

No. 637,316.

Patented Nov. 21, 1899.

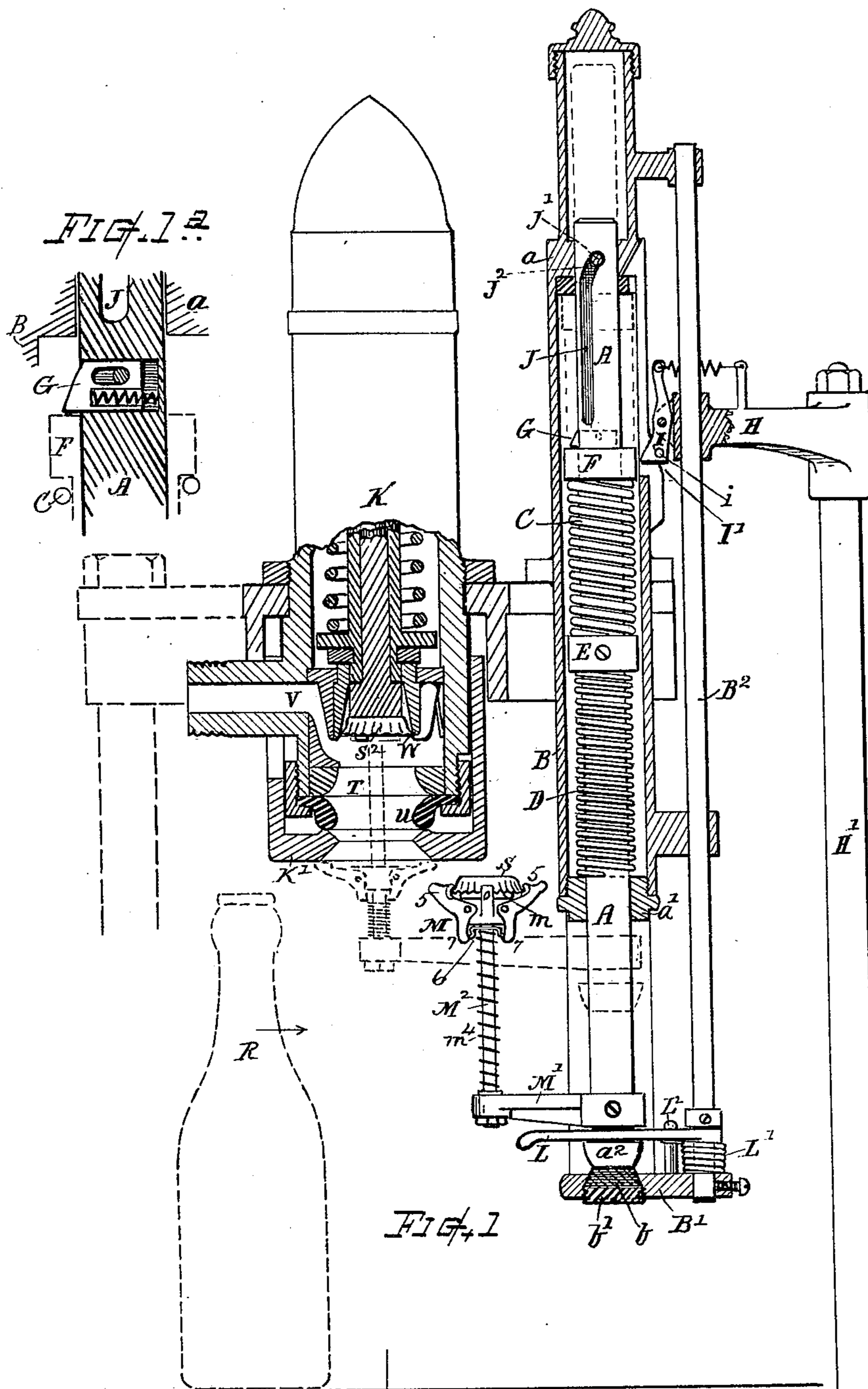
F. O. WOODLAND.

CROWN PLACER FOR BOTTLE FILLING AND STOPPERING MACHINES.

