

930,144.

Patented Aug. 3, 1909.

Fig. 1.

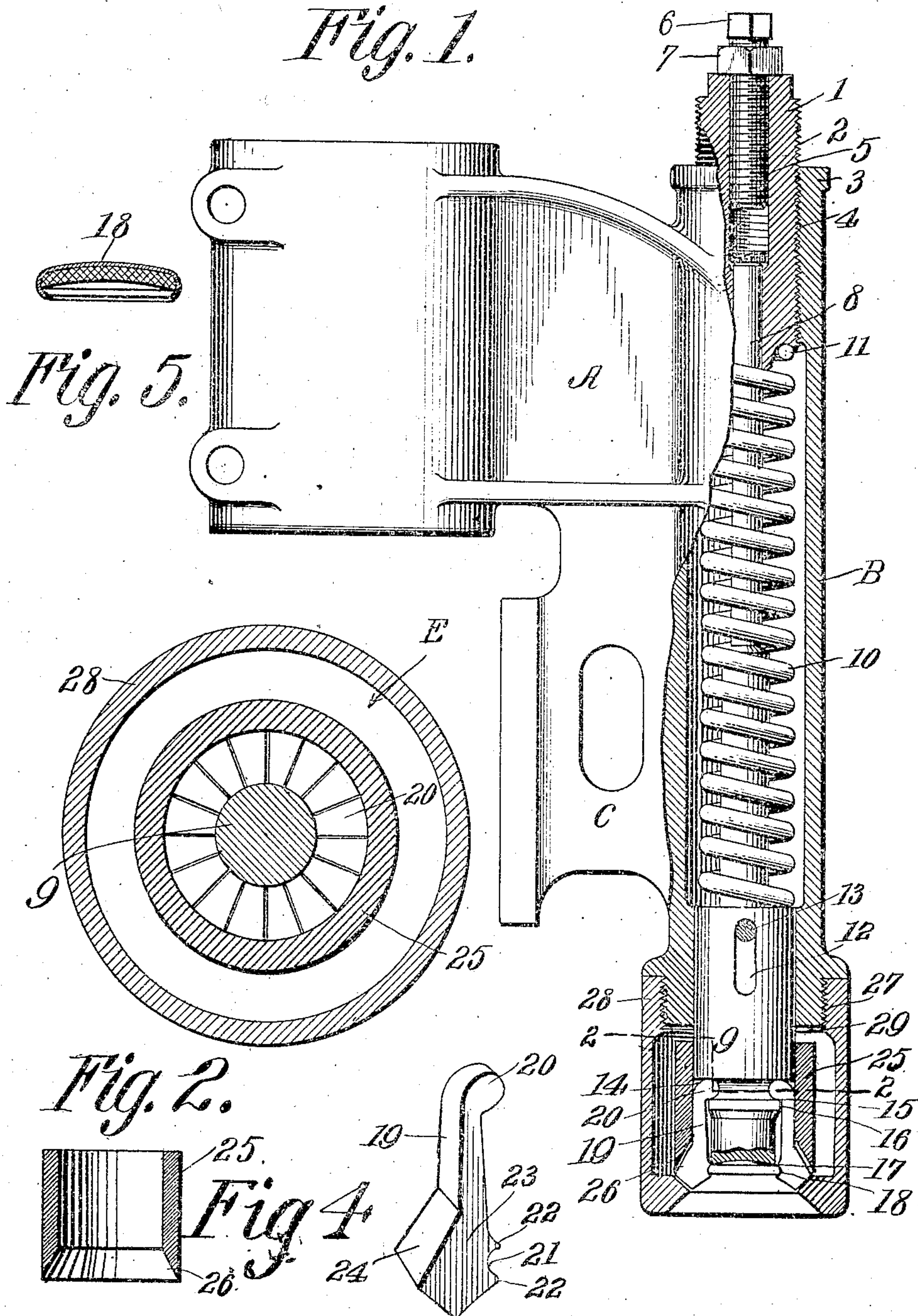


Fig. 2.

Fig 4

Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

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BOTTLE-CAPPING MACHINE.

