A. CALLESON.

MACHINE FOR ATTACHING CLOSURES TO BOTTLES AND THE LIKE.

APPLICATION FILED OCT. 21, 1907.

987,670. **Patented Mar. 21, 1911.**

4 SHEETS—SHEET 1.

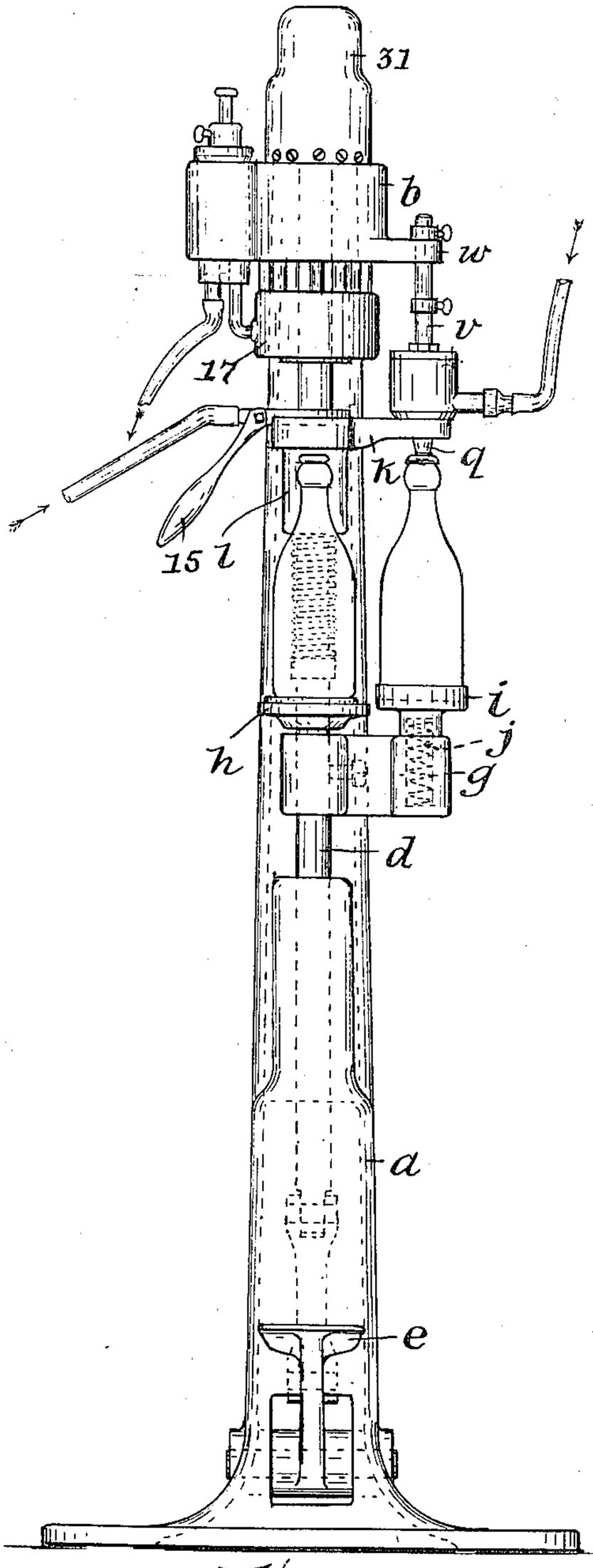

Fig. 1.

