Dec. 28, 1954 F. E. BRONK 2,698,156

AUTOMATIC CONTAINER FILLER

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FIG. 1.

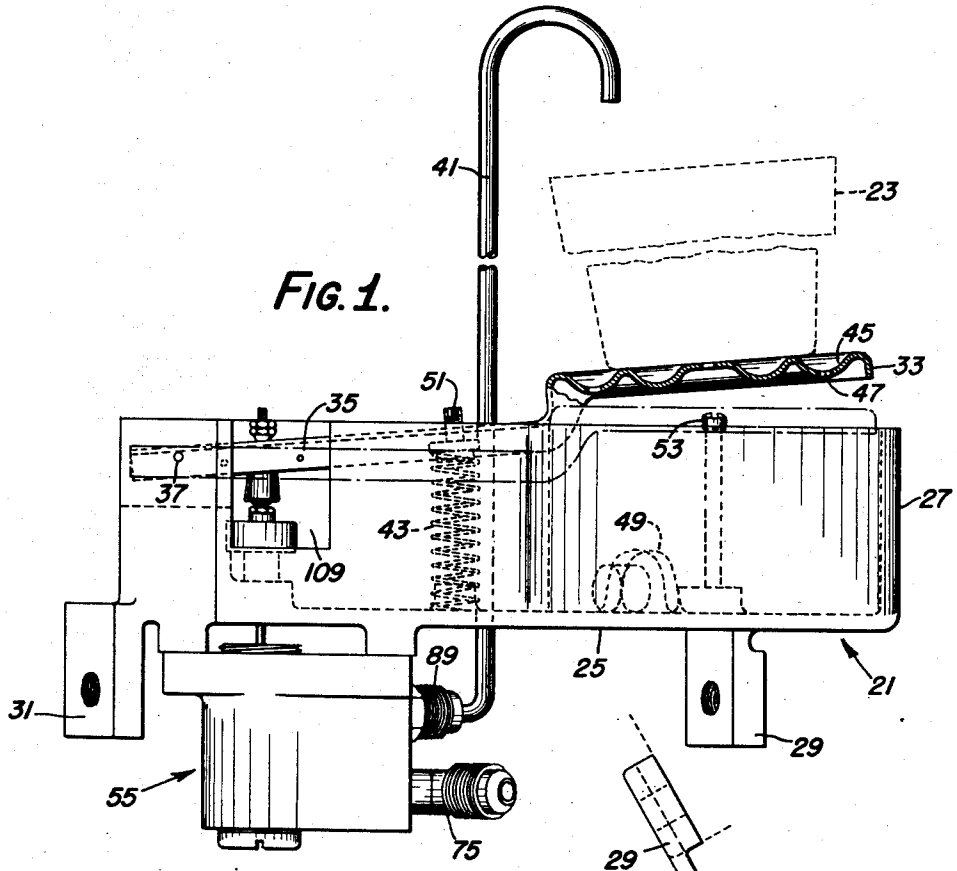
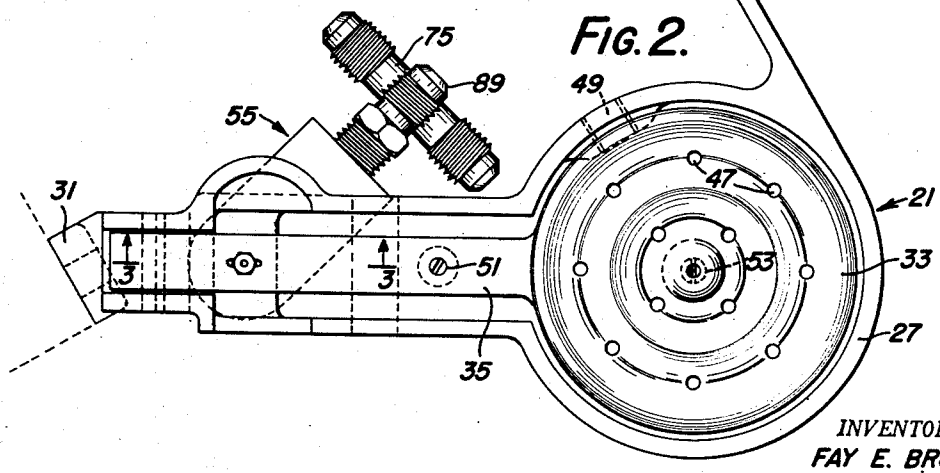


FIG. 2.



