March 22, 1960 J. F. RYAN, JR 2,929,418

AUTOMATIC GASOLINE DISPENSING HOSE-NOZZLE VALVE

Filed Feb. 5, 1957 3 Sheets-Sheet 1

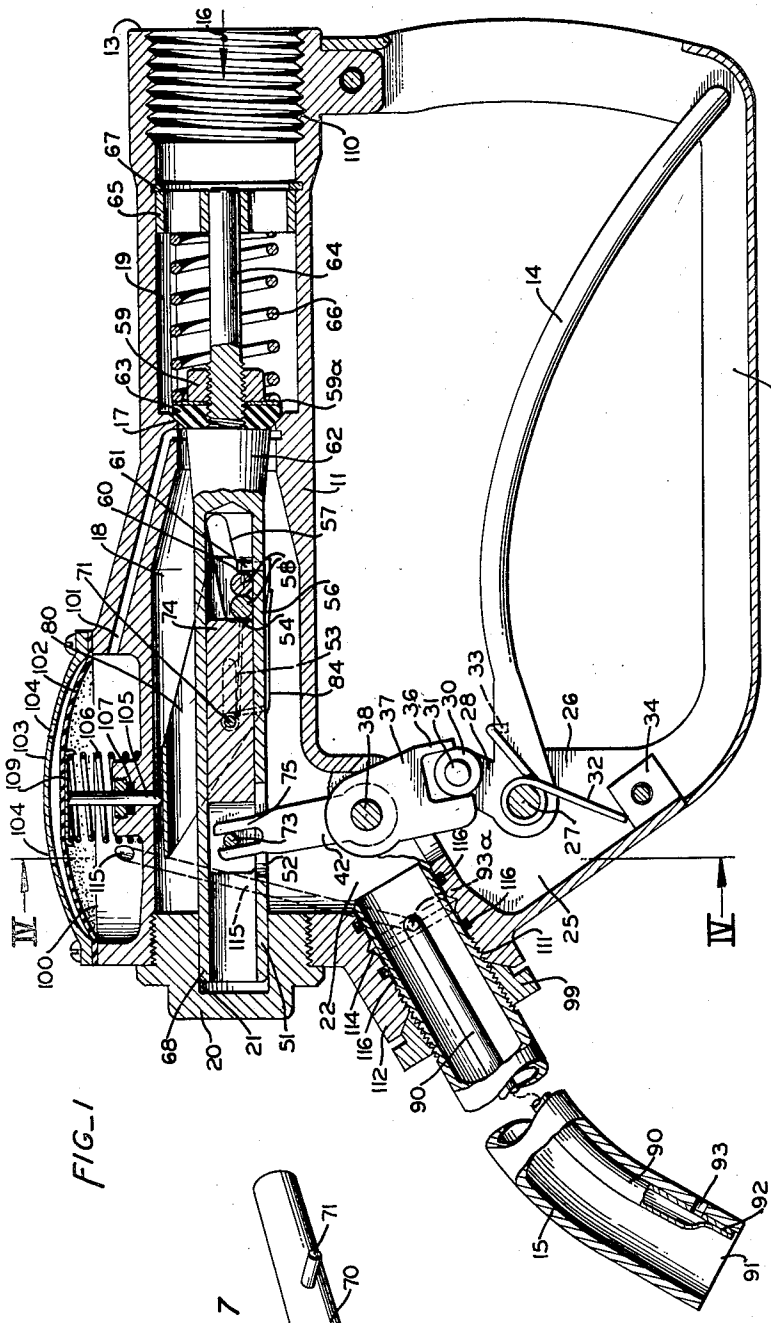


FIG_1

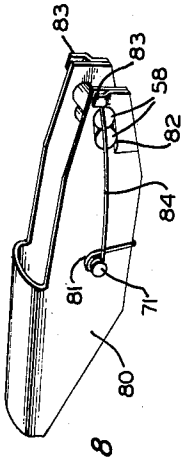


FIG_8

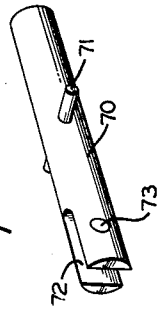


