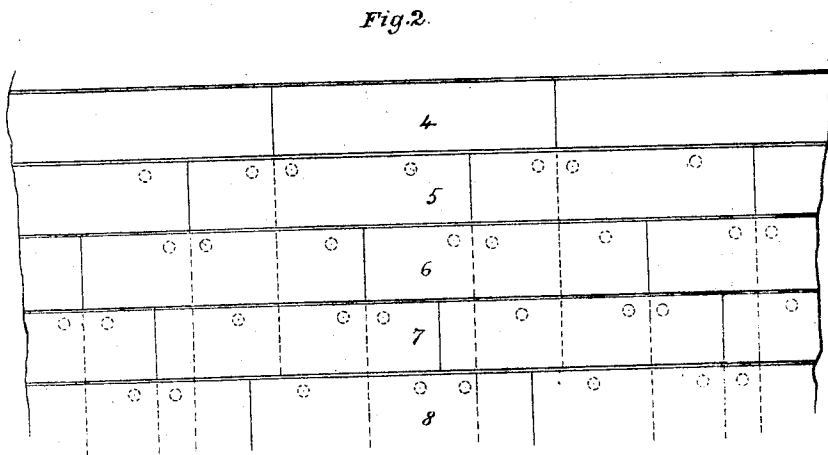
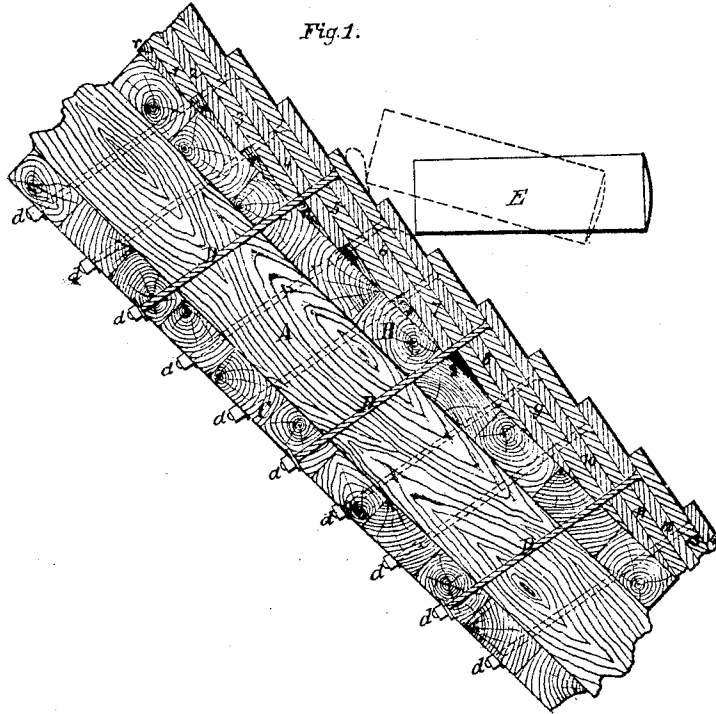


B. B. Hotchkiss,
Armor Clad.

N^o 36,152

Patented Aug. 12, 1862.



Witnesses

G. W. Bolewick,
Thos. Cregin

Signature.

B. B. Hotchkiss.

UNITED STATES PATENT OFFICE.

B. B. HOTCHKISS, OF SHARON, CONNECTICUT.

IMPROVED METALLIC DEFENSIVE ARMOR.

Specification forming part of Letters Patent No. 36,152, dated August 12, 1862.

To all whom it may concern:

Be it known that I, B. B. HOTCHKISS, of Sharon, in the county of Litchfield, in the State of Connecticut, have invented a certain new and important Improvement in Armor Plating for War-Vessels and Fortifications; and I do hereby declare that the following is a full, clear, and exact description of the same, which has been prepared with a view to the procuring of Letters Patent therefor.

It has been found in experiments heretofore conducted relative to the effect of projectiles upon iron plates that the flat-headed bolt will penetrate more readily than other forms, and that the corners of such bolts will gain a hold upon and tend to tear up or penetrate inclined armor where other projectiles are deflected and thrown off.

The object of my invention is to produce an armor which will act equally well against round or conical shot as that heretofore known, and which will also serve to deflect the flat-headed bolt in circumstances where other armor would be penetrated or loosened.

The nature of my invention consists in so overlapping inclined and superposed armor-plates that a portion of the edges of each is only exposed, and such edges when struck by a flat-headed bolt or other projectile having sufficient power to penetrate will become detached and form a shoe or false point for the projectile, on which shoe it glances or slides upon the next plate, and is thereby deflected and prevented from doing other damage.

The accompanying drawings form a part of this specification, and similar letters of reference indicate like parts in both figures.

