

Feb. 26, 1946.

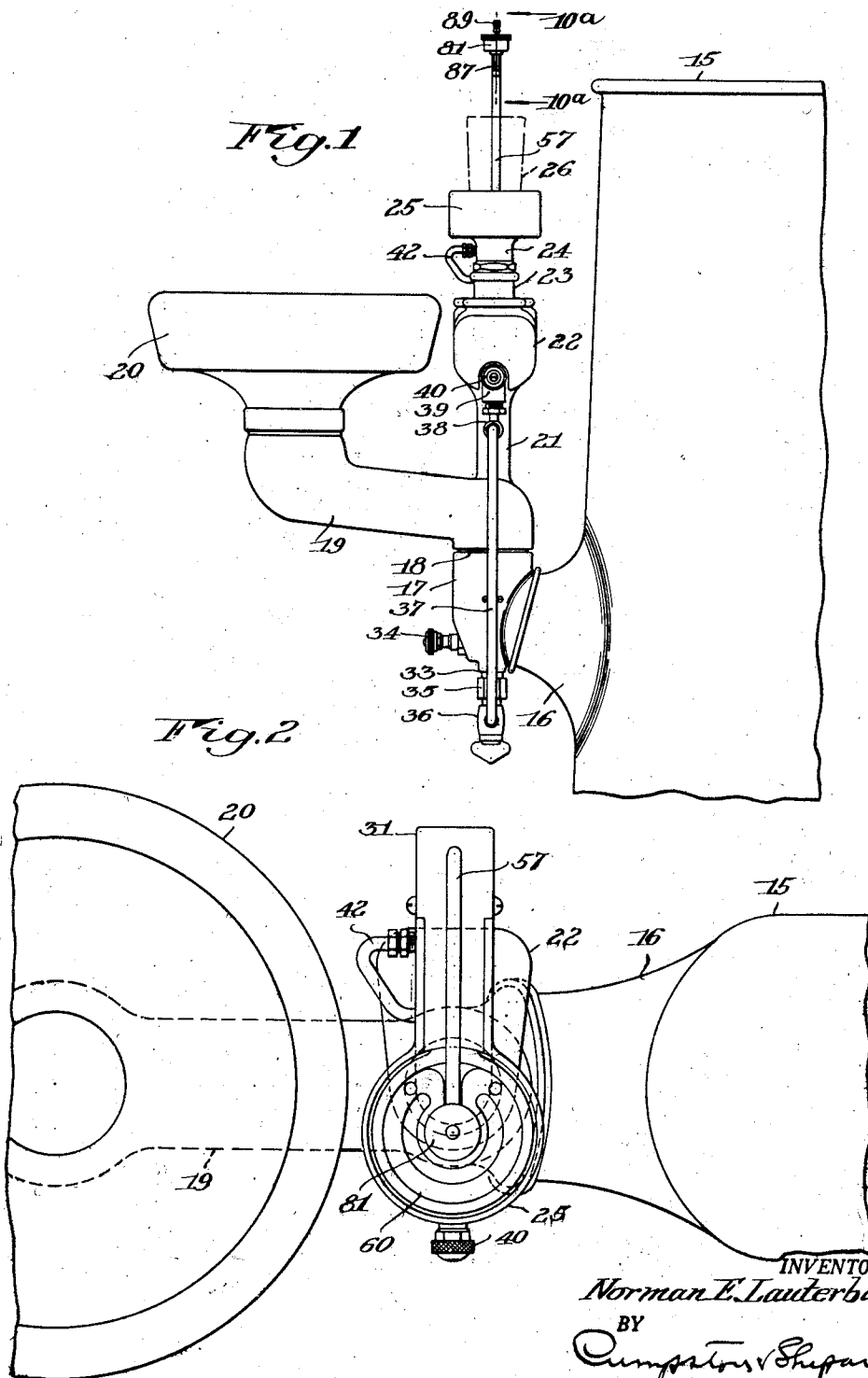
N. E. LAUTERBACH

2,395,674

AUTOMATIC CONTAINER FILLER

Filed Sept. 27, 1943

5 Sheets-Sheet 1



