

REPORT ON MACHINERY.

No. 8126

Received at London Office WED. JUN. 4 - 1919

Date of writing Report 24th May 1919 When handed in at Local Office 19 Port of Belfast
No. in Survey held at Belfast Date, First Survey 27th Nov 1918 Last Survey 20th May 1919
Reg. Book. on the T.S.S. "Port Bowen" (Number of Visits 123)
Master C. D. Beck Built at Belfast By whom built Workman Clark & Co when built 1919
Engines made at Belfast By whom made - when made -
Boilers made at - By whom made - when made -
Registered Horse Power - Owners Commonwealth & Dominion Port belonging to London
Shaft Horse Power at Full Power 5000 Is Refrigerating Machinery fitted for cargo purposes Yes Is Electric Light fitted Yes

TURBINE ENGINES, &c.—Description of Engine Two Screw Double Reductors Leaved of Turbines
Diameter of Rotor Shaft Journals, H.P. 3" I.P. 3 1/2" L.P. 6 1/2" Diameter of Pinion Shaft 4 1/2"
Diameter of Journals 4 1/2" Distance between Centres of Bearings 12 1/2" x 18 1/2" Diameter of Pitch Circle H.P. 7' 14" L.P. 10' 0"
Diameter of Wheel Shaft 14 1/2" Distance between Centres of Bearings 59 1/2" Diameter of Pitch Circle of Wheel 87' 33"
Width of Face 2 at 10 1/2" Diameter of Thrust Shaft under Collars 13 1/2" Diameter of Tunnel Shaft as per rule 12' 7"
No. of Screw Shafts 2 C.L. Diameter of same as fitted 15' 12" Diameter of Propeller 16' - 6" Pitch of Propeller 17' - 6"
No. of Blades 3 State whether Moveable Yes Total Surface 80 sq ft. Diameter of Rotor Drum, H.P. 17 1/2" L.P. 35 1/2" Astern 28 1/2" x 43 1/2"
Thickness at Bottom of Groove, H.P. 3/16" L.P. 1/8" Astern do Revs. per Minute at Full Power, Turbine H.P. 3600 L.P. 2400 Propeller 85

ARTICULARS OF BLADING.

	H. P.			L. P.			ASTERN.		
	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.	HEIGHT OF BLADES.	DIAMETER AT TIP.	NO. OF ROWS.
1ST EXPANSION									
2ND									
3RD									
4TH									
5TH									
6TH									
7TH									
8TH									

No. and size of Feed pumps 1 Weir Rotary 1 Weir Vertical Feed 10 x 13 1/2 x 24, 1 Central 9 x 6 x 10
No. and size of Bilge pumps 3 - 8" x 10" x 10" 4" x 8" x 8" 7" x 8" x 8"
No. and size of Bilge suction in Engine Room 9-3 1/2"
In Holds, &c. 10-3 1/2"

No. of Bilge Injections 2 sizes 10" Connected to condenser, or to circulating pump Pumps 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 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 Below
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 Forehold Suctions 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 Top of E. Room

