May 22, 1928. 1,670,559

S. L. WILLIAMS

APPARATUS FOR DIE CASTING VALVE STEMS

Filed Sept. 30, 1926

FIG 1

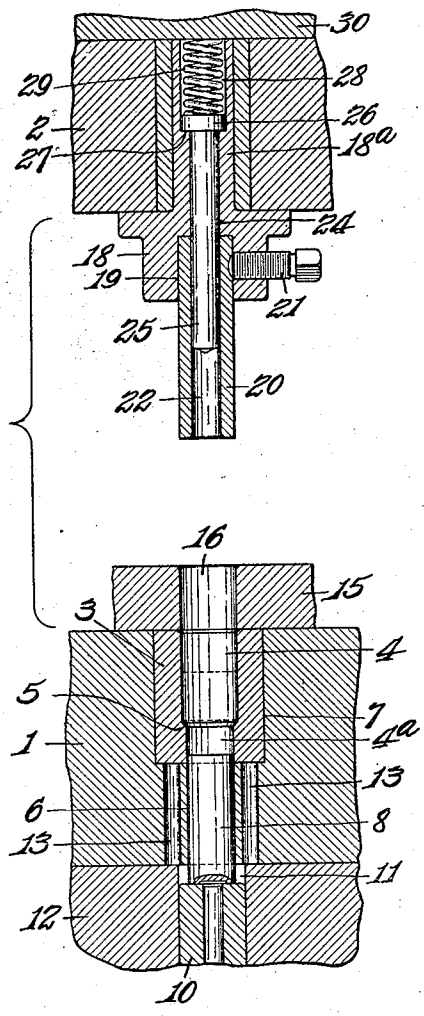


FIG 3

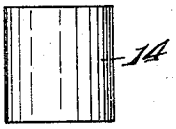


FIG 2

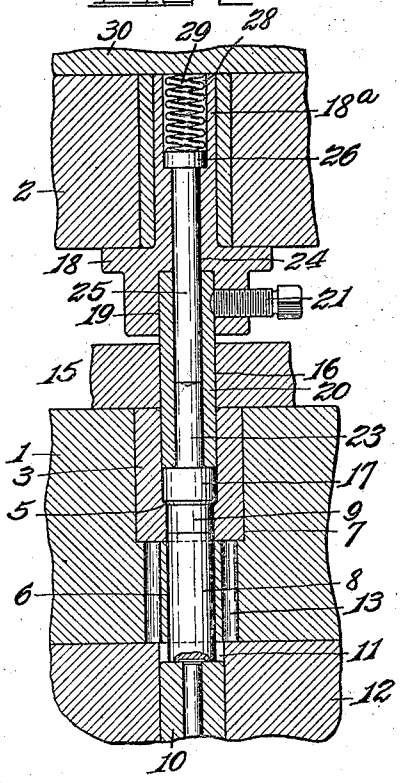


FIG 4

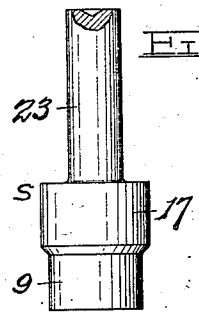
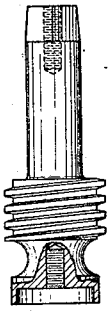


FIG 5



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR DIE-CASTING VALVE STEMS.

Application filed September 30, 1926. Serial No. 138,627.

This invention relates broadly to die-casting apparatus, and it has for its object to provide simple and practical mechanism for die-casting blanks for the valve stems of water faucets and the like.

In describing the invention in detail, reference is herein had to the accompanying drawings, in which—

Figure 1 is a vertical section of the bed and head portions of a power press embodying my invention, the press head being shown in its elevated position;

Figure 2 is a similar section showing the head lowered to the limit of its movement and showing a blank for a valve stem formed in the press by extrusion of the metal of a slug;

Figure 3 is an enlarged side elevation of the slug employed;

Figure 4 is a similar view of the casting formed by extruding the metal of the slug by means of the invention; and

Figure 5 is a similar view of the valve stem in the manufacture of which the casting is utilized.

Referring to said drawings, 1 designates the bed plate and 2 the vertically reciprocable head of a power press which, generally considered, may be of any appropriate type. Mounted in the bed plate 1 with its upper end flush with the top surface of said plate is a die block 3 provided with a vertical bore 4 extending partially, as two thirds of the way, therethrough; and extending throughout the remainder of the thickness of said die block is a bore 4^a of reduced diameter located in axially alined relation to said bore 4, an annular shoulder 5 being thus formed intermediate said bores, as shown.

