

(No Model.)

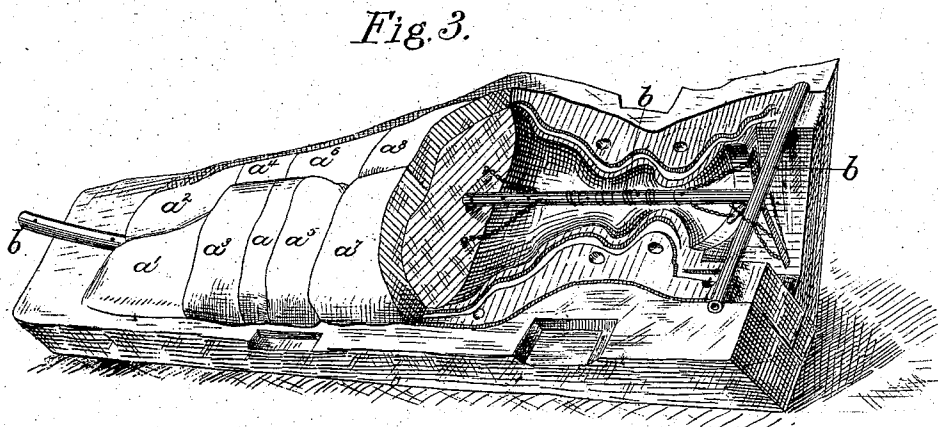
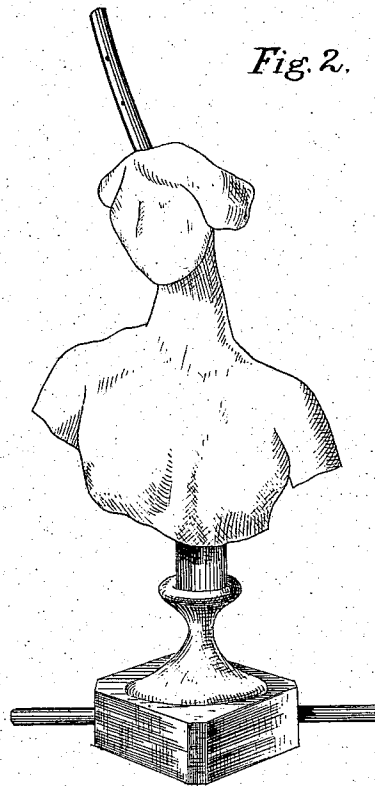
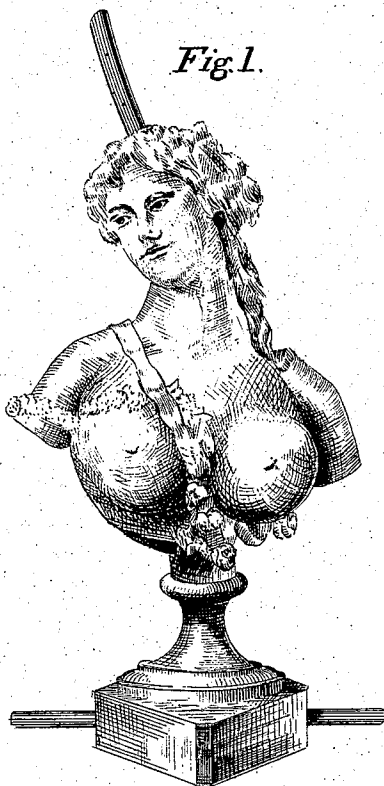
2 Sheets—Sheet 1.

C. A. LE BOURG & V. M. COSSÉ.

METHOD OF MOLDING WITH MOLTEN WAX FOR REPRODUCTION OF CASTS.

No. 537,297.

Patented Apr. 9, 1895.



Witnesses:
George Baumann
S. L. Connor

Inventors
Charles A. Le Bourg
Victor M. Cosse
By their Attorneys
Hobson and Hobson

(No Model.)

