J. F. COX.

METHOD OF MAKING MOLDERS' PATTERNS.

APPLICATION FILED APR. 8, 1908.

898,728.

Patented Sept. 15, 1908.

2 SHEETS—SHEET 1.

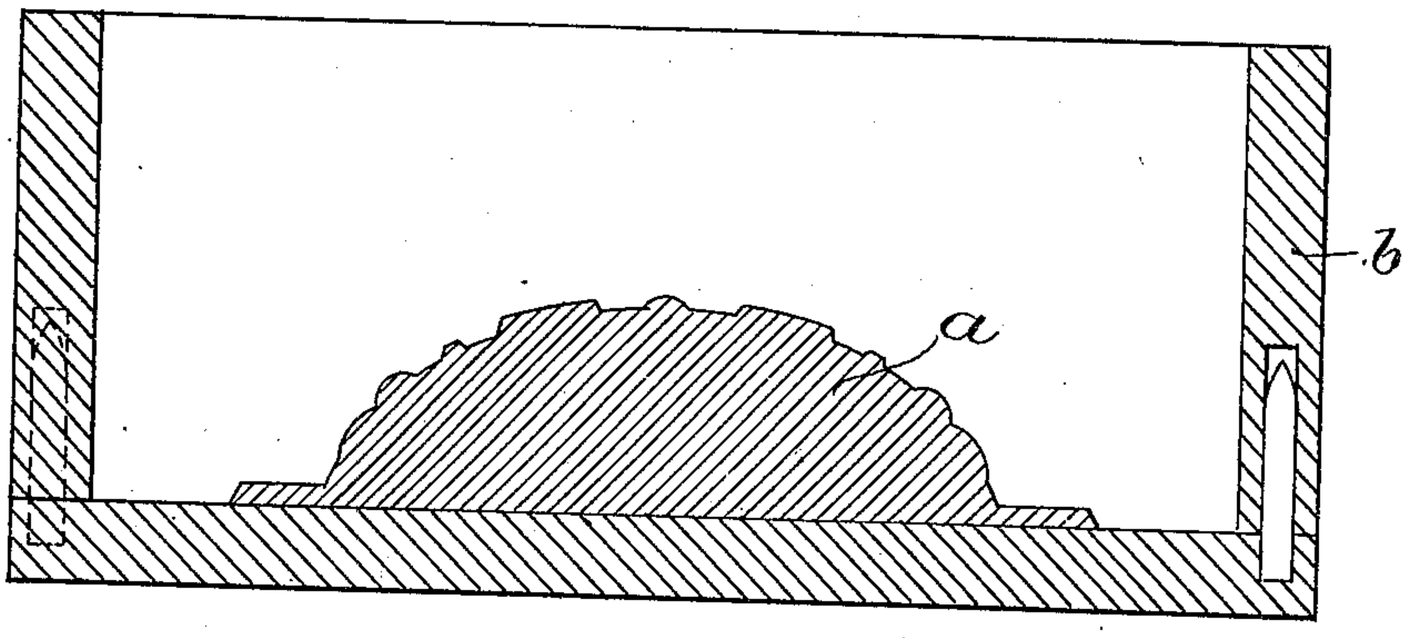

Fig. 1.

