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REPORT ON MACHINERY.

4019

No. 4019 Port of Belfast
 No. in Survey held at Belfast Date, first Survey Dec 23rd 1890 Last Survey Dec 5th 1891
 Reg. Book. on the Steel Twin Screw Steamer "Pindari" Received at London Office
 (Number of Visits 34)
 Gross 5674.3 Tons
 Net 3686.2 Tons
 Master Built at Belfast By whom built Harland & Wolff Lim. When built 1891
 Engines made at Belfast By whom made Harland & Wolff Lim. when made 1891
 Boilers made at Belfast By whom made Harland & Wolff Lim. when made 1891
 Registered Horse Power 375 Owners J. & D. Brocklebank Port belonging to Liverpool

ENGINES, &c.—
 Description of Engines Two sets, triple expansion. Twin screws No. of Cylinders Six
 Diam. of Cylinders 19"; 31"; 52" Length of Stroke 42" Rev. per minute 80 Point of Cut off, High Pressure .66 Low Pressure .55
 Diameter of Screw shaft 11 1/4" Diam. of Tunnel shaft 10 1/2" Diam. of Crank shaft journals 11" Diam. of Crank pin 11" size of Crank webs 8 x 1 1/2" shaped
 Diameter of screw 13" 9" Pitch of screw 17" 6" No. of blades 3 state whether moveable yes total surface 50 each screw
 No. of Feed pumps two diameter of ditto 4 1/4" Stroke 2 1/4" Can one be overhauled while the other is at work yes
 No. of Bilge pumps two diameter of ditto 5" Stroke 2 1/4" Can one be overhauled while the other is at work yes
 Where do they pump from All bilges & sea. Other pumps:—Weir's 8" x 6" x 21" from hot well or sea into boilers.
 No. of Donkey Engines two Size of Pumps 4" x 2 1/2" x 5" Where do they pump from Duplex feed donkey 7 1/2" x 3" x 6"
Westminster Ballast Pump 10" x 10" x 10" Carruthers truck donkey 4" x 2 1/2" x 5" pumps from sea or exhaust tank
 Are all the bilge suction pipes fitted with roses yes Are the sluices on Engine room bulkheads always accessible yes
 No. of bilge injections two and sizes 5 lbs Are they connected to condenser, or to circulating pump Circulating pump at main injection
 How are the pumps worked Air, fed & bilge by side levers off middle engines. Separate centrif. circulating pumps.
 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 cessel yes Are the blow off cocks fitted with a spigot and brass covering plate yes
 What pipes are carried through the bunkers Bilge pipes. How are they protected 2" wood casing
 Are all pipes, cocks, valves, and pumps in connection with the machinery accessible at all times yes
 Are the pipes, cocks, and valves arranged so as to prevent an unintentional connection between the sea and the bilges yes
 When were stern tube, propeller, screw shaft, and all connections examined in dry dock Examined before launching
 Is the screw shaft tunnel watertight yes and fitted with a sluice door yes worked from level of upper deck.

