

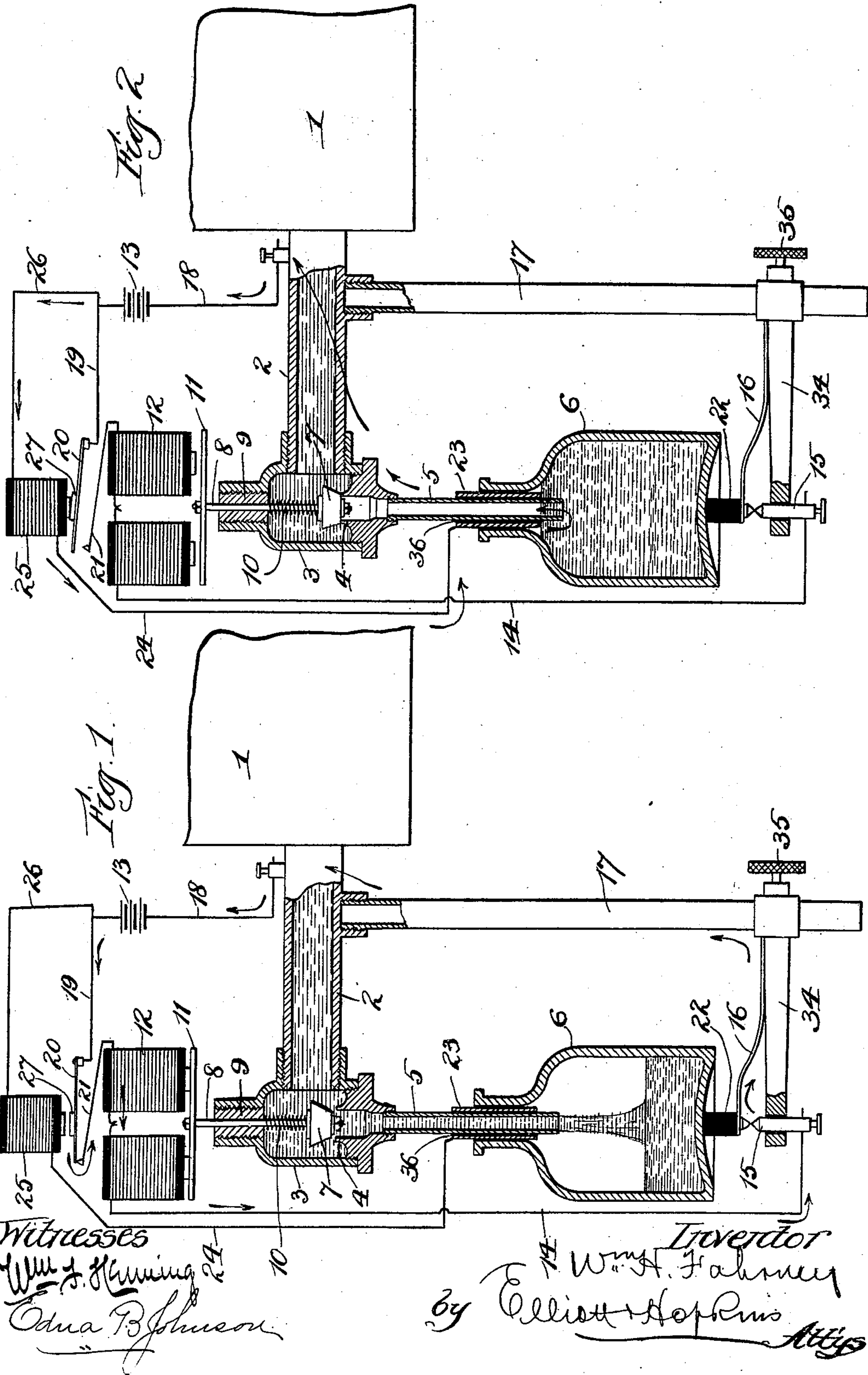
(No Model.)

2 Sheets—Sheet 1.

W. H. FAHRNEY.
BOTTLE FILLER.

No. 563,464.

Patented July 7, 1896.