No. 930,144.

Specification of Letters Patent.

Patented Aug. 3, 1909.

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To all whom it may concern:

Be it known that I, HENRY S. BREWINGTON, a citizen of the United States, residing at Baltimore city, State of Maryland, have invented certain new and useful Improvements in Bottle-Capping Machines, of which the following is a specification.

My invention relates to improvements in capping heads as applicable to bottle capping machines and machines of like character, the object being to automatically secure a sealing cap on the head or mouth of a bottle.

The particular kind of bottle which I employ as the most applicable, is that which has an exterior locking shoulder or bead on the head thereof, and the kind of cap which is more particularly desired to be used and for which the crowning head is most applicable is a metallic cap having a depending flange, the flange adapted to be locked under the shoulder or bead on the bottle head, thereby securing the cap on the bottle by the use of the crowning head now about to be described.

It will be observed that in the present invention I have provided a sleeve that encircles the plunger and the closing fingers; the function performed by this sleeve is as follows: First, it provides means to hold the closing fingers in position in the groove of the plunger, having a flaring lower end portion it operates as closing means for the fingers, fitting around the fingers loosely and having a space at the top part separating the sleeve from the lower end portion of the head, the sleeve is permitted to rise a limited distance, thus permitting the fingers at their lower end portion to be opened to receive the cap, the weight of the sleeve resting on the lower portion of the fingers being sufficient to hold them in a closed position with sufficient resistance to retain the cap in proper position prior to being secured on the bottle head. The space above the sleeve at the upper end portion enables the plunger to rise and at the same time receive the pressure from the spring surrounding the upper part of the plunger before the fingers commence to close in on the cap, since, as the sleeve rises with the upper movement of the plunger, it does not operate by closing against the fingers until it comes in contact with the lower end

portion of the head. The diameter of the lower end portion of the plunger is slightly larger than that of the bottle head, thus keeping the fingers open a sufficient distance so that in the descent of the plunger on the bottle head the fingers will be kept away from the head and will not close about the head until the cap is firmly seated thereon; in keeping the fingers away from the bottle head until the cap has become seated thereon, and then causing the fingers to close in and around the cap, by this construction the bottle head is protected until the final sealing operation actually begins, at which time the cap affords the necessary protection to keep the bottles from being broken or the heads chipped or splintered during the descent of the plunger. From actual observation it is found that more bottles are broken or injured by the descent of the plungers upon them than by the actual sealing operation. The form of cap most applicable for use by the machine is a cap having a concavo convex flange, which cap is adapted to be closed upon and under a bead on the bottle head by pressure being applied to the convex portion of the flange. The commercial value of machines of this character depends more or less upon the estimated breakage of bottles in the process of capping and with the object of eliminating this objection as much as possible, I have invented the machine now about to be described.

With the foregoing object in view, my invention consists in certain novel features of construction and combinations of parts, which will be hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation partly in section of a crowning head constructed in accordance with my invention. Fig. 2 is a sectional view drawn to an enlarged scale on the line 2—2 of Fig. 1. Fig. 3 is a detail view of one of the closing fingers. Fig. 4 is a sectional view of the sleeve, and Fig. 5 is a sectional view of the sealing cap.

A, represents an arm carried by any suitable machine imparting to the said arm a reciprocating movement. B, the sealing head which is centrally bored throughout its entire length and is shown integral with the

said arm, although this need not necessarily be, as the head may be made separate and secured to the arm by means too well known to those skilled in the art to demand further description here.

1, is a hollow plug exteriorly threaded at 2, and secured in the upper end 3 of the head by means of the head being inwardly threaded at 4 to receive it. The plug is inwardly threaded at 5 into which is secured the set screw 6, which set screw is adjustably secured therein by means of the nut 7; the object and purpose of this construction and adjustment will be hereinafter explained. Below the arm A and adjacent to the said head B is a guide arm C. Secured within the head B is a plunger 8, provided with an enlarged lower end portion 9; 10 is a spiral spring surrounding the said plunger, supported by the enlarged end portion 9 thereof, the upper end of which abuts against the lower end 11 of the plug 1. The enlarged end portion 9 of the plunger 8 is provided with a slot 12 extended therethrough, through which is fitted a pin 13, which pin extends through the head B and is secured stationary in the head, the slot reciprocates with respect to the pin, although this construction might be reversed without impairing the result obtained, the object being to limit the reciprocation of the plunger 8, and secure the plunger within the head.

