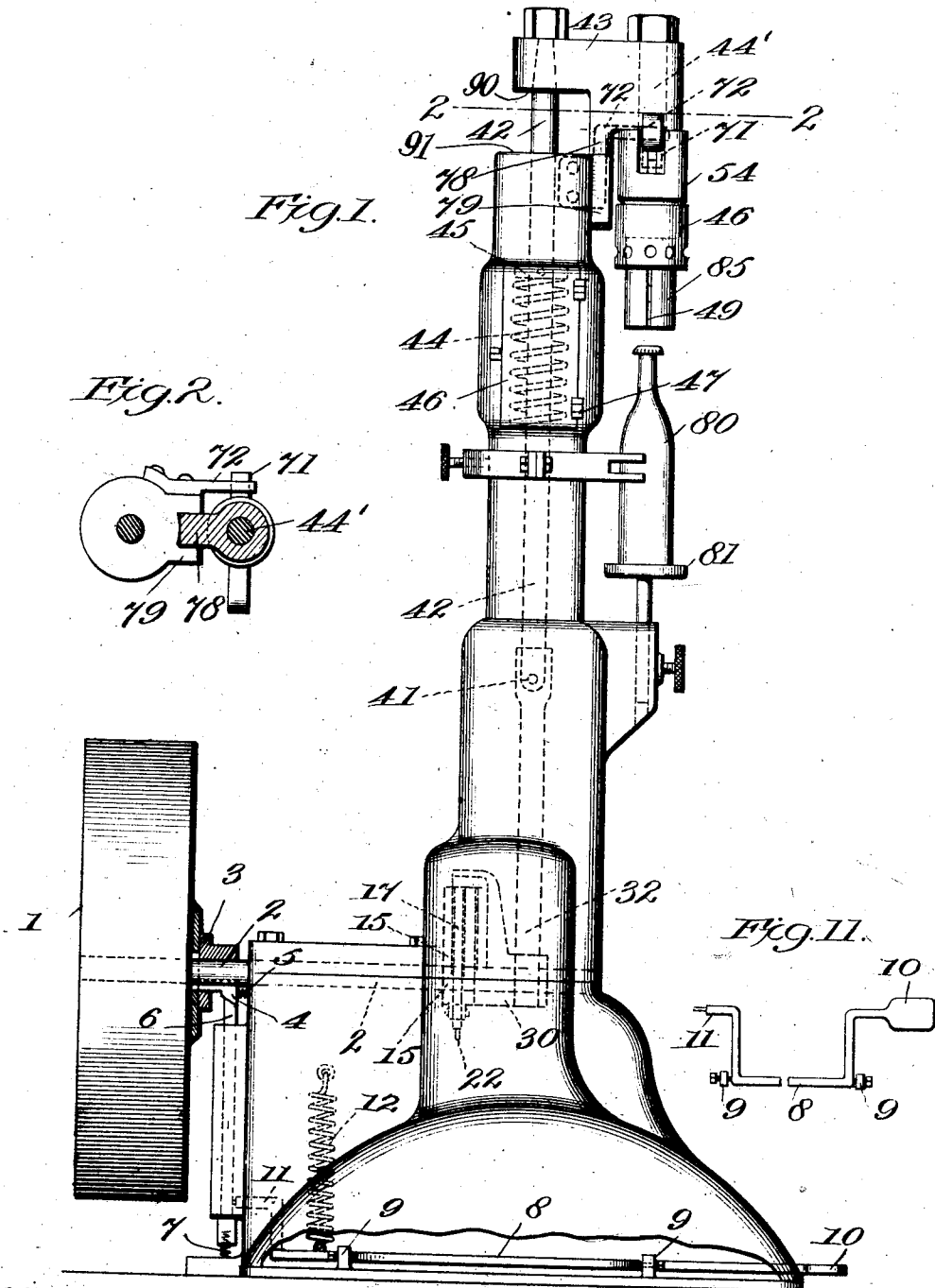


997,142.

