

# REPORT ON MACHINERY.

Port of *West Hartlepool*

No. in Survey held at *Hartlepool*  
Reg. Book.

Date, first Survey *20<sup>th</sup> March* Last Survey *14<sup>th</sup> Sep 1893*  
Received at London Office *MON. 13 SEP. 1893*  
(Number of Visits *52*)

on the *Screw Steamer Appomattox*  
Master *Maxwell* Built at *Hartlepool* By whom built *Summers Witherby & Co*  
Engines made at *Hartlepool* By whom made *Messrs. Richardson & Sons* when made *1893*  
Boilers made at *Hartlepool* By whom made *Messrs. Richardson & Sons* when made *1893*  
Registered Horse Power *412* Owners *Chesapeake & Ohio Steamship Co. Ltd* Port belonging to *West Hartlepool*  
Tons { Gross *2874.60*  
Net *1821.46*  
When built *1893*  
Nom. Horse Power as per Section 28 *412*

**ENGINES, &c.**— Description of Engines *Inverted, Triple Expansion, 3 Cranks* No. of Cylinders *3*  
Diameter of Cylinders *28" 44" 72"* Length of Stroke *48"* Revolutions per minute *68* Diameter of Screw shaft as per rule *13.01*  
Diameter of Tunnel shaft as fitted *12.35* Diameter of Crank shaft journals *13 1/2"* Diameter of Crank pin *14"* Size of Crank webs *21 1/2" x 9"*  
Diameter of screw *14 1/2"* Pitch of screw *16.6 to 19.6* No. of blades *4* State whether moveable *yes* Total surface *86.1 sq. ft.*  
No. of Feed pumps *2* Diameter of ditto *3 1/2"* Stroke *36"* Can one be overhauled while the other is at work *yes*  
No. of Bilge pumps *2* Diameter of ditto *4"* Stroke *36"* Can one be overhauled while the other is at work *yes*  
No. of Donkey Engines *3* Sizes of Pumps *(10x9)(4 1/2 x 10)(2 1/2 x 4)* No. and size of Suctions connected to both Bilge and Donkey pumps  
In Engine Room *Four* Two *3 1/2" dia.*, Two *3" dia.*, In Holds, &c. *Five*, One for hold *3 1/2" dia.*  
*One 3 1/2" dia. main hold, One 3 1/2" dia. After hold, One 3 1/2" dia. Aftermost hold, 1-2" dia. tunnel bulk.*  
No. of bilge injections *one* sizes *7 1/2"* Connected to condenser, or to circulating pump *Cal pump* Is a separate donkey suction fitted in Engine room & size *yes, 3 1/2" 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 *no sluices*  
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 *11.7.93* Is the screw shaft tunnel watertight *yes*  
Is it fitted with a watertight door *yes* worked from *top platform of Engine room*

**BOILERS, &c.**— (Letter for record *(8)*) Total Heating Surface of Boilers *6981 sq. ft.*  
No. and Description of Boilers *Two, Cylindrical, Double Ended* Working Pressure *160 lb.* Tested by hydraulic pressure to *320 lb.*  
Date of test *15.7.93* Can each boiler be worked separately *yes* Area of fire grate in each boiler *93.75 sq. ft.* No. and Description of safety valves to each boiler *Two, Spring* Area of each valve *12.56 sq. in.* Pressure to which they are adjusted *165 lb.* Are they fitted with easing gear *yes* Smallest distance between boilers or uptakes and bunkers *15"* Mean diameter of boilers *14.6"*  
Length *15.9"* Material of shell plates *Steel* Thickness *1 1/2"* Description of riveting: circum. seams *Full 15" lap* long. seams *double butt straps*  
Diameter of rivet holes in long. seams *1 1/2"* Pitch of rivets *12 in 7/4", 2 in 3/8"* Lap of plates or width of butt straps *19 1/2"*  
Per centages of strength of longitudinal joint plate *85.08* Working pressure of shell by rules *161 lb.* Size of manhole in shell *16 3/4" x 13"*  
Size of compensating ring *2.6 x 2.3 x 1 1/2"* No. and Description of Furnaces in each boiler *6, Morrison's* Material *Steel* under 26 tons Outside diameter *3.7 3/4"*  
Length of plain part top *4"* bottom *7"* Thickness of plates crown and bottom *9/16"* Description of longitudinal joint *welded* No. of strengthening rings *none*  
Working pressure of furnace by the rules *160 lb.* Combustion chamber plates: Material *Steel* Thickness: Sides *5/8"* Back *5/8"* Top *5/8"* Bottom *13/16"*  
Pitch of stays to ditto: Sides *8 1/2" x 8 1/2"* Back *8 1/2" x 8 1/2"* Top *8 1/2" x 8 1/2"* If stays are fitted with nuts or riveted heads *nuts* Working pressure by rules *176 lb.*  
Material of stays *Steel* Diameter at smallest part *1 3/8"* Area supported by each stay *74.37* Working pressure by rules *159.6 lb.* End plates in steam space: Material *Steel* Thickness *1 1/16"* Pitch of stays *18" x 18"* How are stays secured *Double nuts & washers* Working pressure by rules *165 lb.* Material of stays *steel*  
Diameter at smallest part *2 3/4"* Area supported by each stay *324 sq. in.* Working pressure by rules *165 lb.* Material of Front plates at bottom *Steel*  
Thickness *1 3/16"* Material of Lower back plate Thickness Greatest pitch of stays Working pressure of plate by rules  
Diameter of tubes *3 1/2"* Pitch of tubes *4 1/2" x 4 3/8"* Material of tube plates *Steel* Thickness: Front *15/16"* Back *3/4"* Mean pitch of stays *9" x 8 3/4"*  
Pitch across wide water spaces *14 1/2"* Working pressures by rules *160 lb.* Girders to Chamber tops: Material *Steel* Depth and thickness of girder at centre *10" x 1 3/4"* Length as per rule *39"* Distance apart *8 3/4"* Number and pitch of Stays in each *3 — 8 1/2"*  
Working pressure by rules *166 lb.* 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



