J. B. McCUNE.

CASTING DIE-PLATES.

No. 181,194. Patented Aug. 15, 1876.

Fig. 1.

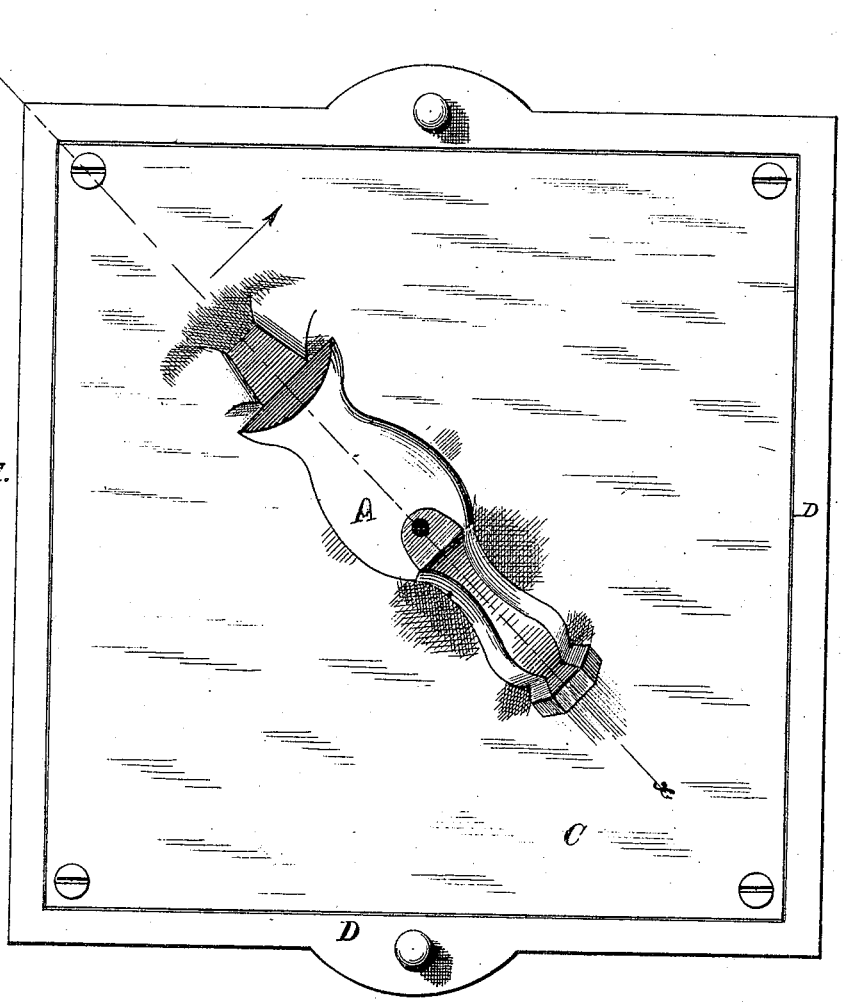



Fig. 2.

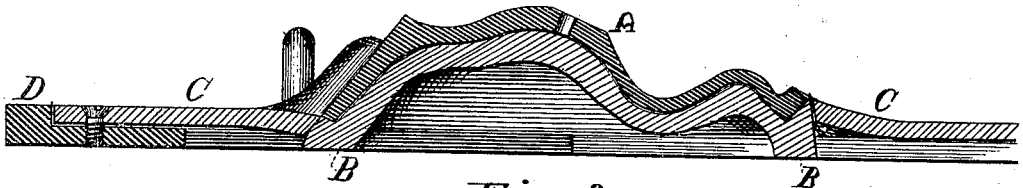
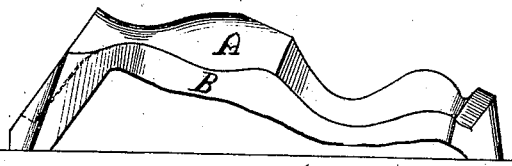



Fig. 3.

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JOSEPH B. McCUNE, OF HAMILTON, ONTARIO, CANADA.

## IMPROVEMENT IN CASTING DIE-PLATES.

Specification forming part of Letters Patent No. **181,194**, dated August 15, 1876; application filed July 13, 1876.

*To all whom it may concern:*

Be it known that I, JOSEPH B. McCUNE, of Hamilton, in the county of Wentworth, Canada, have invented certain new and useful Improvements in the Construction of Dies and Die-Plates for Forming Molds for Castings, of which the following is a specification:

This invention relates to certain improvements in the construction of patterns and pattern-plates for the formation of molds for metallic castings, and is designed to enable such molds to be made rapidly by machinery, being especially intended to be employed in connection with the apparatus for which Letters Patent of the United States were granted to me on the 11th day of January, 1876, No. 172,044, in which such pattern-plates are used in the process of casting by stamping the mold in the sand.

The ordinary method of forming molds in sand and other material for metallic castings by hand has been found a tedious and expensive process, requiring the services of a skilled mechanic. Attempts have been made, by the employment of metallic dies, to simplify the method of forming such molds, and enable the same to be constructed rapidly by machinery. To this end metallic pattern-plates have been used in connection with the ordinary patterns, such plates being constructed of sheet metal stamped into proper shape to fit around the patterns. Such plates have necessarily to be very accurately constructed, in order that both the pattern and bed may be removed from one side of the plate, which has rendered the construction of such plates from stamped metal very difficult, if not wholly impracticable, as well as extremely expensive. The principal object of my invention, therefore, is to overcome said objections by forming said pattern-plate from the pattern itself by first forming a pattern-bed, then casting suitable metal directly around and in contact with the pattern-bed, whereby the greatest accuracy is attained, and the pattern-plate is constructed at comparatively little expense.

