C. J. KRYZANOWSKY.

CAPPING APPARATUS.

APPLICATION FILED JAN. 8, 1915.

1,216,705.

Patented Feb. 20, 1917.

3 SHEETS—SHEET 1.

Fig. 1.

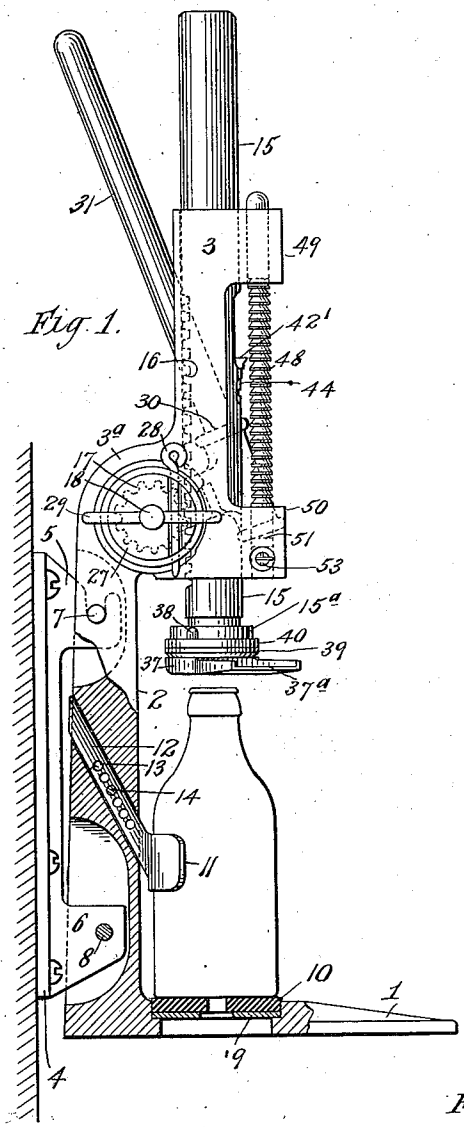


Fig. 2.

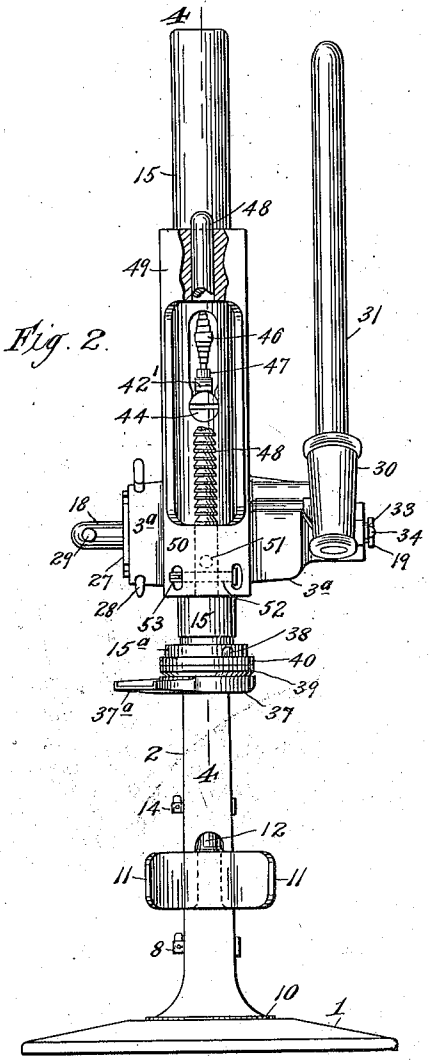
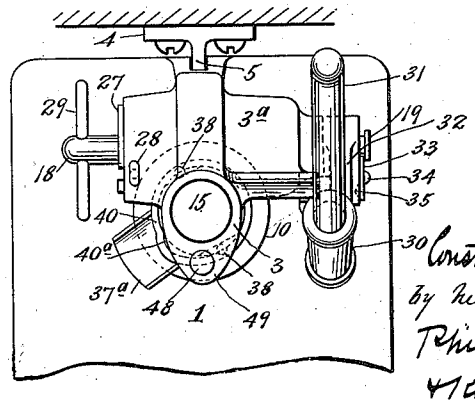


Fig. 3.



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3 SHEETS—SHEET 2.

Fig. 4.

