R. POWELL.

Iron Vessels.

No. 153,375. Patented July 21, 1874.

Fig. 1

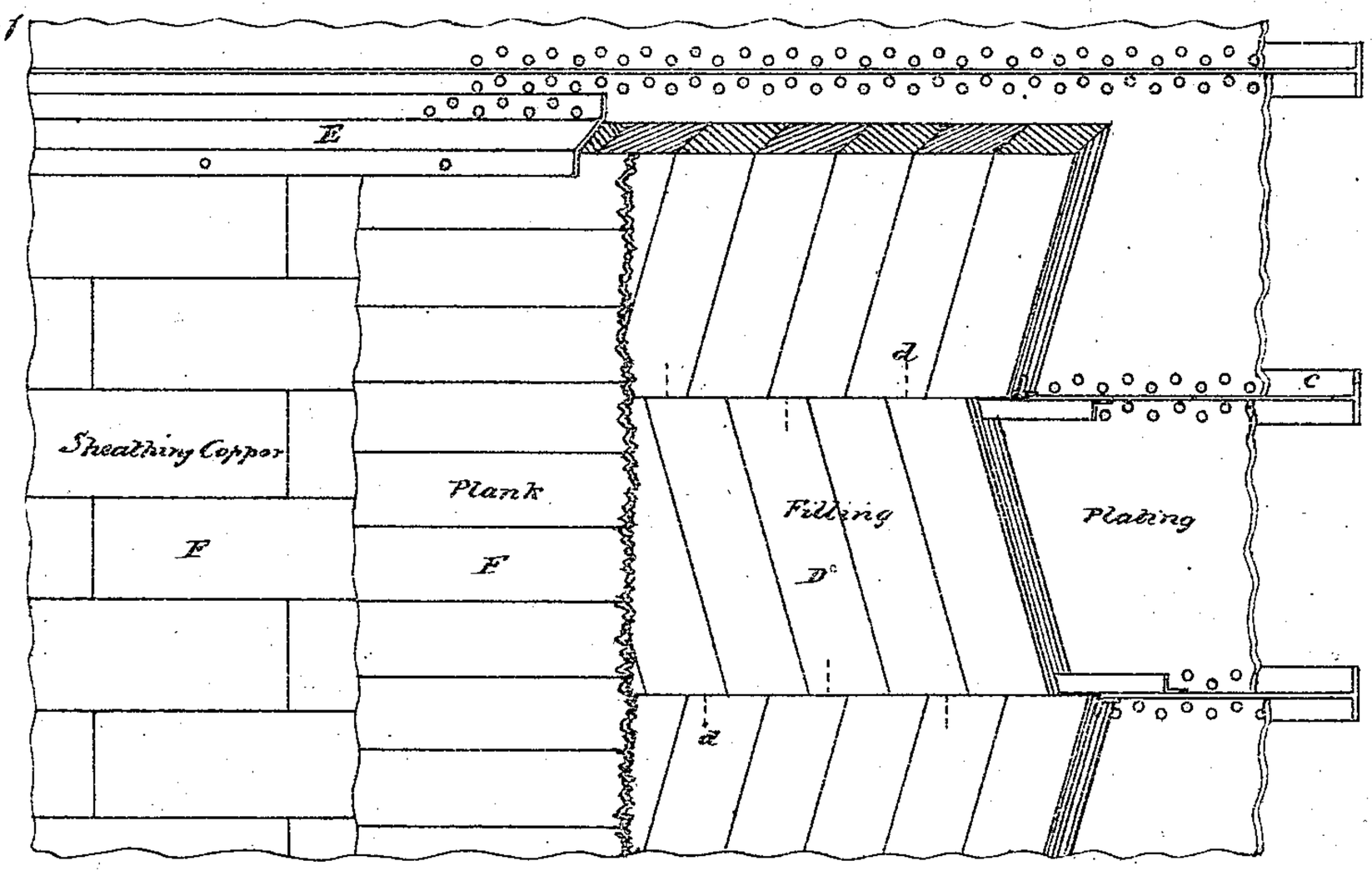


Fig. 2

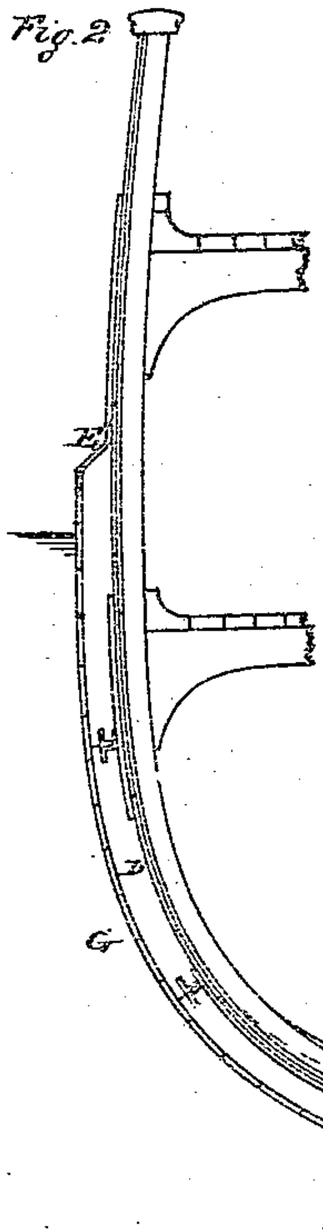


Fig. 4

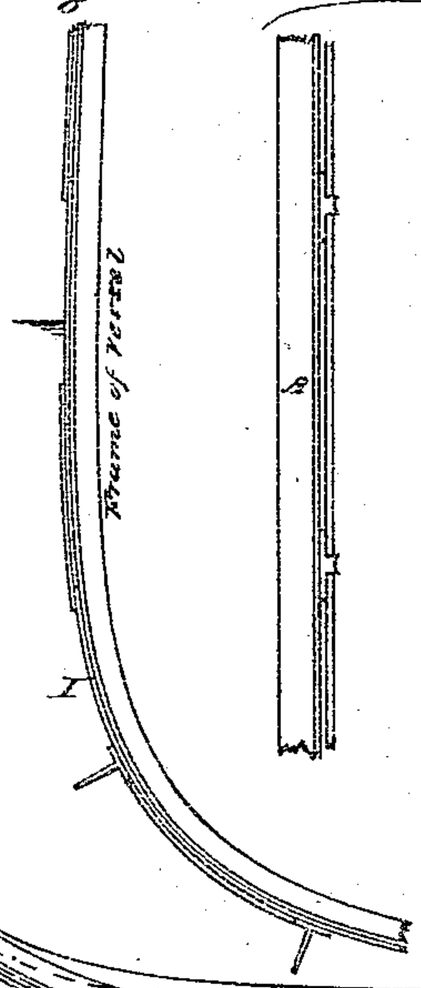


Fig. 6

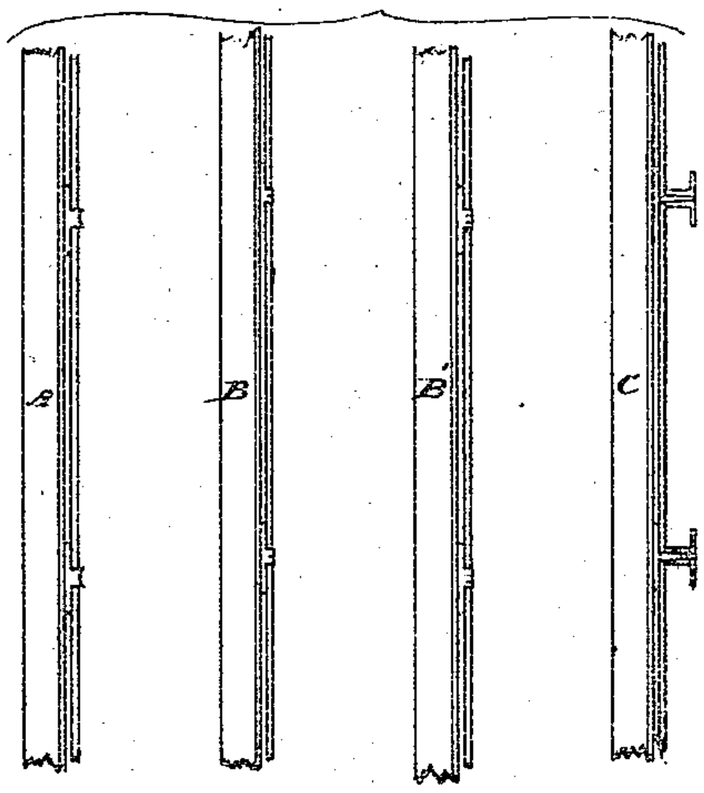


Fig. 5

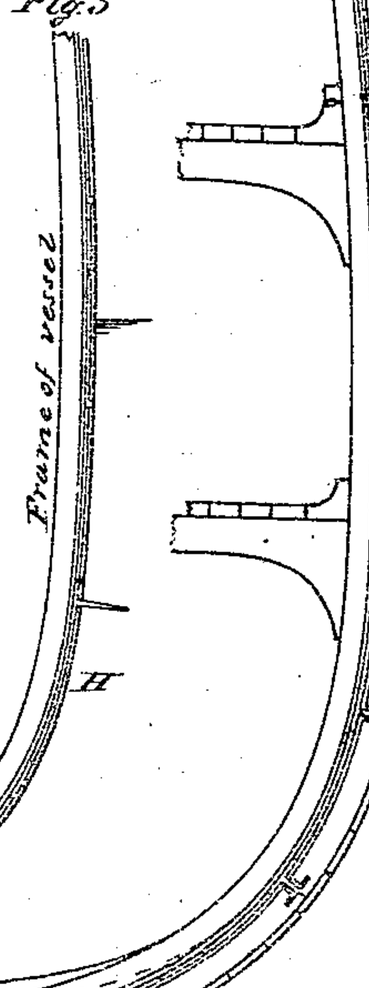
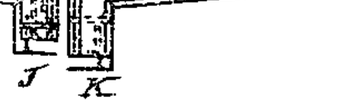


Fig. 3



Witnesses
Jas. B. Fullerton
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Richard Powell
Inventor

UNITED STATES PATENT OFFICE.

RICHARD POWELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN IRON VESSELS.

Specification forming part of Letters Patent No. **153,375**, dated July 21, 1874; application filed October 23, 1873.

To all whom it may concern:

Be it known that I, RICHARD POWELL, of the city of Washington, District of Columbia, have invented certain Improvements in the Manner of Building Iron Vessels, of which the following is a specification, reference being had to the accompanying drawing and the letters of reference thereon.

The drawing shows sections of the side of a ship and details of the mode of building, herein described, with designs for tools.