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AUTOMATIC CONTAINER FILLER

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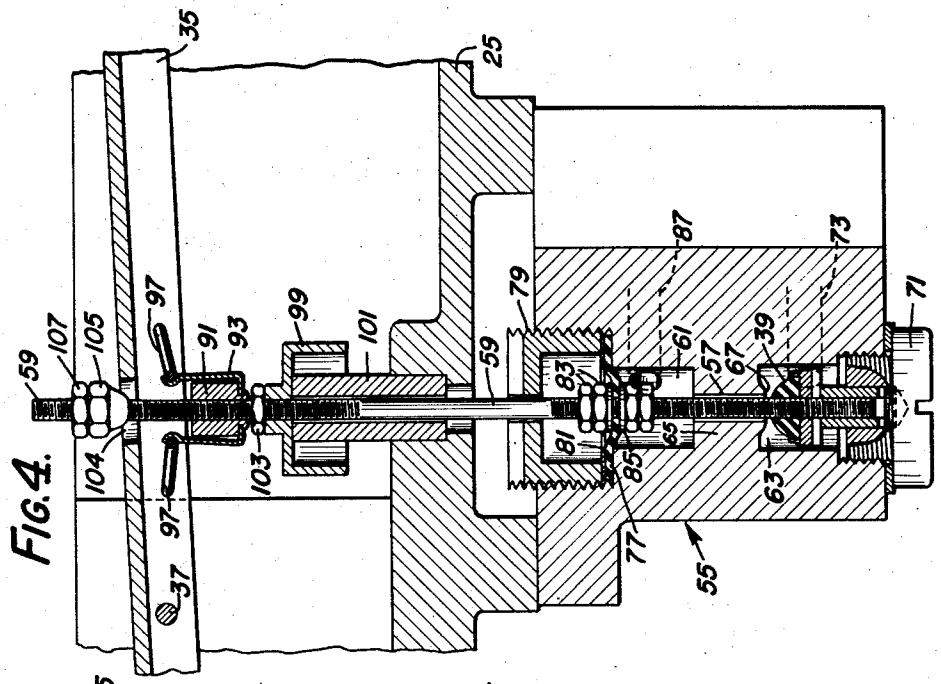


FIG. 4.

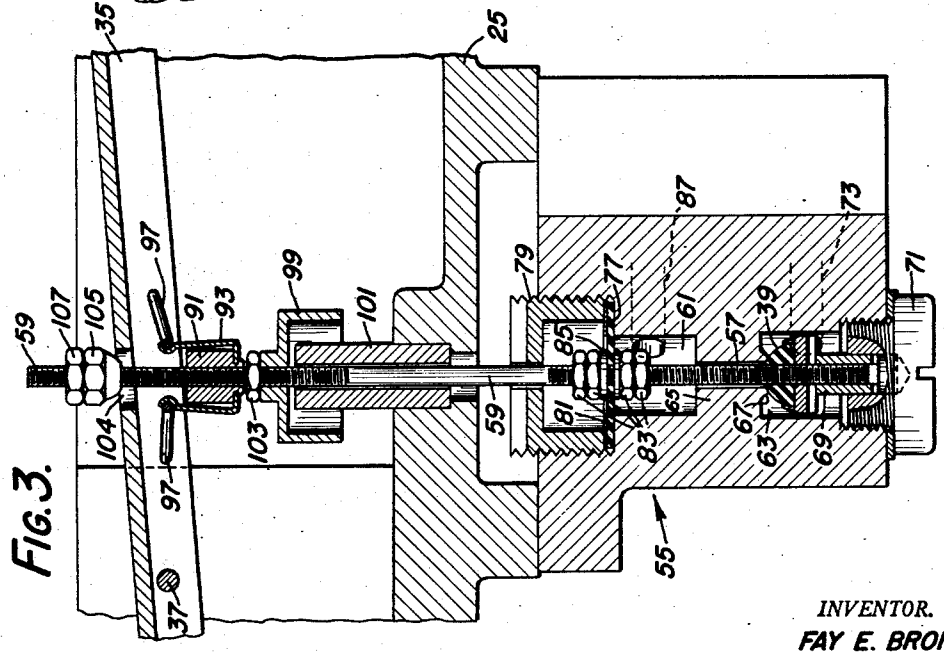


FIG. 3.

