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P. J. CAWLEY.
BOTTLE FILLING MACHINE.
APPLICATION FILED MAY 11, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

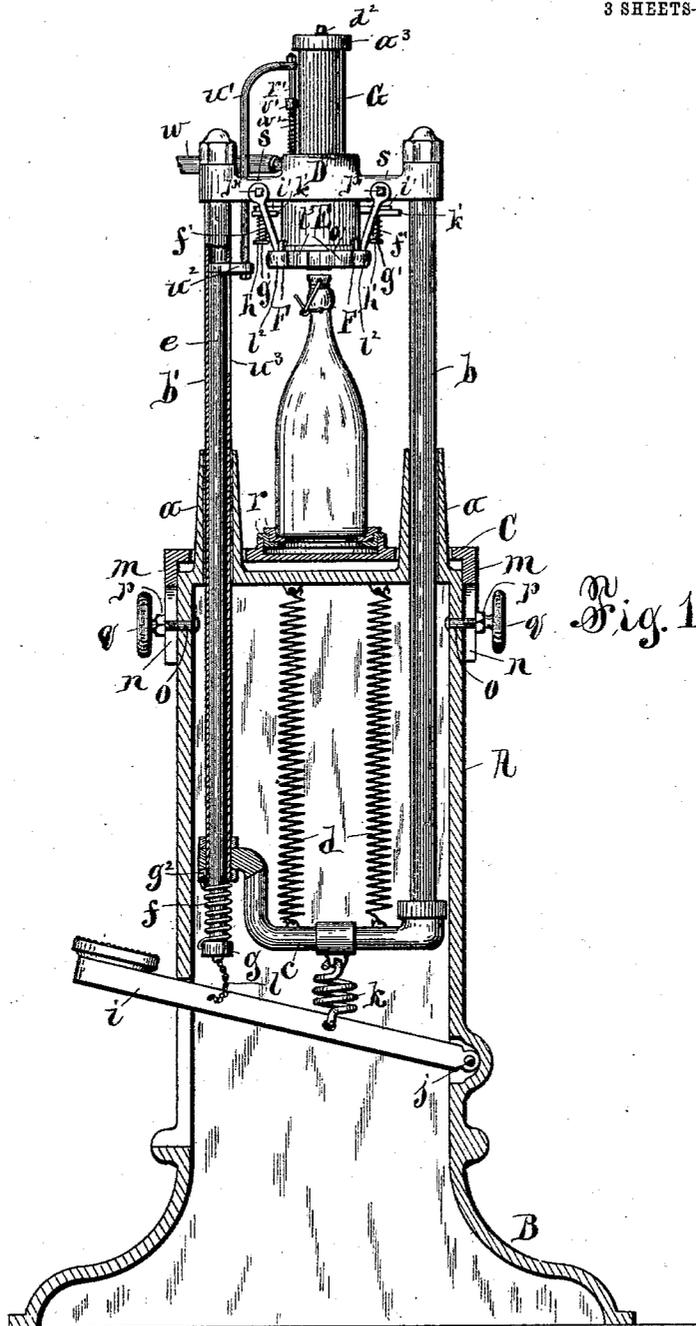


Fig. 1

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3 SHEETS—SHEET 2.