The letters of reference in the specification will fully explain the drawing.

The objects of my invention are, first, an improved plan of constructing the hulls of iron vessels, so as to have a fair and smooth outside surface; second, to secure wood backing or filling, for the reception of wood planking to be covered with copper sheathing, so that none of the fastenings will pass through or penetrate the outer iron plating or skin of the vessel, particularly in the portion to be immersed; third, to lessen the rolling motion of iron vessels, with advantage to their speed, steering, &c.

To secure the first object (a fair outer surface) I attach to the timbers seam-straps, running fore and aft, for the reception of the outside plating. These seam-straps are rolled with a tongue in the center for the plating to seam against. The thickness of the tongue should be about the same as that of the plating, and its depth, in and out, about one-tenth of an inch more. Where the plating is heavy, the edge of the tongue is to be rolled hollow—that is, the edges should project an eighth or a tenth of an inch beyond the surface of the plating, and the hollow or center of the tongue be on a line with the surface of the plating. (See Fig. 6, A.) These projecting edges are dressed down into the seams with a round-faced hammer, thus filling and calking both seams at the same time, leaving little if any trimming. The outside plating is riveted to the seam-straps in the usual manner. Where light plating is used, the tongue of the seam-strap may be square on its outer edge, projecting, say, a tenth of an inch, as it can be dressed down with a hammer, calking the seams without bruising the plating, making smooth work with little or no trimming. The seams can also be calked by setting a sharp cold-chisel into the center of the tongue, opening it sufficient to fill the seams, after which the score, Fig. 6, B, will be filled with putty, when painting. If calked in this way, the tongue of the seam-strap must be rolled full the depth of the outside plating. This will require no trimming. When the plating and tongue are heavy, two scores, Fig. 6, B′, will be necessary in calking, in which case the tongue should be about one and one-third the thickness of the plating. (See Fig. 6, B B′.)

