

REPORT ON MACHINERY.

Port of MIDDLESBROUGH ON TEESReceived at London Office THUR 26 NOV 1896No. in Survey held at Middlesbrough on Tees Date, first Survey 14th April Last Survey 23rd Nov 1896
Reg. Book. "Gunhild" (Number of Visits 49)on the Screw Steamer "Gunhild"Ton. ^{Gross} 1532
_{Net} 956Master F. A. Andersen Built at Middlesbrough By whom built R. Craggs & Sons When built 1896Engines made at Middlesbrough on Tees By whom made Sir C. Furness, Westgarth & Co. Ltd. when made 1896Boilers made at Middlesbrough on Tees By whom made Sir C. Furness, Westgarth & Co. Ltd. when made 1896Registered Horse Power 143 Owners Hederaaktidlaget Sigurd Port belonging to MalmöNom. Horse Power as per Section 28 143

ENGINES, &c.— Description of Engines Triple Expansion No. of Cylinders Three

Diameter of Cylinders 19"-31½"-52" Length of Stroke 36" Revolutions per minute 69 Diameter of Screw shaft as per rule 9½"
as fitted 9½"

Diameter of Tunnel shaft as per rule 8½" Diameter of Crank shaft journals 9½" Diameter of Crank pin 9½" Size of Crank webs 15" x 4½" apart
as fitted 9"

Diameter of screw 13' 9" Pitch of screw 15ft. to 16ft. No. of blades 4 State whether moveable No Total surface 55 sq. ft.

No. of Feed pumps 2 Diameter of ditto 2½" Stroke 19" Can one be overhauled while the other is at work Yes

No. of Bilge pumps 2 Diameter of ditto 3" Stroke 19" Can one be overhauled while the other is at work Yes

No. of Donkey Engines Two Sizes of Pumps Feed 3½" x 3½" x 6" Ballast 8" x 8" x 10" No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room Three: 2½" dia. In Holds, &c. Fore Hold: Two - 2½" dia.
After Hold: Two - 2½" dia. Tunnel well vapor peak: one - 2½" dia.

No. of bilge injections 1 sizes 4" Connected to condenser, or to circulating pump C.P. Is a separate donkey suction fitted in Engine room & size Yes: 4" dia.

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 Yes

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 New Vessel Is the screw shaft tunnel watertight Yes

Is it fitted with a watertight door Yes worked from Top platform in Engine room

BOILERS, &c.— (Letter for record \$) Total Heating Surface of Boilers 1380 x 2 = 2760 sq. ft.

No. and Description of Boilers Two: Cylindrical Single Ended Working Pressure 160 lbs Tested by hydraulic pressure to 320 lbs

Date of test 2/10/96 Can each boiler be worked separately Yes Area of fire grate in each boiler 45 sq. ft. No. and Description of safety valves to each boiler Two: Direct Spring Area of each valve 4.06" 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 15" Mean diameter of boilers 12' 0"

Length 10' 6" Material of shell plates Steel Thickness 1½" Description of riveting: circum. seams Lap double long. seams Butt Straps
medium two rows

Diameter of rivet holes in long. seams 1½" Pitch of rivets 4½" 3 3/4" Lap of plates or width of butt straps 16½"

Percentages of strength of longitudinal joint ^{rivets} 83.6 Working pressure of shell by rules 160 lbs Size of manhole in shell 16" x 12"
_{plate} 85.7

Size of compensating rings 4' 2 1/2" x 16" No. and Description of Furnaces in each boiler 3: Morrison's Material Steel Outside diameter 40"

Length of plain part ^{top} 4' 0" Thickness of plates ^{crown} 1½" _{bottom} 1 3/4" Description of longitudinal joint Welded No. of strengthening rings ✓

Working pressure of furnace by the rules 143 lbs Combustion chamber plates: Material Steel Thickness: Sides 5" Back 5" Top 9 1/8" Bottom 1 1/8"

Pitch of stays to ditto: Sides 8" x 8" Back 9 1/8" x 9 1/8" Top 8" x 4 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 163 lbs

Material of stays Iron Diameter at smallest part 1 5/8" Area supported by each stay 83" Working pressure by rules 186 lbs End plates in steam space: Material Steel Thickness 4" Pitch of stays 14 1/2" x 13" How are stays secured Washers Working pressure by rules 166 lbs Material of stays Steel

Diameter at smallest part 2 1/8" Area supported by each stay 184" Working pressure by rules 160 lbs Material of Front plates at bottom Steel