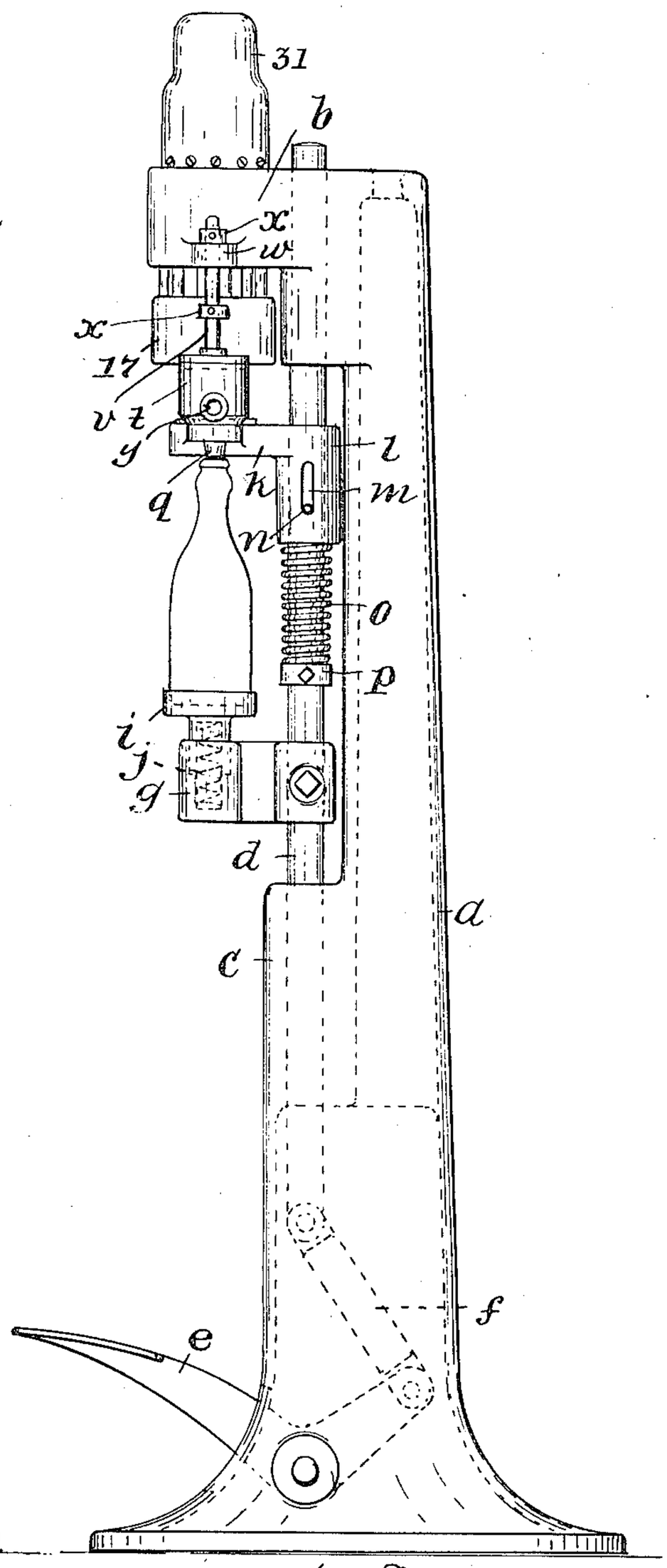

Fig. 2.

WITNESSES

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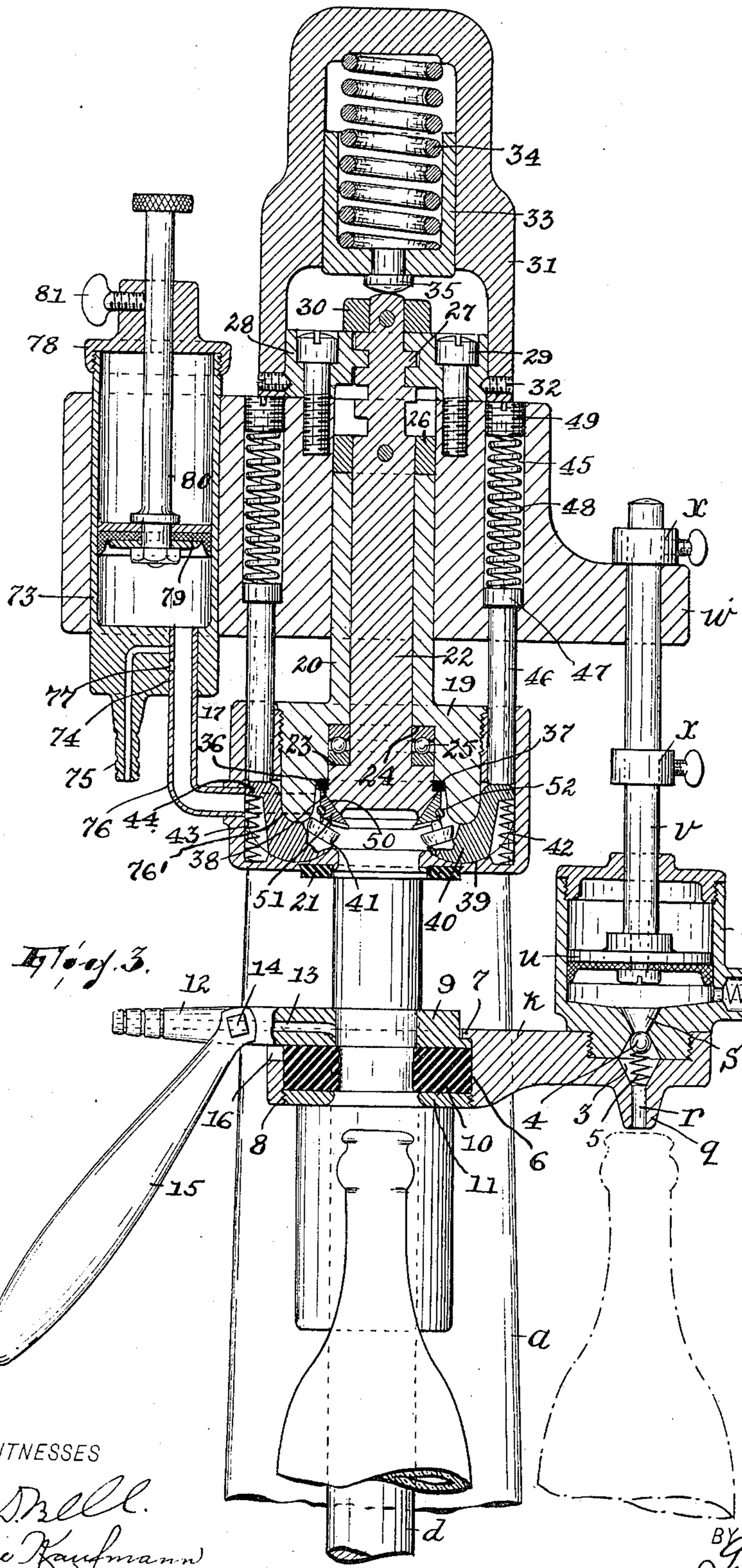

Fig. 3.

