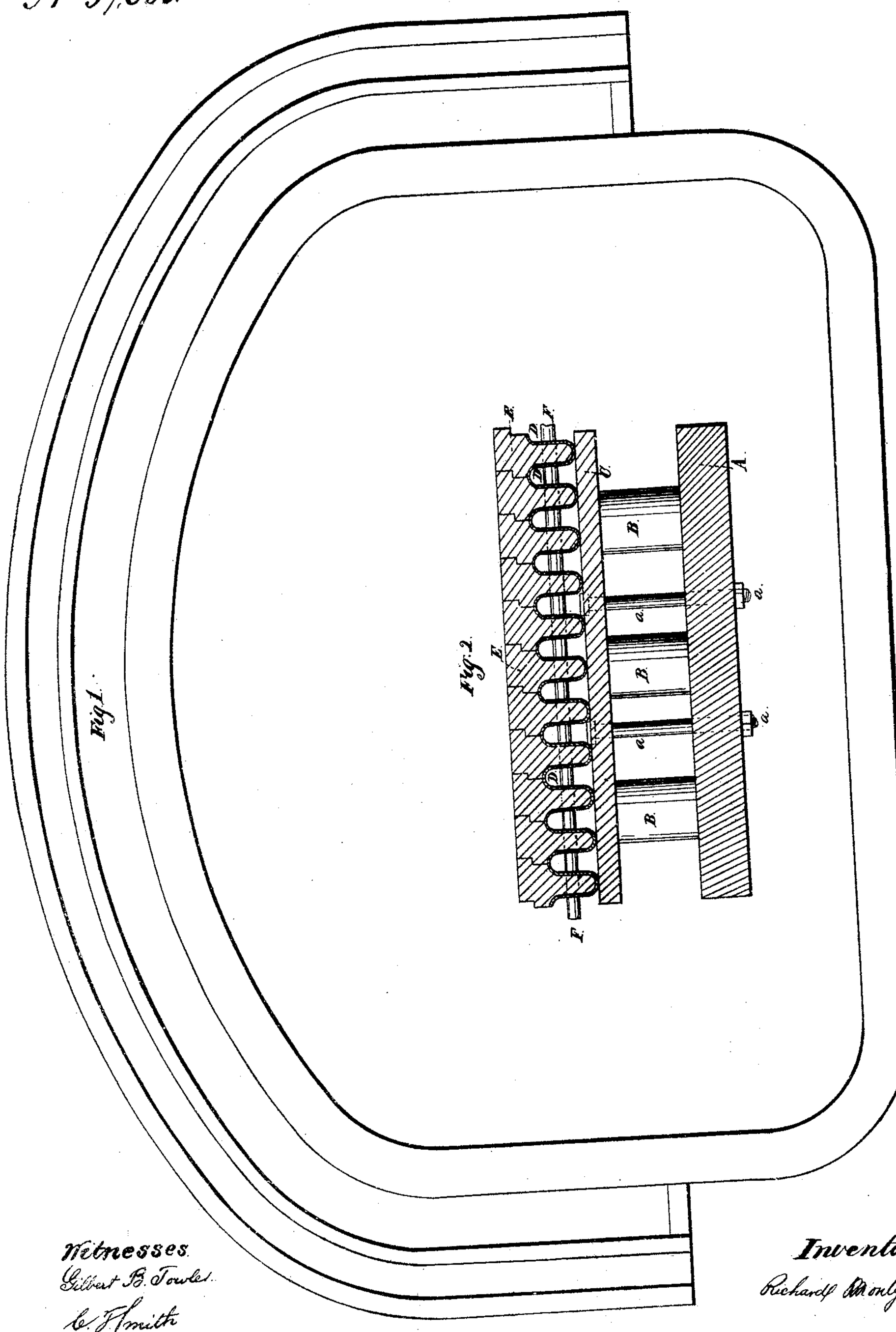
R. Montgomery.

Armor Clad.

No. 37,633. Patented Feb. 10, 1863.



Witnesses.

Gilbert B. Fowler.

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UNITED STATES PATENT OFFICE.

RICHARD MONTGOMERY, OF NEW YORK, N. Y.

IMPROVED DEFENSIVE ARMOR FOR SHIPS AND OTHER BATTERIES.

Specification forming part of Letters Patent No. **37,633**, dated February 10, 1863.

To all whom it may concern:

Be it known that I, RICHARD MONTGOMERY, of the city, county, and State of New York, have invented an Improved Iron-Clad Armor for Naval and other Structures; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference thereon.

The nature of my invention consists in a certain combination of resisting-surfaces and elastic supports for the production of an improved iron-clad armor for naval and other structures.

To enable any person skilled in the art of producing such structures to construct and apply the same, I will proceed to give a description thereof, and of the principle upon which it is founded.

In the drawings, Figure 1 represents a section amidship of a steamer or other vessel of war, with a skeleton view of my armor attached thereto; and Fig. 2, a detached section showing in detail the several parts constituting my invention.

I construct the hull A of wood or iron as usual, but prefer to make it of corrugated iron; but, whatever be the material used in forming the hull, instead of stopping, as usual, at the gunwales, I continue the structure upward and curve it inward from each side, so as to form an arched covering over the entire upper deck, as seen in Fig. 1. The necessary openings therein for port-holes, ingress and egress, ventilation, &c., must of course be provided. Upon this arched surface, covering it entirely, and extending down the sides of the ship to a proper distance below the surface of the water to insure complete protection to the hull, I apply my improved coat of mail or elastic iron armor.

