

J. B. Eads.
Armor Clad.

No 39,218.

Patented Jul. 14, 1863.

Fig. 4.

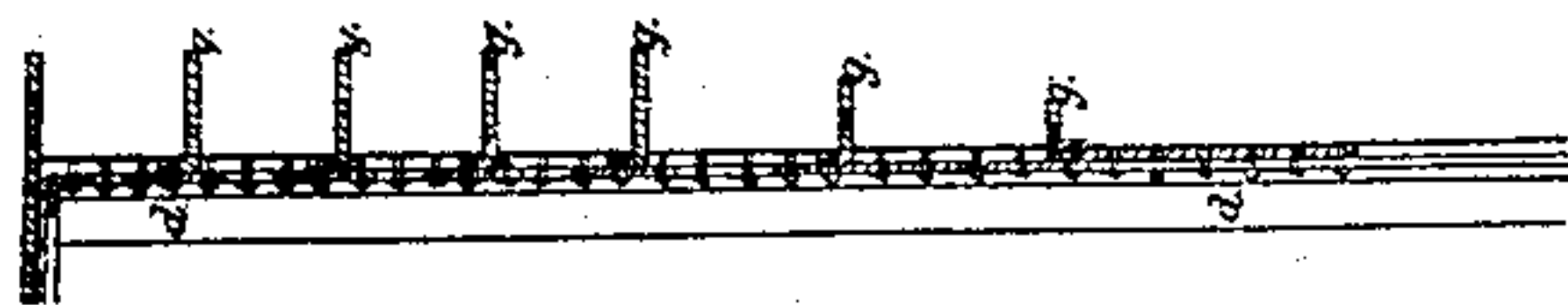


Fig. 1.

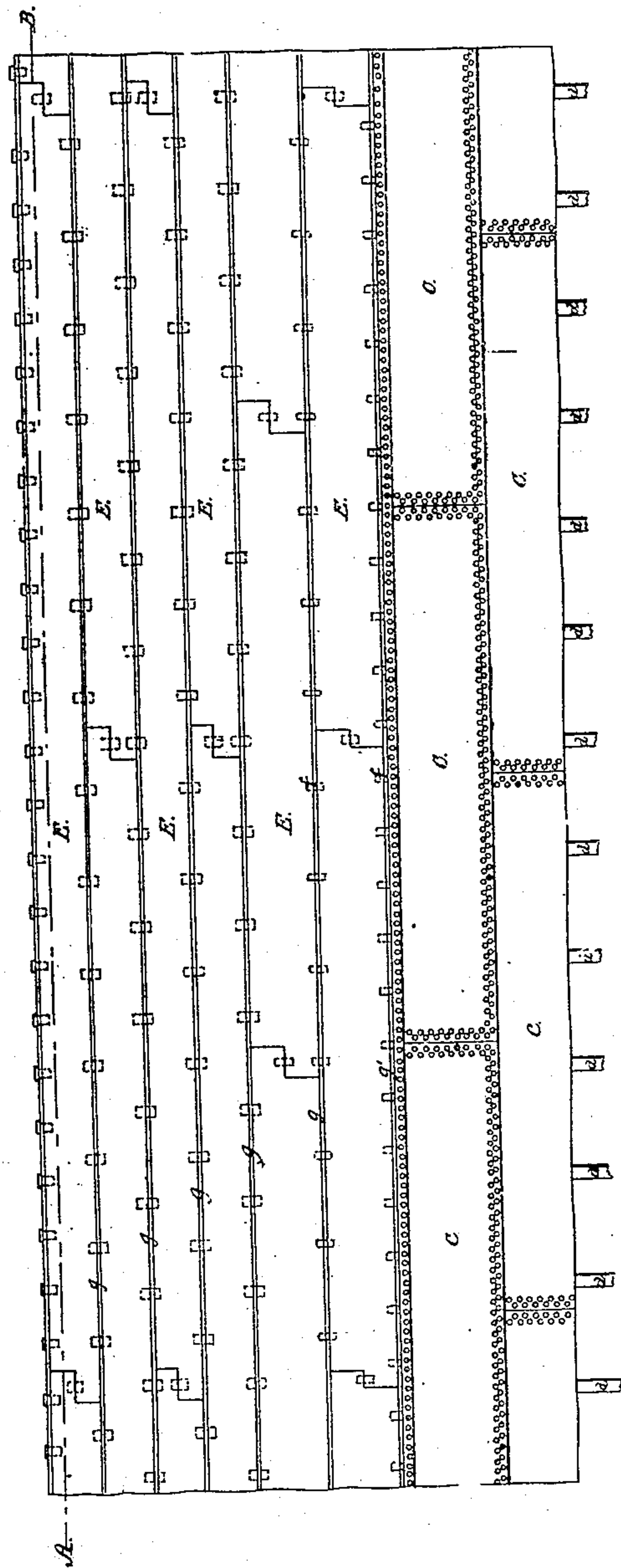


Fig. 3.

