

## REPORT ON MACHINERY.

No. 1069.

Port of NAGASAKI.

Received at London Office WED. 19 JUL. 1916

No. in Survey held at NAGASAKI. Date, first Survey 26<sup>th</sup> June 1915 Last Survey 21<sup>st</sup> 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 &amp; Engine Works When built 1916

Engines made at Nagasaki By whom made Mitsubishi Dockyard &amp; 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 $\frac{1}{2}$ " 33 $\frac{1}{2}$ " 56" Length of Stroke 48" Revs. per minute 89 Dia. of Screw shaft as per rule 12.89 as fitted 13.8 Material of screw shaft Steel  
 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  
 Is 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 5' 3"  
 Dia. of Tunnel shaft as per rule 11.6 as fitted 12 Dia. of Crank shaft journals as per rule 12.185 as fitted 12.5 Dia. of Crank pin 13" Size of Crank webs 17" x 8" Dia. of thrust shaft under  
 collars 12 $\frac{1}{2}$ " 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 $\frac{1}{2}$ " Stroke 24" Can one be overhauled while the other is at work Yes  
 No. of Bilge pumps 4 Diameter of ditto 3 $\frac{1}{2}$ " Stroke 24" Can one be overhauled while the other is at work Yes  
 No. of Donkey Engines 2 auto duplex Sizes of Pumps 10" x 12" x 10" 10" x 8" x 9" No. and size of Suctions connected to both Bilge and Donkey pumps  
 In Engine Room 3 @ 3 $\frac{1}{2}$ " In Holds, &c. 2 @ 3 $\frac{1}{2}$ " in No. 1, 2, 3, 4 & 5 Holds and in  
 Crossbunker, 1 @ 3 $\frac{1}{2}$ " in shaft tunnel and Tunnel well.

No. of Bilge Injections 2 sizes 9 Connected to condenser, or to circulating pump Is a separate Donkey Suction fitted in Engine room & size 2 @ 3 $\frac{1}{2}$ "  
 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 $\frac{5}{16}$ " 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 Double butt strap Diameter of rivet holes in long. seams 1 $\frac{3}{8}$ " Pitch of rivets 9 $\frac{1}{2}$ " 4 $\frac{3}{4}$ " Lap of plates or width of butt straps 20 $\frac{1}{2}$ "  
 Per centages of strength of longitudinal joint rivets 88.6% plates 85.5% 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 $\frac{1}{2}$ " No. and Description of Furnaces in each boiler 3 Morrison's Material Steel Outside diameter 45 $\frac{1}{2}$ "  
 Length of plain part top Thickness of plates crown 5" bottom 8" 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 $\frac{1}{2}$ " Back 1 $\frac{1}{2}$ " Top 1 $\frac{1}{2}$ " Bottom 1 $\frac{1}{2}$ "  
 Pitch of stays to ditto: Sides 8" x 9" Back 8 $\frac{1}{2}$ " x 9" Top 8 $\frac{1}{2}$ " 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 $\frac{1}{2}$ " Pitch of stays 9 $\frac{1}{2}$ " x 16 $\frac{1}{2}$ " How are stays secured Double nuts 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" Material of Lower back plate Steel Thickness 1 $\frac{1}{2}$ " Greatest pitch of stays 7 $\frac{1}{2}$ " x 15" Working pressure of plate by rules 216 lbs.

Diameter of tubes 3" Pitch of tubes 4 $\frac{1}{2}$ " x 4 $\frac{3}{8}$ " Material of tube plates Steel Thickness: Front 3" Back 3" Mean pitch of stays 8 $\frac{1}{2}$ "  
 Pitch across wide water spaces 13 $\frac{3}{4}$ " Working pressures by rules 216 lbs. Girders to Chamber tops: Material Steel Depth and

thickness of girder at centre 10" x 3 $\frac{1}{2}$ " double Length as per rule 29 $\frac{5}{16}$ " Distance apart 8 $\frac{1}{2}$ " Number and pitch of stays in each 2 @ 9"  
 Working pressure by rules 325 lbs. Superheater or Steam chest; how connected to boiler By pipe Can the superheater be shut off and the boiler worked

separately Yes Diameter Length Thickness of shell plates Material Steel 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 3.14 sq. in. 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 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,

1915 Mitsubishi Dockyard & Engine Works

General Manager, Manufacturer.

Dates of Survey while building

During progress of work in shops—	4.6.8.12.13.17.18.20.22.24.27.29.30. Decr. 1.3.4.6.7.10.13.15.16.17.18.20.21.22.24.27.29. 1916 Jan. 6.7.8.10.
During erection on board vessel—	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.
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

Stern tube 1.3.16 Steam pipes tested 27.5.16 Engine and boiler seatings 8.4.16 Engines holding down bolts 12.4.16

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 jam nuts No. 122

Material of Crank shaft Steel Identification Mark on Do. A.S.W. 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. 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.

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

Committee's Minute

FRI. 21 JUL. 1916

Assigned

MACHINERY CERTIFICATE WRITTEN.

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



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