

REPORT ON MACHINERY.

Port of **NAGASAKI.**

Received at London Office **WED. 19. JUL. 1916**

No. in Survey held at **NAGASAKI.**

Date, first Survey **26th June 1915** Last Survey **21st June 1916**

Reg. Book. on the **Twin s.s. "Iouruga Maru"**

(Number of Visits **123.**)

Tons } Gross **7289**
 } Net **4507.**

Master **N. Shibata** Built at **Nagasaki** By whom built **Mitsubishi Dockyard & Engine Works** When built **1916**

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

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

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

Nom. Horse Power as per Section 28 **620** Is Refrigerating Machinery fitted for cargo purposes **No.** Is Electric Light fitted **Yes.**

ENGINES, &c.—Description of Engines **Twin screw, Triple expansion** No. of Cylinders **6** No. of Cranks **6**

Dia. of Cylinders **20 1/2", 33 1/2", 56"** Length of Stroke **48"** Revs. per minute **89** Dia. of Screw shaft as per rule **12.89"** Material of screw shaft **Steel**
as fitted **13.8"**

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 **Yes.** If two

liners are fitted, is the shaft lapped or protected between the liners **Yes.** Length of stern bush **5' 3"**

Dia. of Tunnel shaft as per rule **11.6"** Dia. of Crank shaft journals as per rule **12.185"** Dia. of Crank pin **13"** Size of Crank webs **17" x 8"** Dia. of thrust shaft under

collars **12 1/2"** Dia. of screw **15.9"** Pitch of Screw **17.9"** No. of Blades **4** State whether moveable **Yes** Total surface **66.5 sq. ft. each.**

No. of Feed pumps **2** Diameter of ditto **4 1/2"** Stroke **22"** Can one be overhauled while the other is at work **Yes.**

No. of Bilge pumps **4** Diameter of ditto **3 1/2"** Stroke **22"** Can one be overhauled while the other is at work **Yes.**

No. of Donkey Engines **3** auto Duplex **3** auto Simplex Sizes of Pumps **1 @ 10" x 12" x 10" 1 @ 8 1/2" x 6" x 9" 1 @ 8" x 10 1/2" x 12"** No. and size of Suctions connected to both Bilge and Donkey pumps

in Engine Room **3 @ 3 1/2"** In Holds, &c. **2 @ 3 1/2"** in No. 1, 2, 3, 4 & 5 Holds and in

Crossbunker, **1 @ 3 1/2"** in shaft tunnel and Tunnel well.

No. of Bilge Injections **2** sizes **9"** Connected to condenser, or to circulating pump **circulating pump** Is a separate Donkey Suction fitted in Engine room & size **2 @ 3 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 **Valves & 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 pipes** How are they protected **with steel plate.**

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 **6.3.16** of Stern Tube **6.3.16** Screw shaft and Propeller **22.3.16.**

Is the Screw Shaft Tunnel watertight **Yes.** Is it fitted with a watertight door **Yes.** worked from **Upper deck**

OILERS, &c.—(Letter for record **S**) Manufacturers of Steel **David Colville & Sons Ltd.**

Total Heating Surface of Boilers **8903.4** Is Forced Draft fitted **Yes.** No. and Description of Boilers **4 Cylindrical, Single ended.**

Working Pressure **200 lbs.** Tested by hydraulic pressure to **400 lbs.** Date of test **10.3.16** No. of Certificate **66**

Can each boiler be worked separately **Yes.** Area of fire grate in each boiler **56.2 sq. ft.** No. and Description of Safety Valves to

each boiler **2 Spring loaded** 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 **18"** Mean dia. of boilers **14' 3"** Length **11' 6"** Material of shell plates **Steel**

Thickness **1 5/16"** Range of tensile strength **28 to 32 tons** Are the shell plates welded or flanged **No.** Descrip. of riveting: cir. seams **Double riveted lap**

long. seams **Double riveted** Diameter of rivet holes in long. seams **1 3/8"** Pitch of rivets **9 1/2" x 4 3/4"** 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 **209 lbs.** Size of manhole in shell **12" x 16"**

Size of compensating ring **31" x 35" x 1 7/16"** No. and Description of Furnaces in each boiler **3 Morrison's** Material **Steel** Outside diameter **45 1/2"**

Length of plain part top **5"** Thickness of plates crown **5"** Description of longitudinal joint **Welded** No. of strengthening rings **15**

Working pressure of furnace by the rules **244 lbs.** Combustion chamber plates: Material **Steel** Thickness: Sides **1 1/16"** Back **1 1/16"** Top **1 1/16"** Bottom **1 1/16"**