BOILERS, &c.—(Letter for record S.) Manufacturers of Steel Steel Coy of Scotland L^d
Total Heating Surface of Boilers 12800 sq ft Forced Draft fitted Yes No. and Description of Boilers 4 - Single End bylin^d
Working Pressure 210 lbs Tested by hydraulic pressure to 420 lbs Date of test 4-9-18 No. of Certificate 529
Can each boiler be worked separately Yes Area of fire grate in each boiler 80 sq ft No. and Description of Safety Valves to each boiler 2 - Direct Spring Area of each valve 11' 04" Pressure to which they are adjusted 215 lbs Are they fitted with easing gear Yes
Smallest distance between boilers or uptakes and bunkers or woodwork about 20" Mean dia. of boilers 17' - 3" Length 12' - 2" Material of shell plates Steel
Thickness 1 1/2" Range of tensile strength 31-35 tons Are the shell plates welded or flanged No Descrip. of riveting: cir. seams Lap Double
long. seams Welded Diameter of rivet holes in long. seams 1 1/8" Pitch of rivets 10 1/2" Lap of plates or width of butt straps 23 1/2"
Per centages of strength of longitudinal joint rivets 94.4 Working pressure of shell by rules 247 lbs Size of manhole in shell 16" x 12"
Size of compensating ring McNeill No. and Description of Furnaces in each Boiler 4 - Morrison Material Steel Outside diameter 48 1/2"
Length of plain part top 8" Thickness of plates crown 45 bottom 64 Description of longitudinal joint Weld No. of strengthening rings 1
Working pressure of furnace by the rules 241 lbs Combustion chamber plates: Material Steel Thickness: Sides 1/2" Back 3/8" Top 1/2" Bottom 3/8"
Pitch of stays to ditto: Sides 9' x 8 1/2" Back various top 9' x 8 1/2" If stays are fitted with nuts or riveted heads Nuts Working pressure by rules 225 lbs
Material of stay Steel at smallest part 1 1/2" supported by each stay Working pressure by rules 246 lbs End plates in steam space Steel
Material Steel Thickness 1 1/2" Pitch of stays 2 1/2" x 17" How are stays secured Plates Wash Working pressure by rules 217 lbs Material of stays Steel
Diameter at smallest part 4' 2" x 8' 4" Area supported by each stay 365 1/2 sq ft Working pressure by rules 237 lbs Material of front plates at bottom Steel
Thickness 1" Material of Lower back plate Steel Thickness 3/4" Greatest pitch of stays 14' x 8 1/2" Working pressure of plate by rules 246 lbs
Diameter of tubes 3" Pitch of tubes 4 1/2" x 4 1/2" Material of tube plates Steel Thickness: Front 1 1/4" Back 1 1/8" Mean pitch of stays 12 1/2" x 8 1/2"
Pitch across wide water spaces 14" Working pressures by rules 213 lbs Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 11 1/2" x (3/4" x 2) Length as per rule 38 1/2" Distance apart 8 1/2" x 6 1/2" Number and pitch of stays in each 3-9"
Working pressure by rules 218 lbs Steam dome: description of joint to shell ✓ % of strength of joint ✓ Diameter 2020
Thickness of shell plates ✓ Material ✓ Description of longitudinal joint ✓ Diameter of rivet holes ✓ Pitch of rivets ✓
Working pressure of shell by rules ✓ Crown plates: Thickness ✓ How stayed ✓

RETAIN

SUPERHEATER. Type *Robinson* Date of Approval of Plan *✓*

Tested by Hydraulic Pressure to *630 lb*

Date of Test *8-11-18*

Is a Safety Valve fitted to each Section of the Superheater which can be shut off from the Boiler *Yes*

Diameter of Safety Valve *1-3"*

Pressure to which each is adjusted *220 lb*

Is Easing Gear fitted *Yes*

IS A DONKEY BOILER FITTED? *No*

If so, is a report now forwarded? *✓*

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

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

Manufacturer.

M. H. Bell

Dates of Survey while building { During progress of work in shops -- *1917 Nov 27 to 20 May 1919*
During erection on board vessel ---
Total No. of visits *123*

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

Dates of Examination of principal parts—Casings *11-1-18* Rotors *17-10-18* Blading *17-10-18* Gearing *16-5-19*

Rotor shaft *11-1-18* Thrust shaft *3-1-19* Tunnel shafts *6-9-18* Screw shaft *4-12-18* Propeller *27-11-18*

Stern tube *27-11-18* Steam pipes tested *29-11-18* Engine and boiler seatings *18-3-19* Engines holding down bolts *11-4-19*

Completion of pumping arrangements *16-5-19* Boilers fixed *13-3-19* Engines tried under steam *16-5-19*

Main boiler safety valves adjusted *8-5-19* Thickness of adjusting washers *11-15-19*

Material and tensile strength of Rotor shaft *Nickel Steel 50.6 lbs 21.0 in 48.0 - 22.0* Identification Mark on Do. *1529 AF 1414 AF*

Material and tensile strength of Pinion shaft *Nickel Steel 48.0 - 21.0 49.0 - 21.0* Identification Mark on Do. *1529 AF 1414 AF*

Material of Wheel shaft *S. Steel* Identification Mark on Do. *ADS, 18-1-18* Material of Thrust shaft *S. Steel* Identification Mark on Do. *F.T.B. 3*

Material of Tunnel shafts *-* Identification Marks on Do. *JP, 6-9-18* Material of Screw shafts *-* Identification Marks on Do. *F.T.B. 4*

Material of Steam Pipes *W. Iron* Test pressure *630 lb sq*

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 a duplicate of a previous case *No* If so, state name of vessel

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

The machinery of this vessel has been constructed under Special Survey, and in accordance with the Rules; workmanship and the materials of the Turbines are of good description.

The double reduction gearing of both Port and Starboard Turbines when on the official trial trip in Belfast Lough worked with a considerable degree of noise, due apparently to the coarseness of the teeth pitch, and some irregularities in the machining of the teeth.