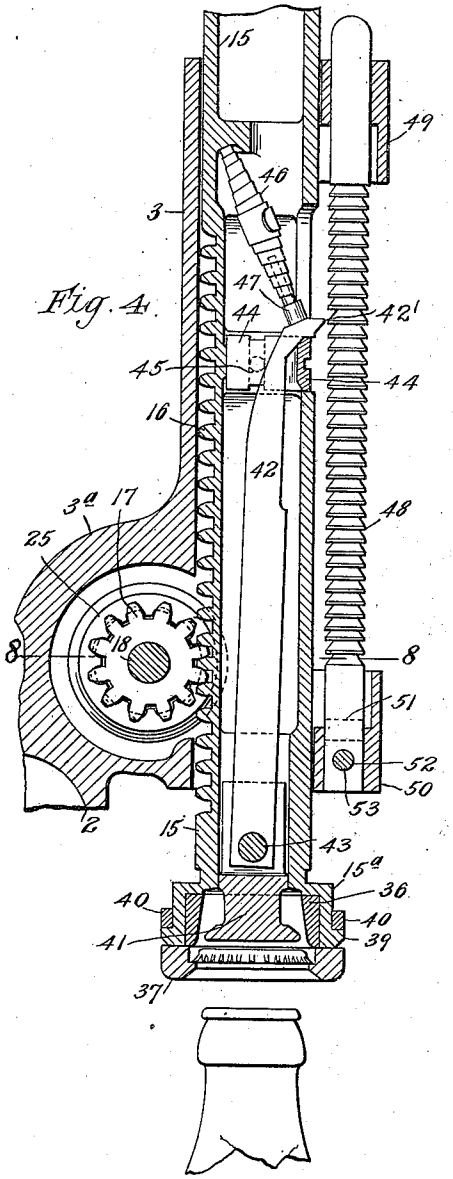


Fig. 5.

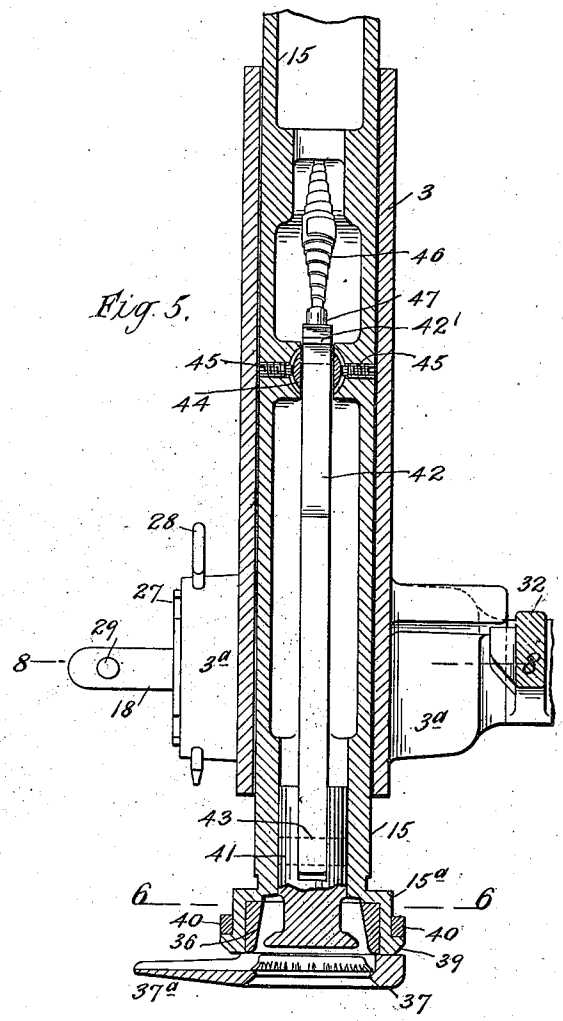


Fig. 7.

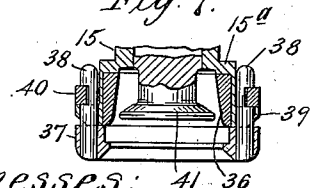
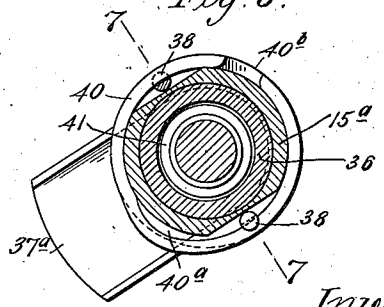


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 8.