WITNESSES

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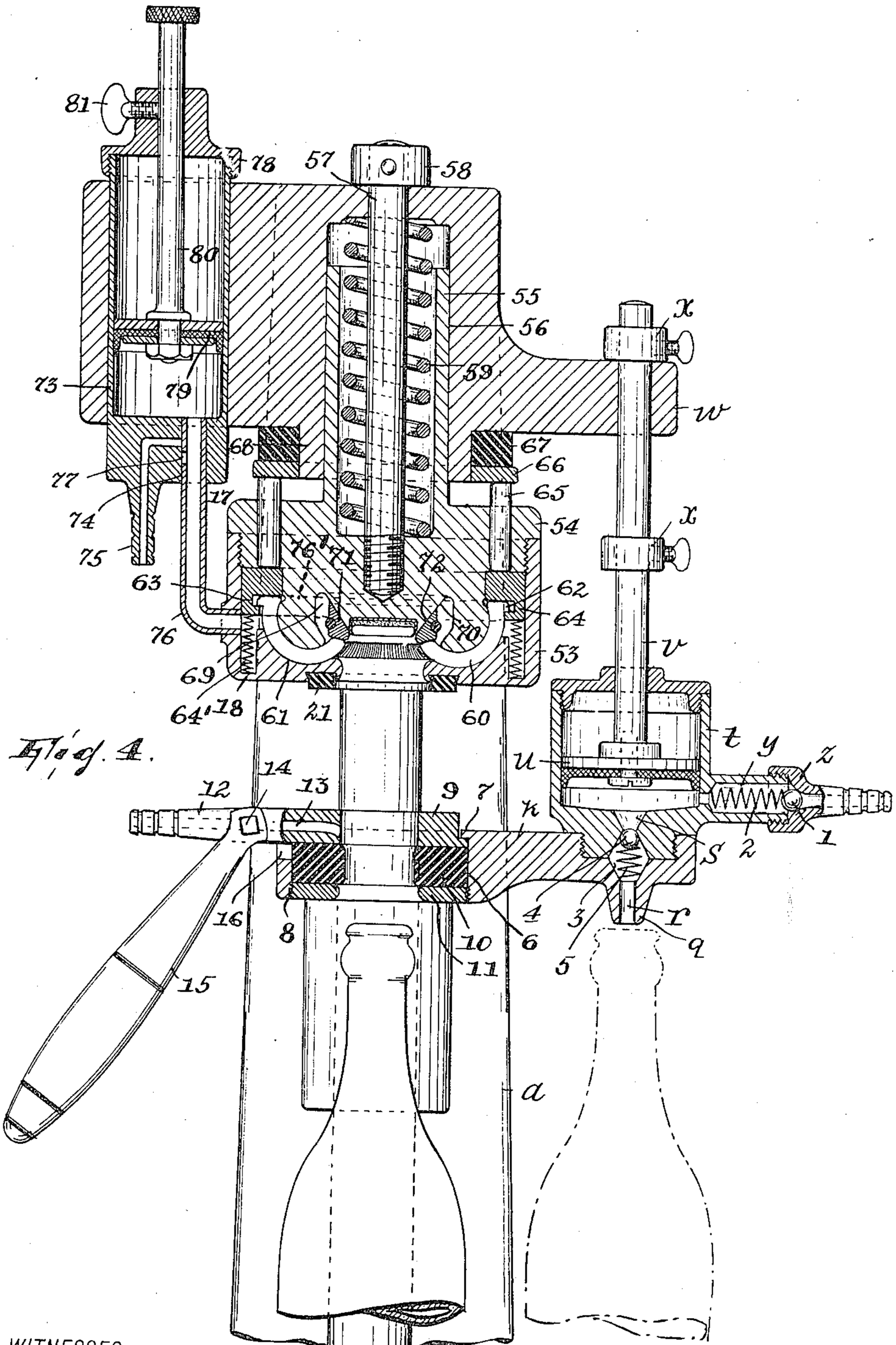

Fig. 4.

WITNESSES

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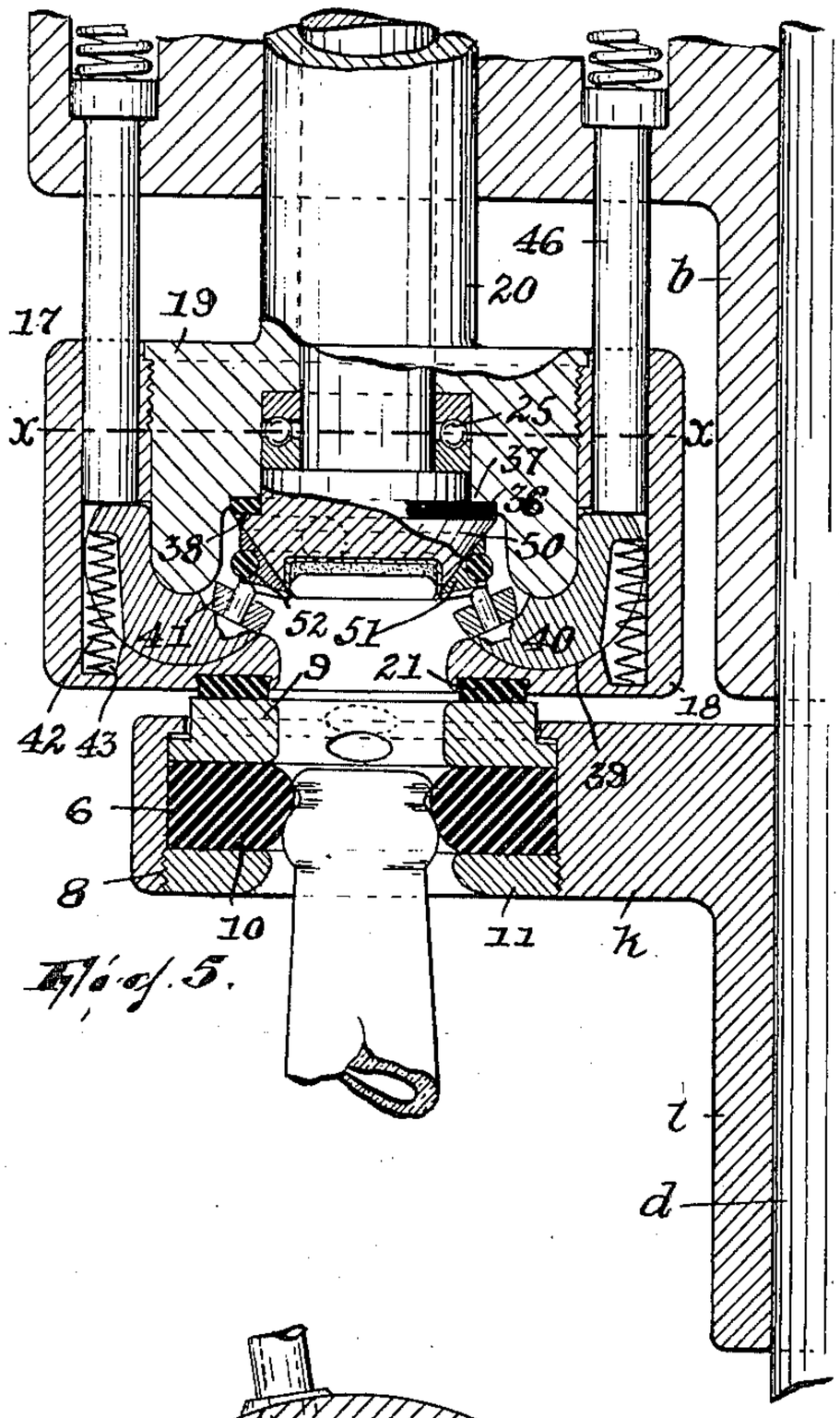

