

R. FLANIGAN.
BOTTLE CAPPING MACHINE.

(Application filed June 15, 1901.)

(No Model.)

3 Sheets—Sheet 1.

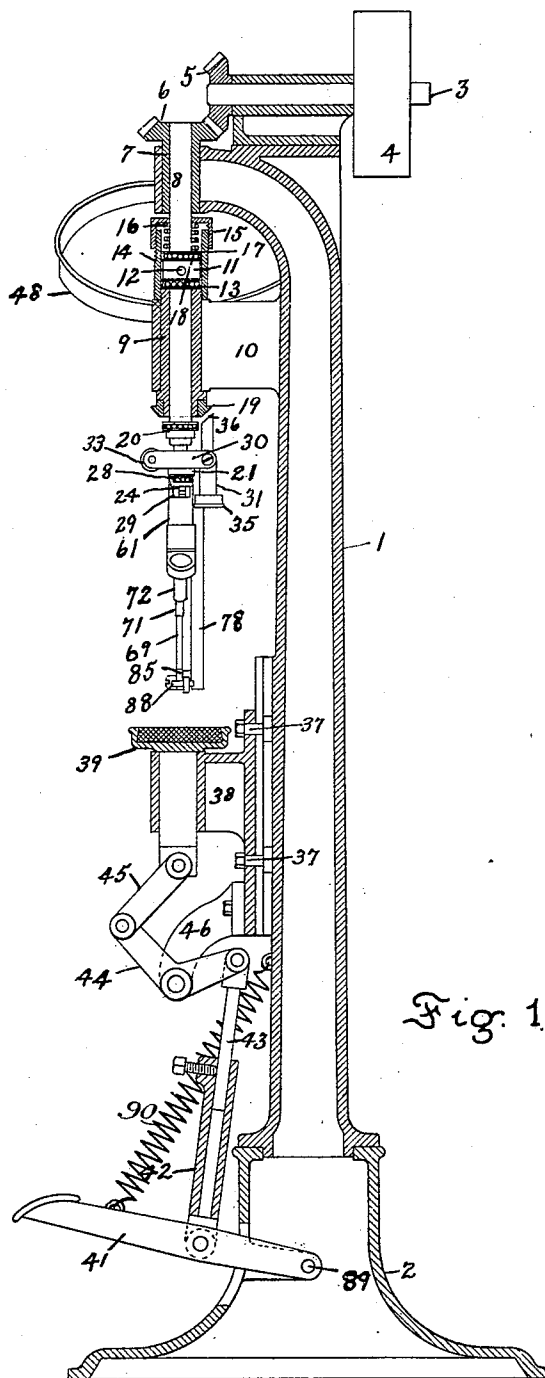


Fig. 1.