In the drawing, Figure 1 represents a plan view of the pattern, pattern-plate, and its supporting-frame. Fig. 2 represents a sectional view of the same, showing the pattern-bed also; and Fig. 3, a detached view of the pattern and pattern-bed.

In the said drawing, the letter A represents the pattern, which may be constructed in the ordinary manner of wood, metal, or any suitable material; B, the pattern-bed; C, the pattern-plate; and D, a supporting-frame surrounding said plate.

In the construction of the pattern-bed I first prepare a half-flask with molding-sand in the same manner as for an ordinary mold, after which I embed the pattern therein, face downward, and tamp the sand around the same, as usual, and afterward work it off carefully around the line of parting. I then cover the surface with parting-sand, after which I place upon the half-flask another half-flask, and fill in and tamp with sand, forming the two sides of the mold. So far the operation is precisely the same followed in the preparation of the ordinary sand molds. The two half-flasks are then separated, the pattern being allowed to remain in the first-mentioned half-flask. To the top of said half-flask is then secured a section of a flask, or a frame similar to the supporting-frame, of a height corresponding to the thickness of the pattern-bed to be formed, and sand is filled in and built up carefully around the edges of the pattern to a height corresponding with the thickness desired in the pattern-bed. The last-mentioned half-flask is then secured upon the section, proper gates or channels having previously been made in the sand, and the metal poured in, filling the space between the pattern and the mold formed upon the sand in the sections and the upper or last-tamped half-flask, and forming the desired pattern-bed, the edges of which may be afterward dressed off to remove any irregularities; or, instead of forming the counterpart in the last-tamped half-flask, after the pattern is embedded in the first, the section may be attached to the first half-flask with the pattern embedded in the sand therein, and additional sand filled in and built around the pattern. The second half-flask may be then secured, and after dusting the surface of the sand and pattern with parting-sand, the counterpart may be formed, as before mentioned. The part of the mold-core formed in the last-mentioned half of the flask may then be

worked roughly off, so as to leave a proper space between it and the pattern when the parts of the flask are again placed together, and the metal is again cast in, as before; or I fill the first-mentioned half-flask with sand, and embed the pattern therein face downward, and then carefully work off the sand along the parting-line or upper edges of the pattern. After this is done I dust the whole surface with parting-sand, and then secure the other half-flask and ram in the sand as in the ordinary method of making a sand mold. Upon separating the two parts of the flask I have an exact impression of both sides of the pattern, as in the ordinary molds for casting metal. I then take the first-mentioned half-flask, containing the pattern embedded in the sand, and sink the pattern farther therein to a depth corresponding to the thickness of the pattern-bed to be formed. This may be done by gently rapping the pattern into the sand, being careful to preserve the contour of the edges of the sand, or by pressing the pattern firmly into the sand. The two parts of the flask are then secured together, the gates or channels being previously formed in the ordinary manner. It will be perceived that the last-mentioned part of the flask will contain the sand and face of the pattern-bed, the metal, on being poured in, occupying the space between said face and the reverse side of the pattern embedded in the first-mentioned part of the mold. The pattern-bed thus formed, when removed, is trimmed off, if necessary, and is ready to be used in the formation of the pattern-plate, as hereinafter described.

From the pattern A and pattern-bed B, thus constructed, the pattern-plate C is formed as follows: A half-flask is filled with sand, as usual, which is struck off. The frame D is then embedded in the sand until its upper edges are flush with the surface of the same, after which the pattern A and pattern-bed B are embedded in the sand within the frame D, the pattern uppermost. The sand is then carefully worked off along the parting-line or the lower edge of the pattern, after which another half-flask is secured to the first, and a counterpart of the sand, and embedded pattern in the same, is formed in said second half-flask in the usual manner. The parts of the flask are then separated, and the sand is carefully worked off below the parting-line of the pattern, along the edges of the pattern-bed, in a line as nearly parallel with the parting-line or lower edge of the pattern as possible, and at a sufficient distance therefrom to give the desired thickness to the pattern-bed when finished. The surrounding portions of the surface of the sand within the frame are also removed to a depth corresponding to the thickness of the pattern-plate C, to be formed, after which the two parts of the flask are properly secured together for casting, which is done in the ordinary manner, the metal filling in the space formerly occupied by the sand, which has been removed from within the frame, forming the pattern-plate C around the pattern A and its bed B.

It is evident from the above description that the pattern and pattern-bed may be constructed and used in one piece, when desired, being formed in such case by removing the pattern from the mold after the mold for the bed has been formed, and before casting, as will readily be understood by any founder.

I have described my invention as applied to the formation of molds for stove-legs, in which the pattern draws from only one side; but it is evident that it may be applied to the construction of molds for stove-plates, car-wheels, car-boxes, sewing-machines, and all other castings, whether drawing from one or two sides—in the latter instance two beds and pattern-plates being formed, one for each side of the mold.

It is obvious that other methods of forming the pattern-plates by casting the metal around the patterns may be employed, such as would naturally be suggested to any one familiar with the casting and founding of metals; and hence I do not confine myself to the precise details as hereinbefore set forth.

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

The process, herein described, of forming pattern-plates from the pattern itself by first forming a pattern-bed and casting metal directly around and in contact with the same, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

JOSEPH B. McCUNE.

Witnesses:

JAMES L. NORRIS,

CHAS. L. COOMBS.