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Fig. 3

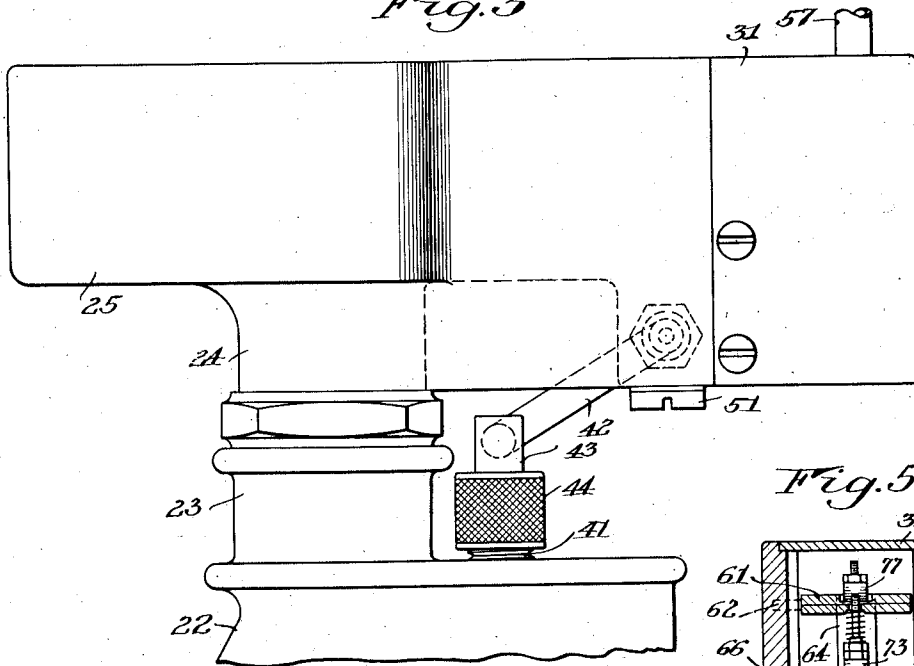


Fig. 5

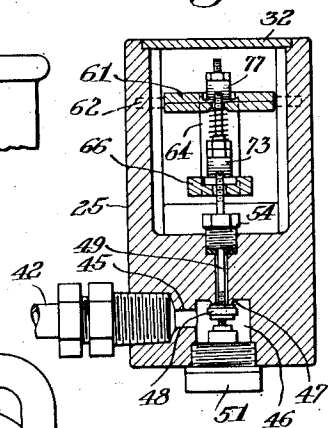
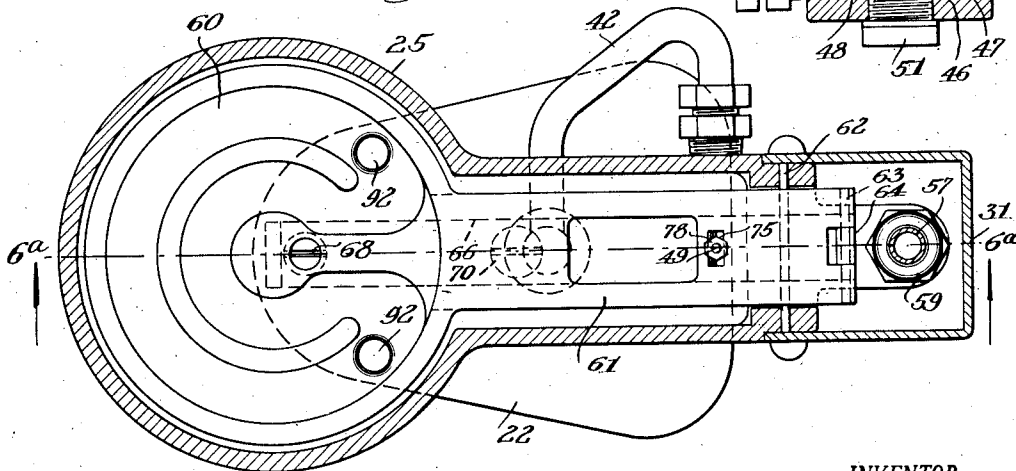