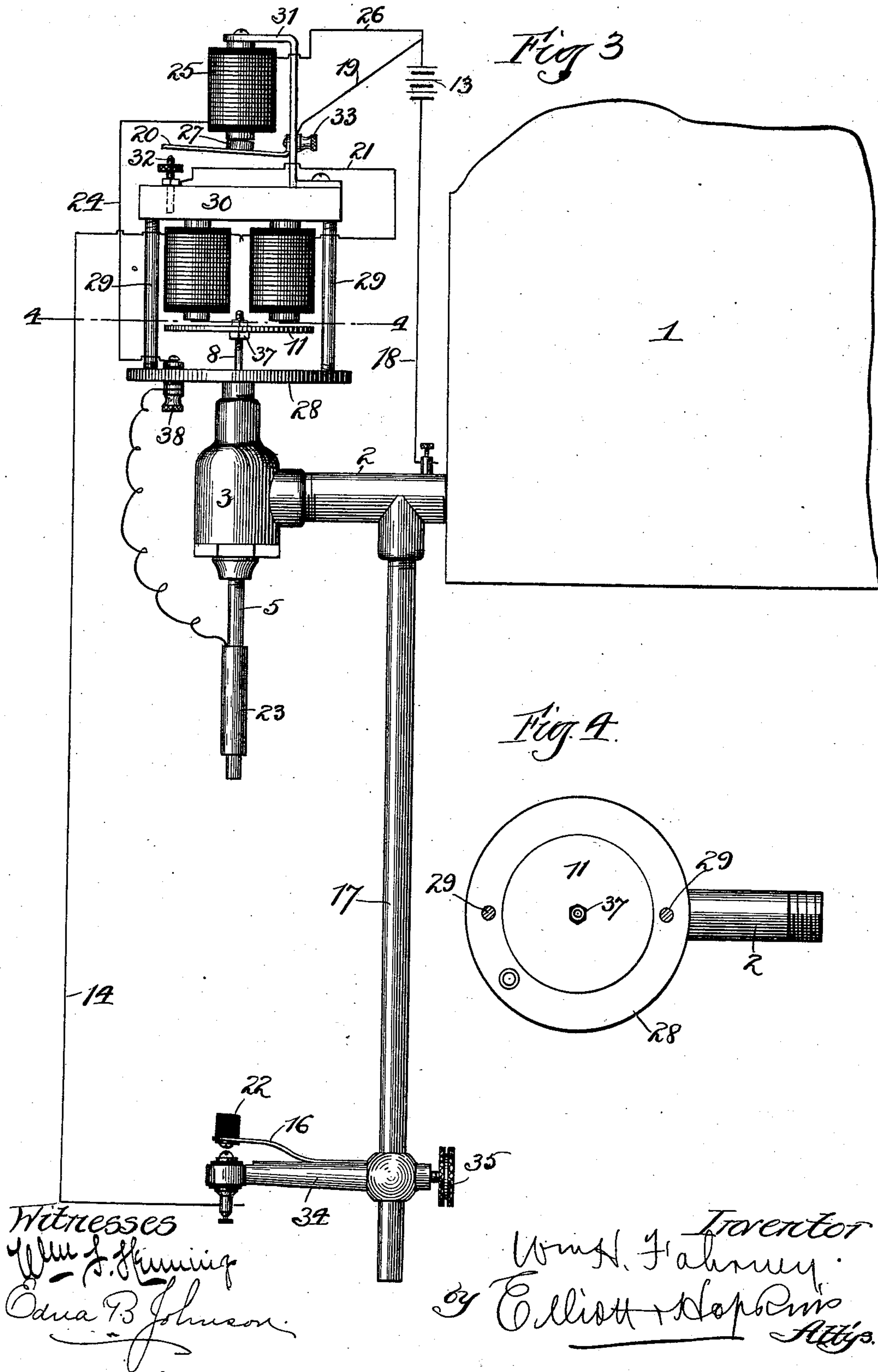
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UNITED STATES PATENT OFFICE.

WILLIAM HENRY FAHRNEY, OF CHICAGO, ILLINOIS.

BOTTLE-FILLER.

SPECIFICATION forming part of Letters Patent No. 563,464, dated July 7, 1896.

Application filed March 11, 1895. Serial No. 541,228. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY FAHRNEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bottle-Fillers, of which the following is a full, clear, and exact specification.

My invention relates to means for holding open the valve between the bottle and the supply until the level of the liquid in the bottle has reached a predetermined point, and then closing such valve or permitting it to close. It has heretofore been proposed to effect this operation by means of a float so arranged that the liquid upon rising to a certain level would raise the float against two contacts and thus close the circuit through the float and shut off the supply; but in practice it is found that this prior method is ineffectual, because, owing to the necessarily small dimensions of the float, its buoyancy is too slight to produce sufficient pressure on the contacts (which are often coated with the dried substance of which the bottle is filled) to complete the circuit. Then, again, in the majority of instances, the liquid is more or less adhesive, which property in some cases causes the float to stick, while it invariably renders the movement of the float so slow that the bottle becomes too full before the float reaches the contacts.

