

March 31, 1964

W. D. BOONE

3,126,925

SAFETY CUT-OFF FOR AUTOMATIC DISPENSING VALVE

Filed Feb. 2, 1961

2 Sheets-Sheet 1

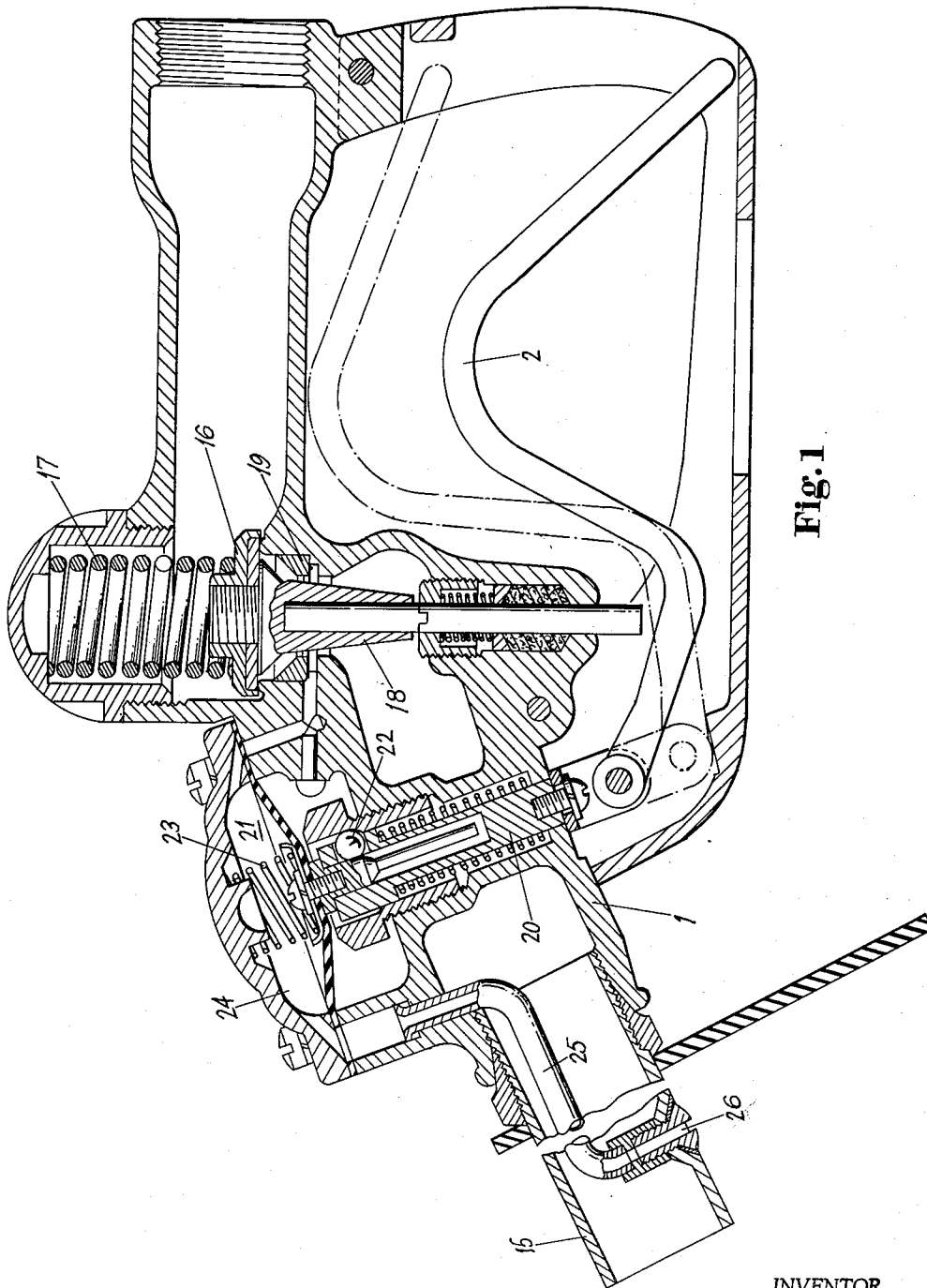


Fig. 1

INVENTOR
WALLACE D. BOONE,
BY *Yungblut, Melville,
Shaser & Foster,*
ATTORNEYS.

