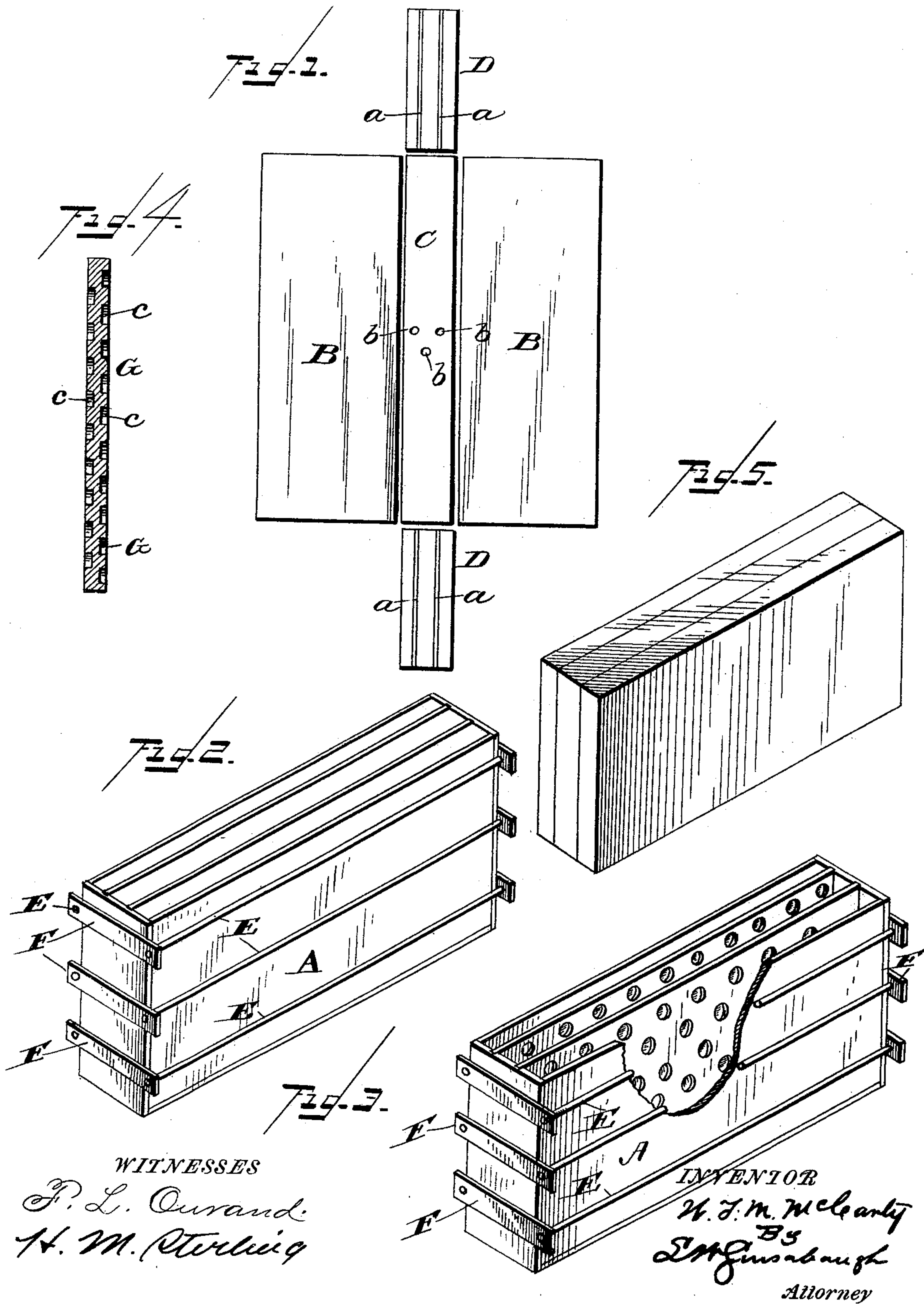


(No Model.)

