

# REPORT ON MACHINERY.

No. 1075.

Port of **NAGASAKI.**

SAT. AUG. 12. 1916

Received at London Office.

No. in Survey held at **NAGASAKI** Date, first Survey **19<sup>th</sup> June, 1915** Last Survey **8<sup>th</sup> July 1916**

Reg. Book. on the **S.S. Yamagata Maru** (Number of Visits **103**)

Master **Built at Nagasaki** By whom built **Mitsubishi S. S. Works** When built **1916**

Engines made at **Nagasaki** By whom made **Mitsubishi Dockyard Engine Works** when made **1916**

Boilers made at **Nagasaki** By whom made **Do.** when made **1916**

Registered Horse Power **342** Owners **Nippon Yusen Kaisha** Port belonging to **Tokio**

Nom. Horse Power as per Section 28 **342** Is Refrigerating Machinery fitted for cargo purposes **No** Is Electric Light fitted **Yes**

ENGINES, &c.—Description of Engines **Triple Expansion** No. of Cylinders **3** No. of Cranks **3**

Dia. of Cylinders **23" 38" 64"** Length of Stroke **48"** Revs. per minute **87** Dia. of Screw shaft **14.5"** Material of screw shaft **Steel**

Is the screw shaft fitted with a continuous liner the whole length of the stern tube **No liner fitted** 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 **Yes** If two liners are fitted, is the shaft lapped or protected between the liners **Yes** Length of stern bush **5' 1 3/8"**

Dia. of Tunnel shaft **12.49"** as per rule **12.4"** as fitted **12.4"** Dia. of Crank shaft journals **13.116"** as per rule **13.3"** as fitted **13.3"** Dia. of Crank pin **14"** Size of Crank webs **8 3/4" x 19 5/8"** Dia. of thrust shaft under collars **13 1/2"** Dia. of screw **16.6"** Pitch of Screw **17.3"** No. of Blades **4** State whether moveable **Yes** Total surface **84.4 sq. ft.**

No. of Feed pumps **2** Diameter of ditto **4 1/2"** Stroke **24"** Can one be overhauled while the other is at work **Yes**

No. of Bilge pumps **2** Diameter of ditto **4 1/2"** Stroke **24"** Can one be overhauled while the other is at work **Yes**

No. of Donkey Engines **3** Sizes of Pumps **9 x 12 x 10, 7 x 5 x 7, 9 1/2 x 7 x 2 1/2** No. and size of Suctions connected to both Bilge and Donkey pumps **In Engine Room 3 @ 3 1/2"** In Holds, &c. **No. 1 Hold 2 @ 3 1/2", No. 2 Hold 2 @ 3 1/2"**

No. of Bilge Injections **1** sizes **8"** Connected to condenser, or to circulating pump **Yes** Is a separate Donkey Suction fitted in Engine room & size **Yes, 5"**

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 **Bilge pipes** How are they protected **With steel plates**

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 **2.5.16** of Stern Tube **25.4.16** Screw shaft and Propeller **2.5.16**

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 **Stewart & Lloyds Ltd.**

Total Heating Surface of Boilers **4394 sq. ft.** Is Forced Draft fitted **Yes** No. and Description of Boilers **2 Single ended, Scotch**

Working Pressure **200 lbs.** Tested by hydraulic pressure to **400 lbs.** Date of test **28.4.16** No. of Certificate **67**

Can each boiler be worked separately **Yes** Area of fire grate in each boiler **52.31 sq. ft.** No. and Description of Safety Valves to each boiler **2 Spring loaded** Area of each valve **9.6 sq. ins.** 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 **16 1/2"** Mean dia. of boilers **14' 0"** Length **11' 6"** Material of shell plates **Steel**

Thickness **1 3/16"** Range of tensile strength **28 to 32 tons** Are the shell plates welded or flanged **No** Descrip. of riveting: cir. seams **Double lap.**

long. seams **2 straps** Diameter of rivet holes in long. seams **1 3/8"** Pitch of rivets **9 1/2" 4 1/2"** Lap of plates or width of butt straps **20 1/2"**