Fig. 4



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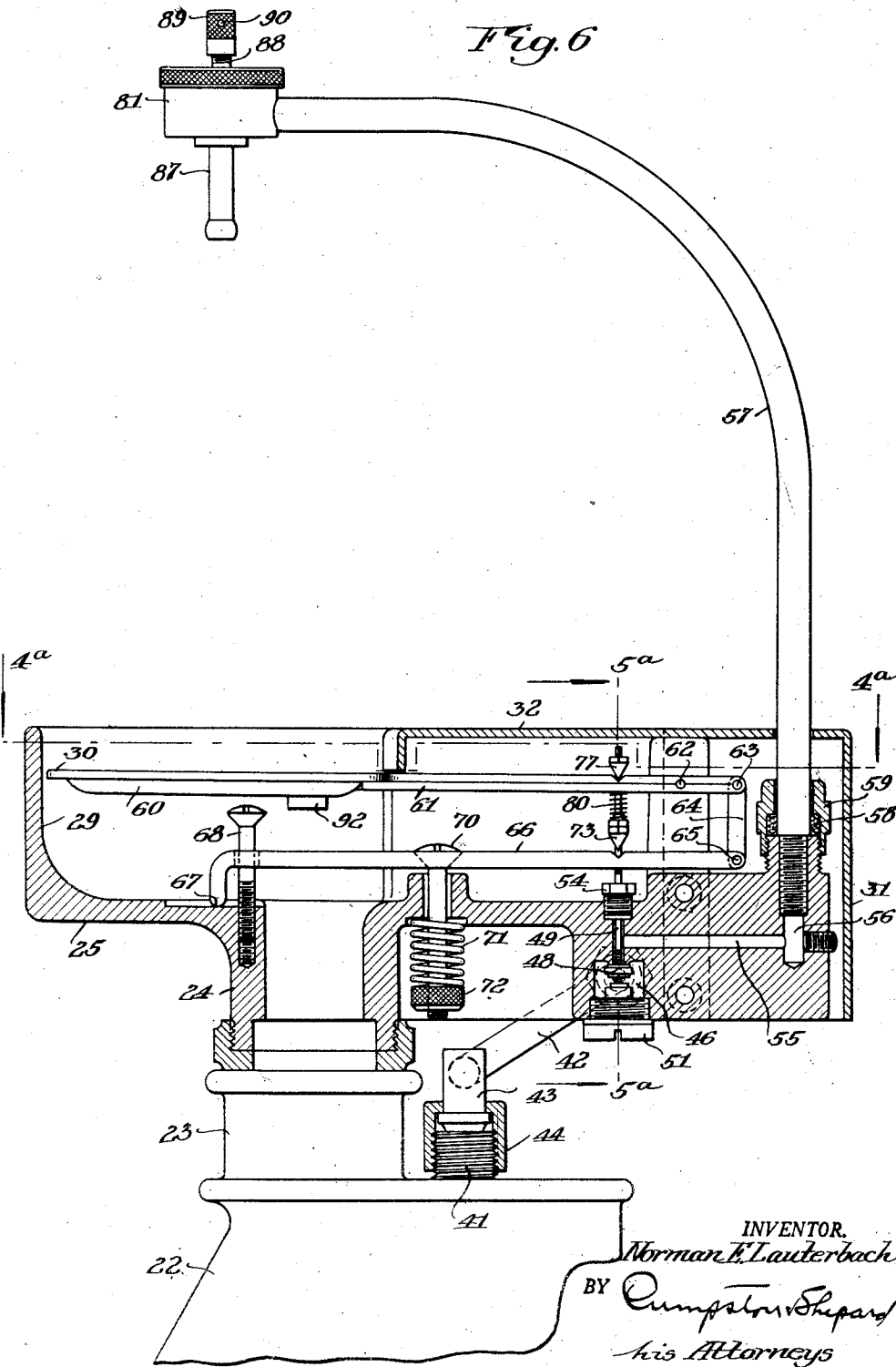
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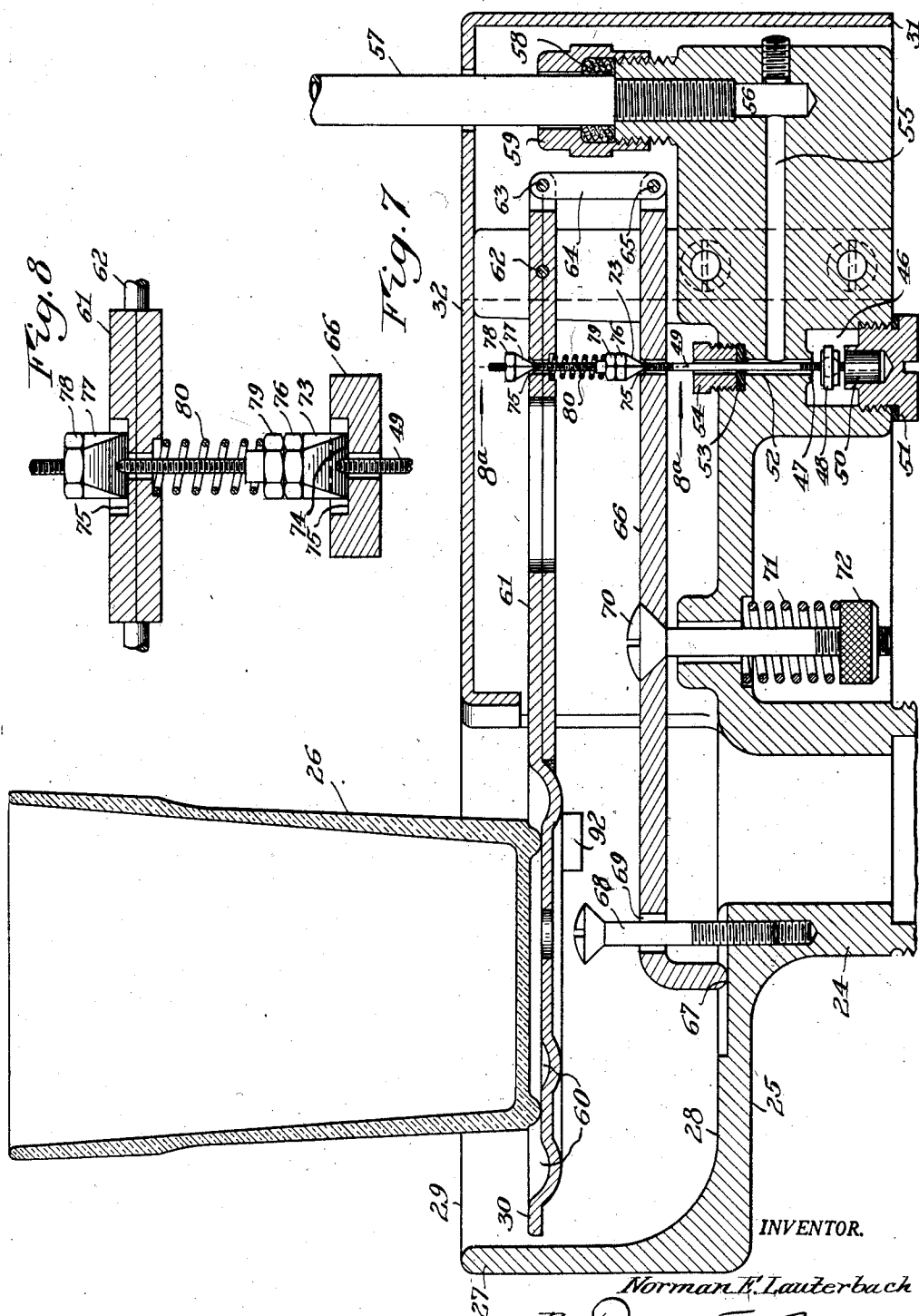
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5 Sheets-Sheet 4



