

# REPORT ON MACHINERY.

Received from  
Surveyor.  
4 - DEC 1900

Port of Glasgow

Received at London Office 18

No. in Survey held at Glasgow. Date, first Survey 15 February Last Survey 28 November 1900.  
Reg. Book. Suppt. (Number of Visits 38)

20 on the Screw Steamer "Dunbar" Tons } Gross 3749.54  
Net 2410.03

Master A. Campbell Built at Glasgow By whom built C. Bonnell & Co. When built 1900

Engines made at Glasgow. By whom made Dunsmuir & Jackson. when made 1900.

Boilers made at Glasgow. By whom made Dunsmuir & Jackson. when made 1900.

Registered Horse Power Owners Dunedin Steamship Co. Ltd. Port belonging to Leith

Nom. Horse Power as per Section 28 353. Is Refrigerating Machinery fitted No. Is Electric Light fitted No.

## ENGINES, &c.—Description of Engines Triple expansion. No. of Cylinders Three No. of Cranks Three

Dia. of Cylinders 25" 41" 66" Length of Stroke 45" Revs. per minute 40. Dia. of Screw shaft 12.8" Lgth. of stern bush 4.4"

Dia. of Tunnel shaft 11.2" Dia. of Crank shaft journals 12.2" Dia. of Crank pin 12.5" Size of Crank webs 8 1/2" x 18" Dia. of thrust shaft under collars 12 1/8" Dia. of screw 16.0" Pitch of screw 17.0" to 19.0" 18 ft. No. of blades 4 State whether moveable Yes Total surface 82.59 sq. ft.

No. of Feed pumps 2 Diameter of ditto 3 1/2" Stroke 24" Can one be overhauled while the other is at work Yes Klein's feed pump

No. of Bilge pumps 2 Diameter of ditto 4" Stroke 24" Can one be overhauled while the other is at work Yes 1 (8" x 6" x 21")

No. of Donkey Engines Two Sizes of Pumps (6" x 4 1/2" x 6") (9" x 10" x 10") No. and size of Suctions connected to both Bilge and Donkey pumps

In Engine Room Four: 3 1/2" dia. In Holds, &c. No. 1 Hold: 2-3 1/2" dia. No. 2 Hold: 2-3 1/2" dia.

No. 3 Hold: 2-3 1/2" dia. No. 4 Hold: 1-3 1/2" dia. Tunnel Well: 1-2 1/2" dia.

No. of bilge injections 1 sizes 5" Connected to condenser, or to circulating pump C. P. 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 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.

When were stern tube, propeller, screw shaft, and all connections examined in dry dock New vessel. Is the screw shaft tunnel watertight Yes.

Is it fitted with a watertight door Yes. worked from Top platform in Engine Room.

## BOILERS, &c.— (Letter for record £) Total Heating Surface of Boilers 4862 Sq. ft. Is forced draft fitted Yes.

No. and Description of Boilers 2: Cylindrical: Multi: Single ended. Working Pressure 140 lbs. Tested by hydraulic pressure to 340 lbs.

Date of test 6 Nov 1900 Can each boiler be worked separately Yes. Area of fire grate in each boiler 47 Sq. ft. No. and Description of safety valves to each boiler 2: Direct Spring Area of each valve 4.06 sq. in. Pressure to which they are adjusted 145 lbs. Are they fitted with easing gear Yes.

Smallest distance between boilers or uptakes and bunkers or woodwork About 2.6' Mean dia. of boilers 14.10' Length 11.6' Material of shell plates Steel

Thickness 1/32 Range of tensile strength 28-32 tons Are they welded or flanged No. Descrip. of riveting: cir. seams Lap: Double Long. seams AB Straps

Diameter of rivet holes in long. seams 1 5/16" Pitch of rivets 8 3/8" 4 3/8" Lap of plates or width of butt straps 1 1/4"

Percentage of strength of longitudinal joint rivets 88 Working pressure of shell by rules 192 lbs. Size of manhole in shell 16" x 12"

Size of compensating ring Flanged Ring No. and Description of Furnaces in each boiler 3: Deighton's Material Steel Outside diameter 45"

Length of plain part 34.9" Thickness of plates 1 1/4" 3/32" Description of longitudinal joint Weld No. of strengthening rings None

Working pressure of furnace by the rules 182 lbs. Combustion chamber plates: Material Steel Thickness: Sides 5/8" Back 5/8" Top 5/8" Bottom 2 1/2"

Pitch of stays to ditto: Sides 9 1/2" x 8 1/2" Back 9 1/2" x 8 1/2" Top 8 1/2" x 8 1/2" If stays are fitted with nuts or riveted heads Nuts. Working pressure by rules 176 lbs.

Material of stays Steel Diameter at smallest part 1 1/2" Area supported by each stay 46.7 sq. in. Working pressure by rules 183 lbs. End plates in steam space:

Material Steel Thickness 1/4" Pitch of stays 18" x 16 1/2" How are stays secured By nuts. Working pressure by rules 238 lbs. Material of stays Steel

Diameter at smallest part 2 1/16" Area supported by each stay 293 sq. in. Working pressure by rules 214 lbs. Material of Front plates at bottom Steel

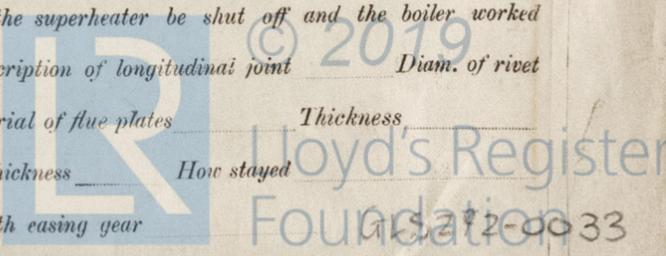
Thickness 1/16" Material of Lower back plate Steel Thickness 1/16" Greatest pitch of stays 13 1/2" Working pressure of plate by rules 172 lbs.

