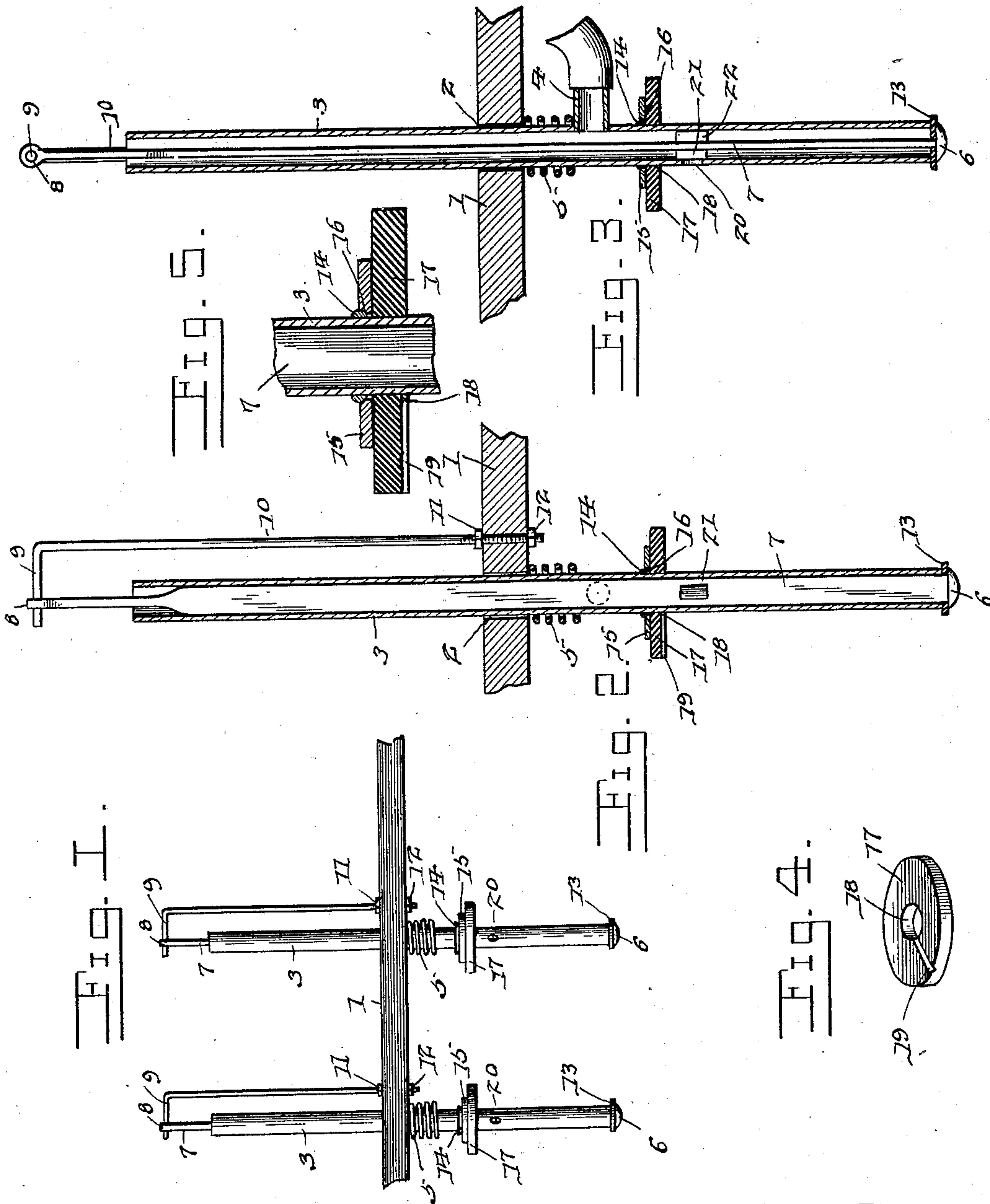


No. 665,893.

Patented Jan. 15, 1901.

G. W. FIELD.
BOTTLE FILLING MACHINE.
(Application filed Apr. 16, 1900.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE W. FIELD, OF NORTH BRANCH, NEW JERSEY.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 665,893, dated January 15, 1901.