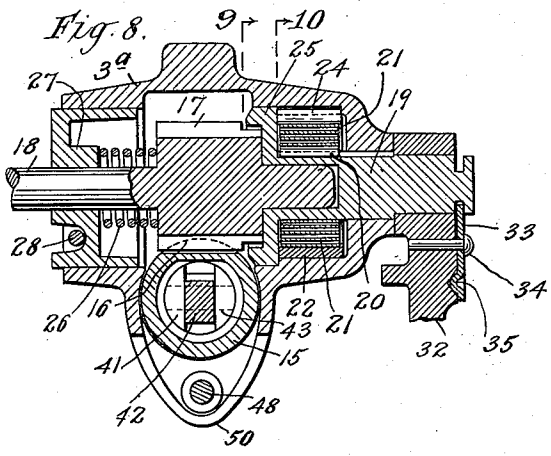


Fig. 9.

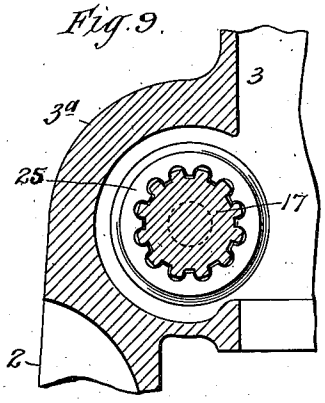


Fig. 10

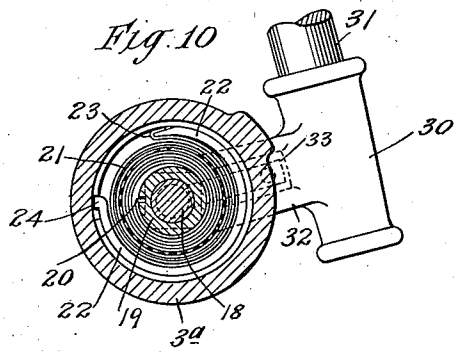
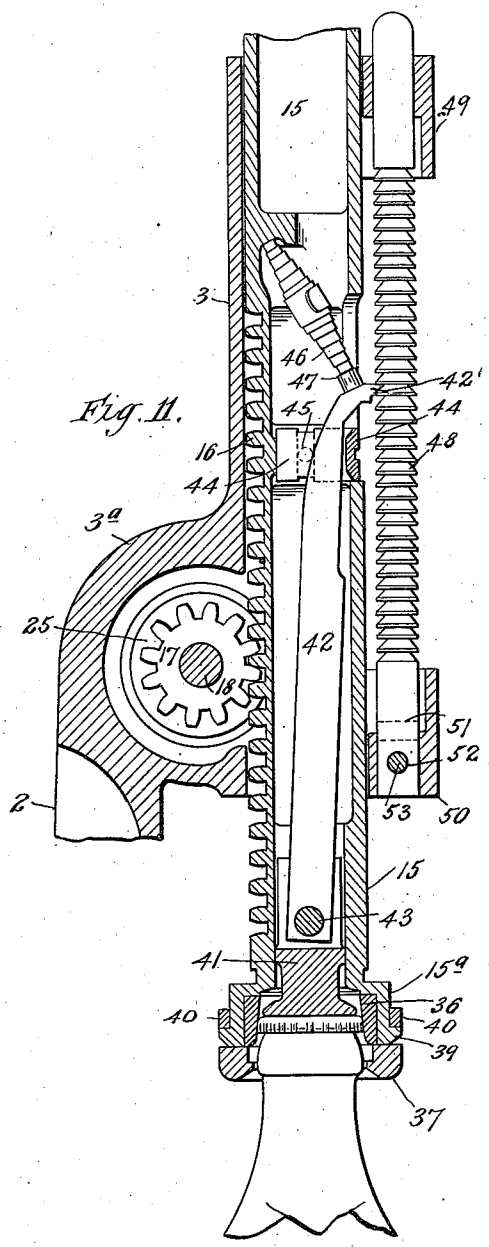


Fig. 11.



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UNITED STATES PATENT OFFICE.

CONSTANT J. KRYZANOWSKY, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE CROWN CORK AND SEAL COMPANY OF BALTIMORE CITY, OF BALTIMORE, MARYLAND, A CORPORATION OF MARYLAND.

CAPPING APPARATUS.

1,216,705. Specification of Letters Patent. Patented Feb. 20, 1917.

Application filed January 8, 1915. Serial No. 1,083.

To all whom it may concern:

Be it known that I, CONSTANT J. KRYZANOWSKY, a citizen of the United States, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Capping Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in crowning machines, and particularly to a hand machine for applying crowns to milk bottles.

