Aug. 16, 1938. A. WEISS 2,126,848

LIQUID DISPENSING MEANS

Filed July 8, 1936

Fig. 1

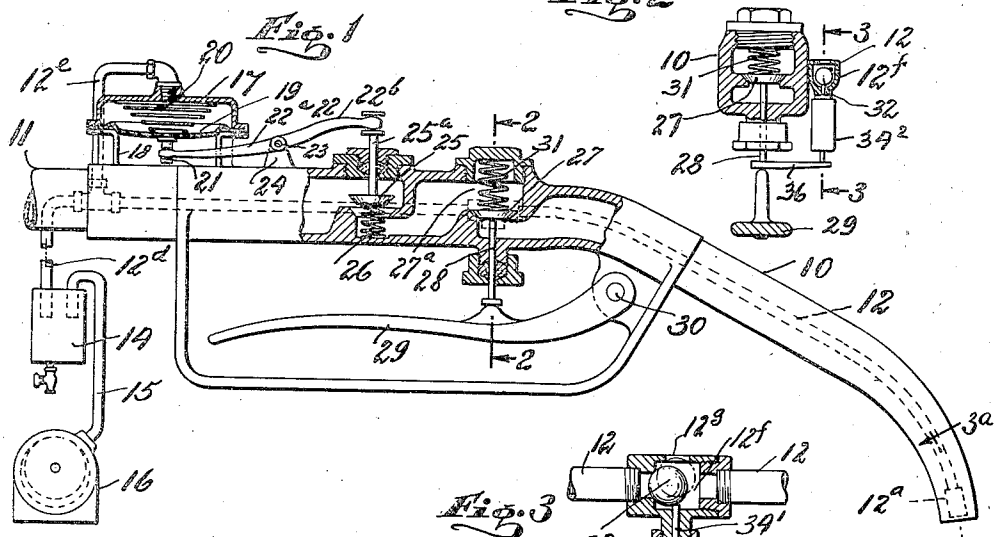


Fig. 2

Fig. 3

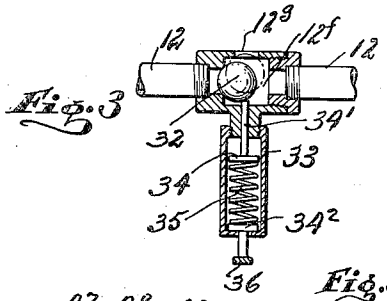


Fig. 3a

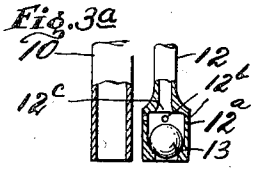
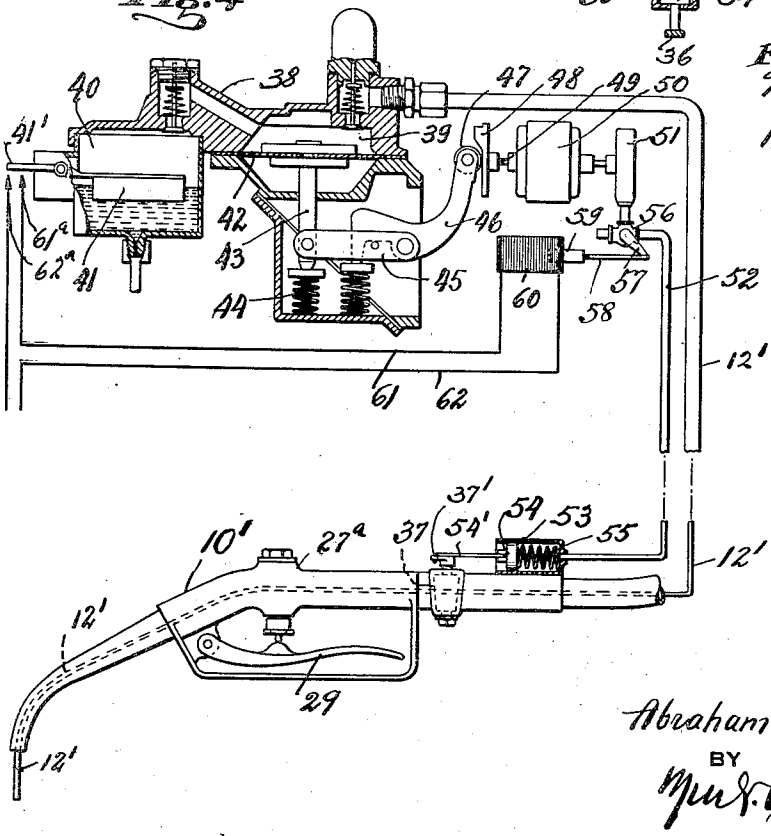


Fig. 3b

Fig. 4



Abraham Weiss INVENTOR

BY

Myer Wolman ATTORNEY

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LIQUID DISPENSING MEANS

Abraham Weiss, New York, N. Y.