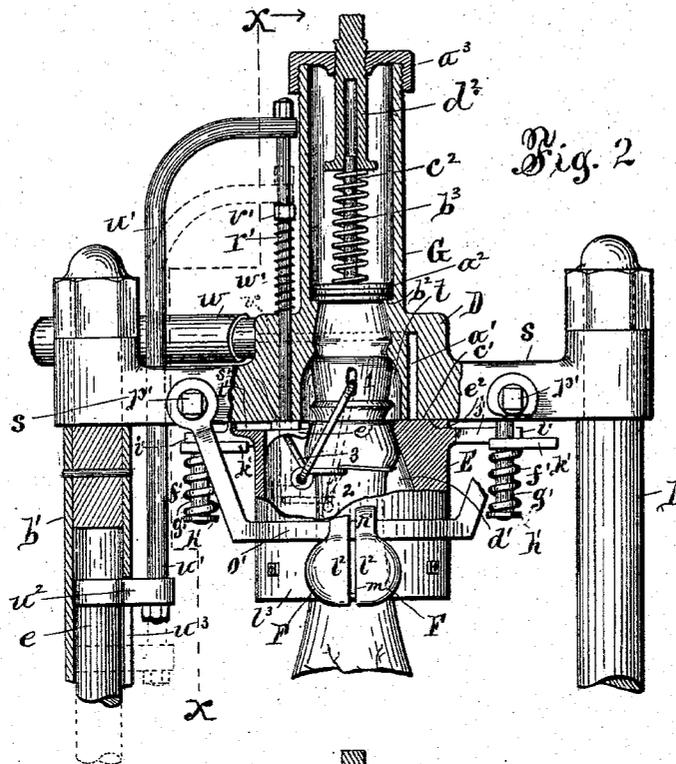


Fig. 2

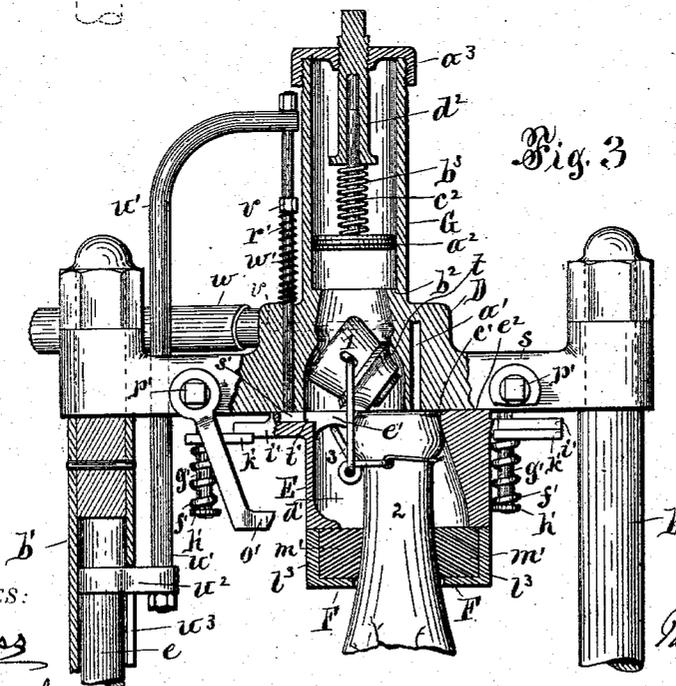


Fig. 3

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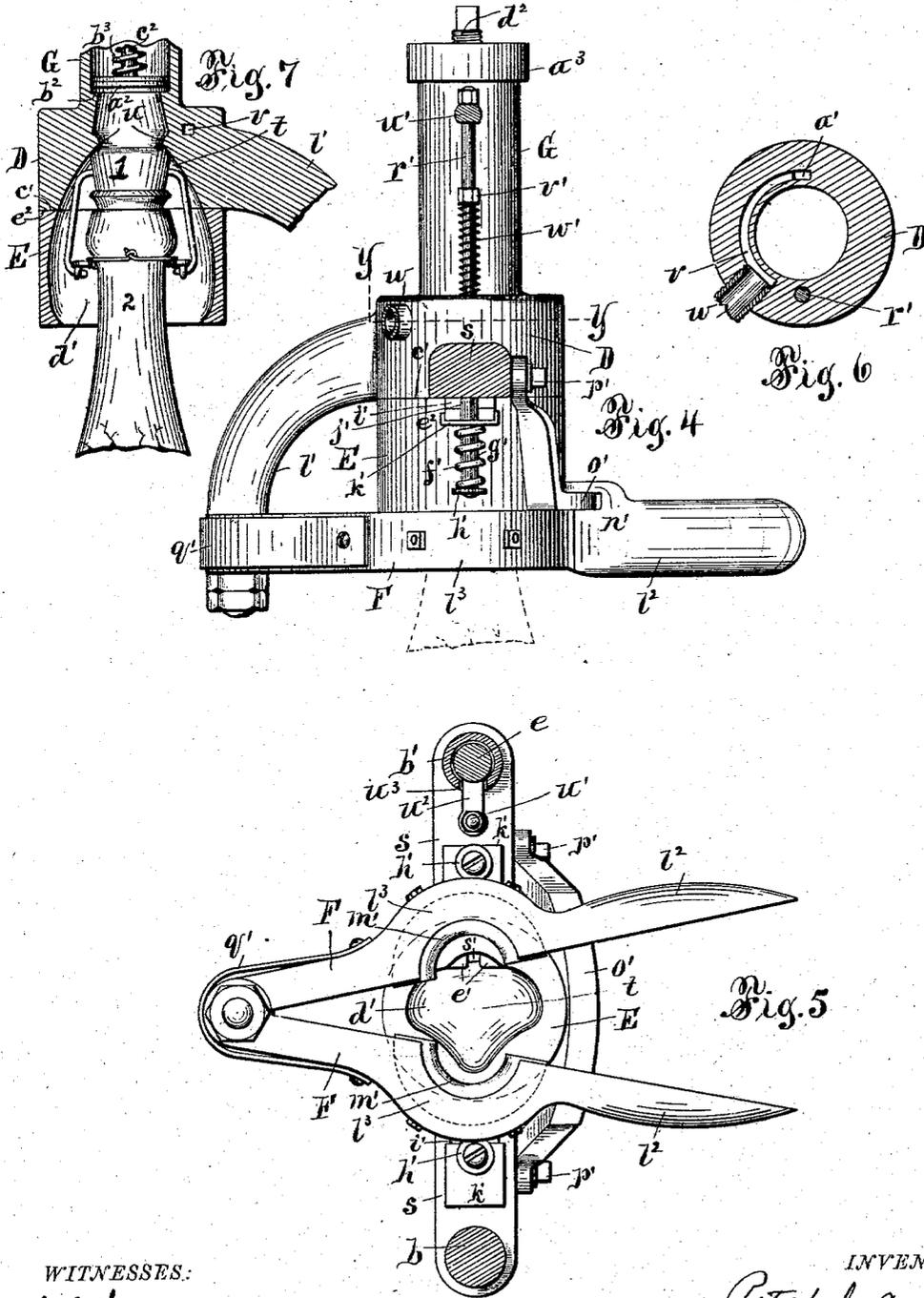
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