FIG_7

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AUTOMATIC GASOLINE DISPENSING HOSE-NOZZLE VALVE

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FIG_2

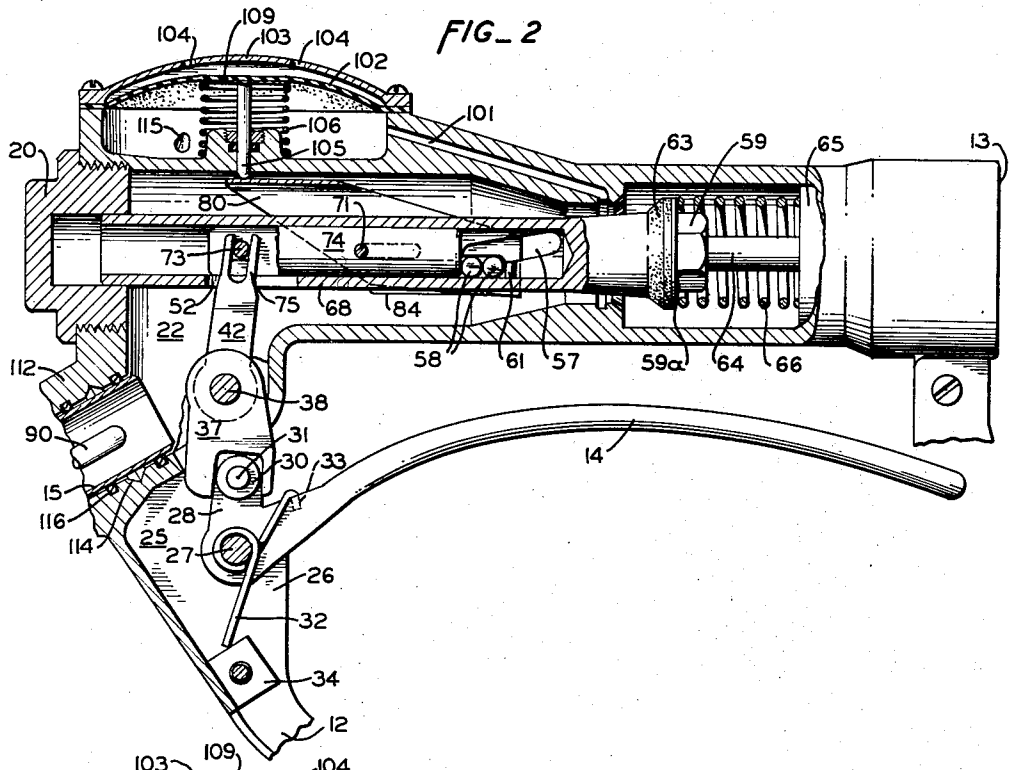
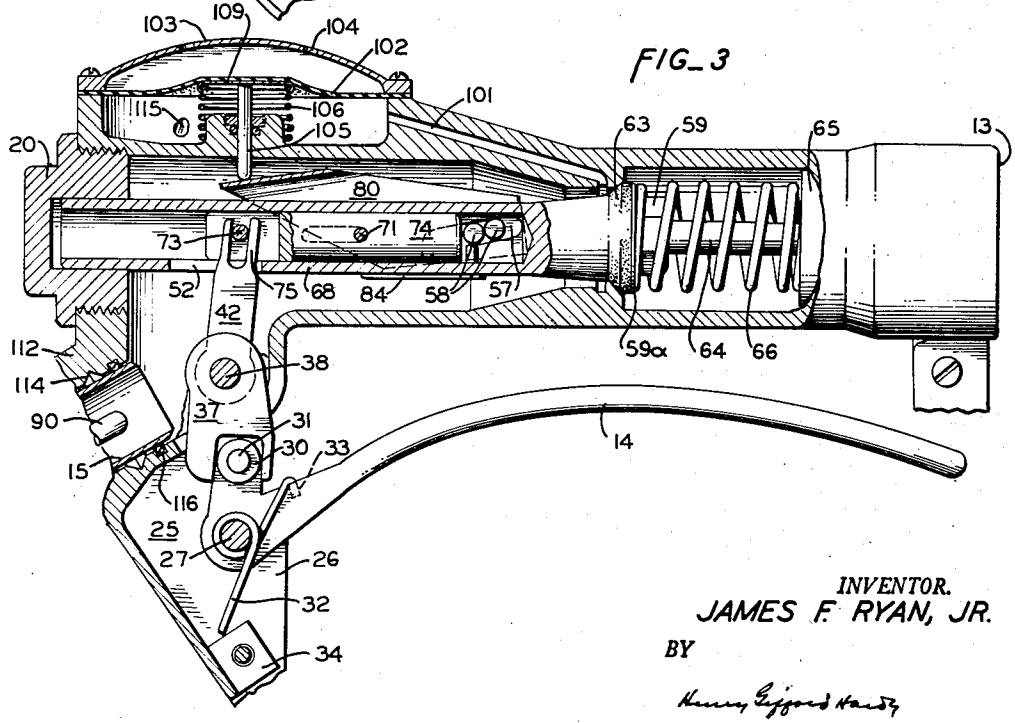


