No. 47,796. PATENTED MAY 23, 1865.

S. D. CARPENTER.

SHIP'S DEFENSIVE ARMOR.

Fig. 1.

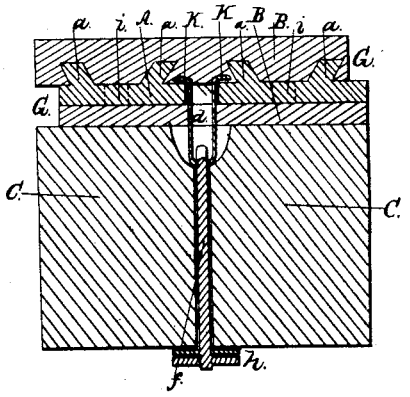
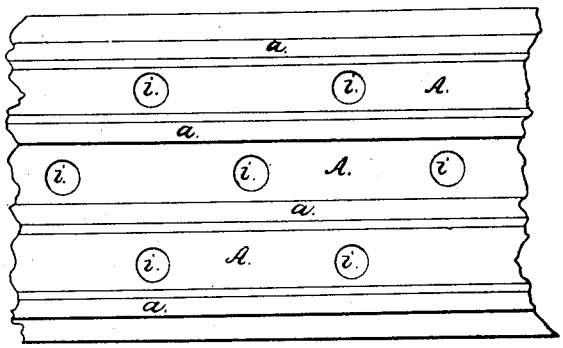


Fig. 2.



Witnesses.

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STEPHEN D. CARPENTER, OF MADISON, WISCONSIN.

IMPROVED SHIP'S DEFENSIVE ARMOR.

Specification forming part of Letters Patent No. **47,796**, dated May 23, 1865.

To all whom it may concern:

Be it known that I, STEPHEN DECATUR CARPENTER, of Madison, in the county of Dane, State of Wisconsin, have invented a new and useful Mode of Constructing Defensive Armor for Gun-Boats, War-Vessels, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and the letters of reference marked thereon.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and application.

I construct my gun-boat in any of the approved modes, preferring the outward-inclined angles with level deck, described in S. D. Carpenter's application for a patent, dated December 24, 1864. I then prepare my plating, which I make in segments or detached sections, of two by four feet surface, or such other shape and size as may be deemed most practicable for strength and durability, and also of the proper form and curvature to match the space each segment or section is designed to fit. These sections or segments I construct as follows: I first construct wrought-iron or steel plates of the proper size and thickness, (say one or more inches in thickness,) corrugated on one or both sides, but especially on the outward surface, as seen in Figures 1 and 2. This may be done by passing heated wrought-iron or steel between grooved iron or steel rollers, raising the ribs or corrugations to the proper height, (say from half to one or more inches,) as may be required for strength. The sides of these ribs or corrugations should be perpendicular, with square corners, as they pass through the first set of rollers. I then pass these plates between another set of rollers, having V-shaped rings to pass between each alternate groove, pressing the ribs apart so as to leave the dovetail space between each alternate groove or corrugation, as seen at *a a a a*, Figs. 1 and 2, or by forcing dovetail flat bars of steel between each rib or corrugation, the plate being well heated and the bar being cold, I produce a dovetail space between each instead of each alternate rib. I then perforate the wrought-iron plate with round holes, of one or more inches in diameter, at intervals, say, six or more inches, taking care that the proper number of holes shall be made in the proper locality for the insertion of my fastening-staples. These holes or perforations are represented by the letter *i* in Figs. 1 and 2. I then prepare wrought-iron staples, as seen at *d*, Fig. 1, which are shaped so as to pass sufficiently through the inner coating of cast-iron into the wooden wall of the vessel, to allow of the necessary play or free action for the eye of the fastening-bolt F, to prevent straining or fracture by the shock of projectiles and rebound of the armor. I make this staple of at least one inch round wrought-iron or steel, the two ends, when properly bent for use, coming sufficiently close together to pass through a hole in the wrought or steel plate, being flattened at their extremities, should, well heated, be inserted, as above stated, from the inner side, and well swaged to the outer surface of the aforesaid plate, turning the ends in opposite directions, as seen at K, Fig. 1. I would provide these plates with five or more staples, as will best conduce to strength.

When I have thus prepared my wrought-iron or steel plate and adjusted its proper size and shape, I prepare a mold in sand, in the usual way, by the proper pattern, taking care to provide for a chill of the outer surface, in the usual manner of producing chilled iron. I then place my prepared wrought-iron or steel plate in said mold, as I would a core, leaving the proper space on both sides of the same. My mold thus completed, I pour in molten cast-iron, after the usual manner, so as to cover my wrought or steel plate the proper thickness on both sides, connecting through the holes in said plate, as seen at B B, Fig. 1. The object of this combination is to present an outward surface so hard that no projectile can make an incision in its disk, and will be more likely to rebound from its surface, thus rendering it more secure from the effects of projectile forces, and at the same time by the intermediate wrought-iron or steel plate, corrugated and dovetailed, as above described, to secure tenacity and sufficient elasticity to prevent the hard, chilled surface from becoming detached, in case of fracture by collision or other cause. The plates should be cast with projecting lips or babbitt joints on each side and end, so as to lap or project over each other, say, one inch, and at the same time secure a smooth outward surface. This lip or projection for babbitting will be seen at G G, Fig. 1.

I make the plates secure to the outer surface of the vessel by means of a bolt with an eye at the outer end to lock with the eye of the staple, and screw, washer, and nut on the inside of the wooden wall C C, said bolt, nut, &c., being represented at F and *h*, Fig. 1. The open space between the eye of the bolt and the combined plating is intended to accommodate the sudden vibration or rebound of the plating caused by the concussion of projectiles.

The principal object in making the plates in segments or separate sections is to facilitate and cheapen their attachment, to replace one or more, even during an action, that may have been rendered vulnerable, and also in times of peace the vessel may be dismantled of its entire armor and employed in transport, cruising, or other service.

Fig. 1 is a transverse section. Fig. 2 is a top or front side view of the wrought-iron or steel plate before being coated with chilled iron.

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

Wrought-iron or steel perforated plates with dovetail corrugations, and the chilled cast-iron facing and backing with the attached staples, all for the purposes and substantially in the manner herein described.

STEPHEN D. CARPENTER.

Attest:
GEO. A. MATILE,
GEO. C. LAMBRIGHT.