

H. A. ALLWARDT.
BOTTLE CAPPING MACHINE.
APPLICATION FILED MAY 24, 1909.

991,125.

Patented May 2, 1911.

3 SHEETS—SHEET 1.

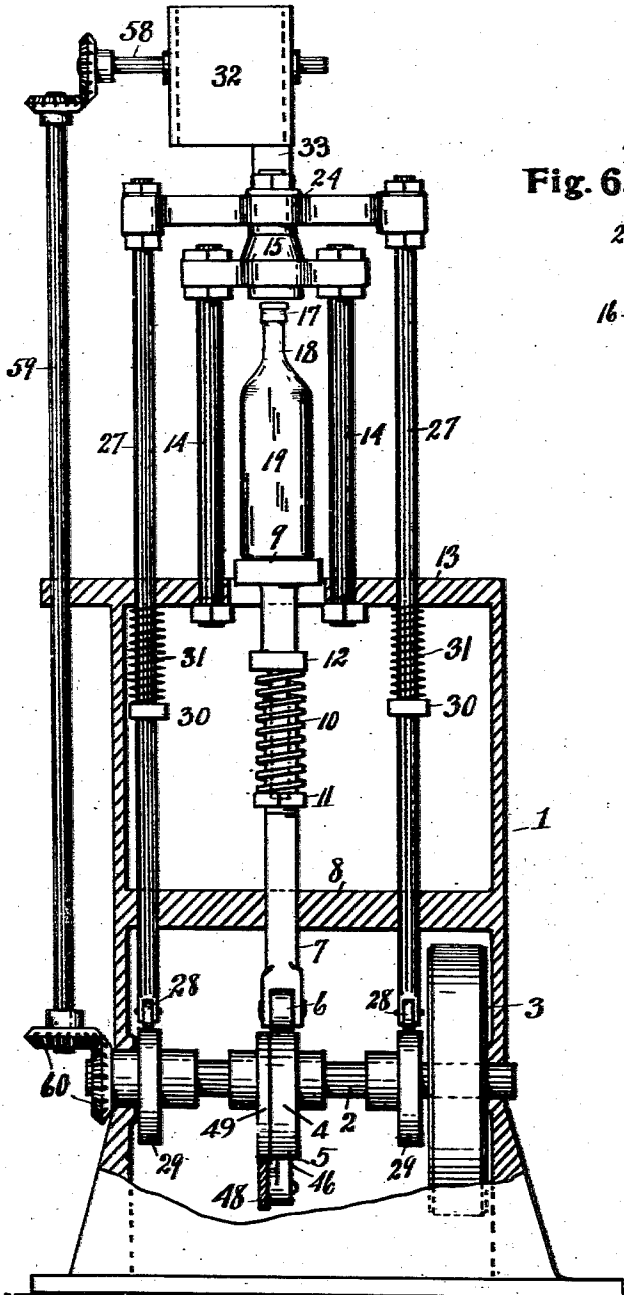


Fig. 1.

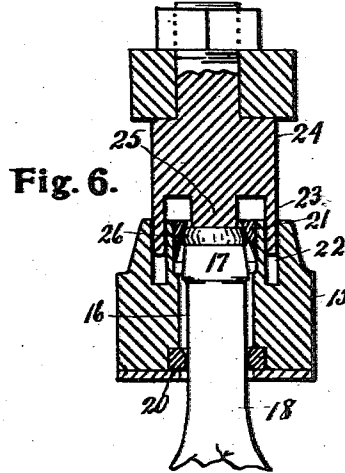


Fig. 6.

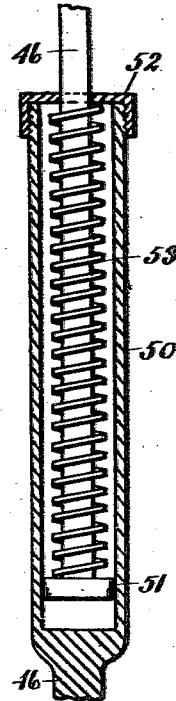


Fig. 7.