The invention has for its primary object to cause the liquid in the bottle to constitute the conductor for automatically effecting the closing of the valve the instant the level of the liquid in the bottle reaches a certain point, thus insuring absolute accuracy and uniformity of measurement in filling, and consequently avoiding a great source of annoyance heretofore caused in bottle-fillers lacking these advantages.

A further object of my invention is to cause the valve to automatically open when the bottle is placed in position for filling.

My invention consists, primarily, in regulating the discharge into the bottle by means of an electric current closed through the liquid itself in the bottle.

With a view to attaining the described objects and certain other objects hereinafter appearing my invention consists, further, in

certain features of novelty hereinafter described, and particularly pointed out in the claims, reference being had to the accompanying drawings, showing an example of my improved apparatus for carrying out my improved method.

In the said drawings, Figure 1 is a diagrammatic view of the improved apparatus, showing the valve open and the bottle filling. Fig. 2 is a similar view of the same, showing the valve closed and the bottle filled. Fig. 3 is a side elevation of the apparatus, showing its construction more in detail, the bottle being omitted; and Fig. 4 is a detail plan section taken on the line 4 4, Fig. 3.

Like signs of reference indicate like parts throughout the several views.

In adapting my improvements and method for use in connection with a bottle-filler having a valve which controls the discharge from the supply into the bottle, I hold the valve open by means of electromagnetism, and cause such valve to close by gravity or other means when the current producing such electromagnetism is broken by a second current closed through the liquid in the bottle when such liquid reaches a predetermined point. I find it more convenient, practical, and preferable to hold the valve open by the magnetic influence and to permit it to close by gravity, assisted, if desired, by a spring or other means, instead of holding it closed by the magnetic influence and forcing it open by a spring or equivalent device; but it will nevertheless be understood that this latter arrangement is but an obvious reversal of that which I have described and shown as the preferred way.

Referring now more particularly to Figs. 1 and 2 of the drawings, 1 represents the tank or supply, from which extends a pipe 2, leading to a valve-chamber 3, having a valve-seat 4, from which depends the bottle-pipe 5, through which the liquid discharges into the bottle 6. Within the valve-chamber 3 is located a valve 7, whose stem 8 passes upward through a plug 9 in the upper side of the valve-chamber and has sleeved upon it a coil-spring 10 for assisting gravity and the weight of the liquid in the chamber to quickly and firmly seat the valve. The upper or outer end of the stem 8 is provided with an

armature 11, over which is supported an electromagnet 12, which, when energized, raises the armature and consequently holds the valve 7 from its seat against the influence of the spring 10. The electromagnet 12 is in circuit with a source 13 of electricity through the medium of the conductor 14, the isolated contact 15, the switch 16, the arm 17 of the frame, the conductor 18 in electrical connection with such arm 17 and with one pole of the source 13, while the other pole of such source 13 connects with the other end of the helix of magnet 12 through the medium of the conductor 19, the switch 20, and conductor 21. Thus it will be seen that so long as the described circuit is complete the magnet 12 will attract the armature 11 and hold the valve open, but as soon as the bottle is removed from its support 22, situated on the spring-switch 16, the latter will rise out of connection with the contact 15 and break the described circuit, thereby permitting the valve to close instantly and prevent further escape of the liquid. In order, now, that the described circuit may also be broken when the liquid in the bottle reaches a predetermined level, the bottle-pipe 5 is provided with an isolated contact 23, which, like the bottle-pipe 5, projects downwardly into the bottle, but preferably terminates a considerable distance above the lower end of the pipe 5. This isolated contact 23 is connected by conductor 24 to one end of the helix of an electromagnet 25, while the other end of such helix is in electrical communication with the source of electricity 13, via conductor 26, the pipe 5 being metal or provided with an electrical connection extending from its lower end to the metal fittings or castings to which it is connected, or any other electrical communication may be established between the lower end of the pipe 5 and the pole 18 of the battery 13.

The magnet 25 is arranged opposite an armature 27 on the switch 20, so that the instant the magnet 25 is energized the armature 27 will be attracted and the circuit through the magnet 12 broken. Hence it will be seen that when the liquid in the bottle rises sufficiently high to place the isolated contact 23 and pipe 5 in electrical communication, the magnet 12 will be deenergized and the valve 7 allowed to fall and shut off the discharge, and such position of the valve will exist so long as the armature 27 is attracted. As soon as the bottle is removed, however, the circuit through the magnet 25 will be broken; but before the magnet 25 becomes deenergized by this interruption of the current the switch 16 will leave the contact 15 and thus maintain the breakage of the current through the magnet 12 and consequently prevent the latter from reopening the valve before another bottle is inserted.

