

M. S. VALENTINE.
MACHINE FOR CORKING BOTTLES.

No. 173,088.

Patented Feb. 1, 1876.

FIG. 1.

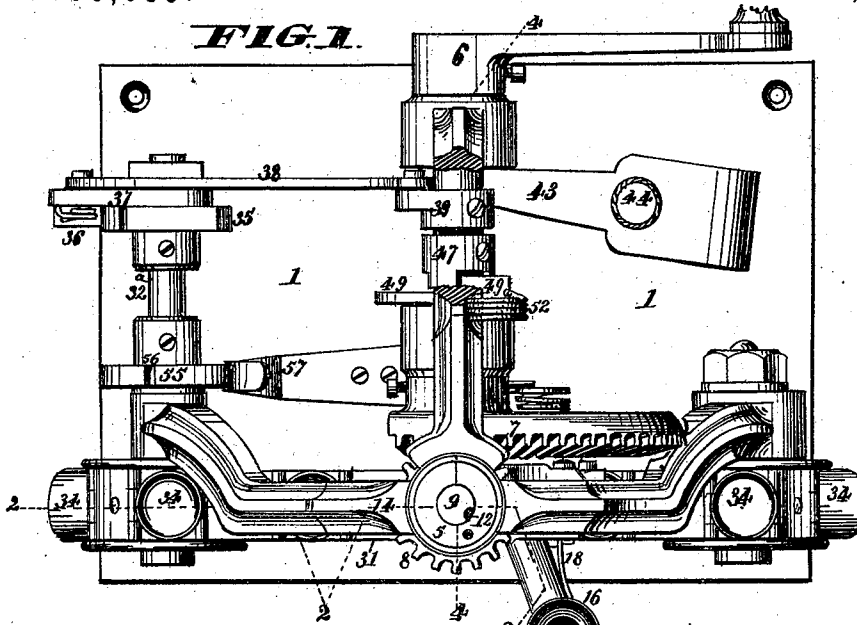
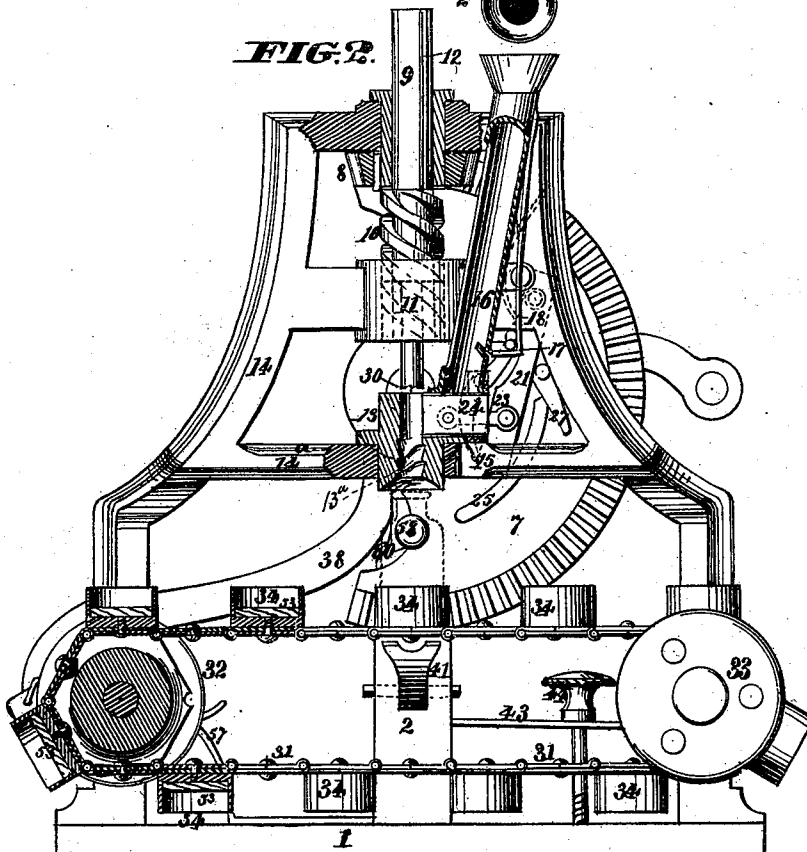


FIG. 2.



