

No. 890,665.

PATENTED JUNE 16, 1908.

F. M. LAWRENCE.  
METHOD OF MAKING MOLDS.  
APPLICATION FILED FEB. 20, 1907.

Fig. 1.

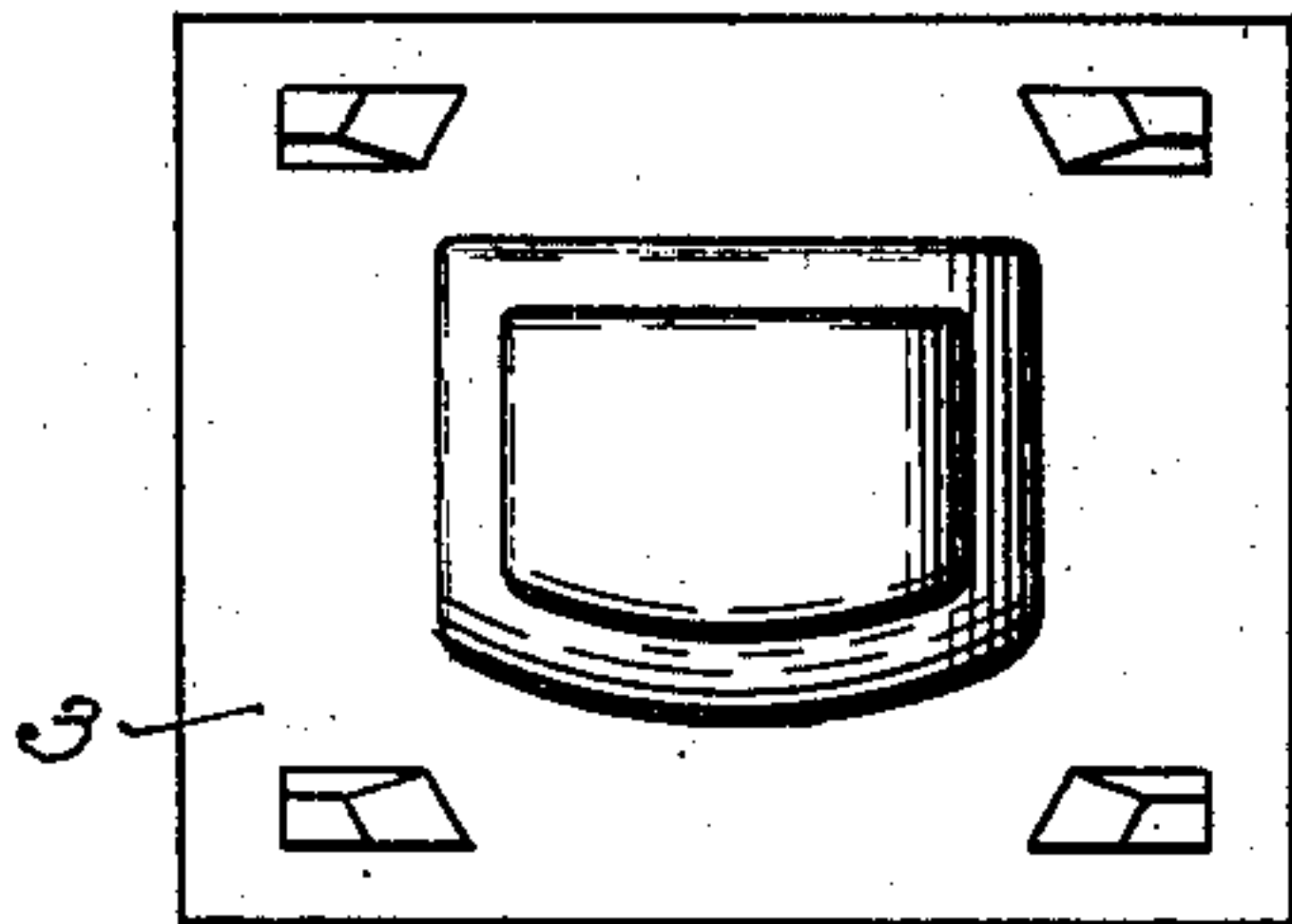


Fig. 2.