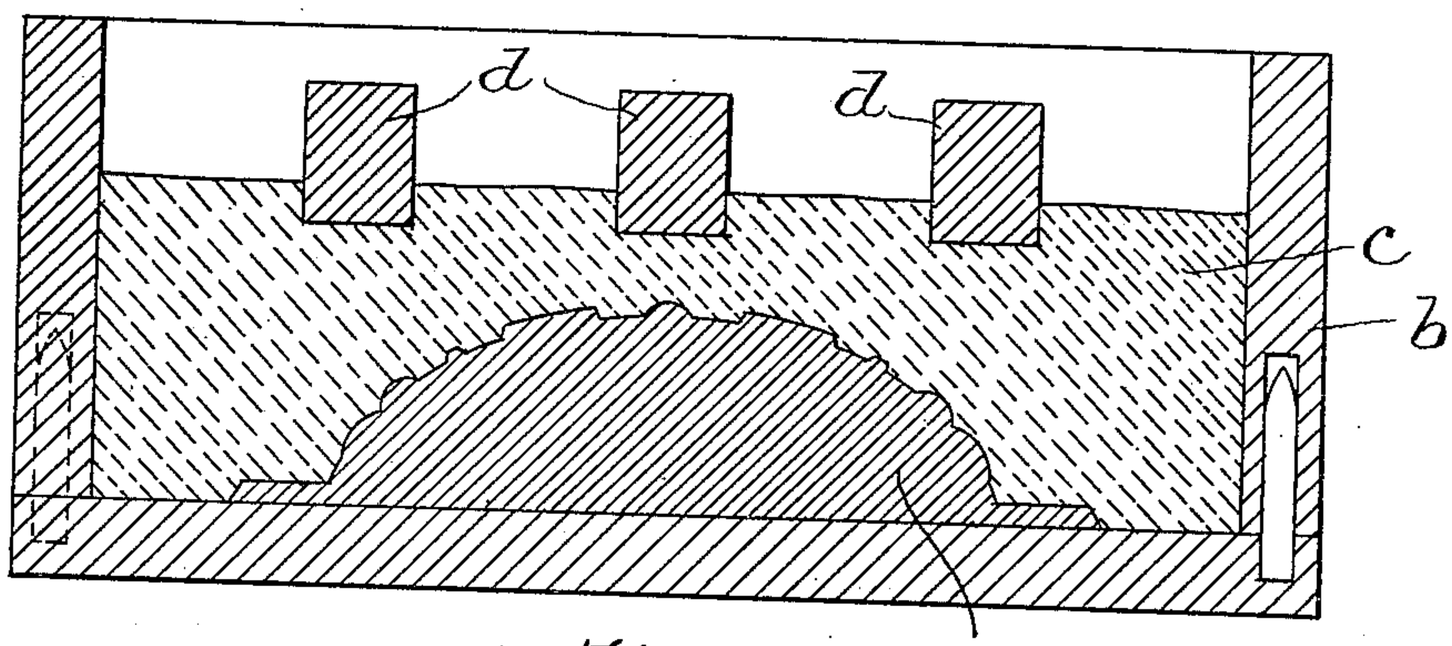

Fig. 2.