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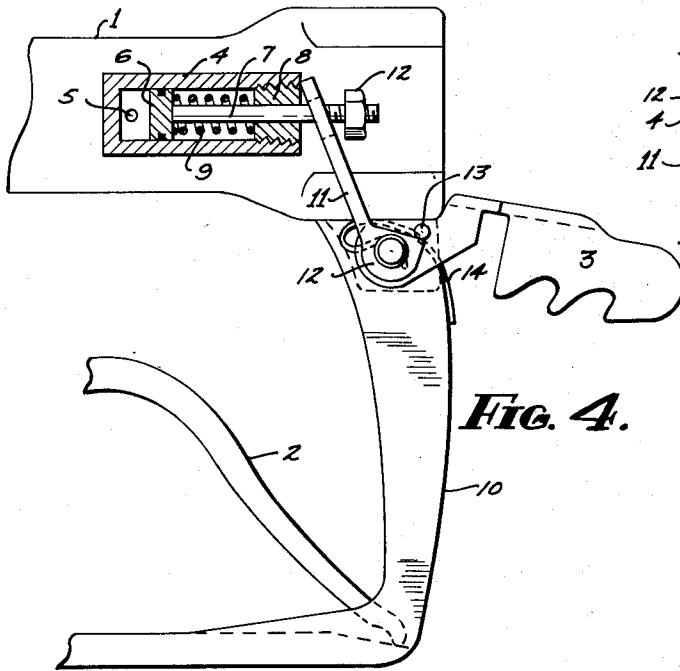


FIG. 4.

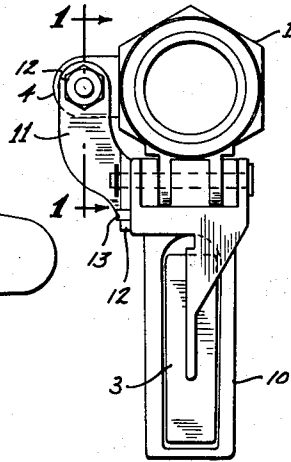


FIG. 3.

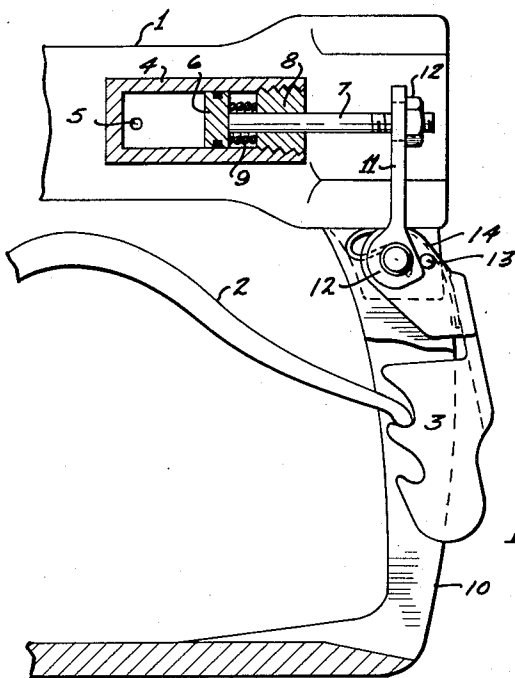


FIG. 2.

INVENTOR.
WALLACE D. BOONE,
BY *Allen & Allen*
ATTORNEYS.

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SAFETY CUT-OFF FOR AUTOMATIC DISPENSING VALVE

Wallace D. Boone, Cincinnati, Ohio, assignor to Dover Corporation, a corporation of Delaware
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 7 Claims. (Cl. 141-209)

The invention relates to automatic shut-off dispensing nozzle valves of the type exemplified by U.S. Patent No. 2,582,195 to L. H. Duerr, wherein submergence of the discharge tube of the nozzle in the liquid being dispensed causes the main flow discharge valve to close.

It has been noted by those skilled in the art that a cessation of flow of liquid at the intake of such a nozzle valve, caused by some obstruction in or constriction of the connecting means between the nozzle valve and the liquid dispensing pump, or preset shut-off of the pump itself, may under some circumstances result in siphoning of the tank being filled. Further, the operator of the nozzle valve, thinking the tank is full and the main dispensing valve closed, may remove the nozzle from the tank and hang it up on the dispensing pedestal before the desired quantity of fuel has been dispensed. Under such circumstances, should the fuel pressure be restored ahead of the nozzle, dangerous and wasteful spillage of the liquid being dispensed may result.

It is an object of this invention to provide an automatic shut-off dispensing nozzle valve with automatic means for closing the main dispensing valve in the event the liquid being dispensed loses pressure or is cut off ahead of the intake end of the nozzle valve, due to some failure of the connecting means between the nozzle valve and the liquid dispensing pump, or preset shut-off of the pump itself.

