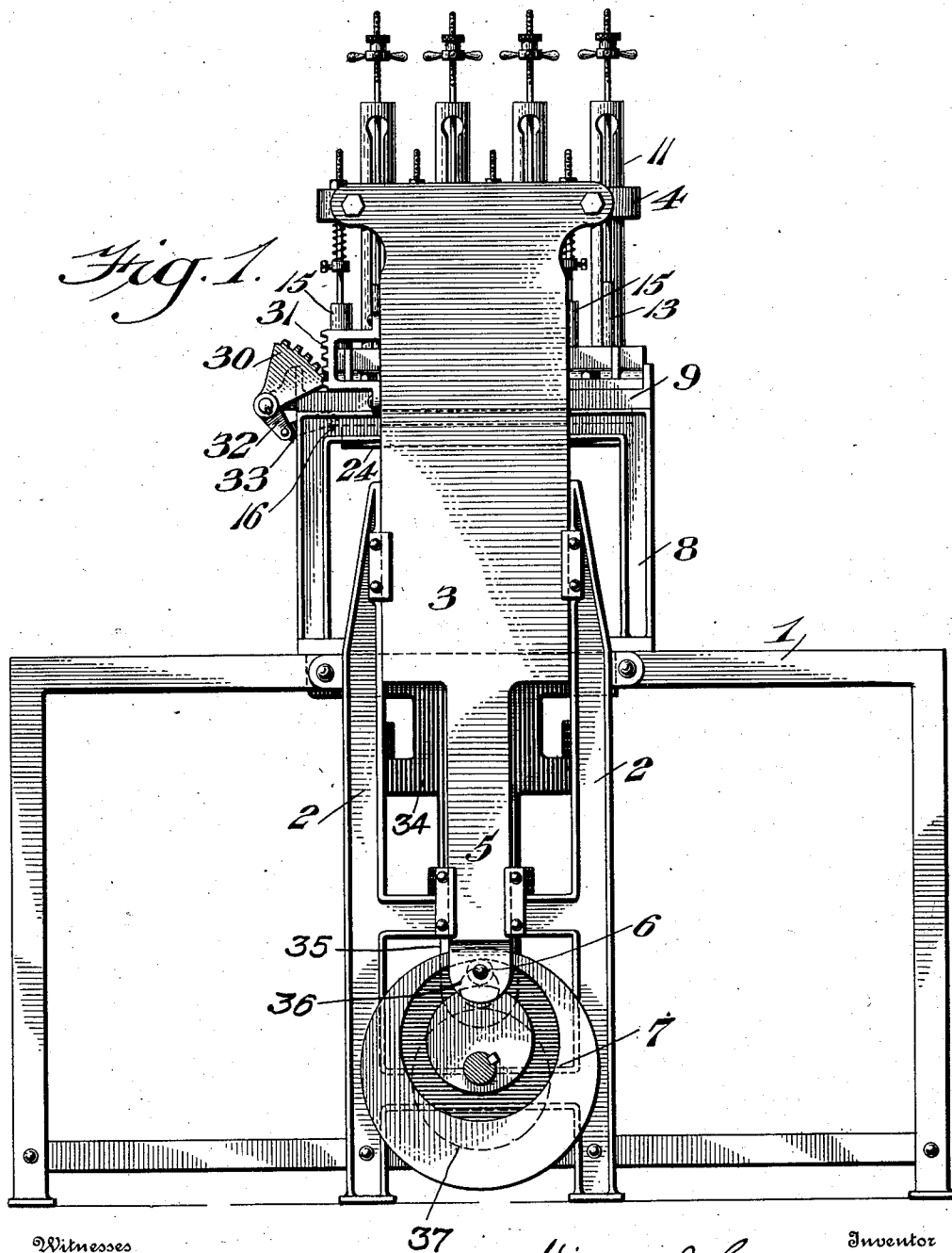


W. J. CUNNINGHAM.
MACHINE FOR CAPPING BOTTLES.
APPLICATION FILED OCT. 22, 1908.

1,022,829.

Patented Apr. 9, 1912.

