

# REPORT ON MACHINERY.

No. 2916

Received at London Office

TUE. SEP. 28 1920

Date of writing Report 9<sup>th</sup> July 1920 When handed in at Local Office Osaka Port of Kobe

No. in Survey held at Osaka Date, First Survey July 3<sup>rd</sup> 1919 Last Survey May 27<sup>th</sup> 1920.

Req. Book. on the Steel Single Screw Steamer "ETNA MARU" (Number of Visits 34)

Master Y. Hamada Built at Osaka By whom built The Osaka Iron Works, Ltd. When built 1920

Engines made at Osaka By whom made Osaka Iron Works, Ltd. when made May, 1920

Boilers made at do By whom made do when made May, 1920

Registered Horse Power 552 Owners Kokusai Kisen Kabushiki Kaisha Port belonging to Osaka

Nom. Horse Power as per Section 28 552 Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted yes

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

Dia. of Cylinders 27": 45": 75" Length of Stroke 51" Revs. per minute 65 Dia. of Screw shaft as per rule 15 1/8" Material of 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'-4 3/4"

Dia. of Tunnel shaft as per rule 13.68 Dia. of Crank shaft journals as per rule 14.37 Dia. of Crank pin 14 7/8" Size of Crank webs 9 1/4" x 27 1/2" Dia. of thrust shaft under collars 14 7/8" Dia. of screw 18'-3" Pitch of Screw 18'-3" No. of Blades 4 State whether moveable yes Total surface 100 sq. ft.

No. of Feed pumps Two Diameter of ditto 4" Stroke 27" Can one be overhauled while the other is at work yes

No. of Bilge pumps Two Diameter of ditto 4 1/2" Stroke 27" Can one be overhauled while the other is at work yes

No. of Donkey Engines 4 Sizes of Pumps Ballast 10" x 13" x 13" dupl. x 1 No. and size of Suctions connected to both Bilge and Donkey pumps In Engine Room Two @ 3 1/2" Tunnel Well one @ 3 1/2" In Holds, &c. Nos. 1, 2, 3 + 4 two each @ 3 1/2"

No. of Bilge Injections 1 sizes 9 1/2" Connected to condenser, or to circulating pump yes Is a separate Donkey Suction fitted in Engine room & size yes 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 ✓

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 ✓ How are they protected ✓

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 Top platform.

**BOILERS, &c.**—(Letter for record S.) Manufacturers of Steel Otis Stl. Co.; Cambria Stl. Co.; Am. Spiral Pipe Works.

Total Heating Surface of Boilers 8084.4 Is Forced Draft fitted yes No. and Description of Boilers Three Single ended

Working Pressure 180 lbs. Tested by hydraulic pressure to 360 lbs. Date of test 3<sup>rd</sup> May, 1920 No. of Certificate TEST 1920 2220

Can each boiler be worked separately yes Area of fire grate in each boiler 61.8 No. and Description of Safety Valves to each boiler 2 Spring loaded Area of each valve 7.0686 Pressure to which they are adjusted 185 lbs. Are they fitted with easing gear yes

Smallest distance between boilers or uptakes and bunkers or woodwork 15" Mean dia. of boilers 15'-0" Length 12'-0" Material of shell plates steel

Thickness 9/16" Range of tensile strength 28-32 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams Double riveted

long. seam Double straps Diameter of rivet holes in long. seams 1 5/8" Pitch of rivets 10 5/8" + 5 5/16" Lap of plates or width of butt straps 1 3/4" x 1 1/4" (ex)

Per centages of strength of longitudinal joint 92.9 Working pressure of shell by rules 227 lbs. Size of manhole in shell 12" x 16"

Size of compensating ring 3'-2" x 2'-10" x 1 9/16" No. and Description of Furnaces in each boiler 3 Morrison's. Material steel Outside diameter 3'-11 1/4"

Length of plain part top ✓ Thickness of plates crown 1 1/16" Description of longitudinal joint Weld No. of strengthening rings ✓

Working pressure of furnace by the rules 239 lbs. Combustion chamber plates: Material steel Thickness: Sides 1 1/16" Back 1 1/16" Top 1 1/16" Bottom 7/8"

Pitch of stays to ditto: Sides 8 1/4" x 8 1/4" Back 8" x 8 1/2" Top 8" x 8 1/2" If stays are fitted with nuts or riveted heads nuts Working pressure by rules 239 lbs.

Material of stays steel Area at smallest part 2.1 Area supported by each stay 68 Working pressure by rules 277 lbs. End plates in steam space: Material steel Thickness 1 1/32" Pitch of stays 18" x 20" How are stays secured Double nuts Working pressure by rules 236 lbs. Material of stays steel

Area at smallest part 8.76 Area supported by each stay 360 Working pressure by rules 253 Material of Front plates at bottom steel

Thickness 7 3/4" + 3/4" Material of Lower back plate steel Thickness 7 3/4" + 3/4" Greatest pitch of stays 14 1/2" 50% stay Working pressure of plate by rules 249 lbs.

Diameter of tubes 3" Pitch of tubes 4 1/4" x 4 1/8" Material of tube plates steel Thickness: Front 7/8" Back 7/8" Mean pitch of stays 9 1/16"

Pitch across wide water spaces 13 1/2" Working pressures by rules 277 lbs. Girders to Chamber tops: Material steel Depth and thickness of girder at centre 9 3/4" x 2" Length as per rule 33 1/16" Distance apart 8 1/2" Number and pitch of stays in each 3 @ 8"

Working pressure by rules 280 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 ✓ Date of Approval of Plan ✓ Tested by Hydraulic Pressure to ✓

Date of Test ✓ Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler ✓

Diameter of Safety Valve ✓ Pressure to which each is adjusted ✓ Is Easing Gear fitted ✓

Rivets in Bracket Bulkheads

Number. Dia. In.