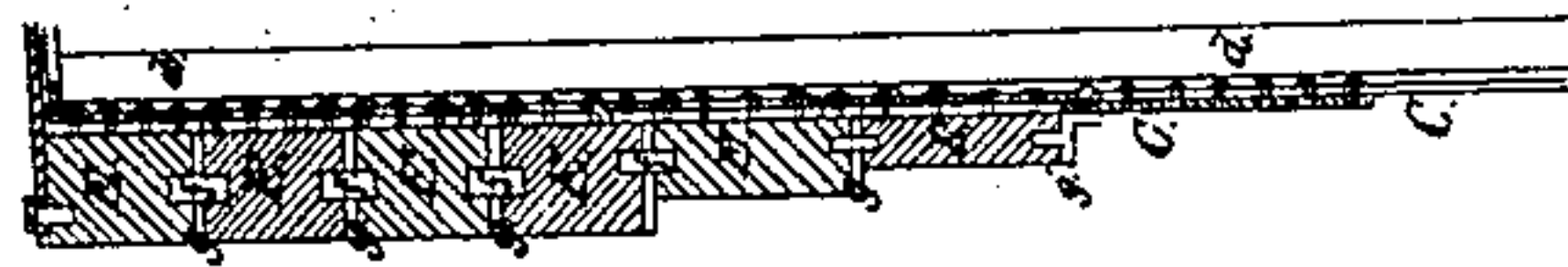
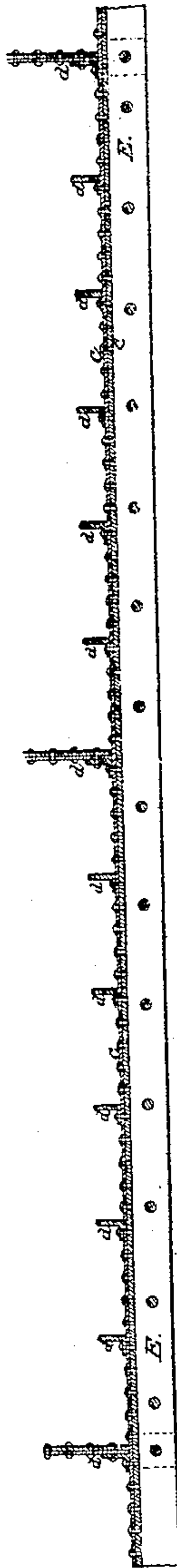


Fig. 2.



Witnesses,

*H. E. Clayton
 & associate*

Inventor,

Jas. B. Eads

UNITED STATES PATENT OFFICE.

JAMES B. EADS, OF ST. LOUIS, MISSOURI.

IMPROVED DEFENSIVE ARMOR FOR MARINE AND OTHER BATTERIES.

Specification forming part of Letters Patent No. 39,218, dated July 14, 1863.

To all whom it may concern:

Be it known that I, JAMES B. EADS, of the city and county of St. Louis, and State of Missouri, have invented certain new and useful Improvements in Armor for War-Vessels; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and made to form a part of this specification.

It is well known that serious difficulty has been experienced in the practical employment of iron-clad war-vessels, from the fact that the transverse bolts used to secure the armor-plates have been liable to breakage and other damage by the labor and strain of the vessels at sea, and also by the action of projectiles used against said vessels by the enemy, thereby creating leakage and endangering the vessel and the lives of those on board.

To avoid those and other difficulties, and to secure many important advantages, among which may be mentioned giving to the vessel additional strength, (which is due to the mass of metal forming the armor,) cheapness of construction, and practical efficiency are the objects of this invention, the nature of which relates to the employment of T or angle-iron bars, in combination with metallic dowel pins, for securing the armor-plates, and making a system of breaking joints by an arrangement of the said angle-iron bars and armor-plates, as hereinafter specified and represented.

In reference to the accompanying drawings, Figure 1 is a side elevation representing a portion of an iron-clad vessel constructed in accordance with my invention. Fig. 2 is a horizontal longitudinal sectional plan taken through the red line A B. Fig. 3 is a vertical section showing the peculiar mode of securing the armor-plates; and Fig. 4 is a vertical section showing, specially, the arrangement of the angle-irons, the armor-plates being removed.

C represents the metallic sheathing, which will be arranged, riveted or bolted, and secured to the ribs *d* of the vessel, in accordance with the usual method of constructing iron vessels.