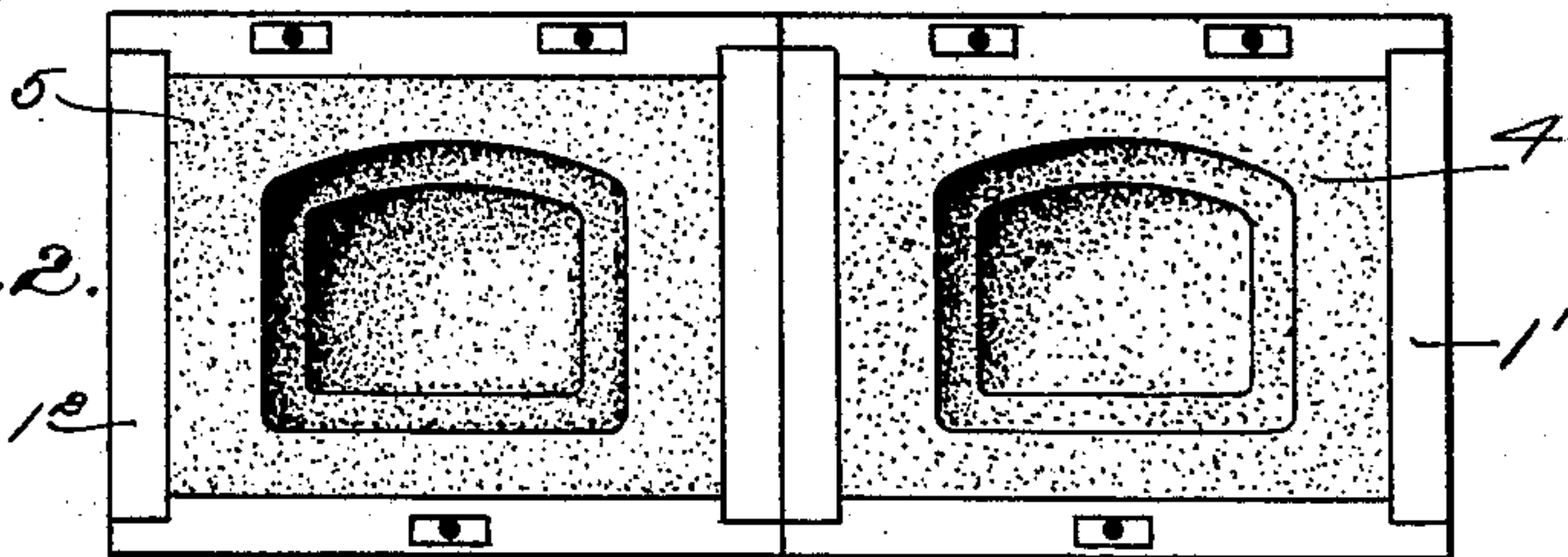


Fig. 3.