PATRICK J. CAWLEY, OF SYRACUSE, NEW YORK.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,236, dated March 1, 1904.

Application filed May 11, 1903. Serial No. 156,510. (No model.)

To all whom it may concern:

Be it known that I, PATRICK J. CAWLEY, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Bottle-Filling Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of machines which are employed for filling bottles with carbonated mineral waters and other charged liquids; and the invention resides in a machine which is specially designed to be used in filling bottles which are equipped with the well-known porcelain bail-stoppers.

The main object of the present invention is to produce a machine which shall operate to unseat or remove the stopper from the bottle, effectually fill the bottle, and seat or replace the stopper, and finally lock the stopper in the bottle; and, furthermore, the object is to produce a machine which shall be simple and compact in construction, safe, efficient, and reliable in its operation, and at the same time can be easily and conveniently manipulated and controlled.

To that end the invention consists in the novel arrangement and combination of the component parts of the filling-machine hereinafter fully described, and set forth in the claims.

In the accompanying drawings, Figure 1 is partly a front elevation and partly a vertical section of a bottle-filling machine embodying my improvements. Fig. 2 is an enlarged detail front view of the filling-head and the collar which receives the bottle-neck and adjacent members partly in section and illustrating the position of the parts previous to the unseating of the stopper. Fig. 3 is also a detail view showing the position of the parts when the stopper is unseated and the mouth of the bottle under the discharge-port of the filling-head. Fig. 4 is a vertical section on line X X in Fig. 2 and illustrating the hand-levers employed for shifting the bottle-neck. Fig. 5 is an inverted plan view illustrating more clearly the said hand-levers and their

clamps for gripping the neck. Fig. 6 is a transverse section on line Y Y in Fig. 4, and Fig. 7 is a sectional view of the filling-head and neck-receiving chamber viewed at right angles to those parts shown in Fig. 2.