Said bore 4^a registers at its lower end with a vertical bore 6 which extends downward through the bed plate 1 from the die seat, or bottom of the die-receiving socket 7. Extending upward through the bore 6 and having its upper end received within the bore 4^a of the die 3 is a gauge pin 8 which forms a bottom closure for said bore 4^a and which may be adjusted to suit the length of the lower cylindrical portion 9 of the casting S which is to be produced. The means for adjusting the elevation of said gauge pin 8 may be of any appropriate character involving a member, as 10, movable through a passage 11 in the bed-supporting frame 12 of the press into stationary supporting relation to said pin. The bed plate 1 has the usual passages 13 through which knock-out pins may be directed for effecting removal of the die block 3.

Any appropriate means may be employed for depositing a brass slug 14 in the bore 4, as, for example, a feeder plate or table 15 shiftable over the top face of the bed plate to and from a position wherein a pocket 16 thereof in which the slug is initially received is presented in register with said bore 4 and whence such slug drops into said bore, seating upon the shoulder 5, as indicated in dotted lines in Fig. 1.

It will here be noted that the bore 4 is made of a diameter which snugly accommodates the cylindrical slug 14 and that the diameter of the latter is that required for the barrel portion 17 of the casting, such barrel portion being designed to be machined for forming the threaded bonnet engaging portion of the valve stem.

Mounted on the head 2 of the press is a tool carrier or holder 18 having a stem 18^a fitted in said head. Said holder has therein a socket 19 in which is mounted an end of a plunger 20, a set screw 21 being employed for rigidly securing said plunger in place. Said plunger, which is adapted to be carried into and out of the bore 4 of the die block 3 with reciprocations of the press head 2 for effecting extrusion of the metal of the slug 14, has a diameter corresponding substantially with that of said bore 4 and has extending therethrough an axial bore 22 of the diameter required for the reduced stem portion 23 of the casting to be produced. Said bore 22 is axially alined with a similar bore 24 provided in the holder 18, and received in the alined bores 22 and 24 is a pin 25 having on its upper end a head 26 which is normally held seated upon a shoulder 27 formed at the junction of said bore 24 with a larger bore 28 in which is located a compression spring 29. Said spring is interposed between the head 26 of the pin 25 and a backing member 30 of the press head, as shown in Fig. 1, and functions to yieldingly present the pin in a depressed position wherein it will predeterminedly mold the end of the stem portion 23 of the casting, at the same time pro-

viding for slight elevation of said pin to accommodate any excess of metal in the slug over that which is required in the production of the casting.

In practice, when the press head is lowered upon the bed, the plunger 20 enters the bore 4 in the die and, seating upon the slug 14 which is heated to the required temperature, exerts a force which causes the metal of the slug to be extruded into the bore 4^a of the die and into the bore 22 of the plunger, as shown in Fig. 2, thus producing a die casting of the form shown in Fig. 4.

What is claimed is—

1. In apparatus for die casting valve stems, a power press having a bed plate and a reciprocable head, said bed plate having therein a die seat and a vertical bore opening through the bottom of said seat, a die mounted on said seat and having therein axially alined vertical bores of which the lower is of smaller diameter than the upper, a gauge pin directed through the bore of the bed plate with its upper end received within the lower portion of the lower bore of the die, a holder carried by the press head, and a plunger carried by said holder and adapted to be lowered into extruding relation to a metal slug disposed within the upper bore of the die, the external diameter of said plunger corresponding approximately with the diameter of the last mentioned bore, said plunger having therein an axial bore into which metal of the slug may be extruded.

2. In apparatus for die casting valve stems, a power press having a bed plate and a reciprocable head, said bed plate having therein a die seat and a vertical bore opening through the bottom of said seat, a die mounted on said seat and having therein axially alined vertical bores of which the lower is of smaller diameter than the upper, said bores forming an annular shoulder at the junction thereof, a holder carried by the press head, and a plunger carried by said holder and adapted to be lowered with the press head into extruding relation to a metal slug seated upon said shoulder, said plunger having its external diameter corresponding approximately with the diameter of the upper bore of the die and being provided with an axial bore into which metal of the slug may be extruded.

3. In apparatus for die casting valve stems, a power press having a bed plate and a reciprocable head, said bed plate having therein a die seat and a vertical bore opening through the bottom of said seat, a die mounted on said seat and having therein axially alined vertical bores of which the lower is of smaller diameter than the upper, said bores forming an annular shoulder at the junction thereof, a holder carried by the press head, and a plunger carried by said holder and adapted to be lowered with the press head into extruding relation to a metal slug seated upon said shoulder, said plunger having its external diameter corresponding approximately with the diameter of the upper bore of the die and being provided with an axial bore into which metal of the slug may be extruded, an elevatable pin directed downward into the bore of said plunger, and compression means yieldingly maintaining said pin depressed to the limit of its downward movement.

In testimony whereof, I affix my signature.

STEPHEN L. WILLIAMS.