The object of the invention is to provide a simple, economical and reliable hand apparatus which may be readily adjusted to operate on bottles of different sizes.

The invention consists in the features, details of construction and combinations of parts which will first be described in connection with the accompanying drawings and then particularly pointed out.

In the drawings—

Figure 1 is a side elevation, partly in section, of one embodiment of the invention, the machine being shown detachably attached to a wall or the like;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a plan view thereof, with a part of the foot-plate broken away;

Fig. 4 is a detail vertical section taken through the center of the crown-applying mechanism;

Fig. 5 is a detail sectional view, partly in elevation, taken at right angles to the plane of Fig. 4;

Fig. 6 is a horizontal sectional view on the line 6—6 of Fig. 5;

Fig. 7 is a detail sectional view showing the throat of the crown-applying plunger;

Fig. 8 is a horizontal sectional view on the line 8—8 of Fig. 4;

Fig. 9 is a detail sectional view on the line 9 of Fig. 8;

Fig. 10 is a similar view on the line 10 of Fig. 8; and

Fig. 11 is a view similar to Fig. 4, showing the plunger in its lowered position at the moment when a cap has been applied to a bottle.

Referring to the drawings, 1 is a foot-plate, 2 a standard, and 3 a guide-head, these parts being suitably united, as, for example, by making them integral. These three parts constitute what may be termed the frame of the machine. The standard carries at its junction with the head, a housing indicated at 3^a.

The foot-plate 1 is made broad enough to serve as a suitable base on which the apparatus may stand when it is to be used as a table machine.

By providing suitable means for securing the apparatus to a wall, pillar or post, it may be used as a wall machine. In the best embodiment of the invention, the securing means comprises a wall-plate 4 suitably secured to a wall, pillar or post, as by means of screws, this wall-plate being provided with two forward-projecting lugs 5, 6, arranged to enter slots in the back of the standard 2, as shown in Fig. 1. The upper lug 5 is formed as an upturned hook, into the opening of which may enter a pin 7 extending transversely through the standard and across the upper slot thereof. The lower lug has a hole arranged to register with a similar hole extending transversely through the standard. When these holes are in register, a pin 8 may be inserted through them, thereby firmly securing the apparatus to the wall-plate. The slots in the standard have sufficient length vertically to allow the standard to be shifted vertically with relation to the lugs when the pin 8 is withdrawn. In this way, the pin 7 may be freed from the opening in the hooked upper lug 5 and the machine removed from the wall. The foot-plate carries a suitable bottle-pad, which, in the present example, is arranged as follows: The foot-plate is provided with a circular opening, whose axis is in vertical alinement with the axis of the guide-head 3. This opening has its upper edge rabbeted and in this rabbet is placed a circular metallic disk 9, on top of which is mounted a circular bottle-pad 10 of elastic material, this pad projecting slightly above the upper surface of the foot-plate.

The apparatus is provided with a suitable bottle-guide adjusted for bottles of different diameters. In the present example, this bottle-guide comprises a pair of bottle-engaging wings 11 arranged at an angle to each other, into which angle a bottle may be pushed by the operator. The faces of the wings which are arranged to contact with the bottle are advantageously plane surfaces