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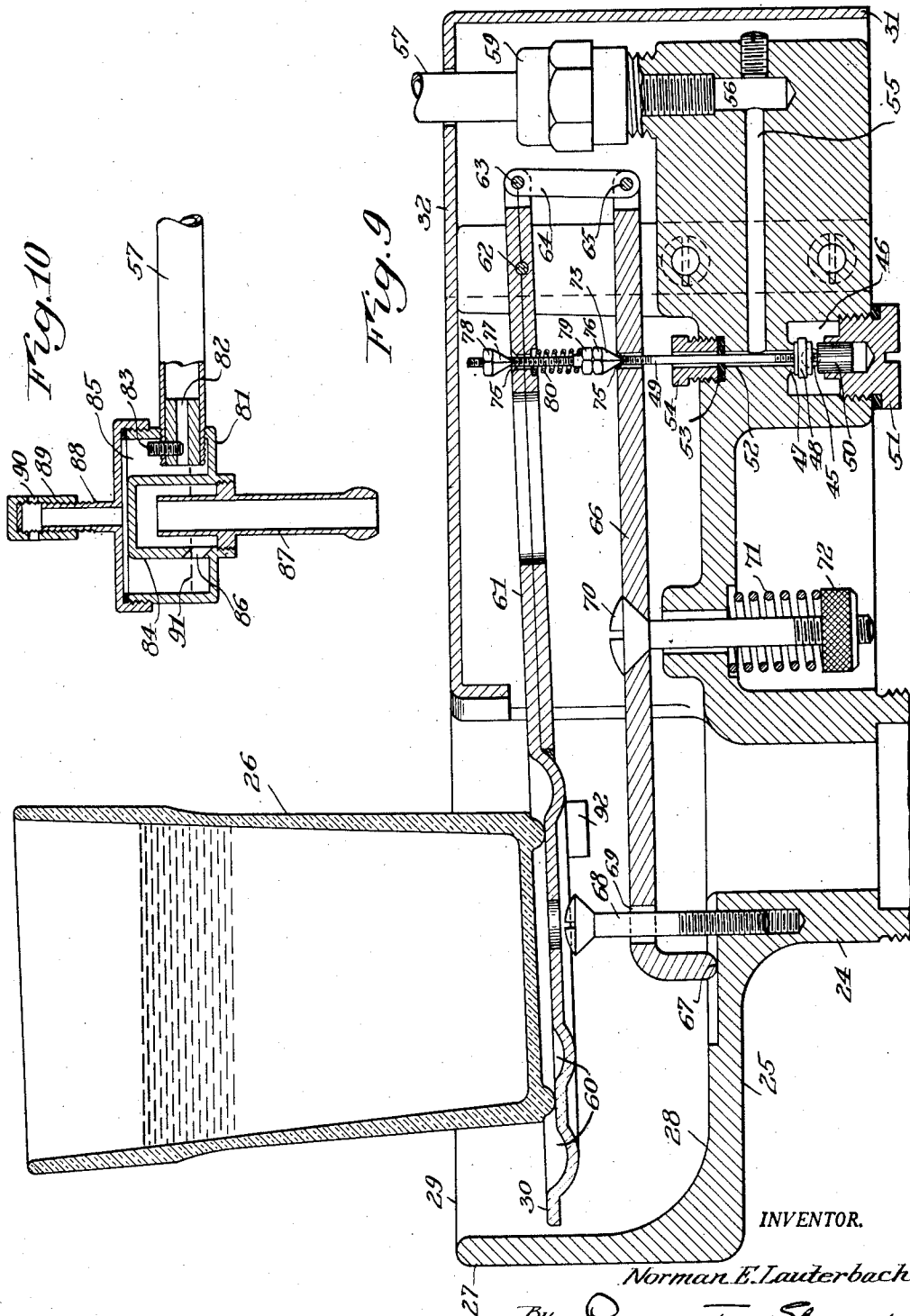
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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,395,674

AUTOMATIC CONTAINER FILLER

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Application September 27, 1943, Serial No. 503,968

10 Claims. (Cl. 249—58)

This invention relates to automatic devices for filling removable containers with water or other liquids, one object of the invention being to provide a fully automatic and more efficient device of the above character, adapted to form part of an article of furniture, or the like, such, for example, as a dental equipment stand, for filling a drinking glass or other container commonly supported thereon.