WITNESSES

George H. Read
Charles L. Durbin

INVENTOR

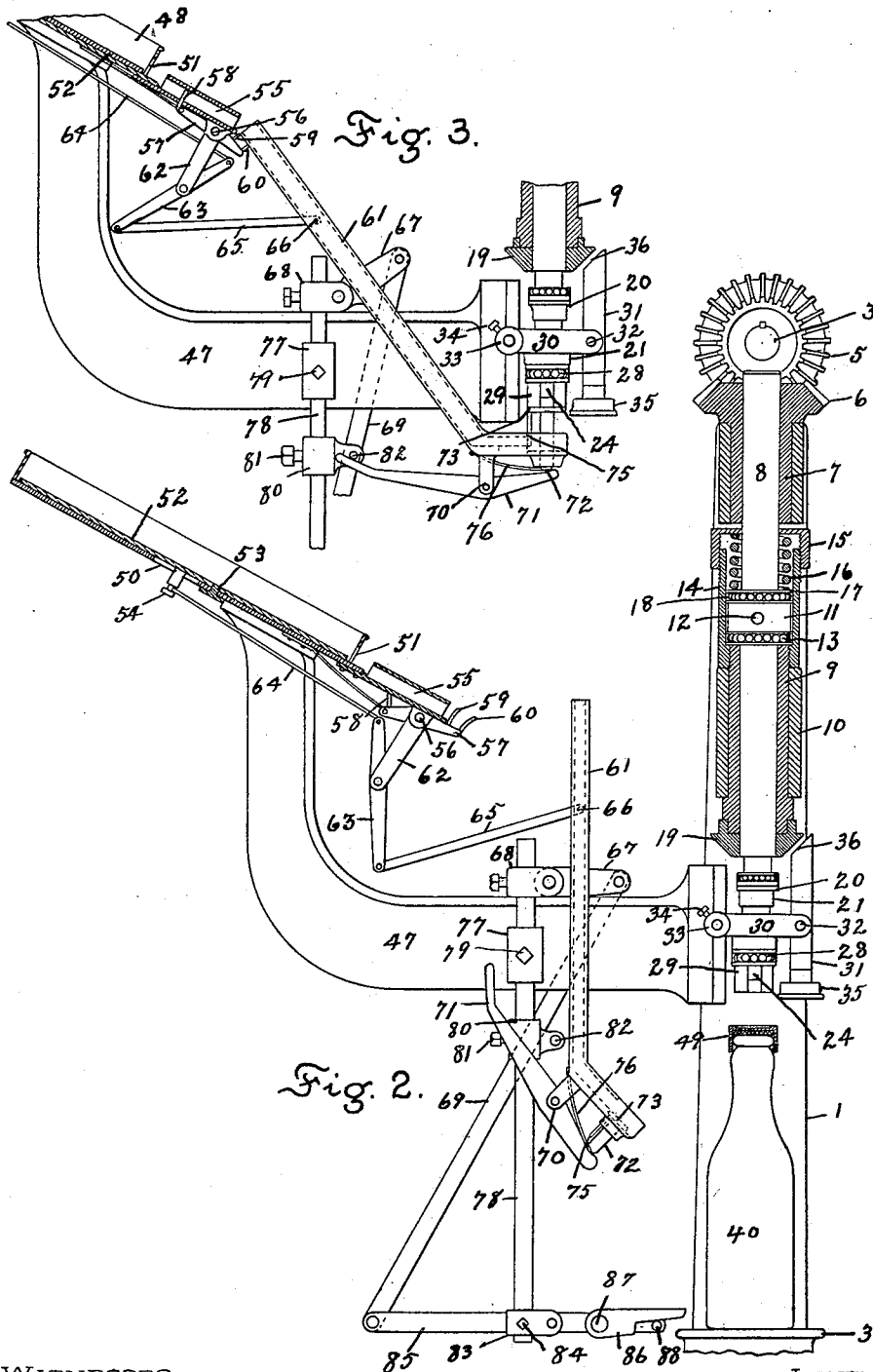
Robert Flanigan
By Chapin A. Ferguson
ATTORNEY

R. FLANIGAN. BOTTLE CAPPING MACHINE.

(Application filed June 15, 1901.)

3 Sheets—Sheet 2.

(No Model.)



WITNESSES

George H. Read.
Charles L. Durbrow.

INVENTOR

Robert Flanigan
By Chapman & Ferguson.
ATTORNEY.

No. 694,144.