It is an object of this invention to provide an automatic shut-off dispensing nozzle valve with an automatic device for positively closing the main dispensing valve in the event of flow failure at the intake end of the nozzle valve, thereby preventing dangerous and wasteful spillage of the liquid being dispensed.

It is a primary object of the invention to provide an automatic shut-off nozzle which will not be returned to the boot of a dispensing stand after a filling operation without the nozzle being first shut off. This is accomplished by the addition of an independent device which will effect closure of the nozzle valve if or when a preset pump shuts off or if for any other reason the pressure in the line to the nozzle drops to a low value, the device acting without interference with the normal automatic shut-off actuated by a sensing device.

The general objects of this invention as well as the more specific ones which will be referred to later or will be clear to the skilled worker in the art upon reading these specifications, are accomplished in that manner and by that construction and arrangement of apparatus elements of which a certain exemplary embodiment will now be described. Reference is made to the drawings forming a part hereof, and in which:

FIG. 1 is a longitudinal cross-sectional view of an automatic dispensing valve of a character to which this invention may be applied.

FIG. 2 is a partial side view with parts in cross section of the nozzle valve of this invention in the dispensing position.

FIG. 3 is an end elevational view of the structure showing means for operating the latch.

FIG. 4 is a partial side elevation with parts in section showing the latch in open position.

The nozzle valve comprises a body 1 having a guard 10. As is well understood, the nozzle valve will have a dispensing spout 15. Within the body is a main valve 16 normally held in a closed position by a spring 17. The

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main valve generally has a valve stem 18, frusto-conical in section, with its widest part adjacent a valve seat 19 so as to provide a venturi effect.

Also, as is well understood, an operating lever 2 is provided for the main valve. This lever, as shown in the patent, is pivoted at its forward end. At the rear of the dispensing nozzle valve there is a latch element 3 with notches to engage the rear end of the operating lever. An engaged position is illustrated in FIG. 2, and it will be understood that the latch will maintain the position of the operating lever 2 such that the nozzle valve will remain open.

The forward end of the operating lever 2 is pivoted, not to the body of the dispensing valve, but to the end of a plunger 20. In a portion of the valve body there will be a separate chamber containing a diaphragm 21 to which is attached a locking means 22 for the plunger. The diaphragm is held in depressed position by a spring 23. The means providing the venturi effect above noted (or other equivalent means), is connected to the chamber 24 above the diaphragm so as to tend to produce a vacuum. This vacuum, if not relieved, would raise the diaphragm, causing a shift in the position of a locking pin holding the plunger, so that the plunger can move downwardly under the influence of the valve spring. The vacuum is relieved through a connection between that portion of the chamber above the diaphragm and the outer air. In the form of apparatus described in the patent, this connection comprises a tube 25 extending downwardly within the nozzle to a point near the nozzle end, where it has an outward opening 26.

During a tank filling operation, the main valve will remain open because of the locking of the operating lever, until such time as the fuel within the tank reaches the level of the external opening of the tube. When this occurs, however, the tube will be effectively closed, and the drawing of a greater vacuum above the diaphragm will cause the diaphragm to rise so that the pin will unlock the plunger. The plunger thereupon descends under the influence of the spring of the main valve, and this will permit the main valve to close. The tube and its outlet, therefore, constitute a sensing means, cutting off the flow of fuel when the tank is full. The structure thus briefly described is susceptible to modifications which do not form a limitation on this invention. Thus for example other sensing means may be employed. But it will be evident that the sensing means will not be effective in closing the main valve if there is a cessation or diminution of the pressure of the fuel ahead of the nozzle valve itself, so long as the rear end of the operating lever 2 remains in engagement with the latch 3.

In the practice of this invention means are provided which will release the latch in the event of failure of pressure ahead of the dispensing nozzle valve. In the exemplary embodiment a small cylinder 4 is attached to or is formed integral with the body 1 of the valve structure. One end of this cylinder is closed as shown and is connected to the interior of the valve body as by an opening 5 or in any other suitable way. The cylinder 4 has a piston 6 with a piston rod 7 extending through a plug 8 in the opposite end of the cylinder. A coiled spring 9 surrounds the piston rod within the cylinder and engages between the piston and the plug 8.