WITNESSES

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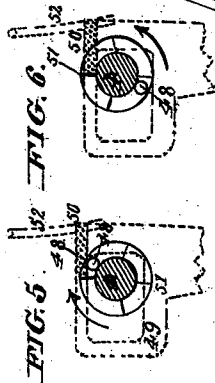
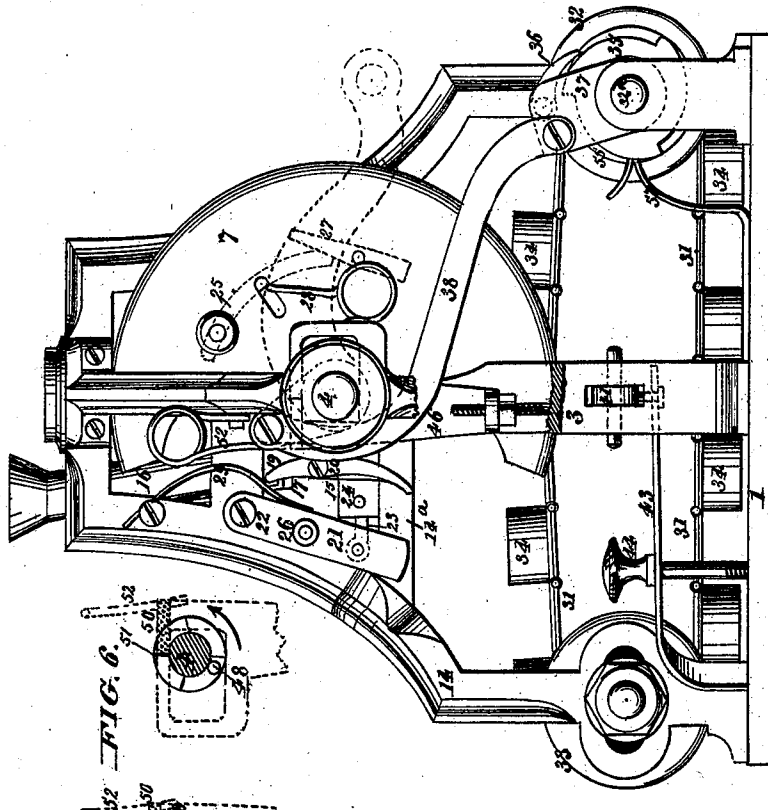
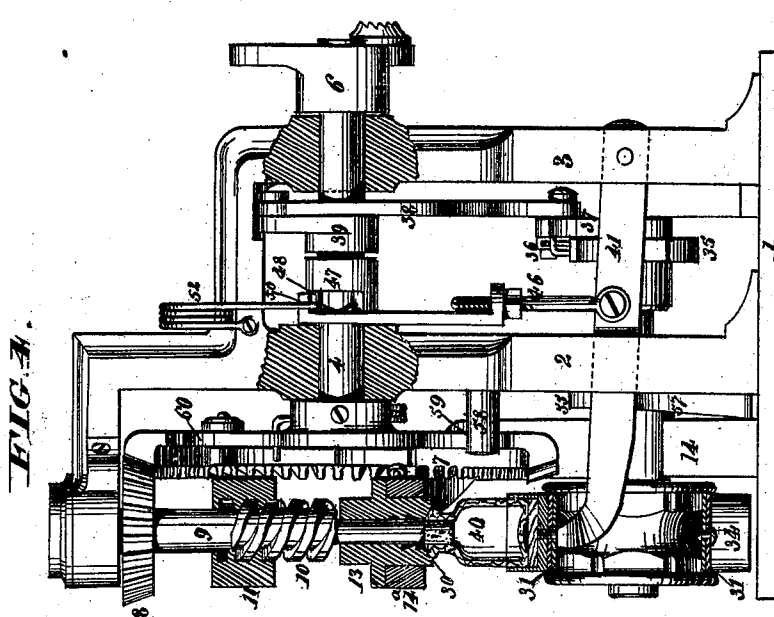
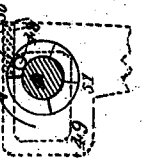


FIG. 6.