FIG_3



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AUTOMATIC GASOLINE DISPENSING HOSE-NOZZLE VALVE

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FIG_4

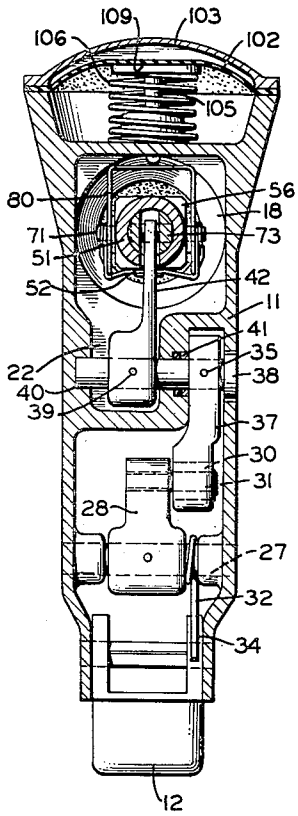


FIG_5

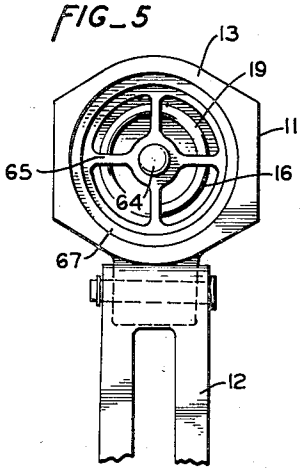


FIG_9

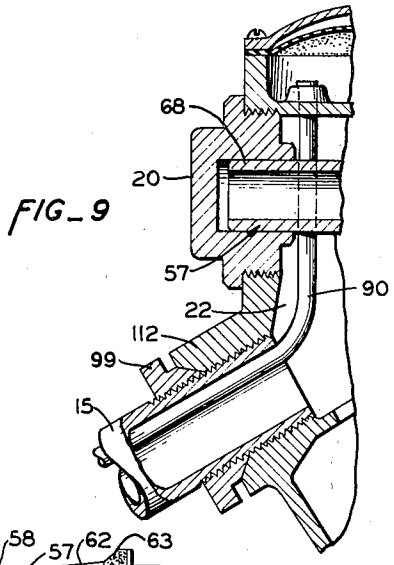
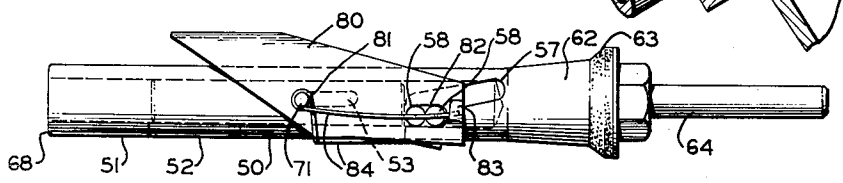


FIG_6



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2,929,418

AUTOMATIC GASOLINE DISPENSING HOSE-NOZZLE VALVE

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Application February 5, 1957, Serial No. 638,309

11 Claims. (Cl. 141—225)

The invention relates to automatic gasoline dispensing hose-nozzle valves, and more particularly to valves which employ a vacuum operated mechanism for assisting in accomplishing the automatic shut-off.

It is well-known that when a tank or other receptacle is being filled with a liquid and particularly an inflammable liquid such as gasoline, that guess work, whether by eye or ear, is not a safe test for determining the filling operation. Frequently human error means the wasting or spilling of valuable liquid. Vacuum operated mechanisms have been used in conjunction with dispensing nozzles in order to supply automatic means of shut-off when the liquid level in the container has reached a predetermined height. However, even the best of the previously known means are subject to the vagaries of human error and it is, therefore, an object of the present invention to provide a nozzle which eliminates the possibility of human error in controlling an automatic shut-off at the appropriate liquid level.

It is a further object of the present invention to provide a liquid dispensing nozzle where the closing mechanism cannot be interfered with when the appropriate liquid level has been reached, no matter where the position of the hand lever mechanism may be at that time, and even though the hand lever mechanism is held open either intentionally or through inadvertence. Thus, the automatic shut-off mechanism cannot be overridden or by-passed.

It is a further object of the present invention to provide a liquid dispensing device where the release mechanism and the valve opening mechanism are combined in a single assembly which is axially in line and which assembly is immersed in the operating fluid during the dispensing.

It is also another object of the present invention to provide the release mechanism separate from the valve opening mechanism, although combined in line, in a single assembly.

Among the further objects is the provision of a self-contained, automatic dispensing mechanism, providing pivotal mountings at all critical points to give precision action with a minimum of friction.

Another object is to provide such a device where there is no need for packing glands of any type to get out of order and leak, but where rotary-type seals using O-rings are sufficient to meet any such contingency, eliminating the friction and dirt penetration found with sliding seals.

A still further object is to provide a dispensing means of this type employing a logical use of pressure and leverage, e.g., the more pressure exerted on the valve to seat the same, the more leverage is available on the saddle to operate the trip, because the saddle is moving away from the operating pin of the diaphragm longitudinally, the same being moved by the mounting pivot for the saddle.

It is another object to provide such a device where the nozzle may be disengaged from the body without disturbing or disconnecting any fixed parts.

Further objects are to provide a construction of maximum simplicity, economy and ease of manufacture and assembly, also such further objects, advantages and capabilities as will fully appear and as are inherently possessed by the device and the invention described herein.

The invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while there is shown therein a preferred embodiment thereof, it is to be understood that the same is merely illustrative of the invention and that the invention is capable of modification and change, and comprehends other details of construction without departing from the spirit thereof or the scope of the appended claims.

Referring to the drawings:

Figure 1 is a vertical, axial section of the dispensing nozzle of the present invention, with the operating linkages shown in elevation and showing the nozzle in the closed-cocked position.

Figure 2 is a fragmentary view, similar to Figure 1, showing the operation of the linkage to move the valve mechanism to the full open position.

Figure 3 is a view similar to Figures 1 and 2, but showing the valve mechanism in closed-tripped position, although the lever mechanism remains in the open or operative position.

Figure 4 is a vertical transverse section taken on the line IV—IV of Figure 1.

Figure 5 is a fragmentary, rear elevational view.

Figure 6 is a side elevational view of the valve mechanism alone.

Figure 7 is a perspective view of the solid push rod.

Figure 8 is a perspective view of the roller carrier.

Figure 9 is a fragmentary vertical section showing an alternate form for the air tube assembly.

Referring now more particularly to the drawings, in which like reference numerals indicate like parts in the several views, and with particular reference to Figure 1, the automatic nozzle of the present invention consists of several major assemblies, the basic one of which is the body member 11, and contains substantially all of the operating mechanism. Joined to or formed with the body 11 is the hand trigger guard 12 which protects the hand lever or trigger 14 from inadvertent movement.

The body member 11 is provided with horizontal fluid passage 16 extending longitudinally entirely therethrough. At the inlet end 13 it is widest in diameter and narrows slightly to form the chamber 19 and then narrows perceptibly to form the valve seat 17, then widens again to define the delivery chamber 18 and is closed at the opposite end by the screw plug 20 which is internally counterbored at 21 to provide a bearing surface as will hereinafter be described. The chamber 18 empties obliquely downward into an extension chamber 22 to which the spout 15 is removably attached for full communication therewith.

