Dec. 29, 1925. 1,567,897

H. F. BECHMAN

STEREOTYPE PLATE CASTING BOX

Original Filed June 10, 1922

Fig. 1.

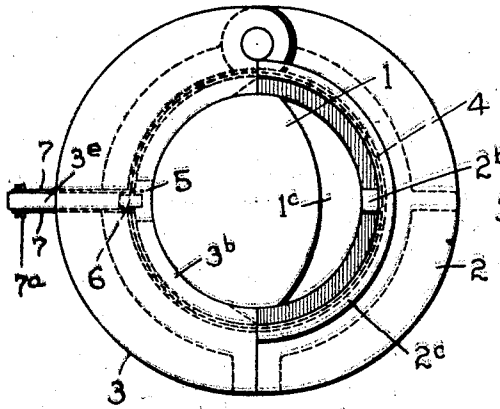


Fig. 3.

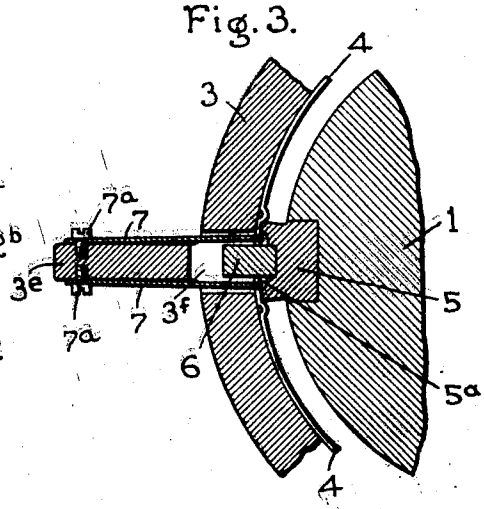


Fig. 2.

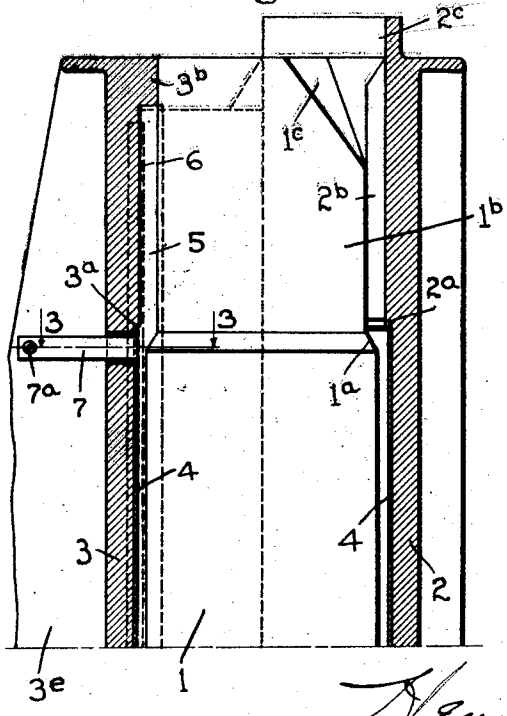
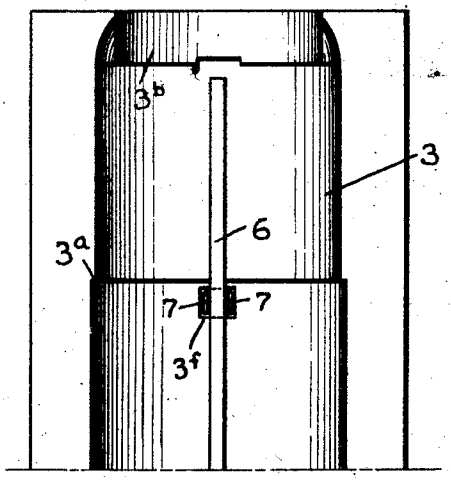


Fig. 4.



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UNITED STATES PATENT OFFICE.

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STEREOTYPE PLATE CASTING BOX.

Application filed June 10, 1922, Serial No. 567,343. Renewed September 28, 1925.

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Stereotype Plate Casting Boxes; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in stereotype plate casting boxes of the type shown in Patent #1,223,026 granted to me April 17, 1917. These boxes are adapted for casting so-called "tubular" stereotype plates such as shown in my Patent #945,678 of January 4, 1910, for example.

The objects of the present invention are to prevent shifting of the core in the mold under the action or pressure of the inflowing metal; to insure plates of uniform thickness; to automatically spread the matrix in the mold previous to the casting operation; and to improve the form of the core so that the inflowing metal itself will also tend to spread the matrix in the mold; to greatly reduce the amount of the waste metal head or "sprue" formed in casting the plate; and to do away with the necessity of using any tail piece or pouring sheet to direct the metal into the mold. These and other minor objects, hereinafter explained, are attained by the present invention.

The invention embodies novel improvements in the construction of the cope, the drag, the core, and the matrix positioning devices, such as illustrated in the accompanying drawings and hereinafter described; and the novel features of construction and novel combinations of parts for which protection is desired, are set forth in the claims following the description.