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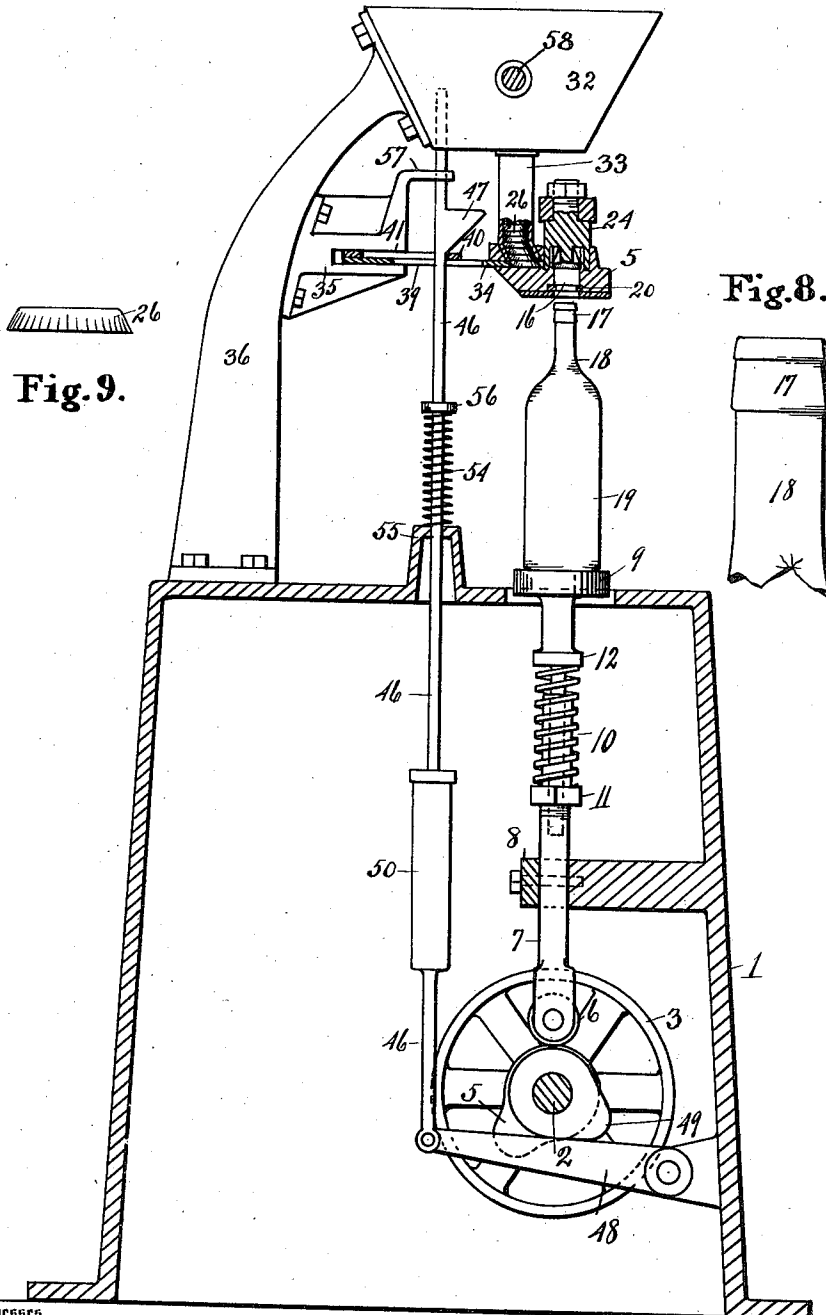
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3 SHEETS-SHEET 2.



Witnesses
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Fig. 2. Henry A. Allwardt.
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3 SHEETS—SHEET 3.