In the practical construction of my apparatus shown in Figs. 3 and 4 the magnets and superposed mechanism are supported on

a plate 28, which in turn is supported upon the upper side of the valve-chamber 3, and is provided with a pair of standards 29, which carry a cross-bar 30 at their upper ends, to which the poles of the magnet 12 are secured, and upon this cross-bar is mounted a bracket 31, from which depends the magnet 25, and to which is also secured the switch 20, which, when the magnet 25 is deenergized, drops into connection with a contact-point 32, and this in turn is connected to the conductor 21, the switch 20 being connected by binding-post 33 to the conductor 19.

The isolated contact 15, to which the conductor 14 is connected, is carried by an arm 34, mounted upon the arm 17, and being adjustably held in position on the latter arm by thumb-screw 35. The arm 34 carries the switch 16, upon which is mounted the support 22 for the bottle, which support is preferably composed of non-conducting material. By this means it will be seen that the arm 34 may be raised and lowered on the rod 17, and thus cause the pipe 5 and contact 23 to project more or less into the bottle and thereby vary the quantity of liquid in the bottle. The rod 17 is preferably of metal, so as to serve as an electrical conductor as well as a support, and it is secured in any suitable way to the pipe 2, which is also of metal, for the sake of its electrical conductivity.

The isolated contact 23 is preferably in the form of a tube or sleeve surrounding the pipe 5, and between which tube and pipe is interposed an insulating-sleeve 36.

In order that the rotation of the valve or its stem 8 may not carry the ends of the armature 11 away from the poles of the magnet 12, such armature 11 is circular, as shown in Fig. 4; and in order that it may be readily adjusted with reference to the magnet 12, it is mounted upon the valve-stem 8 between two jam-nuts 37.

The conductor 24 is carried to a binding-post 38 on the plate 28, and thence to the contact 23.

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

1. A device for the purpose described having in combination means for shutting off the supply, an electromagnet for controlling said means, a circuit including said electromagnet having a switch or shunt, disconnected contacts adapted to be inserted into the vessel to be filled, a second electromagnet for controlling said switch or shunt, and a second circuit including said contacts and second electromagnet, substantially as set forth.

2. An apparatus for the purpose set forth, having in combination a valve, an electromagnet for forcing the valve in one direction, means for forcing it in the other direction with reference to its seat, a circuit including a switch or shunt and said magnet, a second magnet for controlling said switch or shunt, two disconnected contacts adapted to be in-

serted into the vessel being filled, and a second circuit including said second magnet and disconnected contacts, substantially as set forth.

5 3. An apparatus for the purpose described having in combination means for controlling the supply to the vessel to be filled, an electromagnet for controlling said means, a circuit including said electromagnet and a switch
10 in said circuit arranged to be struck and closed by the vessel to be filled, substantially as set forth.

4. A device for the purpose described having in combination means for controlling the
15 supply to the vessel to be filled, an electromagnet for controlling said means, a switch upon which the vessel rests when in position to be filled, and a circuit including said electromagnet and switch, substantially as set
20 forth.

5. An apparatus for the purpose described having in combination means for controlling the supply to the vessel to be filled, an electromagnet for controlling said means, a support for the vessel, having a switch upon
25 which the vessel rests when in position to be filled, and a circuit including said switch and electromagnet, the said support and switch being adjustable, substantially as set forth.

6. An apparatus for the purpose described 30 having in combination means for controlling the supply to the vessel to be filled, an electromagnet for controlling said means, a circuit in which said electromagnet is included, disconnected contacts adapted to be inserted 35 into the vessel, a switch in said circuit, an electromagnet for controlling said switch, a second circuit including said electromagnet and disconnected contacts, and a second switch in said first circuit, controlled by the 40 vessel, substantially as set forth.

7. An apparatus for the purpose described having in combination means for controlling the supply to the vessel to be filled, an electromagnet for controlling said means, a circuit including said electromagnet, a switch 45 in said circuit, an electromagnet for controlling said switch, a second circuit including said second magnet and arranged to control said switch, disconnected contacts included 50 in said second circuit and adapted to be inserted into the vessel, and a support for the vessel, said contacts and support being relatively adjustable, substantially as set forth.

WILLIAM HENRY FAHRNEY.

Witnesses:

F. A. HOPKINS,
EDNA B. JOHNSON.