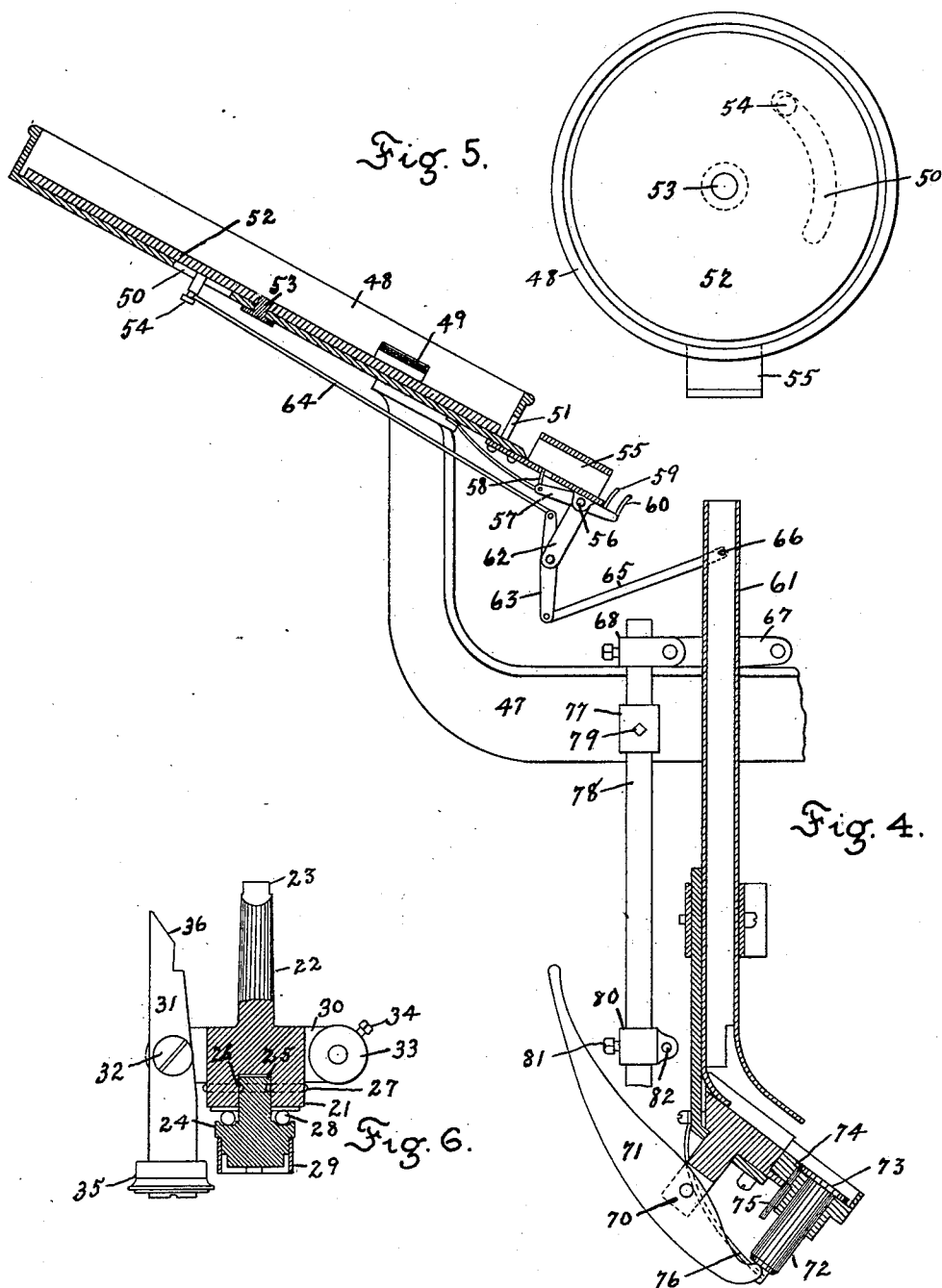
Patented Feb. 25, 1902.

R. FLANIGAN.
BOTTLE CAPPING MACHINE.

(Application filed June 15, 1901.)

(No Model.)

3 Sheets—Sheet 3.



WITNESSES

George H. Read

Charles L. Durbin

INVENTOR

Robert Flanigan

By Chapin Ferguson

ATTORNEY

UNITED STATES PATENT OFFICE.

ROBERT FLANIGAN, OF BALTIMORE, MARYLAND.

BOTTLE-CAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 694,144, dated February 25, 1902.

Application filed June 15, 1901. Serial No. 64,688. (No model.)