WITNESSES
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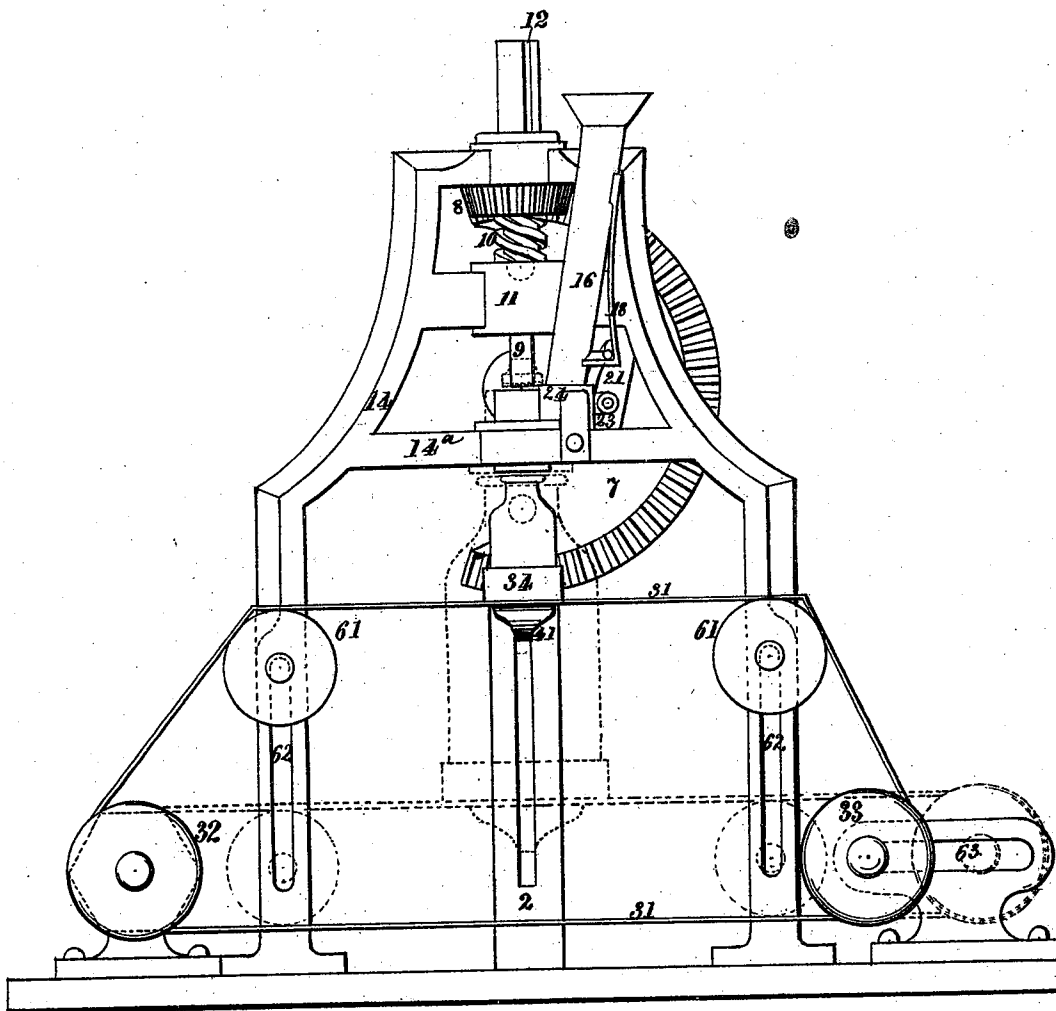
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FIG. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

MANN S. VALENTINE, OF RICHMOND, VIRGINIA.

IMPROVEMENT IN MACHINES FOR CORKING BOTTLES.

