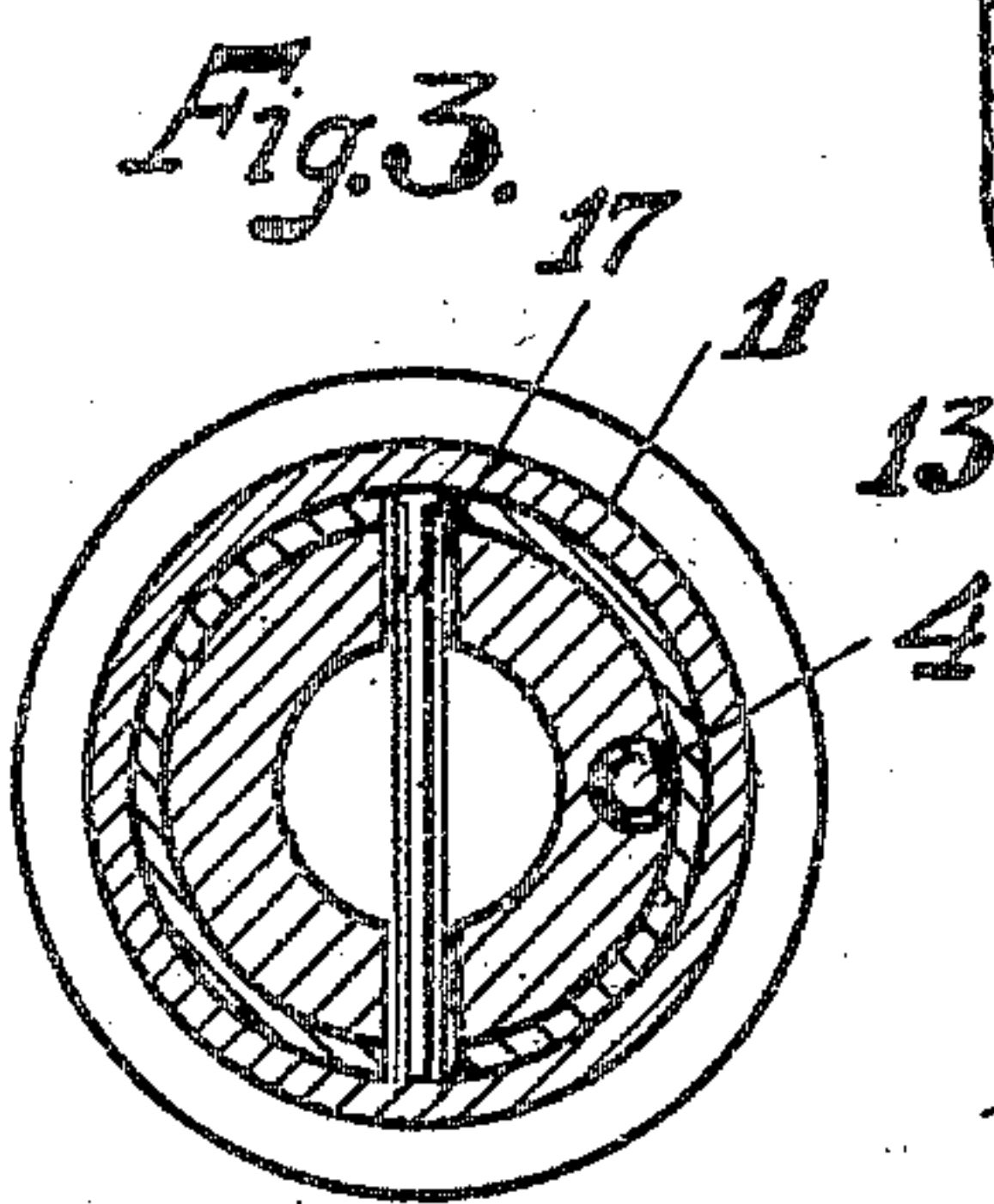
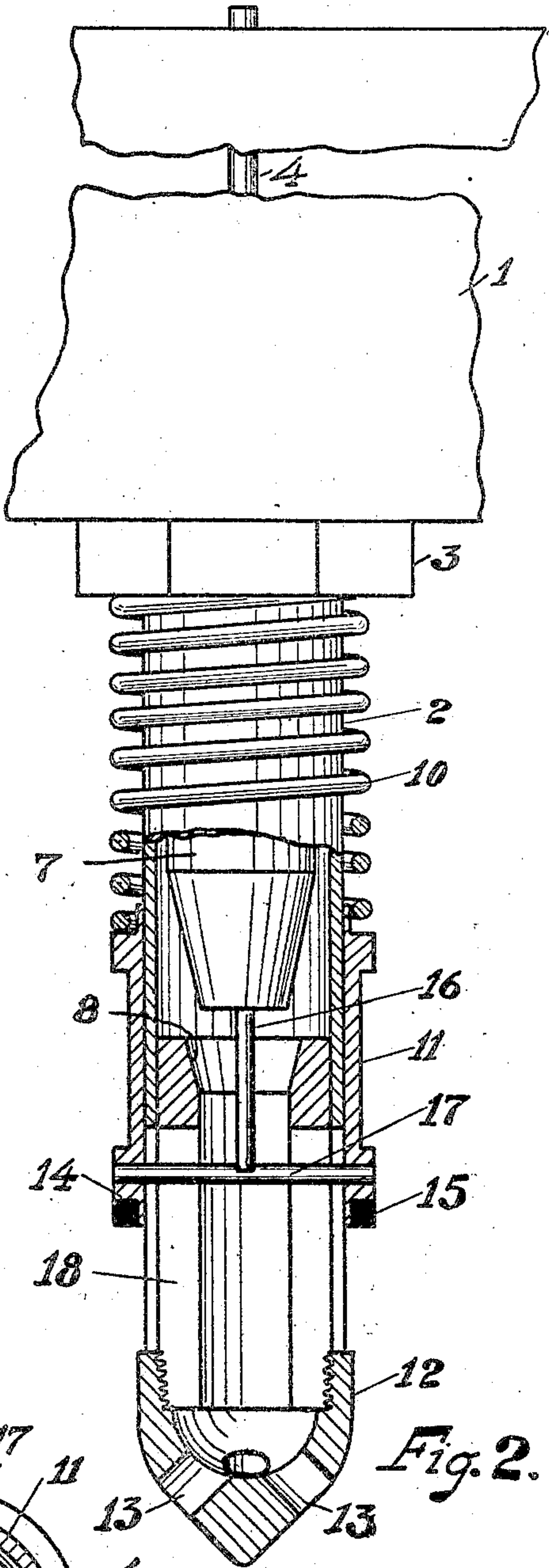
