

REPORT ON OIL ENGINE MACHINERY.

No. 6090.

MON. 21 MAR. 1921

Received at London Office

Writing Report

8th March

1921

When handed in at Local Office

19

Port of Copenhagen

Date, First Survey

2nd Aug. 1918

Last Survey

10th Febr. 1921.

Number of Visits 103.

Survey held at

Copenhagen

Book.

on the Twin

Single

Screw vessels

"Formosa"

C.A. Paulsen

Built at

Copenhagen

By whom built

akt. Burmeister & Wain's Maskin- & Skibbyggeri

Yard No. 315

When built 1919-20

made at

Copenhagen

By whom made

akt. Burmeister & Wain's Maskin- & Skibbyggeri

Engine No. 714

When made 1919-20

Boilers made at

Copenhagen

By whom made

Boiler No. 1

When made 1919-20

Power

2340

Owners

aktieb. Svenska Ostasiatiska Kompaniet (Den Norske)

Port belonging to Gothenburg.

Power as per Rule

568

Is Refrigerating Machinery fitted for cargo purposes

No. Is Electric Light fitted Yes.

GINES, &c.—Type of Engines

Vertical Diesel Oil Engines

2 or 4 stroke cycle 4 Single or double acting Single

Pressure in cylinders

35 kg. per cm²

No. of cylinders

2 x 6

No. of cranks

2 x 6

Diameter of cylinders 630 mm = 24 3/16"

Stroke

960 mm = 37 13/16"

Revolutions per minute

125

Means of ignition

Air compression

Kind of fuel used Crude oil—Flash point above 150°F

Clearing between each crank

Yes

Span of bearings (Page 92, Section 2, par. 7 of Rules)

860 mm

Clearance between centres of main bearings

1300 mm

Is a flywheel fitted

Yes

Diameter of crank shaft journals

as per Rule 376 mm

crank pins

384 mm

Breadth of crank webs

as per Rule 830 mm

Thickness of ditto

as per Rule 250 mm

flywheel shaft

as per Rule 376 mm

as fitted 384 mm

Diameter of tunnel shaft

as per Rule 11.4"

as fitted 11.5/8"

Diameter of thrust shaft

as per Rule 11.97"

as fitted 12 1/4"

screw shaft

as per Rule 12.81"

as fitted 13 1/4"

Is the screw shaft fitted with a continuous liner the whole length of the stern tube

No.

end of the liner made watertight in the propeller boss

No.

If the liner is in more than one length are the joints burned

Yes

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

Shafts are fitted, is the shaft lapped or protected between the liners

Yes

If without liners, is the shaft arranged to run in oil

Yes

Seal gland fitted to stern tube

Edwards self-adjusting lubricating box fitted

Length of stern bush

5'-7"

Diameter of propeller

12'-0"

propeller

9'-3"

No. of blades

4

state whether moveable

not moveable

Total surface

45 square feet

reversing

Direct reversible

Is a governor or other arrangement fitted to prevent racing of the engine when declutched

Yes Burmeister & Wain's Patent

Thickness of cylinder liners

50 mm

Indicators fitted with safety valves

Yes

Means of lubrication

Forced lubrication

Are the exhaust pipes and silencers water cooled or lagged with

The exhaust

Lagging material or lagged If the exhaust is led overboard near the waterline, what means are arranged to prevent water from being syphoned back to the engine

The pipes are water cooled

The silencers are lagged

led above the engine room casing top

No. of cooling water pumps

2 off

Is the sea suction provided with an efficient strainer which can be cleared

vessel

Yes

No. of bilge pumps fitted to the main engines

none

Diameter of ditto

Stroke

Yes

overhauled while the other is at work

No. of auxiliary pumps connected to the main bilge lines

2 double

How driven by electromotors

pumps

Plungers 6 1/2" diam. Stroke 9"

No. and sizes of suctions connected to both main bilge pumps and auxiliary bilge pumps:—In engine room

6 off 3 1/2" diam. each

dis, etc.

as per approved plan

No. of ballast pumps

1 off

How driven

by electromotor

Sizes of pumps Capacity

Rotary wing pump 1,500 tons

last pump fitted with a direct suction from the engine room bilges

Yes

State size

6" diam.