Fig. 5.

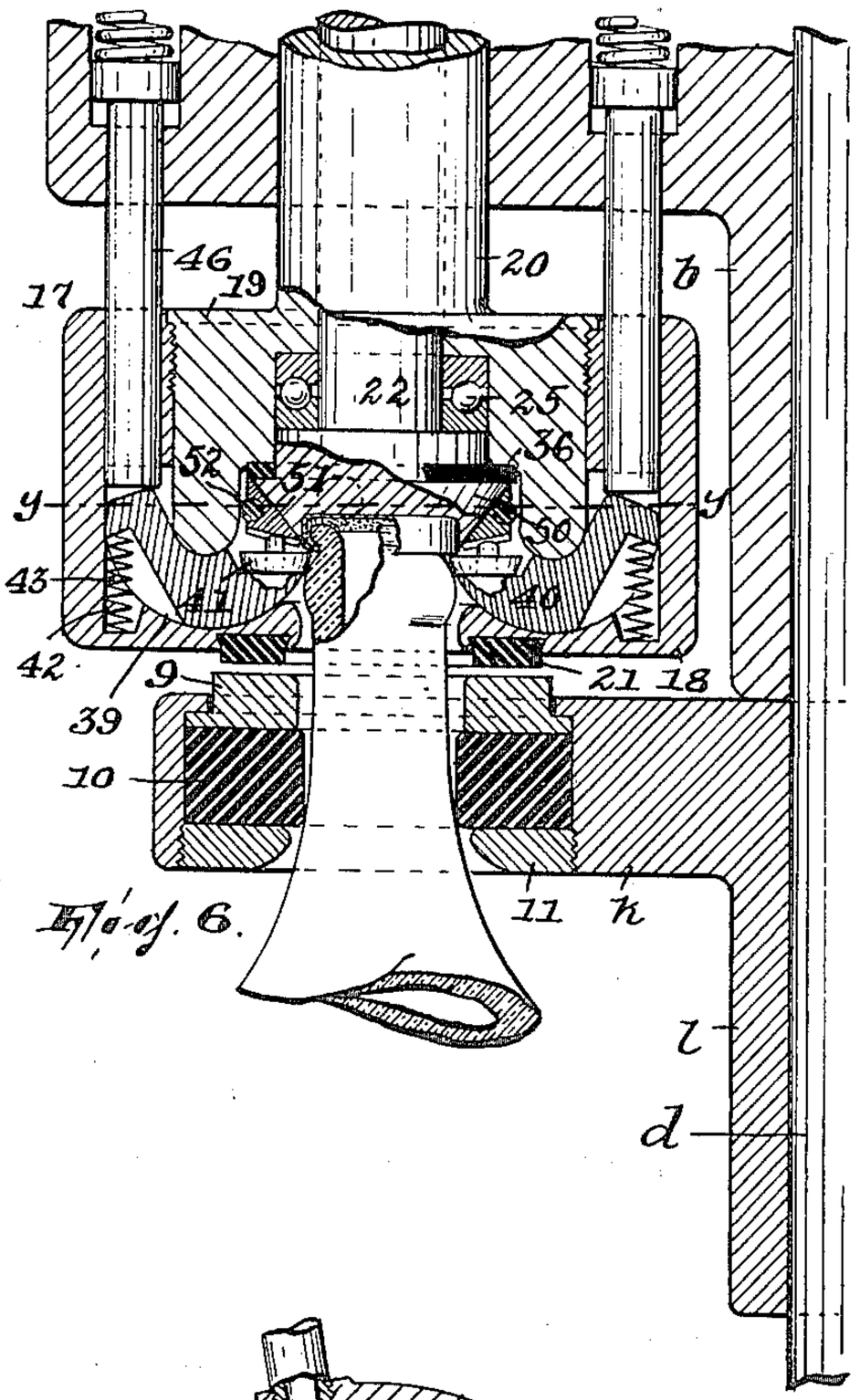

Fig. 6.

