

June 21, 1932.

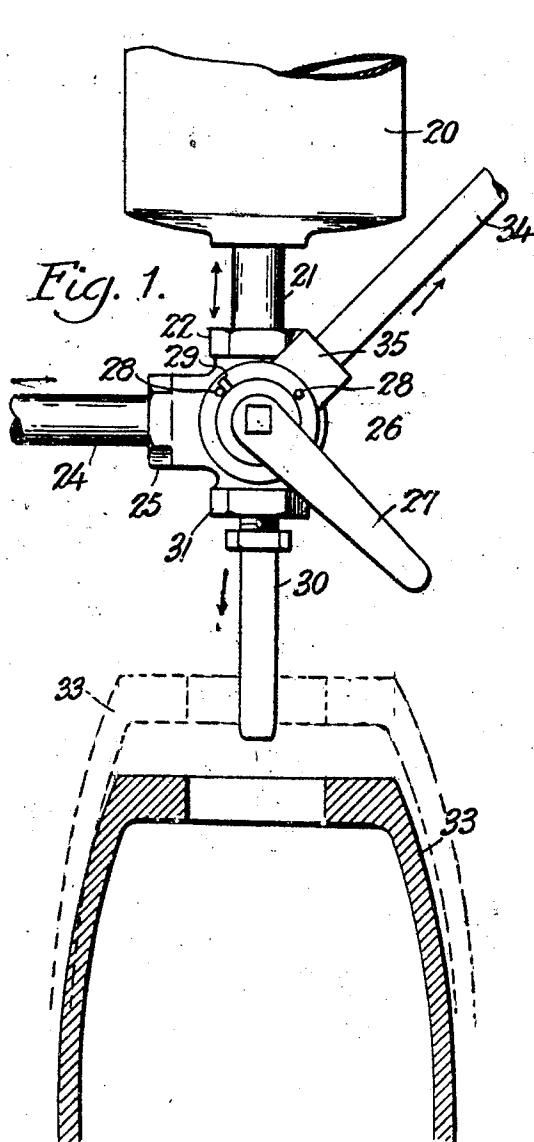
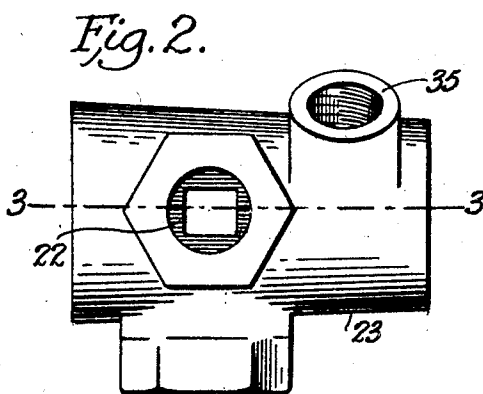
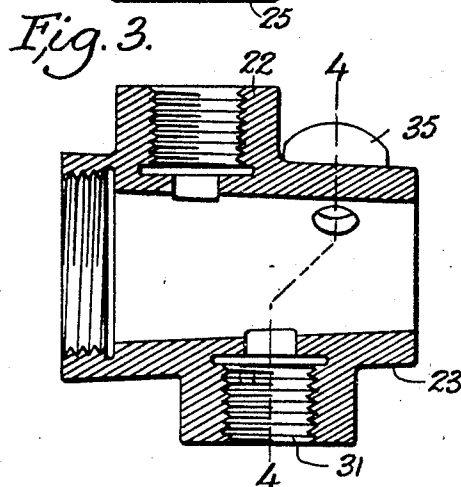
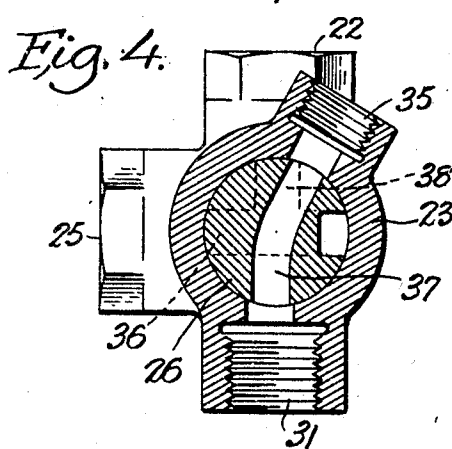
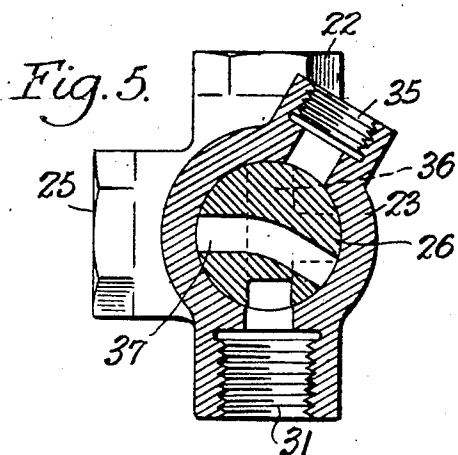
F. L. DREW

