

REPORT ON MACHINERY.

Port of Glasgow

Received at London Office 10.15 22 MAY 1906

No. in Survey held at Glasgow Date, first Survey 1st Aug Last Survey 19 May 1906

Reg. Book. 28 Sup on the Triple Screw Turbine Steamer "Viper" (Number of Visits)

Master Built at Glasgow By whom built The Fairfield S. & E. Co. Ltd Tons ^{Gross} _{Net} When built 1906

Engines made at Glasgow By whom made The Fairfield S. & E. Co. Ltd (No 444) when made 1906

Boilers made at Glasgow By whom made The Fairfield S. & E. Co. Ltd when made 1906

Registered Horse Power Owners Messrs G. & J. Burns, Ltd. Port belonging to Glasgow

Nom. Horse Power as per Section 28 1217 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

ENGINES, &c.—Description of Engines Turbines, Three Screws. No. of Cylinders Three No. of Cranks ✓

Dia. of Cylinders R. 33" : 34 1/2" : 36" : 39". Drum 30". Length of Stroke Revs. per minute 680 Dia. of Screw shaft as per rule 6 3/4" Material of Steel
L.P. 46" : 47 1/2" : 49" : 52" : 55" : 59". Drum 43" as fitted 6 1/2" screw shaft)

Is the screw shaft fitted with a continuous liner the whole length of the stern tube No. Is the after end of the liner made water tight in the propeller boss Yes. If the liner is in more than one length are the joints burned ✓ If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive ✓ If two liners are fitted, is the shaft lapped or protected between the liners No. Length of stern bush 4'0" high.

Dia. of Tunnel shaft as per rule 6'3" Dia. of Drum Crank shaft journals as per rule R. 4" Dia. of Crank pin LP 8" Size of Crank webs Dia. of thrust shaft under collars 6" Dia. of screws 5" : 3" Pitch of Screw 4'6" No. of Blades 3 State whether moveable No. Total surface 12'6" (11 3/4" projected)

No. of Feed pumps Two Diameter of ditto 10 1/2" Stroke 26 Can one be overhauled while the other is at work Yes. (Str. Cyls. 14")

No. of Bilge pumps Two Diameter of ditto 6" Stroke 6 Can one be overhauled while the other is at work Yes, Two duplex (Str. Cyls 6")

No. of Donkey Engines As above and Sizes of Pumps Gen. Dry 9 x 6 x 10 Cartridge Duplex No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room Two 2 1/2" in Turbine Rm & one 2 1/2" in each Bl. rm In Holds, &c. Fore hold, one 2 1/2". Aft one 2 1/2" in each of the two tunnel compartments.

No. of Bilge Injections 1 sizes 10" Connected to condenser, or to circulating pump Cir. p. Is a separate Donkey Suction fitted in Engine room & size Yes 3"

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 Larger valves smaller 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 Yes

What pipes are carried through the bunkers Forward Bilge Suctions How are they protected Strong wooden casing

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.

Dates of examination of completion of fitting of Sea Connections 9.3.06 of Stern Tube 9.3.06 Screw shaft and Propeller 9.3.06

Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight doors Yes worked from Deck.

BOILERS, &c.—(Letter for record S) Manufacturers of Steel Messrs Stewart & Lloyd.

Total Heating Surface of Boilers 16020 Is Forced Draft fitted Yes No. and Description of Boilers Four Hor^{tl} Mult^{ler} Double Ended.

Working Pressure 165 lbs Tested by hydraulic pressure to 330 lbs Date of test 30.1.06 & 2.06 No. of Certificate 7951, 7956, 7952, 7959

Can each boiler be worked separately Yes Area of fire grate in each boiler 126 No. and Description of Safety Valves to each boiler Two Direct Spring Area of each valve 4 1/4 dia. 14 1/4 area Pressure to which they are adjusted 170 lbs Are they fitted with easing gear Yes.