Application July 8, 1936, Serial No. 89,553

11 Claims. (Cl. 226—127)

This application is a continuation in part of my application Ser. No. 62,585 filed February 6, 1936.

The present invention relates to improvements in devices for dispensing liquids from a source into a receptacle, particularly adapted for use with liquid fuel supply nozzles employed with gasoline pumps or the like and having manually operable triggers for actuating cut-off valves therein.

The main object of my invention is to provide means whereby when the liquid reaches a certain level in the receptacle or tank to be filled, the discharge thereof into said receptacle will be automatically cut off so that there will be no waste and fire hazards will be prevented.

Another object of my invention is to so construct the device that it will be simple and relatively inexpensive to manufacture.

With these and other objects in view, my invention consists in the combination, construction and arrangement of parts as will be hereinafter more fully described and defined in the appended claims.

In the accompanying drawing which forms part of this specification and in which similar reference characters denote corresponding parts:

Fig. 1 is a sectional side elevation of a nozzle equipped with my device;

Fig. 2 is a cross section on line 2—2 of Fig. 1;

Fig. 3 is a cross section on line 3—3 of Fig. 2;

Figs. 3*a*, 3*b* are longitudinal sections on line 3^a—3^a of Fig. 1 at right angles to one another and,

Fig. 4 is a sectional side elevation similar to that of Fig. 1 of a modified construction of my device.

Referring first to the modification shown in Figs. 1 to 3*a*, 10 denotes the usual nozzle which is connected to the pipe or hose 11 leading from the source of supply, such as gasoline pump or the like (not shown). Extending alongside of said nozzle or through the same is a tube 12 suitably fixed to or supported on said nozzle and the forward end of which is adapted to be passed into the receptacle or tank (not shown) when liquid is to be dispensed into the latter. In this modification the tube 12 is formed at its forward end with a chamber 12^a open at its bottom and provided at its upper end with a number of air holes 12^b. This chamber has a passage 12^c at its upper end which leads into the tube 12 and is controlled by a suitable float 13, such as a ball or the like. The rear end of said tube is branched, one branch 12^d leading into a vacuum tank 14, which through tube fitting 15 is connected to a vacuum pump 16.

The other branch 12^e of said tube 12 leads into a suction chamber 17 which is suitably mounted at or near the rear end of the nozzle 10 by brackets or supports 18 and whose bottom is formed by a diaphragm 19. Mounted between the top of said chamber 17 and said diaphragm 19 is a spring 20 which normally holds said diaphragm in a neutral position. Centrally fixed to said diaphragm and projecting downwardly therefrom is a rod or stem 21 which engages one arm 22^a of a double armed lever 22 fulcrumed at 23 in a bracket 24 fixed to the nozzle. The other arm 22^b of said double armed lever engages the outwardly projecting end of a stem or rod 25^a of a stop valve 25 provided within the nozzle 10 and which controls the flow of the liquid through said nozzle 10. Normally this valve 25 is held in open position by a spring 26. Arranged adjacent and in front of said valve 25 and within said nozzle 10 is a manually operated valve 27 whose stem 28 projects outwardly and downwardly and is operatively connected with the trigger 29 fulcrumed at 30 to the nozzle. Normally the valve 27 is held closed by the action of a spring 31, so that the flow of liquid through the nozzle is shut off.

Arranged in alinement with the valve chamber 27^a of valve 27 in the nozzle 10, there is a valve chamber 12^f in the tube 12. This valve chamber is arranged between two sections of the tube 12 and is formed with an air vent 12^g leading into the atmosphere. A valve body, such as a ball 32 controls both the air vent 12^g and the passage between the two sections of the tube. Normally the ball 32 closes the passage between the two sections of the tube and keeps the air vent 12^g open. Said valve is adapted to be operated simultaneously with the valve 27 by the pulling of the trigger 29 upwardly. To this end the valve chamber or casing 12^f has a cylindrical or tubular downwardly projecting extension 33 in which is movably mounted a plunger 34, under the tension of a spring 35 and whose stem $34'$ projects upwardly into said chamber and is adapted to engage said valve to move it from one position into the other. A second plunger 34^2 in said extension is operatively connected by a cross member 36 to the stem 28 of the valve 27.