Referring to the drawings, A represents the standard of the machine, which may be of any suitable style, and is formed with a supporting-base B. The top of this standard is formed with two upwardly-extending tubular guides *a a*, in which are disposed, respectively, vertically-movable posts *b* and *b'*, the latter of which is tubular. Said posts are united at their lower ends by a cross-bar *c* and are supported by two vertically-disposed spiral springs *d d*, connected at their upper ends to the under side of the top of the standard and at their lower ends to said cross-bar, as clearly shown in Fig. 1 of the drawings, which springs serve to draw the posts upward for the purpose hereinafter explained. In said tubular post *b'* is disposed a longitudinally-movable rod *e*, which is supported therein by a spiral spring *f* surrounding the lower end portion of the rod and connected at its lower end to a collar *g*, secured to the rod, and connected at its upper end to a collar *g'*, secured to the lower end of said post *b'*. Said spring *f* serves to draw the rod upward and is somewhat stiffer than the spring *d d*; as will shortly be described. Vertical movement is imparted to said posts *b b'* and rod *e* by means of a foot-lever *i*, pivoted to the lower portion of the standard, as indicated at *j*. Said lever *i* is attached to the aforesaid cross-bar *c* of the posts by means of a spring *k* of still greater stiffness and is connected to the lower end of the rod *e*, with a lost motion between them, preferably by means of a short chain *l*, as clearly shown in Fig. 1 of the drawings.

C denotes a table for supporting the bottles to be filled and which is mounted on the standard A. This table is vertically adjustable to accommodate bottles of different heights. This adjustment is effected by forming the table with downwardly-extending arms *m m*, which are provided with vertical slots *n n* for the reception of bolts *o o*, projecting from the walls of the standard, which bolts are pro-

vided with nuts *p p*. To facilitate said adjustment, the said nuts are formed with hand-wheels *q q* for turning the same.

In order that the bottle-supporting table C may accommodate bottles having bodies of various diameters, the said table is provided with a plurality of removable rings *r r*, on which the bottles are to be seated, as shown in Fig. 1 of the drawings.

D denotes the filling-head, which is located the proper distance above the table C and is formed with two horizontal and oppositely-extending supporting-arms *s s*, by which it is rigidly mounted on the upper ends of the aforesaid vertically-movable posts *b b'*, and in the central portion of the head is provided an opening *t* for the reception of the bottle-stopper, (indicated at 1,) in which opening are formed two oppositely-disposed projections or lugs *u u*, on which the stopper is seated when the head is lowered preparatory to filling the bottle, as hereinafter more fully described. Said head D is formed with a segmental inlet-port *v*, which communicates with a liquid-supply pipe *w*, attached to the head, which pipe is to be provided with a suitable valve. (Not necessary to be shown.) The head is also formed with a vertical discharge-port *a'*, communicating with said inlet-port and extending through the bottom or lower face of the head, which face is ground to form a valve-seat, as indicated at *c'*, said inlet-port being clearly illustrated in Fig. 6 of the drawings.

E is a collar which is carried on the bottom of the filling-head D and is formed with a chamber *d'* for the reception of the neck 2 of the bottle and is adapted to be moved laterally for the purpose hereinafter explained. The said chamber is formed with a guard *e'*, disposed to engage the bail-lever 3. The upper face of the collar E is ground smooth to form a valve *e''*, adapted to slide on the aforesaid valve-seat *c'* for the purpose of opening and closing the discharge-port *a'*. Said collar is supported by means of spiral springs *f' f'* surrounding downwardly-projecting pins *g' g'*, rigidly secured to the under sides of the supporting-arms *s s* of the filling-head, which springs are disposed between collars *h' h'* on the lower end of the pins and horizontally-projecting arms *i' i'*, formed on opposite sides of the collar E. The arms *i' i'* are each provided with a longitudinal guide-slot *j'*, engaging one of the pins *g'*, and between the springs *f' f'* and arms *i' i'* are preferably provided shoes or plates *k' k'*, as clearly shown in Figs. 2, 3, and 4 of the drawings. The springs *f' f'* serve to draw the collar upward, and thereby firmly retain the valve *e''* on the seat *c'*.

F F are two hand-levers which are disposed horizontally below the collar E and are pivoted at their rear ends to a downwardly and rearwardly extending arm *l'*, preferably formed integral with the filling-head D. Said

levers are provided at their forward ends with suitable handles *l'' l''* for operating the same and are formed at their intermediate portions with cooperating semicircular clamps *l''' l'''*, adapted to grip the neck of the bottle, which clamps are each provided with a ring-section *m'*, of rubber or analogous yielding material, to effect an air-tight and liquid-tight joint between the clamps and bottom of the collar. The top of each lever is preferably formed with a longitudinally-extending finger *n'*, which rides upon a segmental track *o'*, depending from and rigidly secured to the sides of the aforesaid supporting-arms *s s* of the filling-head by means of bolts *p' p'*, as shown in Fig. 4 of the drawings.

