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DISPENSING NOZZLE WITH AUTOMATIC CONTROL

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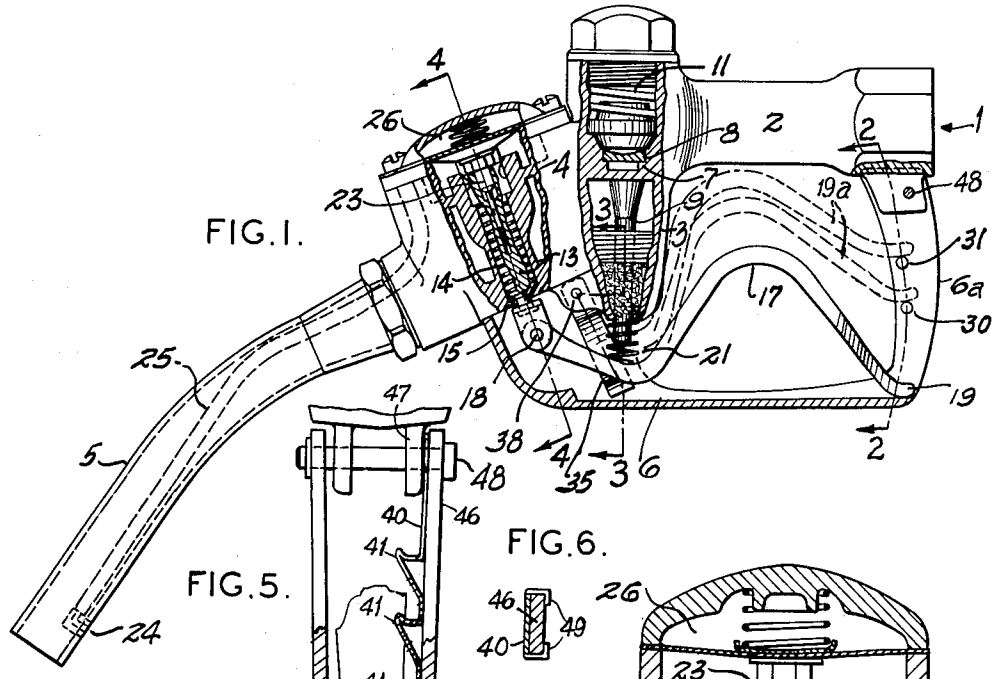


FIG. 1.

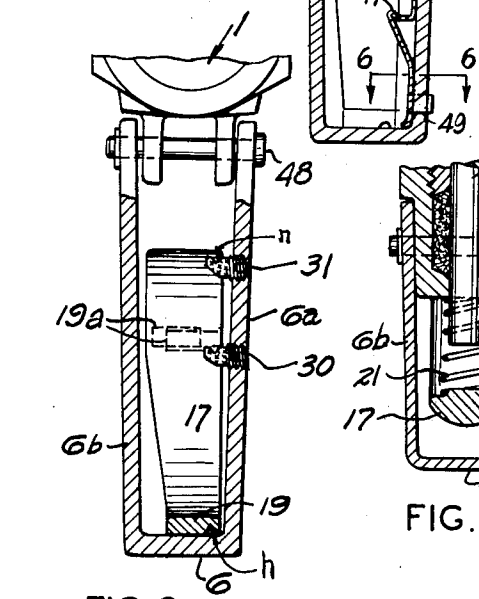


FIG. 5.

FIG. 2.

FIG. 6.

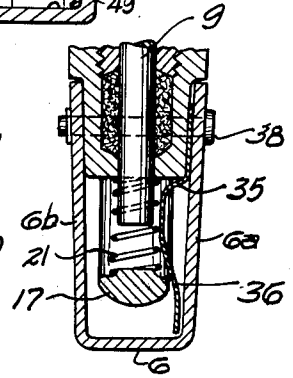


FIG. 3.

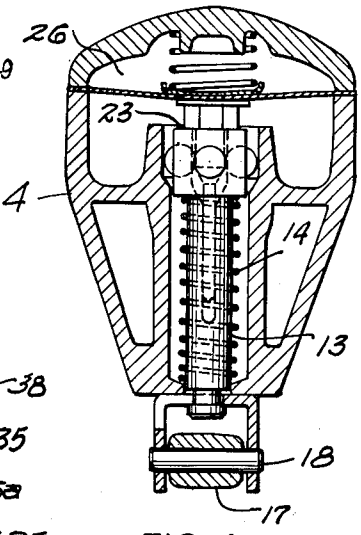


FIG. 4.

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DISPENSING NOZZLE WITH AUTOMATIC CONTROL

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The invention relates to automatic shut-off nozzles, such as are in general use on fuel pumps in filling stations, whereby the operator inserts the nozzle into a motor vehicle fuel tank and opens the nozzle valve by moving a lever and latches the lever to the lever guard to hold the lever in valve opening position while the attendant performs other services such as inspecting the oil supply, tire pressures, cleaning the windshield, etc. When the level of fuel in the tank reaches the discharge end of the nozzle, the nozzle valve closes automatically and the valve control lever is released from the latch which has held it open. Nozzles of this type are described in Patents 2,528,747 and 2,837,240.