Specification forming part of Letters Patent No. **173,088**, dated February 1, 1876; application filed August 4, 1875.

To all whom it may concern:

Be it known that I, MANN S. VALENTINE, of Richmond, in the county of Henrico and State of Virginia, have invented a certain new and Improved Machine for Corking Bottles, of which the following is a specification:

This machine is adapted for the corking of bottles of all sizes, from the largest down to the smallest vials employed by druggists, the individual machine being, by preference, provided with adjusting appliances to suit bottles of different heights. It is arranged with a carrying apron or table, by which the bottles are successively presented to the corking apparatus, and, when corked, are carried away and delivered to a suitable receptacle. While receiving the cork the bottle is held up to the corker by a support with a strong spring, which latter permits it to yield under excessive pressure, to prevent breaking the bottle. The corks are contained in a magazine constructed to deliver one at a time, to be forwarded to the corking mechanism, and retain the remainder. The corking mechanism is constructed to impart a rotary motion to the cork in the act of driving it in the bottle.

It is preferred to construct the machine with reciprocating movement, one stroke forwarding the bottle to its position beneath the corking mechanism, and placing a new cork beneath the corking-plunger, the other stroke elevating and locking the bottle in position to receive the cork, and then driving the cork therein.

In the accompanying drawings, Figure 1 is a plan or top view of a machine illustrating the invention. Fig. 2 is a vertical section thereof on the line 2 2, Fig. 1, showing the corking-plunger elevated. Fig. 3 is a rear view, showing the corking-plunger down. Fig. 4 is a vertical section on the line 4 4, Fig. 3, showing a corking-plunger down and a cork driven into the bottle-neck. Figs. 5 and 6 are sectional views of details, hereinafter described. Fig. 7 is a front elevation, illustrating a modification embracing an adjustable apron, by which the machine is adapted for corking bottles of various sizes.

1 represents a bed or foundation for standards 2 3, and a frame, 14, in which are the bearings of a horizontal shaft, 4, and a rotat-

ing vertical sleeve, 5. The horizontal shaft 4 has keyed to its rear end a crank, 6, and carries at its forward end a segment-gear, 7, meshing with a pinion, 8, on the sleeve 5, which rotates within the frame 14, and has an internal spline fitting in a groove, 12, in the plunger 9, so as to impart a rotary motion to the said plunger, while permitting it to slide up and down.

On the plunger 9 is a double-threaded screw, 10, (the diameter of which can be varied,) fitting within a threaded boss, 11, on the frame 14, and serving to impart a vertical motion to the plunger as it is rotated.

The vertical and rotary motion of the plunger 9 effects the driving of the corks, as hereinafter described. This plunger descends through a corking-guide, 13, mounted on a cross-beam, 14^a, of the frame 14, which frame is attached at top to the standard 3, connecting by a lateral duct, 15, with the lower end of a magazine, 16, which contains corks, one above another. 17 represents a catch projecting into the magazine through a slot therein, and attached to the end of a spring, 18, serving to press it inward against the cork within the magazine and hold it there, while it supports the corks coming from above, and prevents the dropping of more than one at a time in front of the follower, which carries them beneath the corking-plunger. The spring-catch 17 18 is retracted at the proper moment, to allow the corks to descend, by means of a lever-tappet, 19, fulcrumed at 20 to the stationary frame-work, and operated by a lever, 21, which is fulcrumed at 22, and when drawn forward strikes with its lower end the lower end of the tappet-lever 19. The lever 21 is connected near its lower end by a link, 23, with a follower, 24, which works within the duct 15, and carries one cork at a time under the cork-plunger. The motion of the lever 21 to impart this forward movement to the follower 24, and to retract the spring-catch 17 18 by means of the tappet or lever 19, is produced by a cam-flange, 25, on the gear-wheel 7, working over a friction-roller, 26, on the lever 21. A latch, 27, held by a spring, 28, against the cam-flange 25, permits the passage of the roller-stud 26 during the stroke which throws the lever 21 forward, and immediately springs