T. J. LEVEY.
BOTTLE CAPPING MACHINE.
APPLICATION FILED OCT. 30, 1909.

Patented July 4, 1911

3 SHEETS-SHEET 1.



Witnesses
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Geo. A. Payne.

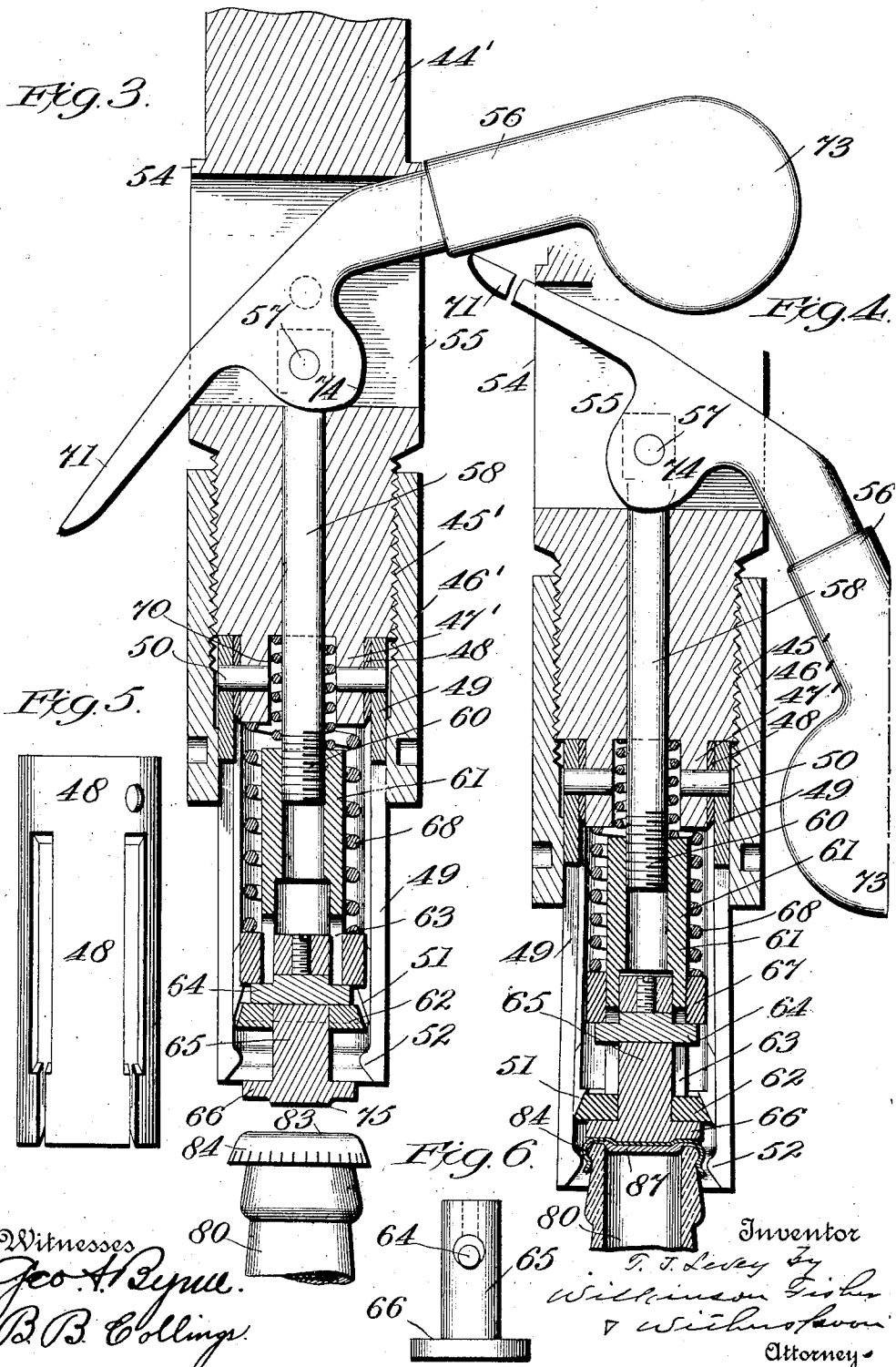
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3 SHEETS—SHEET 3.