4 SHEETS—SHEET 1.



Witnesses
H. S. Richter
P. F. Nagle

Inventor
William J. Cunningham
By *Wiedersheim & Finkbeiner*
Attorneys

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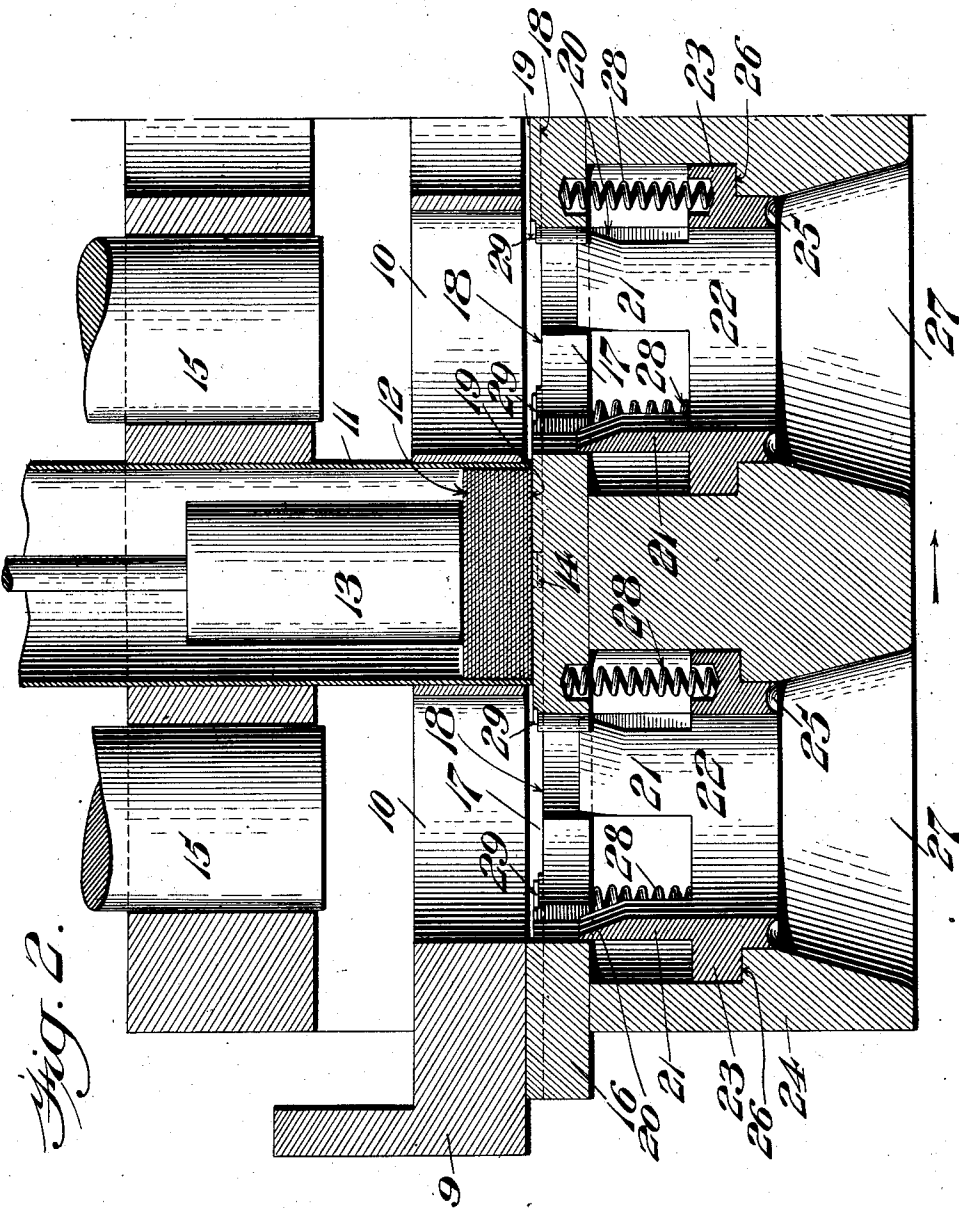


Fig. 2.