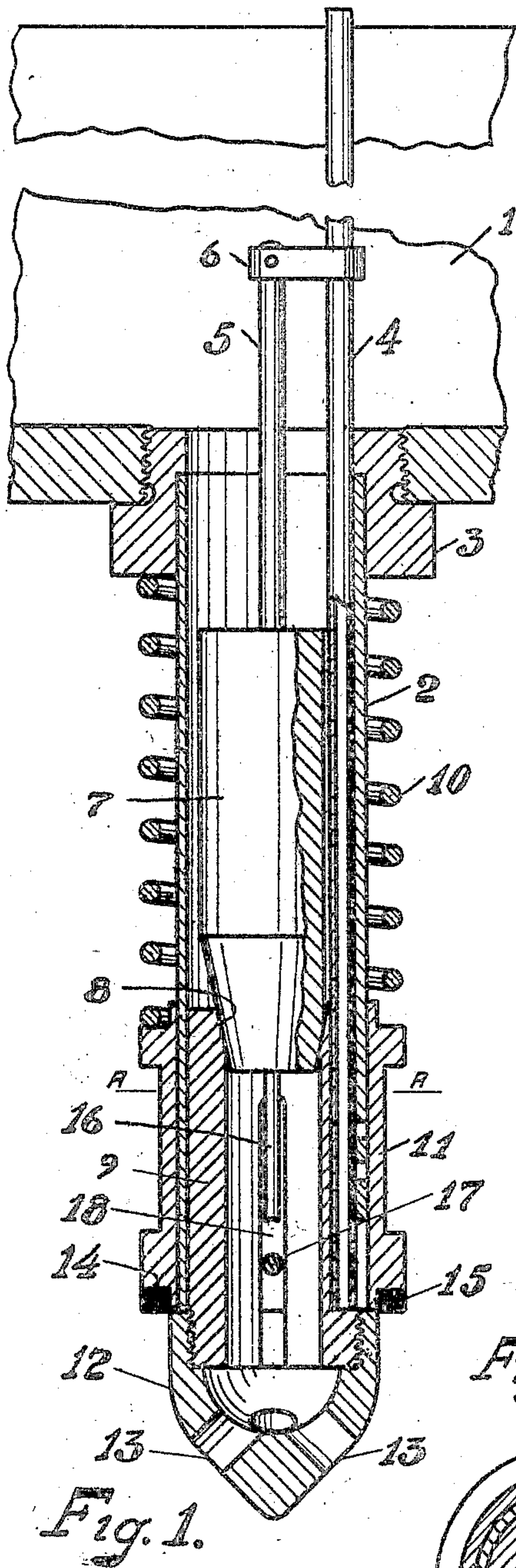


