4.

REPORT ON MACHINERY

No. 5545.

Received at London Office TUE. MAY. 21. 1918

Writing Report 8th May 1918. When handed in at Local Office ____ 19__ Port of Copenhagen

Survey held at Copenhagen Date, First Survey 5th June 1917. Last Survey 7th May 1918.

(Number of Visits 81.)

Book.

No. 6 on the Steel Twin Sc. 3 Mst. Sr. "Lima" (Oil Engine) Yard No. 313. Tons Gross 3764.32 Net 2254.39.

Built by F.W. Grundberg. Built at Copenhagen By whom built Akt. Burmeister & Wain's Maskin-og Skibsbyggeri When built 1917-18.

Engines made at Copenhagen By whom made Akt. Burmeister & Wain's Maskin-og Skibsbyggeri when made 1917-18.

Boilers made at Copenhagen By whom made Akt. Burmeister & Wain's Maskin-og Skibsbyggeri when made 1917-18.

Registered Horse Power 2600 I.H.P. Owners Rederiaktiebolaget Nordstjernan (A.A. Johnson). Port belonging to Stockholm.

Horse Power as per Section ~~28~~ 29 482 N.H.P. Is Refrigerating Machinery fitted for cargo purposes No Is Electric Light fitted Yes.

ENGINES, &c.—Description of Engines 2 off 4 Stroke Cycle Single Acting Diesel Oil engines. No. of Cylinders 12 No. of Cranks 12.

Dia. of Cylinders 590 m/m = 23 1/4" Length of Stroke 900 m/m = 35 7/16" Revs. per minute abt. 125 Dia. of Screw shafts as ~~per rule~~ approved 12 1/4" as fitted 12 1/4" Material of screw shaft S.M.I. Steel.

Is the screw shaft fitted with a continuous liner the whole length of the stern tubes No liners fitted Is the after end of the liner made water tight in the propeller boss ✓ If the liner is in more than one length are the joints burned ✓ If the liner does not fit tightly at the part in the bearings in the stern tube, is the space charged with a plastic material insoluble in water and non-corrosive ✓ If two screws are fitted, is the shaft lapped or protected between the liners ✓ Cedervall's patent lubricating boxes fitted. ✓ Length of stern bushes 5'0"

Dia. of Tunnel shaft as ~~per rule~~ approved 11" as fitted 11" Dia. of Crank shaft journals as ~~per rule~~ approved 365 m/m as fitted 365 m/m Dia. of Crank pin 365 m/m Size of Crank webs 780 m/m x 225 m/m Dia. of thrust shaft under collars 11 1/2" Dia. of screw 11'-3" Pitch of Screw 9'-0" No. of Blades 4 State whether moveable No. Total surface 35.5 sq ft

No. of Feed pumps ✓ Diameter of ditto ✓ Stroke ✓ Can one be overhauled while the other is at work ✓

No. of Bilge pumps ✓ Diameter of ditto ✓ Stroke ✓ Can one be overhauled while the other is at work ✓

No. of Donkey Engines 6 off ✓ Sizes of Pumps See the following sheet ✓ No. and size of Suctions connected to both Bilge and Donkey pumps in Engine Room 2 off 5" - 3 off 3 1/2" and 2 off 3" each. ✓ In Holds, &c. In No. 1, 2 & 3 holds forward the Engineroom 2 off in each, size 3 1/2" each, hold 2 off 3 1/2" and 2 off 2 1/2" each, In tunnel well one 3 1/2" In FPT & APT one in each 3 1/2" In double bottom tanks and side tanks aft, size 4" each as per approved plan. ✓

No. of Bilge Injections 2 off sizes 5" ✓ Connected to ~~condenser, or to circulating pump~~ the centrifugal cooling water pumps ✓ Is a separate Donkey Suction fitted in Engine room & size ✓

Have 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, except the blow off cock from donkey boiler.

Are they fixed sufficiently high on the ship's side to be seen without lifting the ~~stokehold~~ engine room 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 No 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 Upper deck. ✓

BOILERS, &c.—(Letter for record ____) Manufacturers of Steel ____

Total Heating Surface of Boilers ____ Is Forced Draft fitted ____ No. and Description of Boilers ____

Working Pressure ____ Tested by hydraulic pressure to ____ Date of test ____ No. of Certificate ____

Can each boiler be worked separately ____ Area of fire grate in each boiler ____ No. and Description of Safety Valves to each boiler ____ Area of each valve ____ Pressure to which they are adjusted ____ Are they fitted with easing gear ____

Smallest distance between boilers or uptakes and bunkers or woodwork ____ Mean dia. of boilers ____ Length ____ Material of shell plates ____

Thickness ____ Range of tensile strength ____ Are the shell plates welded or flanged ____ Descrip. of riveting: cir. seams ____ long. seams ____ Diameter of rivet holes in long. seams ____ Pitch of rivets ____ Lap of plates or width of butt straps ____