The lower end of the enlarged end portion 9 of the plunger is reduced at 14, and is provided with a circumferential groove 15 adjacent to the said enlargement, and a shoulder 16 below the same; the lower end of this reduced portion is provided with a concave face 17 for the purpose of centering the cap 18 on the bottle (not shown) just prior to the sealing operation.

Suspended from within the groove 15 and supported by the shoulder 16 are a series of closing fingers 19, forming a segmental closing die E; these fingers are provided on their upper end portions with round heads 20 conforming to the dimensions of the groove 15 into which they are fitted. In the lower inner face ends of the fingers is provided a groove 21 adjacent to and on each side of which are provided the teeth 22. The lower end portions 23 of the fingers are considerably enlarged and the outer faces thereof are tapered at 24 at an angle of about forty-five degrees. Surrounding the closing fingers 19, is a sleeve 25, the lower inner end portions of which are tapered at 26 to conform to and engage with the tapered faces 24 of the fingers 19. Secured on the lower threaded end 27 of the head B, is a guide 28, which supports therein the sleeve 25. The length of the sleeve is made shorter than that of the guide, so that a space 29 is afforded between the lower end of the head and the upper end of

the sleeve, one object being to permit the spreading or opening of the fingers for the insertion of the cap 18 into the groove 21 prior to its being secured on the bottle head (not shown); the other and more important reason is to permit a downward pressure of the plunger to be brought upon the cap below which a bottle (not shown) has been placed and thus insures a sealing contact between the bottle and cap before the final sealing operation takes place by causing the fingers to close in and around the cap, which operation takes place as soon as the upper end of the sleeve is brought in contact with the lower end of the head, by reason of which the tapered edge 26 of the sleeve is made to engage with the tapered faces 24 of the fingers, thus causing the fingers to close in and around the cap, and secure it on the head of the bottle head (not shown).

My invention is operated as follows: A cap is first placed within the die E, below the plunger and held therein by the grooves 21 in the series of fingers. A bottle (not shown) is placed below the plunger, the head B is made to descend, thereby causing the plunger to ascend within the head, by the descent of the head beyond a given point the tapered edge 26 of the sleeve 25 is brought into contact with the tapered face 24 of the closing fingers 19, thereby closing them in and around the flange of the cap, causing the flange to be pressed under the bead on the bottle head. As the head ascends, the pressure being released, the tension spring 10 will cause the plunger to descend, thereby causing the fingers to be released from around the cap, and permitting the capped bottle to be withdrawn.

The plug 1 regulates the tension of the spring 10, and the set screw 6 regulates the reciprocation of the plunger within the limit afforded by the slot 12 and pin 13.

Slight changes and alterations might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, hence I do not wish to limit myself to the exact construction as herein set forth, but

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

1. A bottle capping machine of the character described, comprising a reciprocating arm, a head centrally bored throughout its entire length and carried thereby, a hollow plug adjustably secured in the upper end thereof, a solid reciprocating plunger secured within the head, means for reciprocating the plunger, a plurality of closing fingers carried on the lower end portion of the said plunger, a reciprocating sleeve secured around the said closing fingers, and supported thereby, and adapted to engage the said fingers and force

them inwardly toward a common center, a guide secured on the lower end of the said head inclosing the said sleeve, substantially as described.

2. A bottle capping machine of the character described, comprising a reciprocating arm, a head centrally bored throughout its entire length and carried thereby, a solid plunger secured within the head, a tension spring secured around the said plunger, means for adjusting the tension on said spring, means for limiting the reciprocation of the said plunger, a segmental closing die composed of a plurality of closing fingers around which is secured a reciprocating sleeve, carried on the lower end of the said plunger, and means provided on the said fingers for supporting the said sleeve thereon, the said sleeve adapted to engage the said fingers and force them inwardly toward a common center, substantially as described.

