

J. B. Love,
Armor Clad.

Patented Oct. 22, 1861.

N^o 2,528.
N^o 33,532.
Fig. 2.

Fig. 1.

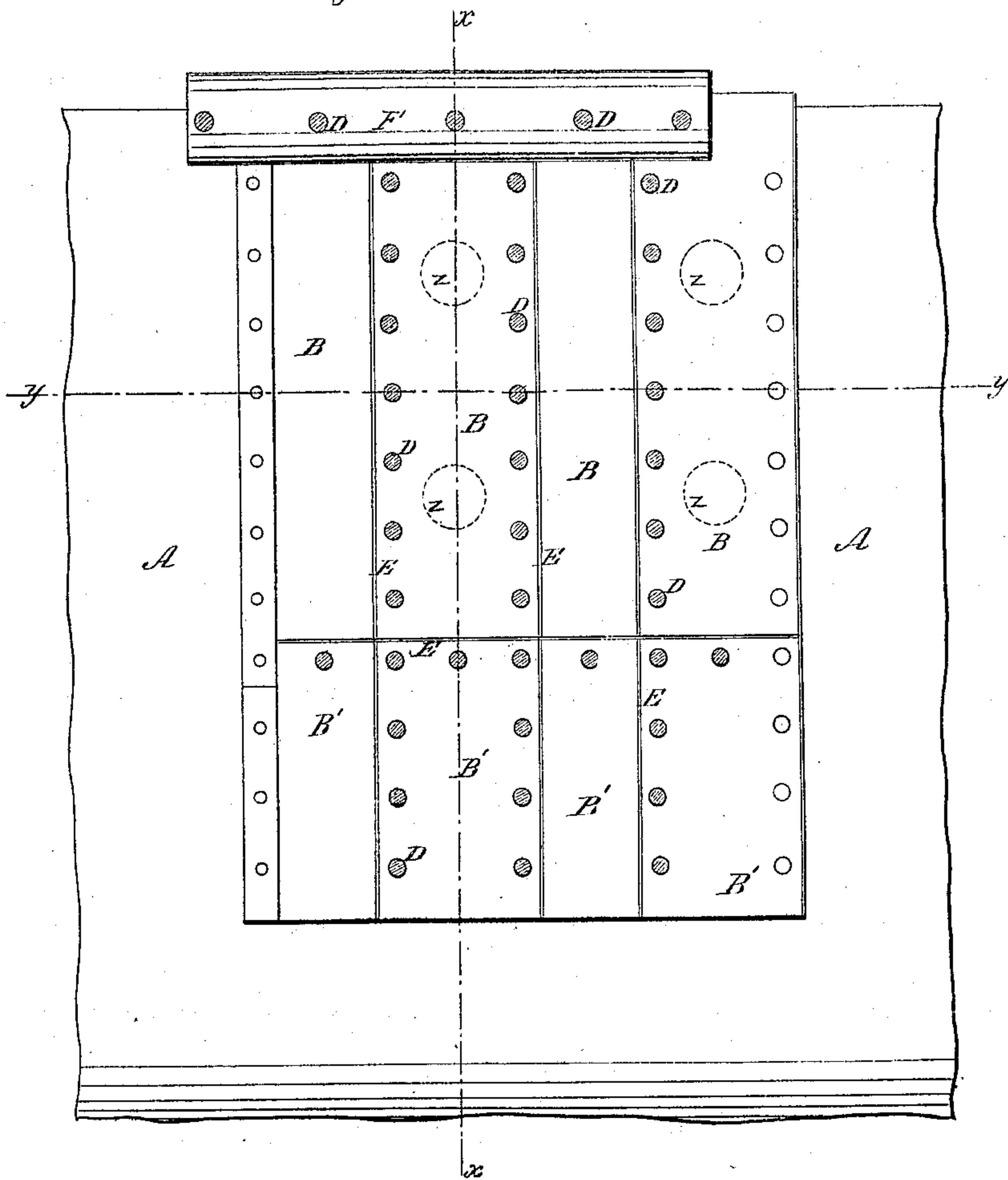
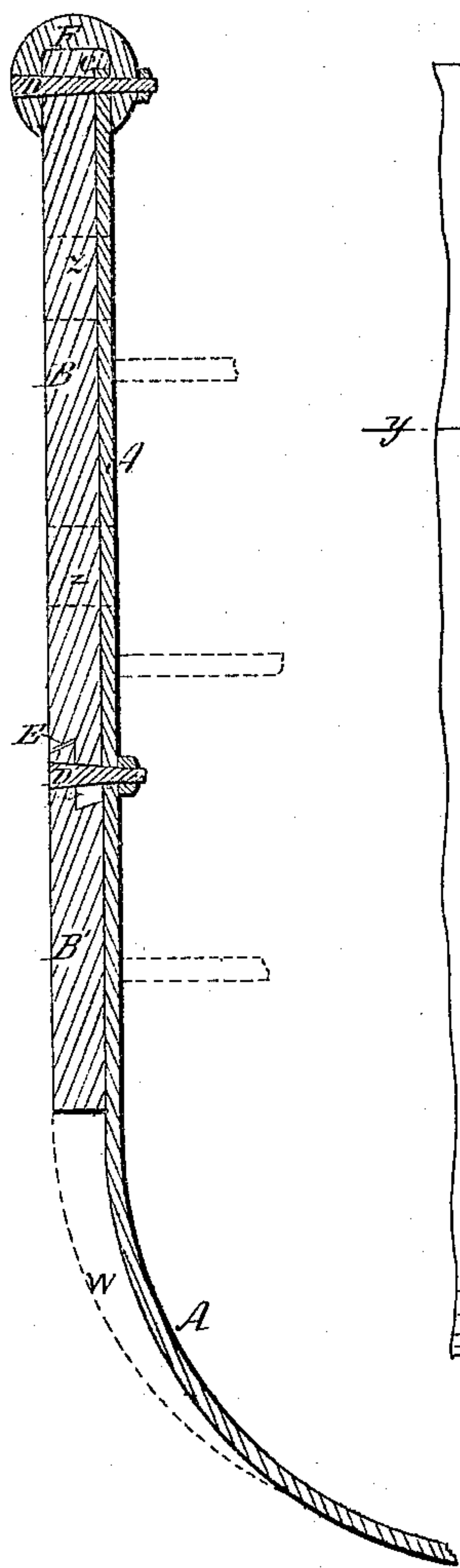
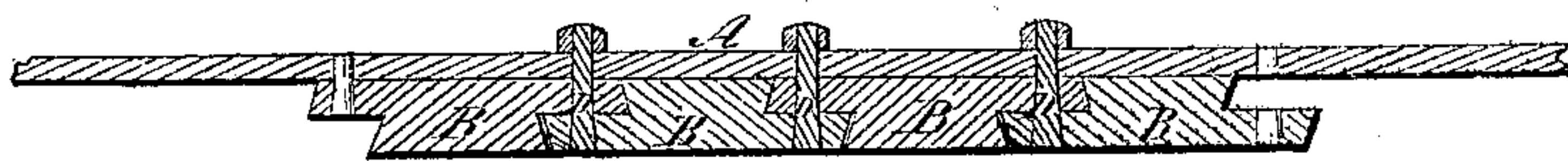