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.

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 of a device embodying the present invention and shown in association with a dental equipment stand;

Fig. 2 is an enlarged top plan view of the same;

Fig. 3 is an enlarged side elevation of the device as viewed from the right in Fig. 1, partly broken away;

Fig. 4 is a plan view, partly in section on the line 4a—4a in Fig. 6;

Fig. 5 is an enlarged, sectional elevation of valve parts, on the line 5a—5a in Fig. 6;

Fig. 6 is a sectional elevation on the line 6a—6a in Fig. 4, showing the position of the parts with the container removed;

Fig. 7 is an enlarged, sectional elevation similar to Fig. 6, but showing the position of the parts with the container in place but unfilled;

Fig. 8 is an enlarged, sectional elevation on the line 8a—8a in Fig. 7, showing parts of the valve operating mechanism;

Fig. 9 is a sectional elevation similar to Figs. 6 and 7, but showing the position of the parts with the container in place and filled; and

Fig. 10 is an enlarged, sectional elevation on the line 10a—10a of Fig. 1 showing the liquid discharge nozzle.

The preferred embodiment of the invention, herein disclosed by way of illustration, shows it as applied for use with the drinking glass commonly provided on a dental equipment stand. Referring more particularly to the drawings,

there is shown at 15, Figs. 1 and 2, the column or pedestal of such a stand, of the type disclosed, for example, in the United States patent to O. H. Pieper, No. 2,021,518. At 16 on the pedestal is a laterally projecting arm on which is secured an outer portion 17 formed with a bearing 18 for rotatably supporting an arm 19 for a cuspidor bowl 20, the parts 16 to 19, inclusive, being hollow and containing conduit means through which the discharge from the bowl is carried off, as disclosed in said patent and well understood in the art.

Supported on the inner end of the arm 19 is a hollow upstanding arm 21, the upper end of which is enlarged as at 22 and provided with a hollow extension 23 on which is mounted the hollow discharge outlet or neck 24 of a support and housing 25 for the drinking glass 26 and an automatic filler mechanism therefor embodying the present invention.

The housing 25 for the drinking glass and filler mechanism comprises, preferably, a tray-like body portion 27, Figs. 6 and 7, having a bottom 28 from which the outlet neck 24 depends and from which rise side walls 29. The drinking glass is received on a circular plate support 30 located in the forward end of housing 25, the rear end of which contains a control valve for the nozzle of the water supply means, as well as a mechanism which is actuated automatically by the drinking glass for operating the valve, as hereafter described. A cover portion 31 has side walls and a lid 32 which close in these parts.

The water supply system for the drinking glass, cuspidor bowl and saliva ejector (not shown) comprises the usual supply pipe (not shown) extending up through the pedestal and its portions 16 and 17, as disclosed in said patent and well understood in the art. Branching from this pipe, on the bearing portion 17, is an outlet 33 controlled by a valve 34 and coupled by a union nut 35 with a nipple 36. Communicating with the nipple is an upwardly extending pipe 37 terminating at its upper end in a nipple 38 which is rotatably connected with an inlet 39 of a control valve (not shown) housed within the enlargement 22 at the upper end of arm 21. The inlet 39 of such control valve is opened and closed by a cock 40, and the valve has several outlets leading to the nipple 41 (Fig. 6) for the drinking glass filler and to the nipples (not shown) for flushing the bowl and supplying the ejector as disclosed in said patent and well understood in the art. This construction allows the cuspidor arm 19 and its upstanding arm 21 and associated parts to swing

about the vertical axis of bearing 13 while continuously connected with their supply and waste connections inside the pedestal 15.

The supply line for the drinking glass comprises an angular pipe 42 (Figs. 5 and 6) having a terminal 43 connected by a union coupling 44 with the supply nipple 41. The pipe 42 is coupled at its other end with an intake passage 45, Fig. 5, formed in the housing 25 and leading to the valve chamber 46. Projecting downwardly from the upper wall of the chamber is a valve seat 47 with which coacts a valve head 48 adjustably threaded on a vertical stem 49 which is continued below the valve head and carries a plunger 50 sliding in a bore in a plug 51 screwed into the bottom of the valve chamber. In the movement of the valve head toward and from its seat 47, plunger 50 reciprocates loosely in the bore in the plug and serves to guide and cushion the action of the valve stem. The stem reciprocates with clearance in a bore or passage 52 (Fig. 7) and is further guided by a closely fitting gasket 53 received in the bottom of an enlargement, or well, at the upper end of the bore, the gasket being compressed by a plug 54 threaded into the well and loosely embracing the stem. The stem is reciprocated by the control mechanism hereafter described.

