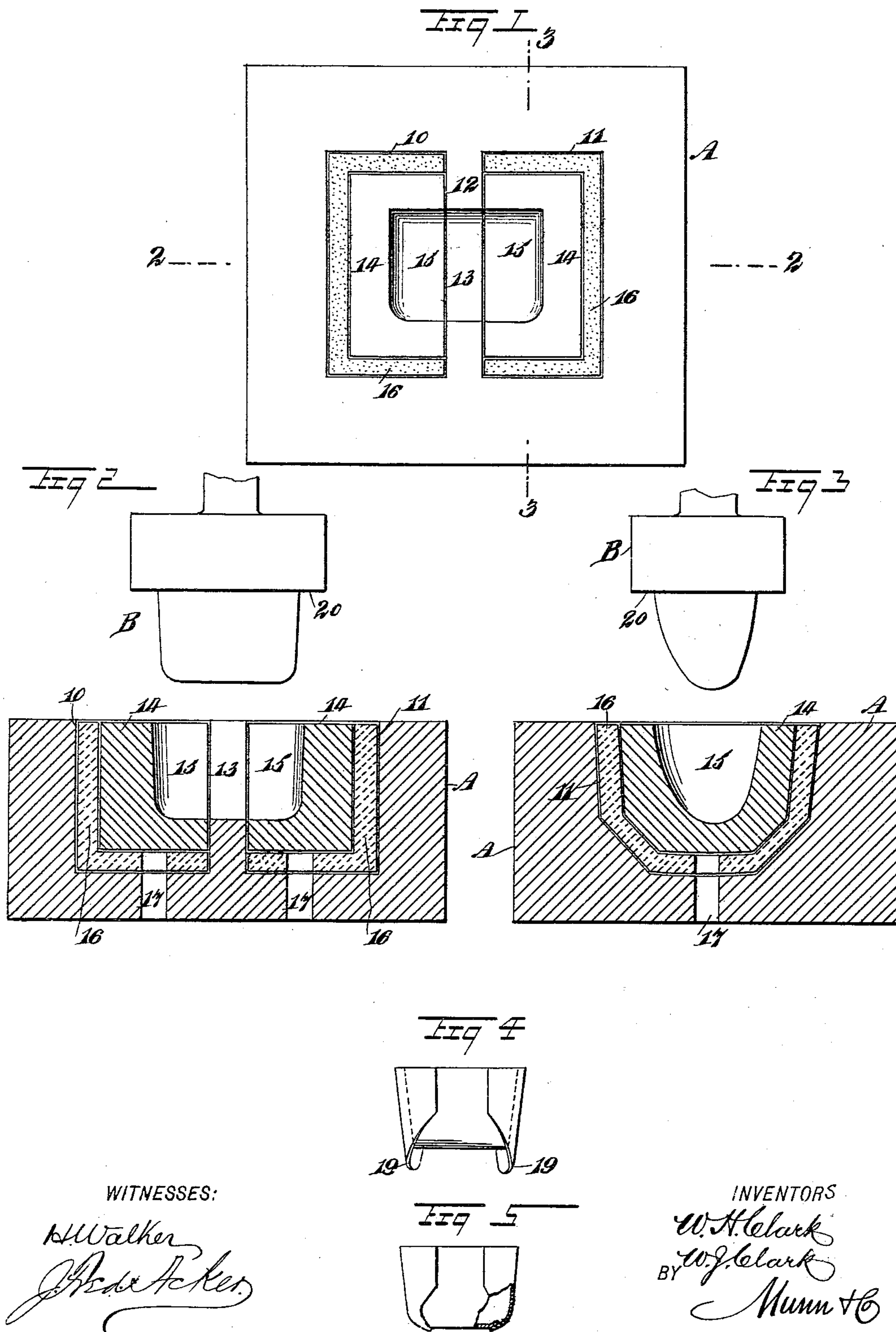


(No Model.)