At the place on the guard pin where the latch 3 is pivoted there is also pivoted a lever 11. The upper end of this lever is perforated so as to pass the piston rod 7 loosely. There is an abutment on the outer end of the piston rod which in the drawings has been illustrated as a nut 12. The pivoted end of the lever 11 is shown as comprising a cam having a portion which engages a pin 13 on the latch body near the pivot point.

In operation, so long as there is pressure of the fuel

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ahead of the nozzle valve structure, this pressure will be effective to keep the piston of cylinder 4 moved to the right against the pressure of the spring 9. This is illustrated in FIG. 1; and it will be noted that the cam portion of the lever 11 is now in a position to permit engagement of the latch 3 with the operating lever 2.

If however the fuel pressure ahead of the cylinder 4 diminishes or is cut off entirely the spring 9 will move the piston to the left in the figures. The lever 11 will be turned in a counterclockwise direction, and the engagement means on the cam 12, acting on the pin 13, will release the latch as is illustrated in FIG. 4. This will cause the nozzle valve to close under the influence of its spring since the lever is now free to move.

The strength of the spring 9 may be chosen in such a way that the relief mechanism will operate only upon a total cessation of the fuel pressure ahead of the dispensing nozzle valve, or in such a way as to cause it to operate upon the occurrence of a predetermined diminution in fuel pressure. The manner of interconnection of the lever 11 and the latch may likewise be varied. They may indeed be integral; but it is generally preferable to provide a structure such as that illustrated wherein the lever 11 will act to release the latch but will leave the latch free to swing open to the fullest possible extent under the influence of the latch spring 14.

The latch member is normally urged to open position by a spring, as known in the art, so that it becomes possible for the operator to close the nozzle valve at will.

Modifications may be made in the invention without departing from the spirit of it. The invention having been described in said exemplary embodiments, what is claimed as new and desired to be secured by Letters Patent is:

1. In a dispensing nozzle, a body with an inlet portion and a main valve together with means for actuating the valve comprising a lever and a latch to hold the lever in valve-opening position, fluid actuated means at said inlet portion having a connection with the inlet portion of said nozzle and a connection with said latch for releasing said latch upon failure of fluid pressure within said inlet portion.

2. The structure claimed in claim 1 wherein the fluid actuated means is a cylinder and piston with a piston rod and a lost motion connection between said piston rod and said latch.

3. The structure claimed in claim 2 wherein said cylinder contains a spring acting on said piston in opposition to said fluid pressure, so as to actuate said lost motion connection upon failure of said pressure.

4. In a dispensing nozzle, a body with an inlet portion and a main valve together with means for actuating the valve comprising a lever and a latch to hold the lever in valve-opening position; fluid actuated means comprising a cylinder cast integral with said inlet portion, there being a passageway between the interior of said cylinder and said inlet portion, a piston in said cylinder, a piston rod

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on said piston, a lever arm connected to said piston rod and having a common pivot point with said latch, the lever arm having an eccentric portion engaging an abutment on the latch, and a spring in said cylinder acting to move said piston against the fluid pressure in said cylinder whereby to cause said lever to move said latch to a disengaged position.

5. A dispensing nozzle having a body with an inlet portion and a main valve, together with means for actuating the valve comprising a lever and a latch to hold the lever in valve-opening position, and means actuated by a sensing device for effecting closure of said valve, fluid actuated means at said inlet portion having a connection with the inlet portion of said nozzle and having a connection with said latch, for releasing said latch upon failure of fluid pressure within said inlet portion.

6. In a dispensing nozzle, a body with an inlet portion and a main valve together with means for actuating the valve comprising a lever and a latch to hold the lever in valve-opening position, means actuated by a sensing device for effecting closure of said valve, fluid actuated means comprising a cylinder cast integral with said inlet portion, there being a passageway between the interior of said cylinder and said inlet portion, a piston in said cylinder, a piston rod on said piston, a lever arm connected to said piston rod and having a common pivot point with said latch, the lever arm having an eccentric portion engaging an abutment on the latch, and a spring in said cylinder acting to move said piston against the fluid pressure in said cylinder whereby to cause said lever to move said latch to a disengaged position.

7. In a dispensing nozzle, a body with an inlet portion and a main valve together with means for actuating the valve comprising a lever and a latch to hold the lever in valve-opening position, fluid actuated means at said inlet portion having a connection with the inlet portion of said nozzle and a connection with said latch for releasing said latch upon failure of fluid pressure within said inlet portion, wherein the fluid actuated means is a cylinder and piston with a piston rod and a lost motion connection between said piston rod and said latch, the lost motion connection comprising a lever having a common pivot point with said latch and coacting abutment means on said lever and on said latch.

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