

July 3, 1962

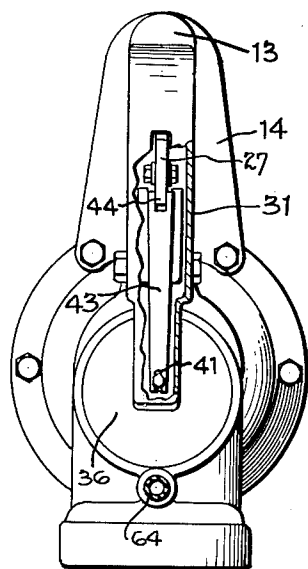
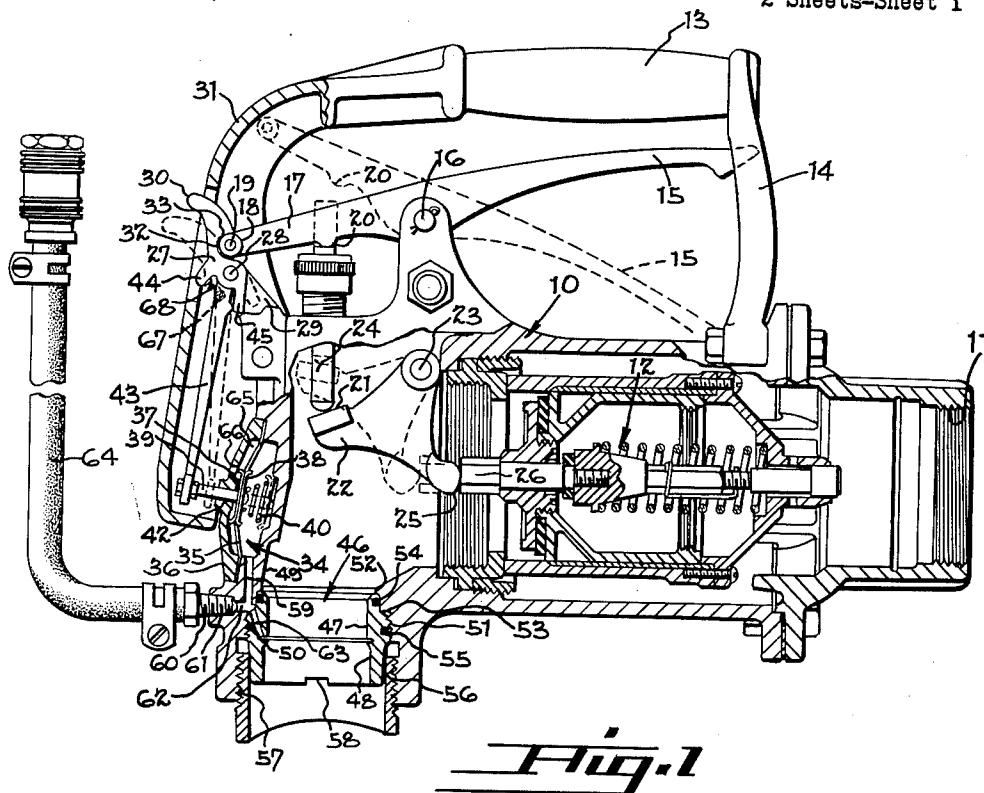
W. D. BOONE ETAL