A suitable spring *q'*, secured to the hand-levers F F, serves to force the same apart to release the bottle from the grip of the clamps. I prefer to employ the form of spring shown in Figs. 4 and 5 of the drawings.

r' denotes a vertically-movable plunger which passes through the filling-head D diametrically opposite the aforesaid discharge-port *a'* and is provided on its lower end with a foot *s'*, which moves through the aforesaid guard *e'* to engage the lever of the bail to force the same downward, as hereinafter explained. The said foot *s'* of the plunger is normally in the path of a groove or slot *t'* in the top of the collar E, which groove permits the collar to be shifted laterally. The plunger is rigidly secured at its upper end to the corresponding end of an arm *u'*, which passes freely through one of the supporting-arms *s* of the filling-head and is connected to the upper end of the aforesaid sliding rod *e* by means of a short horizontal bar or pin *u''*, which moves in a longitudinal slot *u'''*, provided in the tubular post *b'*, as more clearly shown in Figs. 2, 3, and 4 of the drawings. On the said plunger is provided a loose collar *v'*, and between said collar and the top of the filling-head D and surrounding the plunger is a spiral spring *w'*, which serves as a cushion for the plunger in its downward movement.

On top of the filling-head D, and preferably formed integral therewith, is an upwardly-extending cylinder G, which communicates with the stopper-receiving opening *t* of the head and with the neck-receiving chamber *d'* of the collar E, into which cylinder the air is automatically snifted during the operation of filling the bottle. To effectually control the snifting of the air, the said cylinder is provided with a piston *a''*, normally seated on an annular shoulder *b''*, formed in the cylinder at its lower end, which piston is provided with an upwardly-extending rod or stem *c''*, sliding in a sleeve *d''*, which latter has a screw-threaded connection with a cap *a'''*, closing the upper end of the cylinder, and surrounding the rod or stem *c''* is a spiral spring *b'''*, disposed between the piston and sleeve to force the piston downward to control the snifting of the air during

the filling operation. By turning the said sleeve the tension of the spring may be regulated as desired, the outer end of the sleeve being formed, preferably, with a nut.

5 The operation of my described machine is as follows, to wit: The bottle is placed upon the supporting-table C, which latter is adjusted to a proper elevation in accordance with the height of the bottle to be filled—*i. e.*, to
 10 allow the top of the stopper in unlocked condition to pass under the hand-levers F F, or, more properly, the semicircular clamps $\bar{b} \bar{b}'$,
 15 as shown in Fig. 1 of the drawings, said clamps being held apart by the spring q' , as hereinbefore described. As illustrated in Fig. 2,
 20 the collar E is normally axially in line with the filling-head D to maintain the discharge-port a' closed and the chamber d' and opening t in position to receive the bottle neck and
 25 stopper, respectively, the head being held in its upper position by means of the aforesaid spiral springs $d \bar{d}$, and the plunger r' held up by the spiral spring f . The bottle thus placed
 30 and the parts being in the positions stated, the foot-lever i is moved downward, whereby the posts $b \bar{b}'$ impart like movement to the filling-head D and the collar E carried thereon by
 35 which movement the neck of the bottle is caused to enter the collar, and the stopper 1 is caused to be seated on the projections or
 40 lugs in the opening t in the head, which limits the movement of the head and collar. At this time the top of the bottle is brought substantially flush with the top of the collar E, and
 45 the lever 3 engages the guard e' to maintain the top of the lever directly below the plunger r' . The person in charge then draws the hand-levers F F together, whereby the clamps $\bar{b} \bar{b}'$
 50 are made to grip the neck of the bottle. By swinging said levers to the right the neck is shifted, and by engagement of the neck with the collar E said collar is moved correspondingly, whereby the valve e^2 opens the discharge-port a' , and the mouth of the bottle is
 55 brought under said port. By reason of the stopper being disposed in the opening t of the filling-head this movement of the neck causes said stopper to be tipped or unseated, as clearly shown in Fig. 3 of the drawings. When the
 60 parts are in the position just described, the liquid, which is supplied to the head by means of the pipe w , is allowed to enter the bottle. It will be understood that during the operation of filling the neck is securely gripped by the clamps, whereby the yielding ring-sections thereof effect an air-tight joint between the neck and bottom of the collar, and the air is snifted from the chamber and head by the cylinder G, as hereinbefore stated, which air
 65 is subsequently expelled from the cylinder by the piston when the neck is released from the clamps. When the bottle has been sufficiently filled, the hand-levers F F are swung back to the position shown in Fig. 2, whereby the neck of the bottle is shifted to cause the stopper to be