To obtain the second object—that of securing the wood backing or filling—I use seam-straps, running fore and aft, rolled with a projecting tongue in a T shape, forming a seam-strap and stringer. The corners in this seam-strap must be rolled sharp and square, saving the slight taper to be given to the tongue, so that the plating will lie close when properly riveted, and be calked in the usual manner. After calking, angle-irons are riveted to both sides of this projecting tongue, (see Figs. 1, 2, and 6, C,) which must project sufficiently to receive half the thickness of the wood filling within the angle-irons. The wood filling or backing between the tongue-stringers is to lie close against the outside plating of the hull, the ends being grooved to fit over and within the angle-irons on the tongued seam-strap. (See Figs. 1, 2, and 3, D.) The pieces of this filling reverse their angle, bracing each course, as shown in the drawing, Fig. 1, D, the angle to be not less than the width of the widest timber used in the filling, set off on a square on the opening to be filled. An angle of not less than this is necessary to insure good work in fitting and getting the timber into place; but it should not exceed forty-five degrees. Every third piece of filling should have a short bolt, *d*, driven through the angle-irons into each end, the upper ends of the upper course finishing under the double angle-iron, shown at E, Figs. 1, 2, and 3, the bolts to be driven through its outer face. The purpose of these fastenings is to resist the calking. To facilitate the driving of these bolts all the courses must be filled at the same time. The upper edge of the double angle-iron must be riveted to the outside plating of the vessel. The calking of the filling should commence

at both ends of the courses at the same time, and all of the seams in the courses be calked before the butt seams running fore and aft over the seam-straps.

After being calked and planed off fair, if desired, the sheathing-copper can be put on the filling; but for first-class work, the filling should be covered with sheathing boards or plank, and this also calked and planed off before putting on the sheathing-copper. (See Fig. 1, F.)

This system of sheathing can be applied to vessels already built. For such vessels a double angle-iron (see Fig. 2, G) must first be riveted to the plating and frame of the hull. A single angle-iron is then riveted to this double angle-iron, and the wood filling or backing is fitted and worked, as before described.

The mode of casing the keels with wood and securing the filling or backing thereto is illustrated at J and K of Figs. 2 and 3 of the drawing.

To secure the third object of my invention, to lessen the rolling motion of iron vessels, I use a seam-strap with tongue-stringer, as already described. (See Fig. 5, H.) The stringer here shown projects outside the plating, forming keels on each seam from the main keel to near the water-line. These side keels may be formed on the alternate seams only, as may be advisable, according to the form and width of the plating of the vessel. These stringers, by their depth and number, will keep the vessel steady, and prevent the rolling motion. Their projection, clear of the outside plating, must vary according to the size and form of the vessel, say, from six to twelve inches. They form bilge-keels, and there is no danger of their carrying away or straining the plating, the number of them giving little or no opportunity to roll, and consequently there is but little strain on the stringers. Oscillation being prevented, the propelling power can be used to its full extent. These outside stringers or keels are to run along the main body of the vessel, for, say, three-fifths of the length of the vessel on the water-line, and be rounded off at the ends. They will thus make but little if any resistance to the free passage of the vessel through the water, while, by keeping her steady, there will be a marked effect on the steering and speed, the strong transverse friction of rapid rolling being avoided. The number and position of these stringers, also serve to strengthen the main body of the vessel where strength is most needed, and protect the outside skin should she touch the ground. The edges of the plating having their bearing against the stringer are more substantially secured than when they seam against each other. The stringer, giving a fair firm base for either side, acts also as a stiffener between the frames for calking. On this account the stringers usually placed on the inside of the hull can be reduced in size, so that the outside stringers need not be wholly an additional weight to the hull. This T-iron stringer can be applied to vessels already built. In this case it must be laid on the outside and riveted through every frame it passes over, in the manner shown at I, Fig. 4.

In building with the seam-strap tongue-stringer, the frames can be spaced farther asunder than is usual, reducing the weight almost as much as the seam-strap will increase it, and make a much stronger vessel in very nearly the same weight of material.

In using the seam-straps and tongues, the plating is increased in width by the amount of the laps and tongues, and the number of streaks of plating is thereby reduced.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. A tongued seam-strap, the tongue being rolled hollow on its outer edge, and adapted to be combined in the manner herein described with the plating of iron vessels, so as, when dressed down with a round-faced tool, to calk the seams and give a smooth surface, substantially as set forth.

2. The method described of calking the seams in iron vessels by scoring the tongue of the seam-strap, substantially as shown and specified.

3. The combination of angle-irons and seam-straps, for the purpose of securing wood backing, in the manner set forth and shown.

4. The wood backing applied in a diagonal position, for the purpose of strengthening and bracing vessels, in combination with the angle-irons, substantially as shown and described.

5. In iron vessels, the T-iron, constituting stringers and seam-straps applied in the manner described, for the purposes set forth.

In testimony that I claim the above I have hereunto set my name in presence of two witnesses.

RICHARD POWELL.

Witnesses:

CHAS. L. HUGHES,

D. CAMERON MORRISON.