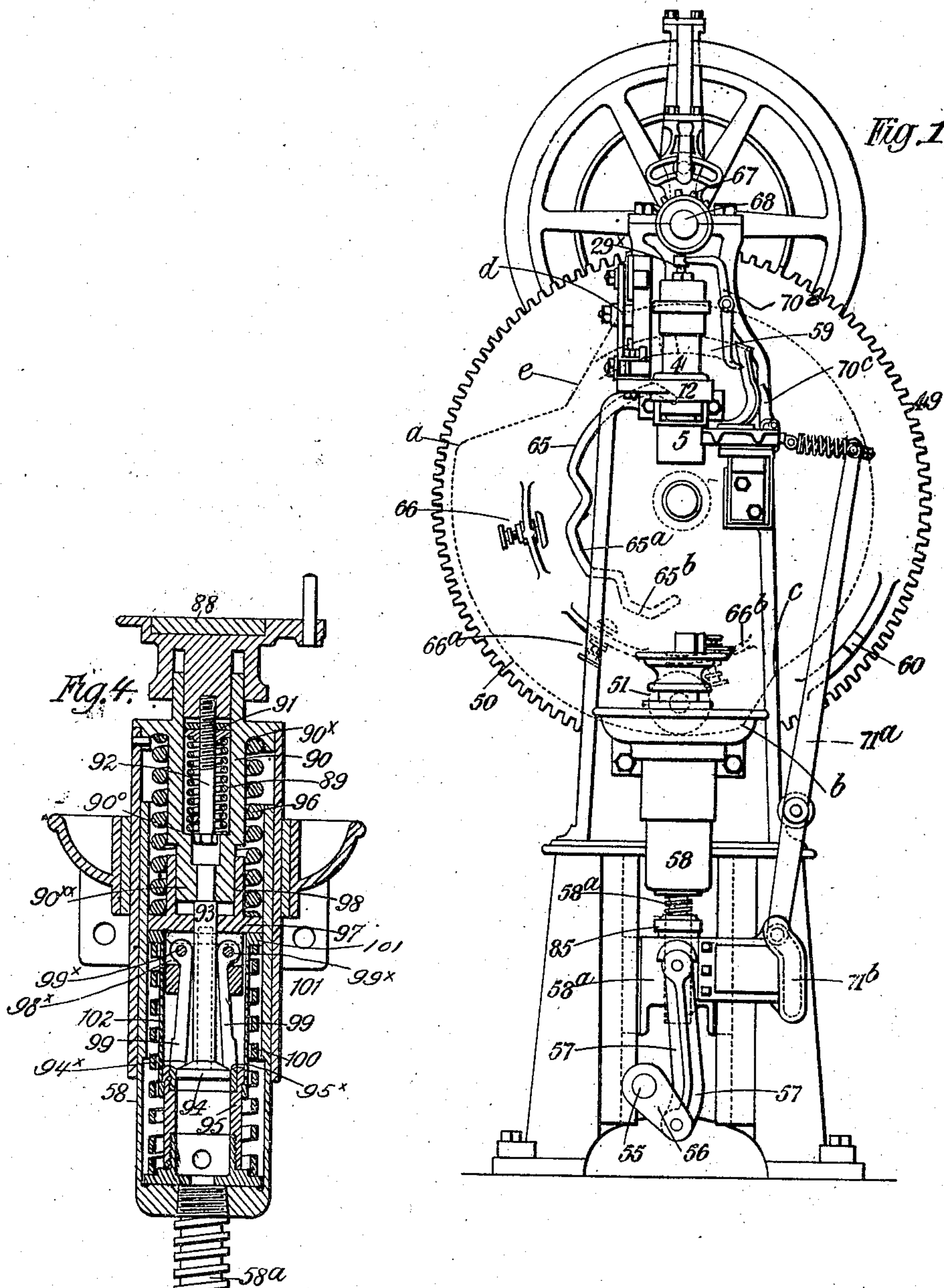


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MACHINE FOR CAPPING OR CLOSING CHARGED BOTTLES OR OTHER RECEPTACLES.
APPLICATION FILED JUNE 7, 1904.