Application filed April 16, 1900. Serial No. 13,085. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. FIELD, a citizen of the United States, residing at North Branch, in the county of Somerset and State of New Jersey, have invented a new and useful Bottle-Filling Machine, of which the following is a specification.

The invention relates to improvements in bottle-filling machines.

One object of the present invention is to improve the construction of bottle-filling machines, more especially the valve mechanism for closing the filling-tubes and for providing vents for the escape of air as the liquid is introduced into the bottles or other receptacles.

A further object of the invention is to provide a simple and efficient device adapted to close the mouth of a bottle or other receptacle and conform to the configuration of any irregularities of the neck of the same and capable of automatically opening a vent when it is desired to remove the filling-tubes from the receptacle to admit air to the interior of the latter and thereby prevent suction.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is an elevation of a portion of the support of a bottle-filling machine provided with valve mechanism constructed in accordance with this invention. Figs. 2 and 3 are enlarged vertical sectional views of the same, taken at right angles to each other. Fig. 4 is a detail perspective view of the elastic gasket or cap. Fig. 5 is an enlarged detail sectional view illustrating the manner of mounting the elastic cap or gasket.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a horizontal support which may consist of a vertically-movable beam or which may be constructed and arranged in any desired manner, and it is provided with a series of vertical openings 2 for the reception of filling-tubes 3, which are loosely arranged in the said openings and which extend above and below the support. Each filling-tube is provided below the support 1 with a branch 4, which is adapted to be connected with a

suitable tank or reservoir containing a liquid to be supplied to the bottles or other receptacles, and a coiled spring 5 is interposed between the support and the branch 4 and is adapted to force the loosely-mounted filling-tubes downward to cause a valve 6 to close its lower end. The valve 6 is arranged at the lower end of a rigidly-mounted valve-stem 7, constructed substantially the same as that shown and described in an application for patent filed by me on or about October 21, 1899, in the United States Patent Office, Serial No. 734,362. The valve-stem, which is flat, divides the filling-tube into two separate channels or passages, one of which communicates with the branch tube and the other forms a vent when the valve 6 is open to permit air to escape from the bottle or receptacle as the air flows therein. The upper end of the valve-stem is provided with an eye 8, which receives a horizontal arm 9 of a resilient supporting-rod 10, adapted to be sprung out of engagement with the eye. The resilient rod 10, which has its lower end threaded for the reception of nuts 11 and 12, is adjustable, and it is adapted to hold the flat valve-stem rigidly in proper position and is capable of preventing the same from turning in the filling-tube. The valve 6 is rigidly secured to the lower end of the valve-stem or it may be formed integral therewith, and it is preferably provided with an elastic washer or gasket 13 to form a tight joint when it is in engagement with the lower end of the filling-tube.

The filling-tube is provided at a point below the support 1 with an exterior ring or flange 14, having a rounded outer face and adapted to form a bearing similar to a ball-and-socket joint for a plate 15, which is provided with a corresponding groove 16 and which has an opening for the filling-tube. This construction forms a rocking bearing to permit an elastic cap or gasket 17 to conform to any irregularities of the neck of a bottle or receptacle and even to assume an inclined position if necessary to close such receptacles. The elastic cap or gasket 17 is provided with a central opening 18 of considerably less diameter than the filling-tube, so that the said cap or gasket must be stretched to arrange it on the tube, and the frictional

engagement between the elastic gasket or cap 17 and the tube is sufficient to retain it and the plate 15 in position.

The support 1 may be vertically movable to engage the elastic cap with the neck of a bottle or other receptacle and compress the spring to open the valve, or the bottles may be moved vertically against the elastic caps or gaskets to effect the same result, and the said elastic caps or gaskets are adapted to expand and contract sufficiently to preserve an air-tight connection between the tube and the receptacle during the operation of filling the latter.

In order to prevent any suction in removing the receptacles from the filling-tubes, each elastic cap or gasket is provided with a channel or gutter 19, which is closed by the pressure incident to the compression of the coiled spring 5 during the operation of filling, but which opens automatically through the expansion of the rubber when the pressure is removed, thereby admitting air to the interior of the bottle and preventing the pressure of the exterior air from creating a suction. One or more grooves or gutters may be provided and they may be formed in any suitable manner, as will be readily understood.