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AUTOMATIC CONTAINER FILLER

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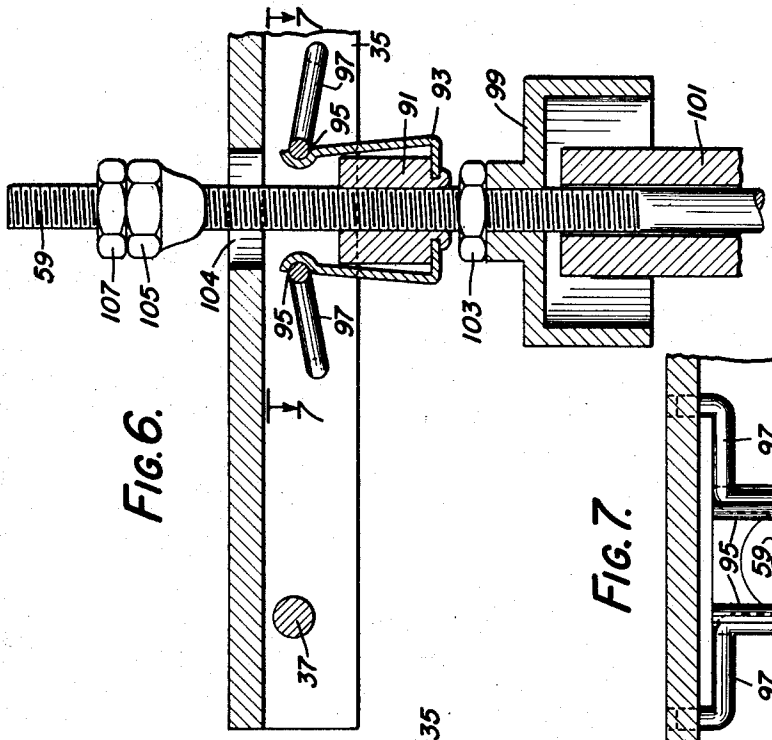


FIG. 6.

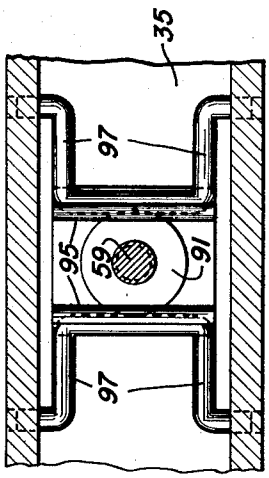


FIG. 7.

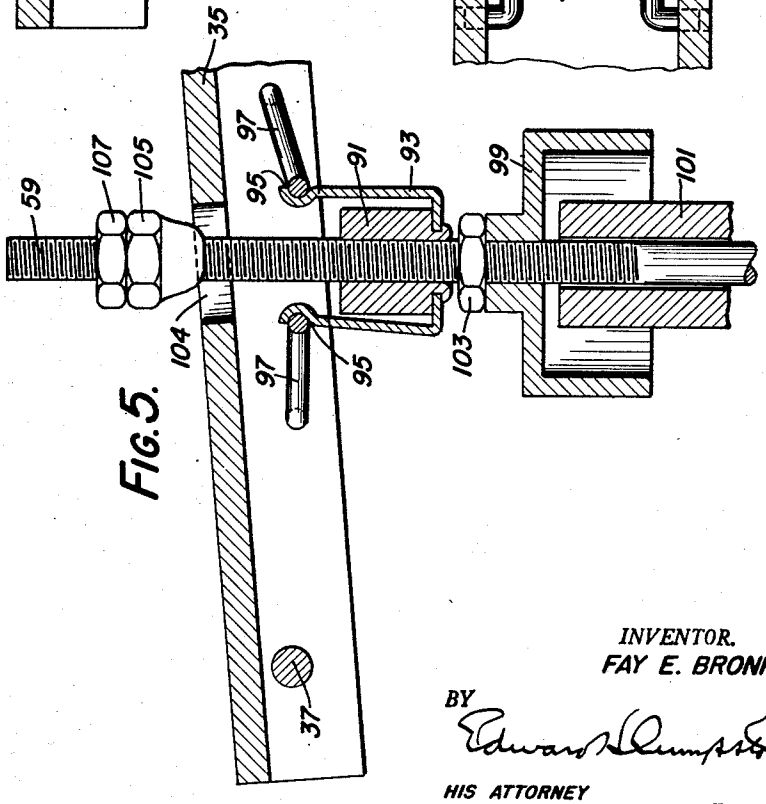


FIG. 5.