928,781.

Patented July 20, 1909.
3 SHEETS—SHEET 1.



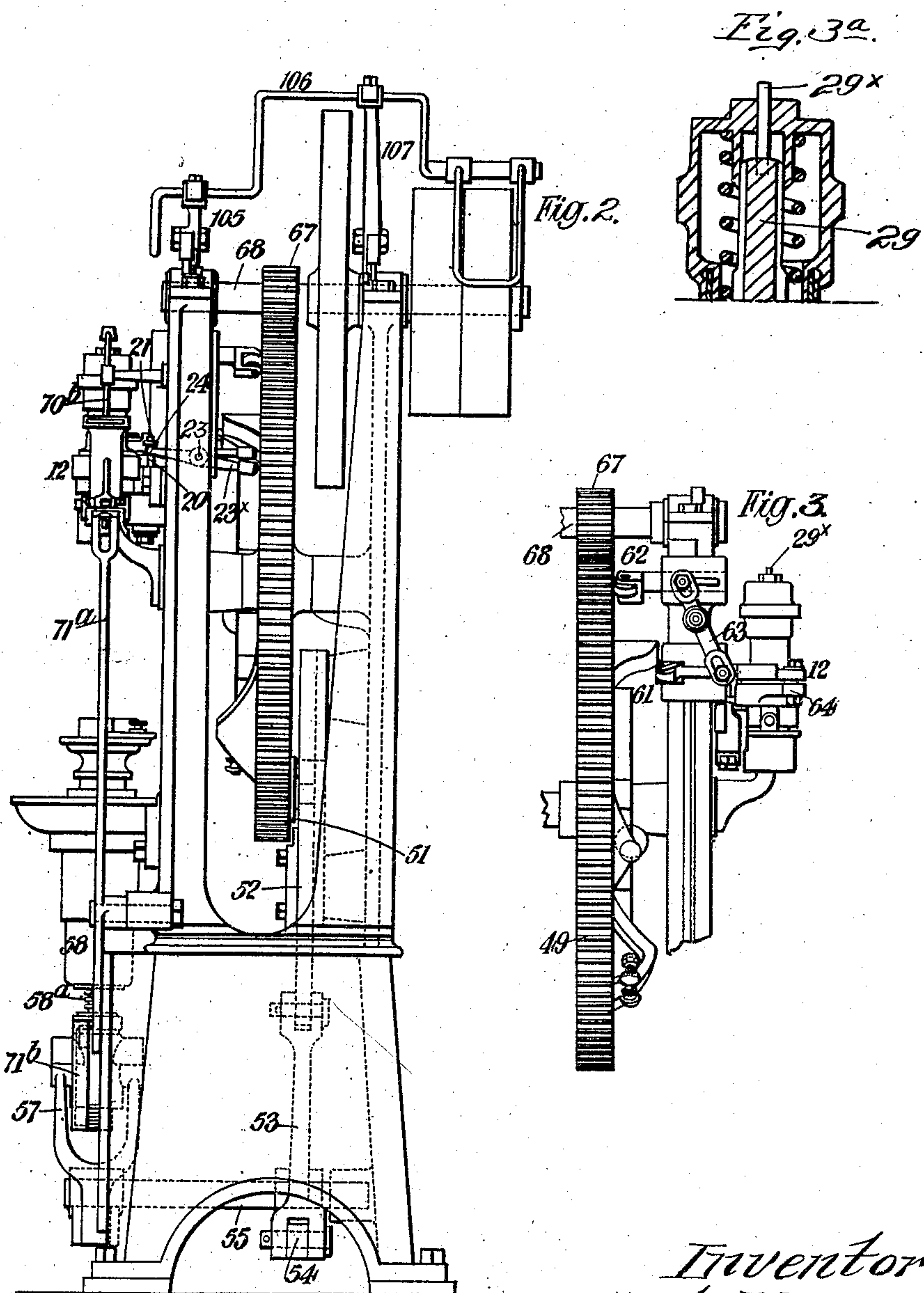
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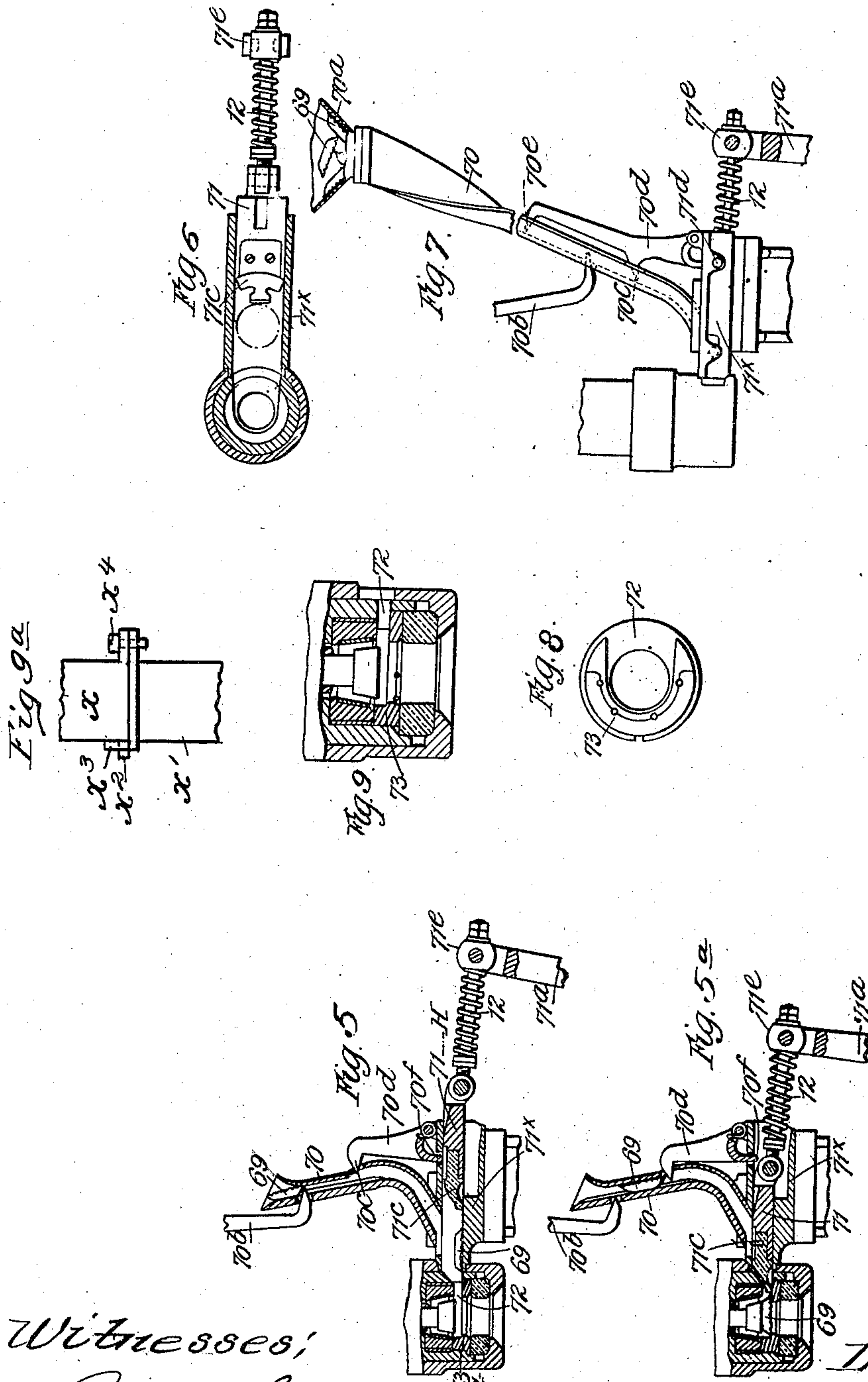
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Witnesses;
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UNITED STATES PATENT OFFICE.

