

# REPORT ON MACHINERY

Gls. No. 24593  
Lith. No. 11734  
THUR. NOV. 8 1906

Port of Glasgow

Received at London Office

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No. in Survey held at Glasgow

Date, first Survey 21st March

Last Survey 8th Oct 1906

(Number of visits 23rd Dec 1906)

Reg. Book.

on the S.S. "AWAJI MARU."

Master W Cockburn Built at Grangemuth By whom built Grangemouth S&B When built 1906

Engines made at Glasgow By whom made Dunsmuir & Jackson Ltd when made 1906

Boilers made at Glasgow By whom made do do when made 1906

Registered Horse Power \_\_\_\_\_ Owners Nippon Yusen Kaishiki Kaisha Port belonging to Tokio

Nom. Horse Power as per Section 28 214 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes

**ENGINES, &c.**—Description of Engines Triple Expansion - Screw No. of Cylinders 3 No. of Cranks 3  
 Dia. of Cylinders 19, 31, 52 Length of Stroke 39 Revs. per minute 90 Dia. of Screw shaft 10.85 Material of screw shaft iron  
 Is the screw shaft fitted with a continuous liner the whole length of the stern tube yes Is the after end of the liner made water tight in the propeller boss yes  
 If the liner is in more than one length are the joints burned ✓ If the liner does not fit tightly at the part between the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive ✓  
 If two liners are fitted, is the shaft lapped or protected between the liners ✓ Length of stern bush 3.9  
 Dia. of Tunnel shaft 9.87 Dia. of Crank shaft journals 10.35 Dia. of Crank pin 10.5 Size of Crank webs 6.4 Dia. of thrust shaft under collars 10.5 Dia. of screw 13.1 Pitch of Screw 14.9 No. of Blades 4 State whether moveable yes Total surface 62 sq. ft.  
 No. of Feed pumps 2 Diameter of ditto 3 Stroke 18 Can one be overhauled while the other is at work yes  
 No. of Bilge pumps 2 Diameter of ditto 3 Stroke 18 Can one be overhauled while the other is at work yes  
 No. of Donkey Engines 3 Sizes of Pumps { 9x10x10 - 4x2.4x5 } No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room Four 2.3/4 dia. In Holds, &c. Two in each No. 1 & 2 - 2.3/4 dia.  
Aft hold one 3.1/2 dia. Tunnel well one 2.3/4 dia.  
 No. of Bilge Injections 1 sizes 5 Connected to condenser, or to circulating pump pump 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 none  
 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 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 yes  
 Are the Bilge Suction Pipes, Cocks, and Valves arranged so as to prevent any communication between the sea and the bilges yes  
 Dates of examination of completion of fitting of Sea Connections 2/8/06 of Stern Tube 2/8/06 Screw shaft and Propeller 2/8/06  
 Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from Engine room top platform

**BOILERS, &c.**—(Letter for record (S.) Manufacturers of Steel

Total Heating Surface of Boilers 3770 Is Forced Draft fitted no No. and Description of Boilers Two single ended  
 Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 17/9/06 No. of Certificate 8334  
 Can each boiler be worked separately yes Area of fire grate in each boiler 57.75 No. and Description of Safety Valves to each boiler 2 Patent spring Area of each valve 7.07 Pressure to which they are adjusted 180 lbs Are they fitted with easing gear yes  
 Smallest distance between boilers or uptakes and bunkers or woodwork 2-0 Mean dia. of boilers 14-0 Length 10-8 Material of shell plates steel  
 Thickness 1.9 Range of tensile strength 28 to 32 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams double long. seams treble  
 Diameter of rivet holes in long. seams 1.5 Pitch of rivets 8.7 Lap of plates or width of butt straps 19.4  
 Per centages of strength of longitudinal joint rivets 88.4 plate 85.2 Working pressure of shell by rules 220 lbs Size of manhole in shell 16 x 12  
 Size of compensating ring McNeil's No. and Description of Furnaces in each boiler 3 Morrison Material steel Outside diameter 3.10  
 Length of plain part top ✓ bottom ✓ Thickness of plates crown 9/16 bottom 9/16 Description of longitudinal joint welded No. of strengthening rings ✓  
 Working pressure of furnace by the rules 191 lbs Combustion chamber plates: Material steel Thickness: Sides 5/8 Back 21/32 Top 5/8 Bottom 7/8  
 Pitch of stays to ditto: Sides 8 x 8.5 Back 8.5 x 8.5 Top 9.5 x 7.5 If stays are fitted with nuts or riveted heads nuts Working pressure by rules 194 lbs  
 Material of stays steel Diameter at smallest part 1.76 Area supported by each stay 7.6 Working pressure by rules 184 End plates in steam space: Material steel Thickness 1.8 Pitch of stay 19.5 x 19 How are stays secured nuts Working pressure by rules 192 lbs Material of stays steel  
 Area at smallest part 7.5 Area supported by each stay 370 Working pressure by rules 202 Material of Front plates at bottom steel  
 Thickness 7/8 Material of Lower back plate steel Thickness 7/8 Greatest pitch of stays 14.4 x 8.4 Working pressure of plate by rules 188 lbs  
 Diameter of tubes 3.4 Pitch of tubes 4.8 x 4.8 Material of tube plates steel Thickness: Front 1 Back 13/16 Mean pitch of stays abt 11  
 Pitch across wide water spaces 11.4 Working pressures by rules 189 lbs Girders to Chamber tops: Material iron Depth and thickness of girder at centre 9.5 x 7-1 Length as per rule 7.9.3 Distance apart 9.4 Number and pitch of stays in each 3 - 7.4  
 Working pressure by rules 200 lbs Superheater or Steam chest; how connected to boiler none Can the superheater be shut off and the boiler worked separately ✓ Diameter ✓ Length ✓ Thickness of shell plates ✓ Material ✓ Description of longitudinal joint ✓ Diam. of rivet holes ✓ 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 ✓