Figure 1 is a vertical section, and Fig. 2 is a plain view, of a portion of the side of a vessel or fortification constructed of wood and armored according to my invention.

A represents a wall of timber, and B and C, respectively, the outer and inner skin or planking and ceiling, these parts being arranged and bolted together in the same manner as is generally adopted in ship-work. The entire structure—bulwarks, wall, casemate, breast-work, or whatever name it may be called—is not perpendicular, but inclined at an angle of about forty-five degrees with the horizon, in accordance with what are generally considered

correct principles in iron-plated defenses against ordnance.

1 2 3 4 5 6, &c., are plates of iron of plain form and of proper length and breadth. D D, &c., are bolts having heads countersunk into the plates at the points indicated, and provided with nuts *d* and suitable washers at their inner ends, as represented. The plates are arranged relatively to each other and to the wood-work A B C in the manner represented, each plate lying with its lower edge next the wood and covering the sheet next above, except a portion of the upper edge, and the plates of each series are arranged to break joints with the other series, as shown in Fig. 2. The head of each bolt, except the lowermost ones, on the entire structure is covered by the outer and lower plate, so as to conceal and protect it in the manner represented. The manner of arranging these and their fastenings is analogous to the arranging of shingles or clapboards on a building, except that in my invention the positions are the reverse of those of clapboards, the butts or exposed edges being in my invention presented upward.

I prefer to use for the plates 1 2, &c., iron as tough as can be commanded, accurately rolled and cut to the required shape, and about one inch thick. The drawings represent four such plates superposed one upon the other at every point on the outer surface of the work; but it is obvious that a greater or lesser number may be made to serve, as may be desired. The plates are previously punched or drilled by suitable machinery, so that the holes accurately coincide in position with each other and with the holes in the wood-work, and the plates are applied by the aid of the bolts and nuts in the obvious manner, beginning with the uppermost tier of plates and adding the next lower tiers successively.

E represents the position of a flat-headed bolt from a Whitworth or other suitable rifled gun at the instant of its impact with the plates. The red lines indicate an important function or effect of the invention in "shoeing" such a bolt and making it at least practically rounded in form outside. It will be observed that the lower edge of the projectile at its forward end meets the outer plate in a favorable position for cutting off the plate on

the outside layer, so as to commence to penetrate the shield or armor, but that the mere act of cutting the outer plate under these circumstances causes the piece cut to be carried forward with the shot on an angle, as shown in red outline. In this condition the front of the projectile will meet the face of the next and next succeeding plate with less ability to cut them—that is to say, while the bolt E would bite effectively hold of the solid plating of an ordinarily plated vessel, in my improved armor, so soon as it cuts clear a piece of the outer plate, the said piece is held by friction and other circumstances in the front of the shot, so as practically to blunt or round the front of the bolt and cause it to slip or glance from the succeeding plates.

I am aware that plating has before been made in several separate layers of plates; but I do not know that it has ever been before arranged so as to produce the effect of my invention in glancing the projectiles upward, causing a portion of the outer plate to be cut off or crushed out and carried forward, so as to shield the other plates in part from the action of the projectile, or rather from the edges thereof, in the manner I have shown.

It is obvious that if the blow is sufficiently severe the under plates, *a*, and the plates, 1 2 &c., which are first applied, may be crushed and indented by the force upon the superposed plates; but the general effect of the invention is sufficiently indicated by the figures.

The facility afforded by my invention for fitting and applying the armor, also for allowing the same to work in a seaway, and also for allowing rough edged or untrimmed plates to be used, is very obvious.

I have represented three methods of adapting the lower edges of the several plates to the outer surface of the wood. One is shown by the strips of wood *r r* of triangular section fitted in the space below each of the uppermost plates, 1 2, &c. Another is shown by the vacant space *s*, below the plate 6. Another is shown by the scarfed edges of the plates 7 8 9 10. Either these or various others—such as shaping the surface of the wood to match to the square edges—may be employed, or any suitable soft material may be introduced to fill the spaces.

All the plates of my invention may of course be underlaid with any other material or overlaid with any material, or each plate may be separately coated or laid upon any suitable fibrous, gummy, or other modifying or preserving material.

The bolts D may be made in any style or secured in any manner other than by nuts *d*, if desired, and the plates 1 2, &c., may be grooved and tongued together at their edges, so as to strengthen the joints, if desired.

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

The arrangement of the plates 1 2 3, &c., upon the inclined sides of vessels and fortifications, so that the lower plates shall overlap upon the higher, in the manner and for the purpose herein set forth.

B. B. HOTCHKISS.

Witnesses:

G. H. BABCOCK,
THOS. CREGIN.