Sides 19" Back 32" Top 32" Bottom 1 1/16"  
 Pitch of stays to ditto: Sides 7 1/8" x 7 1/4" Back 13" x 1 1/4" Top 7 3/8" x 4 1/8" If stays are fitted with nuts or riveted heads Nuts. Working pressure by rules 203 lbs.  
 Material of stays Steel Diameter at smallest part 1 3/8" Area supported by each stay 60 # Working pressure by rules 261.2 End plates in steam space: Material S. Thickness 1 1/16" Pitch of stays 15" x 15" How are stays secured D. N. W. Working pressure by rules 234.6 Material of stays S.  
 Diameter at smallest part 2 1/2" Area supported by each stay 225 # Working pressure by rules 224.4 Material of Front plates at bottom S.  
 Thickness 3/4" Material of Lower back plate S. Thickness 1 3/16" Greatest pitch of stays 13 1/2" Working pressure of plate by rules 188.5  
 Diameter of tubes 2 1/2" Pitch of tubes 3 3/4" x 3 3/4" Material of tube plates S. Thickness: Front 32" + 5/8" Back 32" Mean pitch of stays 9 1/2"  
 Pitch across wide water spaces 13 1/2" Working pressures by rules 73.483.6 Girders to Chamber tops: Material S. Depth and thickness of girder at centre 8 1/2" x 1 1/2" Length as per rule 29" Distance apart 4 3/8" Number and pitch of Stays in each 2: 9 3/8"  
 Working pressure by rules 223.8 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 ✓  
 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 *Cyl. Mult <sup>or</sup> 2 plain furnaces*  
 Made at *Stockton* By whom made *Riley Bros* When made *3.12.99* Where fixed *St. Richard Spring*  
 Working pressure *100 lb* tested by hydraulic pressure to *200 lb* No. of Certificate *2115* Fire grate area *27* Description of safety valves *Spring*  
 No. of safety valves *2* Area of each *5.94* Pressure to which they are adjusted *100 lb* If fitted with casing gear *yes* If steam from main boilers or enter the donkey boiler *no* Diameter of donkey boiler *9.0* Length *9.0* Material of shell plates *S. 27-32* Thickness *1/32*  
 Description of riveting long. seams *d. butt str.* Diameter of rivet holes *13/16* Whether punched or drilled *dr.* Pitch of rivets *3 1/2*  
 Lap of plating *1 1/2 str.* Per centage of strength of joint Rivets *86.8* Thickness of shell plates *13/16* Radius of do. *Pitch* of Stays to do. *16 1/2*  
 Dia. of stays *1 1/4* Diameter of furnace Top *31* Bottom *2* Length of furnace *5-10 1/2* Thickness of furnace plates *1/2* Description of joint *welded* Thickness of furnace plates *1/2* Stayed by *1 1/2* s. *7 1/2* to *8* p. r. Working pressure of shell by rules *106*  
 Working pressure of furnace by rules *123 lb* Diameter of uptake tubes *3 1/2* Thickness of uptake plates *1 1/2* Thickness of water tubes *5/16*

SPARE GEAR. State the articles supplied:— *2 top & 2 bottom end, 2 main bearing & 1 set Coupling bolts & nuts, 2 propeller blades, 2 rings for pis. valves, 1 set rings H & M. P. pis., 1 set Springs L. P. pis., 1 slide valve rod & distance pieces for either valve, 1 set each top & bottom end brasses, 1 Air & 1 Circ. pump rod & bucket, 1 set each air & pump valves, 1 1/2 set each feed, bilge & donkey pump valves, 1 Safety valve Spring, 1 Escape valve Spring, bolts & nuts assorted & view of various*

The foregoing is a correct description,  
 For SIR CHRISTOPHER FURNESS, WESTGARTH & CO., LD. Manufacturers of Engines & Marine Boilers.

Dates of Survey while building  
 During progress of work in shops: 1899 Mar: 6, 8, 10, 13, 16, 20, 23, 25, 30 Apr: 5, 7, 10, 12, 13, 17, 19, 22, 27, 29, May: 1, 3, 11, 16, 19, 25, 29, 31 June: 2, 5, 8, 12, 14, 22, 26, 27, 29, July: 4, 10, 15, 18, 22, 25, 28, 31 Aug: 3, 5, 8, 10, 11, 22, 23, 24, 25, 29, 30, Sept: 1, 2, 25, 26, 27, Oct: 2, 4, 9, 11, 14, 17, 19, 25, 27, 30, Nov: 1, 4, 8, 10, 11, 15, 22, Dec: 1, 5, 8, 11, 15, 18, 22, 25, 28, 31  
 During erection on board vessel: 22. 1900 Jan: 4, 5, 9, 10, 11, 12, 15, 16, 17, 18.  
 Total No. of visits (M. d. b.) *90* (S. G. P.) 1899. Oct. 24, 28. Nov. 8, 15, 17. 1900. Mar. 9, 22. (97)

General Remarks (State quality of workmanship, opinions as to class, &c.) *The Machinery of this vessel has been built under Special Survey, in accordance with Rule requirements. The materials, and workmanship, are good and efficient. When completed and fitted on board they were tried under steam at knockings, with satisfactory results, and are now in good working order and in our opinion eligible for notation L.M.C. 3.00 in the Society's Register Books.*

It is submitted that this vessel is eligible for THE RECORD. L.M.C. 3.00. F.D. Dec. Leg.

Certificate (if required) to be sent to W. Northpool

The amount of Entry Fee. £ 3 : 0 :  
 Special £ 44 : 15 :  
 Donkey Boiler Fee £ : :  
 Travelling Expenses (if any) £ : :  
 When applied for, 27.3.1900  
 When received, 27.3.1900

*Lidley Powell & Richard King*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping

Committee's Minute  
 Assigned + 2 M.C. 3.00



MACHINERY CERTIFICATE WRITTEN