

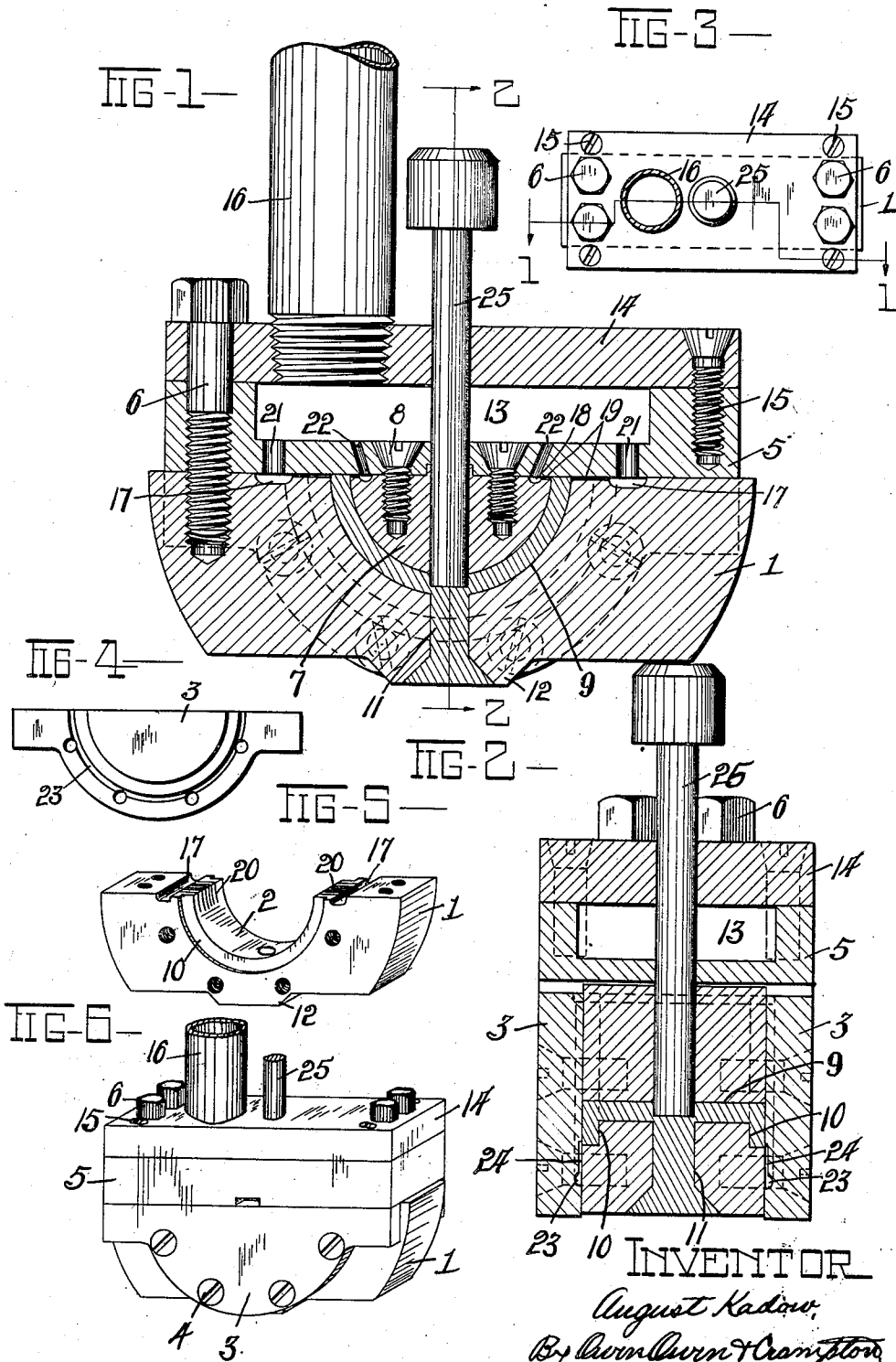
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SUCTION MOLD

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SUCTION MOLD.

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To all whom it may concern:

Be it known that I, AUGUST KADOW, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have made an Invention Appertaining to a Suction Mold; and I do hereby declare the following to be full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to the molding of articles from molten metal by suction action, and particularly to a mold for such purpose.