(Application filed Mar. 3, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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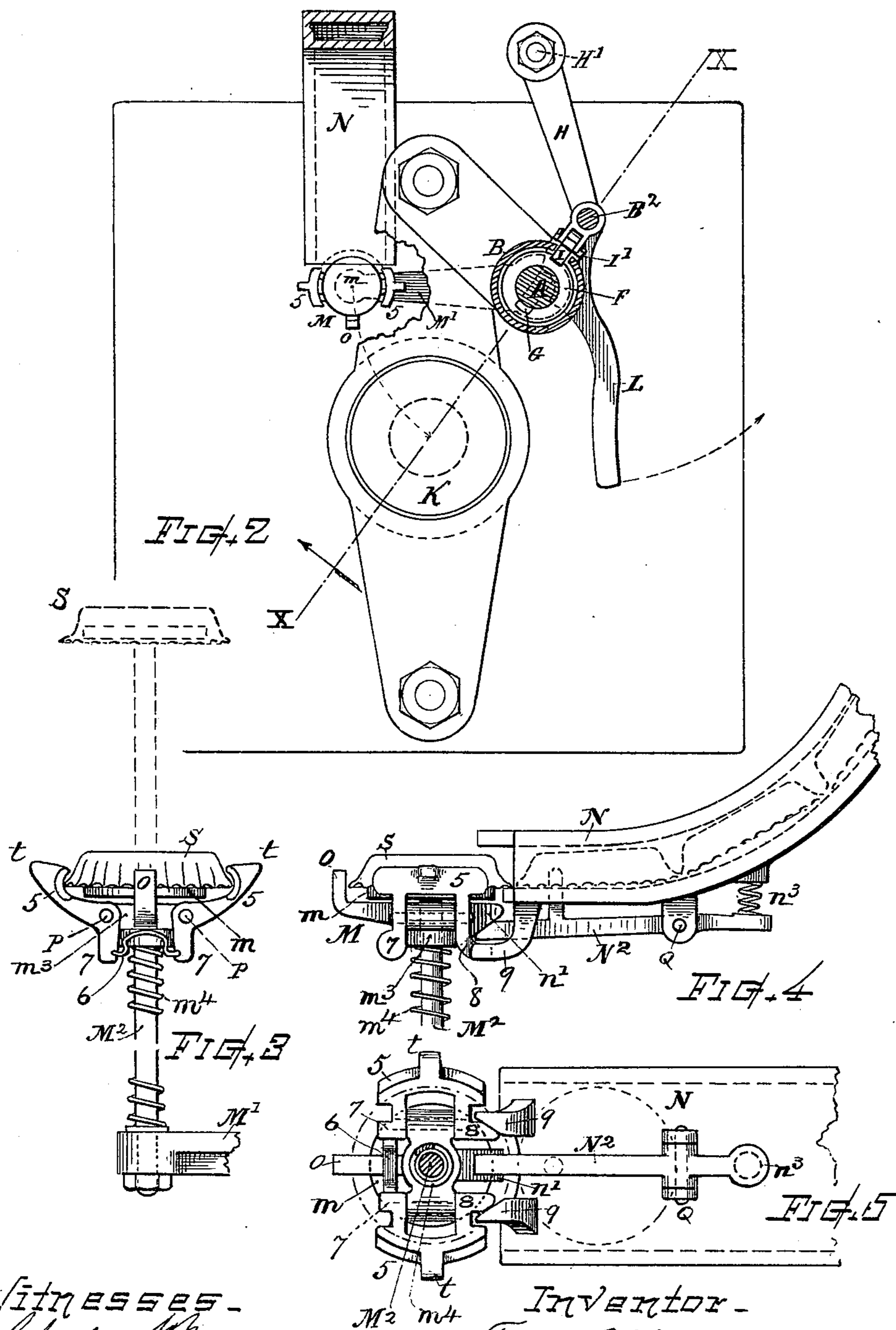
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# UNITED STATES PATENT OFFICE.

FRANK O. WOODLAND, OF WORCESTER, MASSACHUSETTS.

CROWN-PLACER FOR BOTTLE FILLING AND STOPPERING MACHINES.

SPECIFICATION forming part of Letters Patent No. 637,316, dated November 21, 1899.

