No. 822,755. PATENTED JUNE 5, 1906.

C. E. McMANUS.

DIE FOR FINISHING BOTTLE CAPS.

APPLICATION FILED JULY 28, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

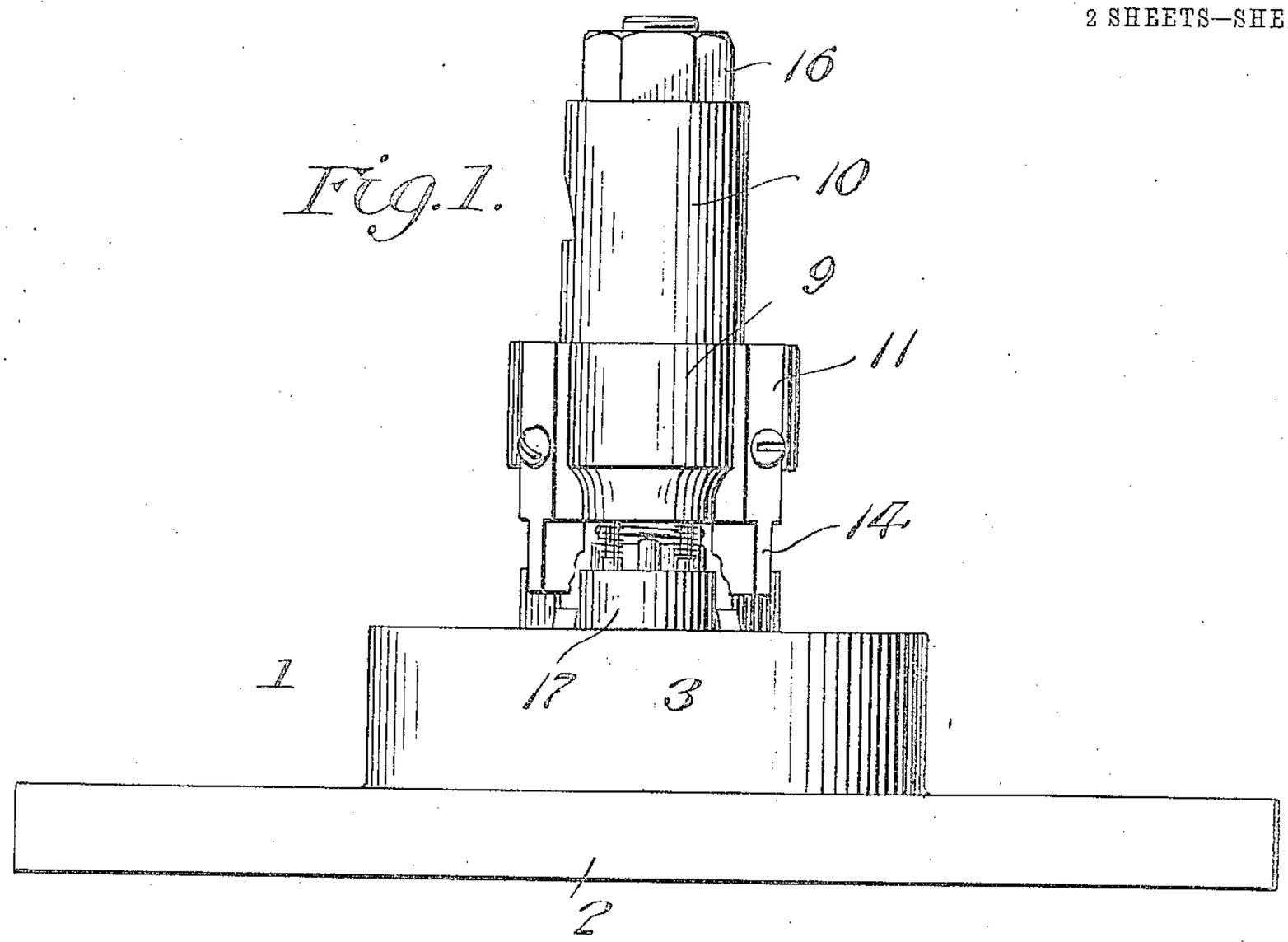
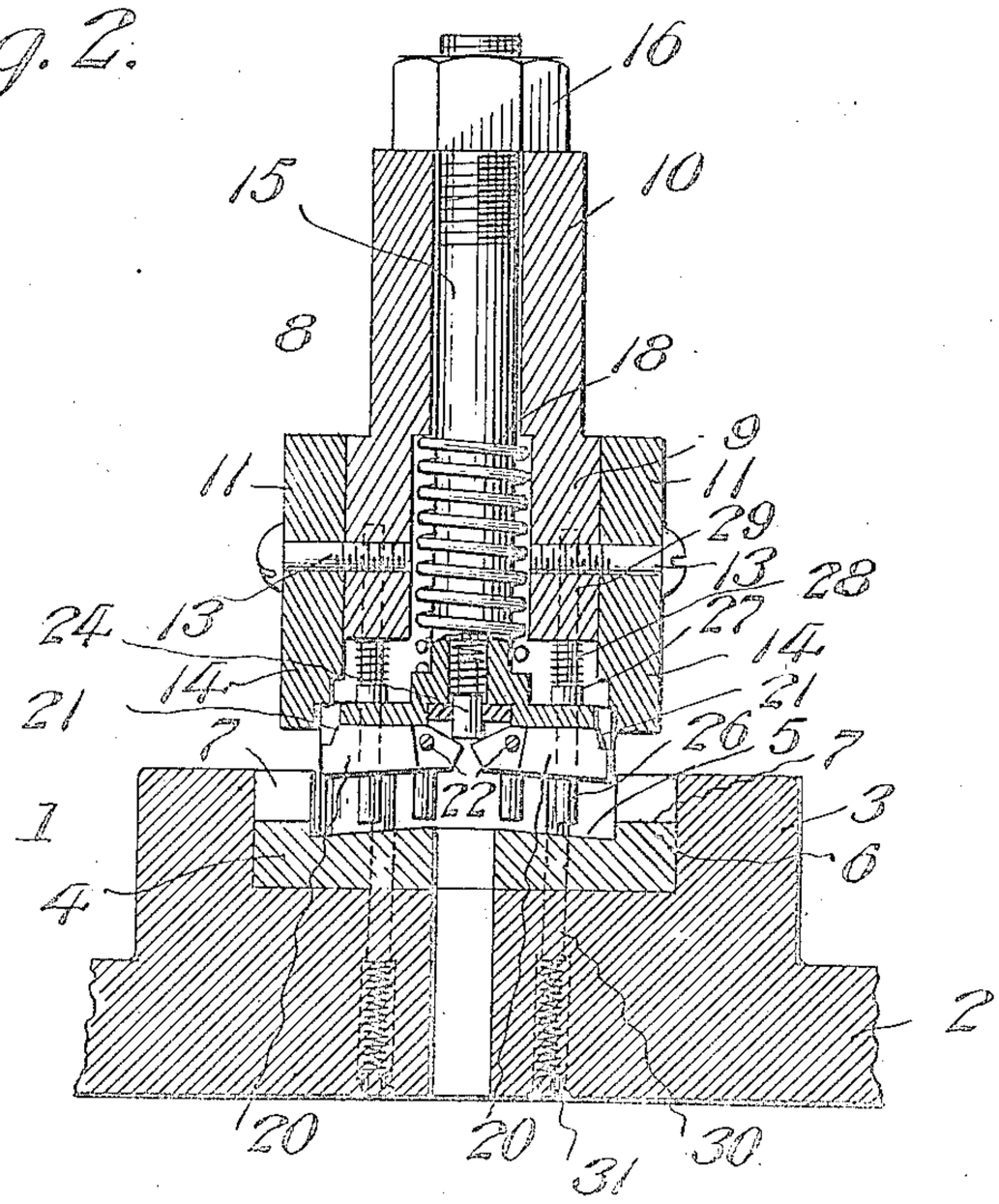


