Oct. 25, 1927.

W. A. PARKER

1,646,592

MOLD FOR DIE CASTING SCREENING BUTTONS

Filed July 11, 1922

2 Sheets-Sheet 1

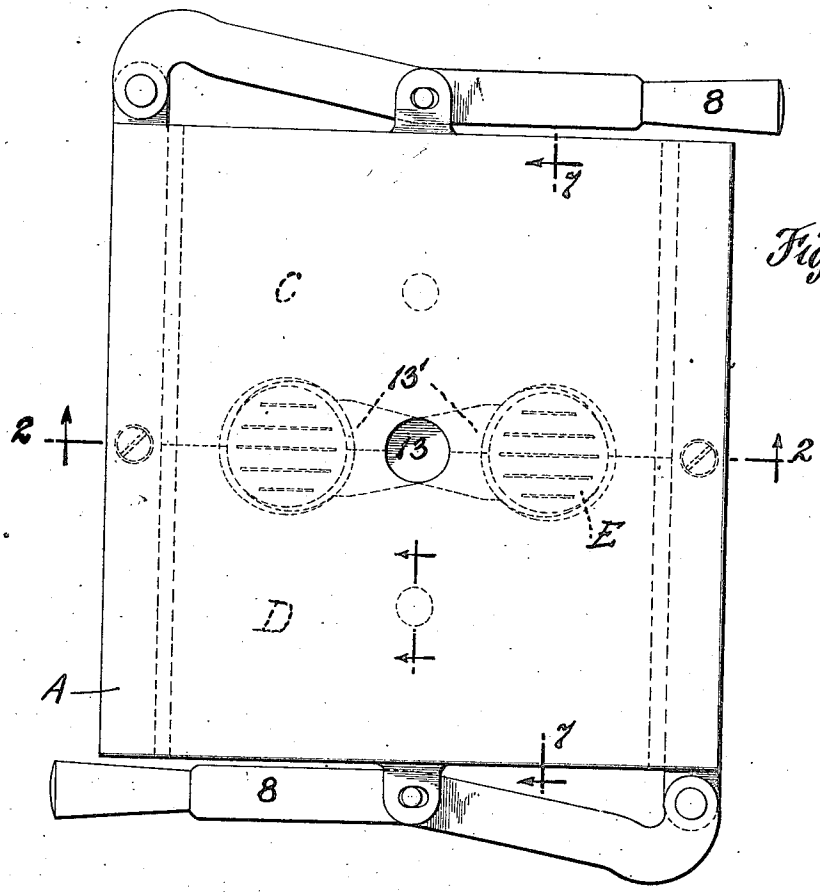

Fig. 1.

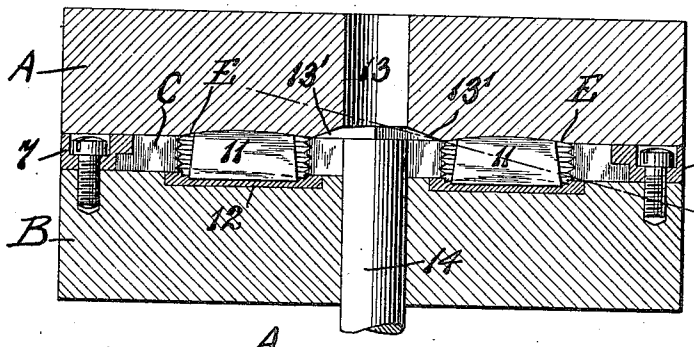

Fig. 2.

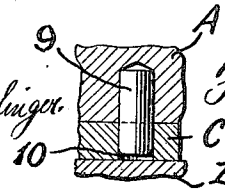

Fig. 3.

WITNESS

Gustav Genzlinger.

BY

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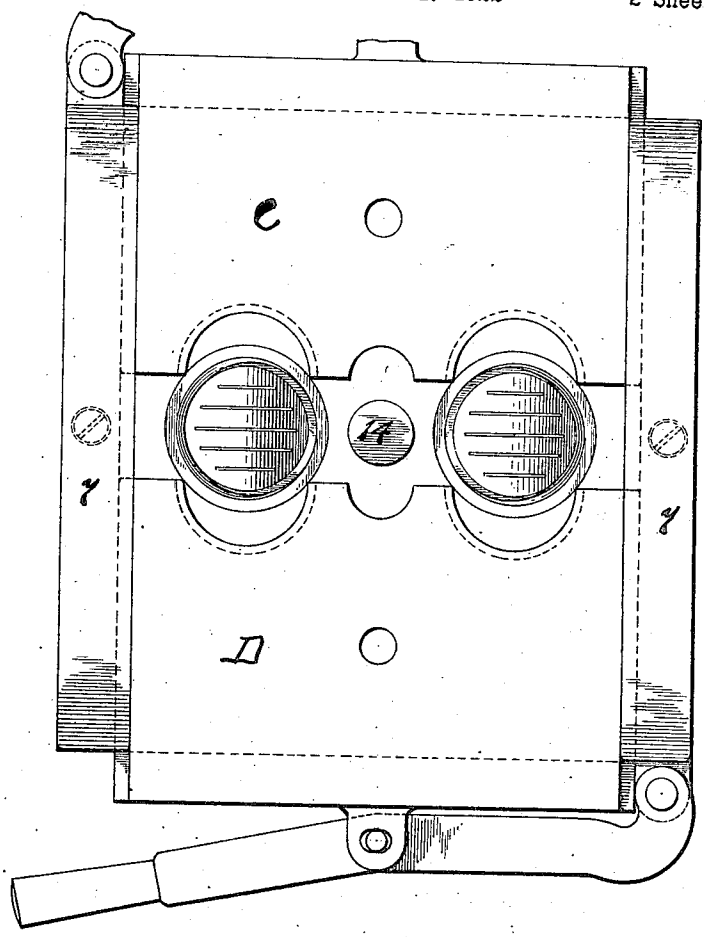