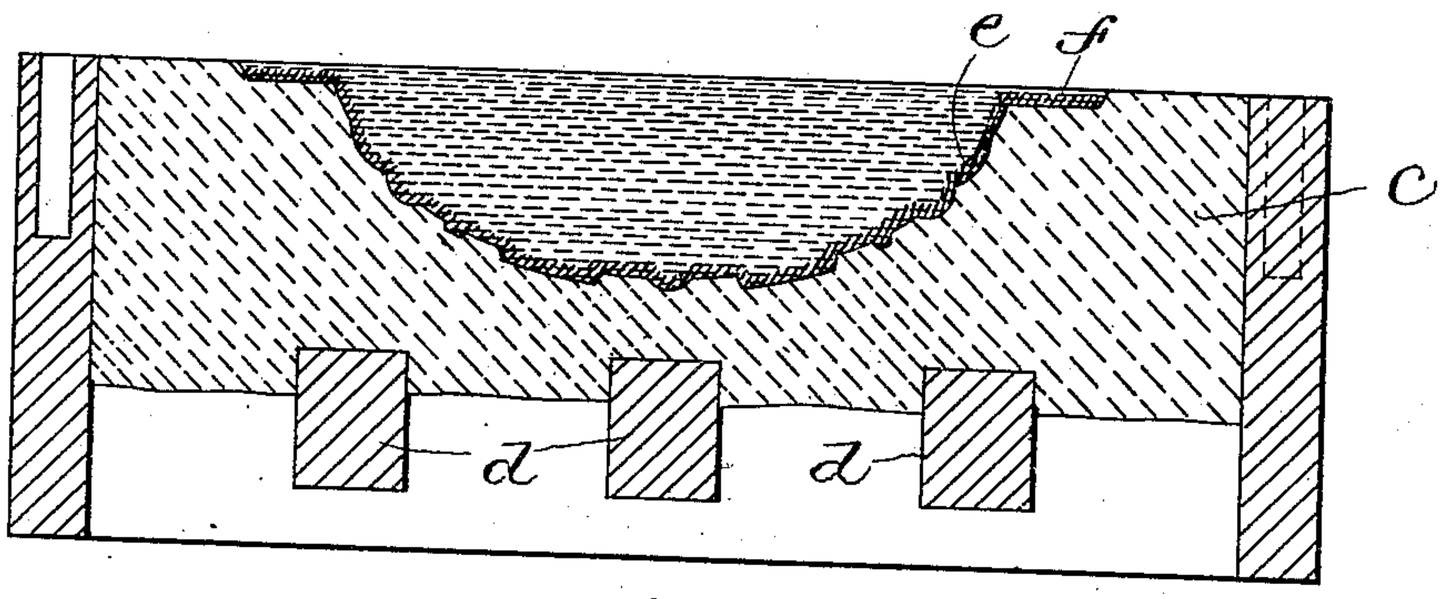

Fig. 3.

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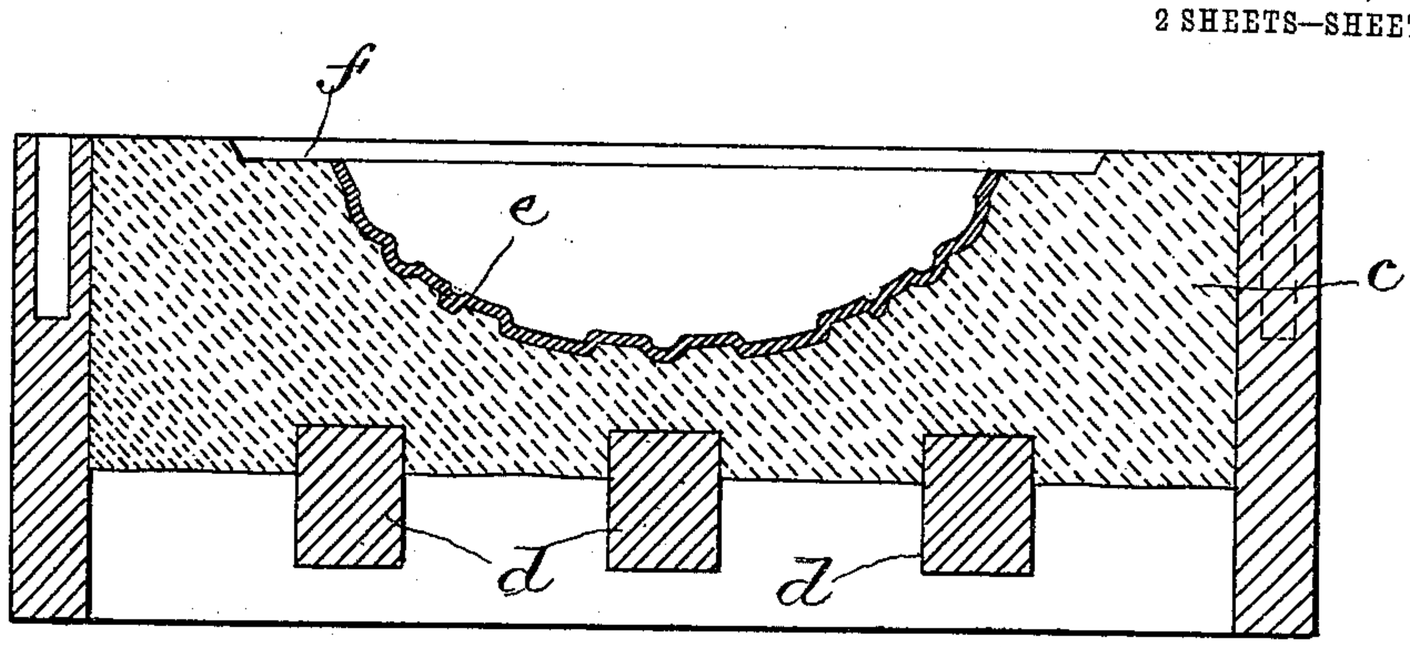