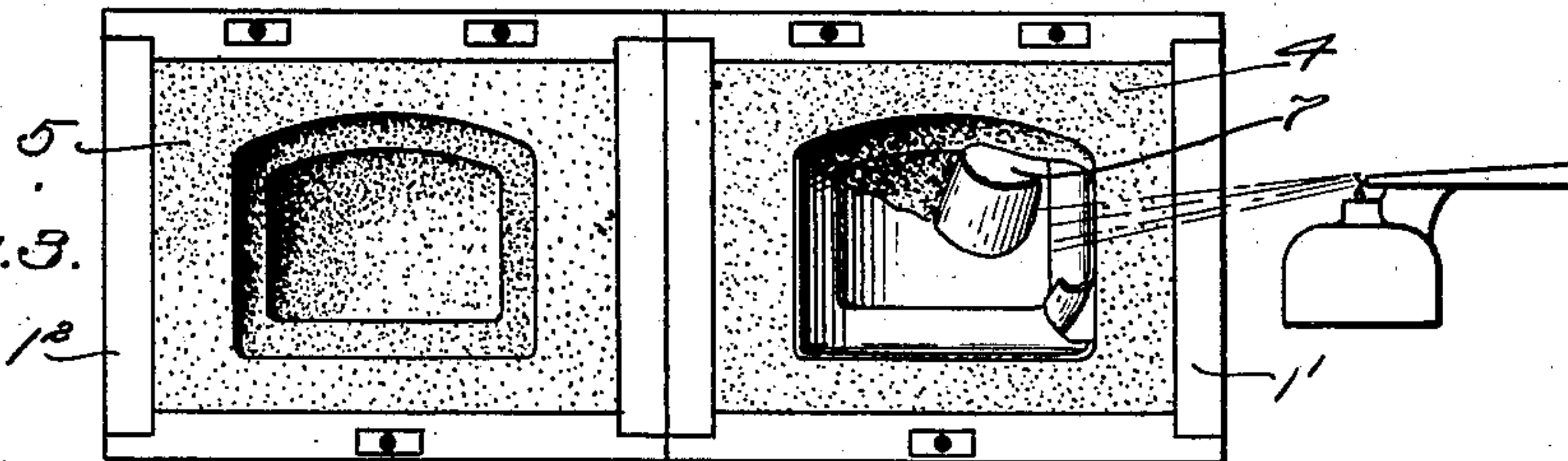


Fig. 4.

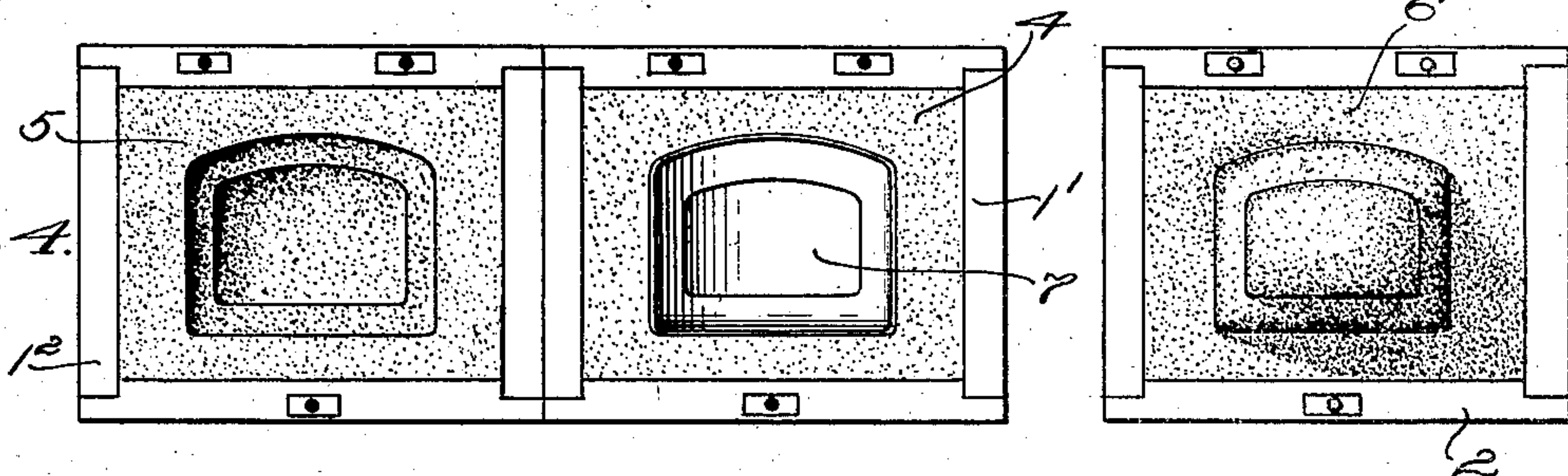
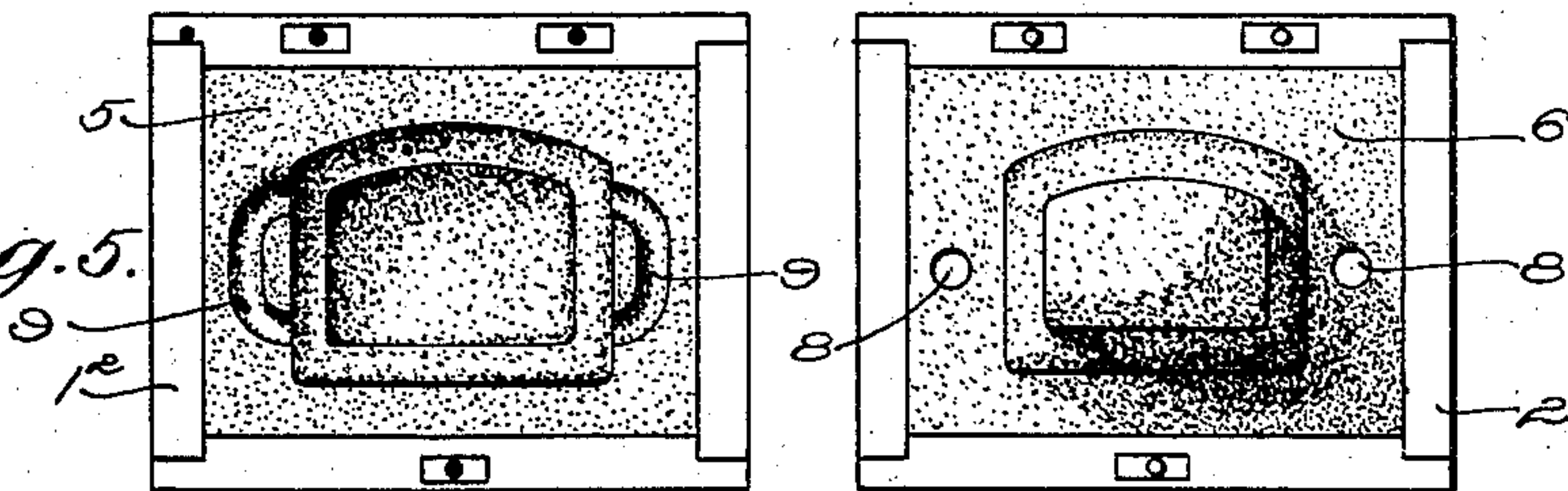