1,863,652

VALVE

Filed Sept. 29, 1930

3 Sheets-Sheet 1



Inventor
Frank L. Drew.

W. Dahm,
Attorney

June 21, 1932.

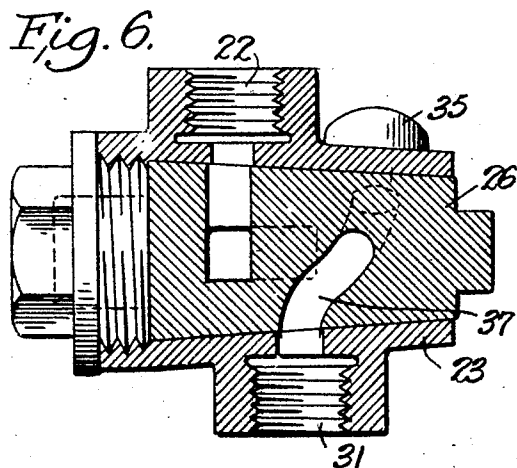
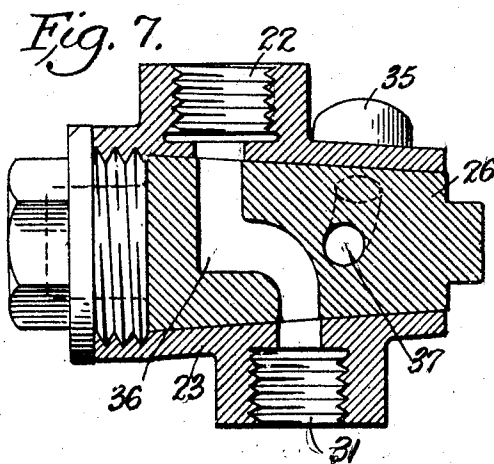
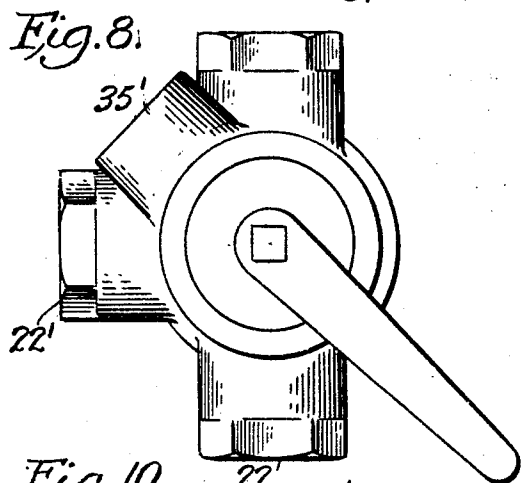
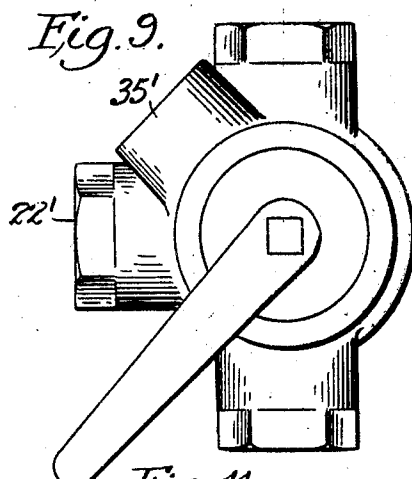
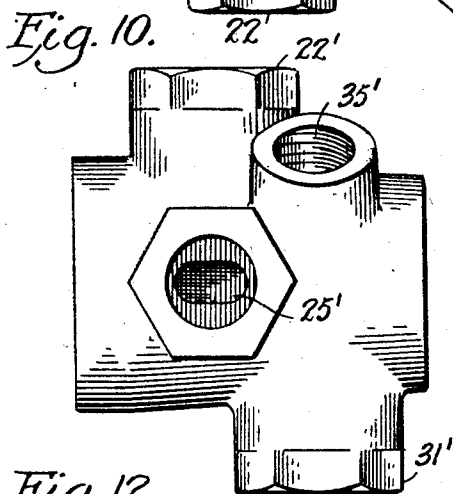
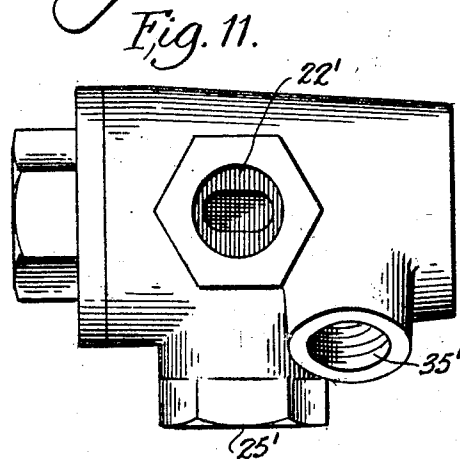
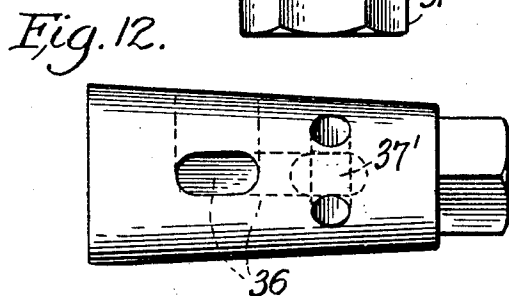
F. L. DREW

