

REPORT ON MACHINERY

No. 8484

WED. 16 FEB. 1921

Received at London Office

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

Port of Belfast

No. in Survey held at Belfast
Reg. Book.

Date, First Survey 3 Sep 1919 Last Survey 4 Feb 1921

(Number of Visits 91)

on the S.S. City of Cambridge

Gross 7056

Net 4537

Master J. Finister

Built at Belfast

By whom built Warkman Clark & Coys Ltd

When built 1921

Engines made at Belfast

By whom made Warkman Clark & Coys Ltd

when made

Boilers made at

By whom made

when made

Registered Horse Power

Owners City Line Ltd

Port belonging to Glasgow

Nom. Horse Power as per Section 28 647

Is Refrigerating Machinery fitted for cargo purposes No

Is Electric Light fitted Yes

ENGINES, &c.—Description of Engines

Single Screw Quadruple Expansion

Cylinders 4

No. of Cranks 4

Dia. of Cylinders 26-37-53-76

Length of Stroke 51

Revs. per minute 75

Dia. of Screw shaft

as per rule 15.57

Material of I. 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 6'-6"

Dia. of Tunnel shaft

as per rule 14.15

Dia. of Crank shaft journals

as per rule 13.6

Dia. of Crank pin 15 1/4

Size of Crank pin 9 1/2 x 22

Dia. of thrust shaft under

collars 15 1/4

Dia. of screw 18'-6"

Pitch of Screw 17'-3"

No. of Blades 4

State whether moveable Yes

Total surface 124 sq ft

No. of Feed pumps

Diameter of ditto

Stroke

Can one be overhauled while the other is at work

No. of Bilge pumps 2

Diameter of ditto 5"

Stroke 27"

Can one be overhauled while the other is at work Yes

No. of Donkey Engines

Lee Suction Pumps

No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room 7-3 1/2 x 3-3-8

Cofferdam

In Holds, &c. 12-3 1/2

No. of Bilge Injections 1

size 10"

Connected to condenser, or to circulating pump

Pumps a separate Donkey Suction fitted in Engine room & size 2-3 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 Both

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 Fore Hold Suction

How are they protected Wood casing

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 S.)

Manufacturers of Steel

Bend Sinners & Sons Ltd

Total Heating Surface of Boilers 9336 sq ft

Forced Draft fitted Yes

No. and Description of Boilers 3 Single End Cylinders

Working Pressure 225 lbs

Tested by hydraulic pressure to 450 lbs

Date of test 22-9-20

No. of Certificate 572

Can each boiler be worked separately Yes

Area of fire grate in each boiler 758 sq ft

No. and Description of Safety Valves to

each boiler 2-1/2 inch Spring

Area of each valve 12.56 sq in

Pressure to which they are adjusted 230 lbs

Are they fitted with easing gear Yes

Smallest distance between boilers or uptakes and bunkers or woodwork 16'-5"

dia. of boilers 16'-5"

Length 22'-8"

Material of shell plates Steel

Thickness 1 1/2"

Range of tensile strength 28 1/2-32 1/2 tons

Are the shell plates welded or flanged No

Descrip. of riveting: cir. seam Lap, double

long. seams Auto Lubbock

Diameter of rivet holes in long. seams 1 1/2"

Pitch of rivets 10 1/2"

Top of plates or width of butt straps 23 1/2"

Per centages of strength of longitudinal joint

rivets 88.7

plate 84.8

Working pressure of shell by rules 225 lbs

Size of manhole in shell 16" x 12"

Size of compensating ring Hawthorn & Co.

No. and Description of Furnaces in each boiler 4-1/2 inch

Length of plain part

top 2'-8"

Thickness of plates

crown 3 1/2"

Description of longitudinal joint Weld

No. of strengthening rings

No. of strengthening rings

Working pressure of furnace by the rules 235 lbs

Combustion chamber plates: Material Steel

Thickness: Sides 1/2"

Back 1/2"

Top 1/2"

Bottom 3/32"

Pitch of stays to ditto: Sides 8'-7 1/2"

Back 8'-7 1/2"

Top 8'-7 1/2"

If stays are fitted with nuts or riveted heads

Nuts inside

Working pressure by rules 234 lbs

Material of stay Steel

Area at smallest part 2.06 to 2.49 sq in

supported by stay 70 sq in

Working pressure by rules 264 lbs

End plates in steam space

Material of stays Steel

Material Steel

Thickness 1 1/2"

Pitch of stays 2 1/2 x 16"