tangential to the bottle. The wings are carried by a rod 12, whose axis slopes upward from its point of connection with the wings, as shown in Fig. 1. The rod is provided with a plurality of pin-holes, one of which is indicated at 13, Fig. 1. The standard has an opening extending from the front toward the rear of the standard and sloping upward toward the rear. This opening is arranged to receive the rod 12. The standard is also provided with a pin-hole extending transversely to the rod 12, through which hole may be inserted a pin 14 arranged to pass through any desired one of the plurality of holes, such as 13, in the rod 12. By withdrawing the pin 14, the rod 12 may be slid in or out of the standard and, when in its properly adjusted position, the pin 14 may be replaced to hold the rod 12 and with it the bottle-guiding wings 11. By the particular inclined arrangement of the rod 12, the wings 11 are not only moved inward in adjusting the guide to a small-sized bottle, but also are moved downward. In the reverse adjustment of the bottle-guide, to set the machine for operation on large bottles, the wings are not only moved outward from the center of the axis of the bottle, but also are moved upward. In this way, the bottle-guide engages a bottle always about opposite its center of gravity. This is important, because it avoids the danger of a bottle being tipped at an angle or knocked over in the rapid operation of the apparatus. The guiding-head 3 of the frame is provided with a vertical cylindrical bore, in which is mounted a vertically movable main plunger 15. This plunger is formed of a thick tube, circular in cross section and having a thick wall. The tube has a series of rack teeth cut on its back, as indicated at 16, Fig. 4. This rack is arranged to be engaged by a pinion 17 located in the housing 3^a fixed to a shaft 18. One end of this shaft enters a circular socket in the end of an operating shaft 19 journaled in the housing 3^a and having one end projecting beyond the housing and squared to receive an operating lever, hereinafter more fully described. The shaft 19 is provided with a longitudinal slot on its periphery, arranged to be engaged by the inward-bent end 20 (see Fig. 10) of a coil-spring 21. This spring is nearly surrounded by a mutilated bushing 22, one end of which is tapered to engage the hooked outer end of the spring, the hooked portion being indicated at 23. The other end of the mutilated sleeve is bent outward radially, as shown at 24, to enter a notch formed on the inside of the housing 3^a. The main operating shaft 19 carries at its inner end a clutch member 25, Figs. 8 and 9, this clutch member having a flanged portion provided with internal notches arranged to receive the teeth on the pinion 17, these teeth being preferably slightly reduced in length, so that the pinion appears to be shouldered, as indicated in Fig. 8. The shaft 18 is surrounded by a helical spring 26, which bears at one end against the side of the pinion 17, and at the other end bears against a bushing 27 capable of sliding axially in the housing 3^a. It will be obvious that the reaction of the spring 26 tends to push this bushing 27 outward. In order to hold the bushing in place, a suitable retaining device, as for example by providing the bushing with a groove, through which extends a pin 28 passing vertically through the housing, as shown in Fig. 1. The portion of the shaft 18 outside the bushing is provided with a transversely-extending rod 29 serving as a handle, by means of which the shaft 18 may be rotated.

The operating-crank, which engages that part of the shaft 19 extending outside the housing, comprises a socket portion 30 arranged to receive an operating-handle 31, the socket portion being carried on the outer end of an arm 32 which has a squared opening to receive the squared outer end of the shaft 19. The shaft projects slightly outside the arm 32 and is provided with a peripheral groove, into which may be swung one end of a locking-plate 33, fulcrumed on a rivet 34, which is secured in the arm 32. The locking-plate 33 has its other end provided with an inward-projecting tooth 35 arranged to be received in a depression in the outer face of the arm 32, so that when the plate is swung into the peripheral groove in the end of the shaft 19, the tooth 35 will spring into the depression and thereby prevent the locking-plate from being accidentally released. It will be seen that, by pulling on the handle 31, the shaft 19 may be rotated, this rotation being in a direction to tighten or wind up the spring 21. Furthermore, owing to the clutch connection between the shaft 19 and the pinion 17, the pinion also will be rotated and thereby the main plunger 15 will be moved longitudinally. The spring 21 serves to return the operating-handle 31 and its connected parts to the normal position, while at the same time lifting the main plunger 15. By pulling out on the handle 29, the clutch connection between the pinion and the clutch member 25 will be opened, while the pinion remains in engagement with the rack 16 of the main plunger. The plunger may then be adjusted to its proper vertical position by turning the handle 29. Upon releasing the handle, the spring 26 will close the clutch connection between the pinion 17 and the clutch member 25, whereupon the apparatus is ready for operation.

The purpose of this adjustment is to enable the main plunger to be brought to the proper position to operate on bottles of different sizes.

If at any time it becomes necessary to remove the pinion 17, the pin 28 may be withdrawn, whereupon the bushing 27, the spring and the pinion 17 may be pulled out.

The main plunger 15 is provided at the lower end with a head 15^a arranged to receive a throat ring 36, whose interior is coned and of suitable dimensions for applying a determined size of crown. To the under surface of the plunger-head 15^a is attached a crown-supporting device 37, having a hole through which the neck of the crowned bottle may pass, and recessed to receive and hold an unapplied crown in a position above this hole. The crown-supporting device is provided with a chute-plate 37^a and has a lateral opening so related to the channel in the chute-plate that a crown placed in such channel may be pushed into the interior of the crown-supporting device, where it will be held in the recess therein above the hole, as shown in Fig. 5. It is important for the purposes of this invention that the crown-supporting device be detachably secured to the plunger. While any suitable means may be employed for this purpose, the best embodiment of the invention comprises a securing means consisting of a plurality of pins 38 projecting upward from the crown-supporting device, through holes in the flanged edge 39 of the plunger-head. The pins are provided with outward-facing notches, as indicated in Fig. 7, and the plunger-head is provided with a ring rotatable on its axis and arranged to enter these notches, so as to lock the pins against withdrawal downward. The locking-ring indicated at 40 (Figs. 6 and 7) has its interior diameter enlarged at one point, as indicated at 40^a (Fig. 6), and at the opposite side is cut away, as indicated at 40^b (Fig. 6). When the opening 40^b is in line with one of the pins 38, the enlargement 40^a of the ring is in line with the other pin, so that these pins may move upward at the time the crown-supporting device is being pushed into place. By then sliding the locking-ring angularly about its center, it will pass into the notches of the pins and thus hold them against withdrawal.

