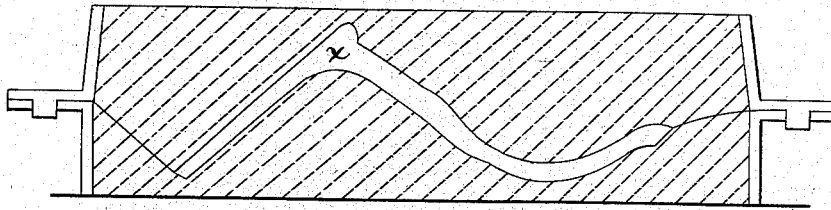


*F. N. Still,*

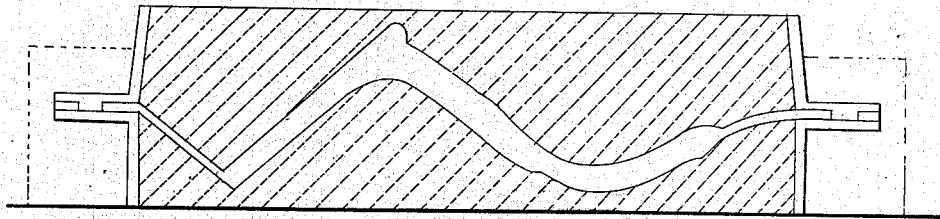
*Pattern for Castings.*

*No 7,915*

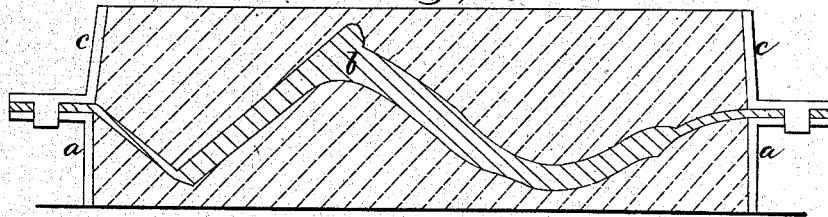
*Patented Jan. 28, 1851.*



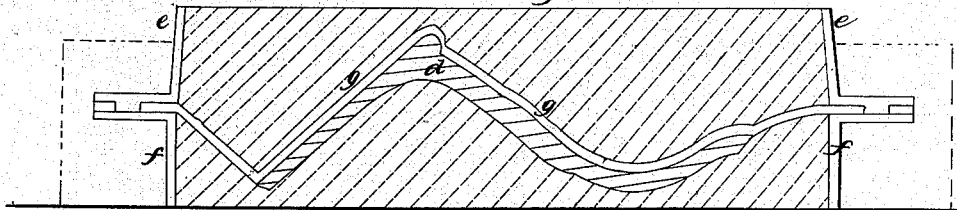
*Fig. 3.*



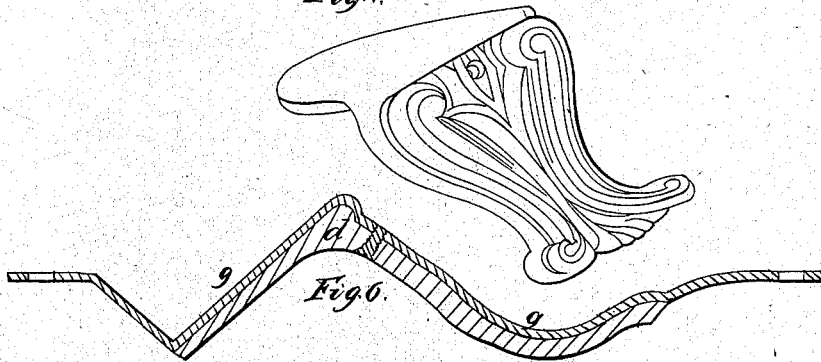
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*Fig. 7.*

# UNITED STATES PATENT OFFICE.

FRANCIS N. STILL, OF NEW YORK, N. Y.

## IMPROVEMENT IN METAL OR SECOND PATTERNS FOR CASTINGS.

Specification forming part of Letters Patent No. 7,915, dated January 28, 1851.

*To all whom it may concern:*

Be it known that I, FRANCIS N. STILL, of the city, county, and State of New York, have invented an Improvement in the Method of Molding for Obtaining Second Patterns and Castings; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes my invention from all other things before known, and of the manner of making, constructing, and using the same.