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AUTOMATIC CONTAINER FILLER

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Application May 24, 1951, Serial No. 228,099

5 Claims. (Cl. 249—58)

This invention relates to automatic fountain devices for filling removable containers, such as a drinking glass, with water or other liquid and more particularly to devices adapted to form a part of an article of furniture, or equipment, as for example, a dental equipment stand, one object of the invention being to provide a fully automatic and more simple and efficient device of the above character for controlling a supply of water to fill a drinking glass or other container.

Another object is the provision of such a device having a more sensitive valve actuating mechanism specially adapted for responding in an accurate and reliable manner to a relative small force such as the weight of a drinking glass.

A further object is to provide a device of the nature described, capable of operation without any unsightly dripping or spilling of the water.

Still a further object is to provide a device capable of operating as described above without requiring use of a special anti-drip discharge nozzle.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a side elevation, partly in section, of a device embodying the present invention;

Fig. 2 is a plan view of a device, as shown in Fig. 1, but with the container removed;

Fig. 3 is an enlarged, fragmentary, sectional elevation substantially along line 3—3 in Fig. 2 and shows the positions of the valve and the valve actuating mechanism when the container is removed;

Fig. 4 is similar to Fig. 3, but shows the positions of the operating parts when an empty container is in position for filling;

Fig. 5 is a view similar to Fig. 3 but further enlarged to more clearly show the position of the valve actuating mechanism when the container is removed;

Fig. 6 is similar to Fig. 5, but shows the position of the valve actuating mechanism when the container supported thereon is filled, and

Fig. 7 is a sectional plan view substantially along line 7—7 in Fig. 6.

The preferred embodiment of the invention, herein disclosed by way of illustration, shows it as applied for use with a tumbler or drinking glass carried by an article of furniture such as a medical or dental equipment stand. Referring more particularly to the drawings, 21 (Fig. 1) shows generally a housing for supporting a drinking glass 23 (shown by broken lines in Fig. 1) and for enclosing an automatic filling mechanism therefor embodying the present invention.

Housing 21 comprises, preferably, a bottom portion 25 from which rise side walls 27. Housing 21 has at the opposite ends thereof, projecting portions 29 and 31 (Figs. 1 and 2) by means of which the housing may be readily fastened by bolts or other suitable means to a dental equipment stand.

Drinking glass 23 is adapted to be placed on a circular support plate 33 which is located in the forward or right-hand end of housing 21, as viewed in Figs. 1 and 2, and which forms the forward end of a support lever 35. Lever 35 is pivoted adjacent its other end, as by means of a pintle 37 mounted at its ends in the side walls of housing 21. Lever 35 is connected adjacent the left end

thereof, by means to be hereafter more fully described, to a valve 39 (Figs. 3 and 4) which controls the flow of fluid through a discharge pipe 41 (Fig. 1) into a tumbler or other container when said tumbler is placed in position on the circular end of support lever 35. The mechanism for connecting support lever 35 to valve 39 is so constructed that when an empty tumbler or other container is placed on the right end of support lever 35, the weight of the empty container moves said lever to an intermediate position at which point valve 39 is opened. As the container becomes filled, lever 35 is moved downwardly until it strikes against a stop. The above automatic valve mechanism closes valve 39, thereby shutting off the flow of fluid to the container just as support lever 35 reaches its lowermost position. When the filled container or tumbler is removed from support lever 35, said lever is moved upwardly to its initial position, as shown in Fig. 1, by a compression spring 43 (Fig. 1) during which movement valve 39 is held in its closed position by the above actuating mechanism, thereby eliminating unsightly dripping from discharge pipe 41.

Tumbler support 33 is preferably in the shape of a circular plate and has moisture collecting grooves 45 and drain holes 47 formed therein. Housing 21 is provided with a drain vent 49 (Figs. 1 and 2) to which is attached a suitable drain pipe, not shown. Support lever 35 is moved upwardly by coil spring 43, the lower end of which bears against housing bottom 25 while the upper end engages an adjusting screw 51 (Fig. 1) mounted on lever 35. A vertically extending bolt 53 fastened to housing 21, as shown in Fig. 1, serves as a stop for limiting downward movement of support lever 35.