Smallest distance between boilers or uptakes and bunkers or woodwork Several feet Mean dia. of boilers 14'0" Length 20'6" Material of shell plates Steel

Thickness 1 1/8" Range of tensile strength 29 to 32 tons Are the shell plates welded or flanged No. Descrip. of riveting: cir. seams Double riv. long. seams Trieb. riv. Strap Diameter of rivet holes in long. seams 1 7/32" Pitch of rivets 8 3/8" Lap of plates or width of butt straps 16 5/8" x 29/32"

Per centages of strength of longitudinal joint 85.5 Working pressure of shell by rules 183 lbs Size of manhole in shell 16" x 12"

Size of compensating ring End plate 4'8" No. and Description of Furnaces in each boiler 6 Horizontal Material Steel Outside diameter 3'9"

Length of plain part top bottom ✓ Thickness of plates crown 1/2" Description of longitudinal joint Welded No. of strengthening rings

Working pressure of furnace by the rules 167 lbs Combustion chamber plates: Material Steel Thickness: Sides 37/64 Back 37/64 Top 37/64 Bottom 13/16

Pitch of stays to ditto: Sides 8 1/2" x 8" Back Top 8 1/2" x 8" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 172

Material of stays Steel Diameter at smallest part 1.48" Area supported by each stay 68" Working pressure by rules 174 lbs End plates in steam space: Section Material Steel Thickness 1 7/32" Pitch of stays 14 1/4" = 16 1/2" How are stays secured Double nuts Working pressure by rules 233 Material of stays Steel

Diameter at smallest part 5.27" Area supported by each stay 14 1/4" = 16 1/2" Working pressure by rules 185 lbs Material of Front plates at bottom Steel

Thickness 23/32" Material of Lower back plate ✓ Thickness Greatest pitch of stays As approved Working pressure of plate by rules 165 lbs

Diameter of tubes 2 1/2" Pitch of tubes 3 5/8" x 3 5/8" Material of tube plates Steel Thickness: Front 23/32 Back 11/16 Mean pitch of stays 7 1/4"

Pitch across wide water spaces 14" Working pressures by rules 200 lbs Girders to Chamber tops: Material Iron Depth and thickness of girder at centre 9" = 1 5/8" Length as per rule 34 1/2" Distance apart 8" Number and pitch of stays in each Three at 8 1/2"

Working pressure by rules 165 lbs Superheater or Steam chest; how connected to boiler None Can the superheater be shut off and the boiler worked separately

holes 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

816-56400-00993-0118

VERTICAL DONKEY BOILER— Manufacturers of Steel

No. None. Description _____

Made at _____ By whom made _____ When made _____ Where fixed _____

Working pressure _____ tested by hydraulic pressure to _____ Date of test _____ No. of Certificate _____ Fire grate area _____ Description of Safety _____

Valves _____ No. of Safety Valves _____ Area of each _____ Pressure to which they are adjusted _____ Date of adjustment _____

If fitted with easing gear _____ If steam from main boilers can enter the donkey boiler _____ Dia. of donkey boiler _____ Length _____

Material of shell plates _____ Thickness _____ Range of tensile strength _____ Descrip. of riveting long. seams _____

Dia. of rivet holes _____ Whether punched or drilled _____ Pitch of rivets _____ Lap of plating _____ Per centage of strength of joint _____ Rivets _____ Plates _____

Working pressure of shell by rules _____ 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 _____

Working pressure of furnace by rules _____ Thickness of furnace crown plates _____ Stayed by _____

Diameter of uptake _____ Thickness of uptake plates _____ Thickness of water tubes _____ Dates of survey _____

SPARE GEAR. State the articles supplied:— Set coupling bolts for one coupling. Fed & bilge pump valves. Safety valve springs. Boiler check valves. Rings for thrust bearing, etc. Assorted iron bolts.

THE FAIRFIELD SHIPBUILDING AND ENGINEERING CO., LIMITED.

The foregoing is a correct description,

Manufacturer.