Pitch of stays to ditto: Sides **8" x 9"** Back **8 1/2" x 9"** Top **8 1/2" x 9"** If stays are fitted with nuts or riveted heads **Nuts** Working pressure by rules **212 lbs.**

Material of stays **Steel** Diameter at smallest part **1.6"** Area supported by each stay **76.5 sq. in.** Working pressure by rules **237 lbs.** End plates in steam space:

Material **Steel** Thickness **1 3/32"** Pitch of stays **19 1/2" x 16 1/2"** How are stays secured **Double nuts & washers** Working pressure by rules **216 lbs.** Material of stays **Steel**

Diameter at smallest part **3"** Area supported by each stay **321.7 sq. in.** Working pressure by rules **229 lbs.** Material of Front plates at bottom **Steel**

Thickness **3/4"** Material of Lower back plate **Steel** Thickness **1 1/16"** Greatest pitch of stays **7 1/2" x 15"** Working pressure of plate by rules **216 lbs.**



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 2 sets of crosshead brasses, 2 sets of crank pin brasses, 1 set of piston springs, 1 crank shaft, 1 propeller shaft, 1 set of propeller blades, 1 set of check valves & seats, 1 valve spindle, 2 eccentric rods, 1 air pump rod, 1 circulating pump spindle &c.*

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

Dates of Survey while building	During progress of work in shops - -	1915 June 26, July 2, 5, 6, Aug. 12, 20, 23, 28, Sept. 2, 4, 10, 16, 17, 18, 21, 25, 30, Oct. 1, 5, 6, 15, 19, 29, Nov. 1, 3, 4, 6, 8, 12, 13, 17, 18, 20, 22, 24, 27, 29, 30, Dec. 1, 3, 4, 6, 7, 10, 13, 15, 16, 17, 18, 20, 21, 22, 24, 27, 29, 1916 Jan. 6, 7, 8, 10, 11, 12, 13, 19, 20, 24, 25, 29, 31, Feb. 5, 7, 8, 9, 12, 16, 21, 24, 26, 28, 29, March 1, 2, 3, 6, 7, 8, 10, 14, 16, 18, 21, 25, 28, 29, 30, April 1, 5, 7, 8, 12, 13, 14, 15, 20, 28, May 2, 3, 8, 10, 12, 13, 15, 18, 20, 22, 23, 25, 27, 30, June 3, 5, 8, 13, 21.
		During erection on board vessel - -
	Total No. of visits	123.

Is the approved plan of main boiler forwarded herewith *yes* ✓
 " " " donkey " " " ✓

Dates of Examination of principal parts—

Cylinders	16. 3. 16	Slides	1. 4. 16	Covers	16. 3. 16	Pistons	1. 4. 16	Rods	1. 4. 16
Connecting rods	1. 4. 16	Crank shaft	20. 1. 16	Thrust shaft	7. 12. 15	Tunnel shafts	7. 3. 16	Screw shaft	26. 2. 16
Propeller	18. 5. 16	Steam pipes tested	27. 5. 16	Engine and boiler seatings	8. 4. 16	Engines holding down bolts	12. 4. 16		
Stern tube	1. 3. 16	Completion of pumping arrangements	30. 5. 16	Boilers fixed	13. 5. 16	Engines tried under steam	3. 6. 16		
Main boiler safety valves adjusted	30. 5. 16	Thickness of adjusting washers	Jamb nuts No. 122						
Material of Crank shaft	Steel	Identification Mark on Do.	A.S.W. No. 122						
Material of Thrust shaft	Steel	Identification Mark on Do.	A.S.W. No. 122						
Material of Tunnel shafts	Steel	Identification Marks on Do.	A.S.W. No. 122						
Material of Screw shafts	Steel	Identification Marks on Do.	A.S.W. No. 122						
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 Baker's Superheaters, and a safety valve fitted to each one. The headers, superheater pipes, and all steam pipes subject to the temperature of the superheated steam have been made of steel, and all stop valves, junction pieces &c. 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 &c. 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 of **LMC 6.16** in the Register Book. It is submitted that this vessel is eligible for THE RECORD. + LMC 6.16. F.D.*

Mean speed of 6 Runs on Trial when Half Loaded = 14.665 Knots. *JWD 20/7/16*

The amount of Entry Fee..	£ 3 : 0 : 0	When applied for,	22 nd June 1916
Special	£ 76 : 10 : 0	When received,	22 nd June 1916
Donkey Boiler Fee	£ .. : .. : ..		
Travelling Expenses (if any) £	.. : .. : ..		

A. J. Williamson
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute **FRI. 21 JUL. 1916**
 Assigned *+ LMC 6.16*
F.D.

MACHINERY CERTIFICATE
 WRITTEN.



Certificate (if required) to be sent to the Committee's Minute.