Fig. 2.



WITNESSES:
Leo Hekeman
E. C. Hines.

INVENTOR:
Charles E. McManus
By his Attorney
Victor J. Evans

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2 SHEETS—SHEET 2.

Fig. 3.

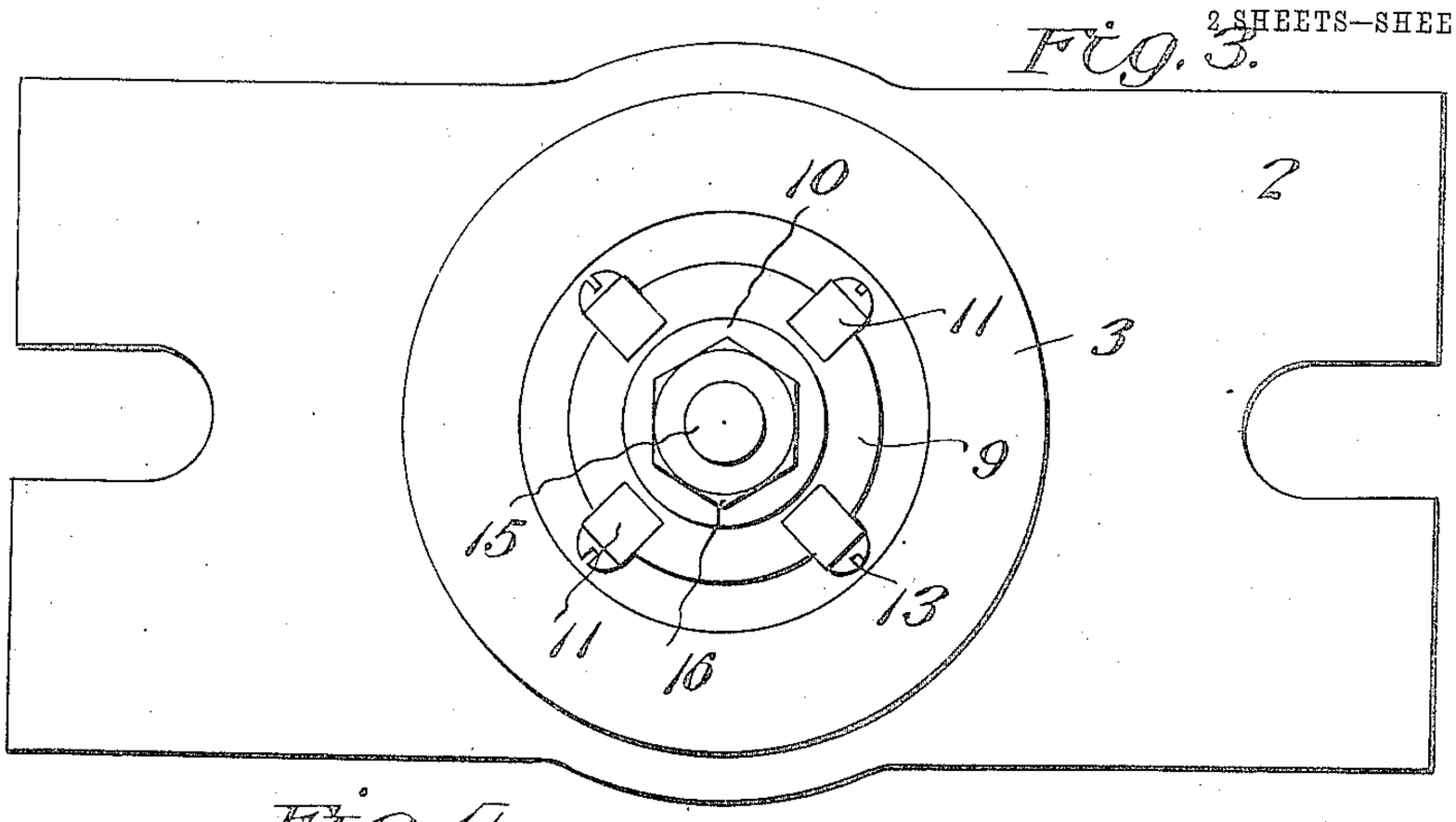


Fig. 4.