seated on the bottle and the valve is caused to cut off the discharge from the port a' . I prefer to provide the supply-pipe w with a suitable valve, as stated, (not shown,) which valve is employed for cutting off the liquid from the head
 70 to relieve the head from pressure, and thus effectually prevent leakage, which might result if the valve on the collar E were relied on. After the stopper has been seated, as described, the foot-lever i is further depressed,
 75 whereby downward movement is imparted to the rod e . Said movement of the rod forces down the plunger r' , which causes the foot s' thereof to engage the lever 3 of the bail and thus actuate the lever to lock the said stopper
 80 on the bottle. The hand-levers F F are then released, whereby they are forced apart by the aforesaid spring q' , and the foot-lever i is allowed to move upward. Thus the spring f is permitted to force the rod e upward, which
 85 rod imparts like movement to the plunger, and at the same time the springs $d \bar{d}$ draw the posts $b \bar{b}'$ upward to lift the filling-head D and the collar E carried thereon, and thereby allow the filled bottle to be removed from the
 90 machine.

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

1. In a machine for filling bottles provided
 95 with bail-stoppers, the combination of a bottle-support, a neck-receiving member, means for unseating the stopper, a filling-head, means for controlling the discharge from said head, means for seating the stopper, and means directly engaging and actuating the lever of the
 100 bail to lock the said stopper on the bottle substantially as described.

2. In a machine for filling bottles provided
 105 with bail-stoppers, the combination of a bottle-support, a filling-head, means for controlling the discharge from said head, a collar carried on the head and formed with a neck-receiving chamber, means for the unseating and
 110 seating the stopper, a plunger disposed to directly engage and actuate the lever of the bail to lock the stopper on the bottle, and means for operating said plunger substantially as described.

3. In a machine for filling bottles provided
 115 with bail-stoppers, the combination of a bottle-support, a filling-head provided with an inlet-port and with a discharge-port, a collar formed with a neck-receiving chamber and supported on the under side of said head, a
 120 valve operative for opening and closing said discharge-port, means for unseating and seating the stopper, and means directly engaging and actuating the lever of the bail to lock the stopper on the bottle substantially as described.
 125

4. In a machine for filling bottles provided
 130 with bail-stoppers, the combination of a bottle-support, a filling-head provided with an inlet-port and with a discharge-port, a laterally-

