

REPORT ON MACHINERY.

No. 1145

No. in Survey held at *West Hartlepool*

Date, first Survey *8th April*

Last Survey *8th August 1886*

Reg. Book.

on the *Screw Steamer "Bakuin"*

(Number of Vials *32*) *999.24* Tons *1531.06*

Master *J.A. Kirkwright* Built at *West Hartlepool* By whom built *H^{rs} Gray & Co^{rs}* When built *1886*

Engines made at *West Hartlepool* By whom made *Central Marine Engineering Co^{rs}* when made *1886*

Boilers made at *do* By whom made *do* when made *1886*

Registered Horse Power *200* Owners *H^{rs} Gray* Port belonging to *London*

ENGINES, &c.—

Description of Engines *Triple Expansion Inverted direct acting with three cranks*

Diameter of Cylinders *21, 33 & 57* Length of Stroke *29* No. of Rev. per minute *60* Point of Cut off, High Pressure *1/2* Stroke Low Pressure *1/2* Stroke

Diameter of Screw shaft *11 1/2* Diam. of Tunnel shaft *11* Diam. of Crank shaft journals *11 1/2* Diam. of Crank pin *11 1/2* size of Crank webs *7 x 21* mean

Diameter of screw *14 1/2* Pitch of screw *Differential* No. of blades *4* state whether moveable to total surface *65* sq. feet

No. of Feed pumps *2* diameter of ditto *4 1/2* Stroke *6* Can one be overhauled while the other is at work *Yes*

No. of Bilge pumps *2* diameter of ditto *3 1/2* Stroke *26* Can one be overhauled while the other is at work *Yes*

Where do they pump from *Sea. Engine Room trunks, Centre of Mokehold forward and aftertrill*

No. of Donkey Engines *2* Size of Pumps *9 dia x 9 stroke 4 dia x 7 stroke* Where do they pump from *Ballast. From all Tanks*

except after peak. Feed Donkey. From Bilges, Sea and Hot well, also from Main Boilers Ballast tanks

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

No. of bilge injections *2* and sizes *5"* Are they connected to condenser, or to circulating pump *one to circulating pump*

How are the pumps worked *By Levers from Piston Rod cross head of Intermediate Engine*

Are all connections with the sea direct on the skin of the ship *Yes* Are they Valves or Cocks *Bottom*

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 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 *Level of Main Deck*

BOILERS, &c.—

Number of Boilers *2* Description *Cylindrical Multitubular* Whether Steel or Iron *Steel*

Working Pressure *150 lbs per sq. in* Tested by hydraulic pressure to *300 lbs per sq. in* Date of test *12th June 1886*

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 *Yes*

No. of square feet of fire grate surface in each boiler *38.94* Description of safety valves *Spring* No. to each boiler *2*

Area of each valve *7.07* Are they fitted with easing gear *Yes* No. of safety valves to superheater *Yes* area of each valve *Yes*

Are they fitted with easing gear *Yes* Smallest distance between boilers and bunkers or woodwork *Across Stokehold* Diameter of boilers *12*

Length of boilers *10' 3"* description of riveting of shell long. seams *Double butt circum. seams Double Lap* Thickness of shell plates *3/8"*

Diameter of rivet holes *1 1/2"* whether punched or drilled *Drilled* pitch of rivets *6 1/2" Long 4" butt* Lap of plating *15 1/2"*

Percentage of strength of longitudinal joint *84.49* working pressure of shell by rules *157.56 lbs* size of manholes in shell *None*

Size of compensating rings *Yes* No. of Furnaces in each boiler *2*

Outside diameter *46 1/2"* length, top *7' 0"* bottom *9' 6"* thickness of plates *9/16"* description of joint *Corrugated* if rings are fitted *Yes*

Greatest length between rings *Yes* working pressure of furnace by the rules *150.53* combustion chamber plating, thickness, sides *7/8"* back *7/8"* top *7/8"*

Pitch of stays to ditto, sides *8 1/8 x 8/8 pack 8 1/8 x 8/8 top 8 1/8 x 8/8* stays are fitted with nuts or riveted heads *Riveted heads* working pressure of plating by rules *157.4*