ELBERT KIRK MOORE, OF FINSBURY, LONDON, ENGLAND, ASSIGNOR TO THE CROWN CORK
COMPANY LIMITED, OF FINSBURY, LONDON, ENGLAND.

MACHINE FOR CAPPING OR CLOSING CHARGED BOTTLES OR OTHER RECEPTACLES.

No. 928,781.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed June 7, 1904. Serial No. 211,561.

To all whom it may concern:

Be it known that I, ELBERT KIRK MOORE, a citizen of the United States of America, temporarily residing at 79 and 81 Paul street, Finsbury, in the county of London, England, engineer, have invented certain new and useful Improvements Relating to Machines for Capping or Closing Charged Bottles or other Receptacles, of which the following is a specification.

This invention relates to improvements in apparatus for capping or closing charged bottles or other receptacles; the objects being to simplify and render more efficient the mechanism employed for this purpose whereby the escape of gas or liquid is prevented while the bottle is being filled and closed, and a more certain and even feeding of the caps or crowns to the head of the machine is insured.

The improvements are more particularly designed for employment with machines such as referred to in the specification of British Letters Patent No. 24,219 of 1901 in which the mouth of the bottle is inserted into the head of the machine and is there filled and closed or crowned.

In order that the invention may be clearly understood and readily carried into effect we will proceed to describe the same with reference to the accompanying drawings, in which:

Figure 1 is a front elevation of a machine constructed in accordance with the invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detail elevation of the cam wheel and head of the machine looking toward the left-hand side of Fig. 2. Fig. 3^a is a detail view in section showing the plunger and projection or pin pertaining to the filling head. Fig. 4 is a longitudinal view of the bottle supporting cylinder and cooperating parts. Figs. 5 and 5^a are detail vertical sections showing two positions of the crown feeding apparatus. Fig. 6 is a section on the line G—H, Fig. 5. Fig. 7 is an elevation partially in section of a modified form of the crown feeding device and by which the crowns are fed automatically into the head of the machine. Fig. 8 is a detail view of the throat ring. Fig. 9 is a vertical section of the lower part of the head of the machine. Fig. 9^a is a detail view show-

ing the feed chute made in two parts and transversely separable.

Referring to Figs. 1 and 3 the cam wheel 49 is provided on one side with a cam-way 50 with which a roller 51 carried by a slide 52 engages; the latter being connected by a rod 53 with a crank 54 on a crank shaft 55. The shaft 55 also carries a crank 56 which is connected by a forked arm 57 with a reciprocating bottle supporting cylinder 58. As the cam wheel 49 rotates, the cam 50, by bearing on the roller 51, rocks the crank shaft 55 and thereby raises and lowers the bottle support 58 as hereinafter described. The wheel 49 also carries cams 59, 60 for cooperating with horizontally reciprocating slides 61, 62 for actuating the ring 12. The slides 61, 62 are respectively connected to the opposite ends of a centrally pivoted lever 63, and the slide 61 is also pivotally connected to a lug 64 on the ring 12. The cam wheel 49 also carries cams 65 and 66 in the path of which the valve lever 23 for operating the snift and liquid valves, lies. The periphery of the wheel 49 is toothed and gears with a pinion 67 carried by a shaft 68 driven by band and pulley gear from any convenient source of power.

Caps or crowns for closing the mouths of the bottles are fed successively through a slot or opening 72 (Figs. 8 and 9) in the head of the machine in a shouldered ring 73 where they are retained until fixed over the mouth of the bottles as hereinafter explained. The caps or crowns 69 for closing the mouths of the bottles may be placed in bulk in a hopper of any suitable design such as 70^a from which they issue and pass through a tube or chute 70. In passing through this tube each cap is caught by a trip lever 70^b which serves to prevent a following crown from passing prematurely into the filling head of the machine that is to say, until the preceding crown has been placed on the bottle and the latter removed. When this has been done, the trip lever 70^b by means of the projection or pin 29^x operated by the plunger 29 see Fig. 3^a, pertaining to the filling head, recedes from the path of the caps or crowns in the tube or chute 70 and the crown held thereby falls on to the lower projecting portion 70^c of the switch lever 70^d which at this period is closed.