Fig. 2 shows the several parts of my invention in detail. A is a portion of the hull of the vessel; B B B, three of the cylindrical masses of vulcanized rubber that support the plating, &c. These masses of rubber are applied over the entire surface to be covered by the coat of mail, and at such distances apart as to give a uniform elastic support thereto. The axial measurement or length of these cylinders may vary to suit the views of the naval constructor upon the range of elasticity to be given the armor, either as to the whole or to certain parts thereof. As a general rule, these cylinders will be from nine to eighteen inches in length and from six to nine inches in diameter. It may, however, be found advantageous in certain cases to give them a greater diameter than this, and even to make them square, three-sided, or of some other form; but this, being a mere change of form, comes within the range of my invention. To secure the cylinders in place, a flat plate, C, (which may be of wood, but I prefer iron,) is placed over their outer end, so as to form a continuous sheathing, and this is brought firmly down upon them by means of screw-bolts and nuts which pass through it and the sides of the vessel, as seen at *a a*. Upon this substructure is applied one course of my corrugated iron D and the imbricated plating E. The corrugated iron is first secured to the plate C, by riveting or otherwise, and the imbricated plates, connected therewith by means of the rods F, which, it will be seen, pass through the sides of the corrugations and the tongue of the imbricated plates that enter these corrugations, thus firmly connecting all the elements of the armor by fastenings entirely secure from external blows or injuries. Sometimes, to increase the elasticity, it may be found advisable to interpose strips or sheets of vulcanized rubber between the corrugated iron and imbricated plates. I roll the imbricated plates E with a tongue to project into and fit the outer groove of the corrugated iron plate D, and with edges having a projecting lip or lap on one side and a recess or notch of corresponding size on the other, the face or exposed surface being smooth and flat. It may not be necessary to roll each of these bars separately, as they are shown in the drawings; but this I think the best form, as it gives great facility in fitting them to each other and adapting them to the varying form of the vessel. Generally I apply these plates and the grooves of the corrugated iron transversely to the length of the vessel; but in certain cases it may be found advantageous to apply them in the direction of this line. This is also a question of construction to be determined by the builder of the vessel. In this construction of armor for ships of war it will be seen that I combine the two most important and essential elements for such structures—to wit, cohesive resistance and elasticity. By

the combination of the imbricated plates and corrugated iron I cover the surface with a massive resisting medium equal to a solid mass of the same thickness, while by the peculiar structure of the corrugated iron I save from one-fourth to one-third of the material that would be required by a solid plating, such as is commonly used in defensive armor. But experience has proven that this mere massive resistance alone is not sufficient for defense against the modern improvements in guns and projectiles. No thickness of solid sides which a ship would be capable of floating with, it is now feared, can be considered as absolutely impenetrable to the improved weapons of modern warfare. It seems useless, therefore, to push the simple element of resistance from cohesive attraction further than it has already been carried in many instances. If we would do more than has yet been done in the production of defensive armor, and yet remain within the domain of practical applicability, we must invoke the assistance of some other property of matter and combine it with this massive or cohesive property. Nothing seems more apposite for this purpose than elasticity—one of the most important properties of matter. It is upon a proper combination of these two that I construct my improved iron-clad armor. The outer covering being made of separate bars, covered somewhat in the form of a bow, become themselves, as it were, a series of semi-elliptical springs capable of yielding to the effect of an exterior blow at any part of their extent, and more particularly at the more abruptly curved extremities which form the sides of the vessel. These rest upon and are firmly secured to a continuous plating of my improved corrugated iron, which in itself combines the greatest amount of resistance and elasticity that can be obtained from an equal amount of material, and these are finally sustained upon a series of columns or cylinders of vulcanized rubber, which not only aid in giving elasticity to the outer coverings, but act as so many "bumpers," to take off the shock which the heaviest projectile can give the ship.

The principle upon which my invention operates is familiarly but imperfectly exemplified in the cushion of a billiard table. Ordinarily these cushions have an outer covering of cloth which lasts for years, and upon which the ball projected by the arm of the most vigorous player, makes but a momentary impression, not separating or breaking the most tender fiber in its composition. Remove a certain portion of the elastic support of this cloth, and supply its place with a solid support of iron, marble, or even hard wood, and a feeble blow from the ball will destroy the entire texture of the cloth at the point of contact. Place my plating, without its vulcanized rubber or other elastic substance as a support, directly against the solid sides of the ship, without the possibility of its exhibiting any of its elastic properties, and it becomes like all other mere iron plating, and offers no other resistance to a projectile than is due to the cohesive attraction of its particles, or, in other words, its capacity to resist a crushing force.

Although I have spoken more particularly of india-rubber or vulcanized rubber for making the columns or cylinders B, I do not intend to confine myself to these materials, as the like elasticity of support may be given by metallic or other springs.

Having thus fully set forth the nature and mode of constructing my invention of an improved iron-clad armor, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The imbricated plates E and corrugated iron D, in combination with the columns or cylinders of vulcanized rubber B, substantially as described.

2. Fastening together the imbricated plates E and corrugated iron D by means of the rod F, as set forth, passing through the corrugations of each plate.

3. The combination of the imbricated plates E with the corrugated iron D, constructed and fastened substantially as set forth.

RICHARD MONTGOMERY.

Witnesses:
GILBERT B. TOWLES,
C. T. SMITH.