Diameter of tubes 2 1/2" Pitch of tubes 3 1/2" x 3 1/2" Material of tube plates Steel Thickness: Front 15/16" Back 7/16" Mean pitch of stays 9 3/8"

Pitch across wide water spaces 13 1/2" Working pressures by rules 174 lbs. 193 lbs. Girders to Chamber tops: Material Steel Depth and thickness of girder at centre 8" x 1 1/4" Length as per rule 30 3/4" Distance apart 8 1/4" Number and pitch of Stays in each 2: 8 3/4"

Working pressure by rules 184 lbs. Superheater or Steam chest; how connected to boiler None. Can the superheater be shut off and the boiler worked separately

Diameter Length Thickness of shell plates Material Description of longitudinal joint Diam. of rivet  
Pitch of rivets Working pressure of shell by rules Diameter of flue Material of flue plates Thickness  
stiffened with rings Distance between rings Working pressure by rules End plates: Thickness How stayed  
Working pressure of end plates Area of safety valves to superheater Are they fitted with easing gear



**DONKEY BOILER**— No. *One*. Description *Cylindrical Shell? Single Ended*.  
 Made at *Glasgow*. By whom made *Dunsmuir & Jackson*. When made *1900*. Where fixed *On Deck*.  
 Working pressure *100 lbs* tested by hydraulic pressure to *200 lbs*. No. of Certificate *5521*. Fire grate area *20 1/2 sq ft*. Description of safety valves *Direct Spring*.  
 No. of safety valves *2*. Area of each *3.98 sq in*. Pressure to which they are adjusted *105 lbs*. If fitted with easing gear *Yes*. If steam from main boilers can enter the donkey boiler *No*.  
 Dia. of donkey boiler *8' 6"*. Length *8' 0"*. Material of shell plates *Steel*. Thickness *1/2"*. Range of tensile strength *28-32 tons*.  
 Descrip. of riveting long. seams *Lap = Quadruple*. Dia. of rivet holes *13/16"*. Whether punched or drilled *Drilled*. Pitch of rivets *3 1/2"*.  
 Lap of plating *6 1/2"*. Per centage of strength of joint *80*. Rivets *80*. Thickness of shell plates *1/2"*. Radius of do. pitch *15 1/2"*.  
 Dia. of stays *2 1/8"*. Diameter of furnace *Top 2 1/2"*. Bottom *2 1/2"*. Length of furnace *5' 6"*. Thickness of furnace plates *1/2"*. Description of joint *Welded*.  
 Thickness of furnace crown plates *1/2"*. Stayed by *1/8" Skuphatted in cut*. Working pressure of shell by rules *102 1/2 lbs*.  
 Working pressure of furnace by rules *133 lbs*. Diameter of tubes *3"*. Thickness of tubes *1/16"*. Thickness of water tubes *1/16"*.

**SPARE GEAR.** State the articles supplied:— *Propeller shaft. Four propeller blades. Slide Spindle. 1 set Crank pin brasses. 1 set Packing Rings for each piston. 1 set Crosshead brasses. 1 set studs for fastening propeller blades. 2 Crank pin bolts. 2 main Bolts. 2 main Bearing Bolts. 1 set Coupling Bolt. 1 set Feed & Relief pump. etc. etc.*

The foregoing is a correct description.

*Dunsmuir & Jackson* Manufacturer.

Dates of Survey while building	During progress of work in shops	1900: Feb. 1. 15. Mar. 1. 7. 14. 21. 28. Apr. 3. 12. 18. 26. May. 1. 8. 18. 22. 28. June 4. 8. 11. 21. 25.
	During erection on board vessel	July 9. 25. Sep. 18. 20. 26. Oct. 2. 11. 16. 22. 30. Nov. 1. 6. 15. 22. 23. 26. 28.
	Total No. of visits	38.

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

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

The engines and Boilers of this vessel have been built under special survey and the materials & workmanship are good. When completed they were examined under full steam and worked satisfactorily.

The machinery throughout is now in good and efficient condition and eligible in my opinion to have the record of **L.M.C. 11,00** marked in the Society's Register Book.

It is submitted that this vessel is eligible for THE RECORD + **L.M.C. 11.00** F.D.

*C.M. 12.12.00*

*H.S.*  
12.12.00

Certificate (if required) to be sent to Glasgow

The amount of Entry Fee...	£ 3	When applied for, 6/12/1900
Special	£ 37	13
Donkey Boiler Fee	£	
Travelling Expenses (if any)	£	When received, 8/12/1900

*Wm. Austin*  
Engineer Surveyor to Lloyd's Register of British & Foreign Shipping.

Committee's Minute **Glasgow** 10 DEC 1900

Assigned **L.M.C. 11,00**