Fig. 5.



Witnesses:  
Koran. Co. Small.  
R. B. Ellms.

Inventor:  
Franklin M. Lawrence.  
by Ellis Spear Jr.  
Att'y



# UNITED STATES PATENT OFFICE.

FRANKLIN MUZZY LAWRENCE, OF PORTLAND, MAINE.

## METHOD OF MAKING MOLDS.

No. 890,665.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed February 20, 1907. Serial No. 358,489.

*To all whom it may concern:*

Be it known that I, FRANKLIN MUZZY LAWRENCE, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Methods of Making Molds, of which the following is a specification.

This invention relates to the method of forming molds for metal castings and particularly to the forming of molds of ordinary molder's sand for casting articles after a carved or ornamental block pattern in which the thickness of the casting is desired to be uniform throughout.

It has been customary heretofore to secure the desired separation between the parts of such molds by carving or shaving down the cope impression. This is a laborious and expensive method as it requires a workman especially skilled to equalize the thickness of all parts which are raised and vertically inclined.

It is the object of my present invention to provide a method which shall be simple and easily practiced with ordinary block patterns and using ordinary molding sand with which castings are usually made.

In the practice of my method, which will be more fully set forth in the following description, molds are produced which are accurate in the relation of their various parts and this accuracy is secured in the ordinary molder's sand without the necessity of carving by skilled labor the parts of the mold.

In the practice of this method I employ a two part wooden flask, the bottom half designated as a nowel box and the top half as a cope box. When filled with sand for casting they are known as nowel and cope.

For the purpose of making my invention clear I have illustrated and will describe a flask arrangement by which my invention may be practiced.

Throughout the specification and drawings the various parts are referred to by like reference numerals which indicate the corresponding parts throughout.

In the drawings Figure 1 shows a block pattern of a stove panel, Fig. 2, primary and secondary nowel from said pattern, Fig. 3, a similar view showing primary nowel lined, Fig. 4, a similar figure showing in addition a cope rammed from the lined primary nowel, and Fig. 5, the cope and secondary nowel gated for assemblage.

1 are identical nowel boxes and 2 a cope box.