Is a separate auxiliary pump suction fitted in

room and size

2 off, 5" diam. each

Are all the bilge suction pipes fitted with roses

Yes

Are the roses in Engine Room always accessible

Yes

Access on Engine Room bulkheads always accessible

No slides fitted

Are all connections with the sea direct on the skin of the ship

Yes

valves or cocks

Valves except the blow off cock from the dandy boiler

Are they fixed sufficiently high on the ship's side to be seen without lifting the floor plates

Yes

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

Pipes, cocks, valves and pumps in connection with the machinery 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

from

If a wood vessel, what means are provided to prevent leakage of either fuel oil or of lubricating oil from saturating the woodwork

main air compressors

2 off

No. of stages

3 stages

Diameters

HP = 600 mm
MP = 540 mm
LP = 148 mm

Stroke

350 mm

Driven by the main engines.

auxiliary air compressors

1 off

No. of stages

2 -

Diameters

HP = 400 mm
MP = 350 mm
LP = 106 mm

Stroke

250 mm

Driven by Electromotor.

small auxiliary air compressors

1 off

No. of stages

2 -

Diameters

HP = 34 mm

Stroke

80 mm

Driven by a steam engine.

scavenging air pumps

Diameter

as per Rule 166 mm

Are the air compressors and their coolers made so as to be easy of access

Yes

of auxiliary Diesel Engine crank shafts

as fitted

170 mm

Are the air compressors and their coolers made so as to be easy of access

Yes

RECEIVERS:—No of high pressure air receivers

3 off

2 main removed 12 3/4" retained as dry spaces

Cubic capacity of each

400 litres

200 "

35 "

Siemens Martin Steel.

Seamless, lap welded or riveted longitudinal joint

Lap welded.

Range of tensile strength 23-28 tons.

working pressure by Rules

25 mm

11.5"

65 Atm.

No. of starting air receivers

2 off

Internal diameter

6'-0 15/16"

capacity

About 500 cub. feet each

Material Siemens Martin Steel.

Seamless, lap welded or riveted longitudinal joint

Riveted.

tensile strength and

28-30 tons

thickness

Shell 1 3/16" + 1/32" and 1"

Ends 1 1/16"

Working pressure by rules

25 Atm.

Is each receiver, which can be isolated,

with a safety valve as per Rule

Yes

Can the internal surfaces of the receivers be examined

Yes

What means are provided for cleaning their

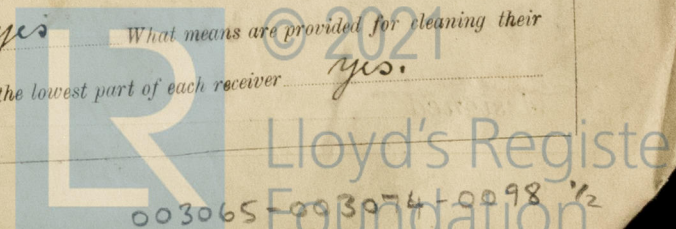
Yes.

The starting air receivers are fitted with man holes.

Is there a drain arrangement fitted at the lowest part of each receiver

Yes.

Surfaces of receivers are fitted from the dandy boiler to the high pressure air receivers for cleaning them by means of steam and caustic soda.



IS A DONKEY BOILER FITTED?

yes

If so, is a report now forwarded?

yes.