The valve and valve seat control the admission of water to the bore 52 around the valve stem and the bore communicates with the horizontal passage 55 (Fig. 7) leading to a vertical passage 56 into which is threaded the lower end of the nozzle supply line, or pipe, 57. The connection of the pipe with the housing is further sealed by packing 58 in a packing nut 59. The other end of pipe 57 extends upwardly and forwardly and terminates in a nozzle positioned to overhang a drinking glass resting on the container or glass support, 30.

The glass support is preferably in the shape of a circular plate 30, with moisture collecting grooves 60, forming the forward end of a lever 61 pivoted adjacent its other end, as by means of a pintle 62 mounted at its ends in the side walls of the housing. The rear end of the lever, on the opposite side of the pivot, has pivotally connected thereto, at 63, a link 64, the lower end of which is pivotally connected at 65 with the rear end of a lever 66, as shown. The forward end of lever 66 is turned downwardly and rounded, as at 67, and fulcrumed or pivoted on an upper surface of the housing bed 28. A screw 68, set in the housing, extends vertically through an opening 69 in lever 66, with suitable clearance, to retain its pivoted end in place, and to also act as an adjustable stop for protection of the valve mechanism in the event of excessive downward force exerted against plate 30.

To yieldably sustain the container support and levers 61 and 66, a bolt 70 is passed through an opening in lever 66 and downwardly through an opening in the bottom of the housing, below which it has coiled about it a spring 71 compressed between the housing and a knurled nut 72 adjustably threaded on the lower end of the bolt. It will be apparent from this construction that spring 71, by means of the head of bolt 70, pulls down on lever 66 which pulls downwardly in turn on the lever 61, so as to raise its forward end which carries the container or glass support 30. Conversely, the weight of the glass and its contents tend to depress support 30 and compress spring 71 as controlled by its adjusted tension. It will be seen that as the container support and

the forward end of lever 61 are thus depressed, the rear end of the lever and the connective lever 66 tend to rise, so that the forward end of lever 61 and lever 66, moving in opposite directions, approach each other.

When the weight of the container is removed from the support, the levers again move in opposite directions, but away from each other, under the force of spring 71. These lever movements are employed to effect the relative movements of the valve seat 47 and valve head 48 toward and from each other, by connecting means which will now be described.

The means for operating the control valve preferably comprises an extension of valve stem 49 upwardly and loosely through openings in levers 61 and 66, as shown in Figs. 7 and 8. This portion of the valve stem is threaded and provided above lever 66 with a threaded lug 73 having a beveled and knife edged lower end 74 cooperating with a flat bearing surface 75 formed at the bottom of a recess in the lever 66 at the upper end of the opening therein through which the valve stem passes. Lug 73 is secured in its adjusted position by a lock nut 76. The contacting portions 74 and 75 form a rocking bearing between the lever and the lug and stem during the slight rocking motion to which the lever is subjected in action. Above lever 61, the valve stem is provided with a similar threaded lug 77 beveled for a similar knife edge bearing in a recess formed in the lever at the upper end of the stem opening, and lug 77 is secured in adjusted position by means of a lock nut 78. Coiled about the valve stem, between the under side of lever 61 and an adjustable nut 79 thereon, is a compression spring 80 which acts as a yieldable link for opening the valve when an empty container is placed upon plate 30, and with spring 71, supplies the necessary resistance to the closing of the valve until water in container 25 has reached the proper level.

With the container or glass removed from its support 30, levers 61 and 66 are moved, mainly by spring 71, to the position shown in Fig. 6 in which the upper lever 61 engages the upper lug 77 and lifts the valve stem positively to close the valve. When an empty glass is placed on the support, the mechanism is moved to the intermediate position shown in Fig. 7 in which lever 61, acting downwardly through spring 80, serves to lower the valve stem and open the valve, lever 66 being raised, in this position of the parts, so that it barely engages the lower lug 73. With such opening of the valve, water flows from the valve chamber through bore 52, passage 55 and nozzle pipe 57, and fills the glass. The increasing weight of the glass and contents produces further downward movement of the forward end of lever 61, and upward movement of its rear end and of lever 66 which latter raises lug 73, to positively close the valve head against its seat, thereby shutting off the supply of water at a desired adjusted level in the glass. Spring 71 counterbalances most of the weight of support 30 and container 25. Spring 80 is compressed by the weight of the water which further compresses spring 71 so that both springs contribute to the weighing of the water which is conveniently controlled by adjusting the accessible outer spring 71 by means of nut 72.

It will thus be seen that downward movement of the support 30, under the weight of the glass and its contents, moves levers 61 and 66 in opposite directions toward each other and recipro-

cates the valve head in opposite directions, relatively to its seat, to first open and then close the valve. When the container is removed, upward motion of the support causes the levers to move through the same positions, but in reverse directions, during which the valve is opened only momentarily as the support is quickly raised by spring 71. Means are provided, as hereafter described, for retaining the water admitted to the nozzle pipe during such brief opening of the valve.