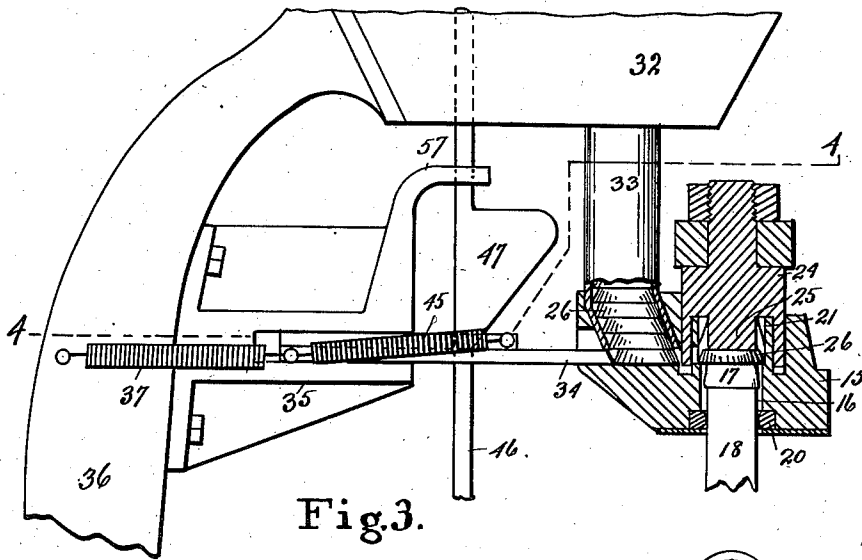


Fig. 3.

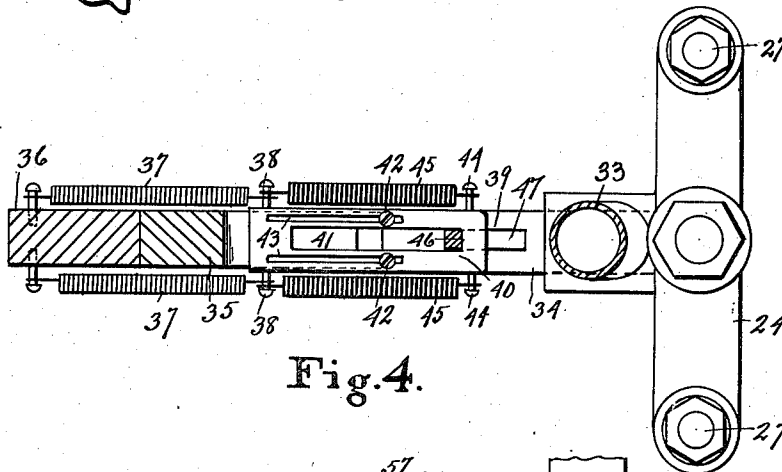


Fig. 4.

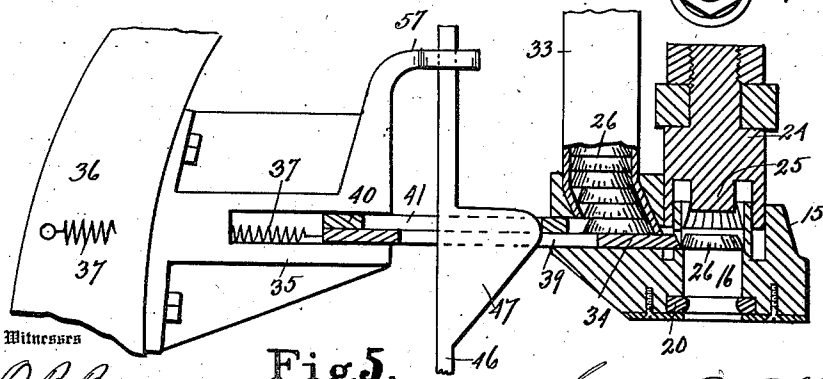


Fig. 5.