1,863,652

VALVE

Filed Sept. 29, 1930

3 Sheets-Sheet 2



Inventor

Frank L. Drew,

W. Dahm

Attorney

June 21, 1932.

F. L. DREW

1,863,652

VALVE

Filed Sept. 29, 1930

3 Sheets-Sheet 3

Fig. 13.

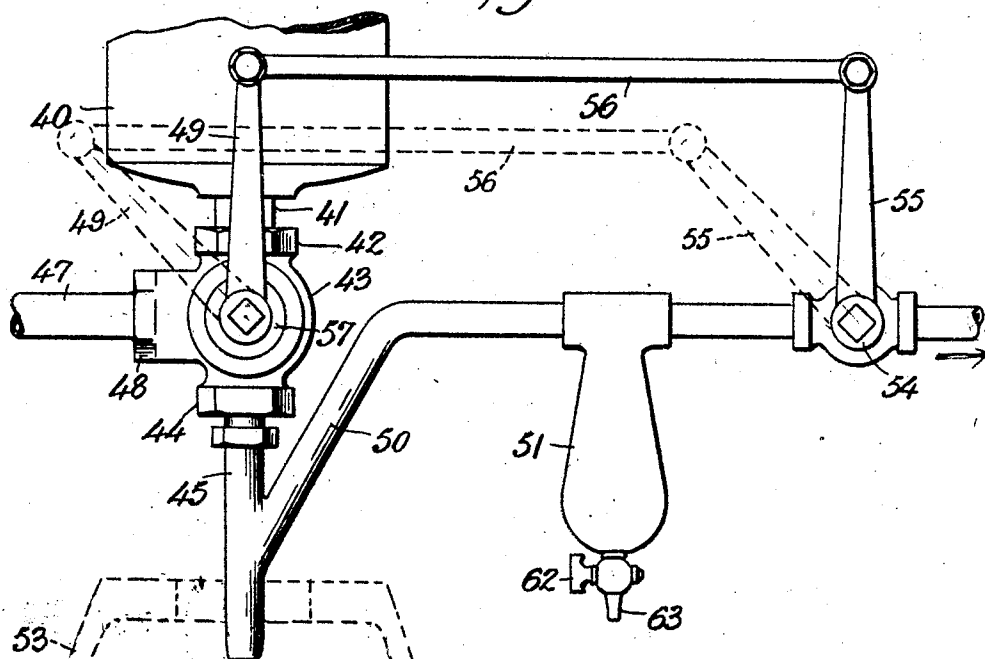
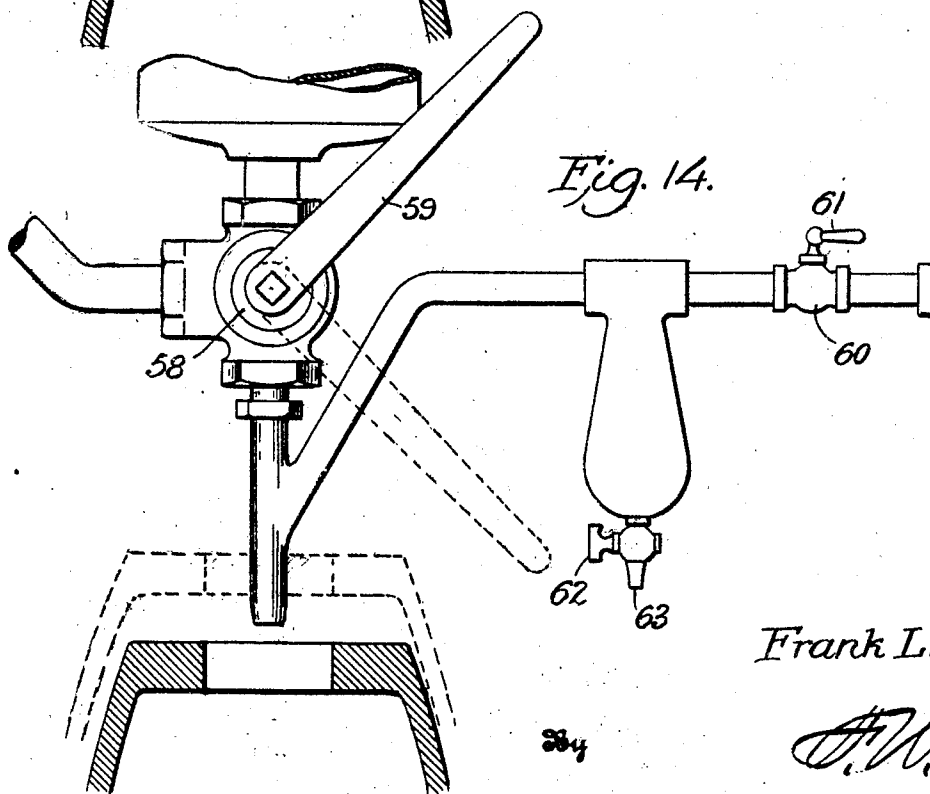


Fig. 14.



Inventor
Frank L. Drew,

W. W. Doherty
Attorney

UNITED STATES PATENT OFFICE

FRANK L. DREW, OF EDGEWOOD ARSENAL, MARYLAND

VALVE

Application filed September 29, 1930. Serial No. 485,225.

My said invention relates to a valve and it is a specific object of the same to provide a non-drip valve constructed in such a manner as to avoid spilling or wasting any of the liquid being dispensed into containers of any suitable type. It is frequently of importance to measure the quantity quite precisely as in putting up expensive medicinal preparations and it is frequently also desirable to prevent any drops from splattering on the floor or on the workmen employed about the dispensing machine. As one instance of such utility I may mention the matter of loading shells with poison gas such as mustard gas where even a single drop adhering to or falling from the dispensing nozzle may cause serious injury to a workman.

Another object of my invention is to provide improved means for filling containers of liquid precisely to a predetermined height. By my device it is possible to fill them to a point above the predetermined height and then to draw off the excess quickly and precisely.