Fig. 4.

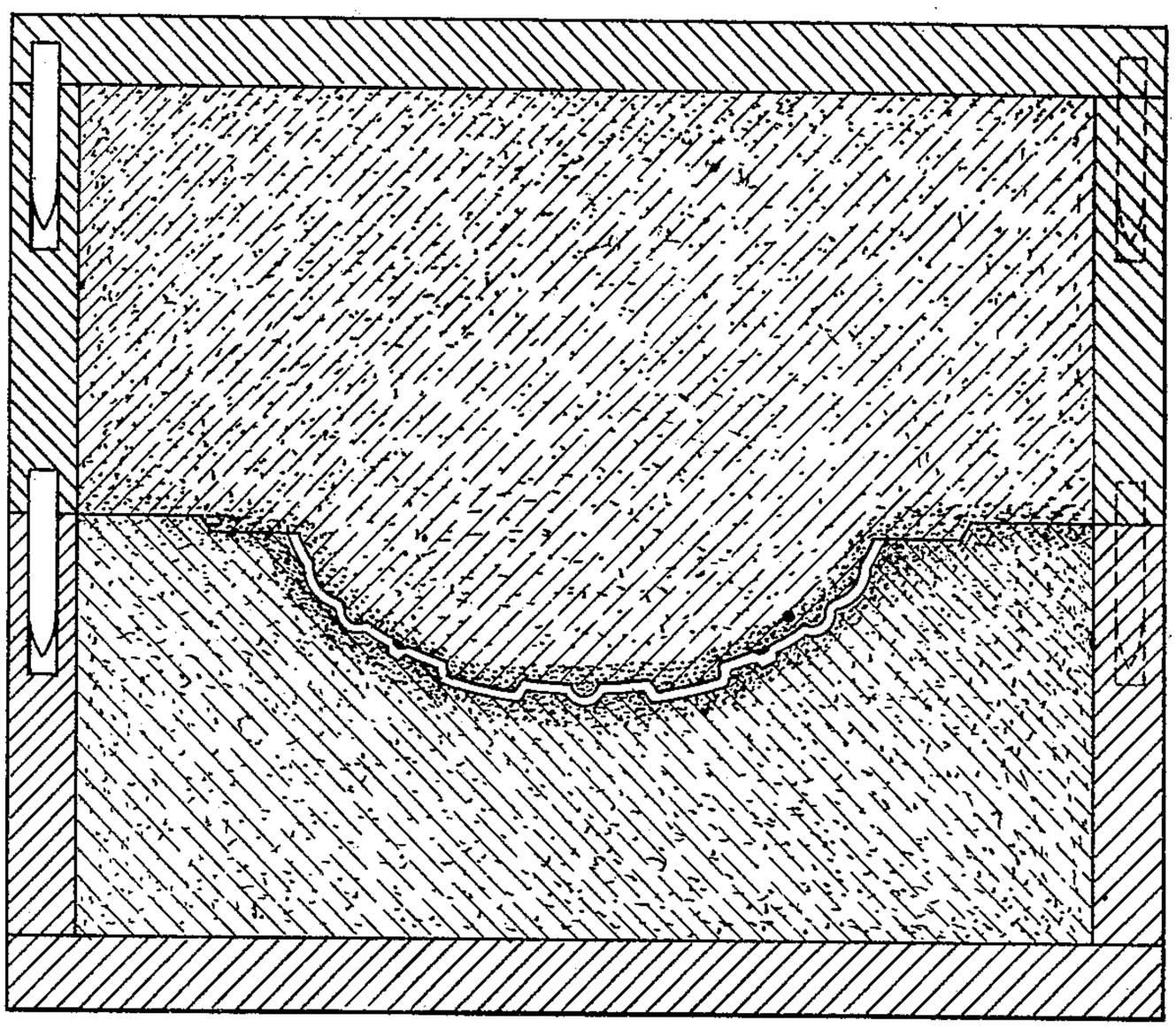

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOSEPH F. COX, OF WATERTOWN, MASSACHUSETTS.

METHOD OF MAKING MOLDERS' PATTERNS.

No. 898,728. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed April 8, 1908. Serial No. 425,829.

To all whom it may concern:

Be it known that I, JOSEPH F. COX, of Watertown, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Methods of Making Molders' Patterns, of which the following is a specification.

This invention relates to a method of making metal patterns which are used by molders or founders for the production of cast metal ware which shall possess a substantially uniform thickness regardless of the amount of ornamentation to be presented by the surface of the plate.

The especial object of my invention is to obtain a hollow pattern of even thickness from a solid or block pattern without requiring any manual operation of backing out the original wood pattern.

While my invention is capable of being utilized for the production of ornamental cast metal ware in general, it has been designed with especial reference for the production of stove patterns. As is well known, many portions of a stove are made of thin cast metal, the plates or ornamental sections being made quite thin, such as $\frac{1}{8}$ or $\frac{1}{10}$ of an inch in thickness, it being necessary to cast metal thin in order to produce good surfaces on the castings. Heretofore, so far as I am aware, the wood patterns used for this class of work have required the employment of wood carvers of considerable experience to "back out" or "shell" the wood pattern to reduce it to a substantially uniform thickness, the "backing out" being made of course to correspond with the raised ornamental portions on the face of the pattern. This work requires not only a high degree of skill but it is slow, because of the constant calipering of the wood. Frequently it takes a wood carver three days or more to "back out" or "shell" one wood pattern. My invention enables a master metal pattern to be produced by means of the face only of the original wood pattern, the work of the carver who "backs out" or "shells" the pattern being therefore dispensed with.

In the accompanying drawings I have illustrated some of the steps followed in practicing my improved method. Each of the Figures 1 to 5 inclusive, is a sectional view illustrating not only the steps of the method but parts of the usual molder's apparatus which may be employed in practicing the invention.

