

# REPORT ON MACHINERY.

No. 4246

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No. in Survey held at *Hastlepool & Middlesbrough* Date, first Survey *13<sup>th</sup> June 1888* Last Survey *18<sup>th</sup> Jan 1889*  
 Reg. Book. *"Echuca"* (Number of Visits *30*) *1881*  
 on the *Screw Steamer "Echuca"* Tons *290.6*  
 Master *J. Pankhurst* Built at *Middlesbrough* By whom built *Messrs. R. Dixon & Co.* When built *1888*  
 Engines made at *Hastlepool* By whom made *Messrs. J. Richardson & Sons* when made *1889*  
 Boilers made at *Hastlepool* By whom made *Messrs. J. Richardson & Sons* when made *1889*  
 Registered Horse Power *400* Owners *Wilhelm Lund* Port belonging to *London*.

## ENGINES, &c.—

Description of Engines *Inverted, Triple Expansion, 3 Cylinders, & 3 Cranks*  
 Diameter of Cylinders *27½", 43½", 71"* Length of Stroke *48"* No. of Rev. per minute *60* Point of Cut off, High Pressure *.5 stroke* Low Pressure *.6 stroke*  
 Diameter of Screw shaft *13"* Diam. of Tunnel shaft *12½"* Diam. of Crank shaft journals *13"* Diam. of Crank pin *13½"* size of Crank webs *20¼" x 8¾"*  
 Diameter of screw *16.0"* Pitch of screw *30.6"* No. of blades *4* state whether moveable *yes* total surface *83 sq. ft.*  
 No. of Feed pumps *2* diameter of ditto *3¼"* Stroke *29"* Can one be overhauled while the other is at work *yes.*  
 No. of Bilge pumps *2* diameter of ditto *3¼"* Stroke *29"* Can one be overhauled while the other is at work *yes.*  
 Where do they pump from *Fore hold, Engine room, After well, sea, & ballast tanks*  
 No. of Donkey Engines *2* Size of Pumps *(8½" x 7") (3½" x 7")* Where do they pump from *(Ballast tanks, sea & all bilges) (Hotwell, tanks, sea & all bilges)*  
 Are all the bilge suction pipes fitted with roses *yes* Are the roses always accessible *yes* Are the sluices on Engine room bulkheads always accessible *yes*  
 No. of bilge injections *One* and sizes *4½"* Are they connected to condenser, or to circulating pump *Circulating pump.*  
 How are the pumps worked *By levers from the after piston rod crosshead.*  
 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 *Bilge suction & fore hold* How are they protected *By wood casing.*  
 Are all pipes, cocks, valves, and pumps in connection with the machinery accessible at all times *yes.*  
 Are the pipes, cocks, and valves arranged so as to prevent an unintentional connection between the sea and the bilges *yes.*

When were stern tube, propeller, screw shaft, and all connections examined in dry dock

Is the screw shaft tunnel watertight *yes* and fitted with a sluice door *yes* worked from *Top platform of engine room*