To all whom it may concern:

Be it known that I, ROBERT FLANIGAN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Bottle-Capping Machines, of which the following is a specification.

This invention relates to improvements in bottle-capping machines.

The object of the invention is to provide a simple and efficient machine for placing caps upon bottles for the purpose of hermetically sealing the latter and to also provide means for automatically feeding the caps to the machine.

The invention consists of the new and novel parts and combination of parts hereinafter more fully set forth and described in the specification and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved machine. Fig. 2 is a front elevation of the upper portion of the machine, partly in section, and showing the automatic feeding mechanism in its normal position. Fig. 3 is a detailed view, partly in section, of the automatic feeding mechanism, showing the position of the parts when feeding a cap to the machine. Fig. 4 is an enlarged detailed view of the feeding mechanism, partly in section. Fig. 5 is a plan view of the magazine for holding the caps, and Fig. 6 is a detailed sectional view of the head for holding the cap in position on the bottle and the tool for spinning the said cap upon the bottle.

Similar numerals refer to like and corresponding parts throughout the several views.

In the accompanying drawings, forming part of this specification, 1 designates an upright or column fixed to a base 2. To the upper end of the column 1 is journaled a horizontal shaft 3, having a pulley 4 on one end, to which power is transmitted from any suitable source for the purpose of driving said shaft 3. To the opposite end of said shaft 3 is fixed the gear 5, which meshes with the gear 6. The gear 6 is provided with an integral hub 7, which latter is splined to the shaft 8 and is journaled in the laterally-projecting upper end of the column 1.

The shaft 8 projects downwardly at right angles to the shaft 3 and is also journaled in

a sleeve 9 which latter is rigidly fixed in the laterally-projecting arm 10. Above the fixed sleeve 9 the shaft 8 is provided with a fixed collar 11, which latter is held to the shaft 8 by the pin 12. Between the collar 11 and the fixed sleeve 9 are ball-bearings 13, upon which the collar 11 revolves when the shaft 8 is in its normal position. To the upper end of the sleeve 9 is screw-threaded a second sleeve 14, which extends up above the collar 11. To the upper end of this sleeve 14 is screw-threaded an adjustable cap 15 for the purpose of adjusting the tension of the spring 16. Surrounding the shaft 8 is a coiled spring 16, having its upper end impinging against the cap 15 and the lower end resting upon the washer 17. Between said washer 17 and the collar 11 are ball-bearings 18, against which the collar revolves when the shaft 8 is forced upward against the tension of the spring 16. The sleeve 14 and the cap 15 completely inclose the ball-bearings 13 and 18 and also the spring 16 and prevents dust and dirt from coming in contact with these parts. The tension of the spring 16 may be increased or diminished by adjusting the cap 15 upon the sleeve 14. To the lower end of the fixed sleeve 9 is an adjustable cam 19 for a purpose which will presently appear. On the said shaft 8, below the cam 19, is a fixed collar 20 to limit the upward movement of the said shaft 8. Between the collar 20 and the cam 19 are ball-bearings, which come into action when forced upward against the cam 19. To the lower end of the shaft 8 is secured a fixed head 21, which latter is provided with a tapering stem 22, as seen in Fig. 6, which is forced up into the end of the shaft 8 and has its upper end square, as at 23, to prevent turning in said shaft. Revolvably secured in the lower end of the fixed head 21 is an auxiliary or secondary head 24. This auxiliary head 24 has a cylindrical stem 25, which projects up into the lower end of the head 21 and is provided with an annular groove 26. The head 24 is held in position by the transverse pin 27, which passes through the fixed head 21 and extends into the annular groove 26, thereby permitting the auxiliary head 24 to revolve in the head 21. Between the fixed head 21 and the auxiliary head 24 are ball-bearings 28. Secured to the outer surface of

and extending slightly below the auxiliary head 24 is a slotted spring 29, which holds the cap in position to be spun on the bottle when placed therein by the automatic feeder; as will presently appear. Secured to the fixed head 21 is a transverse rod 30, to one end of which latter is a lever 31, fulcrumed at 32, and to the other end is secured a counterweight 33, held thereto by a set-screw 34. The lever 31 carries a spinning-tool 35 at its lower end and has its upper end beveled at 36. When the shaft 8 is forced up against the tension of the spring 16, the beveled end 36 of the lever 31 comes into contact with the cam 19 and forces the upper end of the lever 31 outwardly and the lower end inwardly, causing the spinning-tool 35 to come into contact with the lower edge of the cap and spin the same upon the neck of the bottle and hermetically seal the latter.