I first place the solid pattern *a* on the bottom or mold board of a flask *b*, preferably securing it by any suitable means on the bottom board. I then coat the upper face of the pattern and the inside of the flask with any suitable oil such as linseed oil, to prevent the plaster of paris, which is afterwards used, from adhering to the pattern and flask. So far the invention may be considered as illustrated in Fig. 1. I then pour plaster of paris into the flask to cover the upper surface of the wood pattern to a considerable thickness as indicated in Fig. 2, wherein the said plaster of paris is indicated at *c*. In order to hold the plaster of paris firmly within the sides of the flask after the latter has been inverted, as hereinafter described, any suitable supporting means such as braces *d* may be embedded in the plaster of paris before it has set, the ends of the braces being secured to the sides of the flask or held in any suitable way. When the plaster of paris has set, the flask is inverted and the bottom or mold board and the pattern are removed, the concave surface of the plaster of paris being then presented uppermost as indicated in Fig. 3. I then fill or partially fill the concavity with water so as to uniformly cool the plaster. If the concavity is not completely filled, the water will be dashed around so as to practically uniformly moisten or cool all of the surface. Most of the water can be then permitted to soak into the plaster of paris. Having thus obtained a uniformly cooled molding surface of plaster of paris, I fill the concavity with melted wax and leave the same long enough for a film to solidify in contact with the concavity of the plaster. I have found, in practice, that with the surface of the plaster chilled to some 60°, a solidified wax film of about $\frac{1}{8}$ of an inch thick will form in thirty to forty seconds. I then pour out the surplus wax, leaving a film of wax *e* as indicated in Fig. 4, which film will be practically of uniform thickness and will possess an inside and an outside configuration conforming to the surface of the original pattern *a*. Of course the thickness of the film or wax pattern *e* will depend upon the relative temperatures of the plaster of paris and wax when first brought together, and upon the length of time that the wax is