My invention relates to a method of preparing metal or second patterns for molding in sand to obtain castings. The molding of patterns of irregular figures is generally attended with great difficulty, particularly when the pattern is not made in parts, which is usually the case with second patterns—that is, castings in metal made by molding the original wooden pattern in sand. The chief difficulty arises from the separation of the sand in the two-part flask, so that after the pattern has been removed the two parts of the mold shall come together properly. This is avoided by a method now in use of producing the metal or second pattern by first molding the block-pattern (the wooden pattern) in sand in the two-part flask, and, after the block-pattern has been removed, separating the cope from the nowel to the distance of a quarter of an inch, more or less, and, after the said open space has been closed up all around with sand or other means, running in the metal, which will produce a casting with each half of the pattern cast on one side of a plate equal in thickness to the space left between the two parts of the flask, the edges of the said plate corresponding in form to the outside of the flask. The casting thus produced is to be used as the second pattern from which to mold in sand, the two parts being each molded on one face of the plate, so that when the pattern is removed the two parts of the sand mold will come together accurately; but the form of the pattern is sometimes such that if cast on a molding-plate, as above described, in cooling the contraction will be unequal and cause the plate to bend, and, besides this, most foundries have large collections of metal or second patterns made and collected at great expense.

The object of my invention is so to prepare metal or second patterns as to avoid all these difficulties, and at the same time make use of

metal or second patterns already prepared without the molding-plate; and to these ends my invention consists in molding a metal pattern in sand in a two-part flask, and then separating the two parts of the flask to the distance of about one-quarter of an inch, more or less, and, with the patterns retained in one part of the mold, running in metal to cast a plate to fit that face of the pattern which was separated from the sand, so that when removed from the mold and the pattern secured to the plate the pattern should project from one face of the plate, the figure of the other face of the pattern being represented on the other face of the plate. The plate thus prepared and attached to the pattern is to be used in molding in the manner to be hereinafter described.

I will now describe one of the modes of procedure which has heretofore been employed. A block-pattern (represented at Fig. 1) is taken and molded in a two-part flask, as represented at Fig. 2, which is a longitudinal section of the pattern so molded. The pattern is then removed and the two parts of the flask put together, but separated as in Fig. 3, leaving a space of one-quarter of an inch (more or less) between the two, and walled up with sand all around the flask, to prevent the metal from running out of the space between the two parts of the flask. The casting produced from this will be such as is represented by Fig. 4, with one-half of the pattern projecting from each face of the plate. To mold from this second pattern, the nowel *a* is placed on one face of the pattern *b* and rammed full of sand. The nowel, with the pattern in it, is then reversed, and the cope *c* put onto the other face of the pattern, and that is also rammed full of sand.

The cope is then removed, the pattern taken out, and the two parts of the flask put together ready for casting. The casting produced from this molding will be like the original pattern except in its reduced size, due to the contraction of the metal in cooling; but the casting thus produced will be as much less than the second pattern as the second pattern is less than the original block-pattern, for there are two contractions from the original block-pattern.

For various kinds of castings the method above described will not do—such castings, for instance, as would from their peculiarity of form tend to warp the plate in cooling; and,

besides this, there is another inconvenience in practice.

For castings which require accuracy of size patterns previously made cannot be used to produce second patterns on the plan above described, on account of the two contractions above pointed out, the first in obtaining the second pattern, and the second in obtaining the casting from the second pattern.

To avoid the above difficulties is the object of my invention, and I take a metal pattern, *d*, such as one used in foundries, and this I mold in a two-part flask in the usual manner, and when so molded I lift the cope *e*, Fig. 5, from the nowel *f* to the distance of one-quarter of an inch, more or less, leaving the metal pattern *d* in the sand in the nowel, and after the mold has been surrounded, as in the first example, I pour in molten composition of metal consisting of zinc, nine parts; bismuth, two parts, and antimony, two parts, by weight. This will produce a plate, *g*, one face of which will be accurately fitted to one face of the metal pattern, while the other face of the said plate will present the same figure as that face of the pattern which is fitted to the plate. If in cooling the plate has become bent, it can be straightened, and then the metal pattern secured thereto by screws or rivets, as shown in Fig. 6. From the pattern thus fitted to a

plate I mold in the same manner as first above described.

The composition which I have above described will not contract in cooling, or, if at all, only to an immaterial extent. Any other metal or composition of metal may be used for the compound above specified; but in all instances it will be found advisable to use some compound or alloy which will not contract, or do so very slightly. The contracting of the plate will not, however, injure the pattern, as that face of the pattern which is to produce the part of the casting requiring accuracy can be left in the sand, so that the other face, not requiring accuracy, will be produced on the plate.

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

Preparing second patterns by molding metal patterns in two-part molds, and then separating the two parts of the mold, the pattern being left in the sand to cast a plate fitted to the metal pattern so molded as specified, so that the pattern can be attached to the plate and the two be used in molding to produce castings, substantially as described.

FRANCIS N. STILL.

Witnesses:

ALEX. PORTER BROWNE,  
CAUSN. BROWNE.