A valve housing shown generally at 55 (Fig. 1) is fastened to bottom 25 adjacent the left end thereof by bolts or other suitable means, not shown. Valve housing 55 has a longitudinally extending bore 57 (Fig. 3) for the reception of a vertically extending valve stem 59. Bore 57 is slightly greater than the diameter of valve stem 59 and is counterbored at the upper and lower ends thereof for forming outlet and inlet chambers 61 and 63, respectively. Inlet and outlet chambers 63 and 61 are separated by a web portion 65 the lower surface of which forms a valve seat 67 which is adapted to be engaged by the upper surface of valve member 39 on valve stem 59, as shown in Fig. 3. Valve 39 is held in position on the stem by a threaded plunger 69 which slides in a bore in a plug 71 screwed into the bottom of the inlet chamber . As valve 39 moves towards and away from valve seat 67, plunger 69 reciprocates loosely in said bore in plug 71 and serves to guide and cushion the action of the valve stem thereby removing any tendency of the valve to squeal or chatter during the operation of the tumbler filler. Inlet chamber 63 is preferably connected by a passageway 73 (Fig. 3) to suitable warm and cold water supply lines (not shown) which in the present instance may be connected to the opposite ends of inlet T 75 (Fig. 2).

The upper end of outlet chamber 61 is preferably sealed by a flexible diaphragm 77 (Figs. 3 and 4) of natural or synthetic rubber material, such as that which is available under the trade-mark "Hycar," or other known and suitable material. Diaphragm 77 is held in position against a shoulder formed in outlet chamber 61 by a collar or plug 79 which threadedly engages an enlargement of the upper end of output chamber 61, as shown in Fig. 3. A washer 81 (Fig. 3) is inserted between the lower end of plug 79 and the upper surface of diaphragm 77 to insure proper sealing and protect the diaphragm as the plug is tightened into place. Diaphragm 77 is attached to valve stem 59 by nuts 83 (Figs. 3 and 4) and is adapted to flex vertically as the valve stem reciprocates. Small washers 85 (Fig. 3) are placed on opposite sides of the diaphragm to insure a proper seal around valve stem 59 and to prevent nuts 83 from tearing the diaphragm as they are tightened into position. This construction effectively seals outlet chamber 61 against leakage while at the same time it presents a minimum of resistance to the vertical reciprocation of valve stem 59.

Outlet chamber **61** is preferably connected by a passageway **87** (Figs. 3 and 4) to a suitable fitting **89** (Fig. 2) to which is connected the lower end of discharge pipe **41**. Pipe **41**, as shown in Fig. 1, extends upwardly and forwardly so that the opposite end thereof is in position to overhang a drinking glass **23** or the like resting on the right end of support lever **35**. Outlet chamber **61** is connected to inlet chamber **63** by bore **57** in web **65** so that when valve **39** is moved downwardly, by means to be hereafter described, the water may flow from inlet chamber **63** into outlet chamber **61** and through discharge pipe **41** to the container positioned on support lever **35**.

The means for transmitting the pivotal movement of support lever **35** to valve stem **59** for reciprocating valve **39** comprise, preferably, a nut **91** (Figs. 3–6) adjustably threaded on valve stem **59** adjacent its upper end and an upwardly extending, U-shaped, link member **93**, of spring metal, which is secured at the lower center portion thereof to nut **91**, as shown in Figs. 3–6. Member **93** has a curved notch **95** (Figs. 5 and 6) formed adjacent the upper ends thereof for engagement with a pair of opposed U-shaped links **97**. Links **97** are pivotally mounted on support member **35**, as shown in Figs. 3–7, and as hereafter described, transmit the movement of the support member **35** to valve stem **59** and valve **39**. The downward movement of valve stem **59** is limited by a collar **99** (Figs. 3–6) which is adjustably threaded to the valve stem and which, as the valve stem moves downwardly from its position shown in Fig. 3, to its position shown in Fig. 4, strikes against the upper end of a vertically extending sleeve **101** loosely surrounding stem **59** and secured to housing bottom **25**. Collar **99** is located below nut **91** and is provided with a lock nut **103** for securing it in adjusted position. Valve stem **59** passes loosely through an elongated, slot-like opening **104** in lever **35** and a tapered nut **105**, adjustably threaded on the upper end of valve stem **59**, is adapted to be engaged by support lever **35** when in its uppermost position for limiting the upward movement of support lever **35** and for holding valve **39** in its uppermost, or closed position. A lock nut **107** holds nut **105** in adjusted position.