The body member 11 has a depending housing portion 25 which is open at the rear 26 thereof to receive the mechanism operated by the hand lever 14. The hand lever 14 is conveniently shaped in the form of an arc to be easily reached and operated by the fingers when the body portion 11 is grasped in the hand of the operator. The forward end of the hand lever 14 is retained in the depending cavity 25 by the rotating pivot 27. The handle lever 14 is formed at its forward end with an upstanding lug portion or bell crank 28, to which a freely rotating bearing 30 is secured by means of pin 31. Thus, the forward end of the hand lever 14 is provided with a rotating bell crank which moves on pivot 27. A spring 32 passing around the pivot 27, and secured at one end within a stop 33 on the handle 14 and bearing at the

other end against the block 34 attaching the guard 12, constantly urges the lever 14 to the position shown in the figure, which is the "off" position. The fork 36 of the linkage member 37 engages the rotating bearing 30. The linkage member 37 is secured by pin 35 in position on the rotary pivot pin 38, which pin passes through the body wall and through a portion of the liquid flow chamber 22 to seat in the opposite wall, as at 40. Packing, comprising O-rings 41, surrounds the pin 38 so that no liquid leaks from the chamber 22 into the remaining portion of the device. Yoke member 42 is secured by pin 39 to the rotating pin 38 within the chamber 22 and moves arcuately as the pin 38 is rotated.

The valve mechanism shown separately in Figure 6, is another single, complete assembly, immersed in the gasoline flow channel substantially axially therewith. The fundamental portion of this mechanism is the valve body and guide 50. The forward portion thereof, 51, is tubular and is slotted vertically at 52 to provide for the movement of the yoke member 42, and is slotted horizontally at 53 to provide for the longitudinal movement of pin 71. The portion 56 is squared and is bored therethrough laterally to provide a stepped raceway 57. The lower forward end of the raceway 54 is substantially horizontal and of sufficient size to just accommodate two cylindrical rollers 58, with the said rollers projecting laterally at either side. In order to cut down the friction and permit the rollers 58 to roll up over the step 60, a pair of hardened pins 61 are provided along the face of the step. The portion 62 is the tapered valve support terminating in the valve disc 63 preferably made of resilient material, which, obviously, for this particular use, is a material which is not affected by hydrocarbons. A metal washer 59*a* rests on valve disc 63 on the upstream side and the hexagonal nut 59 threaded on guide rod 64 cooperates to secure and compress the metal washer 59*a* and the valve disc 63 against the valve body 50, to provide a liquid tight seal thereon. Extending axially from the valve disc 63 is a guide rod 64 which guides for sliding longitudinal movement in the center aperture of the spider 65. Retained between the spider 65 and the upstream side of the valve 63, is spring 66 which constantly urges the valve 63 to the closed position on its seat 17. The spider 65 is retained within the central bore of the body 11 by means of retaining ring 67 or by any other suitable means. It is apparent that by means of the rod 64 and the spider 65 the valve is assured of precise axial movement on the upstream side. On the downstream side the end 68 of the tube 51 fits axially within the bore 21 of the cap 20 and so centering is obtained at the downstream end, assuring the valve of accurate, centered, longitudinal movement with no whipping, cocking or other untoward movement possible.

Fitted slidably within the hollow tube portion 51 of the valve assembly is a solid push rod 70 (see Figure 7), which is bored laterally to provide a hole through which the pivot pin 71 passes. At its forward or downstream end it is provided with a vertical cut 72 laterally across which is secured the stationary pin 73. The forked end 75 of the yoke member 42 engages the pin 73 for moving the push rod 70 laterally within the tube portion 51. The upstream end 74 of the push rod 70 engages the outermost of the laterally positioned rollers 58, and bears against the same.

Extending on both sides of the valve body 50 and over the top portion thereof is the roller carrier 80 (see Figure 8). It is bored laterally to provide holes 81 through which the pivot pin 71 passes, projecting at either side. At its upstream end are lateral openings 82 to accommodate the projecting ends of the cylindrical rollers 58. On the outside, upstanding ears 83 are provided. A wire spring 84 is engaged at one end thereof in the space between the ear 83 and the main portion of the roller carrier 80, then passes forwardly, lying against the ends of the rollers 58 to retain them in position, then passes along the outside of the roller carrier 80, around the pivot pin 71, and then downwardly and underneath to bear against the solid surface of the underneath portion 56 of the valve assembly, and then continues around and duplicates the form on the opposite side. The spring 84 constantly urges the cage downwardly at its upstream end so that the cylindrical rollers 58 are constantly seated on the raceway 57, whether above or below the step 60.

As indicated earlier, the spout 15 is removably connected in communication with the outlet chamber 22 of the body 11. This may be done in any suitable manner so that the liquid flow therethrough will have the minimum resistance, but is shown in Figure 1 as threaded at 111 in the outlet boss 112 and firmly held in the assembled position by jam nut 99. The tube 90 is permanently assembled within the spout 15 and has a vent hole 93 at the downstream end of the tube to communicate with atmosphere. At the upstream end of tube 90, a vent hole 93*a* therein communicates with an annular chamber 114, which in turn is in communication with a passage 115 drilled in the body 11 connecting it with the chamber 100 above the valve operating mechanism but within an extension of the housing 11 and provides an unobstructed passage therebetween. Seal means 116 are provided to effectively seal the junction of spout 15 in the boss 112 and prevent the passage of air to chamber 22 and prevent the leakage of liquid to chamber 114 and passage 115. It is apparent that the spout 15 and the tube 90 comprise an independent separate assembly which may be connected or disconnected readily at any time without changing or moving any other portion of the device.