Fig. 3.



Witnesses.

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IMPROVED MEANS OF ATTACHING ARMOR TO NAVIGABLE VESSELS AND WATER-BATTERIES.

Specification forming part of Letters Patent No. **33,532**, dated October 22, 1861.

To all whom it may concern:

Be it known that I, JOHN B. LOVE, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Iron War-Vessels and Water-Batteries; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a sectional representation of a ship's side wall having my improvement applied thereto; Fig. 2, a vertical transverse section through the line *x* of Fig. 1, and Fig. 3 a horizontal longitudinal section through the line *y* of the same figure.

Like letters indicate the same objects when in the different figures.

My invention has for its principal object the better protection of the walls of iron war-vessels and water-batteries from the destructive effects of shot and shell and from the penetration of water; and it consists in the peculiar mode hereinafter described and specified of constructing and securing thick plates of iron or steel to the exterior of the same.

In the drawings, A represents a section of the usual side wall of an iron ship, and B B' the improved plates applied thereto. The plates B B' in this instance are arranged in two series in upright positions, and consists of wrought-iron or steel, each formed into a solid plate of about sixteen feet long, four feet wide, and four or five inches thick (more or less) for the upper series B, and for the second or lower series B' the plates are of the same width and thickness as those of the upper series, but only about eight feet long, or of such length in each series as may when edged together cause them to reach from the upper edge of the wall A downward to a sufficient depth below the water line to protect the vessel or battery from shot directed toward such part. The plates of the upper series B are each made with a thick flange C across the inner side of its upper end, so that the same, when resting closely upon the upper edge of the wall A, shall be flush with the inner side of the latter, substantially as seen in Fig. 2. The side and bottom edges of the said upper series of plates are each recessed or cut away about six inches in width

down to half their thickness, and the remaining shoulders or edges planed to either square or beveled faces, so that the said plates will fit accurately and closely together at the overlaps, and also leave the plates flush on both sides, as seen in the drawings. The lower series of plates B' is recessed so as to fit together in the same manner with each other and also with the lower edges of the series B. Both these series of plates are closely and firmly secured to the wall A of the vessel and to each other by means of conical bolts D D, which are about two inches in diameter at their larger ends and one inch at their smaller, and fit into corresponding through-holes made in rows along in the projecting edges of the plates and through the wall A of the vessel, each bolt D being fitted at its smaller end with a screw-nut to be operated, in the usual manner, on the inner side of the said wall after the bolt has been driven in until its larger end has become flush with the outer side of the plates, as seen in the drawings. The bolt-holes in the wall A and plates B B' are bored and tapered so that they shall correspond with each other when the respective lapping edges of the latter are fitted up in close contact with each other and the wall A, and in afterward securing the said plates B B' to the wall a flat packing E, of soft or compressible metal, vulcanized gum-cloth, tarred felt, or other suitably compressible and durable material of about an eighth of an inch thick and of the same width and length as the edge of the outer lap, is to be inserted between in such a manner that as the conical bolts D are driven into their holes the edges of the plates will be gradually forced thereby toward each other, and thus compress the packing E between them firmly or so as to make a perfectly durable watertight joint, the nuts being screwed up firmly against the inner side of the wall A after the bolts D are driven in flush with the outer side of the plates.

In small ships the upper plates B are intended to be made long enough to reach the proper depth below the water-line when fixed in the upright position described, which position is believed to be the best, but the same plates may be as securely attached in several series longitudinally arranged along the ship, if so desired.

The upper edges of the upper series of plates B, together with the upper edge of the wall A of the vessel, are covered by a strong or heavy grooved cap F, which is bolted thereto in sections of about fourteen feet long and so as to "break joints" with the plates for the purpose of giving more solidity and stiffness to the said upper boundary of the vessel's walls. The transverse section of this cap presents a curve on its outer side, which may cause a ball or shell striking it to glance either upward or downward, and so diminish its injurious effect thereon.

Under the bottom edge of the lower series of plates B' a narrow strip of the packing material E should be inserted before the bolts D are driven up for the purpose of making this joint water-tight also.

The recess left by the square lower ends of the bottom plates B' is intended to be filled out by curved plates of boiler-iron bent and secured so as to produce an easy curve or rounding-off toward the keel, as indicated by the dotted line *w*, Fig. 2.

The required port-holes (indicated by the dotted lines *z*) should be cut out or produced during the original constructing of the plates.

The herein-described mode is believed to be the most simple and effective one for constructing and securing proper protective plates to iron war-vessels or water-batteries, and the same not presenting any projecting bolt-heads or other offsets on the exterior surface of the vessel or battery there is comparatively but little chance of injuring the plates by a

point-blank shot, and none at all from such as may strike them obliquely. Besides, the joints are effectively and durably water-tight.

I wish it to be understood that I do not desire to claim, broadly, the bolting of thick plates of iron or steel to the walls of war-vessels and water-batteries, as such has been effected before; but,

Having fully described my invention and pointed out its utility, what I claim as new, and desire to secure by Letters Patent, is—

1. The manner described of constructing the plates so as to combine them together with each other and the walls of an iron war-vessel or water-battery, the same consisting of the flush lapping of the edges of the plates, the intermediate packing E, and the conical draw-bolts D, the whole being constructed and combined together with the wall A, substantially in the manner described and set forth.

2. The projecting flange *c* on the plates of the upper series B when the same is made to rest directly upon the upper edge of the wall A, substantially in the manner described, and for the purpose of supporting the said plates more securely.

3. The cap F, when the same is constructed as described and applied to operate in combination with the upper edge of the wall A and the upper series of plates B, substantially as described, and for the purposes specified.

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Witnesses:

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