Referring to the drawings, which are made a part of this application and in which similar reference characters indicate similar parts:

Fig. 1 is an elevation, partly in section, illustrating a preferred form of my invention,

Fig. 2, a side elevation of the body of the valve,

Fig. 3, a section on line 3—3 of Fig. 2,

Fig. 4, a section on line 4—4 of Fig. 3,

Fig. 5, a similar section showing a different position of the plug,

Fig. 6, a longitudinal section of the valve in a plane corresponding to that of the line 3—3 of Fig. 2 and with the plug in the position of Fig. 4,

Fig. 7, a similar section with the plug in the position of Fig. 5,

Fig. 8, an end view of a modified form,

Fig. 9, a similar view showing the handle and plug in a different position,

Fig. 10, a side elevation of the valve body of Fig. 8,

Fig. 11, a plan of Fig. 10,

Fig. 12, a side elevation of the plug of the valve in Fig. 8,

Fig. 13, an elevation, partly in section, of a modified form of apparatus, and

Fig. 14, a similar elevation of still another modified form.

In the form of the invention illustrated in Fig. 1, reference character 20 indicates a pipette or other suitable container for a supply of liquid connected by a pipe 21 to the port 22 of the valve body 23. A pipe 24 leads from a source of supply of any suitable character to the port 25 and this is adapted to be connected to the pipe 21 for replenishing the supply in the pipette, by suitable manipulation of the plug 26 through the medium of the handle 27. The movement of the plug is an oscillatory one which is limited by two pins 28 on the body and a coacting pin 29 on the plug. A suitable nozzle 30 is connected to a port 31 of the valve body said nozzle being adapted to enter a filling opening in a receptacle 33 of any suitable character, which receptacle is mounted for movement from the solid line position to the dotted line position, in which latter position it is filled and then lowered for removal and replacement. It is filled to the level of the lower end of the nozzle or to a level above such lower end. In the latter case the excess is drawn off to a predetermined level by means hereinafter described and then the shell is lowered and removed. Another pipe 34 extends from a port 35 on the valve body and is connected to a suitable suction device so that by suitable movement of the plug a suction may be exerted upon the nozzle to withdraw any of the fluid remaining in the same or adhering to it at the time when the pipe 24 is connected to the pipette for replenishing the same. The main receptacle for the fluid and the suction device may be of any desirable or conventional character, hence are not illustrated.

In Fig. 5 there is indicated an oblique diametrical passage 36 extending through the plug and, in that position, completing the passage through pipe 21, port 22, port 31 and nozzle 30 to the receptacle to be filled whereby the material in the pipette may flow into the receptacle 33. Another oblique passage 37 is out of action at this time. Now when

the material in the pipette has passed into receptacle 33 the plug is turned by swinging handle 37 to the right into the position shown in Fig. 1 whereupon the diametrical passage 36 connects the pipette to the nozzle but one branch of this passage now extends toward the port 25 as shown in Fig. 4 and a third branch at 38 extends up toward port 22 so that replenishment may now take place from the receptacle connected to pipe 24 through port 25, through the plug, through port 22 and pipe 21. At this time the passage 37 is so located as to communicate with ports 31 and 35 and the suction device now acts to draw out in the direction of the arrow any liquid in the port or the nozzle 30. It will also be evident that if more liquid has been supplied to the receptacle 33 than is desired it will be drawn off through the pipe 34 until the desired level is obtained.

In the form of the invention illustrated in Figs. 8 to 12 the valve is similar to that just described but the ports 31' and 35' are in the same plane so that the four ports are in only two planes instead of being in three planes transversely of the valve body or casing as in the modification first described. As seen in Fig. 12 the passage 37' lies in a plane at right angles to the axis of the plug.

Referring to the form of the invention illustrated in Fig. 13 a pipette 40 communicates by a pipe 41 with a port 42 in a valve body 43 and is adapted to communicate with a port 44 and a nozzle 45, there being also a supply pipe 47 leading from a source of fluid to a port 48 and adapted to be connected to the pipe at 40 for replenishing the supply on appropriate movement of handle 49. Instead of connecting the pipe 50, which leads to the suction device, directly to the valve body I have connected this pipe to the nozzle 45 and have also shown a bulb 51 for receiving the material drawn from the nozzle or from the receptacle 53, which may be a shell to be loaded with mustard gas or the like.