As shown in Figure 9, the tube 90 is retained within spout 15 and terminates adjacent the spout outlet 91. The tube may be flattened as at 92 and sealed off if desired. A hole 93 is bored from the outside of the spout 15 as near the end of the sealed tube as practicable so that there is an air hole communicating from the outside of the spout to the interior of the tube 90.

Sealed chamber 100 has a communicating passage 101 in the body 11 which communicates with the liquid flow chamber just below the valve seat 17. The chamber is sealed by a flexible diaphragm 102 which is secured in position by a cap member 103 providing a space on the opposite side of said diaphragm 102. Since cap member 103 is provided with one or more outlets 104 to atmosphere, the pressure on the top of the diaphragm 102 is always at atmospheric pressure. The flexible diaphragm 102 bears against disc 109 which is secured to a vertically movable rod 105, the other end of which passes through the chamber housing and bears upon the transverse portion of the roller carrier 80. The flexible diaphragm 102, rod 105 and disc 109 are constantly urged upwardly by the spring 106 which engages the disc 109 to prevent rod 105 from exerting any downward pressure against the roller carrier 80, except when the automatic shut-off mechanism is functioning.

Operation

The static or inoperative position of the automatic gasoline nozzle of the present invention is shown in full lines in Figure 1 with the gasoline hose (not shown) from the supply attached to the threads 110 at the inlet end 13 of the body 11. It is to be noted that in the closed-cocked position (see Figure 1) the pin 105 is positioned above the web of the roller carrier 80 at approximately its mid point so that it will not exert either pressure or leverage. The flow of liquid from the supply will fill the body passage 19 at all times up to the seal of the valve disc 63. To use the nozzle and cause flow of liquid therethrough, when the operator has placed the spout 15 within the gas tank inlet with the hole 93 at the level to which the tank is to be filled, he then pulls upwardly on the hand lever 14 against the action of

spring 32, which pivots the bell crank 28 on the rotating pivot 27. The fork 36 engages the rotating bearing 30 causing linkage member 37 to move forwardly, rotating the pivot 38 in a clockwise direction which, in turn, causes yoke member 42 to move rearwardly. Because the fork 75 of the yoke member 42 engages the pin 73 of the push rod 70, the push rod is moved rearwardly within the tube 51. The roller carrier 80 which retains the cylindrical rollers 58 below the step 60, moves longitudinally with the push rod because the pin 71 is fixed in and moves with push rod 70 and the roller carrier 80 is mounted pivotally on pin 71. The lateral openings 82 and roller carrier 80 are dimensioned to provide clearance around the rollers 58 so that the roller carrier 80 does not transmit longitudinal or axial thrust against the rollers 58. The rearward motion of the push rod 70 within the tube 51 thrusts the upstream end 74 of push rod 70 against the rollers 58, which urges the rollers 58 against step 60 and pins 61 of the valve body 50, moving valve body 50 upstream to overcome the pressure of the spring 66 to move the valve disc 63 off of its seat and permit gasoline to flow therethrough to the nozzle outlet 91. The operation just explained takes place as soon as sufficient movement of the hand lever 14 lifts the valve 63 off of its seat 17. The full open position is shown in Figure 2.

Gasoline, in flowing through the apparatus axially, immerses all of the valve parts in chambers 18, 19 and 22, keeping them well-lubricated and in working condition. No gasoline from the connecting chambers 18 and 22 can leak into the linkage which operates the valve mechanism, first, because the pin 38 does not pass through the housing wall on one side as at 40 and, second, because on the other it passes through an inner wall where all flow past the pin is prevented by the rotary seal type O-ring packing 41 (see Figure 4). Because all parts of the automatic shut-off mechanism are completely encased within the assembled body 11, the mechanism is protected from the introduction of foreign matter, such as dust, grit, etc. In addition, this construction prevents tampering and protects the mechanism against external blows.

Gasoline continues to flow until automatically stopped by the automatic shut-off mechanism or by the operator releasing the hand lever 14. Fluid passing the valve seat 17 also passes the opening of channel 101 which leads to chamber 18. In so doing, a suction is created producing a negative pressure in chamber 100 on the under side of the diaphragm 102. However, air at atmospheric pressure is also being conveyed to this chamber 100 through the hole 93 in the spout and up through the tube 90 and the air passageway connecting chamber 100 therewith. This results in a near balancing of the pressure on both sides of the diaphragm 102, so that the differences in pressure between the two sides of the diaphragm 102, while the gasoline is flowing through the device in normal operation, is not sufficient to overcome the upward pressure of the spring 106. Rod 105, therefore, remains in its upward position without exerting downward pressure against the roller carrier 80 while the gasoline is flowing through the device and this situation continues so long as the hole 93 is open to atmosphere.

The apparatus will continue to function in this manner until the liquid level in the tank being filled covers the hole 93 in the spout 15, stopping the flow of atmospheric air through the tube 90 and connecting air passageway to the chamber 100. When the hole 93 is covered by the liquid and atmospheric air cut off, there is an immediate rise in the vacuum in chamber 100. This change is immediate and sharply noticeable. Because of the negative pressure in chamber 100, a differential is established so that atmospheric air pressure presses down on the upper surface of the diaphragm 102 against the action of the light compression spring 106, causing the rod 105 to press down on the transverse surface of the roller carrier 80 causing the same to pivot in a vertical plane about pin 71, causing the rollers 58 to rise up over the step 60 and the pins 61, permitting the valve disc 63 and valve body 50, urged by the compression spring 66, to move axially forward (to the left) and close into the position shown in Figure 3 without changing the positions of the operative members 14, 28, 37, 42 and 70.

