

Rpt. 4. **REPORT ON MACHINERY.** No. 647  
 Received at London Office **WED. 31 MAR 1909**

Date of writing Report 9/3 1909 When handed in at Local Office 9/3 1909 Port of Nagasaki  
 No. in Survey held at Nagasaki Date, First Survey 16/9/1907 Last Survey 8/3 1909  
 Reg. Book. 37 on the Twin Screw Steamer Atsuta Maru (Number of Visits 137)  
 Master H. P. C. Thompson Built at Nagasaki By whom built Mitsui Bishi D & E Wks. When built 1905-9  
 Engines made at Nagasaki By whom made Mitsui Bishi D & E Works when made 1905-9  
 Boilers made at Nagasaki By whom made " " " " when made 1905-9  
 Registered Horse Power " Owners Nippon Yusen Kaisha Port belonging to Tokio  
 Nom. Horse Power as per Section 28 973 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted yes

**ENGINES, &c.**—Description of Engines Triple Expansion, Twin No. of Cylinders Six No. of Cranks Six  
 Dia. of Cylinders 25" H12" 69" Length of Stroke 48 Revs. per minute 80-94 Dia. of Screw shaft 14.81 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 yes 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 no If two liners are fitted, is the shaft lapped or protected between the liners no Length of stern bush 6-0  
 Dia. of Tunnel shaft 13.18 Dia. of Crank shaft journals 13.84 Dia. of Crank pin 14.75 Size of Crank webs 22x9.2 Dia. of thrust shaft under collars 14.25 Dia. of screw 16.6 Pitch of Screw 18-9 No. of Blades 4 State whether moveable yes Total surface 86.33 sq ft  
 No. of Feed pumps Four Diameter of ditto 4.2 Stroke 24 Can one be overhauled while the other is at work yes  
 No. of Bilge pumps Four Diameter of ditto 4.2 Stroke 24 Can one be overhauled while the other is at work yes  
 No. of Donkey Engines Four Sizes of Pumps 10x13.2x10.2 Ballast two No. and size of Suctions connected to both Bilge and Donkey pumps two 3" in each hold  
 In Engine Room Three 3" 9.2x12.2x24 In Holds, &c. Two 3" in each hold, one 3" in each Tunnel and one 3" in Tunnel Well.  
 No. of Bilge Injections (2) sizes 1 1/2" Connected to condenser, or to circulating pump C.P. Is a separate Donkey Suction fitted in Engine room & size 5" 4 1/2"  
 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 Valves and Cocks  
 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 Bilge Exhaust + Soil How are they protected Strong wood casings  
 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 20. 10. 08. of Stern Tube 10. 10. 08. Screw shafts and Propellers 26. 9. 08.  
 Is the Screw Shaft Tunnel watertight yes Is it fitted with a watertight door yes worked from upper deck.

**BOILERS, &c.**—(Letter for record S) Manufacturers of Steel Steel Co. of Scotland, Clydebridge, Lanarkshire S.C.  
 Total Heating Surface of Boilers 14276 Is Forced Draft fitted yes No. and Description of Boilers Six single end Scotch  
 Working Pressure 200 lbs Tested by hydraulic pressure to 400 lbs Date of test 7. 10. 08. No. of Certificate 34435  
 Can each boiler be worked separately yes Area of fire grate in each boiler 56.35 sq ft No. and Description of Safety Valves to each boiler 2 Spring loaded 3 1/2" Area of each valve 9.62 sq in Pressure to which they are adjusted 205 lbs Are they fitted with easing gear yes  
 Smallest distance between boilers or uptakes and bunkers or woodwork 24" Mean dia. of boilers 14.3" Length 11.6" Material of shell plates Steel  
 Thickness 1 1/32" Range of tensile strength 28-32 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams 2R lap  
 long. seams 2 Shapes 3R Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 10.5" Lap of plates or width of butt straps 22"  
 Per centages of strength of longitudinal joint rivets 89% Working pressure of shell by rules 235 lbs Size of manhole in shell 16" x 12"  
 Size of compensating ring 36x31x1 1/32 No. and Description of Furnaces in each boiler 3 Bull Material steel Outside diameter 41 1/4"  
 Length of plain part top 5" Thickness of plates bottom 3" Description of longitudinal joint Welded No. of strengthening rings 3"  
 Working pressure of furnace by the rules 241 Combustion chamber plates: Material Steel Thickness: Sides 1/16" Back 1/16" Top 1/16" Bottom 1/16"  
 Pitch of stays to ditto: Sides 10 1/2" x 7" Back 8 1/4" x 8 1/2" Top 9" x 8 1/4" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 218  
 Material of stays Steel Diameter at smallest part 1 1/32" Area supported by each stay 74.3 sq in Working pressure by rules 246 End plates in steam space: Material Steel Thickness 1 1/32" Pitch of stays 19 1/4" x 16 1/2" How are stays secured 2N + washers Working pressure by rules 219 Material of stays steel  
 Diameter at smallest part 3 3/8" Area supported by each stay 318 sq in Working pressure by rules 250 Material of Front plates at bottom steel  
 Thickness 3/4" Material of Lower back plate Steel Thickness 3/4" Greatest pitch of stays 12 x 10 Working pressure of plate by rules 250  
 Diameter of tubes 3" Pitch of tubes 4 3/8" x 4 3/8" Material of tube plates steel Thickness: Front 3/4" Back 3/4" Mean pitch of stays 8 1/2"  
 Pitch across wide water spaces 1-1 1/2" Working pressures by rules 240 lbs Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 10" x 1 3/4" Length as per rule 30" Distance apart 8 1/4" Number and pitch of stays in each 2 x 9"  
 Working pressure by rules 360 Superheater or Steam chest; how connected to boiler no Can the superheater be shut off and the boiler worked separately no Diameter no Length no Thickness of shell plates no Material no Description of longitudinal joint no Diam. of rivet holes no Pitch of rivets no Working pressure of shell by rules no Diameter of flue no Material of flue plates no Thickness no  
 If stiffened with rings no Distance between rings no Working pressure by rules no End plates: Thickness no How stayed no  
 Working pressure of end plates no Area of safety valves to superheater no Are they fitted with easing gear no