It is to be noted that when support lever **35** is in its uppermost position, as shown in Fig. 3, valve stem **59** is held in its uppermost position by the engagement between nut **105** and the sides of the opening in lever **35**, and links **97** which connect said support lever to valve stem **59** have their inner, or free ends lower than the outer ends thereof. To start the cycle of operation it is only necessary to place an empty container on the free end of support lever **35**. As said lever moves downwardly under the weight of the empty container thereon, links **97** transmit this downward movement to valve stem **59**, thereby opening valve **39**. Valve stem **59** moves downwardly until collar **99** engages the upper end of sleeve **101**, as shown in Fig. 4, at which point it is in its lowermost position and valve **39** is fully opened, thereby allowing water to rapidly fill the container. This flow of liquid into the container increases the weight on support lever **35** and causes the lever to continue to move downwardly against the tension of spring **43**. However, valve stem **59** can no longer move downwardly, because of the engagement between collar **99** and sleeve **101**, and as a result, there is a relative movement between lever **35** and valve stem **59** which brings links **97** into a horizontal or centered position, through resilient yielding of link member **93**. As lever **35** continues downwardly, links **97** snap past their center position and the free ends thereof slant upwardly, as in Fig. 6. This movement of links **97** moves valve stem **59** upwardly bringing valve **39** into engagement with seat **67** and shutting off the flow of liquid to the container or tumbler on lever **35**. Collar **99**, spring **43** and stop **53** are preferably adjusted so that this valve closing action occurs when the desired amount of fluid has passed into the container, and support lever **35** is either in engagement with, or is about to engage, stop **53**.

When the container is removed from support lever **35**, spring **43** quickly moves the lever to its uppermost position, as shown in Figs. 1 and 3. During the first part of this return movement, links **97** which slant upwardly, as shown in Fig. 6, push upwardly against spring link **93** and thereby hold valve **39** closed. As lever **35** continues upwardly, links **97** snap past their center position, and slant downwardly toward the valve stem, as shown in Figs. 4 and 5. However, it is to be noted that because

lever **35** is moving upwardly, links **97** pull upwardly on link **93** and continue to hold valve **39** closed. As a result of this action plus the pressure of the water under valve **39**, said valve remains closed throughout the return movement of tumbler support lever **35**. Lever **35** moves upwardly under the action of spring **43** until it strikes against nut **105** on the upper end of valve stem **59**. At this point spring **43** acts through lever **35** and valve stem **59** to hold valve **39** in its uppermost or closed position, as shown in Fig. 3. Thus, there is no unsightly dripping or spurting of water from discharge pipe **41**, nor is it necessary to provide a special siphon head on pipe **41**, which has been commonly necessary with tumbler fillers of known construction in which the valve is momentarily opened after the filled container is removed and as the parts are returning to their initial positions.

Thus, it will be seen that the above invention provides a fully automatic tumbler or container filler, the operating mechanism of which is so arranged and constructed that it multiplies the limited force exerted by a container and the contents thereof to provide sufficient force for insuring positive and accurate operation of the mechanism and valve. In addition, the device is easily adjusted for containers of varying weights and for varying the amount of liquid delivered per cycle of operation. The screw **51** for regulating the action of spring **43** and the nut **105** for limiting the upward movement of support lever relative to valve stem **59** are both readily accessible from the top of the housing. Housing **21** is preferably provided with a port **109** (Fig. 1) through which collar **99** and nut **91** may be readily adjusted for further controlling the action of the filling mechanism.

In addition, the device is provided with a single valve and seat which are held in sealing engagement throughout the return of the operating parts to their normal positions, and as a result, the device operates without any dripping or spilling of water and without requiring a special siphon or other type of anti-drip nozzle on the upper end of discharge pipe **41**.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of a preferred embodiment, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. An automatic container filler comprising a housing, a container support member pivotally mounted adjacent one end thereof on said housing, a fluid supply line for filling a container on said support member, a valve in said line, a member connected to and movable with said valve, link means on one of said members, resilient means on the other of said members engaged by said link means, said link means and resilient means being moved in substantially the same direction by said support member to open said valve as said support member is moved to an intermediate position by the weight of a container thereon, said resilient means being moved in a second direction by said link means as said support member is moved downwardly by the weight of a filled container thereon, said resilient means moving in a direction opposite said second direction for swinging said link means in a direction opposite the first direction of movement thereof for moving said valve to its initial closed position as said support member is moved to its lowermost position by the weight of a filled container thereon, resilient means for returning said support member to its initial position upon the removal of the container therefrom, and means engaged by said support member during its return movement to initial position for maintaining said valve in closed position.

