

# REPORT ON MACHINERY.

Port of Sunderland

Received at London MON. 15 JUL 1906

No. in Survey held at Sunderland

Date, first Survey 27<sup>th</sup> February 06 Last Survey 23<sup>rd</sup> June 1906

Reg. Book. on the Steel Screw Steamer "Tosto"

(Number of Visits 31)

Tons } Gross 1755.38  
Net 1081.18  
When built 1906

Master B. Hutcheon Built at Sunderland By whom built J.P. Austin & Son

Engines made at Sunderland By whom made G. Clark & Co when made do

Boilers made at do By whom made do when made do

Registered Horse Power \_\_\_\_\_ Owners Pelton Steamship Co. Ltd. Port belonging to Newcastle

Nom. Horse Power as per Section 28 220 Is Refrigerating Machinery fitted for cargo purposes no Is Electric Light fitted do

## ENGINES, &c.—Description of Engines Vertical Triple Expansion fitted amidships No. of Cylinders three No. of Cranks three

Dia. of Cylinders 21 1/2 - 35 - 57" Length of Stroke 39" Revs. per minute 70 Dia. of Screw shaft as per rule 11.6 Material of screw shaft Steel

Is the screw shaft fitted with a continuous liner the whole length of the stern tube yes 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 yes Length of stern bush 3 - 11"

Dia. of Tunnel shaft as per rule 10 1/2 as fitted 10 3/8 Dia. of Crank shaft journals as per rule 10 1/2 as fitted 10 1/8 Dia. of Crank pin 11" Size of Crank webs 8 x 6 1/2 Dia. of thrust shaft under collars 11 1/2 Dia. of screw 14 - 3 Pitch of Screw 15 - 6 No. of Blades 4 State whether moveable no Total surface 65.5 sq ft

No. of Feed pumps two Diameter of ditto 2 3/4" Stroke 24" Can one be overhauled while the other is at work yes

No. of Bilge pumps two Diameter of ditto 3 1/2" Stroke 24" Can one be overhauled while the other is at work yes

No. of Donkey Engines two DUPLEX Sizes of Pumps BALLAST 9 x 10 1/2 x 10 1/2 FEED 6 x 4 x 6 No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room two wings 2 1/2 dia + one centre 3 dia In Holds, &c. two in each 2 1/2 dia one 2 1/2 tunnel well

No. of Bilge Injections 1 sizes 4 Connected to condenser, or to circulating pump yes Is a separate Donkey Suction fitted in Engine room & 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 no

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 yes

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 15.5.06 of Stern Tube 29.5.06 Screw shaft and Propellers 8.6.06

Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from top platform

## BOILERS, &c.—(Letter for record D) Manufacturers of Steel J. Spencer & Sons, Newburn Steel Works

Total Heating Surface of Boilers 3540 sq ft Is Forced Draft fitted no No. and Description of Boilers two single ended multibular

Working Pressure 160 lb Tested by hydraulic pressure to 320 lb Date of test 9.6.06 No. of Certificate 2490

Can each boiler be worked separately yes Area of fire grate in each boiler 56 sq ft No. and Description of Safety Valves to each boiler two spring loaded Area of each valve 7.6 sq ft Pressure to which they are adjusted 165 lb Are they fitted with easing gear yes

Smallest distance between boilers or uptakes and bunkers or woodwork 18" Mean dia. of boilers 13 - 9 1/2" Length 10 - 6" Material of shell plates Steel

Thickness 1 3/4" Range of tensile strength 28 1/2 to 32 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams lap or long. seams butt Diameter of rivet holes in long. seams 1 1/8" Pitch of rivets 1 1/2" Lap of plates or width of butt straps 1 1/2"

Per centages of strength of longitudinal joint rivets 99 plate 85 Working pressure of shell by rules 161.8 Size of manhole in shell end 16 x 13"

Size of compensating ring boxed No. and Description of Furnaces in each boiler two plain Material Steel Outside diameter 42"

Length of plain part top 81" bottom 115" Thickness of plates crown 1 1/4" bottom 1 1/4" Description of longitudinal joint welded No. of strengthening rings yes

Working pressure of furnace by the rules 166 lb Combustion chamber plates: Material Steel Thickness: Sides 1/16" Back 1/16" Top 1/16" Bottom 1"

Pitch of stays to ditto: Sides 10 1/2 x 9 1/2" Back 11 x 9" Top yes If stays are fitted with nuts or riveted heads but Working pressure by rules 161

Material of stays Steel Diameter at smallest part 1 3/4" Area supported by each stay 1120" Working pressure by rules 162 End plates in steam space: Material Steel Thickness 1 1/16" Pitch of stays 2 1/2 x 2 1/2" How are stays secured but Working pressure by rules 161 Material of stays Steel

Diameter at smallest part 13.91" Area supported by each stay 4340" Working pressure by rules 166 Material of Front plates at bottom Steel Thickness 1 3/8" Material of Lower back plate Steel Thickness 1/2" Greatest pitch of stays 15 1/2" Working pressure of plate by rules 165

