

LLOYD'S REGISTER OF BRITISH AND FOREIGN SHIPPING.

ENGINEER SURVEYOR'S REPORT ON MACHINERY.

ENGINES.

Rev 4/10/77

Description *Compound Horizontal Direct Acting*
 Made by *Napier & Sons*
 When *1877* At *Glasgow*
 Diameter of cylinder *53 7/8"* Length of stroke *48"*
 No. of revolutions per minute *60*
 Point of cut off *Variable from 3 to 6*
 Diameter of screw shaft *16 1/2"*
 Diameter of crank shaft journals *16 1/2"*
 Diameter of screw, *at middle wheel* *18 1/2"*
 Pitch of screw *Variable from 2 1/2 to 2 3/4"*
 No. of blades *four* Total surface *90 sq ft*
 No. of bilge pumps *two* and sizes *4 1/2" dia x 26" 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 *4 1/2" dia x 26" stroke*
 What gauges are there attached to the engines and boilers *Five Steam One Vacuum One Compound*
 Description and size of Donkey Pumps *Double Acting 6 1/2" x 12" stroke*
 Where do they pump from *from the sea bilge*
 No. of bilge injections *two* and sizes *one 5" dia pump*
 Are they connected to air, or circulating pumps *one 6 1/2" dia circulating*
 Is there a hand pump in the engine room *Yes*
 Can it be worked by the main engines *Yes*
 Is there a deck hose of sufficient length to reach to any part of the vessel *Yes*

MAIN BOILERS.

Number *two* Description *Round Horizontal*
 Made by *N. Napier & Sons*
 When *1877* At *Glasgow*
 Working pressure *65 lbs*
 Tested by hydraulic pressure to *130 lbs*, Date *August 1877*
 Description of super-heating apparatus *Annular*
 Can each boiler be worked separately *Yes*

Can the super-heater be shut off and the boilers worked separately *No*
 Description and area of safety valves on each boiler *Direct Spring (two) each 25.96" area*
 No. of square feet of fire-grate surface in each boiler *100 sq ft*
 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 Horizontal*
 Where fixed *On Main Deck*
 Working pressure *40 lbs*

Tested by hydraulic pressure to *80 lbs*, Date *August 1877*
 Description and area of safety valves *Lever Weights (two) each 7 lbs*
 No. of square feet of fire grate *22.5 sq ft*

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 and cocks*
 Are they fixed sufficiently high on the ship's side to be seen without lifting the stoke hold plates *All cocks are fitted above the turn of the bilge*
 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 *Main Steam pipe*
 How are they protected *Iron casing*
 When were the stern tube, propeller, screw shaft, and all connections examined in dry dock *On 1st previous to being launched*
 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*

Napier & Sons Manufacturer.

I hereby certify that the whole of the above are correct particulars of the Machinery and Boilers of the Iron (or *Woods*) Screw (or *Double*) Steam Vessel *"Harrack Castle"* owned by *J. Currie & Co.* of the Port of *London* of *1892* Tons Register, and *370* Registered Horse Power, and that they have been carefully inspected and examined by me at *Glasgow* and found to be at this date, viz., *October 2nd 1877* in good order and safe working condition.

Amount of Fee for Survey ... £18:10:00 *not paid* *James Mollison* Engineer Surveyor to Lloyd's Register of Shipping.

(Travelling Expenses, if any, £) *Nil* *25.11.77*

(1000/31/7/76.) *as in case of H. Palmer & Co. Ltd*

IRON 489-0130