Application filed March 3, 1899. Serial No. 707,626. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK O. WOODLAND, a subject of the King of Sweden and Norway, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Crown-Placer for Bottle Filling and Stoppering Machines, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

In the ordinary soda filling and stoppering machines of the character referred to the capping or seal-setting dies are so far up within the throat or chamber that it is somewhat difficult to place the crowns in position by hand and causes sore fingers for the attendant, while with the filling-inlet leading into the space below said dies and the guard-gasket at the mouth of the chamber the lateral introduction of the crowns or stoppers through the side of the collar as employed in non-filling stoppering-machines is rendered impracticable, since it interferes with the perfect closure of the chamber, as required for filling the bottles under pressure.

The prime object of my present invention is to provide an attachment or means whereby crown bottle-stoppers can be automatically introduced into the throat-opening from below and passed upward into the head or capping mechanism of bottle filling and stoppering machines, such as are employed for bottling soda-waters, aerated or other liquids which it is necessary to bottle under pressure.

Another object is to provide means for the automatic presentation of the stopper, crown, or seal beneath the collar-opening of the filling and capping head, the elevation of said stopper, crown, or seal into the capping-on dies above the filling-inlet, and the retraction of the crown-carrier mechanism to its original position during the interval of interchange of the bottles; also, to provide a means for putting the crown-placing mechanism into action by the act of removing a bottle from beneath the filling and capping head.

Another object is to provide a spring-actuated crown-placing mechanism for the purpose specified, comprising a system of primary and secondary actuating-springs and

controlling-clutches and in which the setting or strain of the superior spring is effected by the movement of the bottle-capping head as the filling and stoppering operations are performed.

Another object is to provide a carrier mechanism adapted for automatically receiving the stoppers, crowns, or seals from a feed-chute and transferring the same into the throat or die opening of the bottle-stoppering head.

Minor objects and features of my invention are explained in the following detailed description, the particular subject-matter claimed being hereinafter definitely specified.

The above-noted objects I attain by mechanism the nature and operation of which is descriptively set forth, and illustrated in the drawings, wherein—

Figure 1 represents a vertical sectional view of an automatic crown-placing mechanism embodying my invention, shown as applied to use in connection with a well-known form of bottle-filling and crown-capping mechanism, said section being taken on line X X, Fig. 2, looking in the direction indicated by the arrow. Fig. 1<sup>a</sup> represents a vertical section of a portion of the reciprocating member or main rod, showing a catch device for engaging the spring head or slide thereon. Fig. 2 is a plan view of the mechanism, partly in section. Fig. 3 is an elevation view showing the carrier and the devices for holding the crowns or bottle-stoppers thereon. Fig. 4 is a side view of the carrier-head in conjunction with the end of a feed-chute for delivering the crowns, seals or stoppers to said carrier. Fig. 5 is a bottom view of the same parts as embraced in Fig. 4.

My invention comprises a carrier or means for receiving the stopper, crown, or seal at a position exterior to the bottle-filling and capping-on mechanism and actuating means for automatically imparting motion to the carrier devices for carrying the same beneath the collar or opening of the filling-chamber and capping-dies, then elevating the carrier in a manner to effect the introduction of the stopper, crown, or seal upward through the throat or collar-opening into the interior chamber and to place the same in position within the dies, which are above the filling-inlet and in proper position for receiving and capping onto a bot-

tle, and then to cause said carrier to descend out of the bottling mechanism and return to its original position ready for receiving another stopper, crown, or seal thereon. This inserting and placing operation is preferably performed during the time occupied by the attendant in the act of removing the filled and stoppered bottle and replacing it by an empty bottle.

10 For producing motion of the carrier I employ a system of differential springs arranged for the reactive movement of a reciprocative member to which the carrier is operatively connected, which springs are controlled by  
15 suitably-arranged stops, catches, or let-off devices, and by a setting appliance operated by the movement of the bottle-capping head when clenching the crown or seal to the bottle.

Referring to the drawings, A denotes a reciprocating rod or member movable up and down through the bearings  $a$   $a'$ , and in the present instance inclosed within a tubular housing or frame B. Combined with this rod or reciprocating member A there are arranged  
20 two springs C and D, in the present instance coiled around the rod and acting against a central collar E, fixed on said rod to effect movement of the rod and its connections.