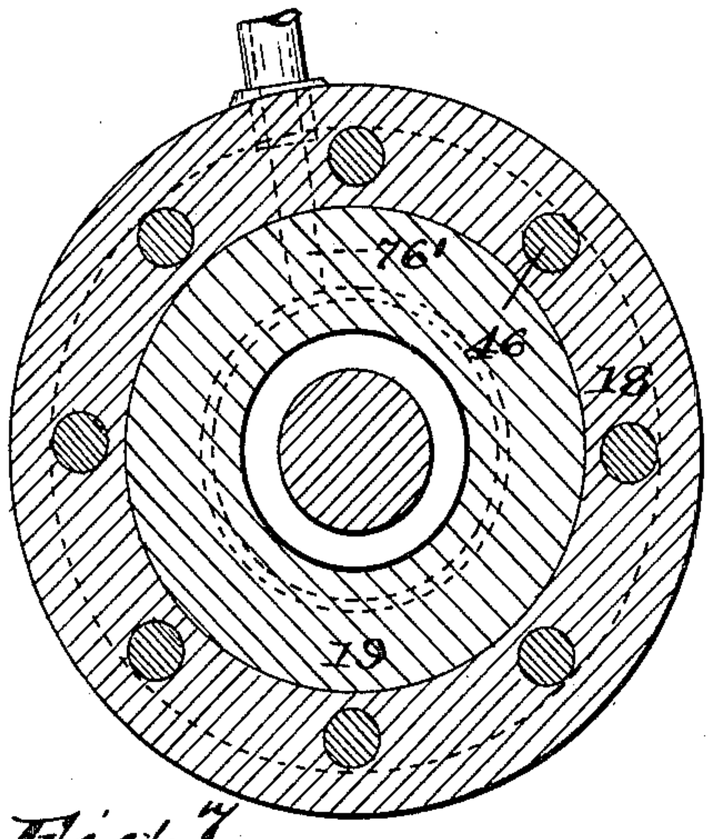

Fig. 7.

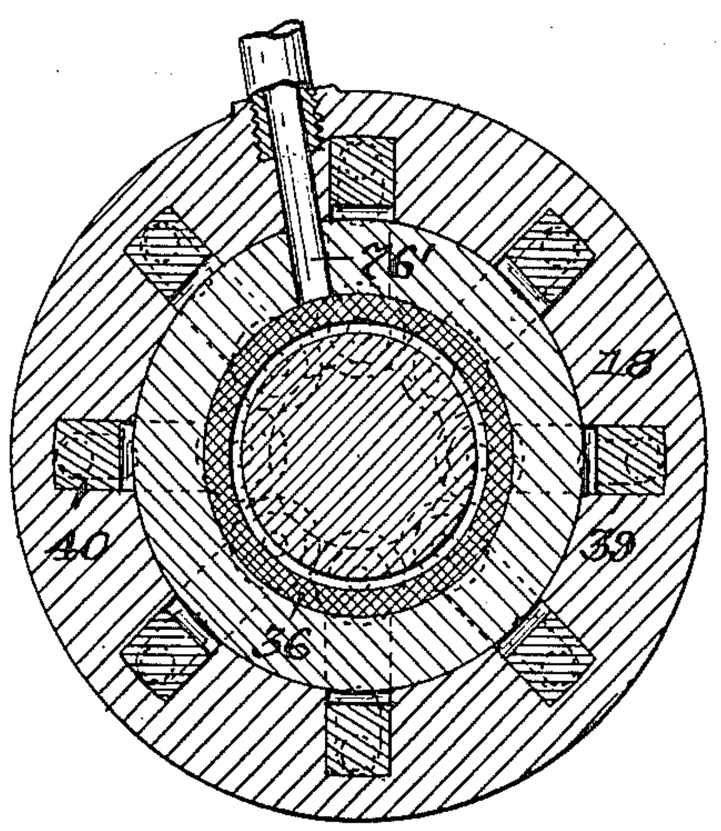

Fig. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

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MACHINE FOR ATTACHING CLOSURES TO BOTTLES AND THE LIKE.

987,670. Specification of Letters Patent. Patented Mar. 21, 1911.

Original application filed June 27, 1907, Serial No. 267,216. Divided and this application filed October 21, 1907. Serial No. 398,364.

To all whom it may concern:

Be it known that I, AMOS CALLESON, a citizen of the United States, residing in Brooklyn, Brooklyn borough, New York, have invented a certain new and useful Improvement in Machines for Attaching Closures to Bottles and the Like; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The invention consists in certain improvements in bottling machines whereby, as the principal object, several of the operations necessary to filling bottles with two liquids, under pressure, are so controlled as to reduce the manipulations necessary to a minimum, so that the attention of the operator is centralized and his work materially expedited.

One salient feature of the invention is a novel combination of a filling head and a closure-affixing means in which the affixing means is alternately inclosed by the filling head and exposed, in the one instance during filling and in the other instance during affixing.

Another leading feature consists in the means whereby the snifting is performed through the movements of certain parts which have to move, anyway, in order to perform other functions.

Still another feature consists in a novel means for charging the bottles with the flavoring liquid in just that (gaged) quantity which is required, which means also operates in the movement of certain parts which are required to move to perform other functions.

Another novel feature is the cap attaching means.

Referring to the accompanying drawings, Figure 1 is a front view of the improved bottling machine; Fig. 2 is a side view thereof; Fig. 3 is a view partly in side elevation and partly in vertical section of the upper portion of the machine; Fig. 4 is a vertical sectional view of the upper portion of the machine and showing a modification of the cap attaching means, the parts being in the same position as in Fig. 3; Fig. 5 is a vertical sectional view taken in a plane at right angles to the section-plane of Fig. 3 and showing the sealing chamber closed; Fig. 6 is a sectional view taken in the same section-plane as that of Fig. 5, but showing the parts in an advanced stage of the operation, *i. e.*, the attaching of the cap to the bottle; Fig. 1 is a horizontal sectional view on the line *x*—*x* in Fig. 5; and, Fig. 8 is a horizontal sectional view on the line *y*—*y* in Fig. 6.