Allen Cleghorn MANAGER

Dates of Survey while building	During progress of work in shops -	1905. Aug. 1. 16. Sep. 1. 16. Oct. 9. 12. 24. 25. Nov. 1. 6. 16. 16. 24. 28. Dec.
	During erection on board vessel -	9. 13. 19. 1906. Jan. 9. 23. 30. Feb. 5. 5. 9. 24. 28. Mar. 9. 12. 19. Apr. 2. 20. 23. May 2. 9. 11. 19.
	Total No. of visits	26

Is the approved plan of main boiler forwarded herewith Yes

Dates of Examination of principal parts—Cylinders 8.2.06 Slides Covers 8.2.06 Pistons Rods

Connecting rods Crank shaft Thrust shaft 13.12.05 Tunnel shafts 13.12.05 Screw shaft 13.12.05 Propeller 9.3.06

Stern tube 9.1.06 Steam pipes tested 14.4.06 Engine and boiler seatings 12.3.06 Engines holding down bolts 2.4.06

Completion of pumping arrangements 23.4.06 Boilers fixed 23.4.06 Engines tried under steam 2.5.06

Main boiler safety valves adjusted 20.4.06 Thickness of adjusting washers for bolts. P. $\frac{1}{16}$ a $\frac{1}{16}$ S. $\frac{1}{16}$ a $\frac{1}{2}$. for bolts. P. $\frac{1}{16}$ a $\frac{1}{16}$ S. $\frac{1}{16}$ a $\frac{1}{2}$.

Material of Crank shaft Identification Mark on Do. Material of Thrust shaft Identification Mark on Do.

Material of Tunnel shafts Steel Identification Marks on Do. 10291 Material of Screw shafts Steel Identification Marks on Do. 10290

Material of Steam Pipes Iron, lap welded $8 \times \frac{5}{16}$ & $6 \frac{3}{8} \times \frac{5}{16}$ Test pressure 500 lbs. per sq. in.

General Remarks (State quality of workmanship, opinions as to class, &c. H.P. turbine in 4 "expansions" having respectively 13, 13, 14 & 14 rows of moving blades, the blade heights being $1\frac{1}{2}$, $2\frac{1}{4}$, 3 & $4\frac{1}{2}$. L.P. turbine in 8 "expansions" having each 7 rows of moving blades, of heights $1\frac{1}{2}$, $2\frac{1}{4}$, 3 , $4\frac{1}{2}$, 6 , 8 , 8 "semi winged & 8" full winged. The astern turbines have casing diameters $31\frac{1}{2}$, 33 , 36 . Drum diam. 30 . Five "expansions" 10 rows $\frac{7}{8}$ blades, 10 rows 2 blades, 30 rows $3\frac{1}{2}$ blades arranged in three stages of ordinary, semi-winged & winged blades. H.P. turbine grooves $\frac{23}{64}$ on drum & $\frac{3}{8}$ on casing. L.P. grooves from $\frac{23}{64}$ to $\frac{47}{64}$ for largest blades. Spacing of rows of blades longitudinally on drum from $1\frac{1}{4}$ " to $2\frac{1}{4}$ " in. On trial the speed attained was 21 knots with natural draught & over 22 with moderate forced draught. The astern speed on three runs on the mile was $14\frac{1}{2}$ knots. From going full speed ahead the vessel was stopped in less than 1 min 30 secs. The machinery has been well made & fitted & is in my opinion eligible for the record of L.M.C. 5.06 in the Register.

It is submitted that this vessel is eligible for THE REGISTERED H.L.M.C. 5.06 F.D. ELEC. LIGHT TURBINES 3 SCREWS.

The amount of Entry Fee..	£ 3 : -	When applied for, 21 MAY 1906
Special ..	£ 80 : 17	When received, 26 MAY 1906
Donkey Boiler Fee ..	£ :	
Travelling Expenses (if any) £	:	

Arthur L. Jones 24.5.06
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute Glasgow 21 MAY 1906

Assigned + L.M.C. 5.06



Certificate (if required) to be sent to the Registrar of Shipping in the space for Committee's Minute.