The spring C, which is above the collar E,  
30 is made of sufficiently superior power and tension to overcome or dominate the power and tension of the spring D, which is below the collar E; but said inferior spring has sufficient power to move the mechanism when the domination of the superior spring is repressed.  
35 The inferior spring effects primary action and the superior spring effects secondary action or reaction.

The spring D seats against a lower stationary bearing, as  $a'$ , and acts by its expansive force against the collar E. The spring C seats against a ring or sleeve F, that is movable on or independent of the rod A and which is adapted for engagement with a catch device  
45 G, arranged in or upon said rod for normally retaining the spring C under compression. A catch or dog I is connected with the arm H, which dog works through a longitudinal slot in the side of the inclosing tube B and serves  
50 for engaging with the sleeve F and for compressing the spring after the latter has been released from the catch G. When the inclosing tube is depressed to a degree that brings the ring F below the dog I, the latter snaps  
55 over the edge of said ring, retaining the same and causing the compression of the spring as the tube and rod rise, bringing the catch G into conjunctive relation with the ring F. The dog I is provided with lugs  $i$ , that contact  
60 with inclined projecting surfaces  $I'$ , formed on the exterior of the tube B for throwing off the catch I or releasing its hold from the ring F immediately after the latter has passed beneath the retaining-catch G, the two catches  
65 acting at their position of coinciding level relation to transfer the strain of the compressed spring C from control of the dog I to catch G.

The reciprocating member or rod is provided with a slot or groove J, that engages with a pin or stud  $J'$ , fixed in the bearing-frame, through which the member moves, and said slot is made on a curve or incline at a portion of its length, as  $J^2$ , for giving a partial rotative movement to the member A as it reciprocates endwise.

B' indicates a bar or plate that forms a stop and rest for the movable parts and which is preferably provided with a cushion-seat  $b$  and adjusting-screw  $b'$  for regulating the seating position.

$B^2$  is a vertical bar that serves as a guide for the arm H and a support for the foot-piece B'. Said vertical bar  $B^2$  can in some instances be dispensed with or substituted by any equivalent guide device.

The rod A is provided with a flange or catch-button  $a^2$ , that engages beneath a laterally-swinging latch-lever L for retaining the reciprocating member at depressed position, as shown in Fig. 1, which is the normal non-active position of the mechanism. A return-spring  $L'$  and a back-stop  $L^2$  are provided for this latch-lever L.

A crown-carrier M is attached to the reciprocating member A by a suitable arm  $M'$ , provided with an upright rod or finger  $M^2$ , having on its top end a device or plate  $m$  of suitable structure and size for receiving and supporting a single crown cap or stopper in position for insertion upward into the chamber of the capping and filling machine. In the present instance the carrier is adapted for receiving crowns automatically from a delivery-chute or feeding mechanism, which feeding mechanism may be of the character heretofore employed for sorting, arranging, and delivering crown-stoppers to non-filling bottle-stoppering machines. The end of such feed-delivery chute, as adapted for my improved mechanism, is shown at N, Figs. 2, 4, and 5, the carrier being shown adjacent thereto and at position for receiving a crown S therefrom. When designed for thus automatically receiving and conveying the crowns, the carrier is provided with a sliding head  $m^3$ , movable on the finger  $M^2$  beneath the plate  $m$ , and supported at normally-elevated position by an expanding spring  $m^4$ , coiled about the finger-pin  $M^2$ , as indicated. Said sliding head is furnished with a stop-finger  $o$  and a projecting detent  $n'$ , having a downwardly-inclined surface, and a pair of laterally-movable jaws 5 are pivoted at P to said sliding head, which jaws extend above the edges of the plate  $m$ , the jaw-faces being properly formed for embracing the edges of the crown S. Said jaws are normally pressed inward by a suitable spring 6, arranged between the depending arms 7 of the jaws, while other depending arms or contact-lugs 8 on said jaws are fitted with suitable surfaces for contact when the carrier approaches the chute, with inclined contact-lugs 9 fixed on the chute N. The jaws 5 are best furnished with protect-

ing-tips  $t$  to strike the under face of the capping-machine collar at  $K'$ . The chute is provided with a suitable stop device for arresting or controlling the movement of the crowns therein, said device, as shown, consisting of a lever  $N^2$ , having a prong that extends into the chute, as indicated in Fig. 4. Said lever is normally held upward by a spring  $n^3$ ; but its fore end is adapted to become depressed for releasing the crown by the inclined surface and contact of the projection  $n'$  on the carrier when the latter approaches the chute.