R. LITTLER.
BOTTLE FILLING VALVE.
APPLICATION FILED SEPT. 10, 1909.

976,085.

Patented Nov. 15, 1910.



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UNITED STATES PATENT OFFICE.

ROBERT LITTLER, OF WESTGROVE, PENNSYLVANIA.

BOTTLE-FILLING VALVE.

976,085.

Specification of Letters Patent.

Patented Nov. 15, 1910.

Application filed September 10, 1909. Serial No. 517,034.

To all whom it may concern:

Be it known that I, ROBERT LITTLER, a citizen of the United States, residing at Westgrove, in the county of Chester and State of Pennsylvania, have invented new and useful Improvements in Bottle-Filling Valves, of which the following is a specification.

This invention relates to improvements in bottle filling valves and particularly to that class used in connection with machines adapted to operate on a plurality of bottles simultaneously. Its objects are: first, to provide a valve that will unerringly fill bottles full, irrespective of their holding capacity or variations in the amount of liquid which they may contain; secondly, to provide a filling means adaptable to any suitable filling machine construction, and finally to provide such filling means so arranged that leakage or loss of liquid cannot occur, even when the tops or mouths of the bottles operated upon are chipped, irregular or rough and which will not cause breakage of the bottles, except by gross misuse; these and allied objects are attained by the mechanism hereinafter fully described and shown in the accompanying drawings, forming part of these specifications, and in which:

Figure 1, is a front elevation, partially in section, of the complete valve construction, showing the same closed. Fig. 2, is a similar view of the same, but shown as having been turned through an angle of 90 degrees and the valve in position to deliver liquids. Fig. 3, is a transverse sectional view, taken on a line indicated by characters *a-a* of Fig. 1.

Similar reference numerals refer to similar parts throughout the several views.

The invention comprehends the use of a suitable liquid containing tank or reservoir 1, of any size or shape compatible with its purpose—which is merely to act as a supply source for the liquids with which the bottles are to be filled—and is not a component part of the present invention.

At the bottom of the reservoir 1, and extending down therefrom, is removably attached a hollow stem or casing tube 2, through the medium of a plug 3, having screw threads tapered so as to form a tight joint, or a shoulder so formed as to serve the same purpose; obviously the end of the tube does not extend above the inner level of the reservoir bottom.

Within the tube 2, and secured to one side thereof, is an air vent tube 4, extending from the lower end—and arranged to communicate with the open interior of the bottle when the bottle shall be raised—to a point above the fluid level of the reservoir. 1: said vent tube also acts as a guide for the plunger stem 5, to which it is connected by the yoke 6, sliding freely on the tube and rigidly attached to the stem 5; this stem has, at its lower end, the relatively heavy, conical ended valve 7, which is fitted to an appropriate seat 8, formed in the upper end of the bushing 9, which is fitted within, and secured to, the lower end of the tube 2.

Sufficient space is provided between the outside of the valve body 7, and the inside of the tube 2, to permit of free passage of liquids at all times except when the valve is in its lower, normal position, or closed.

Encircling the tube 2, is a coiled spring 10, abutting at its upper end against the head of the plug 3, and adapted to exert pressure against the sleeve 11, which is freely slidable longitudinally on the outer surface of the tube 2.

Removably attached, by screw threads, to the extreme lower end of the bushing 9, below the valve seat 8, is a hollow conical nozzle 12, provided with apertures 13, for the discharge of liquid and adapted to enter into and center the bottle as it is raised; the nozzle 12, also serves to retain the sleeve 11, upon the casing tube 2, against the thrust of the spring 10.

A seat 14, is formed at the normal base of the sleeve 11, and is adapted to receive and retain the semi-resilient rings 15, which are made of material capable of being sterilized and rendered anti-septic, by heat or chemical treatment, without injury to themselves and which are readily renewable.