Per centages of strength of longitudinal joint rivets **88.6** Working pressure of shell by rules **212 lbs.** Size of manhole in shell **16" x 12"**

Size of compensating ring **37" x 33"** No. and Description of Furnaces in each boiler **3 Morrison's** Material **Steel** Outside diameter **31' 9 1/2"**

Length of plain part top **16"** bottom **16"** Thickness of plates crown **2"** bottom **1 1/2"** Description of longitudinal joint **Welded** No. of strengthening rings **15**

Working pressure of furnace by the rules **217 lbs.** Combustion chamber plates: Material **Steel** Thickness: Sides **3/4"** Back **3/4"** Top **3/4"** Bottom **7/16"**

Pitch of stays to ditto: Sides **11" x 8"** Back **9 1/2" x 9"** Top **9 1/2" x 7"** If stays are fitted with nuts or riveted heads **Nuts** Working pressure by rules **233 lbs.**

Material of stays **Steel** Diameter at smallest part **1.73"** Area supported by each stay **91 sq. ins.** Working pressure by rules **212 lbs.** End plates in steam space: Material **Steel** Thickness **1 3/32"** Pitch of stays **20" x 18"** How are stays secured **Double nuts and washers** Working pressure by rules **214 lbs.** Material of stays **Steel**

Diameter at smallest part **3 3/8"** Area supported by each stay **360 sq. ins.** Working pressure by rules **221 lbs.** Material of Front plates at bottom **Steel**

Thickness **3 1/32"** Material of Lower back plate **Steel** Thickness **3 1/32"** Greatest pitch of stays **1' 1 1/2"** Working pressure of plate by rules **221 lbs.**

Diameter of tubes **3 1/2"** Pitch of tubes **4 1/2" x 4 1/2"** Material of tube plates **Steel** Thickness: Front **3 1/32"** Back **27"** Mean pitch of stays **10 1/8"**

Pitch across wide water spaces **1' 1 1/2"** Working pressures by rules **216 lbs.** Girders to Chamber tops: Material **Steel** Depth and thickness of girder at centre **10 1/2" x 7"** Length as per rule **31.9"** Distance apart **9 1/2"** Number and pitch of stays in each **3 @ 7"**

Working pressure by rules **214 lbs.** Superheater or Steam chest; how connected to boiler **By pipe** Can the superheater be shut off and the boiler worked separately **Yes** Diameter **12"** Length **12"** Thickness of shell plates **3/16"** Material **Steel** Description of longitudinal joint **Double lap.** Diam. of rivet holes **1 3/8"** Pitch of rivets **9 1/2"** Working pressure of shell by rules **216 lbs.** Diameter of flue **12"** Material of flue plates **Steel** Thickness **3/16"**

If stiffened with rings **Yes** Distance between rings **12"** Working pressure by rules **216 lbs.** End plates: Thickness **3/16"** How stayed **By pipe**

Working pressure of end plates **216 lbs.** Area of safety valves to superheater **3.14 sq. ins.** Are they fitted with easing gear **No**

**VERTICAL DONKEY BOILER—** Manufacturers of Steel

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 \_\_\_\_\_ 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 \_\_\_\_\_ Plates \_\_\_\_\_

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 1 crank shaft, 1 Propeller shaft, 2 Propeller blades, 1 Valve spindle, 2 Eccentric rods, 1 pair of connecting rod brasses, 1 pair of crosshead brasses, 13 Junk ring bolts, 45 Condenser tubes, 12 Boiler tubes, 1 set of valves seats for check valves, 1 set of air pump valves, 1 set of valves for Aux. pumps, 1 air pump rod, 1 centrifugal pump spindle.

\* 1 Propeller shaft for spare for 2 ships (Nos. 252 & 253)

The foregoing is a correct description,  
**MITSUBISHI DOCKYARD & ENGINE WORKS**  
 General Manager.