An object of the invention is the provision of a simple and efficient mold for producing sections of bearing bushings and similar articles in a rapid and efficient manner by the suction method whereby the suction force is so distributed with respect to the molding cavity as to cause a perfect and efficient drawing of the molten metal to all parts of the cavity. Further objects and advantages of the invention will be apparent from the following detailed description of the invention.

While the invention in its broader aspect is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Fig. 1 is a vertical longitudinal section of a mold embodying the invention taken on the line 1—1 in Fig. 3. Fig. 2 is a cross-section of the mold taken on the line 2—2 in Fig. 1. Fig. 3 is a reduced top plan view of the mold. Fig. 4 is an inner elevation of a side plate of the mold. Fig. 5 is a reduced perspective view of the body member of the mold, and Fig. 6 is a reduced perspective view of the mold.

Referring to the drawings, 1 designates the body member of the mold having, in the present instance, a semi-circular recess or depression 2 in its top which extends throughout its width and is open both at the top and sides of the member. A side-plate 3 is secured to the body 1 at each side thereof in closed relation to the respective side of the recess 2, being secured thereto, in the present instance, by screws 4.

A top plate or member 5 is mounted on the top of the body member 1 in close lapping relation at its side edges to the top edges of the plates 3 and is secured to the body member by screws 6 at each end. The top plate 5 carries at its under side a core member 7 fixedly attached thereto, in the present instance, by screws 8 and projecting down into the recess 2 of the body member with its ends in close abutting relation to the respective side plates 3. This core member cooperates with the wall of the recess 2 and the side plates to form a molding cavity 9 of semi-circular form adapted to mold one-half of a ring, bushing bearing, or similar member, the upper ends of the cavity being closed by the top plate 5. If the molded article is to have edge flanges, as is usually the case with bearing bushings, the body member 1 may be marginally recessed at the ends of the depression 2, as shown at 10. An opening for the admission of molten metal to the core 9 is provided through a hole 11, which extends from the central bottom portion of the cavity 9 down through the bottom of the body member 1 and has its outer end enlarged and terminating in the present instance in a bottom extension 12 on the body member.

The top plate 5 is provided in its top with a suction chamber or cavity 13, which has its top closed by a cover plate 14 that is secured closely to the top of the plate 5 by screws 15 and also by the screws 6. The chamber 13 has communication with a suction creating source through a pipe 16 that is tapped into the plate 14.

The top of the bottom member 1 and bottom of the top plate 5 cooperate to form suction passages 17 at the outer sides of the upper ends of the molding cavity 9, and the top of the core 7 and bottom of the plate 5 cooperate to form suction passages 18 at the inner sides of the upper ends of the cavity 9. These passages extend throughout the width of the body member 1 and core 7, in the present instance, by recessing the tops of said members, and each is in communication with the upper end of the cavity 9 through thin relief passages 19 formed between the plate 5 and the respective members 1 and 7, as shown in Fig. 1. The size of each outer relief passage 19 is enlarged by providing a plurality of narrow slits 20 (Fig. 5) in the upper outer end walls of the

cavity 9. The slits 20 and relief passages 19 are not of sufficient size to permit the drawing of metal therein, but provide suction communication between the cavity and suction passages. The suction passages 17 and 18 are in communication with the vacuum chamber 13 through respective openings 21 and 22 in the top plate 5.

In order to effect a suction within the outer edges of the flange forming recesses 10 of the molding cavity throughout the length thereof, each side plate 3 is provided in outwardly spaced relation to its recess with a recess 23, which parallels the recess 10 and cooperates with the respective side of the body member 1 to form a suction passage in communication at its ends with the passages 17 and having a thin relief space 24 extending therefrom to the outer edge of the recess 10 throughout its length. A plunger 25 extends down through the top plates 14 and 5 and core 7 in registering openings provided therethrough, with its inner end extending into the molding cavity 9 in register with and adapted to be projected outward through the inlet opening 11 of the cavity, the inner end of the plunger being of suitable size to fit such opening. During the drawing of the molten metal into the cavity 9 the inner end of the plunger 25 preferably projects a short distance into the cavity and when a sufficient quantity of metal has been drawn into the molding cavity to fill the same and while such metal is still soft the plunger is forced inward to form an opening through the center of the molded article and to force from the inlet opening 11 the metal disposed therein. If it is not desired to provide openings through the molded articles the plunger may be drawn outward to inoperative position or entirely eliminated. Where the plunger is not to be used, it is preferable to have the outer end of opening 11 no larger than its inner portion, in order to avoid difficulty in removing the casting.