At the lower end, and central with the valve 7, is attached a pin 16, extending downward and adapted to make contact with the bar 17, extending across the sleeve 11, to which it is attached at both ends; this bar 17, is free to move up and down within the slots 18, formed longitudinally through the bushing 9, and casing tube 2; the whole being so arranged that as the sleeve 11, is raised the point of the pin 16, contacts with the bar 17, thereby raising the valve 7, and thus opening a clear passage throughout the tube 2, at that time communicating directly with the bottle, the cap seat of which is

tightly pressed against the ring 15, in the action of raising the sleeve; said act being accomplished through the medium of the bottle and mechanism for raising the same.

5 I prefer to use a round bar for part 17, as the same is more readily fitted into sleeve 11, which conveys vertical motion to it, and for the same reason part 16, is also made round and set rigidly into the center of the
10 valve 7, at its extreme lower end; while the same results might be obtained by combining parts 16 and 17, into one reversed T shaped part, it would require far more work in its construction, be more liable to disarrangement and accomplish, at best, no more
5 than the simple arrangement indicated.

In the foregoing construction it will be seen that as the part sealing or forming joint contact with the bottle does not touch
20 the upper part or end of the bottle but rests upon the inner, annular ledge therein, adapted to receive the cap or bottle closure, that chipped, irregular or rough edges on the mouth of the bottle are immaterial so far as
25 leakage is concerned, the joint being made interiorly and independent thereof; also that when the valve is closed, obviously all the liquid pressure is within the casing tube and, as there are no joints above the valve.
30 no leaks can occur in the process of filling from either valve construction or from slightly defective or imperfect bottles. It may also be noticed that the several parts can be readily dismounted from the reservoir and disconnected from each other; that
35 they are of such shape as to be thoroughly cleansed without the use of special appliances and that the liquid passes through a straight, uninterrupted channel—except for
40 the valve seat—and direct from the reservoir to the bottle; no packings, gaskets, etc., are used and that the liquid does not come into contact with springs or other parts difficult of access in the process of cleansing and
45 anti-septic treatment.

In operation, one or more bottles, according to the capacity of the machine, are placed upon a suitable table having means connected therewith for raising and lowering
50 the same; said table being located directly below the liquid reservoir and at a suitable distance therefrom; when the table is raised the bottles first make contact with the conical nozzle, which guides or centers
55 them in register or alinement with the casing tubes; as the bottles rise, the semi-resilient annular rings enter the mouths, resting on the interior annular ledges or seats and forming tight joints therewith; further upward movement of the bottles causes the

sleeves to slide upward on the exterior of the tubes, against the pressure of the springs, bringing the bar set in the sleeve against the valve pin, raising the same and thus opening a clear passage therethrough; at the
65 same time all air or gas contained in the bottles or entrained in the entering fluid, escapes through the vent tube, so that froth and bubbles are not caused. Thus notwithstanding the holding capacity of the bottles—
70 they will obviously become filled full to the level of the seat, minus the small and constantly uniform quantity displaced by the conical nozzle.

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

1. A bottle filling valve comprising a tubular casing, having a conical valve seat at its lower end, a valve loosely contained
80 in said casing, fitted to said seat, a stem attached to and extending above said valve, a vent tube positioned at one side and within the casing, connections between the vent tube and valve stem whereby the latter is
85 guided by the former, a sleeve slidable on the casing, a resilient annular pad attached to the sleeve and adapted to contact with the seat formed interiorly of a bottle, an expansion spring surrounding the said casing and
90 adapted to exert its tension against the sleeve downwardly and means combined with the sleeve adapted to raise the valve upon raising the sleeve above a certain
95 point.

2. In combination with a bottle filling mechanism, comprising a liquid containing reservoir, of a hollow casing having means of connection with the bottom of the reservoir and level with the inner surface thereof,
100 a conical valve seat formed at the lower end of said casing, a gravity operated valve fitted thereto, said valve being of lesser cross sectional area than the interior of the casing, a sleeve slidable on the exterior of the casing
105 adapted to make liquid tight contact with a bottle top, means to exert a tension on said sleeve toward the end of the casing, means to limit the movement of the sleeve downward and means combined with the sleeve to
110 raise the valve coincidently with raising the sleeve above a certain point.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

ROBERT LITTLER

Witnesses:

C. H. WESTBOOK,
WM. GILL.