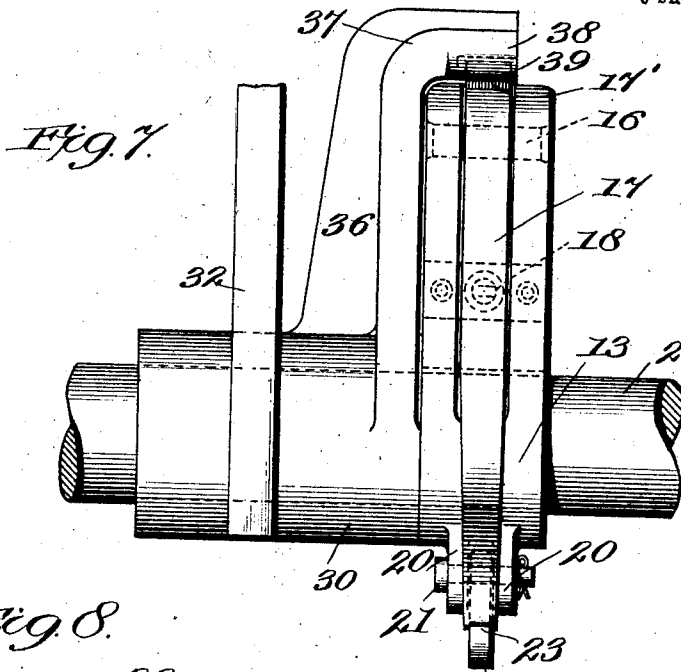


Fig. 7.

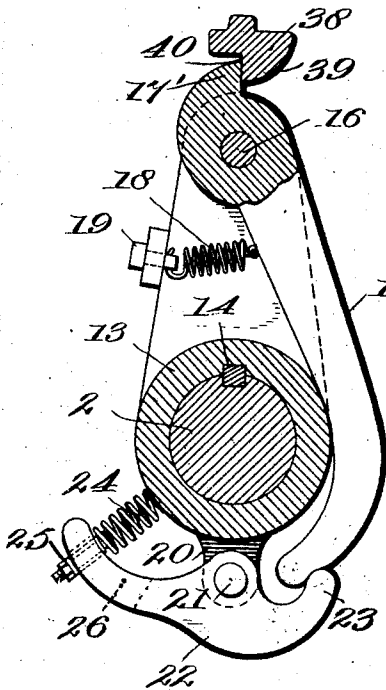


Fig. 8.

Fig. 9.

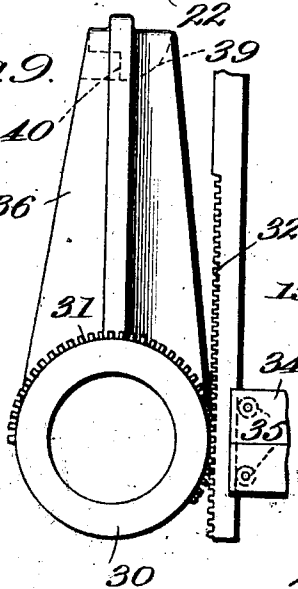
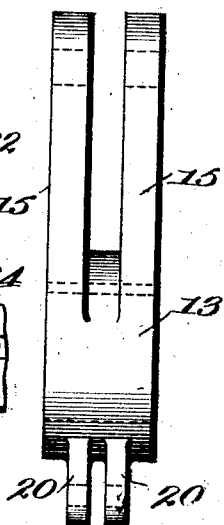


Fig. 10.



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UNITED STATES PATENT OFFICE.

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BOTTLE-CAPPING MACHINE.