The filling-tubes may be constructed of a length substantially the same as those illustrated in the said application; but when the machine is employed for filling bottles with a liquid liable to foam the tubes are preferably extended to within a short distance of the bottom of the bottles or receptacles to deliver the liquid at that point, whereby the liability to foam is reduced to a minimum. Each tube is provided near the top of the bottle or receptacle at a point immediately below the rubber cap or gasket 17 with an aperture 20, forming a vent and communicating with one of the passages formed by the valve-stem. This aperture is simultaneously opened or exposed with the opening of the valve, and when the valve is closed it is covered by a supplemental valve 21, extending from one side of the valve-stem, and the latter is provided at the opposite side with an arm 22, adapted to bear against the filling-tube and designed to hold the supplemental valve firmly over the valve or vent-aperture 20. Instead of constructing the supplemental valve in this manner it may be of any other form. The aperture when open permits the air to escape from the receptacles, and thereby enables the liquid to flow through the filling-tube more freely, and by carrying the lower end of the filling-tube within a short distance of the bottom of the bottle the foaming of the liquid is reduced to a minimum.

It will be seen that the resilient support 10 is adapted to be readily sprung out of engagement with the valve-stem and that it is adapted to hold the same in proper position with relation to the branch tube and the aperture of the filling-tube. Furthermore, it

will be clear that the joint or connection between the elastic cap or gasket 17 and the filling-tube permits the former to be arranged at an angle or in a horizontal position to conform to the configuration of an irregular bottle, and that the gutter or channel, which forms a vent, is automatically closed by the pressure exerted on the elastic cap or gasket incident to the operation of the machine, and that the channel or gutter opens automatically when such pressure is removed.

What is claimed is—

1. In a machine of the class described, the combination of a filling-tube, a valve-stem dividing the filling-tube into separate passages, a valve connected with the stem and a resilient support detachably engaging the stem and adapted to hold the same in proper position with relation to the filling-tube, substantially as described.

2. In a machine of the class described, the combination of a filling-tube, a valve-stem dividing the filling-tube into separate passages and provided with an eye, a valve carried by the stem, and a resilient support detachably engaging the eye of the stem, substantially as described.

3. In a device of the class described, the combination of a filling-tube designed to extend to the bottom of a receptacle and having an aperture located between its ends, a considerable distance above its lower end, whereby it is arranged adjacent to the mouth of the receptacle and at a point above the liquid when the receptacle has received its contents, a cap located above the aperture for closing the mouth of the receptacle, a valve-stem arranged within the filling-tube and forming a separate air-passage communicating with the said aperture, and valves located at the top and bottom of the receptacle and operated by the valve-stem for closing the aperture and the lower end of the filling-tube, substantially as described.

4. In a machine of the class described, the combination of a filling-tube having an aperture, a valve-stem, a valve carried by the stem for closing the lower end of the filling-tube, a supplemental valve carried by the stem for covering and uncovering the aperture, and an arm extending from the stem and bearing against the filling-tube at a point opposite the supplemental valve, substantially as described.

5. In a machine of the class described, the combination of a filling-tube having a movably-mounted cap adapted to fit over the neck of a bottle and capable of rocking or oscillating and thereby automatically adjusting itself to any irregularities of the neck, a valve, and means for operating the same, substantially as described.

6. In a machine of the class described, the combination of a filling-tube provided with an elastic cap provided with a gutter or channel forming a vent and adapted to be automatically compressed to close the same, said

gasket or cap being capable of expanding when the pressure is removed to open the vent automatically and prevent the receptacle from being lifted by the filling mechanism, and means for controlling the passage of a liquid through the filling-tube, substantially as described.

7. In a machine of the class described, the combination of a filling-tube having an exterior rounded flange or collar, a plate having a groove to receive the flange or collar and adapted to rock on the same, and an elastic cap or gasket arranged beneath the plate and adapted to engage the neck of a bottle, substantially as described.

8. In a machine of the class described, the combination of a filling-tube having an exterior rounded flange or collar, a plate detachably arranged on the tube and having a groove to receive the flange or collar and adapted to rock thereon, and an elastic cap or gasket arranged beneath the plate and retaining the same on the tube, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE W. FIELD.

Witnesses:

H. F. RILEY,

J. ROSS COLHOUN.