OILERS, &c.—
 No. of Boilers Three Description 2 double ended & 1 single end Material Steel Letter (for record) 5
 Working Pressure 180 lbs Tested by hydraulic pressure to 360 lbs Date of test 1st Oct 1891
 Description of superheating apparatus or steam chest none
 Can each boiler be worked separately yes Can the superheater be shut off and the boiler worked separately yes
 No. of square feet of fire grate surface in each boiler 98 1/2 d. end. 32 3/4 s. end. Description of safety valves Cockburns No. to each boiler two
 Area of each valve 3 3/4 d. end. 2 1/4 s. end. Are they fitted with easing gear yes No. of safety valves to superheater —
 Are they fitted with easing gear — Smallest distance between boilers and bunkers on woodwork 4 feet Diameter of boilers 13' 0" d. end. 11' 0" s. end.
 Length of boilers 14' 0" d. end. 10' 10 1/4 s. end. description of riveting of shell long. seams Double butt, treble circum. seams riveted. 5 riv. per ris. ch. Thickness of shell plates 1 3/8 d. end. 1 1/16 s. end.
 Diameter of rivet holes 1 3/8 d. end. 1 1/4 s. end. punched or drilled drilled pitch of rivets 9" & 4 1/2" Lap of plating 20 1/2 x 1 in d. end. 19 x 7/8 in s. end.
 Percentage of strength of longitudinal joint 84.75 d. end. 86.7 s. end. working pressure of shell by rules 180 lbs size of manholes in shell 16" x 12"
 No. of compensating rings 31 x 27 x 1 3/32 d. end. 31 x 27 x 1 1/16 s. end. No. of Furnaces in each boiler 6 in d. end. 2 in s. end. Description of Furnaces Patent ribbed flues
 Outside diameter 38 1/2 d. end. 38" s. end. length 4' 0" d. end. 4' 0" s. end. thickness of plates 1/2" description of joint welded if rings are fitted two
 Greatest length between rings 9" working pressure of furnace by the rules 180 d. end. 183.5 s. end. combustion chamber plating, thickness, sides 19/32" back 19/32" top 5/8"
 Pitch of stays to ditto, sides 7 3/4" back 7 3/4" top 7 3/4" 8 1/8" If stays are fitted with nuts or riveted heads twisted outside working pressure of plating by rules 182 d. end. 180 s. end.
 Diameter of stays at smallest part 1 3/8" d. end. 1 3/8" s. end. working pressure of ditto by rules 180" end plates in steam space, thickness 1 1/16 in d. end. 1 1/16 in s. end.
 Pitch of stays to ditto 18 1/2" greatest in d. end. 16 1/2" s. end. how stays are secured double nuts & large washers. working pressure by rules 185 lbs diameter of stays at smallest part 2 1/8 d. end. 2 1/2 s. end. working pressure by rules 190 lbs Front plates at bottom, thickness 13/16" Back plates, thickness 3 1/32"
 Greatest pitch of stays As apprx. working pressure by rules 180 lbs Diameter of tubes 3 1/4 in pitch of tubes 4 1/2 in thickness of tube plates, front 7/8 in back 3/4 in how stayed stay tubes pitch of stays 9" width of water spaces 1 1/2 in d. end. 1 1/2 in s. end.
 Diameter of Superheater or Steam chest — length — thickness of plates — description of longitudinal joint — diam. of rivet holes —
 Pitch of rivets — working pressure of shell by rules — diameter of flue — thickness of plates — If stiffened with rings —
 Distance between rings — working pressure by rules — end plates of superheater, or steam chest; thickness — how stayed —
 Superheater or steam chest; how connected to boiler —

DONKEY BOILER— Description *The single ended auxiliary main boiler is to be used as donkey boiler*

Made at _____ by whom made _____ when made _____ where fixed _____

Working pressure _____ tested by hydraulic pressure to _____ No. of Certificate _____ fire grate area _____ description of safety valves _____

No. of safety valves _____ area of each _____ if fitted with easing gear _____ if steam from main boiler _____

enter the donkey boiler _____ diameter of donkey boiler _____ length _____ description of riveting _____

Thickness of shell plates _____ diameter of rivet holes _____ whether punched or drilled _____ pitch of rivets _____ lap of plating _____

per centage of strength of joint _____ thickness of crown plates _____ stayed by _____

Diameter of furnace, top _____ bottom _____ length of furnace _____ thickness of plates _____ description of joint _____

Thickness of furnace crown plates _____ stayed by _____ working pressure of shell by rules _____

Working pressure of furnace by rules _____ diameter of uptake _____ thickness of plates _____ thickness of water tubes _____

SPARE GEAR. State the articles supplied:— *2 propeller blades. Air pump rod, bucket, foot & head valve with guards. 1 H.P. spindle. 1 P. spindle. Centrif. pump spindle. Set air pump valves. Set feed pump valves. Set bilge pump valves. 12 punk ring bolts. 2 main bearing bolts. Set con. rod bolts bottom end. 2 top end. Set coupling bolts. 8 clud nuts propeller. 4 H.P. piston rings. 2 I.P. ditto & 1 L.P. ditto. Iron various. The foregoing is a correct description, 2 brass valves for feed checks. 1/2 set furnace bars.*

Holland & Moff. Ltd. Manufacturer.

General Remarks (State quality of workmanship, opinions as to class, &c. *The engines & boilers in this vessel have been constructed under special survey, & in accordance with the approved plans of boilers herewith enclosed.*

The steel has been tested as required by the Rules, & the workmanship is throughout good.

Each of the boilers & each separate length of the main & auxiliary boiler steam pipes have been tested by water pressure to double the work pressure.

On the 5th inst the engines were worked for several hours under steam in the Belfast Lough & gave satisfaction.

The safety valves are adjusted to blow off at 180 lbs per sq. in.

The electric lighting is by Messrs W.N. Allen & Co. The currents are generated by two engines & dynamos. 250 revs per min. 90 Amperes. 62 volts.

The machinery in my opinion renders the vessel eligible for the record of + L.M.C 12.91 in the Register Book.

The amount of Entry Fee .. £ 3 : 0 : 0 *appropn received by me,*

Special £ 40 : 18 : 0

Donkey Boiler Fee £ : : :

Certificate (if required) .. £ : : : *14/12/91*

To be sent as per margin.

(Travelling Expenses, if any, £)

A. L. Jones
 Engineer Surveyor to Lloyd's Register of British & Foreign Shipping

FRI 11 DEC 1891

+ L.M.C 12.91

Committee's Minute