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UNITED STATES PATENT OFFICE.

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BOTTLE-CAPPING MACHINE.

991,125.

Specification of Letters Patent.

Patented May 2, 1911.

Original application filed November 15, 1907, Serial No. 402,245. Divided and this application filed May 24, 1909. Serial No. 498,041.

To all whom it may concern:

Be it known that I, HENRY A. ALLWARDT, a citizen of the United States, residing at Battle Creek, in the county of Calhoun, State of Michigan, have invented certain new and useful Improvements in Bottle-Capping Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to a bottle capping machine, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claims.

The object of the invention is to provide a machine of the character described, of comparatively simple and inexpensive construction, wherein the arrangement is such as to enable a filled bottle to be readily and perfectly capped or crowned so as to seal the contents therein, provision being made for feeding the caps successively into position to be crimped onto the heads of the bottles.

The above object is attained by the structure illustrated in the accompanying drawings, in which:—

Figure 1 is a view partly in section, of a machine embodying my invention, showing thereon a bottle in position for capping.

Fig. 2 is a view at right angles to Fig. 1, showing parts in section. Fig. 3 is a fragmentary view partly in section of the cap or crown feeding mechanism. Fig. 4 is a horizontal section as on line 4—4 of Fig. 3.

Fig. 5 is a view similar to Fig. 3 showing the position of the parts at the moment a cap has been fed into the capping head. Fig. 6 is a fragmentary view in section, showing the position of the parts at the time the cap is being crimped onto the head of the bottle. Fig. 7 is an enlarged longitudinal section through the expansible joint in the rod that actuates the cap-feeding slide. Fig. 8 is a view of the neck and head of a bottle. Fig. 9 is an elevation of the crown or cap.

This application is a division of my application Serial No. 402,245.

Referring to the characters of reference, 1 designates a suitable frame in the lower part of which is journaled a main shaft 2 adapted

to be driven by a belt pulley 3 thereon from any suitable source of power.

Upon the shaft 2 is a cam 4 having a high point 5. Rolling upon the cam 4 is an anti-friction roller 6 journaled in the lower end of a vertically reciprocatory shaft 7 which is guided in the cross bar 8 of the frame. Upon the upper end of the shaft 7 is a bottle-supporting disk 9. The shaft 7 is divided and the upper and lower sections thereof are made telescopic by means of the compressible spring 10 which is confined between the collar 11 on the lower section, and the collar 12 on the upper section. Said spring normally maintains said sections in proper relation but will yield to permit one of the sections to enter the other during the upward movement of said shaft should the upward travel of the disk 9 be resisted, obviating the possible breaking of a bottle carried on said disk.

Secured at their lower ends in the top 13 of the frame and projecting vertically therefrom are the rods 14 which carry at their upper ends the capping head 15 having a vertical aperture 16 therethrough adapted to receive the head 17 and neck 18 of a bottle 19. Within the lower portion of said head 15 and surrounding the aperture therethrough is a compressible collar 20 adapted to bear against the neck of the bottle to guide it in its vertical movement. In the upper end of the aperture 16 through said head is a tapered steel ring 21 of such shape as to crimp the caps onto the heads of the bottles when forced upwardly into said aperture, as hereinafter explained.

Surrounding the central aperture 16 through the head 15 is an annular channel 22 into which depends the circular flange 23 on the reciprocatory cross head 24 supported above the capping head 15 in working relation therewith. Depending centrally from the cross head 24 within the circular flange 23 thereof is a cylindrical block 25 adapted to enter the opening through the tapered ring 21 and to extend within the opening 16 through the head 15. Said cylindrical block serves as an abutment for the crowns or caps 26 to force them onto the heads of the bottles over the mouths thereof as the neck of the bottle is carried upwardly into the stationary head 15. Connected to the opposite ends of the cross head 24 are the vertically reciprocatory rods 27 which pass through the

top 13 of the frame and through the cross bar 8, said rods carrying at their lower ends the antifriction rollers 28 which roll in peripheral contact with the cams 29 on the main shaft 2. Embracing the rods 27 and confined between the collars 30 thereon and the top of the frame are the compressible springs 31 which return the rods 27 after they have been raised vertically by the cams 29.