HYDRAULIC TESTS:--

DESCRIPTION.	DATE OF TEST.	WORKING PRESSURE.	TEST PRESSURE.	STAMPED.	REMARKS
ENGINE CYLINDERS <i>Water</i>					
" " <i>COVERS Water passage</i>	17/3, 28/3 & 14/4 1919.	15 lbs. per sq. in.	30 lbs. per sq. in.	R	
" " <i>JACKETS</i>	14/4, 27/4, 2/5, & 14/7 1919.	15 " "	30 " "	"	
" " <i>PISTON WATER PASSAGES</i>	21/7 & 15/8 1919.	15 " "	30 " "	"	
MAIN COMPRESSORS—1st STAGE <i>Water passage</i>	3/7. 19.	15 " "	30 " "	"	
" 2nd " <i>" "</i>	3/7. 19.	15 " "	30 " "	"	
" 3rd " <i>{ air space</i>	20/8. 19 12/3. 19	30 " " 65 Atm.	75 " " 160 Atm.	"	
AIR RECEIVERS—STARTING	13/7 & 18/7. 1919.	25 Atm.	39 Atm.	R HP 39 Atm. WP 25 " "	R HP 39 Atm. WP 25 " "
" INJECTION	23/10. 18 & 30/11. 20	65 " "	130 " "	13.9.19. C.K. LLOYD'S TEST 130 Atm. Working Press. 65 " "	R HP 130 Atm. WP 65 " "
AIR PIPES <i>{ for fuel injection</i>	27/1. 26/1. 27/1. 21.	60 " "	120 " "	No 180, 21, 22, 25, 26, 27 SKIN 23-10-18 A.	
" <i>{ for starting</i>	14/1. 18/1 & 19/1. 21.	25 " "	50 " "	R.	
FUEL PIPES <i>from fuel pump to injection valves</i>	2/9. 19.	75 " "	150 " "	R.	
FUEL PUMPS <i>{ Suction space</i>	6/1. 19.	15 lbs. per sq. in.	150 " "	R.	
" <i>{ Delivery</i>	6/1. 19.	75 Atm.	150 Atm.	R.	
SILENCER					
" <i>WATER JACKET</i>	11/4 & 14/9. 19	30 lbs. per sq. in.	75 lbs. per sq. in.	R.	
SEPARATE FUEL TANKS	2/1 & 8/1 1920		10 lbs per sq. in.	✓	

PLANS. Are approved plans forwarded herewith for shafting

yes

Receivers

yes

Separate Tanks

no.

SPARE GEAR As per accompanying list.

The foregoing is a correct description,
BURMEISTER & WAINSKIN- OG SKIDSBYGGERI.

H. Blencoe Manufacturer.

Dates of Survey while building
During progress of work in shops -- 2/1, 27/1, 2, 5, 14 Sep. 3, 8, 25, 30 Oct. 2, 19 Nov. 5, 11, 19, 18, 20, 30 Dec. 1918 3, 4, 6, 9, 16, 21, 23 Jan. 7, 13, 19, 17, 21, 25, 28 Feb. 12, 19, 26, 28 March 8, 14, 25, 29, 30 Apr. 30, 31 May 1, 11, 17 June 2, 3, 10, 14, 17, 21 July 11, 13, 15, 20 Aug 5, 13, 23, 26 Sep. 2, 18 Oct. 30 Nov. 6 Dec. 1919 2, 8 Jan. 5, 12 Feb. 27 Sep. 1, 5, 30 Oct. 5, 19, 22, 27
During erection on board vessel -- 1, 2, 8, 13, 17, 21, 23, 27 Dec. 1920 5, 7, 8, 14, 18, 19, 24, 26, 27, 31 Jan. 3, 4, 7, 8 & 10 Feb. 1921.
Total No. of visits 103.

Dates of Examination of principal parts—Cylinders 19/2, 26/3, 8/4, 14/4, 19/2, 12/3, 17/3, 8/4, 20/5, 4/6, 2/8, 2/9, 30/10, 29/12. 18
27/8, 31/10. 18 3/5, 18/12, 20/12, 30/12. 18 16/1, 21/1, 9/2, 25/4, 20/4, 17 20/10, 5/1, 24/1. 21
Crank shaft 22/5, 28/5. 19 Thrust shaft 1/6. 20 Tunnel shafts 19/2, 14/5. 19 Screw shaft 19/4, 1/12. 20 Propeller 5/1, 24/1. 21 Stern tube 13/8, 19 5/11. 20 Engine seatings 1/2, 9/2, 8/2
Engines holding down bolts 5/1, 8/1, 19/1. 21 Completion of pumping arrangements 19/1, & 31/1. 21 Engines tried under working conditions 7/2, 9/2, 8/2
Completion of fitting sea connections 1/2 & 2/12. 20 Stern tube 2/12. 20 Screw shaft and propeller 24/1. 21
Material of crank shafts S.M.I. Steel. Identification Mark on Do. No. 5607, 5608 S.M.I. Steel Material of thrust shafts S.M.I. Steel Identification Mark on Do. No. 5609, 5610 S.M.I. Steel
Material of tunnel shafts S.M.I. Steel. Identification Marks on Do. No. 5605, 5606 S.M.I. Steel Material of screw shafts S.M.I. Steel Identification Marks on Do. No. 5607, 5608 S.M.I. Steel
Material of Spare Screw Shaft S.M.I. Steel Identification Marks on Do. No. 5609, 5610 S.M.I. Steel

Is the flash point of the oil to be used over 150° F. yes.