The main plunger 15 carries an auxiliary plunger or presser-foot 41, having a flared head to coöperate with the corresponding throat ring 36. The construction is such that different sizes of presser-feet may be used for different sizes of crowns. Each presser-foot has a cylindrical guide portion arranged to fit in the cylindrical bore of the main plunger 15, this cylindrical portion being slotted to receive the end of a pawl-lever 42 fulcrumed to the presser-foot by means of a pin 43 extending transversely through the presser-foot and through a hole in the end of the pawl-lever. The upper end of the pawl-lever extends through a slot in a cylindrical yoke 44, which has an inclined portion sloping upward and outward and terminating at a flat top portion. In order that the yoke 44 may be readily removed and replaced, it is inserted in a cylindrical opening in the plunger 15 and has its sides provided with grooves arranged to be engaged by the ends of pins 45 secured in the plunger. The front end of the yoke is slotted for the reception of a tool, such as a screw-driver, whereby the yoke may be rotated to free it from the ends of the pins 45, after which it may be withdrawn from the plunger.

The pawl-lever has a forward-extending pawl 42′, whose under face is formed to engage the above-mentioned flat portion of the yoke, as, for example, by flattening such under-face, whereby the pawl-lever and presser-foot are limited in their movement downward. Just beneath the yoke-engaging portion of the pawl is an inclined face arranged to engage and ride along the sloping portion of the yoke. A suitable means is provided for holding the pawl in engagement with the yoke, as, for example, a coiled spring 46 having one end held by a turned down pin 47 secured to the pawl, and the other end inserted in a recess formed in an internal lug carried by the front plunger 15, as shown in Fig. 4.

The front of the plunger is slotted and through this slot the pawl of the pawl-lever extends so as to engage at the proper time a round rack-bar 48, which is mounted in two lugs 49, 50, carried by the guide-head. The round rack-bar has two holes 51, 52, in this case at right angles to each other. A pin 53 may be inserted in either hole. The purpose of having two holes is to allow the rack-bar to be shifted longitudinally in such a way that in one position the rack-teeth would be displaced vertically about half a tooth with relation to the condition when the rack-bar is in the other position. Furthermore the ratchet-bar will be turned 90° and thus give a new wearing surface.

The operation of the device is as follows:

The bottle to be capped is placed upon the bottle-pad 10 and pushed back as far as possible into the angular space between the guide-wings 11. By a proper adjustment of the guide-wings, the bottle will have its axis in line with the axis of the plunger. A crown is placed upon the chute-plate 37^a and, by pushing it with another crown, it is forced into the recess in the crown-supporting device, 37, where it is held in the position shown in Fig. 5. At this time, the presser-foot has its lower face above the lower edge of the throat-ring, being held in this position because its pawl, pressed outward by the spring 46, is hooked over the edge of the yoke. The weight, however, of the presser-foot and pawl-lever causes the

