

## REPORT ON MACHINERY.

Port of Sunderland

MON 30 NOV 1896

Received at London Office 18

No. in Survey held at Sunderland Date, first Survey 18 Sept 1896 Last Survey 23 Nov 1896  
Reg. Book.(Number of Visits 18)on the Screw Steamer "Norman"Tons { Gross 424.54  
Net 222.33Master H. Hawthorn Built at Sunderland By whom built Sld Shipbuilding Co Ltd When built 1896Engines made at Sunderland By whom made No Eastern Marine Eng Co Ltd when made 1896Boilers made at Sunderland By whom made No Eastern Marine Eng Co Ltd when made 1896Registered Horse Power 135 Owners E. Hawthorn Port belonging to LondonNom. Horse Power as per Section 28 134Is Electric Light fitted It is to be fittedENGINES, &c.—Description of Engines Tri compoundNo. of Cylinders 3No. of Cranks 3Diameter of Cylinders 17" 28" 46" Length of Stroke 30" Revolutions per minute 110 Diameter of Screw shaft 8 1/4"  
as per rule 7 3/4" as fitted 8 3/8"Diameter of Tunnel shaft 8" Diameter of Crank shaft journals 8 1/2" Diameter of Crank pin 8 1/2" Size of Crank webs 13" x 5 1/2"Diameter of screw 10' 9" Pitch of screw 12' 3" No. of blades 4 State whether moveable no Total surface 48 ftNo. of Feed pumps 2 Diameter of ditto 2 3/4" Stroke 18" Can one be overhauled while the other is at work yesNo. of Bilge pumps 2 Diameter of ditto 3" Stroke 18" Can one be overhauled while the other is at work yesNo. of Donkey Engines 2 Sizes of Pumps 7" x 9" x 9" No. and size of Suctions connected to both Bilge and Donkey pumps  
5 1/2" x 3 1/2" x 5"In Engine Room 3 of 2" + 1 of 2 1/2" In Holds, &c. Fore hold 2 of 2", aft hold 2 of 2"No. of bilge injections 1 sizes 3 1/2" Connected to condenser, or to circulating pump 6" 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 noneAre all connections with the sea direct on the skin of the ship yes Are they Valves or Cocks bothAre 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 aboveAre 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 yesWhat 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 yesAre the bilge suction pipes, cocks, and valves arranged so as to prevent any communication between the sea and the bilges yesWhen were stern tube, propeller, screw shaft, and all connections examined in dry dock new vessel Is the screw shaft tunnel watertight yesIs it fitted with a watertight door yes worked from top platformOILERS, &c.—(Letter for record S) Total Heating Surface of Boiler 2225 ft Is forced draft fitted noNo. and Description of Boilers One single ended Working Pressure 175 lbs Tested by hydraulic pressure to 350 lbsDate of test 14. 10. 96 Can each boiler be worked separately only one Area of fire grate in each boiler 48 ft No. and Description of safety valves toeach boiler 2 direct spring Area of each valve 8. 29 sq Pressure to which they are adjusted 175 lbs Are they fittedwith easing gear yes Smallest distance between boilers or uptakes and bunkers or woodwork 2' 0" Mean diameter of boilers 14' 4 3/4"Length 10' 6" Material of shell plates S Thickness 1 3/32" Description of riveting: circum. seams D. R. L long. seams R. D. B. SDiameter of rivet holes in long. seams 1 7/32" Pitch of rivets 7 3/8" Lap of plates or width of butt straps 17 3/8"Per centages of strength of longitudinal joint rivets 91 Working pressure of shell by rules 180 lbs Size of manhole in shell 16" x 12"Size of compensating ring 20" x 20" x 1" No. and Description of Furnaces in each boiler 3 Curves Material S Outside diameter 3' 3"Length of plain part top ✓ Thickness of plates crown 33/64" Description of longitudinal joint welded No. of strengthening rings ✓Working pressure of furnace by the rules 186 Combustion chamber plates: Material S Thickness: Sides 9/16" Back 9/16" Top 9/16" Bottom 9/16" + 2 TPitch of stays to ditto: Sides 7 3/4" x 7 1/2" Back 7 3/4" x 7 1/2" Top 7 1/2" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 182Material of stays S Diameter at smallest part 1 3/8" Area supported by each stay 60 sq Working pressure by rules 200 End plates in steam space:Material S Thickness 1" Pitch of stays 14 15/16" How are stays secured nuts Working pressure by rules 200 Material of stays SDiameter at smallest part 2 9/16" Area supported by each stay 223 sq Working pressure by rules 200 Material of Front plates at bottom SThickness 3/4" Material of Lower back plate S Thickness 7/8" Greatest pitch of stays 11 1/2" Working pressure of plate by rules 200Diameter of tubes 3 1/4" Pitch of tubes 4 1/2" Material of tube plates S Thickness: Front 13/16" Back 3/4" Mean pitch of stays 9"Pitch across wide water spaces 12 1/2" Working pressures by rules 180 lbs Girders to Chamber tops: Material S Depth andthickness of girder at centre 6 1/2" x 1 1/4" x 2" Length as per rule 26 1/2" Distance apart 7 1/2" Number and pitch of Stays in each 2 stays 7 1/2"Working pressure by rules 236 Superheater or Steam chest; how connected to boiler none Can the superheater be shut off and the boiler workedseparately ✓ Diameter ✓ Length ✓ Thickness of shell plates ✓ Material ✓ Description of longitudinal joint ✓ Diam. of rivetholes ✓ 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 *Vertical with 2 crosswater tubes*  
 Made at *Stockton* By whom made *Riley Bros.* When made *31. 10. 96* Where fixed *Stoke hold*  
 Working pressure *100 lbs* tested by hydraulic pressure to *200 lbs* No. of Certificate *1379* Fire grate area *19 sq ft* Description of safety valves *direct spring*  
 No. of safety valves *2* Area of each *4.90* Pressure to which they are adjusted *100 lbs* If fitted with easing gear *yes* If steam from main boilers can enter the donkey boiler *no* Diameter of donkey boiler *5' 0"* Length *9' 0"* Material of shell plates *S* Thickness *7/16"*  
 Description of riveting long. seams *Lap Double* Diameter of rivet holes *15/16"* Whether punched or drilled *punched* Pitch of rivets *3 1/4"*  
 Lap of plating *4 3/4"* Per centage of strength of joint Rivets *83* Thickness of shell crown plates *9/16"* Radius of do. *5 ft* No. of Stays to do. *5*  
 Dia. of stays. *1 5/8"* Diameter of furnace Top *4' 0"* Bottom *4' 5"* Length of furnace *4' 3"* Thickness of furnace plates *9/32"* Description of joint *Lap single* Thickness of furnace crown plates *9/16"* Stayed by *Same as shell crown* Working pressure of shell by rules *109 lbs*  
 Working pressure of furnace by rules *103 lbs* Diameter of uptake *12"* Thickness of uptake plates *7/16"* Thickness of water tubes *3/8"*