W. H. & W. J. CLARK.
DIE FOR DROP PRESSES.

No. 555,363.

Patented Feb. 25, 1896.



UNITED STATES PATENT OFFICE.

WILLIAM H. CLARK AND WILLIAM J. CLARK, OF SALEM, OHIO.

DIE FOR DROP-PRESSES.

SPECIFICATION forming part of Letters Patent No. 555,363, dated February 25, 1896.

Application filed September 14, 1895. Serial No. 562,527. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. CLARK and WILLIAM J. CLARK, of Salem, in the county of Columbiana and State of Ohio, have
5 invented a new and useful Improvement in Dies for Drop-Presses, of which the following is a full, clear, and exact description.

Our invention relates to an improvement in dies for drop-presses, and especially to an
10 improvement in dies for stamping elevator-buckets.

The object of the invention is to so construct the female sections of stamping-dies of any weight of cast metal as to secure the
15 greatest possible strength, and at the same time provide an exceedingly hard surface where such dies are subjected to the most wear.

A further object of the invention is to provide economic means for conveniently and expeditiously renewing the said hard or shaping
20 surfaces of the dies.

The invention consists in the novel construction and combination of the several
25 parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.
30

Figure 1 is a plan view of a female section of a stamping-die. Fig. 2 is a vertical section taken on the line 2 2 of Fig. 1, illustrating the male section of the die in side elevation. Fig.
35 3 is a vertical section through the female portion of the die, taken practically on the line 3 3 of Fig. 1, the male section of the die being shown in end view. Fig. 4 is a side elevation of an elevator-bucket, illustrating the
40 shape given the bucket just preparatory to being placed in the die; and Fig. 5 is a side elevation, partly in section, of the elevator-bucket shown in Fig. 4 after it has been removed from the die.

45 Dies for the purpose referred to are commonly made of cast-iron, which to have the strength necessary to withstand heavy blows must be made of exceedingly strong iron. If the die is made of certain kinds of cast-iron
50 having sufficient strength in a die of convenient size and weight, the said dies will be too soft to withstand the scraping and bruising

to which they are necessarily subjected by forming the articles in them. The dies are therefore short-lived and must be thrown out
55 of use as soon as their working surfaces are worn out of shape. Such dies have been made of extremely hard iron, and also of iron capable of being chilled to produce a hard wearing-surface; but in every case the female die
60 cannot be made strong enough to withstand the wedging force of the male die unless the female die is extremely large, or is supported by very heavy wrought-iron bands, which renders the die very expensive. The male
65 die may be made of the hardest of cast-iron, and is not liable to be broken, because of its compact form and the compressive nature of the force exerted upon it.

In the construction of the female die the
70 body A of the die is made preferably of tough cast metal, iron being usually employed because of its cheapness. When the die is to be used in stamping elevator-buckets or like articles, two recesses or mortises 10 and 11
75 are produced about centrally therein, being separated by a partition 12, and the partition is provided with a central recess 13 made in its upper edge, the said recess 13 serving to connect the central portions of the main re-
80 cesses 10 and 11. The partition may be of any desired thickness or of any desired shape. The main recesses 10 and 11 will be hereinafter referred to as "mortises" to distinguish them from the recess 13 in the partition.
85 Each mortise in the die is adapted to receive a shaping block or section 14, and these shaping blocks or sections are made of very hard iron cast upon suitable chills to impart to their inner surfaces the shape necessary to
90 perform the work required. In the drawings, the said inner surfaces of the shaping-blocks are more or less tapering vertically and are rounded at the bottom. Therefore the shaping-blocks may be said to be provided each
95 with a chamber 15 upon its inner face, and the said chambers conform to and register with the recess 13 in the partition 12 of the body of the die.