A valve 54 is interposed between the bulb and the suction device (not shown) and this valve is operated by a handle 55 connected by a link 56 to the handle 49. These handles being both in the form of rock arms it will be seen that oscillation of one will cause the other to oscillate and the valves are so constructed that when the plug 57 is moved into a position to open communication between the pipette 40 and the receptacle 53 the valve 54 will be closed but when the plug 57 is moved to close communication from the pipette to the receptacle 53 and to open communication from the pipe 47 to the pipette 40 (the valve being a three-way valve of any conventional or desirable type) the valve 54 will be open to permit the suction action to remove any liquid upon which the suction is then permitted to act. The position last de-

scribed is that one in which the parts are shown in dotted lines in Fig. 13, while the full-line position is an intermediate one in which all ports are closed. Clockwise movement of the parts 49, 55 and 56 brings the valves into a position where the suction is cut off and the passage from the pipette to the receptacle is open.

In the form of the invention shown in Fig. 14 the parts are or may be substantially of the same character as in Fig. 13 but the three-way valve at 58 is operated by a handle 59 and the valve at 60 is operated by an independent handle 61 so that the two valves must be manipulated independently. In both the forms shown in Figs. 13 and 14 a valve 62 controls an outlet 63 which may be open at suitable times for drawing off the liquid that has accumulated in the bulb 51.

It will be obvious to those skilled in the art that the forms of the invention shown in the drawings are illustrative only and that many changes may be made in the devices shown, all without departing from the spirit of my invention and therefore I do not limit myself to what is shown in the drawings or described in the specification but only as indicated in the appended claims.

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

1. In combination, a container for liquid having a passage for conducting liquid from the container to a receptacle, a valve having a rotary plug for controlling the flow of liquid, and means operated by rotating said plug for withdrawing residual or excess liquid back through said passage.

2. In combination, a container for liquid having a passage for replenishing the supply in the container and a passage leading from the container to a receptacle, a non-drip valve controlling both passages, and means connected to said valve for drawing off residual or excess liquid when the passage from the container to the receptacle is closed.

3. The combination of dispensing means for a liquid including a member having a passage, a valve adapted to be opened or closed for controlling the flow of the liquid through said passage to a receptacle, and means operated in opening or closing said valve for removing residual liquid from said passage.

4. The combination of dispensing means for a liquid said means having a passage, a valve for controlling the flow of the liquid through said passage to a receptacle, a rock-arm for opening and closing the valve and means operated by the rocking movement of said rockarm for creating a suction in the outlet end of said passage to remove residual or excess liquid.

5. The combination of dispensing means for a liquid including a container having a supply passage and a passage leading to a

receptacle, a valve common to said passages for controlling the flow of the liquid to said container and from said container to the receptacle, means for creating a suction in the outlet end of the second-named passage to remove residual or excess liquid, and a valve for controlling the suction.

6. The combination of dispensing means including a fixture having a nozzle and having a dispensing passage leading to the nozzle, said fixture also having a branch passage connected to a source of suction and leading into the first-named passage adjacent the nozzle, and valve means for controlling the suction and the flow of liquid.

7. The combination of dispensing means including a fixture having a nozzle and a dispensing passage leading to the nozzle, said fixture having a branch passage connected to a source of suction and leading into the first-named passage adjacent the nozzle and interconnected valve means for controlling the suction and the flow of liquid.

8. In combination, dispensing means including a container for liquid, said means being provided with a passage for replenishing the supply in the container and a passage leading from the container to a nozzle, a three-way valve having a plug controlling both passages, said dispensing means also provided with a suction passage connected to said valve, and there being a passage in said plug for connecting said nozzle to said suction passage.

9. In combination, dispensing means provided with a container for liquid, said means having a passage for replenishing the supply in the container and a passage leading from the container to a receptacle, a three-way valve controlling both passages, said valve having a body, a plug in said body having a passage with three branches said plug being movable to connect a port in said body through said passage with either one of a pair of other ports, said plug having another passage connecting a fourth port with one of said pairs of ports when the other of said pair of ports is connected to the first-named port, and said dispensing means having a suction passage connected to said fourth port.

10. In combination, a container for liquid having a passage for replenishing the supply in the container and a passage leading from the container to a receptacle, a non-drip valve controlling both passages, a handle movable to opposite positions for opening and closing said valve, and means controlled by the movement of said handle for drawing off residual or excess liquid when the passage from the container to the receptacle is closed.

In testimony whereof I affix my signature.

FRANK L. DREW.