997,142.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed October 30, 1909. Serial No. 525,582.

To all whom it may concern:

Be it known that I, THOMAS J. LEVEY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Bottle-Capping Machines; and I do hereby 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.

This invention relates to bottle capping machines, and has for its object to produce a machine of this nature which will be more compact, cheaper to construct, and more efficient in action than those now in use.

With these objects in view, the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification, in which like numerals refer to like parts in all the views:—Figure 1, is an elevational view, partly in section of a machine made in accordance with this invention; Fig. 2, is a detail sectional view taken on the line 2—2 of Fig. 1; Fig. 3, is an enlarged sectional view of the capping head; Fig. 4, is a view similar to Fig. 3, but showing the parts in another position; Fig. 5, is a detail view of the capping sleeve; Fig. 6, is a detail of a modified plunger in the bottle head; Fig. 7, is an elevational view of the automatic clutch coupling used in connection with this machine; Fig. 8, is a sectional view of the parts shown in Fig. 7; Fig. 9, is a detail of the connections between the power shaft and the capping head; Fig. 10, is an elevational view of a portion of the clutch coupling; and, Fig. 11, is a detail view of a foot operated crank for engaging and disengaging the power pulley with the shaft.

1 represents any suitable source of power, as in this instance shown as a pulley loosely mounted on the power shaft 2 and provided with any suitable clutch mechanism, for example, the collar 3 fast on the shaft 2, and the sliding key 4 fitted to the shaft and passing through the collar 2 and into the hub of the pulley 1, thereby connecting the

shaft and pulley, as will be readily understood. 5 represents a spring for normally forcing the said key 4 into the hub of the pulley 1, and 6 is a beveled vertically moving rod adapted to take against the inclined end of the key 4 and to move the said key out of engagement with the hub of said pulley 1.

7 is a spring for normally holding the rod 6 in engagement with the key 4, and 8 represents a crank which may be of the form shown and which is pivoted at 9 and is provided with the foot lever 10, as will be readily understood. The end 11 of the crank 8 engages the rod 6, and when the foot lever 10 is depressed said end 11 will cause said rod 6 to be likewise depressed and to thereupon permit the spring 5 to move the key 4 into engagement with the hub of the pulley 1 and thereby connect said pulley with the shaft 2. When the foot lever 10 is released a suitable spring restores the parts to their normal position, as will be clear from the drawings. The power shaft is further provided with a lug 13 keyed at 14 to the said shaft, and said lug is provided with two jaws 15 between which is pivoted, as at 16, the dog 17 controlled by the spring 18 which may be adjusted by the screw bolt 19, as will be readily understood. The lug 13 is provided with the smaller bifurcated lug 20 between the parts of which is pivoted, as at 21, the trigger 22 against the toe 23 of which the pawl 17 takes. The trigger 22 is controlled by the spring 24, the tension of which may be adjusted by the screw bolt 25. This screw bolt may be adjusted to and from the pivot 21 by moving the same in the slot 26, with which the arm of the trigger 22 is provided, and by this adjustment the amount of leverage or power required to trip the trigger is readily controlled.

Loose on the shaft 2 is a hub 30, provided with a gear 31 meshing with the vertically moving rack 32 guided by a lug 34 on the machine, which lug is preferably made in two parts, as indicated, and is provided with anti-friction rollers 35. This hub 30 is also provided with an extended arm 36, the upper end 37 of which is bent at right angles, as shown in Fig. 7, to form a lug 38, having a curved face 39 and a straight face 40,

against which a lug 17' on the dog 17 is adapted to abut. The vertically moving rack 32 is connected as at 41 to a rod 42 which extends through the upper part of the machine and has connected at its other end the cross head 43 in which is secured the capping mechanism.

44 represents a spring surrounding the rod 42 the tension of which may be adjusted by the collar 45 held on the rod 42. This spring normally holds the capping mechanism in a raised position, as shown in Fig. 1; and to provide for the assembling and adjustment of the parts a door 46 hinged at 47, is provided in the upper part of the machine.