- movable collar formed with a neck-receiving chamber and carried on the bottom of the head, a valve for opening and closing said discharge-port, means for shifting the bottle-neck to carry the mouth to and from said discharge-port and thereby moving said collar to unseat and seat the stopper, and means actuating the lever of the bail to lock the stopper on the bottle substantially as described.
5. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a filling-head provided with a stopper-receiving opening and with an inlet-port, and a discharge-port at one side of the opening, a laterally-movable collar formed with a neck-receiving chamber and carried on the bottom of the head and formed with a valve for opening and closing said discharge-port, means for operating said collar to unseat and seat the stopper and for shifting the neck to carry the mouth thereof to and from said discharge-port, a vertically-movable plunger passing through said head and disposed to actuate the bail of the stopper to lock the latter on the bottle substantially as described.
6. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a vertically-movable filling-head provided with an inlet-port and a discharge-port, a laterally-movable collar carried on the bottom of said head and formed with a neck-receiving chamber, said collar being operative for opening and closing said discharge-port and for unseating and seating the stopper, a plunger movable vertically through the head and disposed to actuate the lever of the bail to lock the stopper on the bottle, and means for operating said head and plunger substantially as described.
7. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a vertically-movable filling-head provided with a stopper-receiving opening and with an inlet-port and a discharge-port, a laterally-movable collar carried on the bottom of said head and formed with a neck-receiving chamber and with a valve for opening and closing said discharge-port, means for shifting the bottle-neck to move the collar and thereby unseat and seat the stopper and carry the mouth of the bottle to and from the discharge-port, a vertically-movable plunger passing through said head and disposed to actuate the lever of the bail to lock the stopper on the bottle, and a lever for operating said filling-head and plunger substantially as described.
8. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a filling-head provided with an inlet-port and a discharge-port, a valve for opening and closing said discharge-port, a laterally-movable collar formed with a neck-receiving chamber and carried on said head, said head being formed with a stopper-receiving opening, a pair of hand-levers pivoted to the head and formed with cooperating clamps adapted to grip the neck of the bottle below the collar to shift the neck to carry the mouth thereof to and from the discharge-port, and to cause the neck to move the collar and thereby unseat and seat the stopper, and means for actuating the lever of the bail to lock the stopper on the bottle substantially as described.
9. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a vertically-movable filling-head provided with a stopper-receiving opening and with an inlet-port, and a discharge-port at one side of the opening, a laterally-movable collar carried on the bottom of said head and formed with a neck-receiving chamber and with a valve for opening and closing the discharge-port, a pair of levers pivoted to said head and formed with clamps for gripping the neck of the bottle below the collar, said levers being operative for shifting the neck to unseat and seat the stopper and to carry the mouth to and from said discharge-port and cause the neck to move the collar to open and close the latter port, a vertically-movable plunger passing through the filling-head and disposed to actuate the lever of the bail to lock the stopper on the bottle, and a foot-lever for moving said filling-head and plunger substantially as described.
10. In a machine for filling bottles provided with bail-stoppers, the combination with a standard and the bottle-support thereon, of a pair of vertically-movable posts, a filling-head mounted on said posts and formed with an inlet-port and a discharge-port, means for opening and closing said discharge-port, a neck-receiving member carried on said head, means for unseating and seating the stopper, means directly engaging and actuating the lever of the bail to lock the stopper on the bottle, and means for operating the aforesaid posts substantially as described.
11. In a machine for filling bottles provided with bail-stoppers, the combination with a suitable standard, of a bottle-support, a pair of vertically-movable posts supported on said standard and extending above the bottle-support, a filling-head mounted on the said posts and provided with an inlet-port and a discharge-port and with a valve-seat on its bottom, a laterally-movable collar carried on the under side of said head and formed with a neck-receiving chamber and with a valve sliding on said seat, means for shifting the bottle-neck to carry the mouth to and from the discharge-port, whereby the collar is moved to open and close the latter port, means for unseating and seating the stopper, a plunger disposed to actuate the lever of the bail to lock the stopper on the bottle, springs drawing said posts and plunger upward, and a foot-lever for moving the same downward substantially as described.
12. In a machine for filling bottles provided with bail-stoppers, the combination with a

standard, of a bottle-support, a pair of vertically-movable posts supported on the stand and extending above the bottle-support, one of said posts being tubular, a filling-head mounted on said posts and provided with an inlet-port and a discharge-port and with a stopper-receiving opening, a laterally-movable collar carried on the under side of said head and formed with a neck-receiving chamber and with a valve seated on the head, a pair of hand-levers pivoted to said head and provided with cooperating semicircular clamps adapted to grip the neck of the bottle below the collar, said levers being operative to shift the neck and thereby unseat and seat the stopper and carry the mouth to and from the discharge-port and move the collar to open and close said port, a vertical plunger passing through the head and disposed to actuate the lever of the bail to lock the stopper on the bottle, a rod sliding longitudinally in the aforesaid tubular post and connected to the plunger and supported by a spring, and a foot-lever connected to said posts and rod to operate the filling-head and plunger substantially as described.

13. In a machine for filling bottles provided with bail-stoppers, the combination of a filling-head provided with a stopper-receiving opening and with an inlet-port and a discharge-port and formed on its bottom with a valve-seat, a laterally-movable collar carried on the under side of said filling-head and provided with a neck-receiving-chamber and formed with a valve on its upper face sliding on said seat, springs pressing the collar upward to retain the valve seated, means for shifting the bottle-neck to carry the mouth to and from the discharge-port and thereby move the collar to unseat and seat the stopper and open and close said latter port, and means for actuating the bail to lock the stopper on the bottle substantially as described.

14. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a vertically-movable filling-head provided with a stopper-receiving opening and with an inlet-port, and a discharge-port at one side of the opening, a valve-seat formed on the bottom of said head, a laterally-movable collar below said head and formed with a neck-receiving chamber and with a valve on its upper face, springs pressing said collar upward and retaining the valve seated, horizontal guides for said collar, a pair of hand-levers pivoted to said head and disposed below the collar and formed with cooperating semicircular clamps adapted to grip the neck of the bottle, said levers being operative to shift the neck to carry the mouth to and from the discharge-port and to move the collar to unseat and seat the stopper and open and close the latter port, a plunger passing through the filling-head and disposed to actuate the lever of the bail to lock

the stopper on the bottle, and means for operating said head and plunger substantially as described.

15. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a vertically-movable filling-head provided with a stopper-receiving opening and with an inlet-port, and a discharge-port at one side of the opening, and provided with a pair of oppositely-extending horizontal supporting-arms, pins projecting downwardly from said arms, a laterally-movable collar below said head and formed with a neck-receiving chamber and with horizontally-projecting slotted guide-arms engaging said pins, spiral springs surrounding said pins and bearing on the guide-arms to press the collar upward, a horizontally-disposed segmental track rigidly secured to the front of the head-supporting arms, a pair of hand-levers pivoted to the rear of the head and formed with cooperating clamps adapted to grip the neck of the bottle, and sliding on said track, said levers being operative to shift the neck to carry the mouth to and from the discharge-port and thereby move the collar to unseat and seat the stopper and open and close the latter port, a vertically-movable plunger passing through the head and disposed to actuate the bail to lock the stopper on the bottle, and means for operating said head and plunger substantially as described.

16. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a filling-head, a laterally-movable collar carried on the under side of said head and provided with a neck-receiving chamber, a pair of hand-levers pivoted to the head and formed with semicircular clamps disposed below the collar and adapted to grip the neck of the bottle, yielding ring-sections secured in said clamps, said levers operating to shift the neck and move the collar for the purpose set forth.

17. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a filling-head, a laterally-movable collar carried on the under side of said head and provided with a neck-receiving chamber, a snifting-cylinder communicating with said chamber, means for shifting the collar to unseat and seat the stopper, means for controlling the discharge from the head, and independent means for actuating the bail to lock the stopper on the bottle substantially as described.

18. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a filling-head, a chamber for receiving the neck of the bottle, a cylinder arranged to automatically snift the air from the chamber, a piston in said cylinder, a spring forcing the piston toward the chamber, means for controlling the discharge from the head, means for shifting the bottle to unseat and seat the

stopper, and means for actuating the bail-lever to lock the stopper on the bottle substantially as described.

19. In a machine for filling bottles provided with bail-stoppers, the combination of a bottle-support, a vertically-movable filling-head, a collar carried on the under side of said head to receive the neck of the bottle, said collar being movable to control the discharge from the head and to unseat and seat the stopper, a plunger disposed to actuate the bail to lock the stopper on the bottle, means for operating said head and plunger, and a cylinder mounted on top of the head for snifting the air during the operation of filling substantially as described.

20. In a machine for filling bottles provided with bail-stoppers, the combination of a filling-head, a neck-receiving chamber below said head, means controlling the discharge from said head, means for unseating and seating the stopper, a plunger disposed to actuate the bail to lock the stopper on the bottle, a spring cushioning said plunger and means for operating the plunger substantially as described.

21. In a machine for filling bottles provided with bail-stoppers, the combination of a vertically-movable filling-head, a collar carried

on the under side of said head and formed with a neck-receiving chamber, a bail-guard formed in said chamber, means for controlling the discharge from said head, means for unseating and seating the stopper, a vertically-movable plunger disposed above said bail-guard and adapted to engage the lever of the bail to lock the stopper on the bottle, and means for operating said head and plunger substantially as described.

22. In a machine for filling bottles provided with bail-stoppers, the combination with a suitable standard, of a vertically-adjustable bottle-supporting table on said standard, and provided with means adapting the same for bottles of different diameters, a vertically-movable filling-head supported above said table and provided with a laterally-movable collar adapted to receive the neck of the bottle, means for controlling the discharge from said head, means for shifting said collar to unseat and seat the stopper, means for locking the stopper on the bottle, and means for operating said head substantially as described.

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Witnesses:

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