Witnesses
H. G. Dietrich
P. F. Nagle

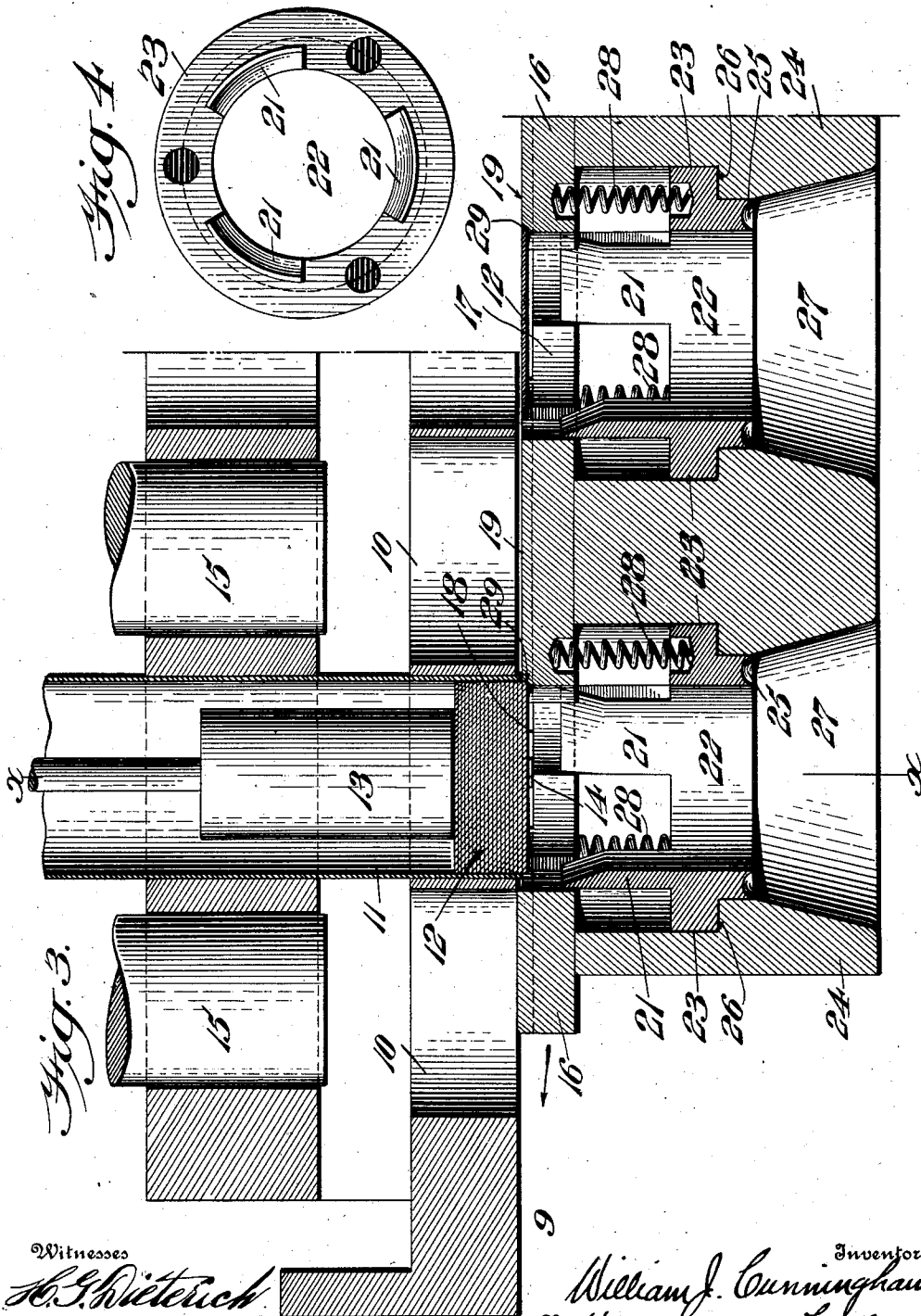
Inventor
William J. Cunningham
By *Wiedersheim & Fairbanks*
Attorneys

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4 SHEETS—SHEET 3.