**VERTICAL DONKEY BOILER—** Manufacturers of Steel **NOT ANY**

No.	Description			
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
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
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:— *As per rule and in addition; Two Propeller Shafts Two right and two left hand propeller blades (bronzes). One length crank shaft interchangeable. Two stern bushes with lignum vitae complete. One Piston Rod, Piston Rings, Slide Rod &c &c*

The foregoing is a correct description,  
 Manufacturer. **ATSU BISHI DOCKYARD & ENGINE WORKS.**  
*V. M. S. N.*  
 General Manager.

Dates of Survey while building: During progress of work in shops - Sep 1907. 1. Dec 3. Jan 1908. 3. Feb 2. March 4. April 6. May 18. June 9. July 14. Aug 12. Sep 10. Oct 4. During erection on board vessel - October 2. November 7. December 13. January 1909. 11. Feb 11. March 2. Total No. of visits **137.** Is the approved plan of main boiler forwarded herewith **Yes?**

Dates of Examination of principal parts—Cylinders 15. 12. 08 Slides 27. 10. 08 Covers 27. 10. 08 Pistons 28. 10. 08 Rods 7. 10. 08  
 Connecting rods 12. 10. 08 Crank shaft 7. 5. 08 Thrust shaft 1. 7. 08 Tunnel shafts 6. 7. 08 Screw shaft 26. 9. 08 Propeller 26. 9. 08  
 Stern tube 10. 10. 08 Steam pipes tested 20. 10. 08 Engine and boiler seatings 23. 3. 08 Engines holding down bolts 24. 11. 08  
 Completion of pumping arrangements 28. 12. 08. Boilers fixed 19. 11. 08. Engines tried under steam 9. 13. 15. 09  
 Main boiler safety valves adjusted ~~2~~ 2-09 Thickness of adjusting washers Jamb nuts no washers. LLOYDS N: 34 A.C.H. 5-1-08.  
 Material of Crank shaft Steel Identification Mark on Do. LLOYDS N: 34 A.C.H. 5-1-08. Material of Thrust shaft Steel Identification Mark on Do. LLOYDS N: 197 C.H.L.P. 31-10-07. S 22. 11. 07. P.  
 Material of Tunnel shafts Steel Identification Marks on Do. " " Material of Screw shafts Lockfast Iron. Identification Marks on Do. LLOYDS N: 197 C.H.L.P. 31-10-07. S 22. 11. 07. P.  
 Material of Steam Pipes Lapweld Iron and Copper. Test pressure 600 + 400 lbs respectively.

**General Remarks** (State quality of workmanship, opinions as to class, &c. *These Engines and Boilers have been constructed under Special Survey, and in accordance with the Rules. The materials used, and workmanship, are good. They are securely and satisfactorily fitted on board, and have been seen working well, under a full head of steam, and are now eligible in our opinion, for notation \* LMC 3-09, in Register Book. Mean average speed on trials, light ship, 16.5. Knots Howdens Forced Draught fitted.*)

It is submitted that this vessel is eligible for **THE RECORD + LMC 3.09.** Elec. light. F.D. *J.W.D. 31/3/09. 1.4.09*

*A.C. Heron.*  
*D. V. Robertson, acting*  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

The amount of Entry Fee	£ 3 : - : -	When applied for,
Special	£ 103. - : -	11/3/1909
Donkey Boiler Fee	£ : : :	When received,
Travelling Expenses (if any)	£ : : :	12/3/1909

Committee's Minute **FRI. 2 APR 1909**  
 Assigned **+ LMC 3.09**  
*elec. light F.D.*



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