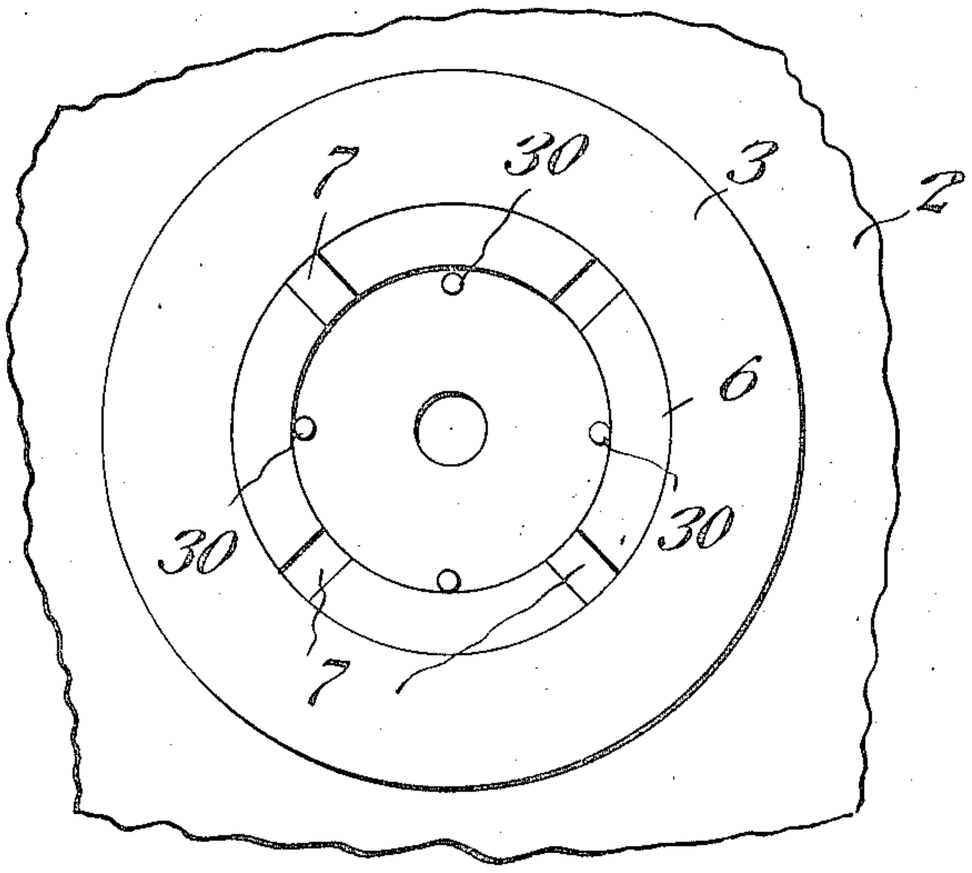


Fig. 5.

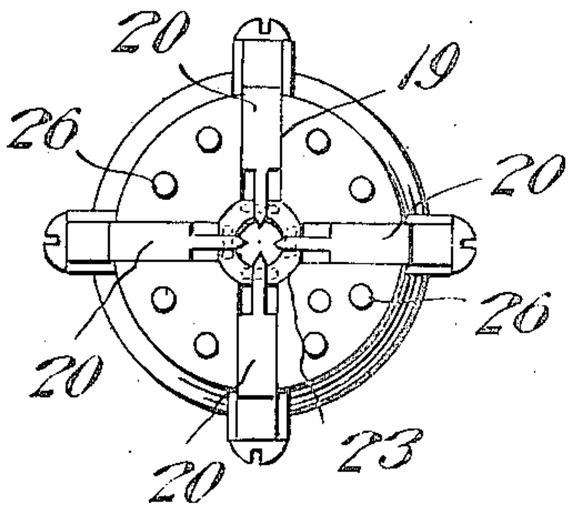


Fig. 7.

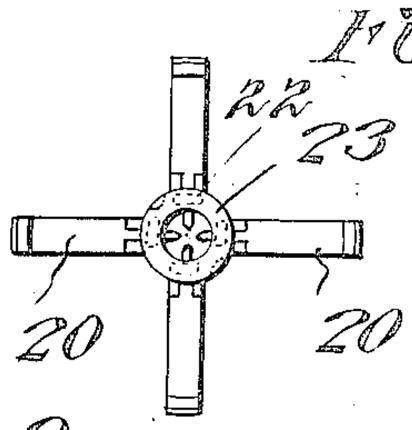


Fig. 6.