The crowns or caps 26 are contained in a hopper 32 from which leads a spout 33 down which said crowns are fed to a way formed in the capping head 15 and communicating with the aperture 16 therethrough. Adapted to reciprocate in said way is a slide 34 whose forward end is adapted to engage the crowns to slide them into position for capping the bottles, and whose rear end is supported in a bracket 35 mounted on the arm 36 of the frame. Attached to the rear end of the slide 34 are the coiled springs 37 which return said slide after each forward movement thereof to feed a cap into the capping head 15, said springs being connected to said slide through the medium of the laterally projecting pins 38 on the rear end thereof to which the forward ends of said springs are attached. Formed through the slide 34 is a longitudinally extending slot 39. Lying upon the slide 34 and adapted to reciprocate thereon is a plate 40 having a longitudinal slot 41 therethrough, said plate being confined to said slide and directed in its movement thereon by means of the pins 42 mounted in said slide which pass through the parallel longitudinally extending slots 43 in said plate. Extending laterally from the forward end of the plate 40 are the pins 44 to which are attached the forward ends of the springs 45, the rear ends of said springs being attached to the pins 38 on the slide 40. The tension of the springs 45 is greater than that of the springs 37.

The slide 34 is actuated to feed the crowns or caps into the capping head by means of a vertically reciprocatory rod 46 which passes through the registering slots in the slide 34 and the plate 40, and is provided near its upper end with a cam 47. The position of the cam 47 upon the rod 46 is such that as said rod moves downwardly, the inclined face of said cam will engage the plate 40 at the terminal of the slot therein, and carry said plate horizontally, imparting at the same time a corresponding horizontal movement to the slide 34 through the medium of the springs 45 connecting said plate and slide. As said slide is caused to move forward through the operation of the cam 47, its forward end engages one of the caps and forces it into the capping chamber 16 of the head 15, as clearly shown in Fig. 5. Upon an upward or return movement of the rod 46, the springs 37 will return the slide and

plate to their normal positions. Should the caps become clogged in the way through which they are fed to the capping chamber in the head 15, from the spout 33, a downward movement of the rod 46 under such conditions will not actuate the slide 34, for the reason that the springs 45 will yield when any undue resistance is offered to the travel of said slide, and allow the plate 40 only to be actuated by the downward movement of the cam 47, thereby obviating the breaking of the parts through the clogging of the machine. It will be noted that as a cap is displaced and carried into the capping chamber through the actuation of the slide 34, the superimposed caps in the spout 33 are supported upon said slide, and that the lowermost of said caps will drop into position to be carried into the capping chamber, as the slide is withdrawn from under the spout upon its rearward or return movement.

Motion is imparted to the rod 46 to actuate the feeding slide, through the medium of a lever 48 which is pivoted to the lower end of the rod 46 and is engaged by a cam 49 on the shaft 2. Said cam is so positioned upon said shaft as to depress the lever 48 and draw downwardly upon the rod 46 to feed a cap into the capping chamber at the proper time in the operation of the machine.

In the actuating rod 46 is an expansible joint consisting of a cylindrical case 50 in which the upper portion of said rod carrying the annular disk 51 is confined and adapted to move vertically, as clearly shown in Fig. 7. Surrounding the rod and confined between said disk and the end 52 of said case is a compressible spring 53. This expansible joint overcomes the rigidity of the connection between the lever and the cam 47, and permits the lower portion of said rod to be actuated without operating the upper portion carrying the cam should any injury to the parts interfere with the movement of the cam 47 in its vertical travel.