It is to be noted that, as the hand lever 14 is raised, push rod 70, valve body 50 and the valve disc 63 are moved upstream together, carrying with them the roller carrier 80. As these operative members move upstream, the distance between the pin 71 and the axis of rod 105 increases. Since pin 71 is the point about which the roller carrier 80 pivots, rod 105 acts with increasing mechanical advantage as the push rod 70, valve body 50 and the valve disc 63 are moved upstream towards the open position. This is desirable because as the spring 66 is compressed by this upstream movement, the rollers 58 are trapped between the push rods 70 and the step 60 with pins 61, with a correspondingly increasing force, and, consequently, greater force is required to dislodge rollers 58 from engagement with the step 60 and pins 61. In other words, as the valve opening increases, greater force is required to operate the automatic shut-off mechanism and such force is inherently provided by the structure as described above.

It is apparent that there are three characteristic positions of the operative members of the apparatus. The first of these is the closed-cocked position shown in Figure 1, in which the flow of gasoline is shut off and the operative mechanisms can be moved into the open position shown in Figure 2 only by intentionally lifting the hand lever 14 as described above. The second of these is the open position shown in Figure 2, which may be initiated and maintained if, and only if, the hand lever 14 is lifted from the closed-cocked position shown in Figure 1 and held up while the hole 93 is open to the atmosphere. The third characteristic position is shown in Figure 3, and is the closed-tripped position in which the flow of gasoline is shut off and the operative mechanisms cannot be moved into the open position except by returning the hand lever 14 to its closed-cocked position. Thus, if the operator inadvertently or carelessly holds the hand lever 14 in its open position after the tank or receptacle has been filled to the desired level, the gasoline flow will shut off and remain shut off, eliminating any danger of spilling or overflow.

To reset the device, all that is necessary is to release the hand lever 14 and permit it to return to the closed-cocked position, which is shown in Figure 1, and to which position it is constantly urged by means of the spring 32. The recocking involves moving the member 70, inside the tube 51 of the valve structure, forwardly, permitting the cylindrical rollers 58 to roll downwardly and forwardly to the position shown in Figures 1 and 2. In so doing, the roller carrier 80 is moved forward, while the spring 106 exerts an upward pressure on the disc 109, returning rod 105 and the diaphragm 102 to the position shown in Figure 1. Should the operator attempt to recock and reopen the device to restore the flow of gasoline into a tank or receptacle while the hole 93 is immersed in the liquid, the automatic shut-off mechanism will be immediately activated, returning the device to the closed-tripped position described above and shown in Figure 3. This prevents spillage or overflow through attempts to override the automatic shut-off mechanism. The flow of gasoline may be shut off at any time by releasing the hand lever 14 so that it may return to its down or closed-cocked position.

It is impossible to transfer directly from the closed-tripped position to the open position. This feature cannot be overridden or by-passed by interference with or manipulation of any external parts of the present device.

While the description hereinabove has related pri-

marily to the dispensing of gasoline, nevertheless, it is to be understood that the device is useful in the dispensing of any type of liquid, and for any type of container or receptacle. Thus, the reference to gasoline is used by way of example and is intended to cover and include all liquids.

Likewise, the word "nozzle" has been used herein as an over-all reference term to the present device. However, it is intended that the structure herein shall include an assembly comprising a valve and a delivery spout in combination.

I claim:

1. A device of the character described adapted for use with a vacuum operated mechanism including an operating rod responsive to the rising of the dispensed liquid to a level predetermined by the position of the discharge end of said device, comprising in combination a single body member having a single longitudinal bore therethrough with a valve seat therein, an inlet thereto for removably connecting a source of fluid under pressure, an outlet therefrom, a discharge spout removably secured to said outlet, a flow control valve seating on said seat on the upstream side and positioned axially within said bore, being mounted for sliding axial movement within said bore with guide means to maintain said axial position in said bore, spring means upstream of said valve biased to maintain said valve in closed position, a passage in said body connecting the vacuum operated mechanism to the throat of said valve in position to be subjected to a suction established by the flow of liquid through said throat, said valve combining in a single assembly a self-contained automatic closing means independent of the manual open position of the lever, said assembly comprising pivotally mounted latch means mounted on said valve guide in sliding engagement with the operating rod of the vacuum operated mechanism, and a lever and linkage assembly actuating the valve for opening or closing said valve manually.

2. A device of the character described adapted for use with a vacuum operated mechanism including an operating rod responsive to the rising of the dispensed liquid to a level predetermined by the position of the discharge end of said device comprising in combination a single body member having a longitudinal bore therethrough with a valve seat therein, an inlet thereto for removably connecting a source of fluid under pressure, an outlet therefrom, a discharge spout removably secured to said outlet, a flow control valve seating on said seat on the upstream side and positioned axially within said bore, being mounted for sliding axial movement within said bore with guide means to maintain said axial position in said bore, spring means upstream of said valve biased to maintain said valve in closed position, a passage in said body connecting the vacuum operated mechanism to the throat of the valve in position to be subjected to a suction established by the flow of liquid through said throat, said valve combining in a single assembly a self-contained automatic closing means, said self-contained automatic closing means being independently and separably operable from said manual open position of the lever and comprising pivotally mounted latch means mounted on and carried by said valve guide in sliding engagement with the operating rod of the said vacuum operated mechanism, and a lever and linkage assembly actuating said valve assembly for opening or closing said valve manually.