Securely held in the outer end of the cross head 43 is the plunger stem 44' of the bottle capping mechanism. This stem is screw threaded as at 45' to accommodate the sleeve 46' and has a reduced lower end 47', as shown. Surrounding this reduced end is the slotted cam sleeve 48, and surrounding said sleeve 48 is the slitted tubular capping member 49. Pins 50 pass through the parts 47', 48 and 49 to hold the same securely together. The sleeve 48 is provided with the cam members 51 and the capping member 49 is provided with the crimping projections 52. The stem 44' is preferably enlarged at 54, and provided with the slot 55 which receives the weighted lever 56 pivoted at 57 to a stem 58 passing through the lower end of the plunger stem and screw threaded at 60 to the tubular stem 61 of the cam head 62. The stem 61 is slotted at 63 to receive the pin 64, passing through the stem 65 of the auxiliary head 66. The head 62 is provided with an opening to receive the stem 65, as illustrated.

Surrounding the tubular stem 61 and resting on the pin 64 is the sliding collar 67, and also surrounding said stem 61 and resting above the collar is the spring 68, while above said stem 61 and surrounding the lower end of the rod or stem 58 is the spring 70, all as will be clearly understood from the drawings.

The locking lever 56 is provided with an extension 71 adapted to take against and to be turned in one direction by the lug 72 attached to the machine, as shown in Figs. 1 and 2, while the weight 73 on the opposite end of said lever will move the same in the opposite direction when not under the influence of said lug 72. The lever 56 is also provided near its pivot with the cam extension 74, which serves to hold the lever in its locked position as will appear more fully below.

The auxiliary head 66 may be provided with the projection 75, as shown in Figs. 3 and 4, or this projection may be omitted, as illustrated in Fig. 6.

The operation of this machine is as follows:—Power being applied to the loose pulley 1, the same runs continuously, and

when the operator depresses the lever 10, the end 11 of the same draws down the rod 6, permitting the dog 4 to be moved by the spring 5 into engagement with the hub of the pulley 1, thereby locking the same to the shaft 2, and causing the same to rotate. The shaft 2 rotates the lug 13 and dog 17, which in turn by reason of the engagement of the shoulder 17' with the lug 38 causes the arm 36 and hub 30 to revolve and the gear 31 to pull down the rack bar 32 and rod 42 against the tension of the spring 44. The downward movement of the rod 42 causes the cross head 43 to move downward being guided in this motion by the extension 78, taking in the ways 79 rigid with the machine. The plunger stem 44', and pressure blocks 62 and 66 also move down with the head 43, and a bottle 80 having been placed on the adjustable stand 81, the auxiliary head 66 will come in contact with the top surface 83 of the bottle cap thereupon firmly seating the same on the bottle. As the plunger continues to descend, the crimping projections 52 will contact with the upper portion of the flange 84 of the bottle cap, and be forced outwardly against the tension of the slitted spring portions 85 into which the tubular capping member 49 is divided. These crimping projections 52 will accordingly wipe down along the flange 84 stretching the metal and taking up any slack so to speak that might be formed owing to the metal buckling or bending away from the bottle, and after the lower edge of the shoulder on the bottle head has been passed the spring tension of the said parts 85 will cause the said crimping projections to snap the stretched metal inwardly and under the said shoulder, thereby causing a firm and tight hold between the cap and bottle. In the meantime, the head 62 will have been brought down in contact with the auxiliary head 66, the spring 68 and 70 will have been compressed, and the upper edge of the bottle mouth will be forced into or will firmly compress the cork 87 of the cap, and thereupon make a gas tight joint of great efficiency, as will be clear from Fig. 4. The projection 75 on the auxiliary head may be employed to depress the metal as illustrated, and theoretically at least, to increase the efficiency of the seal, but in practice seals of very high efficiency have been made without this projection. The pressure of the heads on the top 83 of the cap effectually prevents the metal from buckling in that part of the cap, and therefore, aids the wiping and stretching action of the crimping projections 52.