Supply pipe 57 terminates in a nozzle, Fig. 10, comprising a cylindrical nozzle body 81. The communicating end of the pipe is preferably reduced in diameter, as at 82, and this reduced passage is controlled by an adjustable screw 83, somewhat in the nature of a needle valve, so that the volume of supply can be nicely regulated. Nozzle body 81 has within it a concentric dome 84, of less diameter than the body, leaving an intermediate containing space 85 into which the pipe 57 discharges. Dome 84 is formed adjacent the bottom of the nozzle body with one or more downwardly directed ports 86 providing communication between the space 85 and the bottom of the interior of the dome. Rising through the bottom of the dome is a discharge pipe or nozzle outlet 87, the upper end of which terminates within the dome at a substantial distance above the bottom of the dome and housing. The top of housing 81 has communicating therewith a riser pipe 88, the upper end of which is threaded and carries a cap 89 formed with port openings 90 capable, by adjustment of the cap, of opening the housing to the atmosphere as shown, or of sealing it to prevent the escape of water under pressure.

It will be apparent from the above described nozzle construction that, with cap 89 unscrewed to vent the housing to the atmosphere, the restricted volume of water will flow by gravity through the housing space 85, the openings 86, and through the dome into the upper end of pipe 87 and thence to the container, rising to a height in the housing and dome approximately equal to the height of the upper end of pipe 87. When control valve 48 is closed by the filling of the container, the flow through nozzle pipe 87 produces a siphoning action which lowers the level of liquid in the housing space 85 until air is admitted through openings 86, with the liquid level at about the line 91, to break the siphon action, thus leaving the nozzle housing partly empty. Then when the control valve is briefly opened by the removal of the container and the rise of its support, the water so supplied is insufficient to fill the nozzle housing above the upper end of its pipe 87 and is therefore retained in the nozzle, thus avoiding unsightly dripping of the nozzle and spilling on the container support. The latter is formed, however, with openings 92 in its collecting grooves through which any accumulated water is drained down into the housing 25 and its discharge neck 24 leading to the discharge line of the equipment stand.

Nozzle 87 is formed with a bulbous end, as shown, for the reception, when desired, of an extension hose for delivering water under pressure, and when such a connection is employed, cap 89 is screwed down to close the ports 90.

The operation of the device will be apparent from the above description of its construction. Valve head 48 is seated and closed until a glass is placed on support 30. The weight of the glass then automatically opens the valve to start the supply of water through the overhanging nozzle

87. The valve remains open until the glass receives a predetermined weight of water, which lowers the glass support to such a point that the valve is again seated and closed. When the glass is removed, the parts are returned to initial position and the brief quantity of water released during the return of the parts is retained in the discharge nozzle.

The mechanism comprises levers so arranged and connected, as to afford a mechanical advantage which multiplies the force exerted by the limited size and weight of the drinking glass and its contents, so as to produce sufficient force to overcome the friction of the parts and operate the mechanism and valve in a forceful, positive way capable of being accurately adjusted and controlled. The nut 72 for regulating the control spring 71 is readily accessible from the exterior of the housing. The supply of liquid is controlled by a single valve seat and valve, the action of which also is fully adjustable. The operation of the device is free from dripping and spillage of the water, and fully automatic, as the container is placed on and removed from the support.

It will thus be seen that the invention accomplishes its objects, and while it has been herein disclosed in connection with the details of a preferred embodiment, such disclosure is intended as illustrative, rather than limiting in sense, as it is contemplated that various changes and 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 container support, a fluid supply line for filling a container on said support, a valve in said line, a pair of connected levers, one of said levers having a connection with said support for moving said levers in one direction by the weight of a container and its fluid contents, yieldable means for moving said levers and support in the opposite direction, a connection between said valve and one of said levers for opening said valve when said lever is moved to an intermediate position by the weight of a container on said support, and mechanical connections between said valve and said levers for moving said valve to closed position by the movement of said levers either to one extreme position by the weight of a filled container on said support or to the other extreme position by said yieldable means upon the removal of the container from said support.

2. An automatic container filler comprising a container support, a fluid supply line for filling a container on said support, a valve in said line, a pair of connected levers, one of said levers being connected with said support for moving said levers in one direction by the weight of a container and its fluid contents, yieldable means for moving said levers and support in the opposite direction, a yieldable mechanical connection between said valve and one of said levers for opening said valve when said lever is moved to an intermediate position by the weight of a container on said support, and positive connections between said valve and said levers for moving said valve to closed position by the movement of said levers either to one extreme position by the weight of a filled container on said support or to the other extreme position by said yieldable means upon the removal of the container from said support.

3. An automatic container filler comprising a

container support, a fluid supply line for filling a container on said support, a valve in said line, a pair of connected levers, one of said levers having a connection with said support for moving said levers in one direction by the weight of a container and its fluid contents, yieldable means for moving said levers and support in the opposite direction, a mechanical connection between said valve and one of said levers for opening said valve when said lever is moved to an intermediate position by the weight of a container on said support, and mechanical connections between said valve and said levers for moving said valve to closed position by the movement of one of said levers when said support is moved to an extreme position in one direction by the weight of said container and contents and by the movement of the other of said levers when said support is moved to an extreme position in the other direction by said yieldable means upon removal of the container from said support.