In the drawings, *a* is the usual pedestal or standard having a head *b* in which and the base *c* of the standard slides longitudinally a shaft *d*. The weight of this shaft, and the parts it carries, normally forces it downwardly, it thus acting to normally hold up the free end of a treadle *e* which is fulcrumed in the base and connected with the lower end of the shaft by a pitman *f*. Said shaft carries, adjustably secured thereon, a bracket *g* in which is mounted a rotatable bottle rest *h* and a bottle rest *i*, which latter is guided for movement vertically in the bracket and cushioned by a spring *j*.

k is the lower member of the filling head, the same comprising a sleeve *l* which slides on the shaft *d* and has a guide-slot *m* in which works a pin *n* on the shaft, a spring *o* coiled about said shaft between the sleeve and a collar *p* normally holding the member *k* at its upper limit of movement with respect to the shaft. The member *k* is formed with a nozzle *q* the duct *r* in which forms, with a duct *s* in the bottom of a gage-cup *t* carried by member *k*, the discharge for said cup. *u* is a piston in the gage-cup carried by a stem *v* which is guided in an arm *w* of the head *b* and has secured thereon two adjustable collars *x* arranged above and below said arm. The supply to the gage-cup *t* is afforded through the duct *y*, which enters the cup near the bottom thereof, and which has a nozzle *z* the restricted opening through which a ball-valve 1, held against the adjacent end of the opening of said nozzle by a spiral spring 2 in duct *y*, tends to close. Duct *s* has its discharge end 3 of conical form and in it seats a ball-valve 4 which is held against the pressure in the gage-cup by a spiral

spring 5. Spring 2 is weaker than the pressure of the liquid entering nozzle *z* into the gage-cup, while spring 5 is somewhat stronger than said pressure; so that, while the parts are in position for charging the gage-cup, the pressure of the liquid overcomes spring 2 and, forcing back ball 1, enters the gage-cup, at the same time displacing the piston *u* upwardly to as far as the plunger will go in the cup. The escape of the liquid, the quantity of which is automatically gaged according to the distance which the piston *u* can rise, must now be by way of ducts *s* and *r*; and it follows on the upward movement of member *k*, as hereinafter described, which accomplishes a relatively downward movement of piston *u* in the gage-cup, the thus compressed liquid confined in the gage-cup overcoming spring 5 in order to escape past valve 4. It will be understood that the liquid just referred to is the syrup or flavoring liquid. Member *k* has an opening 6 which is internally flanged at the top, as at 7, and tapped at the bottom, as at 8.

9 is an externally flanged ring which is held up against flange 7 by a soft elastic gasket 10 interposed between said ring and a nut 11 screwed into the tapped part of opening 6. Ring 9 has a nozzle 12 the duct 13 through which opens into said ring (Fig. 4) and is controlled by a valve 14 having a handle 15; since ring 9 has some downward movement in member *k*, a slot 16 is formed in member *k* to accommodate the nozzle.

The upper member 17 of the filling head, as shown in Figs. 3, 5, 6, 7 and 8 comprises a ring 18 into which is screwed the lower enlarged end 19 of a sleeve 20 arranged to slide vertically in the head *b*. The ring 18 carries an elastic gasket 21 set into its lower face and adapted to be impinged by the upper face of ring 9, which is flat. Sleeve 20 is penetrated by a plunger 22 having a shoulder 23 near its lower end between which and an internal shoulder 25 of the sleeve is an anti-friction thrust device 25. The device 25 and a collar 26 on the plunger, taking against the upper end of sleeve 20, prevent relative longitudinal movement of the sleeve and the plunger. The upper end of the plunger is formed as a steep-threaded spindle 27 which works in a nut 28 secured to the top of head *b* by screws 29. A collar 30 secured on the spindle above the nut limits the downward movement of the plunger.

31 is a cap which receives nut 28 and is secured thereto by screws 32. Between the top of this cap and a socket 33 arranged to slide vertically therein is a spring 34, said socket carrying a hardened bearing pin 35 taking against the upper end of the spindle. As thus constructed, any upward pressure applied against the plunger 22 sufficiently to overcome spring 34 will raise the upper member of the filling head, the threaded connection between the plunger and the nut 28 acting to rotate the former as it rises. Since, as hereinafter explained, a gas-tight chamber or space is formed by the two members of the filling head and the bottle at a certain stage of the operation, leakage between the plunger and sleeve is prevented by a rubber gasket 36 interposed between shoulders 37 and 38 on the portion 19 of the sleeve 20 and the plunger, respectively.

In arc-shaped grooves 39 in ring 18 is set a series of arc-shaped segments 40 arranged radially in the ring (see Fig. 8) and carrying at their inner ends rotary crimping knurls 41, the free ends of said segments being normally pressed upwardly in the ring, so as to retract the knurls, by springs 42 each being set in a vertical bore 43 in the ring and engaging a lug 44 on the segment. In the vertical bores 45 in the head *b* is arranged to move a series of pins 46 which project down into the ring 18 each in alinement with the free end of a segment 40. Downward movement of the pins is limited by their heads 47 engaging the bottoms of the bores 46, against which they are normally held by springs 48 arranged in the bores between said heads and adjusting screws 49 tapped into the bores. The arrangement is such that, when the parts stand in the position shown in Fig. 3, the segments 40 are retracted, but when the upper member of the filling head rises, springs 48 overcome springs 42 and cause the segments to move in their grooves 39, thus contracting the circle in which their knurls stand. The lower end of the plunger 22 is conical, as at 50, said conical portion being surrounded by a concentric series of cap-holding fingers 51 which are surrounded by an elastic band 52. Said band tends to contract the fingers into a small circle; this action is always limited by the knurl ends of the segments 40, which thus act to keep the fingers in place, but it is overcome, with the consequence that the fingers withdraw, when the segments move inwardly to contract the circle in which their knurls stand, the fingers 51 at this time sliding up on the cone 50.