E represents the armor-plates, which will be formed of iron of suitable shape and thickness for the vessel to be constructed, reference being had to the purpose for which the vessel

is intended, and of a length as great as possible, in order to avoid frequent joints and to secure continuity of metal to the greatest possible extent. The said armor-plates E may be graduated in thickness, so as to afford the proper resistance above and below the water-line, and suitable sockets will be formed in them for the reception of the metallic dowel-pins *f*. (Shown clearly in Fig. 3, and by dotted lines in Fig. 1.)

g represents the angle-iron bars, which will be formed of suitable strength and thickness and firmly bolted to the sheathing C and to the ribs *d*. Their lateral or horizontal projection will be equal to the thickness of the armor-plates employed, so that a smooth and even surface may be produced. In the said lateral projections of the angle-irons will be formed perforations to correspond with the sockets in the armor-plates for the reception of the dowel-pins *f*, so that, as the said armor plates E are placed upon the vessel, they will be permanently and rigidly secured in such manner as to become a part of the vessel by means of the said angle-irons *g* and dowel pins *f*, as fully shown in Fig. 3. Dowel-pins will also be inserted in the armor-plates E at the joints formed at their ends, as fully shown by dotted lines in Fig. 1, by means of which the said joints will be perfectly secured. In the construction of the said angle irons *g* and armor-plates E, and in their arrangement upon the vessel, care will be taken that the joints formed by the butting or meeting of their ends may alternate, thereby creating a system of breaking joints, which is very important and essential to the strength and efficacy of the vessel. This arrangement of parts and system of breaking joints will be clearly understood by reference to Fig. 1 of the drawings.

The operation of laying on and securing the said armor-plates may be described as follows: At the proper point upon the hull of the vessel for the base of the first or lowest armor-plate will be secured, as before described, the lowest angle-iron, *g'*. (It will be seen that the vertical portion of this angle-iron *g'* extends downward.) The first armor-plate will then be placed in its proper position upon the vessel, resting upon the said angle-iron *g'*. Dowel-pins (which in this instance may, if found necessary, be formed with a screw-thread) will then be driven up through the angle-iron *g'*

into the lower edge of the said armor-plate in such manner as to hold it rigidly in its place. The second angle-iron will then be fitted and bolted to its place. A secondary iron plate of a thickness equal to that of the vertical portion of the said angle-iron, and of a width adapted to the difference between the height of the said vertical portion of the angle-iron *g'* and the width of the armor-plate, may then be fitted to its proper place and firmly bolted or riveted to the sheathing *C* and ribs *d*. The principal object of this secondary plate is to afford a smooth, even, and solid surface against which the next armor-plate may be fitted. The second angle-iron, *g*, being now secured in its proper place, dowel-pins *f* will be driven down through its perforations into the sockets in the upper edge of the armor-plate already fitted to its place. The upper ends of the said dowel-pins will extend above the angle-iron in such manner as to be adapted to fit into the sockets in the lower edge of the next armor-plate, which may then be fitted to its place.

The above description will answer for each succeeding angle-iron and armor-plate until the armor of the vessel is completed. The upper edges of the last or upper armor-plates will be secured by means of pins corresponding with the dowel-pins *f*, which will be driven down through the deck of the vessel into sockets, before described. It will thus be seen that the armor of the vessel is rigidly and permanently secured in the most thorough and efficient manner, so as to form a vital part of the strength of the vessel without the employment of a single through bolt or rivet, and that the within-described system of breaking joints is such as to secure the continuous strength of the metal employed in the highest possible degree.

Among the many advantages resulting from my invention may be mentioned security to life and property against the dangerous effect of through-bolts being driven through the sides of the vessel by the action of hostile

projectiles; also, safety from leakage caused by the breaking of through-bolts either by the said action of projectiles or the labor of the vessel at sea; vast economy in labor and expense in the construction of vessels and keeping the same in repair, and converting the strength of the armor into part and parcel of the strength of the vessel instead of carrying an immense dead-weight of metal as armor which affords no material strength to the vessel, which is the case with iron and iron-clad war-vessels now in common use.

I do not confine myself to any particular thickness for the iron armor-plates *E*, as it is obvious the same may be varied to meet the requirements of the service for which the vessel may be intended.

I do not wish to be understood as claiming that there is anything new in alternate joints for ordinary purposes, for I am aware that similar devices are common for various purposes; but I believe the within-described arrangement of the angle-iron bars *g* and armor-plates *E* and dowel-pins *f*, creating a system of breaking joints for the purpose of giving additional strength to the armor of war-vessels, is new. Therefore,

Having described the nature, object, and application of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The employment of the angle-iron bars *g*, in combination with the armor-plates *E* and dowel-pins *f*, constructed and arranged as herein described and represented, for securing the armor of war-vessels and making a system of breaking joints, substantially as herein set forth and represented.

In testimony of which invention I have hereunto set my hand and seal this 14th day of April, A. D. 1863.

JAS. B. EADS. [L. S.]

Witnesses:

H. E. CLIFTON,
E. A. SKEELE.