

## REPORT ON MACHINERY.

No. 1180.

Received at London Office

TUE. 9-JUL. 1918

Date of writing Report 14 May 1918 When handed in at Local Office 14 May 1918 Port of NAGASAKI

No. in Survey held at NAGASAKI

Reg. Book.

Date, First Survey 22<sup>nd</sup> May, 1917 Last Survey 13<sup>th</sup> May 1918

(Number of Visits 120)

on the Twin s.s. "Arabia Maru"

Master S. Nagata Built at Nagasaki By whom built Mitsubishi Zosen Kaisha Tons Gross 9500 Net 5993 When built 1918

Engines made at Nagasaki By whom made Mitsubishi Zosen Kaisha when made 1918

Boilers made at Nagasaki By whom made Mitsubishi Zosen Kaisha when made 1918

Registered Horse Power Owners Osaka Shosen Kaisha Port belonging to Osaka

Nom. Horse Power as per Section 28 993.5 Is Refrigerating Machinery fitted for cargo purposes Yes 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 27" 44 1/2" 15" Length of Stroke 48" Revs. per minute 82 Dia. of Screw shaft as per rule 15.009 as fitted 15 1/2" 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 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 5' 9"

Dia. of Tunnel shaft as per rule 13.83 as fitted 14 Dia. of Crank shaft journals as per rule 14.323 as fitted 14 3/4 Dia. of Crank pin 15" Size of Crank webs 22 1/2" x 9 1/2" Dia. of thrust shaft under collars 14 3/4" Dia. of screw 17' 9" Pitch of Screw 21' 0" No. of Blades 4 State whether moveable Yes Total surface 78 sq. ft. each

No. of Feed pumps 4 Diameter of ditto 5" Stroke 24" Can one be overhauled while the other is at work Yes

No. of Bilge pumps 4 Diameter of ditto 5" Stroke 24" Can one be overhauled while the other is at work Yes

No. of Donkey Engines 6 Sizes of Pumps Sanitary 5" x 6" x 12" Ash 12" x 8" x 10" 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. 3 Hold 2 @ 3 1/2" No. 4 Hold 2 @ 3 1/2" No. 5 Hold 2 @ 3 1/2" No. 6 Hold 2 @ 3 1/2" Tunnel 2 @ 3 1/2"

No. of Bilge Injections 2 sizes 10" Connected to condenser, or to circulating pump Pump Is a separate Donkey Suction fitted in Engine room & size Yes 6"

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 Under bottom ceiling

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

Is the Screw Shaft Tunnel watertight Yes Is it fitted with a watertight door Yes worked from Shelter deck

**BOILERS, &c.—(Letter for record S)** Manufacturers of Steel Worth Bros. Steel Works & Illinois Steel Corp.

Total Heating Surface of Boilers 13284.5 Is Forced Draft fitted Yes No. and Description of Boilers 5 Single ended, Cylindrical.

Working Pressure 200 lbs. Tested by hydraulic pressure to 400 lbs. Date of test 15/7/19 Mch. 1918 No. of Certificate 83 & 84

Can each boiler be worked separately Yes Area of fire grate in each boiler 66.12 sq. ft. No. and Description of Safety Valves to each boiler 2 Spring loaded Area of each valve 9.62 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 7/16" Mean dia. of boilers 15' 0" Length 12' 0" Material of shell plates Steel

Thickness 1 1/2" Range of tensile strength 28 to 32 tons Are the shell plates welded or flanged No. Descrip. of riveting: cir. seams riveted lap.

long. seams 2 straps Diameter of rivet holes in long. seams 1 1/2" Pitch of rivets 10" x 5" Lap of plates or width of butt straps 22"

Per centages of strength of longitudinal joint rivets 87.6 plate 85 Working pressure of shell by rules 228 lbs. Size of manhole in shell 16" x 15"

Size of compensating ring 36 3/4" x 32 1/2" x 1 1/2" No. and Description of Furnaces in each boiler 3 Morrison's Suspension type Material Steel Outside diameter 4' 0 3/4"

Length of plain part top 21" bottom 32" Thickness of plates crown 21" bottom 32" Description of longitudinal joint Helical No. of strengthening rings 15

Working pressure of furnace by the rules 219 lbs. Combustion chamber plates: Material Steel Thickness: Sides 11/16" Back 11/16" Top 11/16" Bottom 15/16"

Pitch of stays to ditto: Sides 9 1/4" x 8" Back 9" x 8 1/2" Top 8 3/4" x 8 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 213 lbs.

Material of stays Steel Area at smallest part 2.02 sq. ins. Area supported by each stay 76.5 sq. ins. Working pressure by rules 237 lbs. End plates in steam space:

Material Steel Thickness 1 3/32" Pitch of stays 18" x 19 3/4" How are stays secured Double nuts washers Working pressure by rules 218 lbs. Material of stays Steel

Area at smallest part 7.67 sq. ins. Area supported by each stay 356 sq. ins. Working pressure by rules 224 lbs. Material of Front plates at bottom Steel

Thickness 3 1/4" x 13/16" Material of Lower back plate Steel Thickness 3/4" Greatest pitch of stays 17" x 17 3/4" Working pressure of plate by rules 273 lbs.