Dates of Survey while building	During progress of work in shops - -	1915 June 19, 20, July 29, 31, Aug. 4, 7, 18, 20, 24, 28, Sept. 6, 21, 22, 24, 29, 30, Oct. 1, 4, 5, 11, 12, 15, 16, 19, 20, 29.
		Nov. 1, 2, 3, 4, 6, 8, 12, 13, 17, 18, 22, 24, 29, 30, Dec. 3, 7, 8, 10, 13, 15, 20, 22, 24, 28, 29.
		1916 Jan. 8, 17, 19, 26, Feb. 2, 4, 5, 24, March 3, 4, 15, 20, 23, 28, April 1, 5, 6, 11, 13, 14, 15, 18, 21, 24, 25, 28, May 2, 3, 4, 8, 12, 17, 23, 25, 27, 30, 31.
	During erection on board vessel - -	June 1, 2, 5, 6, 9, 10, 12, 14, 15, 17, 19, 22, 24, 28, July 8.
	Total No. of visits	103

Is the approved plan of main boiler forwarded herewith yes.

" " " donkey " " " ✓

**Dates of Examination of principal parts—**

Cylinders	3. 5. 16	Slides	6. 6. 16	Covers	3. 5. 16	Pistons	6. 6. 16	Rods	8. 5. 16
Connecting rods	8. 5. 16	Crank shaft	7. 12. 15	Thrust shaft	3. 12. 15	Tunnel shafts	5. 2. 16	Screw shaft	18. 4. 16
Stern tube	14. 4. 16	Steam pipes tested	9. 6. 16	Engine and boiler seatings	13. 5. 16	Engines holding down bolts	18. 5. 16		
Completion of pumping arrangements	2. 6. 16	Boilers fixed	17. 5. 16	Engines tried under steam	24. 6. 16				
Main boiler safety valves adjusted	19. 6. 16	Thickness of adjusting washers	Jamb nuts						
Material of Crank shaft	Steel	Identification Mark on Do.	No. 121 ASW	Material of Thrust shaft	Steel	Identification Mark on Do.	No. 121 ASW		
Material of Tunnel shafts	Steel	Identification Marks on Do.	No. 121 ASW	Material of Screw shafts	Steel	Identification Marks on Do.	No. 121 ASW		
Material of Steam Pipes	Solid drawn steel	Test pressure	600 lbs. per sq. in.						

**General Remarks** (State quality of workmanship, opinions as to class, &c. Boilers fitted with leaky Superheaters, and a safety valve fitted to each one. The headers, superheater pipes, and all steam pipes subjected to the temperature of the superheated steam have been made of steel, and all stop valves, junction pieces subjected to the temperature of the superheated steam have been made of cast steel, all the steel castings have been tested as required by the Rules. The headers and superheater pipes were tested by hydraulic pressure to 1000 lbs. per sq. in., and the steam pipes, stop valves, junction pieces to 600 lbs. per sq. in., and found satisfactory.

These Engines and Boilers have been constructed under Special Survey, in accordance with the Rules, and of good materials and workmanship. They have been securely fitted on board, and have been satisfactorily tried under steam. The Machinery of this vessel is eligible, in my opinion, for the record **LMC 7.16** in the Register Book.

Mean speed of 6 Runs on Trial when  $\frac{1}{2}$  Loaded = 14.458 knots.

It is submitted that this vessel is eligible for **THE BROOD** + **LMC 7.16** F.D.  
 J. S. Williamson  
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

The amount of Entry Fee..	£ 3 : 0 : 0	When applied for,
Special .. .. .	£ 55 : 13 : 0	10 <sup>th</sup> July 1916
Donkey Boiler Fee .. .	£ : : :	When received,
Travelling Expenses (if any) £	✓ : ✓ : ✓	11 <sup>th</sup> July 1916

Committee's Minute TUE. 22. AUG. 1916  
 Assigned + L.M.C. 7.16 J.S.

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

Rpt. 13.  
 Port of  
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 Owners  
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