In the operations above described, as the parts descend the weight 73 causes the lever 56 to turn on its pivot and to bring its cam 74 into the position shown in Fig. 4 wherein it rests on the cut away portion of the stem 44', and locks the parts against rising,

in their lowered positions. As, however, the plunger stem 44' continues to descend, the cams 51 on the sleeve 48 contact with the beveled edge of the head 62, and this head, therefore, forces outwardly the crimping projections 52, as indicated in Fig. 4. When this position of the parts has been reached the tension of the spring 70 will have been taken off the weighted lever 56, and, therefore, the weight 73 will descend to lock the crimping projections in their outward position as above intimated, so that when the parts rise, said projections will be prevented from moving inward under their spring tension and thereupon stripping off the cap. As the parts continue to rise after the capping operation is completed, the lug 72 turns the lever 56 in the opposite direction, thereby raising the weight and permitting the spring 68 to restore the parts to the positions shown in Fig. 3, wherein the spring 70 counterbalances the weight 73, and wherein the capping head and crimping projections are ready for another operation. As the shaft continues to revolve during the downward operation of the parts above described, the pressure between the pawl 17 and the toe 23 of the trigger increases by reason of the resistance of the bottle and if these parts are not sooner released from this or other causes when the lower surface 80 of the cross head 43, contacts with the upper surface 91 of the frame of the machine, this pressure suddenly becomes so great that the pawl 17 escapes from the trigger, thereupon freeing the arm 36 and rod 42 from the influence of the shaft. The spring 44, after having been compressed serves to raise the capping mechanism into the position shown in Fig. 3, to return the arm 36 and lug 39 to their normal positions, and the spring 18 serves to snap the pawl 17 back into engagement with the trigger 22, thereupon bringing the projection 17' into the proper position to again engage the lug 39.

From the above it will be evident that the parts will repeat the above cycle of operations as long as the pulley 1 is connected to the shaft 2, but as soon as the rod 6 is permitted to rise under the influence of its spring 7 so as to disconnect said pulley and shaft the operation of the capping mechanism ceases.

It is evident that changes in the details of construction and in the operation of the parts as described may be made by those skilled in the art without departing from the spirit of my invention, and, therefore, I do not wish to be limited to such features except as may be required by the claims.

What I claim is:—

1. In a bottle capping machine, the combination of a power shaft; a reciprocating capping plunger; connections between said

plunger and said shaft; a split tubular member carried by the plunger and provided with crimping projections adapted to contact with and to surround the flange of a bottle cap; and means adapted to force said projections outwardly and away from said flange during the return of the plunger and after the capping operation is completed, substantially as described.

2. In a bottle capping machine the combination of a power shaft; a reciprocating capping plunger; connections between said shaft and said plunger comprising a friction controlled clutch coupling; a tubular member attached to said plunger and provided with resilient spring fingers having crimping projections adapted to contact with the flange of a bottle cap upon the downward movement of said plunger; and means for forcing said projections out of contact with said flange during the upward movement of the plunger and after the capping operation is completed, substantially as described.

3. In a bottle capping machine, the combination of a power shaft; a reciprocating capping plunger comprising a friction controlled clutch coupling; adjustable spring means for controlling the friction of said coupling; a tubular member attached to said plunger and provided with spring controlled crimping projections adapted to contact with the flange of a bottle cap; and means comprising a wedging member for forcing said projection out of contact with said flange during the return movement of the plunger and after the capping operation is completed, substantially as described.

4. In a bottle capping machine, the combination of a rotating shaft; a rod 42; a friction controlled clutch between said shaft and said rod adapted to disconnect the parts when the strain exceeds a predetermined limit; a spring for moving said rod in one direction; a reciprocating plunger; a connection between said rod and said plunger; and a split capping tubular member attached to said plunger, substantially as described.

