

LLOYD'S REGISTER OF BRITISH AND FOREIGN SHIPPING.

ENGINEER SURVEYOR'S REPORT ON MACHINERY.

ENGINES.

Description *Inverted Compound, surface Condensing,*
 Made by *Gourlay Bros*
 When *1869* At *Dundee*
 Diameter of cylinders *43 1/8* x *78* Length of stroke *36*
 No. of revolutions per minute *about 65*
 Point of cut off *HP 20 LP 23*
 Diameter of screw shaft *11 3/4*
 Diameter of crank shaft journals *11 1/2* pins *12 1/2*
 Diameter of screw, or of paddle wheel *13 0*
 Pitch of screw *about 22 ft*
 No. of blades, *4* Total surface *70 sq. feet*
 No. of bilge pumps *2* and sizes *5 dia x 18 stroke*
 Do they pump from each compartment *from engine room & aft hold.*

Are all the bilge suction pipes fitted with roses *yes*
 No. of feed pumps *2* and sizes *4 1/2 dia x 14 1/2 stroke*
 What gauges are there attached to the engines and boilers ... *2 steam gauges on each boiler and 1 in the engine room. 1 vacuum gauge*
 Description and size of Donkey Pumps ... *one inverted double acting 4 1/2 dia x 8 stroke*
 Where do they pump from ... *sea & bilges of the engine room, and fore and after holds.*
 No. of bilge injections *1* and sizes *4 dia*
 Are they connected to air, or circulating pumps *to circulating pumps*
 Is there a hand pump in the engine room *in the stokehold*
 Can it be worked by the main engines *no*
 Is there a deck hose of sufficient length to reach to any part of the vessel *yes*

MAIN BOILERS.

Number *2* Description *Cylindrical, fired from each end.*
 Made by *The North Eastern Marine Engineering Co.*
 When *Oct 1876* At *Sunderland*
 Working pressure *70 lbs per sq. inch*
 Tested by hydraulic pressure to *140 lbs*, Date *Sept 29/76*
I was present H.A.
 Description of super-heating apparatus *none*
 Can each boiler be worked separately *yes*

Can the super-heater be shut off and the boilers worked separately
 Description and area of safety valves on each boiler *2 spring safety valves 5 dia = 39 sq. ins area*
 No. of square feet of fire-grate surface in each boiler *66*
 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. *all except which steam & exhaust in the hold & bunkers, and the bilge suction of the forward hold*

DONKEY BOILER.

Description *Upright Cylindrical with 4 cross tubes*
 Where fixed *in the forward stokehold*
 Working pressure *57 lbs per sq. inch*

Tested by hydraulic pressure to *120 lbs*, Date *Oct 25/76*
I was present H.A. & J. W. W.
 Description and area of safety valves *one loaded duct 3 1/2 = 10.3*
 No. of square feet of fire grate *17*

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 ... *valves and cocks*
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stoke hold plates ... *yes*
 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*

What pipes are carried through the bunkers *which exhaust*
 How are they protected *close up to the deck*
 When were the stern tube, propeller, screw shaft, and all connections examined in dry dock *Oct 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*

Wm. E. M. B. & Co. Ltd Manufacturers of the Cylinders and Main Boilers
Wm. Allison

I hereby certify that the whole of the above are correct particulars of the Machinery and Boilers of the Iron (or Wood) Screw (or Paddle) Steam Vessel *"Libra"* owned by *General Steam Navigation Company*
 of the Port of *London* of *617* Tons Register, and *250* Registered Horse Power,
 and that they have been carefully inspected and examined by me at *Sunderland*
 and found to be at this date, viz., *Nov 2* 1876 in good order and safe working condition.

Amount of Fee for Survey ... *£ see annexed report*
 (Travelling Expenses, if any, £ ...)

William Allison
 Engineer Surveyor to Lloyd's Register of Shipping.