3. A device of the character described adapted for use with a vacuum operated mechanism including an operating rod responsive to the rising of the dispensed liquid to a level predetermined by the position of the discharge end of said device comprising in combination a single body member having a longitudinal bore therethrough with a valve seat therein, an inlet thereto for receiving fluid under pressure, an outlet therefrom, a discharge spout removably secured as a unit to said outlet, a flow control valve seating on said seat on the upstream side and positioned axially within said bore, being mounted for sliding axial movement within said bore with guide means to maintain said axial position in said bore, spring means upstream of said valve biased to maintain said valve in closed position, a passage in said body connecting the vacuum operated mechanism to the throat of the valve in position to be subjected to a suction established by the flow of liquid through said throat, said valve combining in a single assembly a self-contained automatic closing means, said self-contained automatic closing means being independently operated by the vacuum mechanism to close the said valve independently of the valve opening mechanism or its poistion and comprises pivotal latch means mounted on and carried by said valve guide in sliding engagement with the operating rod of said vacuum operated mechanism, and a lever and linkage assembly cooperating with said valve assembly for opening or closing the same manually.

4. A device of the character described adapted for use with a vacuum operated mechanism including an operating rod responsive to the rising of the dispensed liquid to a level predetermined by the position of the discharge end of said device comprising in combination a single body member having a longitudinal bore therethrough with a flow control valve seat therein, an inlet thereto for receiving fluid under pressure, an outlet therefrom, a discharge spout removably secured to said outlet as a unit assembly, a valve seating on said seat on the upstream side and positioned axially within said bore, being mounted for sliding axial movement within said bore with guide means to maintain said axial position in said bore, spring means upstream of said valve biased to maintain said valve in closed position, a passage in said body connecting the vacuum operated mechanism to the throat of the valve in posiiton to be subjected to a suction established by the flow of liquid through said throat, said valve combining in a single assembly completely immersed in liquid during operation, a self-contained automatic closing independently and separably operable from the manual closing means and comprising pivotally mounted latch means carried by said valve guide in sliding engagement with the operating rod of said vacuum means, and a lever and linkage assembly mounted on said body for rotary action, for opening and closing said valve manually.

5. A liquid dispensing nozzle with automatic shut-off comprising in combination a single body member having a longitudinal bore therethrough with a flow control valve seat therein, an inlet communicating with said bore for receiving fluid under pressure, an outlet chamber integral with said body and communicating with said bore, a spout removably secured as a unit assembly to said outlet chamber, a vent tube assembled with said spout, said vent tube communicating with atmosphere at the tip end and at the other end with a pressure differential chamber on said body separated into two chambers by a diaphragm having an axial rod movable therewith one side of which is always subject to atmospheric pressure and the other side communicating with said vent tube and also being in communication with a source of vacuum, a manual valve actuating assembly comprising a lever and linkages all mounted with rotary action on said body engaging the valve assembly, a valve assembly seated against said seat on the upstream side, automatic independently operating self-contained closing means in conjunction with said valve comprising pivotally mounted roller latch means mounted on and carried by said valve assembly in sliding engagement with said axial rod of said diaphragm all positioned within said longitudinal bore, and spring means upstream of said valve normally biased to keep said valve assembly on said seat.

6. A liquid dispensing nozzle with automatic shut-off comprising in combination a single body member having a longitudinal bore therethrough with a valve seat therein,

an inlet communicating with said bore to receive fluid under pressure, an outlet chamber integral with said body and communicating with said bore, a spout removably secured to said outlet chamber, a vent tube assembled within said spout, said vent tube communicating with atmosphere adjacent the outlet end and at the other end with a pressure differential chamber on said body, said vent tube being rendered inoperative and closed to atmosphere to prevent airflow therethrough when the liquid level closes the atmosphere inlet thereof, a pressure differential chamber on said body separated into two chambers by a diaphragm having an axial rod movable therewith one side of which is always subject to atmospheric pressure and the other side communicating with the said vent tube and also being in communication with a source of vacuum, a manual valve actuating assembly comprising a lever and linkages all mounted with rotary action on said body engaging the valve assembly, a valve assembly seated against said seat on the upstream side and mounted for sliding axial movement within said bore with guide means on the downstream side to maintain said axial position in said bore and with self-contained automatic closing means comprising a pivotally mounted saddle latch mounted on and carried by said guide means in sliding contact with the axial rod for closing said valve independently of the position of the manual lever all positioned within said longitudinal bore, and spring means upstream of said valve biased to keep said valve assembly on said seat.

7. A liquid dispensing nozzle with automatic shut-off comprising in combination a single body member having a longitudinal bore therethrough with a valve seat therein, an inlet communicating with said bore to receive fluid under pressure, an outlet chamber integral with said body and communicating with said bore, a spout removably secured to said outlet chamber, a vent tube assembled with said spout, said vent tube communicating with atmosphere at the outlet end of said spout and at the other end with a pressure differential chamber on said body, said vent tube being rendered inoperative when the liquid level closes the atmospheric communication thereof, a pressure differential chamber on said body separated into two chambers by a diaphragm having an axial rod for movement therewith one side of which is always subject to atmospheric pressure and the other side communicating with the said vent tube and also being in communication with a source of vacuum, a manual valve actuating assembly comprising a lever and linkages all mounted with rotary action on said body engaging the valve assembly, a valve assembly completely immersed in liquid during operation seated against said seat on the upstream side and mounted for sliding axial movement within said bore with guide means on the downstream side to maintain said axial position in said bore, said valve assembly including self-contained automatic open holding and closing means comprising pivotally mounted saddle latch means mounted on and carried by said valve guide means in slidable engagement with said axial rod all positioned within said longitudinal bore, said self-contained closing means being independently and separably operable without respect to the position of said manual lever, and spring means upstream of said valve biased to keep said valve assembly on said seat.