Witnesses
H. G. Dieterich
P. J. Nagle

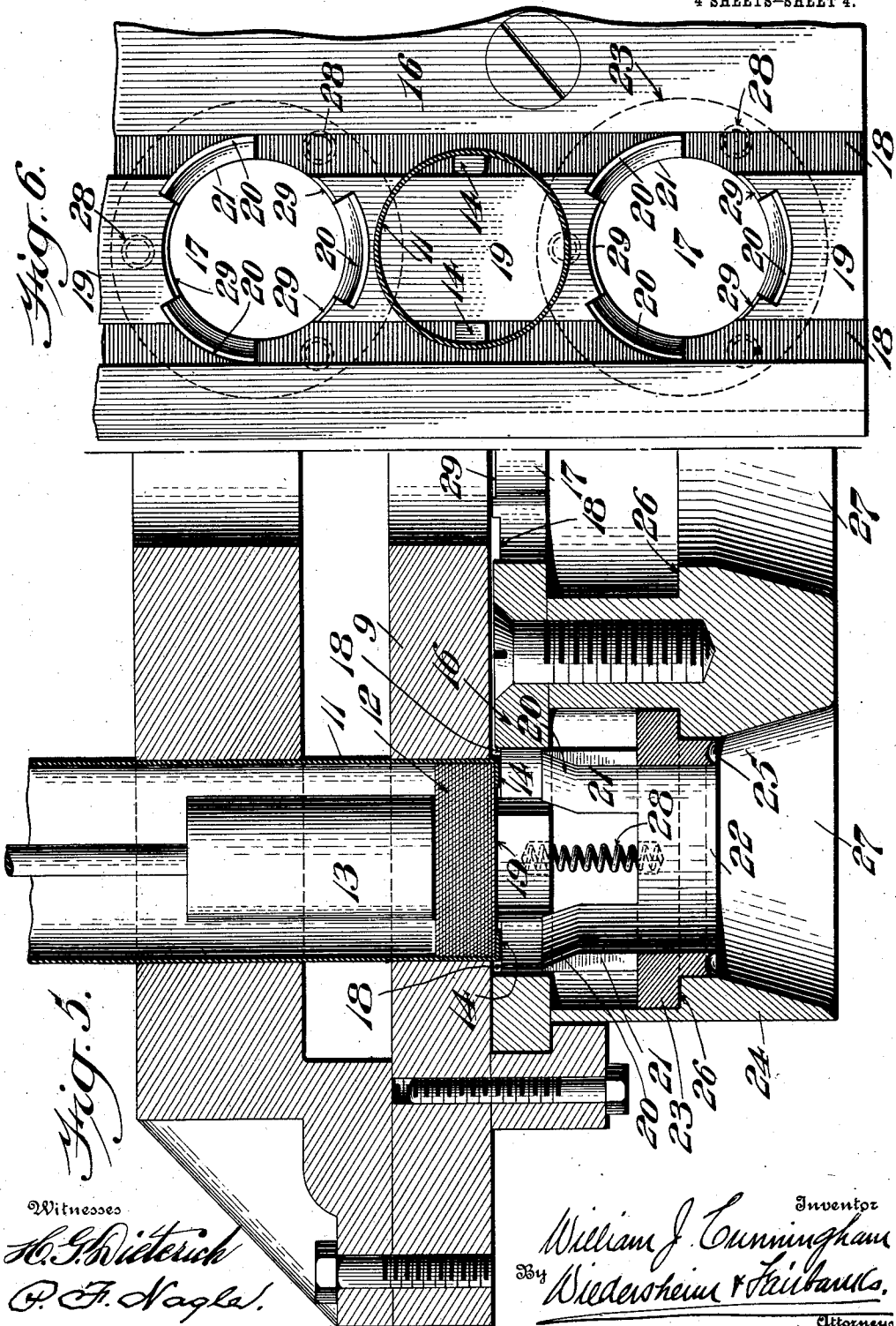
Inventor
William J. Cunningham
By Wiedersheim & Schenk
Attorneys

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4 SHEETS—SHEET 4.



Witnesses
H. G. Wieterich
O. F. Nagel.

Inventor
William J. Cunningham
By
Wiederheim & Heitmann.
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM J. CUNNINGHAM, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR CAPPING BOTTLES.

1,022,829.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed October 22, 1908. Serial No. 459,074.

To all whom it may concern:

Be it known that I, WILLIAM J. CUNNINGHAM, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Machine for Capping Bottles, of which the following is a specification.

My invention relates to a new and useful machine for capping bottles and more particularly milk bottles, wherein the paper cap is inserted within the mouth of the bottle and it consists of novel means for removing the cap from the magazine and placing the same in position to be properly inserted in the mouth of the bottle.

It further consists in mounting the bottle centering and receiving device whereby the same is moved backward and forward in order to directly receive the cap.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents a side elevation of a capping machine showing an embodiment of my invention. Fig. 2 represents a sectional view of a portion of my capping mechanism showing the caps in the magazine. Fig. 3 represents a sectional view showing a cap about to be removed from its position in the magazine to be placed beneath a plunger. Fig. 4 represents a sectional view of one of the cap receiving means. Fig. 5 represent a sectional view taken on line $x-x$, Fig. 3. Fig. 6 represents a plan view of the plate and receivers employed showing a magazine in section.