4. An automatic container filler comprising a container support, a fluid supply line for filling a container on said support, a valve for controlling said line, a pair of levers, one of said levers being pivoted intermediate its ends and having one end connected with said support, the other of said levers being pivoted adjacent one end thereof and having the other end thereof connected with the other end of the first mentioned lever, yieldable means for counterbalancing said levers against the weight of a container and its contents on said support, a connection between said valve and one of said levers for moving said valve to open position by the movement of said lever to an intermediate position by the weight of a container on said support, and connections between said valve and said levers for moving said valve to closed position by the movement of said levers to one extreme position by the weight of a filled container on said support or to the other extreme position by said yieldable means upon the removal of the container from said support.

5. An automatic container filler comprising a container support, a fluid supply line for filling a container on said support, a valve for controlling said line, a pair of levers, one of said levers being pivoted intermediate its ends and having one end connected with said support, the other of said levers being pivoted adjacent one end thereof and having the other end thereof connected with the other end of the first mentioned lever, yieldable means for counterbalancing said levers against the weight of a container and its contents on said support, a connection between said valve and the first mentioned lever for opening said valve when said lever is lowered to an intermediate position by the weight of a container on said support, a connection between said valve and the first mentioned lever for closing said valve when said lever is raised by said yieldable means upon removal of the container from said support, and a connection between said valve and said other lever for closing said valve when said lever is raised by the weight of a filled container on said support.

6. An automatic container filler comprising a container support, a fluid supply line for filling a container on said support, a valve for controlling said line, a pair of levers, one of said levers being pivoted intermediate its ends and having one end connected with said support, the other of said levers being pivoted adjacent one end thereof and having the other end thereof connected with the other end of the first mentioned lever,

yieldable means for counterbalancing said levers against the weight of a container and its contents on said support, a yieldable compression spring between said valve and the first mentioned lever for opening said valve when said lever is lowered to an intermediate position by the weight of a container on said support, a positive connection between said valve and the first mentioned lever for closing said valve when said lever is raised by said yieldable means upon removal of the container from said support, and a positive connection between said valve and said other lever for closing said valve when said lever is raised by the weight of a filled container on said support.

7. An automatic container filler comprising a movable container support, a fluid supply line for filling a container on said support, a single valve movable to control said line, a pair of levers, one of said levers being pivoted intermediate its ends with one end connected with said support, the other of said levers being pivotally supported at one end and provided at its other end with a link pivotally connected therewith and with the other end of the first mentioned lever, yieldable means resisting movement of said levers by the weight of a container and its contents on said support, a connection between said valve and one of said levers for opening said valve when said levers are moved to an intermediate position by the weight of a container on said support, and a connection between said valve and each of said levers for closing said valve by extreme movement of one lever when said container is filled and by extreme movement of the other lever when the container is removed from said support.

8. An automatic container filler comprising a movable container support, a fluid supply line for filling a container on said support, a valve having a stem movable to control said line, a pair of levers, one of said levers being pivoted intermediate its ends with one end connected with said support, the other of said levers being pivoted at one end with its other end connected by a pivoted link with the other end of the first mentioned lever, spring means for counterbalancing said levers against the weight of said container, yieldable means connecting said valve stem with the first mentioned lever for opening said valve by the weight of a container on said support, and adjustable connections between said valve stem and said levers for moving said valve to closed position by the movement of said levers in opposite directions by the weight of a container and its contents on said support and by said spring means when the container is removed from said support.

9. An automatic container filler comprising a pair of levers, one of said levers being pivoted intermediate its ends and nearer one end than the other and having a container support mounted on its longer end, the other of said levers being pivoted adjacent one end with its other end connected with the shorter end of the first mentioned lever, yieldable means for moving said levers in a direction to counterbalance the weight of said support and container thereon, a fluid supply line for filling a container on said support, a valve having a single seat for controlling said line, a valve head movable toward and from said seat and having a stem, yieldable means connecting said valve stem with the inner end of said first mentioned lever for opening said valve under the weight of a container on said support,

and a pair of shoulders on said valve stem for actuation alternately by said levers, respectively, to close said valve on extreme movement of said support in opposite directions by the filling of said container or by the removal of said container 5 from said support, respectively.

10. An automatic container filler comprising a container support, a fluid supply line for filling a container on said support, a valve in said line, a pair of connected levers, one of said levers 10 having a connection with said support for moving said levers in one direction by the weight of a container and its fluid contents, yieldable means for moving said levers and support in the opposite direction, a connection between said valve 15 and one of said levers for opening said valve

when said lever is moved to an intermediate position by the weight of a container on said support, mechanical connections between said valve and said levers for moving said valve to closed position by the movement of said levers to extreme position in opposite directions by the weight of a filled container or by said yieldable means on the removal of said container from said support, and a reservoir in said line having a siphoning discharge for draining the same after the filling of a container and the closing of said valve and for retaining fluid released by said valve during the return motion of said support when said container is removed therefrom.

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