Secured to the column 1 by the bolts 37 is a laterally-projecting bracket 38. Adjustably mounted in the end of the said bracket 38 is a table or seat 39, upon which the bottle 40 rests. A treadle 41, pivoted at 89 to the base 2, is provided for moving the said table or seat 39 up and down. Motion is transmitted from the said treadle 41 to the seat 39 through the medium of the rods 42 and 43, the bell-crank lever 44, and the toggle 45, which latter is secured to the lower end of the said table or seat 39. The bell-crank lever 44 is fulcrumed to the arm 46. The treadle 41 and table 39 will be returned to their normal position by the spring 90.

The description up to this point has reference to the machine proper. I will now proceed to describe the automatic feeding mechanism and the operation of same.

To the column 1 is secured an outwardly and upwardly projecting arm 47, to the upper end of which is secured a magazine 48 for the reception of the caps 49 and having an opening 50 in its bottom and an opening 51 in the front thereof. Within the magazine 48 is a false bottom or agitator 52, pivoted at 53 and provided with a pin 54, projecting through the opening 50 in the bottom of the magazine. Secured to the front of the magazine in line with the opening 51 is a throat or guide 55, into which one cap at a time is permitted to pass. Pivoted to the under side of the guide 55 at 56 is a lever 57, provided with pins 58 and 59, which work in the guide 55 alternately to permit but one cap at a time to enter said guide, and also a pin 60, against which the upper end of the race 61 impinges when in the position shown in Fig. 3. Extending downwardly from the said guide 55 is a rod 62, to the lower end of which latter is pivoted the rock-arm 63. A rod 64 connects the upper end of the rock-arm 63 with the pin 54 for the purpose of reciprocating the agitator 52 when the said arm 63 is rocked. To the lower end of the rock-arm 63 is pivoted the rod 65, which latter has its opposite end pivoted to the race 61 at 66. To the race 61

is fixed a cross-bar 67, which latter has one end pivoted to the adjustable collar 68 and the opposite end pivoted to the rod 69. Projecting from the under surface of the race 61 is a lug 70, to which is pivoted the lever 71. Within the lower end of the race 61 is a plunger 72, the lower end of which projects through the bottom of the race 61. The upper end of the said plunger 72 is provided with a head 73, which normally rests in the recess 74 and is flush with the bottom of the said race. From the periphery of the head 73 a pin 75 projects downwardly through said race to prevent the cap from falling under said head when the plunger is in the position shown in Fig. 3. This plunger 72 is held to its normal position by the spring 76. The arm 47 is provided on one side with a perforated boss 77, through which projects the vertical rod 78, the said rod being held in position by a set-screw 79. Secured to the vertical rod 78 below the arm 47 is an adjustable stop 80, held in position by a set-screw 81 and provided with a laterally-projecting pin 82, against which the lever 71 impinges when the parts are in position shown in Fig. 3. To the lower end of the vertical rod 78 is an adjustable collar 83, held to said rod by a set-screw 84. Pivoted to the collar 83 is a horizontal rod 85, which latter has its rear end pivoted to the rod 69. The front end of the rod 85 is provided with a trip 86, pivoted at 87 and which normally rests upon the pin 88.