inclined faces of the pawl and yoke to engage and thereby hold the pawl out of engagement with the rack-bar. If, now, the handle 31 be pulled toward the operator, the shaft 19 will be rotated and the spring 21 coiled. Also, owing to the clutch connection between the clutch-member 25 and the pinion 17, this pinion will be rotated and by its engagement with the rack at the back of the plunger will drive the plunger downward. During this downward movement, the crown will first be brought in contact with the top surface of the bottle-mouth, whereupon, by the downward movement of the plunger, the presser-foot will be brought in contact with the upper surface of the crown. The further downward movement of the plunger will cause the yoke to pass from under the upper end of the pawl-lever, thus permitting the spring to force the pawl lever properly outward into engagement with the ratchet-bar. The ratchet-bar and pawl-lever act to lock the presser-foot so that it will hold the crown in close contact with the bottle. Thereafter, the further downward movement of the plunger causes the tapered throat-ring to engage the outward-extending skirt of the crown and gradually force the same downward and inward toward the bottle, whereby the crown is locked under the rim around the mouth of the bottle. Upon releasing the handle, the coiled spring reacts to lift the handle and rotate the pinion 17 to lift the plunger. During the initial movement of the plunger in lifting, the pawl stays in contact with the ratchet-bar, thus maintaining the presser-foot in contact with the crown and holding the bottle firmly to its base-pad, while the throat-ring is moving upward to clear the capped bottle. When the plunger has raised sufficiently to bring the inclined portion of the yoke in contact with the corresponding incline of the pawl, the continued lifting of the plunger forces the pawl-member angularly about its pivotal point, so as to drive the pawl from its contact with the ratchet-bar, whereupon, as the plunger continues to rise, the pawl hooks onto the yoke and is lifted with the plunger, thereby lifting the presser-foot away from the capped bottle.

In order to enable the machine to be used for capping bottles of different sizes employing different sizes of crowns, it is necessary that the crown-supporting device, the throat-ring and the presser-foot may be readily removed and replaced by corresponding devices of different dimensions. That is to say, in the present machine the crown-supporting device, the throat-ring and the presser-foot are interchangeable with corresponding devices adapted for other sizes of crowns. In order to make this change, the locking-ring may be rotated to release the pins, whereupon the crown-supporting device may be drawn downward and the throat-ring allowed to drop from the plunger head. The upper end of the pawl-lever may be pushed inward to release it from the yoke, whereupon the presser-foot, pawl-lever and attached spring will drop down and may be removed. By withdrawing the fulcrumed pin of the pawl-lever, the presser-foot will be released from the pawl-lever, whereupon another presser-foot may be substituted. Thereupon, the presser-foot is pushed upward, the corresponding substitute throat-ring inserted in the plunger-head, and the corresponding crown-supporting device applied to the bottom of the plunger-throat and locked by the locking-ring. The guide-device may be suitably adjusted, as hereinbefore explained, whereupon it is only necessary to adjust the stroke of the machine, by pulling out on the handle 29 to release the clutch, rotating the handle to bring the plunger to the proper position and then releasing the handle.

It will be noted that all of the parts are readily accessible and that the machine can be dismantled and reassembled by unskilled labor and without the use of special tools. By removing the bottle pad and the crown-supporting device, the plunger may be entirely withdrawn from the guide-head through the opening in the base-plate of the machine.

What is claimed is:—

1. In a bottle-capping machine, the combination, with a capping plunger, and means for reciprocating said plunger, of a presser-foot arranged to engage a crown to retain it on a bottle, a ratchet-bar, and a pawl-lever connected to the presser-foot and having a pawl arranged to engage the ratchet-bar.

2. In a bottle-capping machine, the combination with a capping-plunger, and means for reciprocating said plunger, of a presser-foot arranged to engage a crown to retain it on a bottle, a ratchet-bar, a pawl-lever connected to the presser-foot and having a pawl arranged to engage the ratchet-bar, and a spring normally tending to press the pawl toward the ratchet-bar.

3. In a bottle-capping machine, the combination with a capping-plunger and means for reciprocating the plunger, of a presser-foot arranged to engage a crown to retain it on a bottle, a ratchet-bar, a pawl-lever connected to the presser-foot and provided with a pawl arranged to engage the ratchet-bar, an abutment device movable with the plunger and arranged to move the pawl away from the ratchet-bar, and a spring arranged to press the pawl toward the ratchet-bar.

4. In a capping machine, the combination, with a hollow plunger having an opening, and means for reciprocating said plunger, of a presser-foot arranged to engage a crown to retain it on a bottle, a ratchet-bar

outside the plunger, and a pawl-lever within the plunger and connected to the presser-foot, said pawl-lever having a pawl extending through the opening in the plunger and arranged to engage the ratchet-bar.

5. In a capping machine, the combination, with a hollow plunger having an opening, means for reciprocating said plunger, and a ratchet-bar stationary with relation to the plunger, of a guide device carried by said plunger, a presser-foot arranged to engage a crown to retain it on a bottle, and a pawl-lever within the plunger and connected to said presser-foot, said pawl-lever being guided by said guide device, said pawl-lever having a pawl extending through the opening in the plunger and arranged to engage the ratchet-bar.