Is this machinery duplicate of a previous case yes If so, state name of vessels "George Washington", "Theodore Roosevelt", "Duquesne"

General Remarks (State quality of workmanship, opinions as to class, &c. In accordance with the Rules for Special Survey we have examined

material and workmanship from the commencement of construction until the final trial of the main and auxiliary machinery under full power and found it good in every respect. The material used in the construction of the engines, the air receivers &c. has been tested as required as per certificates produced. The dimensions are specified and in accordance with the Rules, the approved plans and with the requirements of the London letters E dated the 7th June, 8th & 24th July, 12th Sept. 1918, 4th March 1919.

On the trial trip the main engines and the whole auxiliary machinery have been tested under full power working condition and found satisfactory, and the manoeuvring of the main engines tested under working condition and found satisfactory.

Recommend the vessel's machinery to have notation of **L.M.C.-2.21.**

The amount of Entry Fee ... £ 137 : 10 :
Special ... £ 2362 : 69 :
Donkey Boiler Fee ... £ 91 : 40 :
Elect. Light. Just ... £ 811 : 17 :
Travelling Expenses (if any) ...
When applied for, 15. 3. 19
When received, 17. 4. 21

Committee's Minute FRI. 1 APR. 1921

Assigned

+ L.M.C. 2.21
Oil engines



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Lloyd's Register
Foundation

Copenhagen

Continuation of Report No. 6090 dated 8th March 1921 on the

REMARKS.

Steel Twin S.S. 'Formosa' of Gothenburg

Reg. Book 78159.

Burmeister & Wain's Yard No. 315

— " — Eng. No. 714 & 715.

The auxiliary machinery comprising:-

One - 150 Tons rotary wing pump for ballast purpose.

Two - 120 Tons rotary wing pumps for cooling water purpose.

Two pumps each with three separate plungers, - the one being for

bilge purpose, - one for discharging the cooling water for the main engines

and one for the sanitary purpose. Diam. of plungers = 6½" - Stroke 9"

Revolutions p.m. 100 and the capacity 15-20 Tons per hour.

Two - 15 Tons rotary pumps for the forced lubrication.

One - 50 Tons rotary pump for the daily service oil fuel tanks.

One vertical two-stage auxiliary air compressor.

One vertical two stage spare air compressor driven by a directly coupled steam

engine. -

Three - 2 cylinders, four stroke cycle single acting auxiliary Diesel oil engines of 90 E.H.P. each

placed on the port side of the motor room and working 3 compound wound

motors of 60 K.W. - 220 Volt each, - supplying electric current for the motive

power for the following electro motors, viz: -

One - 15 H.P. shunt wound electro motor for working the ballast pump.

One - 15 H.P. shunt wound electro motor for working the cooling water pumps.

One - 7.5 H.P. shunt wound electro motor for working the bilge and sanitary pumps.

One - 10 H.P. shunt wound electro motor for working the forced lubrication oil pumps.

One - 15 H.P. shunt wound electro motor for working the pump to the daily service oil fuel tank.

One - 90 H.P. shunt wound electro motor for working the auxiliary air compressor. -

One - 6 H.P. serie wound electro motors for working the turning gear for the main engines.

One - 2 H.P. shunt wound electro motor for working the turning lathe and drilling machine.

One - 7 H.P. compound wound electro motor for working the CO₂ compressor to the provision

refrigerating appliance.

One - 1 H.P. shunt wound electro motor for working the brine pump to the provision refrigerating appliance.

One - 54 H.P. compound wound electro motor for working the windlass.

One - 20 H.P. compound wound electro motor for working the electro hydraulic steering gear.

One - 21 H.P. serie wound electro motors for working three 5 Tons cargo winches.

One - 12.5 H.P. serie wound electro motors for working eight 3 Tons cargo winches,

and electric current for the lighting purpose with the voltage reduced

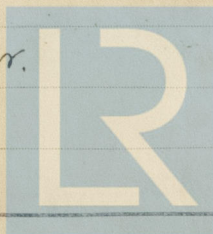
from 220 to 110 Volt after having passed the transformer.

The foregoing is a correct description.

A. J. J. J.
 SURVEYOR TO LLOYD'S
 REGISTER OF SHIPPING

AKTIESELSKABET
 BURMEISTER & WAIN'S MASKIN- OG SKIBSBYGGERI.

H. P. M. M. M. Manufacturer.



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