How are stays secured

Nuts inside

Working pressure by rules 227 lbs

Area at smallest part 7.23 x 7.84 sq in

supported by stay 344 sq in

Working pressure by rules 237 lbs

Material of Front plates at bottom Steel

Thickness 1"

Greatest pitch of stays 13 1/2"

Diameter of tubes 2 1/2"

Pitch of tubes 3 1/2 x 3 5/8"

Material of tube plates Steel

Thickness: Front 1 1/4"

Back 1 1/2"

Mean pitch of stays 11 1/4 x 7 1/4"

Pitch across wide water spaces 13 1/2"

Working pressures by rules 228 lbs

Girders to Chamber tops: Material Steel

Depth and

thickness of girder at centre 3 1/2 x 11 1/4 (3/4 x 2)

Length as per rule 43 3/8"

Distance apart 8 1/2 x 6 1/2"

Number and pitch of stays in each 4-8"

Working pressure by rules 227 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

W603-0154

IS A DONKEY BOILER FITTED? *No*

If so, is a report now forwarded? *Yes*

SPARE GEAR. State the articles supplied:— *See other Sheet*

The foregoing is a correct description,
FOR WORKMAN, CLARK & CO., LIMITED:

J. Cunningham

Manufacturer.

Dates of Survey while building: During progress of work in shops — 1919:— 3 Sep^r to 4th Feb^r 1921
During erection on board vessel —
Total No. of visits 91

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

Dates of Examination of principal parts—Cylinders 5-11-20 Slides 5-11-20 Covers 5-11-20 Pistons 5-11-20 Rods 5-11-20
Connecting rods 18-10-20 Crank shaft 1-2-20 Thrust shaft 5-5-20 Tunnel shafts 6-5-20 Screw shaft 1-9-20 Propeller 17-8-20
Stern tube 17-8-20 Steam pipes tested 17-1-21 Engines and boiler seatings 2-12-20 Engines holding down bolts 2-1-21
Completion of pumping arrangements 3-1-21 Boilers fixed 2-1-21 Engines tried under steam 4-2-21
Completion of fitting sea connections 9-8-20 Stern tube 1-10-20 Screw shaft and propeller 1-10-20
Main boiler safety valves adjusted 3-1-21 Thickness of adjusting washers 6-1-21
Material of Crank shafts *Steel* Identification Mark on Do. *6-2-20* Material of Thrust shaft *do* Identification Mark on Do. *6-2-20*
Material of Tunnel shafts *do* Identification Marks on Do. *do* Material of Screw shafts *do* Identification Marks on Do. *6-2-20*
Material of Steam Pipes *W. Iron* Test pressure *675 lbs sq. in.*

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

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

The machinery of this vessel has been constructed under Special Survey, and in accordance with the Rules. The workmanship and the materials are of good description, and on trial under etc. in Belfast Lough, the machinery worked satisfactorily.

In my opinion, it is eligible for records + L.M.C. 2-21, with notation "Forced Draft" "Electric Light" and "Fitted for oil fuel F.P. at 150° Fahr."

It is submitted that
this vessel is eligible for
THE RECORD. + LMC 2. 21. F.D.

Fitted for oil fuel 2.21. F.P. above 150°F.

The amount of Entry Fee ... £ 6 : - : When applied for, 10-2-21
Special ... £ 107 : 7 :
Donkey Boiler Fee ... £ : :
Travelling Expenses (if any) £ : : 19-2-21

Committee's Minute TUE. FEB 22 1921

Assigned + LMC 2.21 F.D.
Fitted for oil fuel 2.21, F.P. above 150°F.

CERTIFICATE WRITTEN.

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Rpt. 9a.

Port of *Belfast*

Continuation of Report No. 8484 dated 15th Feb^r 1921. on the

S.S. City of Cambridge

List of Pumps

1. *Fire Pump* 25" x 27" Stroke ✓
1. *Circulating* 15" bore, 45" Impeller ✓
1. *Ballast* 8" x 10" x 10" ✓
1. *General* 10" x 6" x 10" ✓
2. *Waste Feed* 12" x 9" x 24" ✓
1. *Surge* 7" x 5" x 12" ✓

Principal items Spare Gear

1. *Pair Crank pin bushes*
Fire pump rods, bushed head valves
2. *Exhaust & traps*
1. *Slide valve spindle*
Set piston packing rings each piston
2. *C. Steel propeller blades*
1. *Spring each size escape valves*
50 *Condenser tubes + 100 ferrules*
1. *Gland for piston rods*
1. *Slide*
4. *Bailer check valves*
12 *plain tubes for bailers*
Set spare gear for fire pump, & fan engine & fuel system
and all gear to our Rules in addition

R. F. Beveridge

W603-0154 2/2