I have found in practice in capping machines now in use that it is extremely difficult to so construct the same that a single cap will be presented to the plunger in suitable position to be properly inserted in the bottle. My invention is designed more particularly to overcome this defect and in the drawings, I have shown a construction which in practice operates successfully but it will be understood that the arrangement of the parts may be varied, other instrumentalities may be employed and changes made in the construction which will come within the scope of my invention and I do not therefore desire to be limited in every instance to the exact construction as herein shown and described but desire to make such changes as may be necessary or desired.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings. 1 designates the frame of the machine carrying the tracks or guides 2 between which slide the plates 3 on opposite sides of the machine, said plates having suitably secured thereto the head 4 which is adapted to move up and down with the said plates 3.

5 designates a suitable portion or extension of the plates 3 on which are mounted the rollers 6 movable in the cam 7 whereby it will be understood that as the cam 7 is rotated the plates 3 will be raised and lowered at the proper time carrying with them the heads 4 and it being further understood that any suitable mechanism may be employed in order to time this raising and lowering of the head 4 and I desire it further understood that while it is necessary to have suitable actuating mechanism for the machine, I do not desire to be limited to any particular form but may employ that which is found most desirable and to operate successfully.

Suitably supported on the frame 1 is a stand 8 which supports a stationary plate 9 in which, at suitable intervals, are openings 10 which are adapted for passage of the plungers as will be hereinafter described. In other openings at suitable intervals in this plate 9 are mounted the tubes or casings 11 which serve as the magazines for the stack of caps 12 it being noted that the said magazines 11 are provided with suitable weights 13 which rest upon the uppermost cap and serve to hold the said caps in their lowermost position and tending at all times to force the same from the magazines which latter it will be understood pass through suitable openings in the head 4 whereby the raising and lowering of said head has no effect upon the receptacles 11. The lower portion of the receptacles 11 is provided on opposite sides with the intumed lips or lugs 14 as best seen in Fig. 5 and upon which lugs the lowermost cap 12 will rest at the proper time and it will be noted that the said intumed lips or lugs 14 are situated at a distance beneath the bottom of the plate 9 equal to the thickness of a single cap, whereby it will be understood that any suitable device which travels below and across the face of the receptacles 11 and extends sufficiently above the plane of the upper surface of the lugs 14, will en-

gage with the lowermost cap and will remove the same, as will be hereinafter described.

The plungers 15 are suitably supported and carried by the head 4 and thus will be raised and lowered therewith, said plungers being provided with springs which serve as resilient bearings therefor.

16 designates a movable member or plate which is provided with suitable openings 17 at intervals in its face corresponding to the position of the openings 10 in the plate 9 and the openings of the receptacles 11.

18 designates grooves or slots in the upper face of the movable member or plate 16 which accommodate or receive the lugs 14 and between which slots 18 and the openings 17 are the surfaces 19 which extend between and above the said lugs 14 a suitable distance, equal to the thickness of one of the caps 12, it being noted more particularly from Figs. 2 and 6 that these surfaces when in position beneath the reservoirs or receptacles 11 serve to support the stack of caps 12 holding the same slightly elevated above the lugs 14 for a purpose to be hereinafter set forth.

20 designates cut away portions in the plate 16 around each of the openings 17 which are adapted to receive extensions or arms 21 on the bearings 22 for the top of the bottles, said bearings being provided with ears 23 movable in suitable recesses in the heads or bottle centering devices 24 which latter are integral with or carried by the said plate 16, it being noted that said bearings are circular and are provided in their lower portions with the curved recesses 25 into which the top of the bottle is adapted to be seated when in position, it being further noted that shoulders 26 are provided on the heads 24 to limit the movement of the bearings 22 and with which the ears 23 contact, as will be best seen in Figs. 2 and 3. The lower portion of the bottle centering devices 24 are provided with openings 27 the walls of which are inclined in order that the bottles will be properly directed to the bearing 22.

Suitably mounted between the plate 16 and the bearings 22 are the springs 28 which serve to hold the bearings 22 in and return the same to the position seen in Fig. 2 but which permit suitable movement of the bearings 22 in order to provide a yielding support therefor and thus for the bottles and prevent breakage of the same, the said bearings being guided in their movement by reason of the arms 21 moving in the recesses 20.