Fig. 4.

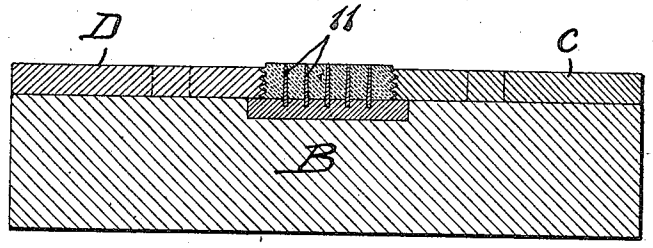

Fig. 7.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM A. PARKER, OF ERIE, PENNSYLVANIA, ASSIGNOR TO LAYNE & BOWLER CORPORATION, A CORPORATION OF CALIFORNIA.

MOLD FOR DIE-CASTING SCREENING BUTTONS.

Application filed July 11, 1922. Serial No. 574,123.

This invention relates to screening buttons and molds for die-casting the same. The screening button to which this invention relates is employed in oil and water wells for the purpose of screening out sand and other detritus from the liquid, the buttons being externally threaded and screwed into openings formed in the well pipes, and having slots or apertures formed therein for the passage of the liquid, such slots tapering toward the exterior, i. e., the small end being at the periphery of the pipes. The buttons are also ordinarily arcuate to conform to the curvature of the particular pipe in which they are to be used. The size of the screening openings or slots also varies with the particular class of service and such openings are sometimes only .010″ at the small end, and sometimes even less.

The invention does not relate to such buttons broadly, inasmuch as they are well-known in this art, but, heretofore, to the best of my knowledge, these buttons have never been die-cast, and I believe that I am the first to die-cast the same, notwithstanding that there may have been intimations that the same might be die-cast. Die-casting such externally threaded and slotted buttons will, of course, greatly decrease the cost of production and it is the purpose of my invention to successfully die-cast the same in such manner as to obtain a useful and superior product, economical to manufacture.

The foregoing, together with such other objects as may hereinafter appear, I accomplish by means of a construction illustrated in the accompanying drawings; wherein:

Fig. 1 is a plan view of a mold embodying my invention; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a fragmentary sectional view illustrating a detail of my invention; Fig. 4 illustrates the mold partly open, with the top member removed; Fig. 5 is a side elevation of one of the buttons illustrated in Fig. 4, drawn on an enlarged scale; Fig. 6 is a side elevation of a button taken at right angles to Fig. 5; and Fig. 7 is a section taken on the line 7—7 of Fig. 1.

Referring now to Figs. 1 and 2, it will be seen that the mold comprises a top member A, a bottom member B and two intermediate members C and D. The members C and D are laterally retractable and are slidably supported in place by the guide 7, screwed to the bottom B. Handles 8 serve to close and open the intermediate members. The top member is provided with a pair of pins 9 and each intermediate member has a hole 10 and when the parts are in operative position for a casting, the pins 9 project into the hole 10 and serve to lock the intermediate members C and D, preventing their spreading apart as the hot metal is forced into the mold cavity, the metal being forced in at a very high pressure.

The mold parts cooperate to form a pair of cavities indicated as a whole by the reference character E. The member B forms the bottom of these mold cavities, the member A, the top of the cavities, and the intermediate members, the sides. The thread-forming portions of the cavity are in the intermediate members and where the buttons are arcuate, the curvature is in the upper and lower members. In this connection, for reasons which will hereinafter appear, it will be noted that the curvature of the buttons terminates approximately at the base of the threads, as shown, for example, in Figs. 5 and 6. From that portion outward the buttons are flat except where the threads are complete. Where the slots are to be of small dimensions, say, for example, .010″ I form the same by employing appropriately shaped plates 11, of the desired dimension, said plates being set or mounted in a block 12 set into the lower member. These plates in the drawings are shown in exaggerated size. Where slots of considerable width are to be formed, the plates or bars may be formed integrally with the lower member.