The upper projecting portion 70^e (Fig. 7) of this switch lever 70^a serves to arrest the feed of the crowns while the crown already in the chute is switched from the trip lever 70^b to the lower portion 70^c of the lever 70^a. Then as the bottle being filled and capped or crowned is lowered out of the filling head by the cylinder 58, and slide nut 58^a dropping to its lowest or normal position, the slide 71 is carried back by means of the lever 71^a which is operated by the cam-plate 71^b connected to the sliding nut 58^a. As the slide 71 moves backward, it strikes a projection 70^f on the switch lever 70^a, tilting the latter so as to allow the cap or crown which up to this time has been resting against the lower nose or projection 70^c to drop into the slide box 71^x and in front of the slide 71 at the same time releasing the caps or crowns situated above, in the tube or chute 70 and allowing them to fall downward until the lowest one rests on the inwardly projecting portion or finger of the trip lever 70^b as before, then as the cam wheel 49 revolves and raises the cylinder 58 and cam plates 71^b, the lever 71^a and slide 71 are moved forward, pushing the crown just previously dropped in front of it into the filling head where it is held in position by the inner part of the slide formed by the rubber tip or tongue 71^c which latter at the same time closes the orifice in the filling head through which the crown has passed, making a tight joint to prevent the escape of gas and water.

The tube or chute 70 may be made in two parts separable transversely viz., an upper and a lower part see Fig. 9^a. The upper part x is connected to the lower part x' by a pin or projection x^2 engaging a lug x^3 and a holding screw x^4 . The lower part x' is attached to the cover of the slide box 71^x and is so arranged that, by loosening a set screw, whereof the knurled head is shown at 71^a, the cover and the said lower part of chute may be readily removed when required. The slide 71 is connected by a link and swivel block 71^e, to the lever 71^a and on this link a spring 12, and adjusting nuts are provided whereby the necessary regulation and tension in respect of the slide 71 may be obtained in order to effectively maintain the closure of the orifice in the filling head. The chute 70 is preferably formed with a twist (amounting to about one-quarter turn) with a view to insuring the proper feeding of the caps.

The caps or crowns may however be fed by hand, a shortened form of the chute 70 being employed as shown in Figs. 3, 4, 7, 7^a the operation so far as the successive serving of the caps or crowns into the filling head being similar to that just described with reference to the automatic method of feeding. In the hand feed arrangement the caps or crowns are placed or dropped singly into the

top of chute 70 while the bottle is being filled and then as before when the bottle is filled and the previous crown already in the filling head has been placed on the bottle, the crown in the upper end of the chute is taken or directed as before explained into position in the filling head; this latter being effected automatically.

The trip lever 70^b may be operated by the projection or pin 29^x which projects through the top of the filling head and rests on the top of the plunger 29. The upper end of this pin impinges against the free end of trip lever 70^b, and, as the plunger 29 is raised to allow the cap or crown to be placed on the bottle, it moves the trip lever 70^b and so allows the succeeding crown to pass in its journey to the filling head. Thus the trip lever 70^b only moves when the previous crown has been placed on the bottle, and, consequently, the passage of a crown into the filling head, while the latter still contains a crown is prevented.

The bottle supporting cylinder 58 is hollow and is provided with a screw threaded stem 58^a which engages with a nut 85 carried by the forked arm 57, so that by rotating the cylinder 58 the bottle support may be adjusted to suit bottles of different lengths. Referring to Fig. 4, 88 is the table or bottle support which is supported by a coiled spring 89 inserted in a cylindrical piece 90; one end of the spring 89 bearing on a shoulder 90^o in the piece 90, and the other end of said spring bearing on adjustable lock-nuts 91 carried by a rod 92 screwed into the support 88. The piece 90 carries a rod 93 having secured to its lower end a beveled disk 94 which accurately fits a cylinder 95 located in the bottom of the cylinder 58 and having a beveled upper edge 95^x. The piece 90 is supported by a coiled spring 96 of predetermined strength, one end of which bears on the under side of a flange 90^x formed on the piece 90, and the other end of which bears upon a shoulder 97 on a cylinder 98 located within the cylinder 58 and working upon a cylindrical part or projection 90^{xx} formed on the piece 90.