In some instances the carrier  $M$  can be loaded by placing the crowns  $S$  thereon by hand during the time that a bottle is being filled and while the carrier stands at convenient position away from the head. The mechanism may be made to swing the carrier to the right or to the left, accordingly as desired by shaping the slot  $J$  with right or left inclination, the actuating-springs being the same in their essential operations in either case.

The arm  $H$  and its standard  $H'$  are in fixed relation to the base or table of the bottling-machine, while the crown-placer mechanism is supported upon the capping-head  $K$  of the bottle filling and stoppering machine, which moves up and down in relation to the bed or table.

The mechanism embraced in the structure of the filling and capping head  $K$  is not of my invention, but is herein shown somewhat in detail in order to afford a full understanding of my combination therewith of means for placing crowns or seal-stoppers within the same.

In the filling and capping head  $K$  the parts are of usual or suitable form and arrangement,  $T$  indicating the throatway or chamber into which the head of the bottle is introduced for filling and capping or sealing.

$U$  indicates the elastic guard-gasket for closure around the bottle-neck,  $V$  the supply-inlet, and  $W$  the crown-setting dies into which the crowns or seals are required to be placed previous to the introduction of the neck of the bottle into the throatway for filling.

The means for controlling the supply of liquid and for moving the head of the machine being well known, the operation, so far as the requirements of such mechanism are concerned, will be understood.

The operation of my crown-placer mechanism is as follows: Assuming that rod  $A$  and springs  $C$  and  $D$  are at positions as shown in Fig. 1, both springs being then under strain or compressed, a crown-stopper  $S$  is loaded upon the carrier  $M$ . The attendant then swings back the let-off latch or lever  $L$ , which is in practice effected by the act of removing the previously filled and stoppered bottle from beneath the filling-head. The movement of the lever  $L$  from the button  $\alpha^2$  releases the rod  $A$ , and the force of the spring  $D$ , acting against the collar  $E$ , instantly throws said rod and parts connected there-

with upward to the position indicated by dotted lines, Fig. 1. The pin  $J'$ , acting in conjunction with the twisted form of the upper part  $J^2$  of the slot or groove  $J$ , causes partial rotation of said rod sufficient to swing the carrier during the first part of the upper movement from its primal position to a position approximately central beneath the head  $K$  and its throat  $T$ , so that the further movement elevates the finger  $M^2$  and carrier-plate  $m$  into the chamber, (see dotted lines, Fig. 1,) thereby placing the crown, seal, or stopper  $S$  within the capping-dies, as indicated at  $S^2$ , where it is temporarily retained by the usual spring-catches provided at that position. As the carrier enters the throatway  $T$  the projecting ends  $t$  of the jaws  $5$  come into contact with the face of the collar  $K'$ , thereby arresting the upward movement of the slide  $m^3$  and opening said jaws to release the crown, the slide and jaws, by compression of the spring  $m^4$ , remaining outside, while the carrier-finger  $M^2$  and plate  $m$  elevate the crown to its proper place and position within the throat or chamber, to be there grasped by the catch devices. When the reciprocating rod or member  $A$  reaches its high position, the catch  $G$ , which holds the tension-sleeve  $F$ , runs into the bearing-ring or against a suitable trip provided therefor, causing the retraction of said catch and the release of the superior spring  $C$  for action. Said spring instantly overcomes the force of the inferior spring  $D$  and throws the rod  $A$  and carrier  $M$  downward and back to their primal positions, also at the same time compressing the spring  $D$ . As the rod reaches its low position it is arrested by the foot-stop  $b$ , and the lever  $L$ , controlled by its reacting-spring  $L'$ , swings into engagement with the button  $\alpha^2$  for retaining the mechanism at set position. The reciprocating rod and carrier are now at their normal position, but the spring  $C$  is expanded and its sleeve  $F$  rests against the upper stop or bearing. The resetting of spring  $C$  is then accomplished by the capping movement, thus: When the bottle has been placed and filled, the machine-head  $K$  is depressed for securing the crown or seal to the bottle, and the bearing-frame or inclosing tube  $B$  moves downward with the head  $K$ , while the standard and arm  $H$  remain stationary. This has the effect of bringing the latch-dog  $I$  above the sleeve  $F$ , upon which it engages. Then as the head  $K$  and frame  $B$  are again elevated the stationary arm  $H$  and catch-dog  $I$  cause the retention or relative depression of the sliding sleeve  $F$ , thereby compressing the spring  $C$  until the edge of the sleeve passes beneath the catch  $G$ , which snaps into position for retaining the spring set. At the same time the lugs  $i$  of the catch-dog  $I$  run onto the inclined cam-surfaces  $I'$ , thereby throwing the catch-dog clear from the sleeve, but leaving the spring held in compress by the catch  $G$ , as shown. The mechanism is then in condition for repeating the operation as the attendant re-