The mode of operation is as follows:

Upon the removal of the nozzle from a hook on the pump (not shown) which hook as usual serves at the same time as an electric switch, both the liquid pump and the vacuum pump 16

will in well known manner be set into operation. No liquid can as yet flow through the nozzle 10 because of the closure of the valve 27. The nozzle 10 and the forward end of the tube 12 are then passed into the receptacle or tank to be filled with the liquid. Upon the pulling of the trigger 29 upwardly, the valve 27 is opened, permitting the liquid to flow into the receptacle or tank, and at the same time the passage between the two sections of the tube 12 is opened, and the ball put into the dotted line position in which it closes the vent 12^g. As long as the trigger is held in raised position the liquid continues to flow into the tank and air is drawn through the tube into the vacuum tank 14. When the liquid reaches a certain level in the tank it enters the chamber 12^a, as a result of which the float 13 rises and closes the passage 12^c therein, thereby shutting off the flow of air from the tank through the tube 12, as a result whereof air will be drawn from the suction chamber 17 through branches 12^e and 12^d into the vacuum tank 14. As the chamber 17 is being evacuated the atmospheric pressure against the outer face of the diaphragm 19 will cause the latter to bulge inwardly thereby swinging the double armed lever 22 on its fulcrum 23, as a result of which the arm 22^b will automatically close the valve 25 thereby shutting off the flow of the liquid through said nozzle 10.

It will be noted that with this construction the user or attendant is free to release the trigger at any time while the liquid is being dispensed without any danger of an accidental overflow of the tank.

In the modification shown in Fig. 4 the structure is somewhat similar to that shown in Fig. 2 of my earlier application Ser. No. 62,585. In this structure the chamber 12^a and float 13 in the forward end of the tube shown in the first modification are omitted. In this modification the nozzle 10' is provided with the valve casing 27^a in which is contained the valve operated by the trigger 29. At the rear of said trigger operated valve is a second valve, here shown as a cock 37, adapted to be operated automatically when the liquid in the tank reaches a certain level. The tube 12' which like in the first modification may extend through or alongside the nozzle 10' and whose forward end is adapted to project somewhat below the mouth end of the nozzle is here not used as an air conduit, but as a liquid conduit. Its rear end leads into a casing 38 having a suction chamber 39 which communicates with a liquid collecting chamber 40 in which is provided a float 41. The bottom of said suction chamber is formed by a diaphragm 42 or the like which is provided centrally with an outwardly projecting stem or rod 43 influenced by springs 44 and linked at 45 to a lever 46. This lever 46 at its free end carries a roller 47 which is adapted to bear on a cam disk 48 fixed on a shaft 49 of an electric motor 50 which is actuated by an electric circuit (not shown) controlled from the hook switch heretofore mentioned. This motor drives a vacuum pump 51, from which leads a pipe 52 terminating into a cylinder 53 mounted at or near the rear end of the nozzle 10' or near the cock 37. Movably mounted in said cylinder is a plunger 54, actuated by a spring 55 and whose rod 54' is connected to a crank arm 37' of the cock 37.

The passage leading from the pump 51 into the pipe 52 is controlled by a valve or cock 56, which by an arm 57 and rod 58 is suitably connected to the armature 59 of an electromagnet 60. This electromagnet is adapted to be energized from an electric source (not shown) in the circuit of which indicated by wires 61, 62 is enclosed an electric switch composed of the contact points 61^a, 62^a and a tail member 41' of conductive material projecting outwardly from the collecting chamber 40 and forming part of the float 41.

The operation of the device according to this modification is as follows:

Upon the insertion of the nozzle and tube into the tank and on the pulling of the trigger 29, the liquid begins to flow into the tank. Before the liquid reaches the desired level in said tank some of the liquid will be sucked through the tube 12' into the suction chamber 39 and thence ejected through the operation of the diaphragm 42 into the collecting chamber 40. When the float 41 in said chamber 40 has risen sufficiently its tail piece 41' contacts with the points 61^a, 62^a closing the circuit through the electromagnet 60.

As a result thereof the armature 59 will be attracted actuating the valve 57 to open communication between the cylinder 53 and vacuum pump 51. The plunger 54 will thereupon be caused by the atmospheric pressure to move inwardly against the tension of spring 55 and thereby close the valve 37, to automatically shut off the flow of the liquid through the nozzle.

In this modification the automatic means, including the collecting chamber 40, suction chamber 38, 39, electromagnet 60 etc. except the cylinder 53 and the parts actuating the valve 37 may be all mounted on a wall or board remote from the nozzle.