Diameter of stays at smallest part *1.258"* working pressure of ditto by rules *150.48* end plates in steam space, thickness *29/32"*

Pitch of stays to ditto *14 5/16 x 14 5/16* how stays are secured *Front double nuts & rivets* working pressure by rules *150.4 lbs* diameter of stays at smallest part *2.16"*

working pressure by rules *165.5 lbs* Front plates at bottom, thickness *1/16"* Back plates, thickness *3/16"*

Greatest pitch of stays *10 1/2"* working pressure by rules *153 lbs* Diameter of tubes *3 1/4" outside* pitch of tubes *4 1/4 x 4 1/4* thickness of tube plates, front *3/16"* back *1/16"*

how stayed *Stay tubes* pitch of stays *8 1/2 x 8 1/2* width of water spaces *1 1/4"*

Diameter of Superheater or Steam chest *Yes* length *Yes* thickness of plates *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* thickness of plates *Yes* If stiffened with rings *Yes*

Distance between rings *Yes* working pressure by rules *Yes* end plates of superheater, or steam chest; thickness *Yes* how stayed *Yes*

Superheater or steam chest; how connected to boiler *Yes*



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DONKEY BOILER— Description *Cylindrical Multitubular. Single Ended.*
 Made at *West Hartlepool* by whom made *Central Marine Engineering Co.* when made *1886* where fixed *Main Deck Level*
 Working pressure *90 lbs* tested by hydraulic pressure to *180 lbs* No. of Certificate *1338* fire grate area *15.12.5* description of safety
 valves *Spring* No. of safety valves *one* area of each *7.06* if fitted with easing gear *Yes* if steam from main boilers can
 enter the donkey boiler *No* diameter of donkey boiler *7' 0"* length *8' 4 3/8"* description of riveting *Double* *Butt* *Single*
 Thickness of shell plates *9/16"* diameter of rivet holes *7/8"* whether punched or drilled *Drilled* pitch of rivets *3 2 1/2"* lap of plating *3 x 9/16"*
 percentage of strength of joint *76.46* thickness of crown plates *1 1/2"* stayed by *✓*
 Diameter of furnace, top *34"* bottom *34"* length of furnace *6' 1 1/8"* thickness of plates *✓* description of joint *Single* *Double*
 Thickness of furnace crown plates *1 5/16"* stayed by *✓* working pressure of shell by rules *117 1/2*
 Working pressure of furnace by rules *101.9* diameter of uptake *✓* thickness of plates *✓* thickness of water tubes *✓*

SPARE GEAR. State the articles supplied:— *2 Connecting Rod top end Bolts & Nuts. 2 Bottom End*
2 Main Bearing ditto. 1 set of Coupling Bolts. Set of Pump valves. 2 Safety Valves
Springs. 6 cylinder escape valve springs. 2 Feed pump ditto. 1 Main Feed Check Valve
1 Donkey Feed ditto. 1 Spare Propeller. 6 Boiler Tubes. 6 Condenser ditto. 1 set Forced draught
Fire Bars. 1 set of ordinary do.
 The foregoing is a correct description,

PER *PRO* *GENERAL MARINE ENGINEERING* Manufacturer.

General Remarks (State quality of workmanship, opinions as to class, &c.)

The Main Boilers of this vessel are fitted with Town's
Patent Forced Draught arrangements.

The Machinery & Boilers have been constructed under
Special Survey. The Material & Workmanship are good. The
Engines have had a full speed trial at sea and worked
satisfactorily, and they are in my opinion they are eligible
to have the notification L.M. 6.8.86. recorded in the Society's
Register Books.

The amount of Entry Fee
 Special *£ 2* received by me.
 Donkey Boiler Fee *£ 30*
 Certificate (if required) *£ 2*
 To be paid at per margin.
 (Traveling Expenses, if any, £ 1 0 0)

Committee's Minute

TUESDAY 17 AUGUST 1886

W. R. Austin
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.