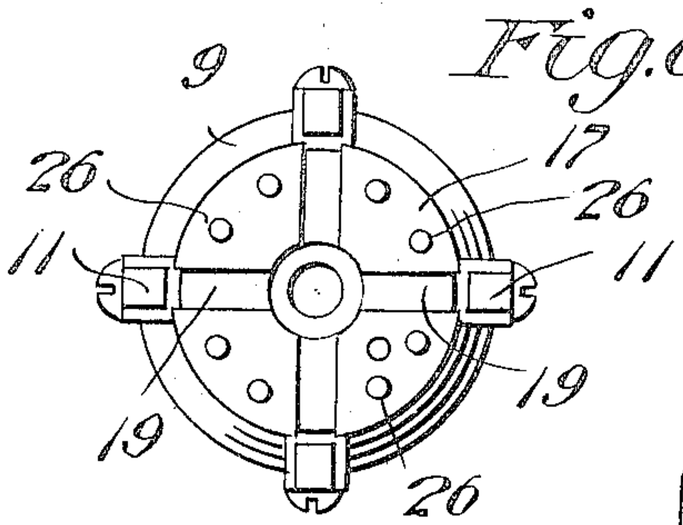
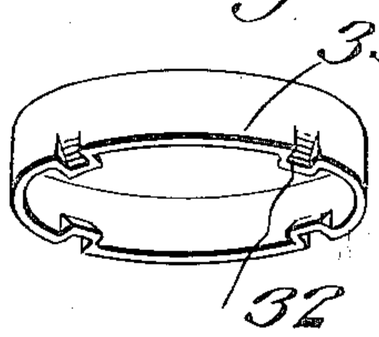


Fig. 8.



WITNESSES:

Geo. Ackman

C. C. Hines.

INVENTOR:

Charles E. McManus,

By his Attorney

Victor J. Evans

UNITED STATES PATENT OFFICE.

CHARLES E. McMANUS, OF NEW YORK, N. Y.

DIE FOR FINISHING BOTTLE-CAPS.

No. 822,755. Specification of Letters Patent. Patented June 5, 1906.

Application filed July 28, 1905. Serial No. 271,604.

To all whom it may concern:

Be it known that I, CHARLES E. McMANUS, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Dies for Finishing Bottle-Caps, of which the following is a specification.

This invention relates to improvements in dies for forming tongues or locking members upon the rims or flanges of bottle-seals of the cap type, and particularly to a die for forming indented or instruck tongues upon bottle-caps of the type shown in my prior United States patent, No. 772,250, dated October 11, 1904, wherein the tongues on the rim of the cap are adapted to be passed downward through spiral grooves formed in a flange or enlargement upon the mouth of the bottle and to bear beneath said flange to secure the bottle-cap in place. I do not, however, limit the invention to forming tongues of the specific construction shown in said patent, as it may be used for making locking members of any other desired form.

The object of the present invention is to provide a construction of die whereby the successive operations of forming the tongues upon the caps fed thereto and ejecting the finished caps may be efficiently and speedily performed, so that a maximum number of caps may be finished within a given time.

With the above and other objects in view the invention consists of the novel features of construction and combination of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevational view of the die and cap-support. Fig. 2 is a vertical section of the same. Fig. 3 is a top plan view thereof. Fig. 4 is a similar view of the cap-support. Fig. 5 is a bottom plan view of the die. Fig. 6 is a similar view with the pivoted die members on the head removed. Fig. 7 is a detail view of the pivoted die members and carrier-ring, and Fig. 8 is a perspective view of a finished cap.

Referring now more particularly to the drawings, the numeral 1 designates a work-support comprising a bed-plate 2, provided with an upwardly-extending boss or anvil-head 3, formed in its upper face with a seat-recess for the reception of a cap receiving and supporting socket 4, having a chamber corresponding in depth and diameter to the cap to be operated upon and in which the cap is inserted in inverted position with its top resting upon the bottom wall 5 of said socket and its flange or rim resting against the annular side wall 6 of the socket, which side wall 6 is formed at intervals with slots or recesses 7.