left in the position shown in Fig. 3 before being tipped or poured out. The marginal portions *f* of the wax film are trimmed off, the wax pattern being left supported by the plaster.

The next step is not illustrated as it will be readily understood from the following description. The founder uses the wax pattern *e* to get his cope impression in sand, and the original pattern is employed in the usual way to get the nowel impression in sand. The cope and nowel are then assembled in the usual manner as indicated in Fig. 5, the space between the two corresponding of course to the thickness that was given to the wax pattern or film *e*.

In Fig. 5 I have not attempted to illustrate the opening by which the cast metal is introduced into the space as the same will be readily understood without further description. This first casting of course produces a master pattern from which any number of duplicates can be made in the usual manner of the founder's art.

As will now be apparent my improved method completely takes the place of backing out or shelling of the original wood pattern, enabling the face alone of the latter to be employed to produce both sides of a casting which is then used as the master pattern.

It will be understood of course that the wax which is the only expensive material which I employ, may be melted and used repeatedly. The plaster of paris of course is broken up and thrown away.

I claim:—

1. The method of making an ornamental casting of substantially uniform thickness, consisting in making a plaster cast from the pattern, filling the cavity in the cast with a fluid material capable of hardening to a thickness varying according to its temperature and the period of contact with the cast whereby a lining is formed in the cast, pouring off the surplus or unhardened material, producing sand molds from the said lining and the pattern, and then assembling the sand molds and casting metal between them.

2. The method of making an ornamental casting of substantially uniform thickness, consisting in making a plaster cast from the pattern, uniformly chilling the plaster cast, then lining the chilled cast with wax, producing sand molds from the wax lining and the pattern, and then assembling the sand molds and casting metal between them.

3. The method of making an ornamental casting of substantially uniform thickness, consisting in making a plaster cast from the pattern, wetting the plaster cast to uniformly chill it, lining the chilled cast with wax, producing sand molds from the wax lining and the pattern, and then assembling the sand molds and casting metal between them.

4. The method of making a metal pattern of substantially uniform thickness, said method including molding a reverse of the face of a wood pattern, treating said reverse to cause all of its surface to possess a substantially uniform temperature, filling the cavity, of said reverse with a fluid material capable of hardening by contact with said reverse to form a film, pouring off the surplus or unhardened material, and then making a cope impression from the inner surface of the film.

5. The method of making a metal pattern of substantially uniform thickness, consisting in forming a molded reverse of the face of a block pattern, treating said reverse to cause all of its surface to possess a substantially uniform temperature, filling the cavity of said reverse with a fluid material capable of hardening by contact with said reverse to form a film, pouring off the surplus or unhardened material, then making the cope and nowel impressions from the film and block pattern respectively, and then casting a metal pattern from said impressions.

6. The method of reproducing the face of a wood pattern to form both surfaces of a metal pattern, said method consisting in forming a molded plaster of paris reverse of the block pattern, wetting the molded plaster to uniformly chill it, lining said molded reverse with a wax film, then making the cope and nowel impressions from the film and block pattern respectively, and then casting a metal pattern from said impressions.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOSEPH F. COX.

Witnesses:

F. R. ROULSTONE,

P. W PEZZETTI.