In the operation of the machine, the bottles which are filled are placed upon the supporting disk 9, which as it rises vertically through the operation of the shaft 7, causes the head of the bottle to enter the capping chamber in the head 15. As the head of the bottle enters said chamber, it encounters the cap 26 supported therein and carries said cap upwardly against the cylindrical block 25 of the cross head 24, whereby the cap is forced onto the head of the bottle. At this moment in the operation of the machine, the head 24 rises through the operation of the cams 29 and the bottle is moved upwardly still farther to crowd the cap into the tapered ring 21, whereby said cap is crimped onto the head of the bottle to complete the operation of capping. Upon the

return movement of the shaft 7 the bottle is withdrawn from the capping head, at which time the lever 48 is depressed to actuate the rod 46 and cause the cam 47 to move the slide 34 forward to feed a succeeding cap into position in the capping head. Another filled bottle is then placed in position upon the supporting disk 9 and the operation of capping repeated.

- 10 To return the rod 46 after it is depressed by the cam 49, a coiled spring 54 is employed which is confined between the guide 55 on the frame through which said rod passes and the fixed collar 56 on said rod.
- 15 The rod 46 is supported at its upper end by a guide 57 through which it passes.

The caps in the hopper 32 are fed into the spout 33 by suitable devices within said hopper, not shown, actuated by the shaft 58 passing therethrough, and driven by the vertical shaft 59 from the main shaft 2 through the medium of the beveled gears 60.

Having thus fully set forth my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a bottle crowning machine, the combination of a head, means for presenting a bottle to said head for crowning, a slide for feeding the crowns, a movable plate mounted upon said slide, springs for actuating said slide and plate, a reciprocatory rod having a projecting cam adapted to engage and actuate said sliding plate and said slide through the medium of said plate as said cam moves vertically.

2. In a capping or crowning machine, a capping head having a capping chamber therein, means for presenting the head of a bottle into said chamber for capping, a spout for delivering caps to the cap-feeding mechanism, said mechanism comprising a reciprocatory slide for feeding the caps, a reciprocatory rod means associated with said rod for actuating said slide, springs attached to said slide for returning it after actuation by a movement of said rod, an expansible joint in the actuating rod, and means for actuating said rod in timed relation with the bottle-sealing means.

- 50 3. In a bottle capping machine, a capping head, means for presenting a bottle to said

head for capping, means for presenting crowns or caps in position to be fed into said head, cap-feeding mechanism comprising a reciprocatory slide, springs for retracting it after movement in one direction, a plate movably mounted upon said slide, springs connecting said slide and plate, a reciprocatory cam for actuating the plate and slide, and means for actuating said cam.

4. In a bottle capping machine, a capping head, means for presenting a bottle to said head for capping, a slide for feeding the caps, a plate movably mounted on said slide, said slide and plate having registering slots therethrough, the slot in the slide being longer than the slot in the plate, means for retracting the slide after a forward movement, springs for connecting the plate and slide, and a cam lying within said registering slots for imparting movement to the slide through said plate, and means for actuating said cam.

5. In a bottle capping machine, a capping head, means for presenting a bottle to said head, means within said head for crimping a cap upon the head of a bottle, a slide for feeding caps to said head, a movable plate mounted on said slide, springs connecting said slide and plate, a reciprocatory rod, a cam on said rod for actuating said slide by engagement with said plate, and means for imparting a vertical reciprocation to said rod.

6. In a bottle capping machine, a capping head, means for presenting a bottle to said head for capping, a slide for feeding caps to the capping head, springs for returning said slide, a movable plate mounted on the slide, springs connecting said slide and plate, a cam for actuating the plate and slide, a reciprocatory rod for actuating said cam, said rod having an expansible joint therein, and means for actuating said rod.

In testimony whereof, I sign this specification in the presence of two witnesses.

HENRY A. ALLWARDT.

Witnesses:

RUSSEL W. SNYDER,
GEORGE SNYDER.