

# REPORT ON MACHINERY.

No. 4506

Received at London Office 15th June, 1886.

No. in Survey held at *Glasgow*

Date, first Survey *28<sup>th</sup> Dec<sup>r</sup> 1885* Last Survey *May 29 1886*

Reg. Book.

(Number of Visits *3*) *1593*

968 on the *S.S. "State of Pennsylvania"*

Tons *2472*

Master *Wann* Built at *Glasgow* By whom built *London & Glasgow Coy* When built *1873-2*

Engines made at *Glasgow* By whom made *London & Glasgow Coy* when made *1873*

Boilers made at *"* By whom made *J. & W. Henderson & Coy.* when made *1886*

Registered Horse Power *400* Owners *The State Steamship Coy. Ltd.* Port belonging to *Glasgow*

## ENGINES, &c.—

Description of Engines *Compound Inverted*

Diameter of Cylinders *46" & 82"* Length of Stroke *45"* No. of Rev. per minute *for 14"* Point of Cut off, High Pressure *Variable* Low Pressure *—*

Diameter of Screw shaft *14 1/2"* Diam. of Tunnel shaft *—* Diam. of Crank shaft journals *15"* Diam. of Crank pin *4 1/2"* size of Crank web *—*

Diameter of screw *—* Pitch of screw *—* No. of blades *—* state whether moveable *—* total surface *—*

No. of Feed pumps *Two* diameter of ditto *6 1/8"* Stroke *12"* Can one be overhauled while the other is at work *Yes*

No. of Bilge-pumps *Two* diameter of ditto *8"* Stroke *10"* Can one be overhauled while the other is at work *Yes*

Where do they pump from *all compartments*

No. of Donkey Engines *One* Size of Pumps *—* Where do they pump from *All compartments*

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 *—* Are they connected to condenser, or to circulating pump *Circulating*

How are the pumps worked *By Levers*

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 *near to lead line*

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 pipes to stokehold* 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 *May 1886*

Is the screw shaft tunnel watertight *Yes* and fitted with a sluice door *Yes* worked from *Upper platform*

## BOILERS, &c.—

Number of Boilers *Two* Description *Round Horizontal* Whether Steel or Iron *Steel*

Working Pressure *90 lbs* Tested by hydraulic pressure to *3180 lbs* Date of test *28<sup>th</sup> April 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 *—*

No. of square feet of fire grate surface in each boiler *63 ft<sup>2</sup>* Description of safety valves *Direct Spring* No. to each boiler *Two*

Area of each valve *30.67"* 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 *with stokehold* Diameter of boilers *13' 9"*

Length of boilers *14' 4 1/2"* description of riveting of shell long. seams *Double riveted* circum. seams *Double riveted* Thickness of shell plates *3/8"*

Diameter of rivet holes *1 3/16"* whether punched or drilled *Drilled* pitch of rivets *4 1/4 3/2"* Lap of plating *Straps 20" x 18"*

Per centage of strength of longitudinal joint *83%* working pressure of shell by rules *102 lbs* size of manholes in shell *16" x 12"*

Size of compensating rings *doubling pieces* No. of Furnaces in each boiler *six*

Outside diameter *3' 3"* length, top *6' 8"* bottom *5' 8"* thickness of plates *3/16"* description of joint *Corrugated* if rings are fitted *—*

Greatest length between rings *—* working pressure of furnace by the rules *102 lbs* combustion chamber plating, thickness, sides *1/32"* back *—* top *1/32"*

Pitch of stays to ditto, sides *8" x 8"* back *—* top *8" x 8"* If stays are fitted with nuts or riveted heads *nuts* working pressure of plating by rules *105 lbs* Diameter of stays at smallest part *1 1/4"* working pressure of ditto by rules *115 lbs* and plates in steam space, thickness *1/16"*

Pitch of stays to ditto *10" x 10"* how stays are secured *By double nuts* working pressure by rules *90 lbs* diameter of stays at smallest part *2 1/4"* working pressure by rules *132 lbs* Front plates at bottom, thickness *1/16"* Back plates, thickness *—*