W. F. M. McCARTY.
METHOD OF CASTING ARMOR PLATES.

No. 415,173.

Patented Nov. 12, 1889.



UNITED STATES PATENT OFFICE.

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PART TO SARAH C. ASHTON AND HEMAN DUDLEY WALBRIDGE, BOTH
OF WASHINGTON, DISTRICT OF COLUMBIA.

METHOD OF CASTING ARMOR-PLATES.

SPECIFICATION forming part of Letters Patent No. 415,173, dated November 12, 1889.

Application filed June 22, 1889. Serial No. 315,151. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. M. McCARTY, a citizen of the United States, residing at Hagerstown, in the county of Washington and State of Maryland, have invented new and useful Improvements in Methods of Casting Armor-Plates; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference
10 being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improved method of casting armor-plates for ships of war, and
15 has for its object the construction of armor-plates composed of layers of steel or other metal of different degrees of hardness in order to more effectually resist the force of the shot projected against it.

20 My invention therefore embraces the method of casting armor-plates, which consists in casting compound plates of two or more strata of steel of different hardness by placing division-plates in the molds of fusible metal, said division-plates being provided with cavities for the reception of a flux and case-hardening compound.

Referring to the drawings, Figure 1 is a top or plan view of the mold open. Fig. 2 is
30 a view in perspective of the mold when filled. Fig. 3 is also a view in perspective of the mold, showing the cavities in the division-plates. Fig. 4 is an edge view of the division-plates. Fig. 5 is a view in perspective of one
35 of the compound plates.

A indicates the mold in which the plates are cast, and is composed of the sides B, bottom C, and end pieces D, the whole being held and clamped in position by rods E and end
40 pieces F, in the usual manner. The end sections D of the mold are provided with grooves *a*, to receive and sustain in a vertical position the diaphragms or plates G, and the bottom of said mold is provided with openings
45 *b*, entering each compartment formed by the diaphragms, which communicate with suitable fire-resisting pipes, and through which

the molten metal is admitted to the different compartments of the mold.

The diaphragms or division-plates G are 50 made of cast-iron or other suitable metal which will melt as the molten metal is brought in contact therewith, the sides of said plates being provided with numerous cavities *c*, into which is placed a fluxing and case- 55 hardening compound, so that as the plates melt away a permanent joint is formed and a plate is produced which is not only homogeneous throughout, but case-hardened, and composed of two or more metals having dif- 60 ferent degrees of hardness, or a plate composed of layers of iron and steel, as may be desired. The forming of the cavities in the plates causes the plates to melt away quicker at these points, and allows the molten metal 65 in each compartment to mix and have interlocking joints, which also tend to hold the plates or sections forming the plates more firmly together. This process not only simplifies the manufacture of steel plates, ingots, 70 &c., but the cost of producing them is reduced to the minimum.

The fluxing or cementing compound is filled into the cavities in the plates G, and is composed of the following ingredients: Yellow 75 prussiate of potash, one-fourth; cyanide of potash, one-fourth; animal charcoal, one-half. These ingredients are mixed into a paste with either glycerine, glucose, or any other suitable vehicle to form a paste, which 80 is filled into the cavities of the plates and well dried to harden the flux in position.

The molten masses of metal of which the plates are formed are subjected to a vacuum to remove all the occluded gases, so that a 85 homogeneous mass may be formed, free from blow-holes, gases, &c., thus producing a molecular structure more dense and consequently stronger than by any other process, this process of vacuum treatment being embraced in 90 my patent, No. 404,723, of June 4, 1889.

What I claim is—

The method herein-described of making compound armor-plates, ingots, &c., which

consists in dividing the mold up into two or more compartments by fusible partitions or diaphragms, said partition-plates being provided with cavities containing a fluxing and
5 case-hardening compound, then flowing metals of different degrees of hardness through the bottom of the mold into the several compartments, as set forth.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

WM. F. M. McCARTY.

Witnesses:

L. W. SINSABAUGH,
H. M. STERLING.