3. A bottle capping machine of the character described, comprising a reciprocating arm, a head centrally bored throughout its entire length and carried thereby, a guide arm secured to the head, a solid reciprocating plunger secured within the head, means for limiting the reciprocation thereof, a plurality of segmental closing fingers carried on the lower end portion of the said plunger, a reciprocating sleeve secured around the said closing fingers and adapted to be engaged therewith, a guide secured on the lower end portion of the said head surrounding the said sleeve, substantially as described.

4. A machine of the character described comprising a reciprocating arm, a head centrally bored throughout its entire length and carried thereby, a solid plunger enlarged on the lower end portion thereof, a plurality of closing fingers carried by the said plunger, a reciprocating sleeve secured around the said closing fingers means on the said fingers for supporting the said sleeve in position, and means for reciprocating the said plunger, thereby causing the said sleeve to engage the said fingers and force them inwardly toward a common center, substantially as described.

5. A machine of the character described, comprising a reciprocating arm, a head centrally bored throughout its entire length and carried thereby, a reciprocating solid plunger secured within the head, means for limiting the reciprocation thereof, and means for adjusting the reciprocation of the plunger within the limit afforded by the means of limitation, a plurality of closing fingers secured on the end portion of the said plunger, the said fingers being provided with enlarged end portions, the inner faces of which are provided with a circumferential groove and a plurality of teeth adjacent thereto, the exterior faces of which are tapered, a reciprocating sleeve secured around the said fingers, and

means on the fingers for supporting the said reciprocating sleeve thereon, substantially as described.

6. A machine of the character described, comprising a reciprocating arm, a head centrally bored throughout its entire length and carried thereby, a reciprocating solid plunger secured within the head and enlarged on the lower end portion thereof, a circumferential groove provided in the lower end portion of the said plunger, a plurality of closing fingers secured within the groove, a reciprocating sleeve secured around the said fingers, a guide inclosing the said sleeve, substantially as described.

7. A machine of the character described, comprising a reciprocating arm, a head centrally bored throughout its entire length, and carried thereby, a reciprocating solid plunger secured within the head, a plurality of closing fingers, means on the lower end of the said plunger for supporting the said closing fingers, a reciprocating sleeve tapered on the lower inner end portion thereof and secured around the said fingers, a follower, and means for securing the said guide to the said head, substantially as described.

8. A machine of the character described, comprising a solid plunger, a segmental closing die composed of a plurality of independent closing fingers carried thereby, a circumferential groove provided in the inner face thereof, a plurality of teeth adjacent thereto, the exterior end portion of the said fingers being enlarged and provided with a tapered face, means for securing the said fingers on the said plunger, a reciprocating sleeve surrounding the said fingers and adapted to engage with the exterior tapered faces thereon, and means on the fingers for supporting the said sleeve in position, substantially as described.

9. A bottle capping machine of the character described, comprising a solid plunger, a segmental closing die carried on the lower end portion thereof, a reciprocating sleeve loosely surrounding the said closing die and adapted to engage therewith, thereby forcing the said closing die inwardly to a common center, by the ascent of the said plunger and thereby causing the said sleeve to engage with the said closing die, substantially as described.

10. A bottle capping machine of the character described, comprising a yielding solid plunger, a groove provided in the lower end portion thereof, a plurality of individual closing fingers secured within the groove, a reciprocating sleeve loosely surrounding the fingers and adapted to force the fingers toward a common center by the upward movement of the plunger whereby a cap is secured to the head of a bottle, substantially as described.

11. A bottle capping machine of the character described, comprising a yielding solid plunger with a groove in the lower portion thereof, a plurality of individual fingers secured within the groove, a reciprocating sleeve loosely surrounding the fingers, means for securing a sealing contact between a cap and bottle head prior to securing the flange

of the cap in final sealing contact with a bottle head, substantially as described. 10

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

HENRY S. BREWINGTON.

Witnesses:

MARY M. MAGRAW,

KATHERINE M. MANNION.