

## REPORT ON MACHINERY.

No. 11690

JUL MAR 29 1921

Date of writing Report 10 May 1921 When handed in at Local Office

10 Port of Rotterdam

No. in Survey held at Rotterdam  
Reg. Book.

Date, First Survey 15 April 20

Last Survey 7 March 1921

(Number of Visits 24)

on the Steel Screw Steamer "ARCO"

Tons { Gross 1393.09  
Net 737.10.

Master J. P. Johansen

Built at Rotterdam

By whom built

Hachinifed - Schepwerf

When built 1921

Engines made at Rotterdam

By whom made

ditto van P. Smits Jr

when made 1921

Boilers made at

ditto

By whom made

ditto

when made 1921

Registered Horse Power 212

Owners Finska Angfartygs A. Bolag

Port belonging to Helsingfors.

Nom. Horse Power as per Section 28 212

Is Refrigerating Machinery fitted for cargo purposes no

Is Electric Light fitted Yes.

ENGINES, &amp;c.—Description of Engines Vertical Triple Expansion. of Cylinders 3 No. of Cranks 3

Dia. of Cylinders  $20\frac{3}{4} \times 32\frac{1}{4} \times 55$  Length of Stroke  $39\frac{3}{8}$  Revs. per minute 75 Dia. of Screw shaft as per rule  $12\frac{1}{2}$  Material of screw shaft Sell

Is the screw shaft fitted with a continuous liner the whole length of the stern tube no 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 no 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  $4'-1"$ Dia. of Tunnel shaft as per rule  $10\frac{3}{8}$  Dia. of Crank shaft journals as per rule  $10\frac{3}{8}$  Dia. of Crank pin 11 Size of Crank webs  $9\frac{1}{2} \times 7\frac{1}{4}$  Dia. of thrust shaft undercollars 11 Dia. of screw  $13\frac{1}{2}$  Pitch of Screw  $6'-9"$  No. of Blades 4 State whether moveable no Total surface  $64.5 \text{ sq ft}$ No. of Feed pumps 2 Diameter of ditto  $3\frac{1}{2}$  Stroke  $19\frac{1}{16}$  Can one be overhauled while the other is at work YesNo. of Bilge pumps 2 Diameter of ditto  $3\frac{1}{2}$  Stroke  $19\frac{1}{16}$  Can one be overhauled while the other is at work YesNo. of Donkey Engines 3 Sizes of Pumps  $7\frac{1}{2} \times 5 \times 10$  No. and size of Suctions connected to both Bilge and Donkey pumpsIn Engine Room  $8 \times 2\frac{3}{8}$  in Tunnel  $1 \times 2\frac{1}{4} \times 2\frac{3}{4} \times 4$  In Holds, &c. N I  $5 \times 2\frac{3}{8}$  in II  $5 \times 2\frac{3}{8}$ No. of Bilge Injections 1 sizes 5 Connected to condenser, or to circulating pump Is a separate Donkey Suction fitted in Engine room & size Yes  $2 \times 2\frac{3}{4}$ 

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 Yes

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 none How are they protected Yes

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 E R top platform

BOILERS, &amp;c.—(Letter for record S) Manufacturers of Steel Hamannmann Rohr Werke

Total Heating Surface of Boilers  $3341 \text{ sq ft}$  Is Forced Draft fitted no No. and Description of Boilers 2 S Enmultitubular

Working Pressure 180 lbs Tested by hydraulic pressure to 360 Date of test 20-7-20 No. of Certificate 703

Can each boiler be worked separately Yes Area of fire grate in each boiler  $60 \text{ sq ft}$  No. and Description of Safety Valves toeach boiler 2 Spring loaded Area of each valve  $7.8 \text{ sq in}$  Pressure to which they are adjusted 180 lbs. Are they fitted with easing gear YesSmallest distance between boilers or uptakes and bunkers or woodwork 24 Mean dia. of boilers  $14'-5\frac{1}{4}"$  Length  $10'-10"$  Material of shell plates SellThickness  $\frac{1}{4}"$  Range of tensile strength 20-32 Are the shell plates welded or flanged no Descrip. of riveting: cir. seams D laplong. seams Tuck DB Diameter of rivet holes in long. seams  $1\frac{3}{8}"$  Pitch of rivets  $8\frac{7}{8}"$  Lap of plates or width of butt straps  $20\frac{1}{16}"$ Per centages of strength of longitudinal joint rivets 80% Working pressure of shell by rules 190 Size of manhole in shell  $12 \times 16"$ Size of compensating ring  $29\frac{1}{2} \times 1\frac{1}{4}"$  No. and Description of Furnaces in each boiler 3 Horizontal Material Sell Outside diameter  $47\frac{1}{4}"$ 

Length of plain part top bottom Thickness of plates crown 2 32 Description of longitudinal joint Welded No. of strengthening rings 1