2 Sheets—Sheet 2.

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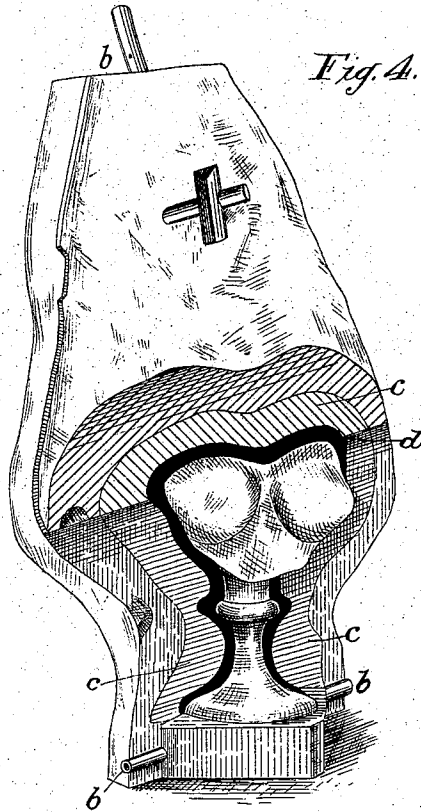


Fig. 4.

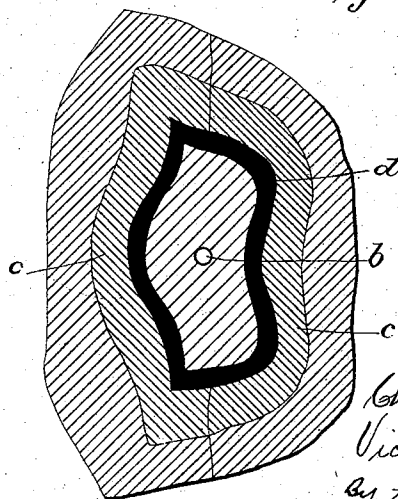


Fig. 5.

Witnesses
George Baumann
T. C. Connor

Inventors
Charles A. Le Bourg
Victor M. Cosse
by their Attorneys,

Howson and Howson

UNITED STATES PATENT OFFICE.

CHARLES A. LE BOURG AND VICTOR M. COSSÉ, OF NANTES, FRANCE.

METHOD OF MOLDING WITH MOLTEN WAX FOR REPRODUCTION OF CASTS.

SPECIFICATION forming part of Letters Patent No. 537,297, dated April 9, 1895.

Application filed February 28, 1894. Serial No. 501,801. (No model.)

To all whom it may concern:

Be it known that we, CHARLES AUGUSTE LE BOURG, manufacturer, and VICTOR MARIE COSSÉ, refiner, citizens of the French Republic, residing at Nantes, (Loire-Inférieure,) in France, have invented certain new and useful Improvements in the Method of Molding with Molten Wax for the Reproduction of Casts, of which the following is a specification.

The objects of our invention are to insure accuracy in the reproduction of casts in metal of works of art, together with economy of cost and simplicity of operation, to obtain smooth homogeneous cores capable of resisting heat in casting, and to avoid the necessity attending existing processes of retouching the casts produced.

Hitherto the methods in use of applying molten wax to the formation of patterns employed in the reproduction of metal casts have been attended with imperfections and uncertainty of results, besides extravagance in cost which has rendered them practically unprofitable. For instance the method in which the wax pattern is cut into sections and afterward pieced together on the core, destroys sharpness of form, besides involving considerable expenditure of time and labor, and being uncertain of success. Again, the present method of forming the core by pressing moist clay into a hollow wax pattern has the objection that evaporation during the drying of the clay core within the pattern injures this interior pattern, and detaches fragments therefrom. Another existing method, according to which a metal core is cast embedded in a plaster core, has the defect that gas liberated from the substance of the core by heat interrupts the flow of metal around the core, and so causes irregularities in the cast.

According to our invention we effectually obviate the defects and objections above described by improvements more particularly relating to the preparation of the patterns, the formation of the core, and the casting of the wax, the other parts of the operation remaining as in existing processes, and we attain our objects in the manner hereinafter described, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective elevation of a proof taken from a plaster reproduction

of the original object, Fig. 2 being a second proof of the same, reduced by scraping or grinding its surface. Fig. 3 shows the plaster core box, the upper part being formed in sections and tapered while its lower part may be made in one piece or in sections and tapered. Figs. 4 and 5 represent in section an elevation and plan respectively of the gelatine mold and core, prepared for the metal cast as hereinafter described.