29 designates small recesses which are formed around the openings 17 at suitable points in the plate 16, which recesses are in depth equal to the thickness of a cap and into which the cap falls from the re-

ceptacles 11 when the plate 16 is properly moved in a position beneath the same. Any suitable means for actuating the plate 16 may be employed in order that the same will be actuated at the proper time with respect to the movement of the head 4 and plungers 15 and in the drawings, I have shown at toothed segment 30 meshing with the teeth 31 carried by the plates 3, said segment 30 suitably actuating the arm 32 connected by a link 33 with the plate 16 whereby it will be understood that as the plates 3 are raised and lowered the teeth 31 actuate the gear 30 in order to move the said plate backward and forward so that the openings 17 are moved a sufficient distance and placed first beneath the receptacles 11 and then moved over to a position beneath the plungers 15 in order that the caps are forced into the bottles.

In order to properly raise and lower the bottles so that the tops thereof will be properly presented with respect to the centering devices 24, and the mouths properly positioned to receive the caps, I provide a table 34, suitably mounted, upon which is the arm or extension 35, carrying a roller 36, the latter being in engagement with a cam 37 which latter is adapted to be suitably actuated.

The operation of the device is as follows:—Suitable power being imparted to the machine the cam 7 will be actuated and will raise and lower the plates 3 carrying with it the head 4 and consequently the plungers 15 which are carried thereby. Suitably timed with respect to the plunger movement, the table or support 34, will be elevated to cause the tops of the bottles to suitably enter the centering devices 24, this movement of the table, and so of the bottles, is accomplished by the actuation of the cam 37, which is in engagement with the roller 36 carried by the arm or extension 35 of the table 34 whereby it will be understood that the table will be, properly and suitably, raised and lowered. The parts being in the position seen in Fig. 2, it will be noted that the openings 17 in the plate 16 are beneath the openings 10 in the bed 9 and the caps 12 are resting upon the elevated surface 19 of the plate 16. By the proper actuation of the plate 16 in the direction, for example, to the right in Fig. 2, as indicated by the arrow in said figure, the openings 17 will be moved to a position beneath the receptacles 11 at which time the weight 13 will force down the caps 12 causing the lowermost one to rest upon the lugs 14 and to be seated in the small recesses 29 formed around the openings 17, that is, in the position seen in Fig. 3. When the plate 16 is moved backward again, it will be seen that the lowermost cap will be carried over with the plate 16 into a po-

sition beneath the openings 10 and the plungers 15, it being understood that the surface 19 passing beneath the stack of caps 12 will again support the same. The plungers will now be actuated by the plates 3 and will be lowered. In the meantime, the mouths of the bottles will have entered the openings 27 of the centering devices 24 and will be seated in the recess 25 in the bearing 22 and as the plunger 15 descends the cap is moved from the recesses 29 and will be forced into the mouth of the bottle which is in position to receive the same, it of course being understood that in the movement of the plate 16 the cap will be carried from the support of the lugs 14 and will be only supported by the said small recesses 29.

It will be further noted that by means of the centering devices 24, the bearings for the bottle will be moved with the plate 16 and the cap for the bottle will be received directly from the receptacles 11 and placed in its proper position to be inserted in the mouth of the bottle, in other words, no further positioning of the cap will be necessary.

The devices heretofore in use, where the cap is received from the receptacles and by some means is passed to another place in the machine where it falls to a position beneath the plungers, I have found do not operate successfully, the disadvantages of which in practice being, that the cap will often, in falling, be inclined or otherwise improperly positioned with respect to the plungers and will thus not be received properly in the mouth of the bottle.

By my device where I employ a receiving device for the mouth of the bottles and place the caps directly therein, I obviate any double handling of the cap and positively place same in a position directly over the bottles, the advantages of which will be apparent.

From the above it will be understood that in order to locate the cap in proper position with respect to the bottle head receiving means it is necessary that relative movement between the receptacles containing the caps and the bottle receiving means be had and while I have described and shown the plate carrying the bottle receiving means as moving, it will of course be understood that any arrangement of the parts may be made which will accomplish the desired result.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, means for supporting a plurality of caps, bottle head receiving means adapted to be moved to a position beneath said supporting means and receiving a cap therefrom, means on said receiving means for support-

ing a cap, means for forcing the cap from the receiving means into the mouth of a bottle and means for actuating said receiving means whereby the same is placed alternately beneath the supporting means and said forcing means.