moves the recently-stoppered bottle from beneath the head K, and thereby again moves the lever L.

If the carrier is to be loaded by hand, the attendant places a crown S thereon while the bottle is becoming filled; but if the loading is automatically effected, then as the carrier swings back to the end of the chute F the lugs 8 run onto the inclined lugs 9, thus overcoming the spring 6 and effecting the opening of jaws 5 for receiving a crown from the feed-chute. At the same time the incline on the projecting detent *n'* operates the lever stop device N<sup>2</sup>, allowing a crown to pass from the chute onto the carrier M. The jaws 5 are freed from the influence of lugs 9 the instant the carrier starts away from the chute and are closed upon the edges of the crown by the action of spring 6.

From the foregoing it will be seen that I have produced a crown-placing mechanism that can be incorporated with or attached to bottle filling and closing machines employing crowns, caps, or seals that are introduced from below the chamber without requiring special alteration of the filling or closing devices of the machines themselves; also, a means by which the crowns can be quickly and conveniently injected through the regular throatway from an exterior position and into the securing-dies, and the carrier retracted out of the way of the bottle without loss of time in the bottling operations, without inconvenience, and with a saving of labor to the attendant.

What I claim, and desire to secure by Letters Patent, is—

1. The combination with mechanism for filling and closing bottles; of a crown-placing carrier adapted for supporting a crown bottle-stopper, said carrier being movable into and from the throatway of the filling-chamber, axially from beneath the collar, and means for advancing, elevating and retracting said carrier, substantially as set forth.

2. The combination with the bottling-machine head having the filling-inlet passage, the crown-setting dies, and the gasket-guarded throatway; of a carrier comprising an arm or finger fitted for supporting a crown bottle-stopper, and adapted for projectively moving into and from said throatway-passage and coacting with said crown-setting dies in the transfer of a crown or stopper thereinto, a support for said carrier-arm, and means for automatically advancing and retracting the carrier, for the purpose set forth.

3. A crown-placer mechanism for bottle filling and stoppering machines, comprising, in combination with a suitable attaching-frame, a reciprocating rod or member provided with an arm, a carrier for the stoppers, crowns or seals supported on said arms, two oppositely-actuating springs for said rods, one an elevating-spring of moderate tension, the other a depressing-spring of superior tension,

an abutting sleeve for said latter spring sliding on said rod, a spring-controlling catch carried by said rod, a rod-retaining and let-off latch, and a spring-setting device actuated by movement of the bottling head or frame, for the purposes set forth.

4. In a crown-placing mechanism, the combination, with a reciprocating member having the crown-carrier attached thereto, of an elevating-spring and a depressing-spring, of differential strengths or tension for moving said member in opposite directions, and means for compressing and releasing said springs.

5. In a crown-placing mechanism for the purpose set forth, the combination of an endwise-movable rod or member having the crown-carrier connected thereto, a slot or groove in said rod having a curved portion, a pin fixed in the bearing-frame and engaging in said slot, and means for reciprocating said rod.