6. In a capping machine, the combination, with a hollow plunger having an opening, a yoke forming a guide device inserted transversely in the plunger below the opening and having an inclined surface, means for reciprocating the plunger, and a ratchet-bar outside of and stationary relative to the plunger, of a presser-foot mounted in and movable within the plunger, said presser-foot being arranged to engage a crown and retain it on a bottle, a pawl-lever connected to the presser-foot and passing through the yoke, said pawl-lever having a pawl extending through the opening in the plunger to engage the ratchet-bar and having an inclined surface coacting with the inclined surface of the yoke device, and yielding means tending to press said pawl toward the ratchet-bar.

7. In a bottle capping machine, the combination with a cap-applying means including a die, of a bottle support, means for effecting a relative movement between the applying means and the support to apply a crown, a presser-foot arranged to engage the crown to hold it on the bottle, and means for holding the presser-foot against the crown until the die is clear of the crown.

8. In a bottle-capping machine, the combination with a capping plunger, and means for reciprocating said plunger, of a presser-foot arranged to engage a crown to retain it on a bottle, and means for locking the presser-foot against the crown during a portion of the upward movement of the plunger.

9. In a bottle-capping machine, the combination, with a capping plunger, and means for reciprocating said plunger, of a presser-foot arranged to engage a crown to retain it on a bottle, and positively acting means for holding the presser-foot against the crown during the upward movement of the plunger.

10. In a capping machine, the combination with a plunger having a head, a throat-ring insertible in said head, a presser-foot insertible within the plunger and having a detachable portion removable with the throat-ring, and a crown-supporting device detachably connected to the head and arranged to hold the throat-ring in place.

11. In a capping machine, the combination, with a plunger having a head provided with holes, and a throat ring insertible within the plunger-head, of a crown-supporting device arranged to retain the throat-ring in place and provided with notched pins extending through the holes in the plunger head, and a rotatable locking ring carried by the head and arranged to engage the notches in the pins to lock the crown-supporting device to the head.

12. In a capping machine, the combination, with a plunger, having a head provided with a flange and with holes, and a throat-ring insertible in the flange, of a crown-supporting device arranged to retain the throat-ring in place and provided with notched pins extending through the holes in the plunger head, and a rotatable locking-ring located around the head above the flange and arranged to engage the notches in the pins to lock the crown-supporting device to the head.

13. In a capping machine, the combination, with a plunger, having a head, means for reciprocating said plunger, a presser-foot within the plunger, and means independent of the plunger for holding the presser-foot against a crown during the upward movement of the plunger, of a crown-supporting device having a recess arranged to receive a crown, an open chute leading to said recess, and means for detachably securing said crown-supporting device to the plunger-head.

14. In a capping machine, the combination, with a plunger, having a rack, a pinion arranged to be shifted axially into and out of engagement with the rack, an operating lever, and a clutch connection intermediate the operating lever and the pinion.

15. In a capping machine, the combination, with a standard having a guiding head, and a housing, of a plunger movable in the guiding head and having a rack, a main operating shaft rotatably mounted in the housing and provided with a clutch member, an operating lever arranged to actuate said shaft, a pinion mounted in the housing and having a shaft one end of which is journaled in the main operating shaft, a bushing arranged to be inserted in the housing in which bushing the other end of the pinion shaft is journaled, and means for securing said bushing in place.

16. In a capping machine, the combination, with a standard having a guiding head, and a housing, of a plunger movable in the guiding head and having a rack, a main operating shaft rotatably mounted in the housing and provided with a clutch member,

an operating lever arranged to actuate said shaft, a spring tending to maintain the operating lever in a predetermined position, a pinion mounted in the housing and having a shaft one end of which is journaled in the main operating shaft, a bushing arranged to be inserted in the housing in which bushing the other end of the pinion shaft is journaled, and means for securing said bushing in place.

17. In a capping machine, the combination, with an inclined guide-way, of a bottle guide having a stem arranged to move in said inclined guideway, a pair of wings secured to said stem and having bottle engaging tangential plane surfaces, and means for securing the stem at any desired position in the guideway.

18. In a capping machine, the combination, with a standard having an inclined guideway, and a plunger movable in the standard, of a bottle guide having wings arranged to contact with a bottle whose axis is in line with the plunger, said guide also having an inclined stem arranged to move in the inclined guideway of the standard, and means for securing said stem at any desired position relatively to the standard.

In testimony whereof, I have hereunto set my hand in the presence of two subscribing witnesses.

CONSTANT J. KRYZANOWSKY.

Witnesses:
MAX W. MUELLER,
H. W. SAITHE.