The operation of the machine is as follows: Motion is transmitted to the shaft 8 through the gears 5 and 6 and the shaft 3. The said shaft 8 is revolving at all times. A cap having been placed up against the auxiliary head 24 and held thereto by the spring 29, a bottle is then placed in position on the table or seat 39 and the treadle forced downwardly, whereby motion will be transmitted through the rods 42 and 43, bell-crank lever 44, and the toggle 45 to the said seat, forcing the latter upward, carrying with it the bottle to which the cap is to be secured. The top of the bottle will enter the cap and force the heads 21 and 24 and also the shaft 8 up against the tension of the spring 16. The fixed head 21 will continue to revolve with the shaft 8, but the auxiliary head 24 will remain stationary, as the friction between the bottle and the cap will be greater than the friction between the two heads 21 and 24, owing to the ball-bearings between the said heads. When the head 21 is forced upwardly, the lever 31 is carried with it, and when the latter comes into contact with the cam 19 the upper end of the lever 31 will be forced outwardly and the spinning-tool will be forced in against the lower edge of the cap, and as the spinning-tool is carried around by the head 21 it will spin the said cap tightly around the neck of the bottle and hermetically seal the latter. When the treadle 41 is released and the table or seat 39 returns to its normal position by the action of the spring 90, the said seat 39 comes into

contact with the trip 86, forcing the latter down against the pin 88, carrying with it the front end of the rod 85, forcing the rod 69 up in the position shown in Fig. 3. As the rod 5 69 is forced upward it in turn forces the front end of the cross-bar 67 upwardly, which latter, being fixed to the race 61, caused the said race to take the position shown in Fig. 3. As the lower end of the race 61 is being raised 10 upwardly the rear end of the lever 71 comes into contact with the pin 82, forcing the front end of the lever 71 upwardly, carrying with it the plunger 72, as shown in Fig. 3, which latter carries with it another cap and forces the said cap into the spring 29 ready for the next bottle. As the lower end of the race 15 travels upwardly the upper end is forced down against the pin 60, forcing the pin 58 up into the guide and allowing but one cap to pass into the race. The said cap is prevented from passing under the head 73 of the plunger 72 by the pin 75. When the race returns to its normal position, the plunger 72 will be returned to its normal position by the spring 76, 25 with the head 73 resting in the recess 74 ready for another operation. When the race 61 is raised from the pin 60, the pin 59 will be forced up in front of the guide 55 and allow but one cap to enter the said guide. As the race 61 30 is worked up and down an oscillating or reciprocating motion is imparted to the bottom or agitator 52 through the medium of the rock-arm 63 and the rods 64 and 65 to cause the caps to pass into the guide 55. It will be seen that as one cap is being forced into the spring 29 of the machine another cap passes from the guide 58 to the race and rests against the pin 75, and when the race returns to its normal position the cap in the race passes 40 down and rests over the plunger 72, with its edges in the recess 74, ready to be lifted by said plunger.

Having thus described my invention, what I claim as new, and desire to secure by Letters 45 Patent of the United States, is—

1. In a bottle-capping machine, the combination of a vertically-movable shaft; means for rotating said shaft; a fixed head secured to the lower end of said shaft; a spinning- 50 tool carried by said fixed head; an auxiliary head revolubly secured to the fixed head and having means at its lower end to hold a bottle-cap; and means for automatically feeding the caps to the said auxiliary head, substantially as described. 55

2. In a bottle-capping machine, the combination of a vertically-movable shaft; means for rotating said shaft; a fixed head secured to the lower end of said shaft; a spinning- 60 tool carried by said fixed head; an auxiliary head revolubly secured to the fixed head and having means for holding a bottle-cap; and means for forcing the spinning-tool in against the bottle-cap when the shaft is moved upwardly, substantially as described. 65

3. In a bottle-capping machine, the combi-

nation of a vertically-movable shaft having a fixed collar thereon; means to rotate said shaft; a spring surrounding the shaft above the said collar; means to change the tension 70 of said spring; a fixed head secured to the lower end of said shaft; a spinning-tool carried by said fixed head; an auxiliary head revolubly secured to the fixed head and having means for holding a bottle-cap; and means 75 for automatically feeding the caps to the auxiliary head, substantially as described.

