

LLOYD'S REGISTER OF BRITISH AND FOREIGN SHIPPING.

ENGINEER SURVEYOR'S REPORT ON MACHINERY.

ENGINES.

Description *Compound, Inverted Direct Acting*
 Made by *Lees, Anderson, & Co. Glasgow*
 When *1876* At *Glasgow*
 Diameter of cylinder *20 1/4 x 3 1/4* Length of stroke *27"*
 No. of revolutions per minute *about 85*
 Point of cut off *3/8 of stroke*
 Diameter of screw shaft *6 3/4"*
 Diameter of crank shaft journals *6 3/4"*
 Diameter of screw, ~~as in plan~~ *8" x 9"*
 Pitch of screw *13 ft*
 No. of blades, *4* Total surface *26 ft²*
 No. of bilge pumps *One* and sizes *3" dia x 11" stroke*
 Do they pump from each compartment *Yes*

Are all the bilge suction pipes fitted with roses *Yes*
 No. of feed pumps *Two* and sizes *3" dia x 11" stroke*
 What gauges are there attached to the engines and boilers ... *One Vacuum, & one Steam to Engine, & two Steam to Boiler*
 Description and size of Donkey Pumps ... *Double acting 3 1/2 x 10" stroke*
 Where do they pump from ... *From the Sea & Bilge*
 No. of bilge injections *One* and sizes *3 1/2"*
 Are they connected to air, or circulating pumps *to Circulating*
 Is there a hand pump in the engine room *Donkey worked by hand*
 Can it be worked by the main engines
 Is there a deck hose of sufficient length to reach to any part of the vessel *Yes*

MAIN BOILERS.

Number *One* Description *Round, Horizontal*
 Made by *Lees, Anderson, & Co. Glasgow*
 When *1876* At *Glasgow*
 Working pressure *70 lbs*
 Tested by hydraulic pressure to *140 lbs*, Date *Mar. 1/76*
 Description of super-heating apparatus *None*
 Can each boiler be worked separately *One Boiler*

Can the super-heater be shut off and the boilers worked separately
 Description and area of safety valves on each boiler *Spring (Direct) Two 9.6" area*
 No. of square feet of fire-grate surface in each boiler *38 ft²*
 Are there separate blow off and brine cocks on each boiler, independent of those on the vessel's skin *Yes*
 Are all pipes, cocks, roses, and pumps in connection with the machinery accessible at all times. *Yes*

DONKEY BOILER.

Description *Round Vertical*
 Where fixed *at Ship's side in Stowhold*
 Working pressure *50 lbs*

Tested by hydraulic pressure to *100 lbs*, Date *March 1/76*
 Description and area of safety valves *Direct weighted*
 No. of square feet of fire grate *4 ft² 39" area*

PIPES, COCKS, AND CONNECTIONS.

Are all connections with the sea direct on the skin of the ship *Yes*
 Are they Kingston valves or common cocks ... *Screw down Valves & Cocks*
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stoke hold plates ... *the blow off cocks are under stokehold plates*
 Are the discharge pipes above or below the deep water line *Above*
 Are they each fitted with a discharge valve on the plating of the vessel *Yes*
Lees, Anderson & Co. Manufacturer.

What pipes are carried through the bunkers *None*
 How are they protected
 When were the stern tube, propeller, screw shaft, and all connections examined in dry dock *On Slip 14 March 1876*
 Are the pipes, cocks, and valves arranged so as to prevent an unintentional connection between the sea and the bilge *Yes*
 Is the screw shaft-tunnel water tight and fitted with a sluice door on bulkhead *Yes*

I hereby certify that the whole of the above are correct particulars of the Machinery and Boilers of the Iron (and ~~and~~) Screw (and ~~and~~) Steam Vessel "*Lairy Lucen*" owned by *Lanlands*
 of the Port of *Glasgow* of *200* Tons Register, and *Sixty* Registered Horse Power,
 and that they have been carefully inspected and examined by me at *Glasgow*
 and found to be at this date, viz., *April 11th* 18*76* in good order and safe working condition.

James Morrison
 Engineer Surveyor to Lloyd's Register of Shipping.