In the use of my mold it is lowered into molten metal a sufficient distance to submerge the inlet end of the opening 11 therein, and a vacuum being present in the chamber 13 will cause the metal to enter and completely fill the cavity 9 and associated flange forming recesses 10, if such recesses are provided, due to the uniform distribution of the suction action across the upper ends of the cavity and around the side edges thereof through the relief passages 19 and 24, in communication with the passages 17, 18 and 23 which in turn are in communication with the vacuum chamber 13 through the openings 21 and 22. When a sufficient quantity of metal has been drawn into the mold to fill the cavity 9 the mold is removed from the molten metal bath and the plunger 25 operates to force a hole through the

molded article and to eject the metal from the inlet opening 11. If the metal is of such a consistency that it might have a tendency to run back out of the molding cavity through the inlet opening 11 after the mold has been raised from the bath and before the metal has been sufficiently cooled or congealed to retain its shape, then the plunger 25 may be employed as a valve or closure member for the opening 11 to prevent such outward flowing action of the metal from the cavity. The provision of such a valve is particularly useful when molding lead, Babbitt metals and other metals or alloys adapted to melt at relatively low temperatures, as in such cases it is more difficult to cool the metal quickly enough after removal of the mold from the bath to prevent the metal or a portion of the same from flowing back out of the cavity, thereby forming imperfect castings. When an article has been formed in the mold the top plates 5 and 14 and core 7 are removed from the body of the mold by a removal of the screws 6, after which the molded article may be withdrawn from the body recess 2. If the side plates 3 have a tendency to hold the molded article in the recess 2 these plates may be removed from the body member 1 to permit an easy removal of the article.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts as it is capable of embodiment in numerous forms without departing from the spirit of the claims.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is,—

1. A mold of the class described, having a semi-annular molding cavity angular in cross section and passages in communication with the cavity entirely around the same at the external angles thereof and in communication with a suction creating source.

2. A mold of the class described, having a molding cavity of substantially semi-circular form with an inlet opening at its central portion, suction passages at the inner and outer sides of the end portions of the cavity and around the side edges of the cavity with said passages in communication with a suction creating source.

3. A mold of the class described, having a molding cavity of arcuate form with an inlet opening, a vacuum chamber in communication with a suction creating source, suction passages in communication with the vacuum chamber and with the molding cavity at its ends and around its sides.

4. A mold of the class described, having a body portion forming a cavity with an inlet opening thereto, means removably secured to the body and cooperating with its

cavity to form an arcuate molding cavity, and a vacuum chamber adapted to have communication with a suction creating source, the body and means forming suction passages with the ends and sides of the molding cavity and with the vacuum chamber.

5. A mold of the class described, comprising a body member having a recess in its top and an inlet opening to the bottom of said recess, side members secured to the body member and closing the opposite sides of the recess, a top means removably mounted on the body member and having a core part extending down into the recess and cooperating therewith to form an arcuate molding cavity, said means, body and side members forming relief passages which communicate with the ends and sides of the molding cavity and with a suction creating source whereby molten metal is drawn into and caused to fill all parts of the molding cavity by a suction action in the relief passages.

6. A mold of the class described, forming a molding cavity of thin elongated form, an inlet opening into the cavity midway of its length and suction passages in communi-

cation with the ends and sides of the cavity and adapted to have communication with a suction creating source, and a member movably carried by the mold and adapted to be projected through a portion of the molding cavity and into the inlet opening in closing communication therewith.

7. A mold of the class described, having a molding cavity of arcuate form with the middle of the arc downward, an inlet opening into the lowest portion of the cavity, suction passages connecting the ends of the arcuate cavity with a vacuum chamber, and a plunger movable vertically through the mold cavity and into position to close the inlet opening.

8. A mold of the class described, having an inlet opening in its bottom, a molding cavity flaring upward and outward from the opening, and suction passages connecting a vacuum chamber with the portion of the cavity most distant from the inlet, and a plunger movable through the cavity into closing relation with the inlet.

In testimony whereof I have hereunto signed my name to this specification.

AUGUST KADOW.