Diameter of tubes 3 1/2" Pitch of tubes 4 1/2 x 4 1/2" Material of tube plates Steel Thickness: Front 1/16" Back 1/4" Mean pitch of stays 10"

Pitch across wide water spaces 14 1/4" Working pressures by rules 249 Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 12 1/2", 14 1/2 x 12" Length as per rule yes Distance apart yes Number and pitch of stays in each yes

Working pressure by rules yes Superheater or Steam chest; how connected to boiler yes Can the superheater be shut off and the boiler worked separately yes Diameter yes Length yes Thickness of shell plates yes Material yes Description of longitudinal joint yes Diam. of rivet holes yes Pitch of rivets yes Working pressure of shell by rules yes Diameter of flue yes Material of flue plates yes Thickness yes

If stiffened with rings yes Distance between rings yes Working pressure by rules yes End plates: Thickness yes How stayed yes

Working pressure of end plates yes Area of safety valves to superheater yes Are they fitted with easing gear yes

If not, state whether, and when, one will be sent? If a Report also sent on the Hull of the Ship?

**VERTICAL DONKEY BOILER—** Manufacturers of Steel

No. \_\_\_\_\_ Description \_\_\_\_\_

Made at \_\_\_\_\_ By whom made \_\_\_\_\_

Working pressure tested by hydraulic pressure to \_\_\_\_\_ When made \_\_\_\_\_ Where fixed \_\_\_\_\_

Valves \_\_\_\_\_ No. of Safety Valves \_\_\_\_\_ Area of each \_\_\_\_\_ No. of Certificate \_\_\_\_\_ Fire grate area \_\_\_\_\_ Description of Safety \_\_\_\_\_

If fitted with easing gear \_\_\_\_\_ If steam from main boilers can enter the donkey boiler \_\_\_\_\_ Date of adjustment \_\_\_\_\_

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:— *1 Propeller, 2 each bolts & nuts for top & bottom ends + main bearings, six of Coupling bolts, piston rings, valves for all pumps + check valves, Condenser tubes, bolts, nuts, & iron die.*

The foregoing is a correct description,  
*FOR GEORGE WALKER LIMITED*  
*Henry Clark* Manufacturer.

Dates of Survey while building: During progress of work in shops— *1906: July 27, Mch 27, 30, Apl 4, 5, 12, 19, 20, 23, 24, 26, 30, May 3, 7, 9, 11, 14, 15, 16, 22, 24, 25*  
 During erection on board vessel— *30, June 1, 2, 5, 9, 12, 13, 24, 25*  
 Total No. of visits *31*

Is the approved plan of main boiler forwarded herewith *Yes*

Dates of Examination of principal parts—Cylinders	<i>27.3.06</i>	Slides	<i>30.3.06</i>	Covers	<i>30.3.06</i>	Pistons	<i>26.4.06</i>	Rods	<i>26.4.06</i>
Connecting rods	<i>26.4.06</i>	Crank shaft	<i>26.4.06</i>	Thrust shaft	<i>26.4.06</i>	Tunnel shafts	<i>14.5.06</i>	Screw shafts	<i>14.5.06</i>
Stern tube	<i>14.5.06</i>	Steam pipes tested	<i>23.6.06</i>	Engine and boiler seatings	<i>12.6.06</i>	Engines holding down bolts	<i>13.6.06</i>	Propeller	<i>6.6.06</i>
Completion of pumping arrangements	<i>21.6.06</i>	Boilers fixed	<i>13.6.06</i>	Engines tried under steam	<i>5/7/06</i>	Thicknes of adjusting washers	<i>7/16, 7/16, 7/16, 3/8, 3/8</i>	Material of Crank shaft	<i>1 1/2 S.S. Identification Mark on Do. 158 PA</i>
Main boiler safety valves adjusted	<i>5/7/06</i>	Material of Thrust shaft	<i>1 1/2 S.S. Identification Mark on Do. 218 PA</i>	Material of Tunnel shafts	<i>1 1/2 S.S. Identification Marks on Do. 387 PA</i>	Material of Screw shafts	<i>Scrap Iron Identification Marks on Do. 270 C</i>	Material of Steam Pipes	<i>Druid copper 4 lengths 5 dia 6 swg. Test pressure 35 lbs.</i>

**General Remarks** (State quality of workmanship, opinions as to class, &c.)  
*The machinery of this vessel has been constructed under special survey, the material and workmanship found good, tested and fitted in accordance with the rules, and eligible in my opinion for classification with record of + L.M.C. 6.06*

It is submitted that this vessel is eligible for **THE RECORD** L.M.C. 6.06.

*J.M. [Signature]*  
 10/7/06

*E.M. [Signature]*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

The amount of Entry Fee..	£ 2	When applied for.	<i>14.7.06</i>
Special .. .. .	£ 31	When received.	<i>17.9.06</i>
Donkey Boiler Fee .. .	£ ..		
Travelling Expenses (if any) £	£ ..		

Committee's Minute  
 Assigned  
 TUES. 17 JUL 1906  
 + L.M.C. 6.06

MACHINERY CERTIFICATE WRITTEN.



Certificate (if required) to be sent to  
 (The Surveyors are requested not to write on or below the space for Committee's Minute.)