6. In a crown-placing mechanism for the purpose set forth, the combination of an endwise-movable rod or member having the crown-carrier connected therewith, a support for said rod having upper and lower bearing, a central collar fixed to said rod, a spring between said collar and lower bearing, a sleeve or abutment ring sliding on said rod adjacent to the upper bearing, a superior spring between said collar and sleeve, a catch device carried on said rod and engageable with said sleeve, said catch retractable by contact with an upper stop or bearing, for the purpose set forth.

7. In a crown-placing mechanism for the purpose set forth; the combination with an endwise-movable rod or member having the crown-carrier connected therewith; of a supporting-frame provided with upper and lower bearings through which said rod reciprocates, springs for elevating and depressing said rod, a foot-stop for arresting the downward movement of said rod, and a retaining-latch or let-off engageable with said rod at its depressed position.

8. In a crown-placing mechanism for the purpose set forth, the combination with an attachable supporting-frame, of a vertically-movable rod or member, a horizontally-projecting arm rigidly attached to said rod and having an upright portion provided at its top with a carrier plate or device adapted for supporting a stopper, crown or seal, means for imparting upward and downward movement and partial lateral rotation to said rod and arm for swinging said carrier device beneath, into and from the capping-head of a bottle-stoppering machine.

9. In a crown-placing mechanism for the purpose specified, the combination, of a crown-carrier comprising a rod or finger adapted for endwise upright entrance into the capping-machine throat, and for the diskwise support of a crown or bottle-stopper upon its end face, and a movable jaw or retractable means for

temporarily retaining the crowns at position upon said carrier end while projecting the same to the throatway.

10. A carrier for crown bottle-stoppers, comprising a finger or rod having a tip end plate adapted for seating a crown thereon, a head or slide mounted on said rod adjacent thereto, an expanding spring supporting said slide, grip-jaws mounted on said slide and projecting above the end plate for holding the crowns, a jaw-closing spring, and contact-lugs at counter position to said spring adapted for opening said jaws.

11. In a mechanism for introducing stoppers, crowns or seals into bottle-filling and bottle-stoppering machines, the combination, with the filling or capping head of a carrier mechanism adapted for projecting the stopper, crown or seal into the throat and placing it within the capping-dies, said carrier provided with retractable jaws or holding devices adapted to be arrested and opened by contact with the collar or face of the filling and capping head, and means for automatically moving said carrier to and from said head, for the purpose set forth.

12. In a mechanism for placing stoppers, crowns or seals in bottle filling and stoppering machines, the combination with the movable filling and capping head and crown-placing device, comprising the endwise-movable rod, a carrier attached thereto, and actuating-springs arranged on said rod; of a tubular bearing-supporting frame attached to the movable filling and capping head, its tubular part inclosing said rod and springs.

13. In a mechanism for placing crowns, in combination, with the movable capping-head, the carrier, the endwise-movable rod, its actuating-springs, and the frame of tubular form inclosing said rod and springs; a stationary member provided with a movable catch-dog extending through a slot in said

tube, for engaging and compressing the inclosed spring by upward movement of said capping-head, a projecting lug on said catch-dog, and an incline or cam surface on the tubular frame for throwing off said catch-dog when at normal elevated position.

14. The combination with a bottle-filling or bottle-capping mechanism, a crown-placing carrier adapted for inserting stoppers crowns or seals thereinto, and an automatic actuating mechanism for operating said carrier; of a starter or cast-off lever disposed adjacent to the exit-path and adapted for operation by contact with the bottle as it is removed from beneath the capping-head.

15. The combination with a bottle-filling or bottle-stoppering mechanism, a feed-delivery chute for the stoppers, crowns or seals, and an automatically-actuated carrier adapted for receiving the stoppers, crowns or seals from said chute, passing the same beneath the filling-head, and elevating the same through the throatway to the capping-dies, and means for automatically actuating said carrier.

16. The combination, with a bottle-stoppering machine, a delivery or feed chute, and a stop device for arresting the crowns at the mouth of said chute; of a swinging crown-placing carrier for transferring and introducing crowns or bottle-stoppers to the machine-throatway, said carrier being adapted to move into conjunction with said feed-chute, and provided with a detent that effects retraction of said stop device when said carrier approaches the feed-chute, for the purpose set forth.

Witness my hand this 1st day of March, 1899.

FRANK O. WOODLAND.

Witnesses:

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HORATIO GATES.