On completion of the trial trip the marking on the teeth shows that the bearing pressures were not equally distributed, and it is considered that the double reduction gearing of this vessel should be examined by our Surveyors in six months.

R. J. Beveridge

Subject to the Certificate being sent with this condition, I am of opinion that this vessel is eligible for re-certificate + L.M.C. 5-19, with notation "Force Draft" Electric Light & Refrigerator Machinery.

See Continuation R

The amount of Entry Fee ... £ 3 : - : When applied for, *23-5-19*

Special ... £ 70 : 6 : When received, *31-5-19*

Donkey Boiler Fee ... £ : : Travelling Expenses (if any) £ : : *31-5-19*

Committee's Minute *FRI. 6-JUN. 1919*

Assigned *H. MO 5-19 J. D.*

Subject

Machinery

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

See Continuation R

Belfast

T.S.S. Port Bowen

WED. JUN. 4 - 1919

It is understood that a complete ^{new} set of double reduction gearing is to be ordered for this vessel, and a complete new set has also been ordered for the sister vessel building here.

As an additional safeguard, the following parts of the sister vessels discarded gear have been placed on board the "Port Bowen" as temporary spare gear, viz:-

Four high speed pinions

One low speed pinion

Two first reduction wheels.

RETAIN

Principal Items of Spare Gear

- 1 Propeller shaft complete
- 2 " blades Cast Steel
- 50 Main Condenser tubes + 100 pernoles
- 9 Bolts & nuts for Tunnel Shaft Couplings
- 4 " " " H.P. & I.P. Turbine Shaft couplings
- 9 Propeller blade studs & nuts
- 1 H.P. pinion & spindle
- 1 L.P. " " "
- 1 Set bearing bushes each size Rotax Shaft
- 1 " " " Gear Wheel Shaft
- 1 " " " Pinion Shaft
- 1 set Carbon segments for each Turbine gland
- 1 " Springs with attachments complete each Turbine gland
- 1 " Pads for each size Turbine Thrust block
- 2 Shoes for Main Thrust Blocks
- 1 Escape Valve Spring of each size fitted for Turbines
- 2 Bolts & nuts each size Rotax bearing
- 2 " " " Main gear wheel bearing
- 2 " " " Pinion bearing
- 25 1/2" to 1" 1/2" bolts & nuts each Gear case joint
- 1 " " " Turbine " "
- Set Thermometers oil Circulating system
- Set lens for adjusting block of different thicknesses.
- 1 Spare oil lubricating pump complete
- Assembled bolts & nuts
- Bar of iron steel various sizes
- 100 Fuelbars, 30 Boiler tubes,
- 2 Safety Valve Springs

Continued.

Belfast

T.S.S. Port Bowen

WED. JUN. 4 - 1919

Spare Gear list continued.

9 Elements for Superheaters

1 Safety Valve Spring

1 Impeller & spindle Main Circulating Pumps.

Set suction & delivery valves Main Feed pumps

One - - - - - General Service

- - - - - Bilge

- Impeller & spindle for fuel, Circ. & oil Cooled Circ. pumps

- Piston valve & spindle

- Piston rods & 1 set crank pin brasses

- Cross head

- First stage steam nozzle for fuel injectors

- Second -

- Pump Impeller for Lube driven Rotary Feed pumps

- set - packing rings

- set bearings complete

- Shaft sleeves & set Carbon packing segments

- Pump Impeller for Lube driven Circulating pumps

- set shaft sleeves, bearings, Carbon packing etc

- Pump Impeller for Water Extraction Pumps

- set ball bearings, packing rings, shaft sleeves etc

Pumps, (Independent)Main Circulating 15" ^{pipe} Centrifugal

- - - - - Lube driven Rotary

- - - - - 6" pipe

Water Extraction Pump, Lube driven

Kew dual size 26" x 14" x 8"

- - - - - 12" x 18" x 10"

Wear Feed 10" x 13 1/2" x 24"

- Rotary Feed, Lube driven

General Service 9" x 6" x 10"

Ballast 8" x 10" x 10"

Sanitary 6" x 7" x 8"

Wash Deck 4" x 8" x 8"

Fresh Water 5" x 5" x 8"

Bilge 7" x 8" x 8"

Refueling Circ. 8 1/2" x 10" x 10"

Oil Cooling Circ. 6" pipe Cent.

3 Wear Lubricating oil -

RETAIN