DONKEY BOILER— Description *Cylindrical, multitubular, single ended.*  
Made at *Catehead* By whom made *Clarke, Chapman & Co.* When made *28.6.93* Where fixed *In stokehold*  
Working pressure *80 lb* tested by hydraulic pressure to *160 lb*. No. of Certificates *418* Fire grate area *30 sq. ft.* Description of safety valves *Spring*  
No. of safety valves *one* Area of each *14.19* Pressure to which they are adjusted *85 lb*. If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no* Diameter of donkey boiler *9.0"* Length *9.0"* Material of shell plates *steel* Thickness *7/16"*  
Description of riveting long. seams *Double end lap* Diameter of rivet holes *1"* Whether punched or drilled *drilled* Pitch of rivets *3 3/8"*  
Lap of plating *4 13/16"* Per centage of strength of joint *70* Rivets *70* Thickness of shell *end* plates *5 1/8"* Radius of do. *—* No. of Stays to do. *6*  
Dia. of stays. *1 5/8"* Diameter of furnace *Top 2.9"* Bottom *—* Length of furnace *6.0"* Thickness of furnace plates *7/16"* Description of joint *single end butt* Thickness of *Combustion Chamber* plates *3/16"* Stayed by *18 stays 8 x 7 1/2" pitch* Working pressure of shell by rules *83 lb*  
Working pressure of furnace by rules *86 lb*. Diameter of *water* tubes *3"* Thickness of *water* tubes *5/8"* Thickness of *water* tubes *10 13.4.8.*

SPARE GEAR. State the articles supplied:— *2 Propeller blades, A set of bolts & nuts for a connecting rod, main bearing, & shaft coupling. A set of feed & bilge pump valves, 2 sets of piston springs, Bolts, nuts & Iron ass. Air and Circulating pump buckets and rods, 12 Air pump valves, 4 Circulating pump valves, 50 Condenser tubes, 6 Water tubes.*

The foregoing is a correct description,  
PHO. T. RICHARDSON & SONS. Manufacturer. of Engines & main Boilers  
*J. B. Norton*

General Remarks (State quality of workmanship, opinions as to class, &c.)  
*Main steam pipes tested by hydraulic pressure to 320 lb per square inch and found tight.*  
*The engines and boilers of this vessel have been constructed under Special Survey and of a good quality of workmanship they have been tried under steam the safety valves adjusted and found to work well and are now in safe and efficient working condition and, in my opinion, eligible to have*  
*L.M.C. 9.93. recorded in the Register of this Society.*  
*The Electric Lighting Installation of this vessel has been fitted by Messrs. Clarke Chapman & Co. Ltd. and their Report on the same is appended.*  
*The engine and dynamo are fitted on the lower platform and near the after bulkhead of the engine-room on the port side of the vessel.*

It is submitted that  
this vessel is eligible for  
THE RECORD + L.M.C. 9.93 -

*Arch*  
*18/9/93 -*

*A. Stoddart*  
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

MACHINERY CERTIFICATE

Certificate (if required) to be sent to *WRITTEN*  
The amount of Entry Fee.. £ *3 : 0 :* When applied for,  
Special .. .. £ *40 : 12 :* *16.9.93*  
Donkey Boiler Fee .. .. £ : : When received,  
Travelling Expenses (if any) £ : : *18.9.93*  
*19.9.93*

Committee's Minute  
Assigned *TUES. 19 SEP 1893*  
*+ L.M.C. 9.93*