The die 8 is of the reciprocating type and comprises a head 9, provided with an upwardly-extending tubular shank 10, adapted to be clamped to the chuck or die carrying part of any suitable die-operating mechanism. Arranged upon the outer surface of the head are stationary die members 11, comprising elongated blocks fixed to the head by screws or other preferred fastenings 13, but which may be formed integral with the head, if desired. The lower ends of these die members project below the head and provide forming portions 14, adapted upon the downward movement of the die to enter the recesses 7 in the socket 4 and provided upon the inner faces thereof with stepped forming-surfaces, which may vary in number, according to the depth of the inspringing locking-tongues to be formed upon the rim of the cap.

Movable loosely in the die-body and shank is a supporting-stem 15, provided at its upper end with a check-nut 16 to limit its downward movement and carrying at its lower end a head 17, movable between the forming members 14 of the dies 11. A pressure-spring 18 is coiled about the stem 15 within the head and bears, respectively, at its lower and upper end against shoulders formed upon the body and stem, said spring serving to normally project or force the stem and head downward and permit the same to yield upward. The head 17 is provided in its under side with a series of radial slots 19, corresponding in number to and alining with the forming members 14, and seated within these slots are movable die members 20, having outer forming surfaces or recesses 21. These movable die members are pivotally mounted adjacent their inner ends upon pins 22, mounted upon a slotted carrier-ring 23, occupying a recess in the head at the point of intersection of the slots 19. This manner of pivotally mounting the die members 20 adapts them to fold horizontally into the slots 19 and to tilt downward at their outer or forming ends to release the cap in the manner hereinafter described. A pin 24, carried by the head and projected outward by a spring 25, seated in a socket in the stem 15, engages the inner ends of the dies 20 and ex-

erts pressure thereon to normally hold the same in a horizontal position. Slidably mounted in the head are cap releasing or extracting pins 26, limited in downward movement by stop-shoulders 27, adapted to engage the head and provided between said shoulders and base of the body 9 with surrounding coiled springs 28, serving normally to project said pins and permit the same to have free yielding upward or retractive movement. The upper ends of the pins fit and slide in receiving-sockets 29, formed in the body 9. The pins 26 coöperate with pins 30, carried by the cap-support, to release and extract the finished cap. The pins 30 are vertically movable in the openings in the bed and bottom of the socket 4 and normally pressed upward by springs 31, seated in suitable receiving recesses or sockets in the bed.

In operation the caps are successively fed to the socket 4 by hand or any suitable type of feed mechanism and are disposed in inverted position in said socket. Upon the downward movement of the die the head 17 enters the cap and causes the die members 20 to clamp the rim of the cap against the side wall 6 of the socket 4 and the pins 26 to bear upon the top of the cap and in conjunction with said die members 20 clamp the same against the bottom socket-wall 5. As the die continues to descend the head 17 folds against the bottom of the body 9 and between the forming members 14 of the dies 11, which members 14 come down upon the outside of the rim of the cap and indent or force the portions thereof engaged thereby into the recesses and against the forming-shoulders of the die members 20, thereby forming the tongues 32 upon the cap 33, as shown in Fig. 8. It will be understood that upon the downward movement of the head the pins 30 will be forced downward under the pressure of the head to allow the cap to be held securely within the socket during the operation of forming the tongues. Upon the upward movement of the die the die members 11 will first be withdrawn from engagement with the rim of the cap, the head 17 remaining in position until the nut 16 is engaged by the shank 10 to hold the cap in position until the die moves upward a sufficient extent for its discharge from the socket 4. Upon the upward movement of the head the pins 30 will lift the finished cap from the socket, while the pins 26 will force the rim of the cap out of engagement with the die members 20, the forming ends of the latter tilting downward under the pressure of said pins to release the rim of the cap and permit the latter to be discharged. In practice it is found that the action of the spring-pressed releasing-pins is sufficient to force the finished cap from the socket and out of engagement with the die, so that it will fall from the anvil 3 onto the bed plate or support, to which the latter is attached, thus automatically discharging the cap to free the socket for the reception of the succeeding cap; but it will of course be understood that any suitable additional extracting means may be employed, if desired.