Similar letters refer to similar parts throughout the several views, *a a* being sections forming the upper part of the core box to form the cores; *b*, metallic rod and core iron; *c*, gelatine mold; *d*, wax pattern representing thickness of metal to be cast.

In carrying out our invention we first reproduce the original object in plaster in any ordinary manner. Two proofs are taken from it. One of these proofs is retouched by the artist and forms a permanent artistic pattern. See Fig. 1. The other or reduced proof, shown in Fig. 2, has its entire surface scraped to a depth equal to the thickness of the metal cast required, and constitutes the pattern for producing the core. Both proofs are provided with similar dowels and joining pieces arranged in exactly the same manner.

The pattern shown in Fig. 1 is used for the production of a hollow gelatine mold, or a hollow plaster mold formed in sections, with a suitable shell or casing provided with dowels. The "reduced proof" shown in Fig. 2, is used to form a core box in sections, upon the casing of which are shown the dowels.

The plaster core-box Fig. 3 has its upper part formed in transverse sections *a*, of narrow dimension, each section being numbered. Prepared clay is rammed into the core box thus constructed by removing the upper part of the core box shell and sections, a suitable metallic rod *b*, with core iron and cross-piece, being placed upon the uncovered lower part so that the clay of the core will be supported by the core iron, which serves also to form the necessary dowels. The first section of the upper part of the core box being then put in place, pressure with the fingers is applied upon the clay within the cavity of the core box. The sections *a* are finally inclosed in their shell and the formation of the core is completed when it has dried and set to the

necessary consistency, it being then a seamless homogeneous piece of clay having a metallic rod or core firmly embedded in its substance. In the composition of this clay it is essential that there should be no calcareous constituent. With the same core box as many cores as are required may be formed each reproducing accurately "the reduced proof" of the model. The core thus constructed is placed in the hollow mold of gelatine or in the plaster sections formed from the proof pattern or model, Fig. 1, by fixing its dowels or joining pieces in the lower half of the shell containing half the gelatine mold *c*. See Fig. 4. The gelatine is withdrawn from the upper shell and placed upon the uncovered part of the core. Thus the core is entirely surrounded by gelatine as shown in Fig. 5, a space *d* being left between it and the gelatine equal to the thickness of plaster scraped from the second proof to form the reduced proof, Fig. 2. Into this space *d* the wax is cast. By this method of inclosing the molded core with wax, handling is dispensed with, and a successful cast is insured reproducing the model in its entirety and sharpness of form, and requiring no retouching by the artist. The single seam left by the mold may be readily removed by any ordinary workman. Several reproductions of the proof pattern may be obtained with the same gelatine mold. To complete the permanent mold we cover the wax proof on the core formed as above described with putty or prepared clay, and with a shell of sufficient rigidity. The mold so prepared is removed to a stove to melt and remove the wax. It is afterward placed in

a kiln to get rid of the organic matter, and finally the bronze is cast which takes the exact place of the wax and forms a faithful copy or reproduction of the proof model, Fig. 1.

The core constructed according to our invention has the advantages of capacity to effectually resist heat and molten metal, being non-calcareous. It is one seamless homogeneous piece firmly secured on the metallic core rod *b* embedded within it, and it gives out no vapor.

We claim as our invention—

1. The herein described process of producing hollow castings consisting in making from the original work or object to be reproduced, two proofs in plaster, one to be retouched by the artist, and producing from the one retouched the hollow mold, reducing the other, as by scraping over its entire surface, producing from this a core box, making cores from this latter, fitting the cores in the hollow mold and making hollow-castings from the two, substantially as described.

2. A core-box having its upper part formed of transverse sections *a* of narrow dimension, in combination with a metallic rod *b*, for the purpose of forming by means of ramming or pressing, a seamless homogeneous core supported in the manner shown, and as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

C. A. LE BOURG.
V. M. COSSÉ.

Witnesses:

D. BORHUI,
G. ROUQUI LAGUIRE.