

17796 Iron

Port

Rep^d - 25408
Liverpool 6th Feb 1877
"Mangrove" 1375.26 tons
Rev 10/2/77

Details of Main Boilers of the Steam Ship

Diameter 12' 6" Length 18' 3"
 Thickness of shell plates 1/16
 Description of riveting of longitudinal joints double shap. sa sketch circumferential joints double see sketch
 Pitch of rivets ditto see sketch ditto see sketch
 Diameter of rivets ditto 1/8" ditto 1/8"
 Lap of plating ditto see sketch ditto see sketch
 No. Size of manholes in circular shell Manholes in steam chest through malleable iron branches
 How compensated for plate rings
 Number of furnaces in boiler Six
 Diameter of furnaces 3' 3" Length of furnaces 7' 9"
 Thickness of furnace plates 1/16 full on top. 1/2" in bottom
 Description of joint of furnaces Lapped under bars single riveted
 Port Whether strengthened with rings Yes Greatest length between rings 4' 0"
 Report (if any) on Hull of Vessel. Thickness of combustion chamber plating 1/2"
 Diameter of screw stays to ditto 1 1/4" pitch of stays 10" x 9 1/2"
 End plates, thickness 1/16"
 Diameter of longitudinal stays to end plates 2 1/4" pitch of ditto 14 1/2"
 How stays are secured Double nut. plate washers outside
 Diameter of tubes 4" O.D. pitch of tubes 4 1/2"
 Thickness of tube plates 11/16"
 Stayed by Screwed stays & nuts pitch of stays 13 1/2"
 Description of steam receiver Horizontal cylindrical egg ended
 Diameter of ditto 4' 0" length of ditto 18' 6"
 Thickness of plating of ditto 8/16" ends 7/16"
 Ends, how stayed egg ended, one stay rod
 Malleable iron branches to steam chests.
 Steam chests also serves as superheater.

The main steam pipes - exhaust and feed pipes, are of cast iron, with gland and socket joints, to allow of expansion. The thickness of these pipes was ascertained by boring them in several places and found to be as follows. Steam pipes $\frac{7}{8}$ " thick 8" diam. Feed pipes $\frac{3}{4}$ " thick 4" diam.

Safety valves are guided in seat by three feathers, but left sufficiently slack to allow of expansion

S.H.

S.S. "Mangrove" 17796 Iron

Shell plating }

$$\frac{51520 \times 2.125 \times 70\%}{150 \times 6.5} = 78 \text{ lbs.}$$

Furnaces }

$$\frac{89600 \times .25}{7.75 \times 39} = 74 \text{ lbs.}$$

Perctⁿ of strength of plates in joints as comp^d with solid plates }

$$\frac{(3.875 - 1.125) \times 100}{3.875} = 70\%$$

Perctⁿ of strength of rivets as comp^d with solid plates }

$$\frac{(19840 \times 4) \times 100}{3.875 \times 1062} = 96\%$$

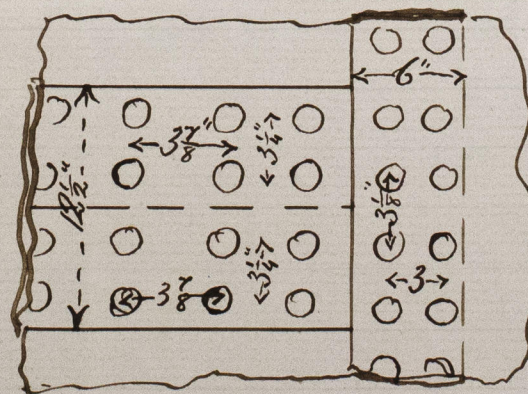
Flat plates between screwed stays }

$$\frac{120 \times 64}{100} = 76 \text{ lbs.}$$

Steam chests }

$$\frac{51520 \times 1 \times 60\%}{48 \times 6.5} = 99 \text{ lbs.}$$

Sketch of riveting of shell plating



Butt straps double $\frac{7}{8}$ " thick
Rivets $\frac{1}{8}$ " diam

Sketch of riveting of steam chest