By the use of a die of the construction described a maximum number of caps may be operated upon within a given time, as the quick release of the finished caps permits the die to be operated at a very rapid rate of speed.

Having thus described the invention, what is claimed as new is—

1. A die comprising a body provided with stationary forming members, a spring-controlled head yieldingly mounted upon the body, pivoted spring-controlled forming members carried by the head, said members being adapted to tilt and automatically release the cap when the die is retracted, and means automatically operating when said forming members tilt for forcing the cap out of engagement therewith.

2. A cap-finishing die comprising a body provided with stationary forming members, a spring-projected head yieldingly mounted upon the body, coöperating dies or forming members pivotally mounted upon the head, and means for normally holding said dies or forming members in operative relation and permitting them to move out of engagement with the cap upon the retraction of the die.

3. A cap-finishing die comprising a body provided with stationary forming members, a spring-controlled head yieldingly mounted upon the body, pivoted forming members carried by the head, means for normally holding said pivoted forming members in operative relation and permitting the same to tilt out of engagement with the cap upon the retraction of the die, and spring-actuated cap-extracting devices carried by the die.

4. The combination with a support provided with a cap-holder and spring-actuated cap-ejecting means, of a die provided with a body carrying stationary forming members, a yielding head carried by the body and provided with coöperating tilting, spring-controlled forming members, and spring-actuated cap-extracting means movably mounted upon the body and head, substantially as described.

5. The combination with a cap-receptacle provided in its side wall with slots, of a die provided with a body carrying stationary forming members adapted to enter said slots, and a yielding head carried by the body to enter the support and provided with coöperating tilting spring-controlled forming members, said forming members being adapted to enter the cap and to tilt and release the same when the die is withdrawn from the support, the said stationary and tilting forming members having forming-faces to engage opposite sides of the flange of the cap.

6. The combination with a support provided with a cap-holder and spring-actuated cap-ejecting means, said holder being provided in its side wall with slots, of a die provided with a body carrying stationary forming members adapted to enter said slots, a yielding head carried by the body and provided with coöperating tilting, spring-controlled forming members adapted to bear against the flange of the cap, and spring-actuated means carried by the die-body and controlled by and movable with relation to the head to release the cap from said tilting forming members.

7. A cap-finishing die comprising a body provided with a stationary forming member, a spring-projected head yieldingly mounted upon the body, a coöperating die or forming member pivotally mounted upon the head, and means for normally holding said pivoted die or forming member in a horizontal position to move into the cap and to permit it to assume a tilting position to move out of engagement with the cap upon the retraction of the die.

8. A cap-finishing die comprising a body carrying stationary forming members, a stem slidably mounted in the body, a head carried by said stem, coöperating forming members pivotally mounted upon the head, means for normally holding said pivoted forming members in operative relation and permitting them to move out of engagement with the cap upon the retraction of the die, and a spring yieldingly connecting the stem and head with the die-body.

9. A cap-finishing die comprising a body provided with stationary forming members, a stem slidably mounted therein, a head carried by the stem, a spring acting on the head to normally force the same outward and permit it to have retractive movement, pivoted forming members carried by the head, means for normally holding said pivoted forming members in operative relation and permitting them to move out of engagement with the cap upon the retraction of the die, and spring-actuated members movable through the head for releasing the cap from said pivoted forming members.

10. A cap-finishing die comprising a body provided with one or more stationary forming members, a stem slidably mounted in the body, a head carried by the stem and carrying one or more pivotally-mounted forming members, means for normally retaining said pivoted forming members in a horizontal position and permitting them to tilt therefrom to move out of engagement with the cap upon the retraction of the die, and means associated with the head for retracting the cap from said pivoted forming members.

11. A cap-finishing die comprising a body provided with stationary forming members, a spring-controlled head yieldingly mounted upon the body, pivoted forming members carried by the head, and a spring-actuated plunger acting upon said forming members to normally hold them in operative position and permit them to tilt to release the cap when the die is retracted.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. McMANUS.

Witnesses:
C. C. HINES,
H. DITTMAN.