Percentages of strength of longitudinal joint rivets ____ plate ____ Working pressure of shell by rules ____ Size of manhole in shell ____

Dia. of compensating ring ____ No. and Description of Furnaces in each boiler ____ Material ____ Outside diameter ____

Length of plain part top ____ bottom ____ Thickness of plates crown ____ bottom ____ Description of longitudinal joint ____ No. of strengthening rings ____

Working pressure of furnace by the rules ____ Combustion chamber plates: Material ____ Thickness: Sides ____ Back ____ Top ____ Bottom ____

Pitch of stays to ditto: Sides ____ Back ____ Top ____ If stays are fitted with nuts or riveted heads ____ Working pressure by rules ____

Material of stays ____ Area at smallest part ____ Area supported by each stay ____ Working pressure by rules ____ End plates in steam space:

Material ____ Thickness ____ Pitch of stays ____ How are stays secured ____ Working pressure by rules ____ Material of stays ____

Area at smallest part ____ Area supported by each stay ____ Working pressure by rules ____ Material of Front plates at bottom ____

Thickness ____ Material of Lower back plate ____ Thickness ____ Greatest pitch of stays ____ Working pressure of plate by rules ____

Diameter of tubes ____ Pitch of tubes ____ Material of tube plates ____ Thickness: Front ____ Back ____ Mean pitch of stays ____

Pitch across wide water spaces ____ Working pressures by rules ____ Girders to Chamber tops: Material ____ Depth and thickness of girder at centre ____ Length as per rule ____ Distance apart ____ Number and pitch of stays in each ____

Working pressure by rules ____ 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 ____

Signed ____

IS A DONKEY BOILER FITTED? Yes. If so, is a report now forwarded? Yes.

SPARE GEAR. State the articles supplied :— As per accompanying list.

The foregoing is a correct description,

AKTIESELSKABET BURMEISTER & WAINS MASKIN- OG SKIBSBYGGERI
[signature] Manufacturer.

Dates of Survey while building
During progress of work in shops — 5, 13, 16, 29 June 3, 7, 19 July 13, 27 Aug. 17, 21, 22, 27 Sept. 13, 16, 18, 25, 27 Oct. 1, 3, 7, 8, 12, 16, 19, 22, 24, 27, 29 Nov. 1, 4, 5, 11, 13, 18, 21, 27, 30, 31 Decbr. 1917.
During erection on board vessel — 4, 7, 8, 9, 10, 11, 12, 14, 15, 19, 21, 22, 25, 29, 30, 31 Jan. 4, 6, 7, 14, 16, 20, 21, 25, 27, 28 Febr. 5, 7, 11, 13, 14, 15, 16, 18, 22, 26 March 4, 10, 15, 24 april 6 & 7 May 1918
Total No. of visits 81.
Is the approved plan of main boiler forwarded herewith No
" " donkey " (A duplicate plan was forwarded on 25th May together with Rpt. No. 5...)

Dates of Examination of principal parts—Cylinders 7/7, 22/9, 1/11, 27/11, 31/12-17. 7/1-18. Slides none. Covers 16/6, 7/7, 13/7, 17/9, 22/9, 16/10, 17/11-17. Pistons 16/6, 22/9, 25/10, 3/11-17. Rods 27/8, 19/9 ...
Connecting rods 10/9, 13/10, 7/11, 29/11-17 10/1-18. Crank shaft 27/9, 13/10, 18/10, 7/11, 5/12, 31/12-17. Thrust shaft 13/10, 18/10, 27/10-17. 4/1-18. Tunnel shafts 17/9, 27/9, 12/10, 18/10, 25/10-17. Screw shaft 17/9, 21/9, 27/9-17 4/1 & 10/1-18. Propeller 6/2, 2...
Stern tube 1/12, 7/12-17 8/1-18. Steam pipes tested none Engine and boiler seatings none Engines holding down bolts 14/2 & 2...
Completion of pumping arrangements 15/3 & 16/3-18. Donkey Boilers fixed 4/2-18. Engines tried under ~~steam~~ working condition 14/3, 15/3, 16/3, 24/4
Completion of fitting sea connections 11/1 & 14/1-18. Stern tube 11/1 & 14/1-18 Screw shaft and propeller 27/2 & 28/2-18
~~Main~~ Donkey boiler safety valves adjusted 16/3-18. Thickness of adjusting washers No adjusting Washers used, check nuts fitted
Material of Crank shafts SMI Steel Identification Mark on Do. Rt. No. 5400, 5401, 5416 & 5417 12-17- G.K. Material of Thrust shaft SMI Steel. Identification Mark on Do. Rt. No. 5419
Material of Tunnel shafts SMI Steel Identification Marks on Do. Rt. No. 5358, 57, 60, 61, 62 & 63 10-17- A.F.G. Material of Screw shafts SMI Steel. Identification Marks on Do. Rt. No. 5... 1-18
Material of Spare Screw Shaft SMI Steel — " — Rt. No. 5454
Material of Steam Pipes None. Test pressure —
Is an installation fitted for burning oil fuel Yes to the donkey boiler Is the flash point of the oil to be used over 150°F. Yes.
Have the requirements of Section 49 of the Rules been complied with Yes.
Is this machinery duplicate of a previous case Yes. If so, state name of vessel m/s Valparaiso Yard No. 311 Cpn. Rpt. No. ...