back against the cam-flange 25, behind the stud-roller 26, so as to hold the lever 21 and follower 24 in their forward position during the one-half of the reverse stroke which drives the cork, or until the cork has fairly entered the guide and taken the threads thereof, so as to insure a spiral descent into the neck of the bottle. The face or end of the follower 24 has a concave form, so as to constitute a part of the guiding-box and make a tight fit of the cork, while the latter is driven through the upper portion of the guide. 29 represents a spring, for retracting the lever 21 as soon as it is released by the cam-flange 25 and latch 27. The extremity of the plunger 9 is formed with teeth or ridges 30, of any proper form, to hold the end of the cork, and assist in imparting rotary motion thereto during the rotation of the plunger as the cork is driven. The guiding-box 13 is formed with spiral threads or grooves 13^a, to aid the rotation.

31 represents an endless apron, stretched on rollers 32 33, and carrying seats or sockets 34, for the reception of the bottles to be corked. These seats or sockets are made adaptable to bottles of various sizes and shapes.

On the shaft 32^a of the roller 32, which is the driving-roller for the apron, is a ratchet-wheel, 35, through the medium of which an intermittent rotary motion is imparted to the roller 32, and thereby to the apron, by means of a pawl, 36, pivoted to an arm, 37, working concentrically with the roller 32 on the shaft 32^a thereof, and operated by a connecting-rod, 38, which is pivoted at its other end to the wrist of a crank, 39, on the horizontal shaft 4. The apron 37 is formed of a number of links equal in length to the diameter of the bottle-seats, and the rollers over which the said aprons work are formed with corresponding faces, giving to the periphery of the rollers a hexagonal or other necessary form. 55 represents a disk on the shaft 32^a, formed on its periphery with notches 56, one-half as many in number as the faces of the wheel 32. A spring, 57, catches in these notches in succession, so that the movement of the apron to bring each successive bottle into position for corking will be determined, and the apron will be held against accidental movement. 40 represents a bottle in position for being corked. In order to press the bottle to be corked firmly upward against the guiding-box 13, and so hold it while the cork is being driven, the part of the apron on which the bottle rests in position for receiving the cork is elevated directly before the descent of the cork-plunger by the following mechanism: 41 represents a lever, fulcrumed at 42 to the rear standard 3, in such a manner as to permit a slight vertical play to said lever, and held down by a spring, 43, which is adjustable by means of a set-screw, 44, to regulate the resistance of the spring to the outward strain of the lever 41. The power is applied to the lever 41 at 45 by means of a connecting-rod, 46, resting at its upper extremity on a cam or boss, 47, on the horizontal shaft

4, the said cam being so formed as to gradually lower the lever 41 when the bottle is to be released. The upper end of the connecting-rod 46 forms a yoke, 49, embracing the shaft and its cam 47 and a pin, 48, which forms a supplement or addition to the said cam. The yoke 49 is formed with a lateral extension, 50, which, when the bottle-seat is lowered, rests on the shaft and against a radial stop, 51, as illustrated in Fig. 6. The next motion of the shaft in the direction indicated by the arrow in Fig. 6, carrying the cam 47 under the lateral projection 50 of the yoke, elevates the connecting-rod 46 and lever 41 to prepare the bottle to receive the cork, and firmly hold it while the cork is being driven. At the extremity of this motion of the shaft the lateral projection drops slightly off the cam 47 and on the pin 48, as illustrated in Fig. 5, until the motion of the shaft is again reversed in the direction indicated by the arrow in Fig. 5, the first of which is to carry the yoke and the upper end of the connecting-rod in a horizontal direction by the contact of the end of the cam 47 until said cam can pass below the lateral projection 50, which projection rests again on the periphery of the cam until the parts approach the position shown in Fig. 6. 52 represents a spring to press the upper end of the connecting-rod horizontally against the face of the shaft or against the cam therein, as the case may be. On the bottom of each bottle-seat is a gum spring or cushion, 53, to form an elastic support for the bottle while receiving the cork.