8. A liquid dispensing nozzle with automatic shut-off comprising in combination a single body member having a longitudinal bore therethrough with a valve seat therein, an inlet communicating with said bore to receive fluid under pressure, an outlet chamber integral with said body and communicating with said bore, a spout removably secured to said outlet chamber, a vent tube within said spout and assembled as a part thereof, said vent tube communicating with atmosphere at the end of said spout and communicating at the other end with a pressure differential chamber on said body, said vent tube being rendered inoperative when the liquid level closes the atmospheric communication thereof, a pressure differential chamber on said body separated into two chambers by a diaphragm having an axial rod secured for movement therewith one side of which is always subject to atmospheric pressure and the other side communicating with the said vent tube and also being in communication with a source of vacuum, a valve actuating assembly comprising a lever and linkages all mounted with rotary action on said body engaging the valve assembly for manual movement thereof, a valve assembly seated against said seat on the upstream side mounted for sliding axial movement within said bore with guide means downstream to maintain said axial position in said bore said valve assembly including self-contained hold open and automatic closing means comprising a pivotally mounted saddle latch means mounted on and carried by said guide means all positioned within said longitudinal bore, said automatic closing means being in sliding engagement with the axial rod of said diaphragm and operable in response to movement thereof independently of and separately from said manual opening means, and spring means upstream of said valve biased to keep said valve assembly on said seat.

9. A valve for dispensing liquids wherein automatic shut-off is accomplished in response to the rising of the dispensed liquid to a level determined by the position of the discharge spout outlet, comprising in combination a single body having a longitudinal bore therethrough for the passage of the liquid flow and having a valve seat and throat therein, an inlet for said bore for coupling to a source of liquid under pressure, an outlet from said bore, a liquid dispensing spout removably secured to said outlet for insertion into a container to be filled, said spout including a vent tube therein the inlet end of which is open to atmosphere and the other end of which communicates with the negative side of a pressure differential chamber in said body, said vent tube being rendered inoperative when the liquid level rises to close the atmospheric opening thereof, a pressure differential chamber in said body divided by a diaphragm having an axial rod secured for movement therewith into two parts one of which is always subject to atmospheric pressure and the other of which communicates not only with said vent tube but with the said valve throat, a valve assembly seated against said seat on the upstream side and mounted for sliding axial movement within said bore with guide means on the downstream side to maintain said axial position said valve assembly including valve hold-open means mounted slidably within said assembly and automatic valve closing means pivotally mounted on and carried by said guide means in sliding engagement with said axial rod and actuated in response to negative pressure in said pressure differential chamber regardless of the position of the manual means, manual means comprising a lever and linkages engaging said valve opening means, and spring means upstream of said valve biased to keep said valve on its seat.

10. A valve for dispensing liquids wherein automatic shut-off is accomplished in response to the rising of the dispensed liquid to a level determined by the position of the discharge spout outlet, comprising in combination a single body having a longitudinal bore therethrough for the passage of the liquid flow and having a valve seat and throat therein, an inlet for said bore for coupling to a source of liquid under pressure, an outlet from said bore, a liquid dispensing spout removably secured as a separate assembly to said outlet for insertion into a container to be filled, said spout including a vent tube therein the inlet end of which is open to atmosphere and the other end of which communicates with the negative side of a pressure differential chamber in said body, said vent tube being rendered inoperative when the liquid level rises to close the atmospheric opening thereof, a pressure differential chamber in said body divided by a diaphragm into two parts said diaphragm having an axial rod secured for movement therewith one of which chambers is always subject to atmospheric pressure and the other

of which communicates not only with said vent tube but with a source of negative pressure at said valve throat, a valve assembly seated against said seat on the upstream side and mounted for sliding axial movement within said bore with guide means on the downstream side to maintain said axial position said valve assembly including valve hold-open means mounted slidably within said assembly and automatic valve closing means pivotally mounted on and carried by said guide means and in sliding contact with said axial rod, the same being actuated in response to negative pressure in said pressure differential chamber independently of the position of the manual means, both said valve hold-open and closing means being immersed in the liquid during operation, manual means comprising a lever and linkages mounted with rotary action on said body engaging said valve opening means, and spring means upstream of said value biased to keep said valve on its seat.

11. A liquid dispensing nozzle with automatic shut-off comprising in combination a body member having a longitudinal bore therethrough with a valve seat therein, an inlet communicating with said bore to receive fluid under pressure, an outlet chamber integral with said body and communicating with said bore, a spout removably secured to said outlet chamber, a vent tube assembled with said spout, said vent tube communicating with atmosphere at the outlet end of said spout and at the other end with a pressure differential chamber on said body, said vent tube being rendered inoperative when the liquid level closes the atmospheric communication thereof, a pressure differential chamber on said body

separated into two chambers by a diaphragm one side of which is always subject to atmospheric pressure and the other side communicating with the said vent tube and also being in communication with a source of vacuum, a valve actuating assembly comprising a lever and linkages all mounted with rotary action on said body engaging the valve assembly, a valve assembly completely immersed in liquid during operation seated against said seat and mounted for sliding axial movement within said bore with guide means to maintain said axial position in said bore, said valve assembly including self-contained release and opening means all positioned within said longitudinal bore, said self-contained release means being pivotally mounted on and movable longitudinally with said self-contained opening means so as to provide greater leverage power to accomplish automatic shut-off, said opening and release means being independently and separably operable, and spring means biased to keep said valve assembly on said seat.

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