W1378-0029

**VERTICAL DONKEY BOILER—** Manufacturers of Steel

No. \_\_\_\_\_ Description *See report attached.*  
 Made at \_\_\_\_\_ By whom made \_\_\_\_\_ When made \_\_\_\_\_ Where fixed \_\_\_\_\_  
 Working pressure tested by hydraulic pressure to \_\_\_\_\_ Date of test \_\_\_\_\_ No. of Certificate \_\_\_\_\_ Fire grate area \_\_\_\_\_ Description of Safety Valves \_\_\_\_\_  
 No. of Safety Valves \_\_\_\_\_ Area of each \_\_\_\_\_ Pressure to which they are adjusted \_\_\_\_\_ Date of adjustment \_\_\_\_\_  
 If fitted with easing gear \_\_\_\_\_ If steam from main boilers can enter the donkey boiler \_\_\_\_\_ Dia. of donkey boiler \_\_\_\_\_ Length \_\_\_\_\_  
 Material of shell plates \_\_\_\_\_ Thickness \_\_\_\_\_ Range of tensile strength \_\_\_\_\_ Descrip. of riveting long. seams \_\_\_\_\_  
 Dia. of rivet holes \_\_\_\_\_ Whether punched or drilled \_\_\_\_\_ Pitch of rivets \_\_\_\_\_ Lap of plating \_\_\_\_\_ Per centage of strength of joint \_\_\_\_\_ Rivets \_\_\_\_\_  
 Working pressure of shell by rules \_\_\_\_\_ Thickness of shell crown plates \_\_\_\_\_ Radius of do. \_\_\_\_\_ No. of stays to do. \_\_\_\_\_ Dia. of stays \_\_\_\_\_  
 Diameter of furnace Top \_\_\_\_\_ Bottom \_\_\_\_\_ Length of furnace \_\_\_\_\_ Thickness of furnace plates \_\_\_\_\_ Description of joint \_\_\_\_\_  
 Working pressure of furnace by rules \_\_\_\_\_ Thickness of furnace crown plates \_\_\_\_\_ Stayed by \_\_\_\_\_  
 Diameter of uptake \_\_\_\_\_ Thickness of uptake plates \_\_\_\_\_ Thickness of water tubes \_\_\_\_\_ Dates of survey \_\_\_\_\_

**SPARE GEAR.** State the articles supplied:— *2 top end bolts & nuts 2 bottom end bolts & nuts, 2 main bearing bolts, 1 set coupling bolts, 1 set of feed & bilge pump valves, assorted bolts & nuts, iron of various sizes, 1/2 crank shaft, 1 spare eccentric strap, 1 circulating pump rod, 1 air pump rod, 1 set valve spindles.*

The foregoing is a correct description,  
 For **DUNSMuir & JACKSON, Limited.**  
*J. S. Fletcher* Manufacturer.

Dates of Survey while building  
 During progress of work in shops - *1906. March 21-27. April 13-21-27. May 24-31. June 19-26.*  
 During erection on board vessel - *July 2-11-25. Aug 8-10-11-16-20. Sep 10-17. Oct 8.*  
 Total No. of visits *lys. 20 Luth. 6. = 26.* Is the approved plan of main boiler forwarded herewith *yes*  
 " " " donkey " " " *yes*

Dates of Examination of principal parts—Cylinders *Various* Slides *do* Covers *do* Pistons *do* Rods *do*  
 Connecting rods *do* Crank shaft *16/6/06* Thrust shaft *21/3/06* Tunnel shafts *21+27/3/06* Screw shaft *11/4/06* Propeller *11/4/06*  
 Stern tube *11/4/06* Steam pipes tested *10/9 + 8/10/06* Engine and boiler seatings *27/7/06* Engines holding down bolts *19/9/06*  
 Completion of pumping arrangements *19/9/06* Boilers fixed *12/10/06* Engines tried under steam *23/10/06*  
 Main boiler safety valves adjusted *12/10/06* Thickness of adjusting washers *all 1/2"*  
 Material of Crank shaft *steel* Identification Mark on Do. *J.W.D.* Material of Thrust shaft *steel* Identification Mark on Do. *J.W.D.*  
 Material of Tunnel shafts *steel* Identification Marks on Do. *J.W.D.* Material of Screw shafts *steel* Identification Marks on Do. *J.W.D.*  
 Material of Steam Pipes *copper* Test pressure *400lbs.*

**General Remarks** (State quality of workmanship, opinions as to class, &c. *The Engines & boilers have been constructed under Special Survey, the materials & workmanship are of good quality. The machinery will be fitted on the vessel at Grangemouth.*)

*The machinery has been fitted on board the vessel in a satisfactory manner, and when tried under steam was found to work well, and in our opinion is eligible to be classed with record of + L.M.C. 10.06*

It is submitted that this vessel is eligible for THE RECORD **H.L.M.C. 10.06. ELEC. LIGHT.**

*All fees charged from Glasgow Office 8-11-06. a/c for Expenses only rendered from Luth 7/11/06.*

The amount of Entry Fee. . . £ *2* : : : When applied for.  
 Special . . . . . £ *30-11* : : : : :  
 Donkey Boiler Fee . . . . . £ *1-0-0* : : : : :  
 Travelling Expenses (if any) £ *1-0-0* : : : : :  
 Glasgow 5 - NOV 1906  
 W. Dinmock & J. Graham  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.  
 FRI. NOV 9 1906  
 Assigned *Deferred for completion.*  
*For Luth.*

Certificate (if required) to be sent to the Surveyors are requested not to write on or below the space for Committee's Minute.