Diameter of tubes 3" Pitch of tubes 4 1/4" x 4 1/8" Material of tube plates Steel Thickness: Front 3/4" x 13/16" Back 3/4" Mean pitch of stays 8 3/8"

Pitch across wide water spaces 13 1/2" Working pressures by rules 245 lbs. Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 10 1/2" x 8" double Length as per rule 2' 11 5/16" Distance apart 8 3/4" Number and pitch of stays in each 3 @ 8 1/2"

Working pressure by rules 248 lbs. Steam dome: description of joint to shell % of strength of joint

Diameter Thickness of shell plates Material Description of longitudinal joint Diam. of rivet holes

Pitch of rivets Working pressure of shell by rules Crown plates Thickness How stayed

**SUPERHEATER.** Type Loaky's Date of Approval of Plan 18/5/15 Tested by Hydraulic Pressure to 1000 lbs.

Date of Test 25<sup>th</sup> March, 1918 Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler Yes

Diameter of Safety Valve 2" Pressure to which each is adjusted 205 lbs. Is Easing Gear fitted Yes

006744-006759-000



IS A DONKEY BOILER FITTED? No.

If so, is a report now forwarded? ☒

SPARE GEAR. State the articles supplied:— As per Rule, and in addition 1 crank shaft, 1 propeller shaft, 4 propeller blades, 1 piston rod, 1 valve spindle, 2 eccentric rods, 1 stern bush, 1 set each of top & bottom brasses & bolts for one connecting rod, 13 junk ring bolts, 46 cylinder cover studs, 4 main bearing bolts, 6 coupling bolts, 63 condenser tubes, 58 boiler tubes, 1 set each valves & seats for main & auxiliary check valves, 1/2 set air pump valves & guards, 1/2 set of total number of valves for auxiliary pumps &c.

The foregoing is a correct description,

YASAKI WORKS, MITSUBISHI ZOSSEN KAISHA, LTD.  
General Manager

Manufacturer.

Dates of Survey while building  
During progress of work in shops - - 1917 May 22, 29, June 11, 14, 19, 25, July 9, 12, 23, 26, 31, Aug. 14, 20, 24, 28, Sept. 4, 7, 8, 19, 21, 22, 25, Oct. 3, 6, 13, 1918 Jan. 10, 11, 14, 15, 18, 24, 26, 29, 30, 31, Feb. 5, 7, 9, 13, 14, 15, 16, 18, 19, 20, 21, 22, 25, 26, 27, 28, March 1, 2, 5, 7, 9, 12, 13, 15, 16, 18, 19, 20, 21, 23, 25, 26, 27, 29, 30, April 1, 2, 4, 5, 6, 8, 10, 11, 12, 13, 15, 16, 17, 18, 19, 22, 23, 24, 25, 27, 29, 30, May 1, 3, 7, 9, 11, 12.  
During erection on board vessel - - -  
Total No. of visits 120.

Is the approved plan of main boiler forwarded herewith ☒ yes.  
" " " donkey " " " ☒

Dates of Examination of principal parts—Cylinders 5/12/18 Slides 21/3/18 Covers 13/3/18 Pistons 13/3/18 Rods 13/3/18  
Connecting rods 13/3/18 Crank shaft 27/2/18 Thrust shaft 9/2/18 Tunnel shafts 9/2/18 Screw shaft 9/2/18 Propeller 23/3/18  
Stern tube 19/3/18 Steam pipes tested 2/4/18 Engine and boiler seatings 21/3/18 Engines holding down bolts 5/4/18  
Completion of pumping arrangements 19/4/18 Boilers fixed 1/4/18 Engines tried under steam 23/4/18  
Completion of fitting sea connections 30/3/18 Stern tube 21/3/18 Screw shaft and propeller 23/3/18  
Main boiler safety valves adjusted 22/4/18 Thickness of adjusting washers Jamb nuts  
Material of Crank shaft Steel Identification Mark on Do. No 143 A.S.W. Material of Thrust shaft Steel Identification Mark on Do. No 143 A.S.W.  
Material of Tunnel shafts Steel Identification Marks on Do. No 143 A.S.W. Material of Screw shafts Steel Identification Marks on Do. No 143 A.S.W.  
Material of Steam Pipes Solid drawn steel Test pressure 600 lbs. per sq. in.

Is an installation fitted for burning oil fuel ☒ Is the flash point of the oil to be used over 150°F. ☒  
Have the requirements of Section 49 of the Rules been complied with ☒  
Is this machinery duplicate of a previous case ☒ yes. If so, state name of vessel "Africa Maru"

General Remarks (State quality of workmanship, opinions as to class, &c. The Boilers have been fitted with Esaky's Superheaters in accordance with the Society's requirements.

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 5.18 in the Register Book.

Mean speed of 6 Runs on Trial when Half Loaded = 16.27 Knots.

After the trial the centre furnace of No. 2 Boiler, and all furnaces of Nos. 3 & 4 Boilers were found to be deformed, due to oil having got into these boilers. The greatest deformations were No. 2 - centre 1/2", No. 3 - centre 4 1/4", starboard 1 1/2", port 1 3/4", No. 4 centre starboard 1 7/8", port 2 1/8". The centre furnace of No. 3 Boiler was renewed, and all the others failed. No. 3 Boiler was again tested by hydraulic pressure to 290 lbs. per sq. in., and all the boilers again examined under steam, and found satisfactory.

It is submitted that this record is eligible for THE RECORD. + LMC 5.18. FD

The amount of Entry Fee ... £ 3.0.0 :  
Special ... £ 104.10.3 :  
Donkey Boiler Fee ... £ : :  
Travelling Expenses (if any) £ : :  
When applied for, 15th May 1918  
When received, 16th May 1918

A.S. Williamson  
Engineer Surveyor to Lloyd's Register of Shipping.

Committee's Minute  
Assigned + LMC 5.18 J.D.

MACHINERY CERTIFICATE WRITTEN.



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