Working pressure of furnace by the rules 22 Combustion chamber plates: Material Sell Thickness: Sides  $5\frac{1}{8}"$  Back  $5\frac{1}{8}"$  Top  $5\frac{1}{8}"$  Bottom  $7\frac{1}{8}"$ Pitch of stays to ditto: Sides  $6\frac{7}{8} \times 7\frac{1}{8}$  Back  $6\frac{3}{4} \times 6\frac{3}{4}$  Top  $6\frac{7}{8} \times 7\frac{1}{8}$  stays are fitted with nuts or riveted heads Riveted and Working pressure by rules 219.Material of stays Sell Area at smallest part  $1.76 \text{ sq in}$  Area supported by each stay  $45.5 \text{ sq in}$  Working pressure by rules 209 End plates in steam space:Material Sell Thickness  $\frac{1}{16}"$  Pitch of stays  $17 \times 15\frac{1}{4}"$  How are stays secured Double Working pressure by rules 227 Material of stays SellArea at smallest part  $5.94 \text{ sq in}$  Area supported by each stay  $26.7 \text{ sq in}$  Working pressure by rules 231 Material of Front plates at bottom SellThickness  $\frac{1}{16}"$  Material of Lower back plate Sell Thickness  $\frac{1}{16}"$  Greatest pitch of stays  $13\frac{3}{16}"$  Working pressure of plate by rules 211Diameter of tubes  $3\frac{1}{2}"$  Pitch of tubes  $4\frac{1}{2}"$  Material of tube plates Sell Thickness: Front  $2\frac{9}{16}"$  Back  $2\frac{9}{16}"$  Mean pitch of stays 9Pitch across wide water spaces  $4\frac{3}{16}"$  Working pressures by rules 330 Girders to Chamber tops: Material Sell Depth andthickness of girder at centre  $2\frac{1}{16} \times 8\frac{1}{2}"$  Length as per rule 20 Distance apart  $7\frac{7}{8}"$  Number and pitch of stays in each  $3 \times 6\frac{7}{8}"$ 

Working pressure by rules 194 Steam dome: description of joint to shell none % of strength of joint Yes

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 Small Date of Approval of Plan Tested by Hydraulic Pressure to 660 lbs

Date of Test 22-5-1920 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 100 lbs. Is Easing Gear fitted Yes

003252-003262-0144



IS A DONKEY BOILER FITTED? *no.*

If so, is a report now forwarded? *✓*

SPARE GEAR. State the articles supplied:— 2 top end bolts and nuts, 2 bottom end bolts and nuts, 2 main bearing bolts, one set of coupling bolts, 1 set of piston rings, 1 set of helge pump valves, 1 set of feed pump valves, assorted bolts and nuts iron of various sizes, 1 set of hupend brass, 1 propeller 12 condenser tubes, 12 boiler tubes.

The foregoing is a correct description,  
MACHINEFABRIEK & SCHEEPSWERF

van P. SMIT Jr.

*P. H. H. van den Brink*

Manufacturer.

Dates of Survey while building	{	During progress of work in shops --	15/4 - 20-29/4 - 2/5 - 10-23/6 - 20/7 - 13-29/8 - 15/23/9 - 10 1920
		During erection on board vessel --	1-7-27/12 - 20/12 - 3-29/1 - 7-8-21-28/2 - 3-5-7/3 1921
		Total No. of visits	24

Is the approved plan of main boiler forwarded herewith *Yes*

Dates of Examination of principal parts—Cylinders	2/5	Slides	2/5	Covers	2/5	Pistons	29/4	Rods	29/4
Connecting rods	20/8	Crank shaft	13/8	Thrust shaft	13/8	Tunnel shafts	13/8	Screw shaft	13/8
Stern tube	23/10	Steam pipes tested	20/12	Engine and boiler seatings	7/12	Engines holding down bolts	20/12		
Completion of pumping arrangements	29/1-1921	Boilers fixed	27/12	Engines tried under steam	20/12-1921				
Completion of fitting sea connections	7/12	Stern tube	1/12	Screw shaft and propeller	7/12				
Main boiler safety valves adjusted	20/12	Thickness of adjusting washers	SB 3/8" - 7/8" - Port 7/8" - 1/2"						
Material of Crank shaft	<i>Steel</i>	Identification Mark on Do.	9081AF	Material of Thrust shaft	<i>Steel</i>	Identification Mark on Do.	9079		
Material of Tunnel shafts	<i>Steel</i>	Identification Marks on Do.	649 AB	Material of Screw shafts	<i>Steel</i>	Identification Marks on Do.	9096		
Material of Steam Pipes	<i>Steel</i>		9092-97-94	Test pressure	600 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 *no* If so, state name of vessel *✓*

General Remarks (State quality of workmanship, opinions as to class, &c. *The machinery has been made and fitted in accordance with the approved plans, Society's Rules and Secretary's letter. Material tested as required and workmanship good. The engines have been running satisfactorily during a trial and may in my opinion be recorded in the Society's Register Book with + L.M.C. 3.21. This vessel has two main boilers of different sizes viz 2076 and 1265 #.*

It is submitted that  
this vessel is eligible for  
THE RECORD. + L.M.C. 3.21.

*Recd*  
*5/4/21* *J.R.B.*

The amount of Entry Fee ...	<i>£ 48.00</i>	When applied for,	
Special ...	<i>£ 63.6.00</i>	19/3 1921	
Donkey Boiler Fee ...	<i>£</i>	When received,	
Travelling Expenses (if any) ...	<i>£ 36.50</i>	23/3 1921	

Committee's Minute TUE. 5 APR. 1921

Assigned

*+ L.M.C. 3.21*

*A. Bijl*  
Engineer Surveyor to Lloyd's Register of Shipping.



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CERTIFICATE WRITTEN