**SPARE GEAR.** State the articles supplied:— *Top and bottom end connecting rod bolts & nuts, two main bearing bolts & nuts, one set of coupling bolts & nuts, feed & bilge pump valves, propeller, bolts & nuts & iron assorted.*

The foregoing is a correct description,  
*J. H. Durin* Manufacturer.  
*For and on behalf of the North Eastern Marine Engineering Company Limited.*

Dates of Survey while building  
 During progress of work in shops— *1896 Sept. 18 October 1. 9. 13. 14. 17. 19. 23*  
 During erection on board vessel— *Nov. 3. 5. 6. 9. 11. 13. 14. 18. 28*  
 Total No. of visits *18.*

**General Remarks** (State quality of workmanship, opinions as to class, &c.)  
*The machinery of this vessel has been constructed under special survey. The materials & workmanship being good & efficient, and the engines when tried under steam worked satisfactorily. The main steam pipe tested by hydraulic pressure to 350 lbs.*  
*The electric light is to be fitted on board by H. Bin & Co., of London, on the vessel's return.*  
*In my opinion the machinery of this vessel is eligible for the notification in the Register Book of 22. 11. 96.*

It is submitted that  
 this vessel is eligible for  
 THE RECORD + L. M. C. 11. 96

*[Large blue ink signature]*  
*30. 11. 96*

The amount of Entry Fee. . . £ *2* : - :  
 Special . . . . . £ *20* : *2* :  
 Donkey Boiler Fee . . . . . £ - : - :  
 Travelling Expenses (if any) £ - : - :  
 When applied for, *24 Nov 1896*  
 When received, *15. 12. 1896*

Committee's Minute  
 Assigned  
 TUES 1 DEC 1896  
*+ 2 Dec 11. 96*

*Patk Salmon.*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.



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Certificate (if required) to be sent to