4. In a bottle-capping machine, the combination of a vertically-movable shaft; means to rotate said shaft; a fixed head secured to 80 the lower end of said shaft; a spinning-tool carried by the fixed head; an auxiliary head revolubly secured to the fixed head and having means to hold a bottle-cap thereto; and a stationary cam which when the shaft is 85 moved upwardly will force the spinning-tool in against the cap held by the auxiliary head, substantially as described.

5. In a bottle-capping machine, the combination of a vertically-movable shaft having 90 a fixed collar thereon; means for rotating said shaft; a stationary sleeve surrounding said shaft below the collar; ball-bearing between the said collar and sleeve; a spring surrounding the shaft above the collar; a vertically- 95 adjustable cap surrounding the shaft above the spring; a cam on the lower end of the said sleeve; a fixed head secured to the lower end of the said shaft; a spinning-tool carried by the said fixed head; and an auxiliary head 100 revolubly secured in the said fixed head and having a slotted spring extending around and below said auxiliary head, substantially as described.

6. In a bottle-capping machine, the combination of a vertically-movable shaft; means 105 for rotating said shaft; a fixed head secured to the lower end of said shaft; a spinning-tool carried by said fixed head; an auxiliary head revolubly secured to said fixed head and 110 having means to hold a bottle-cap; a magazine to hold the caps; and means for passing the said caps from the magazine to the auxiliary head one at a time, substantially as described. 115

7. In a bottle-capping machine, the combination of a vertically-movable shaft; means for rotating said shaft; a fixed head secured to the lower end of said shaft; a spinning-tool carried by said fixed head; an auxiliary head 120 revolubly secured to said fixed head and having means for holding a bottle-cap; a vertically-movable bottle-seat below said shaft and in line therewith; means to operate said seat to carry the bottle up to the auxiliary 125 head and force the shaft upwardly; a magazine for holding the bottle-caps; and means operated by the vertically-movable seat for passing the caps one at a time from the magazine to the auxiliary head, substantially as 130 described.

8. An automatic feeder comprising a maga-

- zine having an opening in the front thereof; a guide in line with said opening; an oscillating race having a recess in the lower end thereof; means to oscillate said race to bring it into communication with the magazine; a plunger normally seated in the recess in said race; and means to force the said plunger upwardly as the race is brought into communication with the magazine, substantially as described.
9. An automatic feeder comprising a magazine having an opening in the front thereof; a reciprocating bottom pivoted in the magazine; an oscillating race; means to oscillate said race to bring it into communication with the magazine; means for reciprocating the bottom in the magazine when the race is oscillating; a plunger in the lower end of the race; and means to force said plunger upwardly as the race is being brought into communication with the magazine, substantially as described.
10. An automatic feeder comprising a magazine having an opening in the front thereof; a guide in front of said opening in the magazine; means to permit but one cap to enter the said guide at a time; an oscillating race; means to oscillate said race to bring it into communication with the magazine; a plunger in said race; and means to force the plunger upwardly as the race is brought in com-

munication with the magazine, substantially as described.

11. An automatic feeder comprising a magazine; an oscillating race having a recess in the lower end thereof; means to oscillate said race to bring it into communication with the magazine; a plunger having its head normally seated in the said recess in the race; a pin projecting downwardly from the head of said plunger; and means to force the said plunger upwardly when the race is being brought into communication with the magazine, substantially as described.

12. In a bottle-capping machine, the combination of an automatic feeder consisting of a magazine for holding the bottle-caps; an oscillating race; means to oscillate said race to bring it into communication with the magazine; a plunger for passing the cap from the race to the machine; and means to operate the said plunger when the race is being oscillated, substantially as described.

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

ROBERT FLANIGAN.

Witnesses:

CHAPIN A. FERGUSON,
GEORGE H. READ.