

# REPORT ON MACHINERY.

Received at London Office TUES. 19 NOV 1907

Date of writing Report 19 When handed in at Local Office 18 Nov 1907 Port of Glasgow  
 No. in Survey held at Glasgow Date, First Survey 17<sup>th</sup> Sept 06 Last Survey 6<sup>th</sup> Nov 1907  
 Reg. Book. H19 on the Triple Screw Turbine Steamer "Heliopolis" (Number of Visits 62)  
 Master Built at Glasgow By whom built Fairfield & B. & C. Ltd When built 1907  
 Engines made at Glasgow By whom made Fairfield & B. & C. Ltd when made 1907  
 Boilers made at do By whom made do when made 1907  
 Registered Horse Power Owners Egyptian Mail S. C. Ltd Port belonging to London  
 Nom. Horse Power as per Section 28 2930 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

**ENGINES, &c.**—Description of Engines Turbine No. of Cylinders 3 No. of Cranks ✓  
 Dia. of Cylinders 5-4 7/8, 7-7 7/8 Length of Stroke ✓ Revs. per minute 340 Dia. of Screw shaft 11 1/4" Material of screw shaft as fitted 11 1/4" 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 ✓ Length of stern bush 5-6"  
 Dia. of Tunnel shaft as per rule 10 1/2" Dia. of Crank shaft journals as fitted 15" Dia. of Crank pin ✓ Size of Crank webs ✓ Dia. of thrust shaft under collars ✓ Dia. of screw 8-1 1/2" Pitch of Screw 8-8 1/2" No. of Blades 3 State whether moceable no Total surface 29 # each  
 No. of Feed pumps 2 pairs Diameter of ditto 15 1/2" Stroke 26" Can one be overhauled while the other is at work Yes - W. W. W.  
 No. of Bilge pumps 2 Diameter of ditto 7 1/2" Stroke 7" Can one be overhauled while the other is at work Yes - Can't tell  
 No. of Donkey Engines 7 Sizes of Pumps 7 1/2" x 12", 7 1/2" x 7", 10" x 24" x 12" No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 2-4" BR. 4-4" 1 1/2" In Holds, &c. 3-3", 2-3 1/2", aft 2-3 1/2" 1-3  
 No. of Bilge Injections 2 sizes 12" Connected to condenser, or to circulating pump pump Is a separate Donkey Suction fitted in Engine room & size 2 at 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 ✓  
 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  
 Dates of examination of completion of fitting of Sea Connections 9 of Stern Tube 9 Screw shaft and Propeller 2.1-12 1/2" / 5707  
 Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from Top grating

**BOILERS, &c.**—(Letter for record (S)) Manufacturers of Steel David White & Son.  
 Total Heating Surface of Boilers 39540 # Is Forced Draft fitted Yes No. and Description of Boilers H.S. & H.D.S.  
 Working Pressure 180 lb Tested by hydraulic pressure to 360 # Date of test 9 No. of Certificate In Book  
 Can each boiler be worked separately Yes Area of fire grate in each boiler D.S. 164 1/2, S.S. 82 1/2 No. and Description of Safety Valves to each boiler D.E. 3, S.E. 2, Spring Area of each valve S.E. 11 # Pressure to which they are adjusted 485 lb Are they fitted with easing gear Yes  
 Smallest distance between boilers or uptakes and bunkers or woodwork abt 12" Mean dia. of boilers 16-9" Length 20-0" Material of shell plates steel  
 Thickness 1 3/16" Range of tensile strength 29/32 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams Double & Treble long. seams D.B.S. Diameter of rivet holes in long. seams 1 1/32" Pitch of rivets 10" Lap of plates or width of butt straps 2 1/4 x 1 3/16"  
 Per centages of strength of longitudinal joint rivets 92.2 Working pressure of shell by rules 206 lb Size of manhole in shell 16 x 12" plate 84.7  
 Size of compensating ring One hole No. and Description of Furnaces in each boiler S.E. 4 Material steel Outside diameter 46"  
 Length of plain part top 1 Thickness of plates crown 9/16 Description of longitudinal joint weld No. of strengthening rings  
 Working pressure of furnace by the rules 191 Combustion chamber plates: Material steel Thickness: Sides 19/32 Back 19/32 Top 19/32 Bottom 7/8  
 Pitch of stays to ditto: Sides 7 3/4 x 8 Back 7 3/4 x 8 Top 7 3/4 x 8 If stays are fitted with nuts or riveted heads nuts Working pressure by rules 196 lb  
 Material of stays steel Diameter at smallest part 1.48 Area supported by each stay 7 3/4 x 8 Working pressure by rules 191 End plates in steam space: Material steel Thickness 1 1/32" Pitch of stays 16 x 16 1/4 How are stays secured Double nuts Working pressure by rules 180 Material of stays steel  
 Diameter at smallest part 5.27 Area supported by each stay 16 x 16 1/4 Working pressure by rules 202 Material of Front plates at bottom steel  
 Thickness 1 3/16" Material of Lower back plate steel Thickness 2 1/32" Greatest pitch of stays 12" Working pressure of plate by rules 180  
 Diameter of tubes 2 1/2" Pitch of tubes 3 3/4" Material of tube plates steel Thickness: Front 1/16 Back DE 7/8 Mean pitch of stays 9 3/8"  
 Pitch across wide water spaces 13 1/2" Working pressures by rules 230 lb Girders to Chamber tops: Material steel Depth and thickness of girder at centre 12 3/4 x 3 3/4 Length as per rule 56 Distance apart 7 3/4" Number and pitch of stays in each 3-8"  
 Working pressure by rules 180 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