2. An automatic container filler comprising a housing, a container support member pivotally mounted adjacent one end thereof on said housing, a fluid supply line for filling a container on said support member, a valve in said line, a member connected to and movable with said valve, opposed links pivotally mounted on one of said members, resilient means on the other of said members engaged by said links, the inner ends of said links slanting downwardly towards each other in the initial, uppermost position of said support member, said links and resilient means being moved downwardly in said position by said

support member to open said valve as said support member is moved to an intermediate position by the weight of a container thereon, said resilient means being moved in one direction by said links as said support member is moved downwardly by the weight of a filled container thereon, said resilient means moving in the opposite direction for swinging the inner ends of said links upwardly for moving said valve upwardly to its closed position as said support member moves to its lowermost position under the weight of a filled container thereon, resilient means for returning said support member to its initial position upon the removal of the container therefrom, and means engaged by said support member during its return movement to initial position for maintaining said valve in closed position.

3. An automatic container filler comprising a housing, a container support member pivotally mounted adjacent one end thereof on said housing, a fluid supply line for filling a container on said support member, a valve in said line, a member connected to and movable with said valve, link means on one of said members, a U-shaped resilient means on he other of said members engaged by said link means, said link means and resilient means being moved downwardly by said support member for moving said other member downwardly to open said valve as said support member is moved to an intermediate position by the weight of a container thereon, said resilient means being moved in one direction by said link means as said support member is moved downwardly by the weight of a filled container thereon, said resilient means moving in the opposite direction for swinging said link means upwardly for moving said other member upwardly to move said valve to its initial closed position as said support member is moved to its lowermost position by the weight of a filled contaner thereon, resilient means for returning said support member to its initial position upon the removal of the container therefrom, and means engaged by said support member during its return movement to initial position for maintaining said valve in closed position.

4. An automatic container filler comprising a housing, a container support pivotally mounted adjacent one end thereof on said housing, a fluid supply line for filling a container on said support, a valve in said line, a valve stem connected to and movable with said valve, a pair of opposed links pivotally mounted adjacent one end thereof on said container support, resilient means on said valve stem engaged by said links, the inner ends of said links slanting downwardly towards each other in the initial, uppermost position of said container support, said links and resilient means being moved downwardly in said position by said container support to open said valve as said support is moved to an intermediate position by the weight of a container thereon, said resilient means being moved in one direction by said links as said support member is

moved downwardly by the weight of a filled container thereon, said resilient means moving in the opposite direction for swinging the inner ends of said links upwardly to move said resilient means and said valve stem upwardly for moving said valve upwardly to its initial closed position as said support member moves to its lowermost position under the weight of a filled container thereon, resilient means for returning said support member to its initial position upon the removal of the container therefrom, and means engaged by said support member during its return movement to initial position for maintaining said valve in closed position.

5. An automatic container filler comprising a housing, a container support member, a fluid supply line for filling a container on said support member, a valve housing connected to said supply line and having inlet and outlet chambers, a single valve in one of said chambers for controlling the flow from said inlet chamber through said outlet chamber to a container on said support, an elongated member connected to and movable with said valve, said member extending from said inlet chamber outwardly through said outlet chamber, a sealing means at the outer end of said outlet chamber comprising a flexible diaphragm attached to and movable with said elongated member, link means on one of said members, resilient means on the other of said members engaged by said link means, said link means and resilient means being moved in substantially the same direction by said support member to open said valve as said support member is moved to an intermediate position by the weight of a container thereon, said resilient means being moved in a second direction by said link means as said support member is moved downwardly by the weight of a filled container thereon, said resilient means moving in a direction opposite said second direction for swinging said link means in a direction opposite the first direction of movement thereof for moving said valve to its initial closed position as said support member is moved to its lowermost position by the weight of a filled container thereon, resilient means returning said support member to its initial position upon the removal of the container therefrom, and means engaged by said support member during its return movement to initial position for maintaining said valve in closed position.

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