

# REPORT ON MACHINERY.

No. 6660

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

Date, first Survey *1883 Nov 23* Last Survey *14<sup>th</sup> Sept 1884*

(Number of Visits *43*)

Tons *838.32*

on the *Screw Steamer "Higo Maru"*

Master *J. Adair* Built at *Glasgow* By whom built *The London & Glasgow Co. Ltd.* When built *1884*

Engines made at *Glasgow* By whom made *The London & Glasgow Co. Ltd.* when made *1884*

Boilers made at *Do* By whom made *Do* when made *1884*

Registered Horse Power *150* Owners *Kioto Unyu Kaisha* Port belonging to *Tokio*

## ENGINES, &c.—

Description of Engines *Inverted direct acting - Compound - Surface Condensing.*  
Diameter of Cylinders *30" & 56"* Length of Stroke *30"* No. of Rev. per minute *70* Point of Cut off, High Pressure *25"* Low Pressure *23"*  
Diameter of Screw shaft *10 9/16"* Diam. of Tunnel shaft *10 1/16"* Diam. of Crank shaft journals *10 9/16"* Diam. of Crank pin *10 9/16"* size of Crank webs *7" x 19"*  
Diameter of screw *12-6"* Pitch of screw *16-6"* No. of blades *Four* state whether moveable *yes* total surface *48 sq ft.*  
No. of Feed pumps *Two* diameter of ditto *3 3/8"* Stroke *22"* Can one be overhauled while the other is at work *yes*  
No. of Bilge pumps *Two* diameter of ditto *3 3/8"* Stroke *22"* Can one be overhauled while the other is at work *yes*  
Where do they pump from *Bilges & Holds - One pump connected to Aft well.*  
No. of Donkey Engines *One & Hand* Size of Pumps *8" cyl. 4 pump & 8" stroke* Where do they pump from *Bilges, Sea, hotwell & tank. Also one Pulverizer 12-6. Connected to tanks, bilges & condenser.*  
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 *4 1/2"* Are they connected to condenser, or to circulating pump *Circulating.*  
How are the pumps worked *By levers from crosshead*  
Are all connections with the sea direct on the skin of the ship *yes* Are they Valves or Cocks *Valves*  
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 *Below.*  
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 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 Before launching.*  
Is the screw shaft tunnel watertight *yes* and fitted with a sluice door *yes* worked from *Engine room platform.*

## BOILERS, &c.—

Number of Boilers *Two* Description *Cylindrical. Mult.* Whether Steel or Iron *Steel*  
Working Pressure *90 lbs* Tested by hydraulic pressure to *180 lbs* Date of test *June 3<sup>rd</sup> 1884*  
Description of superheating apparatus or steam chest *Horizontal. Connected by copper pipes to boiler.*  
Can each boiler be worked separately *yes* Can the superheater be shut off and the boiler worked separately *No.*  
No. of square feet of fire grate surface in each boiler *54* Description of safety valves *Direct spring* No. to each boiler *Two*  
Area of each valve *14.16 sq ins* Are they fitted with easing gear *yes* No. of safety valves to superheater *One* area of each valve *7.9 ins*  
Are they fitted with easing gear *yes* Smallest distance between boilers and bunkers or woodwork *No bunkers at side* Diameter of boilers *13'-3"*  
Length of boilers *10'-6"* description of riveting of shell long. seams *Lap. treble* circum. seams *Lap-double* Thickness of shell plates *13/16"*  
Diameter of rivet holes *1 1/4"* whether punched or drilled *Drilled* pitch of rivets *6.2 + 3.1* Lap of plating *9 7/8"*  
Percentage of strength of longitudinal joint *80* working pressure of shell by rules *98 lbs* size of manholes in shell *12" x 16"*  
Size of compensating rings *Double riveted ring.* No. of Furnaces in each boiler *Three*  
Outside diameter *40"* length, top *6'-6"* bottom *9'-4"* thickness of plates *17/32"* description of joint *Butt* if rings are fitted *yes*  
Greatest length between rings *6'-6"* working pressure of furnace by the rules *97 lbs* combustion chamber plating, thickness, sides *7/16"* back *7/16"* top *7/16"*  
Pitch of stays to ditto, sides *7 3/4"* back *7 3/4"* top *7 3/4"* If stays are fitted with nuts or riveted heads *Nuts* working pressure of plating by rules *90 lbs* Diameter of stays at smallest part *1 3/4"* working pressure of ditto by rules *120 lbs* end plates in steam space, thickness *3/4"*  
Pitch of stays to ditto *1'-2 1/2"* how stays are secured *Nuts* working pressure by rules *96 lbs* diameter of stays at smallest part *2 1/4" screw* working pressure by rules *105 lbs* Front plates at bottom, thickness *7/16"* Back plates, thickness *5/8"*  
Greatest pitch of stays *11 1/2"* working pressure by rules *90 lbs* Diameter of tubes *3 1/2"* pitch of tubes *4 3/4"* thickness of tube plates, front *5/8"* back *5/8"* how stayed *Tubes* pitch of stays *14 1/2" x 9 1/2"* width of water spaces *5"*  
Diameter of Superheater or Steam chest *5'-0"* length *10'-1"* thickness of plates *3/8"* description of longitudinal joint *Double-Lap* diam. of rivet holes *15/16"*  
Pitch of rivets *3-9"* working pressure of shell by rules *95 lbs* 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 *9/16"* how stayed *Dished and angle iron strap* Superheater or steam chest; how connected to boiler *By copper pipes.*