If not stated whether and when, one will be sent

**VERTICAL DONKEY BOILER**— Manufacturers of Steel *None*

No. \_\_\_\_\_ 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:— *Propeller shaft, 2 propellers 1st hand & 1 left hand, 2 turbine main bearing bushes, set steam gland rings for HP & for one of P turbine, 12 coupling bolts & nuts, etc.*

The foregoing is a correct description, **THE FAIRFIELD SHIPBUILDING AND ENGINEERING CO., LIMITED.**  
 Manufacturer. *Allen Cleghorn* MANAGER.

Dates of Survey while building: During progress of work in shops— 1906: *Apr 17, 26, Oct 29, Nov 12, 23, Dec 17, 24, 27, 1907: Jan 5, 10, 11, 20, 29, Feb 2, 9, 15, 19, Mar 12, 20, Apr 9, 10, 16, 24, 29.*  
 During erection on board vessel— *May 29, 14, 21, 22, June 2, 4, 10, 14, 20, 24, 27, July 2, 8, 9, 25, Aug 6, 13, 21, 27, 29, Sept 6, 10, 15, 20, 24, 25, 26, Oct 2, 10, 17, 22, Nov 1, 4, 6.*  
 Total No. of visits *62* Is the approved plan of main boiler forwarded herewith *Yes - two*

Dates of Examination of principal parts: *Turbines* Cylinders *30/3/07* Slides \_\_\_\_\_ Covers \_\_\_\_\_ Pistons \_\_\_\_\_ Rods \_\_\_\_\_  
 Connecting rods \_\_\_\_\_ *Spindles* Crank shaft *8/2/07* Thrust shaft \_\_\_\_\_ Tunnel shafts \_\_\_\_\_ Screw shaft *30/3/07* Propeller *20/3/07* etc.  
 Stern tube *30/3/07* etc. Steam pipes tested *29/11/07* etc. Engine and boiler seatings *2/7/07* Engines holding down bolts *17/11/07*  
 Completion of pumping arrangements *17/11/07* Boilers fixed *24/9/07* Engines tried under steam *8/11/07*  
 Main boiler safety valves adjusted *22/10/07* Thickness of adjusting washers *See below*  
 Material of *Spindles* Crank shaft *steel* Identification Mark on Do. *HGS* Material of Thrust shaft \_\_\_\_\_ Identification Mark on Do. *HGS*  
 Material of Tunnel shafts *steel* Identification Marks on Do. \_\_\_\_\_ Material of Screw shafts *steel* Identification Marks on Do. \_\_\_\_\_  
 Material of Steam Pipes *Iron* Test pressure *540 lbs*

General Remarks (State quality of workmanship, opinions as to class, &c.)  
*The turbines & boilers of this vessel have been constructed under Special Survey & are of good materials & workmanship. They have been securely fitted on board & satisfactorily tried under steam.*

This vessel is in my opinion eligible to have notation **LMC 11.07** in the Register Book.

Boilers. Dates of Test. *17/12/06, 24/12/06, 25/1/07, 27/12/07, 10/1/07, 16/1/07, 30/1/07, 4/2/07.* Certificate Nos. *8681, 8684, 8716, 8731, 8686, 8713, 8717, 8752.*  
 Safety Valve Washers:— P.F.D.E. *23/16, 25/16, 25/16*; S.F.D.E. *23/16, 25/16, 25/16*; P.F.S.E. *19/16, 19/16*; S.F.S.E. *19/16, 19/16*; P.A.S.E. *17/16, 17/16*; S.A.S.E. *17/16, 17/16*; P.A.D.E. *3/8, 13/32, 3/8*; S.A.D.E. *27/16, 13/32, 23/16*

It is submitted that this vessel is eligible for THE RECORD. **LMC 11.07** F.D. Elec. Light *20-11-07*

Amount of Entry Fee. \_\_\_\_\_  
 Special \_\_\_\_\_ £ *166-10*  
 Donkey Boiler Fee \_\_\_\_\_  
 Travelling Expenses (if any) £ \_\_\_\_\_  
 Committee's Minute \_\_\_\_\_  
 Assigned \_\_\_\_\_

When applied for. *18 NOV 1907*  
 When received. *22-11-07*  
*H Gardner-Smith*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

**Glasgow 18 NOV 1907**

*LMC 11.07*



Certificate (if required) to be sent to the Registrar of Shipping (The Registrar of Shipping is not to be sent to the Registrar of Shipping's Agents.)