## BOILERS, &c.—

Number of Boilers *Three* Description *Cyl. built. Double ended* Whether Steel or Iron *Steel*  
 Working Pressure *150 lb.* Tested by hydraulic pressure to *300 lb.* Date of test *26<sup>th</sup> Oct 1888.*  
 Description of superheating apparatus or steam chest *None*  
 Can each boiler be worked separately *yes* Can the superheater be shut off and the boiler worked separately *No Superheater.*  
 No. of square feet of fire grate surface in each boiler *64.3* Description of safety valves *Spring* No. to each boiler *2*  
 Area of each valve *9.62* Are they fitted with easing gear *yes* No. of safety valves to superheater *—* area of each valve *—*  
 Are they fitted with easing gear *—* Smallest distance between boilers and bunkers *or woodwork 6.9"* Diameter of boilers *11.4"*  
 Length of boilers *16.0"* description of riveting of shell long. seams *double butt strap* circum. seams *double riv. lap* Thickness of shell plates *16*  
 Diameter of rivet holes *31/32"* whether punched or drilled *drilled* pitch of rivets *12 in 6½"* 2 rows *3½"* Lap of plating *8"*  
 Percentage of strength of longitudinal joint *85.1* working pressure of shell by rules *152 lb.* size of manholes in shell *16¾" x 13"*  
 No. of compensating rings *2.6 x 2.3 x 15* No. of Furnaces in each boiler *4*  
 Outside diameter *3.04"* length, top *5.9"* bottom *5.9"* thickness of plates *7/8"* description of joint *butt strap* if rings are fitted *no*  
 Greatest length between rings *—* working pressure of furnace by the rules *151 lb.* combustion chamber plating, thickness, sides *3/2"* back *—* top *3/2"*  
 Pitch of stays to ditto, sides *8½" x 8"* back *—* top *8½" x 8½"* If stays are fitted with nuts or riveted heads *nuts* working pressure of plating by rules *150 lb.* Diameter of stays at smallest part *1⅜"* working pressure of ditto by rules *164 lb.* and plates in steam space, thickness *1½"*  
 Pitch of stays to ditto *15⅞" x 16⅞"* how stays are secured *double nut & washers* working pressure by rules *151 lb.* diameter of stays at smallest part *2 3/8"* working pressure by rules *158 lb.* Front plates at bottom, thickness *3/4"* Back plates, thickness *—*  
 Greatest pitch of stays *—* working pressure by rules *—* Diameter of tubes *3¼"* pitch of tubes *4½" x 4⅜"* thickness of tubes *—*  
 Plates, front *176* back *176"* how stayed *stay tube* pitch of stays *9" x 8¾"* width of water spaces *1¼"*  
 Diameter of Superheater or Steam chest *—* length *—* thickness of plates *—* description of longitudinal joint *—* diam. of rivet holes *—*  
 Pitch of rivets *—* working pressure of shell by rules *—* diameter of flue *—* thickness of plates *—* If stiffened with rings *—*  
 Distance between rings *—* working pressure by rules *—* end plates of superheater, or steam chest; thickness *—* how stayed *—*  
 Superheater or steam chest; how connected to boiler *—*

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Lloyd's Register Foundation



**DONKEY BOILER**— Description *Vertical, Centus, Patent,*  
 Made at *Gateshead* by whom made *Wm. Clarke Chapman & Co* when made *27.10.88* where fixed *In stockade*  
 Working pressure *80 lbs.* tested by hydraulic pressure to *160 lbs.* No. of Certificate *2642* fire grate area *23.74 sq. ft.* description of safety  
 valves *Spring* No. of safety valves *2* area of each *7.0* if fitted with easing gear *yes* if steam from main boilers can  
 enter the donkey boiler *no* diameter of donkey boiler *6.6* length *14.0* description of riveting *double riv. lap*  
 Thickness of shell plates *7/16* diameter of rivet holes *7/8* whether punched or drilled *drilled* pitch of rivets *3 3/16* lap of plating *4 in*  
 per centage of strength of joint *72.5* thickness of crown plates *9/16* stayed by *two uptakes & stays, dished to 5.0*  
 Diameter of furnace, top *5.1* bottom *5.8* length of furnace *7.0* thickness of plates *9/16 & 5/8* description of joint *single riv. lap*  
 Thickness of furnace crown plates *9/16* stayed by *same as crown* working pressure of shell by rules *96 lbs.*  
 Working pressure of furnace by rules *80 lbs.* diameter of uptake *15* thickness of plates *7/16* thickness of water tubes *7/16*  
*as reported by J.B. for R. R.*

**SPARE GEAR.** State the articles supplied:— *One set of bolts & nuts for a connecting rod, main  
 bearing, and shaft coupling, One set of valves for a feed-pump & bilge  
 pump, also for a ballast donkey engine & feed donkey engine. One set of springs  
 for each piston, 2 propeller blades, 200 bolts & nuts ass., Iron ass.*  
*The foregoing is a correct description,*  
*J. Richardson & Sons* Manufacturers of Engines & Marine Boilers.

**General Remarks** (State quality of workmanship, opinions as to class, &c.)  
*Main steam pipes tested by hydraulic pressure to 300 lbs. 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 workman  
 they have been tried under steam, the safety valves  
 adjusted, and found to work well, and are now  
 safe and efficient working condition and eligible, in  
 opinion, to have the notification **L.M.C. 1.89.** recorded  
 in the Register of this Society*

The amount of Entry Fee .. £ 3 : 0 : 0 received by me,  
 Special .. .. £ 40 : 0 : 0  
 Donkey Boiler Fee .. .. £ : :  
 Certificate (if required) .. £ : : 19. 1 1889  
 To be sent as per .. in.  
 (Travelling Expenses, if any, £ .. ..)

Committee's Minute **TUES. 22 JAN 1890**  
*+ dmlb 1/89*

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