5. In a bottle capping machine, the combination of a power pulley; a shaft adapted to be operated by said pulley; a rod 42; a friction controlled connection between said shaft and said rod; comprising a lug rigid with said shaft, a pawl carried by said lug, a hub carrying an arm loose on said shaft and controlled by said pawl and a connection between said hub and said rod; a spring for moving said rod in one direction; a plunger; a connection between said rod and said plunger; and a split tubular capping member attached to said plunger; substantially as described.

6. In a bottle capping machine, the combination of a power pulley; a shaft operated by said pulley; a lug rigid on said shaft and

carrying a pawl; a trigger 22 for controlling said pawl; an arm loose on said shaft controlled by said pawl; a bottle capping member and means connecting said arm and said bottle capping member, substantially as described.

7. In a bottle capping machine, the combination of a power pulley; a shaft operated by said pulley; a lug rigid on said shaft and carrying a pawl; a trigger 22 for controlling said pawl; an adjustable spring for controlling said trigger; a hub loose on said shaft provided with an arm adapted to be controlled by said pawl and trigger; and bottle capping means adapted to be operated from said hub, substantially as described.

8. In a bottle capping machine, the combination of a power shaft; a reciprocating plunger; connections between said shaft and said plunger; a bottle capping means comprising a split tubular member having resilient spring fingers and crimping projections rigid with said fingers adapted to contact with the flange of a bottle cap; and means for forcing said projections out of contact with said flange during the return movement of the plunger and after the capping operation is completed; substantially as described.

9. In a bottle capping machine, the combination of a power pulley; a reciprocating plunger; connections between said pulley and said plunger; bottle capping means comprising a split tubular member having resilient spring fingers and crimping projections rigid therewith adapted to contact with the flange of a bottle cap; a head member adapted to rest on the cap; and means for forcing said projections out of contact with said flange after the capping operation is completed; substantially as described.

10. In a bottle capping machine, the combination of a reciprocating plunger; a split tubular member rigid therewith and provided with a crimping projection; a cam member 51 associated with said tubular member; and means for actuating said crimping projections through the agency of said cam member after the capping operation is completed, substantially as described.

11. In a bottle capping machine, the combination of a reciprocating means; a split tubular member carrying integral spring controlled crimping projections associated with said means; and means associated with said member for positively moving said crimping projections outwardly and putting

them under tension after the capping operation is completed, substantially as described.

12. In a bottle capping machine, the combination of a reciprocating plunger; a split tubular member comprising resilient spring fingers carrying crimping projections; means for positively forcing said projections outwardly after the capping operation is completed; a head member associated with said projections and adapted to move in relation thereto; and a locking lever adapted to hold said projections and head member in fixed relations, substantially as described.

13. In a bottle capping machine, the combination of a tubular member provided with resilient spring fingers having crimping projections adapted to encircle the bottle head; a second tubular member associated with said first mentioned member, provided with cam projections; a reciprocating means to which said tubular members are detachably attached; and means cooperating with said cam projections adapted to move said crimping projections away from the bottle head and against the tension of said spring fingers, substantially as described.

14. In a bottle capping machine, the combination of a power pulley; a bottle capping mechanism; means comprising a revolving trigger mechanism connecting said power pulley and said bottle capping mechanism and adapted to move the latter in a downward direction; and means associated with said trigger mechanism causing the same to trip and to disconnect said pulley from said bottle capping mechanism when the strain on said capping mechanism reaches a predetermined point; substantially as described.

15. In a bottle capping machine, the combination of a power pulley; a bottle capping mechanism; a cross head to which said mechanism is connected; means comprising a revolving trigger mechanism connecting said pulley and said cross head and adapted to move said capping mechanism downward; means causing said trigger mechanism to trip when the strain on the capping mechanism reaches a predetermined point; and a stop adapted to suddenly arrest said downward movement; substantially as described.

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

THOMAS J. LEVEY.

Witnesses:

CHAS. M. SCHNEIDER,
MARTIN SCHNEIDER.