When the liquid in the chamber 40 is drained off sufficiently through a drain in the bottom of said chamber, the float 41 returns to its initial position, breaking the electric circuit of the electromagnet 60, as a result of which the two way cock 56 will be reset to close communication between the vacuum pump 51 and cylinder 53 and open communication between the latter and the atmosphere. The spring 55 will thereupon force the plunger 54 in the cylinder 53 outwardly returning the cock 37 to its open position.

It is understood that various other modifications may be made in my device without departing from the spirit of my invention. I, therefore, do not wish to restrict myself to the details shown and described.

What I claim is:

1. In a liquid dispensing means including a discharge nozzle having a trigger operated valve, means for automatically controlling the discharge of the liquid from said nozzle into a receptacle, said means comprising a tube associated with and adjacent said nozzle to be passed together with the latter into the receptacle, an auxiliary valve in said nozzle adapted to be normally open, pneumatically operated means for closing said auxiliary valve, a chamber and a float therein operated by the liquid in said receptacle and controlling the operation of said pneumatically operated means to close said auxiliary valve when the liquid in said receptacle rises to a certain level.

2. In a liquid dispensing means according to claim 1, in which said penumatically operated means include a suction chamber having a pressure operated diaphragm and a lever operatively connecting said diaphragm to said auxiliary valve.

3. In a liquid dispensing means according to claim 1, in which said pneumatically operated

means include a vacuum tank and a suction chamber and in which said tube terminates both into said tank and chamber.

4. In a liquid dispensing means, a discharge nozzle having a trigger operated valve, an auxiliary valve in said nozzle adapted to be normally open, a tube adjacent said nozzle and adapted to be passed together with said nozzle into a receptacle to be filled, a liquid collecting chamber, means for drawing liquid into said chamber through said tube from said receptacle, a float in said collecting chamber, electric means including a switch controlled by said float, and pneumatic means controlled by said electric means for closing said auxiliary valve when the liquid in said receptacle rises to a certain level.

5. In a device of the character described, a discharge nozzle, an air tube adjacent said nozzle having a float adapted to act as a normally open valve at its forward end and adapted to be passed together with said nozzle into a receptacle to be filled, stop valves in said nozzle and said tube, means for manually operating both said stop valves simultaneously to control the flow of liquid through said nozzle and the flow of air through said tube, pneumatic means for drawing air through said tube after the opening of said stop valves, an auxiliary stop valve in said nozzle and means controlled from said pneumatic means and operatively connected to said auxiliary valve, so as to cause said auxiliary valve to automatically close the instant said float valve has been closed when the liquid reaches the desired level in said receptacle.

6. In a device of the character described, a discharge nozzle, a manually operable stop valve and an auxiliary normally open stop valve in said nozzle, and means for causing the automatic closure of said auxiliary valve, when the liquid in the receptacle to be filled reaches a desired level, said means including a tube associated with said nozzle and whose forward end is adapted to be passed together with said nozzle into said receptacle, driven means for drawing liquid through said tube from said receptacle and means affected by the liquid passing through said tube and operatively connected to said auxiliary stop valve.

7. In a device according to claim 6, in which said liquid affected means include a pneumatically controlled means for closing said auxiliary valve.

8. In a device according to claim 6, in which said liquid affected means include an electric circuit, a switch controlling said circuit and operated automatically by the liquid drawn through said tube, and pneumatically operated means controlled from said circuit and operatively connected to said auxiliary valve.

9. In a device according to claim 6, in which said liquid affected means include suction means, electric means controlling the operation of said suction means and controlled from the liquid passing through said tube, and means controlled from said suction means for operating said auxiliary valve.

10. In an automatic valve, the combination of a conduit for conducting liquid to a receptacle, a valve for stopping the flow of liquid therethrough, a float remote from the discharge end of said conduit, suction means adapted to withdraw liquid from the receptacle and conduct it to said float to elevate the same upon the rising of the liquid level in the receptacle to a predetermined height and means actuated by the said elevation of the float to close the said valve.

11. In an automatic valve, the combination of a conduit for conducting liquid to a receptacle, a valve for stopping the flow of liquid therethrough, electromagnetic means for closing the valve, a float chamber remote from the discharge end of said conduit, a float in said chamber, a tube communicating with the float chamber and having an intake orifice adapted for insertion within the receptacle, means for forcing liquid from the receptacle through the tube and into the float chamber to elevate the float upon the liquid level in the receptacle rising to cover said intake orifice and means actuated by the said elevation of the float to energize said electromagnetic means whereby to close the said valve.

ABRAHAM WEISS.