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

In accordance with the requirements of the Rules for Special Survey we have examined the material and workmanship from the commencement of construction until the final trial of the whole machinery under full power working condition and found it good in every respect.
The starting air receivers have been made in accordance with the plan approved and have been tested in our presence, by hydraulic pressure to 39 Atm. and found tight and good. The plates used in the construction of same are manufactured by the Avesta Jernverks Aktiebolag, avesta, and by Surahammars Bruks Aktiebolag Surahammar, Sweden, — the rivets forged by Henze Bros. Cpn. of bars from the Steel Company of Scotland, Glasgow.
The working and spare air receivers for injection of oil fuel are manufactured by the Avesta Jernverks Aktiebolag, avesta, Sweden, have been tested in our presence, by hydraulic pressure to 130 Atmospheres and found tight and good.
The material used in the construction of the machinery, the starting air receivers, the spare and working air receivers been tested as required by the Rules, — or as per London letter S dated the 11th Febr. 1915 as per certificates produced.
The dimensions are as specified, — in accordance with the Rules, the approved plans and the requirements contained in London letters E dated the 18th April 1916, 29th June & 5th Oct. 1917 and letters E dated the 24th Febr. 24th March & 6th June 1916 resp. the pumping arrangements for B & W's Yard No. 311 & 312 which has also been adopted in this case.
On the trial trip the main engines and the whole auxiliary machinery have been tested under full working condition and found to work satisfactorily. The manoeuvring of the main engines has been tested under working condition and found satisfactory.
Recommend / The vessel's machinery to have notation of ✠ LMC-5.18.

The amount of Entry Fee ...	Kr. 54 : 60	When applied for, 8.5. 1918.
Special ...	Kr. 815 : 30	
Donkey Boiler Fee ...	Kr. 38 : 22	When received, 27/5 1918
Electric lighting & power installation ~~Travelling Expenses (if any)~~	Kr. 182 : 00	

[signatures] Engineer Surveyors to Lloyd's Register of Shipping.

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

Committee's Minute FRI-MAY.24.1918 MACHINERY CERTIFICATE WRITTEN.

Assigned +LMC 5.18 Oil Engines

Copenhagen Continuation of Report No. 5545 dated 8th May 1918 on the
Steel Twin Sc. 3 Mst. Sr. "Lima" of Stockholm.
Burmeister & Wain's Yard No. 313.

The auxiliary machinery comprising:—

Two centrifugal ballast pumps, 75 tons each.
Two centrifugal cooling water pumps, 100 tons each.
Two pumps each with two separate plungers, — the one being for bilge purpose and one for sanitary purpose. Diam. of plungers 6½", stroke 9", Revolutions 100 p. M. capacity of bilge pumps 20 tons, and of sanitary pumps 15 tons each.
Four rotary oil pumps for the forced lubrication, 15 tons each.
One oil fuel pump to the daily service oil tanks, 15 tons.
} All worked by electric motors.

Three — 2 cylinders, 4 stroke cycle single acting auxiliary Diesel oil engines of 75 IHP each, fixed on port side of the engine room, working 3 compound wound dynamoes each of 50 K.W. 220 Volts and 228 Amperes, supplying electric current for motive power for the following:—

One — 18 H.P. shunt wound motor for working the ballast pumps.
Two — 15 " — " — motors " the cooling water pumps.
Two 6 " — " — " — " the bilge and sanitary pumps.
Two 10 " — " — " — " the oil pumps for the forced lubrication.
One 4 " — " — " — " the oil fuel pump to the daily service oil tanks.
One 90 " — compound wound motor for working the auxiliary air compressor.
Two 6 " — serie wound motors — " the turning gear to the main engines.
One 2 " — shunt wound motor — " the drilling machine and turning lathe.
One 50 " — compound " " — " the windlass.
One 15 " — shunt " " — " the electro hydraulic steering gear.
One 21 " serie " " — " the warping winch.
Ten 12.5 " — " — the cargo winches.

And electric current for the lighting purposes with the voltage reduced from 220 to 110 Volts after having passed the transformer.

A two stage spare air compressor is fitted in the engine room and being worked by a directly coupled steam engine.

The foregoing is a correct description.
AKTIESELSKABET BURMEISTER & WAINS MASKIN- OG SKIBSBYGGERI
[signature] Manufacturer.
[signature] SURVEYOR TO LLOYD'S REGISTER OF SHIPPING

Committee's Minute FRI-MAY.24.1918
Assigned