The cylinder 98 is supported by four arms or dogs 99, 99, which are pivoted at 99^x in opening 98^x in the said cylinder 98 and have their free ends inclined so as to engage with the beveled parts 95^x of the cylinder 95 and the beveled part 94^x of the disk 94, all of which is more clearly illustrated in my U. S. Letters-Patent 712,832, dated November 4, 1902. When the bottle is being closed, if the pressure on the head of said bottle exceeds the predetermined pressure of the spring 96 said spring is depressed, thereby permitting the part 90 to descend and the disk 94 to descend into the cylinder 95. The arms or dogs 99 then move inwardly toward the rod 93 and thereby permit the

cylinder 98, part 90, and support 88 to freely descend and relieve the pressure on the head of the bottle to prevent said bottle being broken.

5 100 is a coiled spring one end of which bears on a flange on the bottom of the cylinder 95 and the other end of which bears on the shoulder 101 on the upper end of a sleeve 102 which in turn bears upon the shoulder 97 of the cylinder 98. This spring 100 is of only sufficient strength to return the parts 10 88, 90, 98 and 99 to the position shown in Fig. 4 after they have descended as aforesaid. The spring 89 is for preventing the 15 bottle from being forced too far into the filling head in making the joint between the bottle mouth and the gasket and is adjustable whereby the bottle is held there against the pressure during the filling operation.

20 Assuming a bottle to be in position on the bottle support the cycle of operations would be as follows:—A cap or crown 69 having been fed into the throat ring 73, as the cam wheel 49 rotates and the cam 50 travels under the roller 51 from the point *a* to the 25 point *b*, the bottle support 88 with the bottle is in the lowest position as shown in Fig. 3. The continued rotation of the cam-wheel 49 causes the cam 59 to strike the roller on the 30 end of the slide 61 with the effect that the slide is thrust forward and the lever 63 moved about its pivot so as to retract the rod 62. When thus moved, the rod 61 causes the compression of the gasket in the 35 filling head, as will be readily understood. As the cam wheel continues to rotate, the incline *c* on the cam 50 has the effect of raising the roller 51, slide 52 and rod 53, thereby moving the shaft 55 so as to raise 40 the forked arm 57 together with the cylinder and bottle support, the head of the bottle being thereupon caused to fit tightly against the now contracted gasket. As a result of the continued rotation of the wheel 49 the 45 cam 50 passes under the roller 51 from the top of the incline *c* to the point *d*, so as to cause the cam 65 by raising the end 23* of the lever 23 to depress the end 24 of the said lever and effect the opening of the liquid 50 valve 20. The cam 66 then depresses the lever 23, which closes the liquid valve 20 and opens the snift valve 21 for a moment. Then the cam 65^a raises the lever 23, closing the snift valve 21 and again opening the liquid 55 valve 20, as before. The cam 65^a then operates the lever 23 and valves 20 and 21 as previously described, whereupon the cam 65^b operates to again open the liquid valve and thus complete the filling of the bottle. 60 66^b is a third cam operating in a similar manner to the cams 66 and 66^a for use when it becomes necessary to release pressure just previous to crowning all of which is more fully disclosed in my U. S. Letters-Patent 65 712,832, dated November 4, 1902. The cams

may if desired be rendered adjustable in order to regulate the opening and closing of the valves for instance by the lock nut arrangement 66^b illustrated. The incline *c* on the cam 50 then strikes the roller 51 and 73 thereby raises the bottle so as to force its mouth into the head of machine for affixing the cap 69 as above described. At the same time the cam 60 strikes the roller on the end of the slide 62 thereby moving said slide 62 75 forwardly and moving the lever 63 about its pivot so as to retract the rod 61 and thereby move the ring 12 so as to lower the sleeve or jacket 4 to release the gasket. The roller 51 then descends by gravity to the point *a* on 80 the cam 50, when the fully charged and capped or crowned receptacle may be removed and replaced by an empty bottle or receptacle. The feeding of the caps or crowns is effected simultaneously with and 85 is incidental to the movement of the bottle support as previously described.