Thickness 3 1/4" Material of Lower back plate Steel Thickness 3 1/4" Greatest pitch of stays 11" Working pressure of plate by rules 160 lbs

Diameter of tubes 3 1/2" Pitch of tubes 14 1/2" x 4 1/2" Material of tube plates Steel Thickness: Front 3 1/8" Back 3 1/4" Mean pitch of stays 9 1/2"
with doublers at middle

Pitch across wide water spaces 14 1/2" Working pressures by rules 240 lbs 160 lbs Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 7 1/2" x 13" Length as per rule 28" Distance apart 4 1/2" Number and pitch of Stays in each 2: 8"

Working pressure by rules 216 lbs 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 _____

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 *Cylindrical built with two plain furnaces.*
 Made at *Stockton* By whom made *Riley Bros.* When made *29/9/96* Where fixed *In Hokenold*
 Working pressure *80 lbs* tested by hydraulic pressure to *160 lbs* No. of Certificate *1358* Fire grate area *18 Sq. ft* Description of safety valves *One Spring*
 No. of safety valves *One* Area of each *9.62* Pressure to which they are adjusted *85 lbs* If fitted with easing gear *Yes* If steam from main boilers can enter the donkey boiler *No* Diameter of donkey boiler *8' 0"* Length *7' 6"* Material of shell plates *Steel* Thickness *1/2"*
 Description of riveting long. seams *Lap double rivet* Diameter of rivet holes *15/16"* Whether punched or drilled *Drilled* Pitch of rivets *3 1/2"*
 Lap of plating *4 3/4"* Per centage of strength of joint Rivets *72* Thickness of shell *2nd* plates *11/16"* Radius of do. plates *No.* of Stays to do. *15 1/2 x 1 1/2"*
 Dia. of stays *1 1/8"* Diameter of furnace Top *28"* Bottom *24"* Length of furnace *6' 10 1/2"* Thickness of furnace plates *3/16" & 1/8"* Description of joint *Lap Single* Thickness of furnace crown plates *3/16" & 1/8"* Stayed by *1 1/8" 8p stays* Working pressure of shell by rules *83 lbs*
 Working pressure of furnace by rules *89 lbs* Diameter of *tube* 3" Thickness of *tube* plates *3/16" & 1/8"* Thickness of *stay* tubes *5/16"*

SPARE GEAR. State the articles supplied:— *Propeller, 2 main Bearing Bolts & nuts, 2 Crank pin Bolts, 2 Cross head Bolts, 1 Set Coupling Bolts, 6 pump ring Bolts, 1/2 Set each Air & Circulation pump valves, 1 Set Feed & Bilge pump valves, 1 Feed check valve, 1 Set Lp. piston springs, 2 piston rings, 25 Boiler Tubes, 25 Condenser tubes, 1 Safety valve spring, 1 Slide rod, 1 pair eccentric straps, 1 set rings for Hqs. piston etc.*

The foregoing is a correct description,

For Sir Christopher Furness, Westgarth & Co., Ltd. Manufacturer.

For Sir Christopher Furness
General Remarks (State quality of workmanship, opinions as to class, &c.)
MANAGING DIRECTOR

Dates of Survey while building
 During progress of work in shops— *H. Jackson, 1896 Apr 14 June 24 9 14 18 22 24 July 29 16 21 23 25 Aug 1 5 13 14 Sep 1 4 8 15 18 24*
 During erection on board vessel— *1896 Sep 28 Oct 2 3 5 6 7 8 10 13 14 16 17 26 29 Nov 5 6 9 13 18 20 23*
 Total No. of visits *Forty six*

The Engines and Boilers of this vessel have been built under Special Survey and the materials and workmanship are good. When completed they were tried under full steam and worked satisfactorily.

The Machinery throughout is now in good and efficient condition and eligible in my opinion to have the notation **L.M.C. 11, 96** inserted in the Society's Report Book.

It is submitted that this vessel is eligible for **THE RECORD. + L.M.C. 11.96.**

R.E.
26/11/96
26.11.96

Certificate (if required) to be sent to

The amount of Entry Fee	£ 2 : : :	When applied for,
Special	£ 25 : 19 : :	25.11.1896
Donkey Boiler Fee	£ : : :	When received,
Travelling Expenses (if any)	£ : : :	25.11.1896

RWD
Wm R. Austin
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute **FRI 27 NOV 1896**

Assigned

+ L.M.C. 11.96.



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