2. In a device of the character described, means for supporting a plurality of caps, a plate, bottle receiving means carried by said plate, the latter having openings communicating with said bottle receiving means, means for supporting a cap in said openings, said plate adapted to be moved to a position beneath said supporting means whereby the lowermost cap will be seated in the opening therein and said plate being adapted to be moved to a position beneath a plunger whereby the cap carried in said openings will be forced into the mouth of a bottle.

3. In a device of the character described, means for supporting a plurality of caps, a plunger, means for actuating the same, a plate, bearings for the mouth of a bottle carried by said plate, the latter having openings therein communicating with said bearings and a recess formed in said plate around said openings, into which the lowermost cap is adapted to be received and supported while the plate is actuated to a position beneath the supporting means, whereby the cap is directly received in position to be acted upon for insertion in the mouth of a bottle.

4. In a device of the character described, a hopper for receiving a plurality of caps, lugs projecting inwardly from said hopper, and a plate normally supporting the caps and having openings into which the lowermost cap enters when said plate is properly actuated, said lugs assisting in supporting said caps.

5. In a device of the character described, a hopper for containing a plurality of superimposed caps, a plate normally supporting said caps and having an opening at a suitable point therein and a recess in said plate at a suitable point around said opening into which the lowermost cap is received when the plate is moved to a position therefor, means suitably positioned for forcing the cap from said receiving means, a bottle head receiving means carried by and movable with said plate, means for actuating said forcing means and means for reciprocating said plate to alternately place the same first beneath the hopper to receive a cap and then beneath the forcing means.

6. In a device of the character described, a hopper for supporting a plurality of caps, bottle head receiving means adapted to be moved to a position beneath the hopper, means on said bottle head receiving means for receiving a cap directly from the supporting means and carrying the same di-

rectly to a position beneath the forcing means, means for forcing the cap from said receiving means into a bottle, and means for reciprocating said bottle head receiving means whereby the same is placed alternately beneath said hopper and said forcing means.

7. In a device of the character described, a hopper for supporting a plurality of caps, bottle head receiving means adapted to be moved in one direction to receive a single cap directly from the hopper and adapted to move in the opposite direction to carry and place the cap beneath a plunger for insertion into the mouth of a bottle.

8. In a device of the character described, a hopper for receiving a plurality of caps, a plate having a portion thereof normally supporting said caps and having an opening at a suitable point, a recess in said plate at a suitable point around said opening into which the lowermost cap is received when the plate is moved to a position beneath the hopper, and lugs projecting inwardly from said hopper for assisting in holding the caps until the lowermost one is removed by the plate.

9. In a device of the character described, a hopper for receiving a plurality of caps, a plate having a portion thereof normally supporting said caps and having an opening at a suitable point, a recess in said plate at a suitable point around said opening into which the lowermost cap is received when the plate is moved to a position beneath the hopper, lugs projecting inwardly from said hopper for assisting in holding the caps until the lowermost one is removed by the plate, and means for actuating the plate.

10. In a device of the character described, a hopper for receiving a plurality of caps, a plate having a portion thereof normally supporting said caps and having an opening at a suitable point, a recess in said plate at a suitable point around said opening into which the lowermost cap is received when

the plate is moved to a position beneath the hopper, lugs projecting inwardly from said hopper for assisting in holding the caps until the lowermost one is removed by the plate, and a plunger suitably actuated for forcing the caps into the mouth of a bottle.

11. In a device of the character described, a hopper for receiving a plurality of caps, a plate normally supporting said caps and having an opening at suitable points therein, a recess in said plate at a suitable point around said opening, and bottle head receiving means communicating with said opening whereby when a cap is seated in said recess it is in proper position to be forced into the mouth of a bottle.

12. In a device of the character described, a hopper for receiving a plurality of caps, a plate normally supporting said caps and having an opening at a suitable point therein, a recess in said plate at a suitable point around said opening, bottle head receiving means communicating with said opening whereby when a cap is seated in said recess it is in proper position to be forced into the mouth of a bottle, and a plunger for forcing the cap into the mouth of a bottle.

13. In a device of the character described, a hopper for receiving a plurality of caps, a plate normally supporting said caps and having an opening at suitable points therein, a recess in said plate at a suitable point around said opening, bottle head receiving means communicating with said opening whereby when a cap is seated in said recess it is in proper position to be forced into the mouth of a bottle, means actuating said plate and with it said bottle head receiving means, and a plunger for forcing the cap into the mouth of a bottle.

WILLIAM J. CUNNINGHAM.

Witnesses:

C. D. McVAY,

M. E. RINKENBACH.