In said drawings:

Fig. 1 is a top plan view of the upper portion of the cope, drag, and core of a casting box of the type shown in my aforesaid patent.

Fig. 2 is a vertical section on the line 2—2 Fig. 1.

Fig. 3 is an enlarged detail transverse section on the line 3—3 Fig. 2.

Fig. 4 is a detail view of the inner side of the upper portion of the drag.

The drag 3, cope 2, and core 1 of the casting box may be constructed and arranged to operate substantially as described in my aforesaid patent, but improved as hereinafter pointed out, and therefore it is unnecessary to illustrate the entire casting box in the drawings, only the upper portions of the cope, core and drag being shown, which will suffice, in connection with the following explanation thereof, to impart a full understanding of the invention.

As shown the cope 2 is constructed substantially as in my said patent with the exeception that its upper portion is slightly contracted in internal diameter, as shown in Figs. 2 and 3, about the thickness of the matrix 4, just above the upper edge of the matrix thereby forming a shoulder or ledge 2^a which will prevent the inflowing metal striking on the upper edge of the matrix and entering between the back of the matrix and the walls of the cope or drag. This also prevents the metal stuffing the facing sheet from the matrix, where such sheet is used therewith.

As shown, the drag 3 is also constructed substantially as described in my aforesaid patent, but its upper portion above the matrix 4 is also slightly contracted in internal diameter, forming a shoulder 3^a coinciding with and complementary to shoulder 2^a, and like it to prevent the incoming metal striking or entering behind the upper edge of the matrix.

As shown the core is constructed substantially as described in my said patent, but the upper part 1^b of the core is reduced in diameter, beginning at a point just below the shoulders 2^a, 3^a; the reduced upper end of the core being connected with the lower cylindrical portion therof by a beveled portion 1^a, the lower edge of which is slightly below the shoulders 2^a, 3^a. This beveled portion 1^a directs the inflowing metal outwardly against the matrix 4; and such inflowing metal thus tends to automatically spread the matrix 4 outward and press and hold it closely against the inner walls of the drag and cope during the casting operation.

The drag 3 is also provided at its upper end and inner edge with an inwardly pro-

jecting flange 3^b which is adapted to closely contact with the reduced upper end 1^b of the core.

The cope 2 is also provided with a vertically disposed rib 2^b on its inner face above the shoulder 2^a, the inner edge of which rib is adapted to be engaged by the opposed surface of the reduced upper end 1^b of the core; and when the box is closed the end 1^b of the core is tightly clamped between the flange 3^b and the rib 2^b, thereby holding the core in true axial position between the cope and drag, thus insuring that the cast plate shall be of uniform thickness.

The cope 2 also has a semi-cylindric rib 2^c on its upper end which forms a shield or guard to direct the metal into the mold. The upper end of the part 1^b of the core is beveled as shown at 1^c, and the side adjacent the rib 2^b and flange 2^c when the box is closed, and the space formed between this tapered portion 1^c, the rib 2^c and upper end of the cope, forms a mouth into which the molten stereotype metal is poured to fill the mold in casting a plate.

The matrix 4 may be of any suitable kind, and is placed around the core below the shoulder 1^a and confined between the cope and drag, as explained in my aforesaid patent, and the vertical edges of the matrix 4 being separated by a vertical rib or space bar 6 formed on or attached to the inner face of the drag and projecting therefrom as shown, said bar 6 extending nearly to the rib 3^b.

The core is provided on its side adjacent rib 6 with a matrix-clamping bar 5 which is provided with a groove to receive the rib 6 (see Fig. 3) and is adapted to clamp the opposed edges of the matrix 4 at opposite sides of the rib 6, as explained in my said patent, and as shown in Fig. 3. The clamp bar 5 terminates just below the rib 3^b when the parts are in closed position, see Fig. 2.

In the present invention I also provide novel means for spreading the matrix when placed in the mold, so that it will lie closely against the interior surface of the cope and drag. As shown, flat springs 7 are fastened by screws 7^a to opposite sides of the exterior vertical rib 3^e of the drag and project into the mold through an opening 3^f in the drag, just below the shoulder 3^a and coinciding with the rib 6. The opening 3^f is slightly wider than the rib 6, and the inner ends of the springs 7 project slightly beyond the inner face of the drag at opposite sides of the rib 6. These springs 7 are adapted to engage the opposite edges of the matrix 4, as the latter is enclosed in the mold, and they tend to press these edges apart, thereby spreading the matrix in the mold and causing it to fit closely against the inner walls of the drag and cope below the shoulders 3^a, 2^a, just before the edges of the matrix are clamped against the inner wall of the drag by the locking bar 5, as shown in Fig. 3.

The locking bar 5 is provided with recesses 5^a adapted to coincide with the opening 3^f and permit free movement or play of the springs 7, so that the latter will not be caught by, nor interfere with, the locking bar 5.