3 is a block pattern of a stove panel. These panels are usually decorated in relief and are one of the difficult castings in stove foundry work to produce satisfactory as the variations in temperature to which they are subjected render them liable to crack unless they are produced with practically uniform thickness throughout. In practicing my method, therefore, in connection with the production of such an article, I proceed as follows: From a block pattern 3, shown in Fig. 1, I ram up twin primary and secondary sand nowels 4 and 5 in identical nowel boxes 1<sup>1</sup> and 1<sup>2</sup>. Taking the primary nowel 4 in the box 1<sup>1</sup> I treat the surface of the sand with silicate of soda or some other agent to harden its surface structure. This treatment may be given with a brush, or, in any other suitable manner. I then prepare a pliant and impressionable ductile flex which I roll out in the form of a sheet 7 of the thickness desired in the casting to be produced. This plastic material is preferably a specially prepared sedimentary clay. The primary nowel 4 is then lined with this flex sheet which is laid on to and lightly touched into the surface irregularities of the nowel. The lined primary nowel is then sprayed with shellac (as indicated in Fig. 3), or other suitable substance, to which the sand cope will not adhere when formed therein. In the primary nowel thus lined and prepared I ram in the cope box 2, which is placed on the nowel box 1<sup>1</sup>, a sand cope 6. I find that in ramming up the sand cope 6 on the primary sand nowel 4, treated as described and having the interposed ductile flex sheet 7, the said sheet and treated primary nowel will so mutually adapt themselves along the lines of raised or lowered surfaces in the design or pattern as to transmit to the sand cope 6 practically an identical configuration of the original pattern uniformly radially decreased by just the amount of the casting desired to be produced. I then remove the cope 6 thus formed in the primary nowel 4 and provide it with sprue holes 8 which connect with gates 9 formed in the sand of the secondary nowel 5. The parts thus assembled will constitute a mold having interior surfaces of corresponding configuration separated by a space uniform throughout of the thickness desired in the casting.



The action of the ductile and impressionable flex sheet on the surface of the primary nowel and the formation of the sand cope in such a lined nowel is of great importance as only the ordinary skill of the average molder is required and no unusual foundry process or material is necessary. The ordinary molder's sand, when handled and treated as described, works to complete satisfaction. The sand cope thus prepared and used with the secondary nowel gives a mold of practical uniformity throughout and one in which the sharpness of the casting is not lost by any intermediate steps of reproduction.

Where a great number of articles are to be made the casting may be taken for a pattern, finished off, and molded in the usual manner, but, very often it is desired to make only a few articles for a small order, in which case it is possible to save the expense of preparing the casting for molding because the primary lined nowel, prepared as above indicated, may be used for the production of any number of copes and the number of nowels may be multiplied correspondingly from the original block pattern. Should but one casting be desired for a metal pattern, the primary nowel box may have its contents removed and the secondary sand nowel may be made with it direct from the block pattern. Care should be taken in securing uniformity in the blocks and centering studs and some equivalent device should be used to bring the parts into proper relation.

What I therefore claim and desire to secure by Letters Patent is:

1. The method of making molds consisting in preparing from a single block pattern a primary and a secondary molding nowel identical in form and structure, in lining the

primary nowel with a sheet of plastic material coated to prevent adhesion by the cope and having the thickness desired in the casting, in forming in the primary nowel thus prepared a sand cope, and then assembling the cope with the secondary nowel for casting in the usual manner.

2. The method of making molds consisting in preparing from a single block pattern twin primary and secondary identical sand nowels, in hardening the primary sand nowel, in lining said primary nowel with a sheet of plastic material treated as described and having the thickness desired in the casting, in forming in the primary nowel thus prepared a sand cope, and then assembling the said cope with the secondary nowel for casting.

3. The method of making molds consisting in preparing from a single block pattern twin primary and secondary identical sand nowels, in hardening the surface of the primary sand nowel with silicate of soda, in lining said primary nowel with a sheet of plastic material treated as described and having the thickness desired in the casting, in forming in the primary nowel thus prepared a sand cope, and then assembling the said cope with the secondary nowel for casting.

4. The method of making molds consisting in preparing from a single pattern a plurality of sand nowels identical in form and structure, in lining one of said nowels with a plastic sheet, and in forming in said lined sand nowel one or more sand copes.

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

FRANKLIN MUZZY LAWRENCE.

Witnesses:

GEO. H. H. LAWTON,  
ARTHUR P. HOWARD.