The objects of the present invention are to simplify the construction and operation of a nozzle of the type referred to; to avoid the projection of mechanism parts from the lever guard which could scratch vehicle finishes, or injure the attendant's hand or clothing; to avoid interference with the hose connection to the nozzle; to avoid replacements due to breakage or wear of movable lever latching parts.

These and other detail objects are attained by the structure illustrated in the accompanying drawings, in which:

FIGURE 1 is a side view of and vertical longitudinal section through a nozzle embodying the invention.

FIGURE 2 is a transverse vertical section on line 2—2 of FIGURE 1.

FIGURE 3 is a transverse vertical section on line 3—3 of FIGURE 1.

FIGURE 4 is a transverse vertical section on line 4—4 of FIGURE 1.

FIGURE 5 is a section corresponding to FIGURE 2 but illustrating another form of the invention.

FIGURE 6 is a detail horizontal section on line 6—6 of FIGURE 5.

The nozzle includes a substantially rigid body having an inlet 1, a handle 2, a supply valve housing 3, a vacuum control housing 4 and a discharge spout 5. A lever guard 6 is secured to the housing and is rigid therewith. Housing 3 includes a seat 7 for a valve disk 8 having a downwardly extending stem 9 passing through the bottom of the housing. A compression spring 11 thrusts the valve against its seat and moves stem 9 downwardly. A plunger 13 is slidable in housing 4 and normally is thrust upwardly by a coil spring 14 seated on a ledge 15 at the bottom of the housing. A lever 17 has one end pivoted at 18 on the lower end of plunger 13 and extends from the latter below the lower end of stem 9 and toward the other end of guard 6 where its tip 19 is received between spaced apart upright bars 6*a* and 6*b* of the guard. A spring 21 is compressed between the lower end of housing 3 and lever 17 and thrusts the latter downwardly toward the position shown in FIGURE 1 when the lever is released.

Manual lifting of the right hand end of the lever causes it to fulcrum about the lower end of stem 9 and pull downward on plunger 13. Downward movement of the plunger is limited by a releasable latch 23 controlled by the atmospheric pressure in chamber 26, as described in Patent 2,582,195. Continued lifting of the right hand end of lever 17 causes it to raise stem 9 and open the supply valve. As long as air may enter the lower end 24 of a tube 25 and pass to a vacuum chamber 26 above

housing 4, the lifted lever 17 will hold the supply valve open. When liquid rises to the level of inlet 24, the resulting partial vacuum in chamber 26 causes latch 23 to release plunger 13 and the left hand end of lever 17 drops and stem 9 also drops, closing the supply valve irrespective of the position of the right hand end of the lever.

To make it possible for the operator to insert the nozzle into the tank, lift the lever and temporarily secure it in valve-opening position while the operator attends to other duties while the tank is being filled, there are provided stationary projections such as studs or pins 30, 31 inserted through guard upright bar 6*a*. Lever tip 19 is narrower than the space between the inner ends of the projections and the opposite bar 6*b* and there is sufficient play in the lever pivot 18 to permit tip 19 to be moved laterally of the guard and past one or both projections 30, 31 to either position indicated in broken lines at 19*a* in FIGURE 1, where the lever tip may be supported by the selected projection or may clear the latter.

A flat spring 35 is secured at its upper end to the side of the nozzle body or guard, or both (FIGURE 3), and extends downwardly and inwardly to bear transversely at 36 against the side of lever 17. The thrust of spring 35, particularly following the operator's positioning of the lever 17 on one of studs 31, tends to move lever 17 to the left to dislodge it from the engaged projection but this tendency is resisted by the friction between the lever and the projection due to the thrust of valve spring 11. When gasoline rises to the level of and closes air inlet 24 to chamber 26, and plunger 13 and the left hand end of lever 17 drops away from plunger 9, under the thrust of the relatively weak spring 21, there is no longer any pressure between lever 17 and the projection against which it bears and spring 35 instantly dislodges the lever tip 19 from the engaged projection and spring 21 moves the lever downwardly. The left hand offset portion of spring 35 guides the lever past the projections. It will be noted that the lower end of spring 35 is offset to the right (FIGURE 3) so that it offers no frictional resistance to the downward movement of lever 17 when it drops and its tip 19 will be maintained in contact with the bottom part of guard 6 and there will be no tendency for the lever to be caught by a support hook on the pump housing and accidentally moved to the valve opening position. Preferably the lower faces of projections 31 (FIGURE 2) are inclined upwardly to guide the lever to the left if the attendant, in opening the valve, inadvertently presses the lever to the right before having opened the valve to the desired extent. The upper face of each projection 30, 31 is roughened, or provided with a notch *n*, or both, to better engage with notch *h* in the underface of the lever tip.