The upper end of the rib 2^b is preferably beveled as shown in Fig. 2 to allow the molten metal when poured into the mouth to flow easily into the mold. This rib 2^b is adapted to form a slot in the "sprue" or "head" formed on the plate, during the casting operation by the metal in the spaces above the shoulder 1^a. When the box is opened (by swinging the cope 2 to one side) the rib 2^b is withdrawn from such sprue or head, leaving an open slot therein, which enables the plate with such sprue or head thereon to be easily withdrawn from the core when the latter is lowered.

When the box is open the cope is swung to one side and the core lowered. When ready to cast a plate the core is raised and a matrix 4 wrapped therearound with its opposite edges entered into the drag at opposite sides of the rib 6, the opposite edges of the matrix engaging the springs 7 which tend to hold them apart. Then the cope is closed and the matrix automatically positions itself in the mold beneath the shoulders 2^a, 3^a, and around the lower cylindric portion of the core; the springs 7 spreading the upper end of the matrix closely beneath the ledges 2^a, 3^a, until the locking bar 5 engages the opposite edges of the matrix and holds the same securely in position. The core is held securely in axial position within the box during the casting operation by having its upper end 1^b clamped between the flange 3^b and the rib 2^b.

The molten metal is poured into the core mouth (between the beveled portion 1^c on the upper end of the core and the flange 2^c on the cope), and the inflowing molten metal divided by the rib 2^b passes to the right and left thereof down under the flange 3^b, and descends around the end 1^b of the core until it strikes the shoulder 1^a, whereby it is deflected outwardly against the matrix, forcing the same closely against the inner walls of the drag and cope; the metal fills the space below the shoulder 1^a and between the matrix 4 and the core, thus forming the plate proper. The pouring is usually continued until the mouth is filled, the metal above the lower edge of the shoulder 1^a forming a sprue or head which is cut off the plate by suitable mechanism, after the plate and head are removed from the box.

What I claim is:

1. A stereotype casting box having a drag, a cope, and a core, the core having its upper end reduced in diameter beyond the plate forming portion, substantially as described.

2. A stereotype casting box having a drag, a cope, and a core, the core having its upper end reduced in diameter beyond the plate forming portion and adapted to be clamped between opposite portions on the cope and drag to hold the core in position when the mold is closed.

3. A stereotype plate casting box having a drag, a cope and core, the drag and cope each having a rib on its inner face beyond the matrix holding portions to engage the core and hold it in position when the mold is closed.

4. A stereotype plate casting box having a drag, a cope and a core, the core having its upper end reduced beyond the matrix holding portions of the drag and cope, and the drag having a rib on its inner face to engage the reduced portion of the core, and the cope having a vertical rib on its inner face to engage the reduced portion of the core, whereby the core is held in position when the mold is closed.

5. A stereotype casting box having a drag, and a cope slightly contracted in internal diameter beyond the matrix holding portions, substantially as and for the purpose specified.

6. A stereotype casting box comprising a drag and a cope, adapted to enclose a matrix, and spring means adapted to engage the opposed edges of the matrix, substantially as and for the purpose specified.

7. A stereotype casting box having a drag, a cope and a core, the drag and cope being slightly contracted in internal diameter beyond the matrix holding portions to prevent metal entering between the back of the matrix and the walls of the drag and cope, and the core having its upper end reduced in diameter opposite the contracted portions of the drag and cope.

8. In a stereotype box as set forth in claim 7, the cope and drag each having inwardly projecting portions adapted to engage the reduced end of the core to position the core in the box when the latter is closed.

9. A stereotype casting box comprising a drag, a cope, and a core adapted to enclose a matrix, and spring means projecting through an opening in the drag, adapted to engage the opposed edges of the matrix and position it in the box when the same is closed.

10. In a stereotype casting box as set forth in claim 9, the core having its upper end reduced above the matrix, and the drag and cope having inwardly projecting ribs adapted to engage the reduced end of the core.

11. A stereotype casting box comprising a drag, a cope, and core adapted to enclose the matrix, spring means adapted to engage the opposed edges of the matrix and position it in the box when the same is closed, and a bar on the core adapted to engage the edges of the matrix when the box is closed.

12. A stereotype plate casting box having a drag, and a cope, the cope having a rib on its inner face to form a slot in the "sprue" when the plate is cast, substantially as described.

13. A stereotype casting box comprising a drag and a cope adapted to enclose a matrix, and spring means adapted to spread the matrix in the box as the latter is closed, substantially as and for the purpose specified.

14. In a stereotype casting box as set forth in claim 7, spring means adapted to engage the opposed edges of the matrix and position it in the box as the same is closed, substantially as described.

15. In a stereotype casting box as set forth in claim 7, spring means adapted to engage the matrix and position it in the box, substantially as described.

16. A stereotype casting box comprising a drag, a cope, and a core adapted to enclose a matrix, and spring means adapted to engage the matrix and position it in the box when the same is closed.

17. In a stereotype casting box as set forth in claim 16, the drag and cope having ribs on their inner faces adapted to hold the core in position when the mold is closed.

In testimony that I claim the foregoing as my own, I affix my signature.

HENRY F. BECHMAN.