Referring, now, to Fig. 4, the upper member 17 of the filling head comprises a ring 53 which is screwed on to the lower enlarged solid end or head portion 54 of a sleeve 55 arranged to slide vertically in a bore 56 of the head *b*. The ring 53 carries the same rubber gasket 21 described above as adapted to co-act with the ring 9 to close the filling chamber. The sleeve is penetrated by a stem 57 screwed into its head and projecting through the top of the head *b* and having a collar 58 which limits its downward movement under the pressure of a spiral

spring 59 interposed, in the sleeve, between the top of bore 56 and the head 54 of the sleeve. 60 are segments arranged in radial segmental grooves 61 in the ring 53. These segments have plain inner ends, being adapted, by standing close together, when contracted, to inbend the bottle cap flange as a plain circular shoulder, like the knurl-carrying segment 40 already described. At their rear ends they have lugs 62 which are received in an internal groove 63 in a ring 64 arranged to slide vertically in the ring 53. Pins 65 arranged concentrically in the head 54, rest on ring 64, and when the member 17 of the filling head moves upwardly their movement is resisted by an annulus 66 bearing against a rubber gasket 67 on a boss 68 on the head *b*. The head 54 is formed with an annular space 69 having a conical portion 70 around which is arranged a series of fingers 71 like the fingers 51, the same being surrounded by an elastic band 72. The parts 71 and 72 act in the same manner as the parts 51 and 52, and are controlled by segments 60 the same as parts 51 and 52 are controlled by segments 40. Springs 64′ normally hold the ring 64 elevated. So far as I am at present aware, the operation of snifting has been performed by the workman by a separate manipulation of parts for effecting this. In the present machine, the snifting operation is merely incidental to the operation of parts which have to move, anyway, in order to perform other functions. I employ a receiver which, while structurally separated or detached from the filling head, forms a space that is practically a part of a sealed or a closed chamber of which the space in the filling head is also a part; in this art heretofore, as I know it, the space in the filling head afforded the only resort for the air and gas displaced from the bottle during filling, and, since the construction and operation of the parts immediately involved required that space to be more or less restricted, it was necessary for the operator, two or more times during the filling of each bottle, to free the gas and air therein by manipulating a valve for the purpose. Such receiver is shown in the drawing as a cylinder 73 arranged in the head *b* and having a bore 74 and a nozzle 75 whose duct communicates with the bore. Into said bore fits a tube 76 which is mounted in the member 17 of the head and affords at all times communication between the cylinder and the space of said bore 74 through a part 76′. The tube slides up in the bore when the member 17 of the filling head rises and so brings a port 77 in said tube into communication with the duct of the nozzle. 78 is a cap on the cylinder, and 79 a plunger whose stem 80 penetrates the cap and may be vertically adjusted by a set screw 81. The capacity of the receiver, it will be manifest, is regulated by adjusting the plunger.

Operation: A bottle already having its quantum of syrup is placed on the rest *h* and an empty bottle on rest *i*; a cap is also placed in the cavity of member 17 of the filling head and there held by the fingers 51 (or 71). The operator now depresses treadle *e*, which raises shaft *d* and the parts it carries until ring 9 brings up against the gasket 21. The resistance now offered to the upward advance of member *k* indicates to the operator that the filling chamber, which is to be formed by the member 17 and member *k* of the filling head and the bottle on rest *h*, is closed at every point except by the bottle. Continued upward movement of the shaft *d* acts to compress gasket 10 so that its interior diameter is reduced; the mouth of the bottle on rest *h* now enters gasket 10, which snugly fits about the same and seals off the space at all points from the outside. The pressure on treadle *e* is now stopped while the operator opens valve 14 and thereby admits the main or principal liquid up to the desired height, which is readily apparent because practically the whole of the bottle, except its mouth, is exposed, whereupon valve 14 is closed. The air which is expelled from the bottle occupies the filling head and the receiver (cylinder 73) which communicates with the filling head through tube 76. Pressure on the treadle is now resumed, which ultimately causes member *k* of the filling head to impinge against the head *b* where the shaft penetrates it, after which the shaft is free to continue its upward movement a distance approximately the length of the slot *m*. The remaining part of the operation, so far as the bottle rest *h* is concerned, is the step of attaching the cap. Under the continued pressure on treadle *e*, said bottle rises until its mouth impinges against the usual lining pad of the cap, which may be the ordinary disk having a depending flange and the lining pad inserted in the top thereof. The upward pressure of the bottle against the cap acts to raise the upper member of the filling head away from the lower member thereof, but before the seal of the filling chamber is broken as between gasket 21 and ring 9, port 77 begins to register with the port or duct of the nozzle 75, so that the release of the compressed air and gas which have been ejected from the bottle on filling, occurs at the nozzle.

Referring, now, first to Figs. 3, 5, 6, 7, and 8: As the member 17 of the filling head rises, the pins 46, whose upward movement is resisted by springs 48, force the segments 40 inwardly so that their knurls take a contracted circular position and press against the flange of the cap to start the operation of bending the flange in under the lip of

the bottle and thereby locking the cap thereto. During the upward movement of member 17, the plunger 22 is, furthermore, caused to rotate by its threaded spindle working in the nut 28, and, since the combined action of the springs *o* and 34 cause the bottle to be firmly gripped between its rotary rest *h* and the plunger, said rest, the bottle and the plunger rotate together, while the member 17, of the filling head and its segments are held from rotating by the pins 46. The result of this operation is that the knurls on the segments, still held against the flange of the cap, travel in a circumferential path on the cap flange, crimping it in under the lip of the bottle at all points and so effecting the locking of the cap to the bottle. The springs 48, it will be observed cushion the action of the knurls during this operation. The pressure on treadle *e* is now released, so that the bottle first permits the member 17 of the filling head to drop into contact with the member *k* thereof, and then the member *k* and the bottle assume their original positions.