A nozzle service man can readily apply studs as shown in FIGURE 2 to an existing nozzle lever guard by drilling and tapping the guard portion 6*a* and threading the studs into place or by inserting rivets having an inner head shaped to engage the lever. Spring 35 is readily applied to existing nozzles by removing pin 38 securing the nozzle body and lever guard to each other, inserting the upper end of the flat spring, and replacing the pin.

FIGURE 5 illustrates another arrangement of the projection means embodying a flat metallic strip 40 having a series of projections 41 formed therein. The upper end of the strip is inserted between guard portion 46 and the mounting ear 47 therefor on the nozzle body and receives the present pin 48 holding the guard to the nozzle body. The lower end of strip 40 has extension ears 49 which may be bent around the guard portion 46, as best shown in FIGURE 6. This type of projection does not require any drilling or other machine work on the present nozzle. Strip 40 and spring 35 may be sold as a unit for ready application to existing nozzles by service station operators.

With either arrangement the attendant lifts lever **17** and moves it over the selected projection **30**, **31**, **41**, as he grasps the nozzle handle **2** to insert the spout in the tank to be filled. This is done readily with one hand, leaving the other hand free at all times. There are no parts projecting from the guard upright bars to accidentally catch and injure hand, clothing, car or pump. There are no moving latching parts extending from the rear of the guard to wear or break, to bend or be knocked out of operative position. The lever release spring **35** is spaced from the operators' hand and protected by the sides of the guard.

The areas of the interengaging lever and projection parts are substantial and neither part is likely to wear the other so as to avoid secure holding of the lever in valve opening position.

Variations in the details of construction may be made without departing from the spirit of the invention and the exclusive use of those modifications coming within the scope of the claims in contemplated.

We claim:

1. An automatic shut-off nozzle for delivering liquid to a tank, comprising a body having a liquid conduit therethrough and a discharge spout, a control valve in the conduit including a spring urging the valve into closed position, a manually operable valve opening member movably mounted on the body and having a manually engageable handle for moving it against the thrust of said spring, an element fixed on the body and projecting toward the path of movement of said member handle, said member handle being shiftable manually transversely of said path of movement to frictionally engage an attendant-selected one of said elements, a spring seated on the body and distorted by said handle when the latter is shifted transversely, means freeing said member handle from the thrust of said valve spring when the liquid in the tank rises to a predetermined level above the discharge end of said spout, said second-mentioned spring automatically shifting said member handle in the opposite direction, when said member is free of said valve spring pressure against the engaged element, to dislodge the handle from the engaged element.

2. An automatic shut-off nozzle for delivering liquid to a tank, comprising a body having a liquid conduit therethrough and a discharge spout, a control valve in the conduit provided with a spring urging the valve into closed position, a manually operable valve opening lever fulcrumed on the body near one end thereof and having a manually engageable handle near the other end of the body, spaced elements fixed on the body and projecting toward the path of movement of said lever handle, said lever handle being shiftable transversely of said path of movement to frictionally engage an attendant-selected one of said elements, a spring seated on the body and compressed by such transverse shifting of the lever handle,

said spring shifting the lever handle in the opposite direction when said lever handle is free of valve spring pressure against any of said elements, and means automatically freeing said lever of said valve spring pressure when the liquid level in the tank reaches a predetermined level on the nozzle spout.

3. An automatic shut-off nozzle for delivering liquid to a tank, comprising a body having a liquid conduit therethrough and a discharge spout, a control valve and valve stem in the body provided with a compression spring urging the valve closed, a manually operable valve stem-engaging lever having a fulcrum mounted on the body and having a handle portion, a lever guard rigid with said body and including spaced bars at opposite sides of the lever handle portion between which said handle portion moves lengthwise of the bars when pivoted on its fulcrum, rigid projections extending from one of said bars toward the other bar but spaced from the latter bar to permit the movement of the lever handle portion past the projections, said projections being engageable selectively by said handle portion when shifted transversely of the plane of its valve opening movement, and a spring mounted on said guard and manually distortable by said lever handle portion when shifted into engagement with one of said projections, said spring exerting a thrust on said lever handle portion less than the frictional resistance between an engaged projection and said lever due to the thrust of said valve spring but sufficient to move the handle portion off the engaged projection when the valve spring thrust is released.

4. An automatic shut-off nozzle according to claim 3 in which the projections rigid with the guard section are individual studs inserted into the guard section and projecting inwardly therefrom.

5. An automatic shut-off nozzle according to claim 3 in which the projections rigid with the guard section comprise a single unit applicable to and removable from the guard section as a unit.

6. An automatic shut-off nozzle according to claim 3 in which the spaced elements on the guard section are embodied in an elongated flat strip applicable to the face of the guard section and having offset portions forming the projections and having a part bent around the guard section to retain the strip thereon.

References Cited in the file of this patent

UNITED STATES PATENTS

2,106,596	Duff	Jan. 25, 1938
2,528,747	Gravelle	Nov. 7, 1950
2,702,659	Henry	Feb. 22, 1955
2,837,240	Boone	June 3, 1958

FOREIGN PATENTS

521,700	Great Britain	May 29, 1940