7

9

10

11

4 1/2 ELSEWHERE

5 1/4

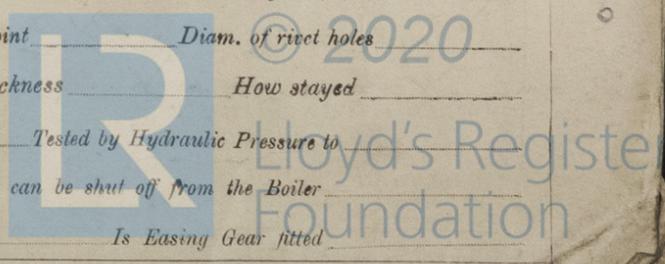
REGIN AND

approved. Angles. 38 5 x 3 1/2 x 4 1/2 38 7 x 3 1/2 x 4 1/2 40 9 x 3 1/2 x 5 1/2

Is a Report also sent on the Hull of the Ship

2m. 17. T

009040-209049-0154



IS A DONKEY BOILER FITTED?

No

If so, is a report now forwarded?

SPARE GEAR. State the articles supplied:—

1 Set packing rings + springs for each size of piston. 1 Set coupling bolts + nuts, 1 Set feed pump valves + port  
 1 Manganese bronze propeller blade with studs + nuts. 2 main bearing bolts + nuts. 1 Set helge pump "  
 1 Set Crank pin brasses. 2 main slide valve spindles. 2 Eccentric rods. 1 Set feed check valves + s  
 1 " Crosshead brasses. 1/4 Set junk ring bolts + nuts. 40 Condenser tubes + 120 Ferrules. 3 safety valves  
 4 Bolts + nuts for Crosshead brasses. 1 Air pump rod. 1/2 Set air pump valves. 3 Cylinder escape valve sp  
 2 bolts + nuts for Crank pin brasses. 1 Centrifugal pump fan + 1 fan shaft. 10 plain boiler tubes. 100 assorted

The foregoing is a correct description

G. Yuanda



Manufacturer.

Dates of Survey while building	During progress of work in shops --	1919	June 3, 11, 26; July 5, 19, 23; Aug. 6, 15, 19, 28; Sept. 4, 11, 20; Oct. 3, 8, 21, 26; Nov. 8; Mar. 1920
		During erection on board vessel ---	Mar. 20, 22, 25, 29; Apr. 5, 6, 10, 19; May 3 <sup>rd</sup> .
			Total No. of visits

Is the approved plan of main boiler forwarded herewith  Yes

" " " donkey " " "  Yes

Dates of Examination of principal parts—Cylinders 6-8-19 etc. Slides 11-9-19 etc. Covers 6-8-19 etc. Pistons 3-10-19 etc. Rods 5-7-19  
 Connecting rods 19-8-19 etc. Crank shaft 21-10-19 Thrust shaft 21-10-19 Tunnel shafts 25-3-20 Screw shaft 5-4-20 etc. Propeller 16-3-  
 Stern tube 11-3-20 Steam pipes tested 21-5-20 Engine and boiler seatings 29-3-20 Engines holding down bolts 11-5-2  
 Completion of pumping arrangements 22-5-20 Boilers fixed 22-5-20 Engines tried under steam 25-5-20  
 Completion of fitting sea connections 29-3-20 Stern tube 29-3-20 Screw shaft and propeller 29-3-20  
 Main boiler safety valves adjusted 22-5-20 Thickness of adjusting washers Lock nuts

Material of Crank shaft Steel Identification Mark on Do. <sup>H.P.M.P. LLOYD'S 26-9-18 ROSS</sup> Material of Thrust shaft steel Identification Mark on Do. <sup>L.P. LLOYD'S 28-9-18 ROSS</sup>

Material of Tunnel shafts Steel Identification Marks on Do. <sup>LLOYD'S 22-7-19 Y.J. R.</sup> Material of Screw shafts steel Identification Marks on Do. <sup>LLOYD'S 25-3-20 Y.J. R.</sup>

Material of Steam Pipes Solid drawn steel Test pressure 540 lbs.

Is an installation fitted for burning oil fuel No 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 If so, state name of vessel

General Remarks (State quality of workmanship, opinions as to class, &c.)

The Crank and Thrust Shafts were forged + finished at the Kobe Steel Works; one tunnel shaft was forged + finished at the Sumitomo Steel Works, five tunnel + Screw shafts were forged + rough turned at the Sizer Forge Company, Buffalo, finished at Osaka Iron Works.

This machinery has been made + fitted under special Survey in accordance with the requirements of the Rules and the materials + workmanship have been found good.

The machinery is eligible in my opinion for the record of L.M.C. 5-20

It is submitted that this vessel is eligible for THE RECORD. + L.M.C. 5-20 F.D.

Kell 1/10/20

J.P.R.

The amount of Entry Fee	Yen 30.-	When applied for,
Special	£ 828.-	June 1 <sup>st</sup> 1920
Donkey Boiler Fee	£	When received,
Travelling Expenses (if any)	£	June 14 <sup>th</sup> 1920

Engineer Surveyor to Lloyd's Register of Shipping

Committee's Minute

TUE. OCT. 15 1920

Assigned

+ L.M.C. 5-20

F.D.

CERTIFICATE WRITTEN



© 2020

Lloyd's Register Foundation

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