6660 grs

DONKEY BOILER— Description *Vertical - Steel Two cross tubes.*  
Made at *Glasgow* by whom made *London & Glasgow Co.* when made *1884* where fixed *In stockhold*  
Working pressure *70 lbs* tested by hydraulic pressure to *140 lbs* No. of Certificate *1377* fire grate area *10 sq ft* description of safety  
valves *Direct springs* No. of safety valves *One* area of each *7 sq in* if fitted with easing gear *Yes* if steam from main boilers can  
enter the donkey boiler *No* diameter of donkey boiler *4-6* length *9-0* description of riveting *Double - lap*  
Thickness of shell plates *7/16* diameter of rivet holes *13/16* whether punched or drilled *punched* pitch of rivets *3 1/8* lap of plating *3 3/4*  
per centage of strength of joint *64.6* thickness of crown plates *1/2* stayed by *Four stays 1 3/4 dia.*  
Diameter of furnace, top *3-2 1/2* bottom *3-11* length of furnace *4-9* thickness of plates *1/2* description of joint *Lap single*  
Thickness of furnace crown plates *1/2* stayed by *Four stays 1 3/4 dia. Top 4-0 radius* working pressure of shell by rules *104 lbs*  
Working pressure of furnace by rules *83 lbs* diameter of uptake *10* thickness of plates *9/16 iron* thickness of water tubes *7/16 iron*.

SPARE GEAR. State the articles supplied:— *Two top & bottom end connecting rod bolts & nuts.*  
*Two main bearing bolts. One set of coupling bolts - Feed & bilge pump*  
*valves. Also one propeller shaft - one valve spindle. Air pump bucket*  
*& rod. Four steel propeller blades & nuts.*  
The foregoing is a correct description.  
*A. Kelly, Secy for Manufacturers*

General Remarks (State quality of workmanship, opinions as to class, &c.)  
*These Engines & Boilers have been constructed*  
*under special survey - They are of good material &*  
*workmanship - They have been well fitted on board*  
*satisfactorily tested under steam & I am of opinion they*  
*are eligible to be classed "LLOYD'S M.C." 9-84 in the*  
*Register Book.*  
*Appended hereto are the reports on Steel tests & Gorgon*  
*also the approved plan of main boilers.*

*It is submitted that this*  
*vessel is eligible to have the*  
*notification of M.C. recorded*  
*M 24/9/84*

*Walter R. Polson*  
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.  
*Glasgow*

The amount of Entry Fee £ *2 : 0 : 0* received by me,  
Special £ *22 : 10 : 0*  
Donkey Boiler Fee £ *0 : 0 : 0*  
Certificate (if required) £ *0 : 0 : 0* 19/9/1884  
To be sent as per margin.  
(Travelling Expenses, if any, £ - *8/-* - )

Committee's Minute  
TUESDAY 23 SEPT 1884  
*W. M. L.*