Referring to Fig. 4, when the bottle impinges against the cap and raises member 17 of the filling head, the segments 60 are caused to move into a contracted circular arrangement by the pins 65 resisting upward movement of the ring 64. These segments simply inbend the flange of the cap under and into locking engagement with the lip of the bottle without bending the flange of the cap inwardly in a plain smooth head or shoulder such as is formed in the operation of the cap-attaching means shown in Figs. 3, 5, 6, 7 and 8. In both arrangements, when the segments contract, they push the fingers 51 and 71 up out of the way, as already clearly indicated. While the bottle on rest *h* is being filled and capped, which is during the upward movement of the shaft *d*, the bottle on rest *i* is receiving its portion of syrup. The pressure from the supply of syrup keeps cup *t* filled, and when the cup rises with the member *k*, its plunger, which is held against its top wall by the syrup in the cup, can only rise with the cup until the lower collar *x* impinges against the arm *w* whereupon the plunger ceases to move farther and the continued rising of the cup causes the plunger to approach the lower end of the cup, which action forces the syrup in the cup out of the nozzle *q* overcoming the spring-pressed valve 4. When the shaft *d* is again lowered, the plunger would follow to its full extent with it except that the pressure from the syrup supply forces more syrup into the cup and so holds the plunger at the top of the latter.

It will be understood that by a slight modification of the operating mechanism the bottle to be filled or capped might be placed on a fixed table and the filling and attaching means arranged to move down into operating position instead of the bottle moving up as shown.

Reference is hereby made to Letters Patent of the United States dated April 27th, 1909, No. 919,319.

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

1. The combination of two members, one of which is movable relatively to the other substantially longitudinally of the axis of the container, one of said members having guiding portions provided with guiding surfaces extending substantially parallel with the axis of the container, and cap-shaping devices slidable in said guiding portions and projecting toward the other member, substantially as described.

2. The combination of two members, one of which is container-actuated and movable relatively to the other substantially longitudinally of the axis of the container, one of said members having guiding portions provided with guiding surfaces extending substantially parallel with the axis of the container, and cap-shaping devices slidable in said guiding portions and projecting toward the other member, substantially as described.

3. The combination of two members, one of which is movable relatively to the other substantially longitudinally of the axis of the container, said movable member having guiding portions provided with guiding surfaces extending substantially parallel with the axis of the container, and cap-shaping devices slidable in said guiding portions and projecting toward the other members, substantially as described.

4. The combination, with means, comprising arc-shaped devices directly engageable with the cap, for shaping the cap into locking engagement with the container, of a container-actuated part having radially arranged arc-shaped recesses, said devices being disposed in said recesses and radially movable therein, and means for effecting relative movement as between the container and said part, substantially as described.

5. The combination, with means, comprising arc-shaped devices directly engageable with the cap, for shaping the cap into locking engagement with the container, of a container actuated part having radially arranged arc-shaped recesses, said devices being disposed in said recesses and radially movable therein, a fixed part, and other parts interposed between said fixed part and said devices and adapted to take the thrust of the latter on the movement of said container-actuated part, substantially as described.

6. The combination of means for shaping a cap into locking engagement with the container, a container-holding means within the

shaping means, said means being adapted for rotary movement the one relatively to the other on the container axis of the holding means as a center and one of said means being also movable longitudinally of said axis, and means, dependent for its action on the movement of one of said means longitudinally of said axis, for causing the relative rotary movement of said means, substantially as described.

7. The combination of means for shaping a cap into locking engagement with the container, a container-holding means within the shaping means, said means being adapted for rotary movement the one relatively to the other on the container axis of the holding means as a center and one of said means being also movable longitudinally of said axis, and means, comprising a threaded member, for causing the relative rotary movement of said means on the movement of the one longitudinally of said axis, substantially as described.

8. The combination of a rotary container holding means having a threaded member, a fixed threaded part engaging with said threaded member and means for shaping a cap into locking engagement with the container, said first-named means having its axis of rotation coincident with the container axis thereof and being also movable longitudinally of said axis, substantially as described.

9. The combination of a rotary container holding means having a threaded member, a fixed threaded part engaging with said threaded member and means for shaping a cap into locking engagement with the container, said first-named means having its axis of rotation coincident with the container axis thereof and being also movable longitudinally of said axis, and said other means being also movable with the container longitudinally of said axis, substantially as described.

10. The combination of a rotary container holding means having a threaded member, a fixed threaded part engaging with said threaded member, said means having its axis of rotation coincident with the container axis thereof and being also movable longitudinally of said axis, a non-rotary part movable with the holding means longitudinally of said axis and means, carried by said last-named part and operative upon its movements with the holding means longitudinally of said axis, for shaping the cap into locking engagement with the container, substantially as described.

11. The combination of means for shaping a cap into locking engagement with the container, a container-holding means within the shaping means, said means being adapted for rotary movement the one relatively to the other on the axis of the holding means as a center, and means, having a threaded part engaged with one of said first-named means, for effecting the relative rotation as between said first-named means, substantially as described.

In testimony, that I claim the foregoing, I have hereunto set my hand this 30 day of September, 1907.

AMOS CALLESON.

Witnesses:
G. W. EGBERT,
WM. D. VAELL.