58 represents a stop-pin or stud projecting from the standard 2, serving to arrest the motion of the segment-gear 7 at the termination of each stroke thereof, the said segment being formed with notches 59 60 in a precisely diametrical line, engaging with the said stop-pin, so that the segment-wheel may make precisely half a revolution at each stroke.

In the modification shown in Fig. 7, 32 33 represent the main driving-rollers of the apron in a corking-machine of large size. They are extended beyond the frame on either side of the bed of the machine. 61 61 represent two other rollers working in slots 62 62 in the frame, the size of these rollers depending on that of the machine. These can be set to any height by set-screws working through the slots 62 62. When the rollers 61 61 are raised to the position shown they raise the apron 31, so as to receive a much smaller bottle. The roller 33 is allowed to slide through the slot 63, and take the position shown, or any intermediate position that will keep the apron 31 tight. The lever that raises the bottle in proper position to receive the cork can be arranged to rise through a slot in the rear standard, working so as to regulate it for any size bottle. The piston and corking guide can be so arranged as to change them with very little trouble to suit the variation in the cork for different size bottles.

Operation: The hasp being in the position shown in Fig. 2, and the magazine 16 supplied

with corks, and the bottles being placed in the various bottles' seats on the upper part of the apron, a fresh bottle may be supposed to have been carried to its position beneath the plunger, as represented. The crank-arm 6 is now reversed from the position shown in the front view, Fig. 2, to the opposite position indicated in dotted lines in the rear view, Fig. 3, the effect of which is, first, to raise the connecting-rod 46 from the position shown in Fig. 6 to that shown in Figs. 4 and 5, pressing the bottle 40 firmly up against the mouth of the corking-guide; second, to rotate the plunger 9 by means of the segment-gear 7, causing it to descend on the cork 54, which has been forced into position in the corking-guide and held and firmly pressed by the follower 24. The downward and rotary motion of the plunger is imparted to the cork, the follower releasing it as it passes into the corking-guide 13, so that the cork is forced into the bottle-neck with a spiral movement. The latch 27 holds the follower 24 firmly in this position while the cork is being driven through the upper portion of the guide, and then permits the follower to be thrown back by its retracting-spring to receive a new cork from the magazine in readiness for the next operation. The crank-arm 6 being now again reversed to the position shown in Fig. 2, the plunger 9 is thereby again elevated, the bottle is released by the lowering of the lever 41, the apron 31 is moved, carrying a new bottle under the plunger, and the follower 24 is moved forward, carrying a new cork beneath the plunger in the corking-guide.

Any suitable device is employed for conveying the corked bottles away as they are deposited one by one by the apron. Such device may consist of an automatic hand and an endless conveyer, of any necessary length, or a reciprocating carrier, moving in proper unison with the apron, so as to take the bottles one

by one, as they are dropped, and deposit them in a suitable receptacle.

The following is claimed as new:

1. A corking-machine constructed with a plunger, receiving a combined vertical and rotary motion, substantially as and for the purposes set forth.

2. The combination of the vertically moving and rotating plunger 9 and the spirally-grooved corking-guide 13, substantially as described.

3. The combination of the cork-magazine 16 and spring-catch 17 18 with the follower 24, for delivering the corks successively, as described.

4. The combination of the intermitently-moving apron 31 and the elevating-lever 41 with the corking-guide 13, for carrying the bottles successively beneath the said corking-guide, and elevating them in fixed position to receive the corks.

5. The spring 43, to afford a yielding bearing to the elevating-lever 41, by which the bottles are supported in position for corking.

6. The combination of the cam 47, pin 48, connecting-rod 46, and horizontal shaft 4, operating substantially as and for the purposes set forth, in connection with the elevating-lever 41.

7. The combination of the ratchet-wheel 35, pawl 36, apron 37, connecting-rod 38, and crank 39, for imparting intermittent motion to the shaft 32^a of the driving-roller of the apron, as explained.

8. The combination of the notched disk 55 and spring-catch 57, to determine the intermittent motion of the apron 31, and retain it against accidental movement, as explained.

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Witnesses:

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