100 Instead of making the shaping-blocks of hard iron chilled, they may be made of forged or cast steel, the object being to form the blocks of as hard a metal as possible. The outer side, the ends, and the bottom of each

shaping-block rest upon or against a metallic cushion 16, the said cushion being made of Babbitt, zinc, or any suitable metal of like character, which is preferably introduced into the mortises 10 and 11 in a molten or very soft state, extending practically around and under the shaping-blocks. The object of the metallic cushion is to form such an easy seat for the aforesaid blocks that they will not crack under the impact of the male die, as they would otherwise do. In this way the body A of the die and the shaping-blocks 14 are united by said cushion 16, so as to form a practically integral ferrule-die, the parts of which may not be separated by any ordinary means.

Apertures 17 are made in the body of the die at the bottom and likewise in the bottom of the metallic packing or cushion 16, as shown in Figs. 2 and 3, and said apertures are also contained in each of the mortises 10 and 11 of the body, whereby a tool may be introduced into either of the apertures and the shaping-block above the aperture be driven from its seat when said block is worn and is to be replaced by another.

In Fig. 4 we have shown a side elevation of an elevator-bucket shaped as it is when adapted to be placed in the die, and it will be observed that the end sections of the bucket extend downward below the bottom, and in Fig. 5 we have illustrated the shape of the bucket when removed from the die, in which it will be observed that the extensions of the ends have been folded up smoothly against the bottom and the sides.

The projecting edges 19 at the bottom of the bucket shave and gutter the hardest metal from which dies can be made. Since the bottom of the bucket is somewhat spherical the projections 19 must be either stove or wrinkled while they are being bent inward. The shaping-blocks are therefore necessarily somewhat frequently removed; but when a die is made in sections, as shown in the drawings, and not in one piece, as heretofore, the shaping-blocks may be made much harder than ordinary, and the cost of the die will be at the same time materially reduced, since the body of the die may be made of soft or tough cast metal, and while the removal of the shaping-block may be conveniently and expeditiously accomplished the replacement of the blocks will not be a frequent occurrence. The male die B is provided with a marginal shoulder 20 on the upper portion of its under face, adapted to engage with the upper edge of the bucket to be stamped.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a stamping-die, a body, a shaping-section supported in the body, being of a material harder than the body, and a cushion

intervening the shaping-section and the body and uniting the said body and shaping-section to form a substantially integral die, as and for the purpose set forth.

2. In a stamping-die for drop-presses, a body-section, shaping-sections supported within the body-sections, made of a material harder than the body and removable therefrom, and a metallic cushion in which the shaping-sections are seated, as and for the purpose set forth.

3. In a stamping-die, a female section, the same consisting of a body constructed of a comparatively soft metal, shaping-sections of a harder metal seated in and removable from the body, a metallic cushion intervening the shaping-sections of the body, and passages formed in the body and cushion and leading to the shaping-sections, whereby the latter may be driven from their seats, as and for the purpose set forth.

4. In dies for drop-presses, the combination, with a female section, comprising a body having a mortise therein, a cushion located within the said mortise, and a shaping section or sections located within the said mortise and resting upon the said cushion, the shaping section or sections being of a harder material than that of the body, of a male section adapted to enter the shaping section or sections of the female section of the die, the said male section being provided with a shoulder adapted for contact with the upper edge of the object introduced in the shaping section or sections of the said female portion of the die, as and for the purpose specified.

5. In dies for drop-presses, the combination, with a female section, comprising a body having a mortise therein, a cushion located within the said mortise, and a shaping section or sections located within the said mortise and resting upon the said cushion, the shaping section or sections being of a harder material than that of the body, of a male section adapted to enter the shaping section or sections of the female section of the die, the said male section being provided with a shoulder adapted for contact with the upper edge of the object introduced in the shaping section or sections of the said female portion of the die, and means, substantially as described, for dislodging the shaping-sections from the female portion of the die, as and for the purpose set forth.

6. A die comprising a body having a recess, mortises formed in the said recess at the ends thereof and shaping-sections held in said mortises, substantially as set forth.

WILLIAM H. CLARK.
WILLIAM J. CLARK.

Witnesses:

W. W. HOLE,
CHARLES D. HOLE.