Greatest pitch of stays *—* working pressure by rules *—* Diameter of tubes *3 1/2"* pitch of tubes *4 3/4" x 4 3/4"* thickness of tube plates, front *1 1/16"* back *1/16"* how stayed *By tubes* pitch of stays *14 1/2" x 9 1/2"* width of water spaces *6"*

Diameter of Superheater or Steam chest *None* 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 *—*

Form No. 8-100-2/184-Transfer Ink



GLS152-0117

7506 g/s

**DONKEY BOILER**— Description *Round Horizontal*  
 Made at *Glasgow* by whom made *J & W Henderson & Coy* when made *1886* where fixed *in Stothold*  
 Working pressure *45 lbs* tested by hydraulic pressure to *150 lbs* No. of Certificate *1688* fire grate area *22.5 1/2* description of safety valves *Direct Spring* No. of safety valves *Two* area of each *4"* if fitted with easing gear *Yes* if steam from main boilers enter the donkey boiler *no* diameter of donkey boiler *8.6"* length *8.4"* description of riveting *Double butt straps double riveted*  
 Thickness of shell plates *1/16"* diameter of rivet holes *13/16"* whether punched or drilled *Drilled* pitch of rivets *4"* lap of plating *1/4"*  
 per centage of strength of joint *80%* thickness of ~~end~~ plates *15/16"* stayed by *Unwelded Stays (iron) 1 1/8" dia 1 1/4" x 1 1/4"*  
 Diameter of furnace *2' 3"* bottom *—* length of furnace *5.9"* thickness of plates *1/16"* description of joint *Welded*  
 Thickness of furnace crown plates *13/16"* stayed by *Screw Stays 1 1/4" dia, nutted 1/4" x 1/4"* working pressure of shell by rules *44 lbs*  
 Working pressure of furnace by rules *118 lbs* diameter of uptake *—* thickness of plates *—* thickness of water tubes *—*

**SPARE GEAR.** State the articles supplied:— *2 main bearing bolts, 4 Coupling bolts 2 bolts for FP + 2 bolts for P, Eccentric straps 2 pairs Eccentric rod brasses 2 do for FP + P gear 5 bilge pump bars and one seat 3 Feed pump valves and one seat 1 circulating pump rod with bolts & guide 1 pair crank pin brasses & 3 Half cranks for forward & after Engine Shaft Coupling for Grommet*  
 The foregoing is a correct description, *Shutting with bolts and keys complete a large assortment of bolts, studs, springs, condensers, tubes &c*  
 Manufacturer.

**General Remarks** (State quality of workmanship, opinions as to class, &c. *The Engines of this vessel have all been thoroughly overhauled & repaired a new Low pressure <sup>Cylinder</sup> has been fitted, all pumps pipes & connections overhauled Sea cocks in Stothold moved to upper turn of bilge. New propeller Shaft fitted, Crank Shaft bearings adjusted & some of the brasses renewed.*

*Main & Donkey Boilers. New*

*The fitting of the new Boilers and repairs to the Engines have been satisfactorily carried out by Messrs J & W Henderson and they are now in good order & safe working condition reliable in my opinion to be noted in the Register Book*  
*Lloyds M.C. 5/86 (New Boilers)*

*This is submitted that this vessel is eligible to have the modification embodied in M.B. 86 recorded*  
*27/6/86*

The amount of Entry Fee .. £ *— : — : —* received by me,  
 Special .. £ *5 : 5 : —*  
 Main & Donkey Boiler Fee .. £ *12 : 12 : —*  
 Certificate (if required) .. £ *— : — : —* *11+12/6/1886*  
 (To be sent as per margin.)  
 (Travelling Expenses, if any, £ .. ..)

*James Morrison*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

FRIDAY 18 JUNE 1886

Committee's Minute

*+ M.B. 86 + M.C. 5/86*