Attached to the caps of the driving gear there may be arranged swivel bearings 105 for carrying the belt shipping bar 106. 90 These swivel bearings may be adjusted to any desired angle to accommodate the position of the driving belt.

What I claim and desire to secure by Letters Patent of the United States is:— 95

1. The combination with the cam wheel, the bottle supporting cylinder and the plunger head device, of a feed chute, a lever, a cam plate cooperating with the said lever, a sliding pusher, and a connection between the 100 said lever and sliding pusher.

2. The combination with the cam wheel, the bottle supporting cylinder, and a feed chute, of a lever, a cam plate for actuating the said lever, a sliding pusher, a connection 105 between the said lever and the sliding pusher, and trip levers adapted to project into said chute.

3. The combination with the cam wheel, the bottle supporting cylinder, of a lever, a 110 cam plate for actuating the said lever, a sliding pusher, a connection between the said lever and the sliding pusher, a feed chute, a trip lever having two horns adapted to project into the feed chute, and another trip 115 lever having another horn also adapted to project into the feed chute between the projecting horns of the first mentioned trip lever.

4. The combination with the cam wheel, 120 the bottle supporting cylinder, and a head device, of a sliding pusher, a lever, a cam plate for actuating the said lever, a connection between the said lever and slide, a feed chute, a trip lever projecting into the feed 125 chute and having an arm adapted for operation by said head, and another trip lever also projecting into the chute and adapted for operation by the said slide.

5. The combination of a head device, a 130

sliding pusher, a lever, means for actuating said lever, an adjustable connection between the said lever and sliding pusher, a feed chute, and trip levers cooperating with said feed chute.

6. The combination with the cam wheel, the bottle supporting cylinder and the head device, of a slide, a lever, a cam plate, a connection between said lever and slide, a feed chute, a pair of trip levers, a pin on a part of the head device for operating against a portion of one of said trip levers, a slide box cooperating with the said slide, and a projection on the other trip lever normally entering the slide box and adapted for operation by the slide.

7. In a bottle support, the combination of a table a depending pin, a coil spring surrounding the said pin and adapted to support the table, a flanged cylindrical piece adapted to receive the said spring and secured to an outer sleeve, a rod carried by said piece, a beveled disk secured to said rod, a coil spring for supporting the said flanged cylindrical piece, a flange on the latter for engaging the upper end of the spring, another cylinder having a shoulder for supporting the lower end of the spring, the pivoted arms or dogs, pivoted in the last mentioned cylinder, a cylindrical member having its upper end adapted to receive the ends of the arms or dogs, a coil spring surrounding

the said cylindrical member, the latter being provided with shoulders against which the ends of the springs surrounding the same have bearing, a screw stem, and a slide nut.

8. The combination of a cam wheel, a bottle supporting cylinder, a plunger head device, a feed chute, a lever, a cam plate for actuating the said lever, a sliding pusher, a connection between said lever and pusher, and trip levers having portions adapted to work in the said feed chute.

9. The combination of a cam wheel, a bottle supporting cylinder, a slide, a lever, a cam plate for actuating the said lever, a connection between the lever and the said slide, a feed chute, and trip levers having portions adapted to project into said chute.

10. The combination of a bottle supporting cylinder, a slide, a lever, a cam-plate for actuating the said lever, an adjustable connection between the lever and slide, a feed chute, trip levers having portions adapted to project into the said feed chute, and a reciprocating projection piece for operating one of the trip levers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses this eleventh day of May 1904.

ELBERT KIRK MOORE.

Witnesses:

STEPHEN H. VILVEN,
WILLIAM C. GOLBY.