The gate 13 through which the hot metal is introduced, is located intermediate the mold cavities and its bottom portions 13′ are formed by the top member and the intermediate members, such portions flaring out widely opposite or across the series of plates 11, as shown in Fig. 1, and narrowing in its other (vertical) dimension to the merest crack, as shown in Fig. 2, the top member and the intermediate members practically coming into abutment just at the edge of the top thread. On inspection of Figs. 1 and 2 it will be seen that the thread is started or ended at a point coming opposite the gate portion 13′, i. e., in a plane cutting the centers of the two mold cavities and the center of the gate. The relation of the thread to the gate is illustrated in dotted lines in Fig. 5.

The metal is projected from the gate portion 13' into the mold cavity in the form of a thin, wide sheet in approximately the plane indicated by the line *a*, i. e., the metal is fed diagonally into the mold cavities. The air above and below the incoming metal, as the cavity fills, vents itself out through the meeting faces of the top, intermediate and bottom members, and I have discovered that unless the metal were fed in substantially this manner, the air would be trapped.

It will also be noted that the incoming metal is fed in a direction longitudinally of the plates 11, striking their inner vertical edges. If the metal were introduced transversely, i. e., against the sides of the plates, the latter would be crumpled over and in addition air would trap itself between the plates.

Furthermore, the metal cannot be introduced in a thick or localized stream for otherwise the plates will be turned over. From inspection of Fig. 1 it will be seen that the sheet of metal entering the cavities is approximately as wide as the distance from outer to outer plate. By feeding the hot metal in this manner I am also enabled to introduce it just at the edge of the thread so that when the riser is removed by causing the pin 14 to travel upward, the fin may be readily broken or brushed off, leaving a clean thread.

By stopping the curvature of the button at the base of the thread, I am enabled to confine the curvature of the mold cavity in the upper and lower members. This makes it possible to simplify the construction of the mold and in addition it would otherwise be exceedingly difficult, if not impossible, to construct a mold with more than one cavity.

By the foregoing I am enabled to economically produce a die-cast screening button, ready for use.

What I claim is:

1. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal so located as to feed the metal into the mold cavity in a direction substantially parallel with the said members.

2. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal so located as to feed the metal into the mold cavity in a direction substantially parallel with the said members and diagonally of the mold cavity.

3. A multi-part mold for die-casting screening buttons having the mold cavity and the gate formed and arranged so that, as the metal enters, the air will vent between mold parts in the upper and lower portions of the cavity above and below the metal.

4. A multi-part mold for die-casting screening buttons having the mold cavity so formed therein that air will vent between mold parts from the upper and lower portions of the mold cavity, the mold being provided with a gate adapted to feed the metal into an edge of the cavity diagonally across the cavity.

5. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal so as to feed the metal into the mold cavity in a direction substantially parallel with the said members, the gate being of substantial width across the series of the said members, but narrowed to a mere crack in its other dimension.

6. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal so located as to feed the metal into the mold cavity in a direction substantially parallel with the said members, the gate being of a width such that the incoming metal is spread out crosswise of and does not all impinge on one of said members.

7. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal of such width that the metal is fed in the form of a thin sheet.

8. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal so located as to feed the metal into the mold cavity in a plane dividing the mold cavity, the mold having means whereby air may be vented from the space on opposite sides of the incoming metal.

9. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal so located as to feed the metal into the mold cavity against edges of the said members.

10. A mold for die-casting screening buttons having an appropriate mold cavity and members for forming the screening slots and provided with a gate for the introduction of the hot metal so located as to feed the metal into the mold cavity in a direction substantially longitudinally of said members.

11. A mold for die-casting externally threaded screening buttons provided with a gate opening into the edge of a thread forming portion of the cavity.

12. A mold for die-casting externally threaded screening buttons provided with a

gate opening into the edge of a thread forming portion of the cavity approximately at one of the ends of the thread.

13. A multi-part mold for die-casting screening buttons comprising an upper member, a lower member, and two laterally retractable intermediate members, one of the first two members being provided with portions forming the slots in the button.

14. A multi-part mold for die-casting arcuate screening buttons comprising an upper member, a lower member, and two laterally retractable intermediate members, said members cooperating to form the mold cavity and the curvature of the mold cavity that gives the buttons their arcuate form being in the upper and lower members.

15. A multi-part mold for die-casting screening buttons comprising an upper member, a lower member, and two laterally retractable intermediate members, one of the first two members being provided with portions forming the slots in the button and the thread forming portions of the cavity being in the intermediate members.

16. A multi-part mold for die-casting arcuate screening buttons comprising an upper member, a lower member, and two laterally retractable intermediate members, said members cooperating to form the mold cavity and the curvature of the mold cavity that gives the buttons their arcuate form being in the upper and lower members and the thread forming portions of the cavity being in the intermediate members.

In testimony whereof, I have hereunto signed my name.

WILLIAM A. PARKER.