3,042,084

AUTOMATIC DISPENSING NOZZLE

Filed Oct. 26, 1959

2 Sheets-Sheet 1



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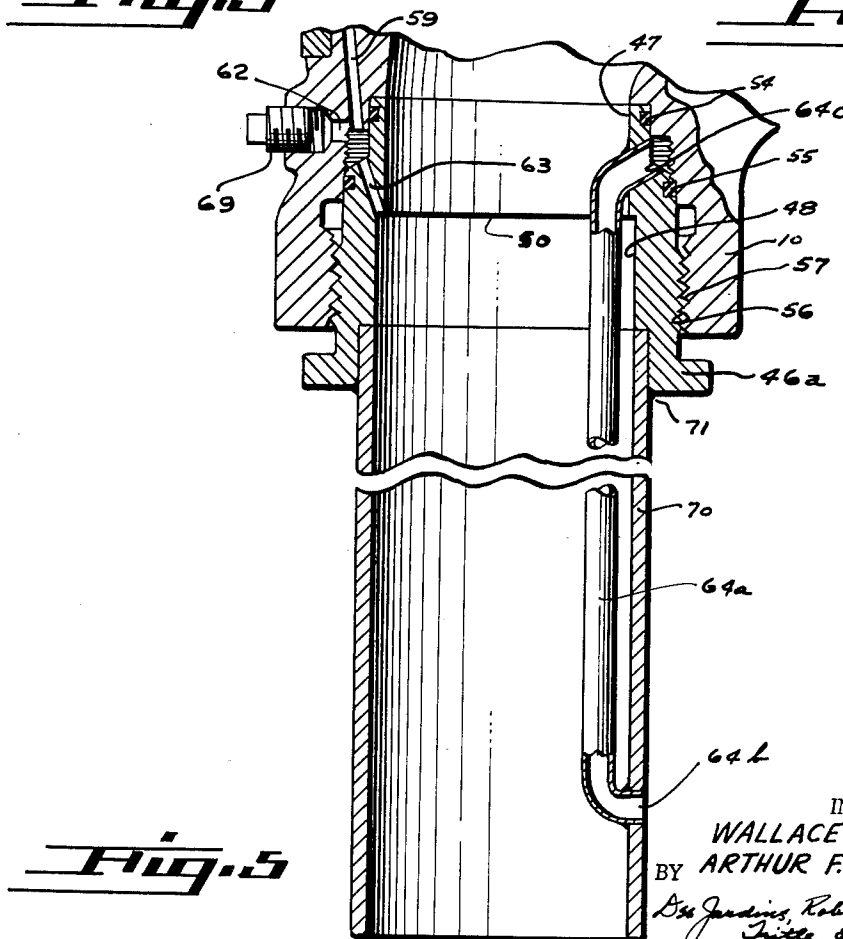
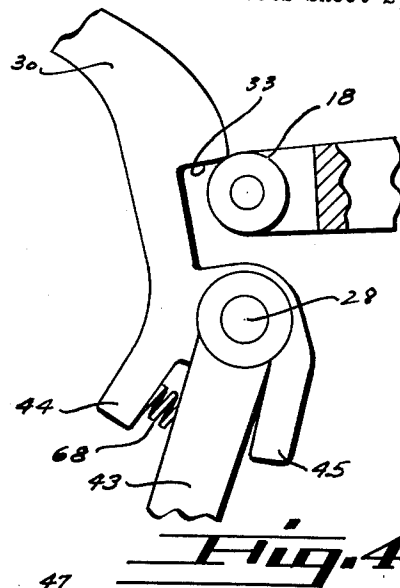
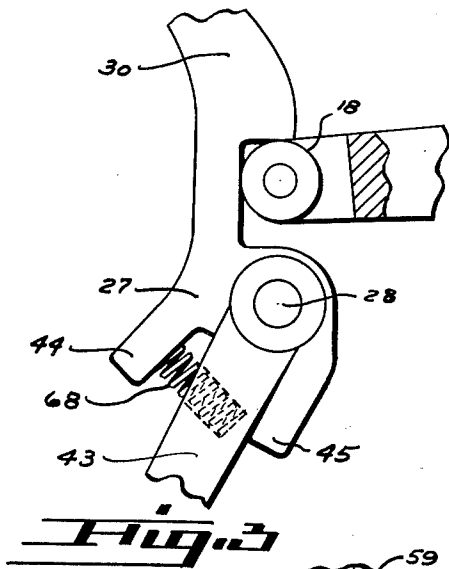
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AUTOMATIC DISPENSING NOZZLE

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2 Sheets-Sheet 2



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3,042,084

AUTOMATIC DISPENSING NOZZLE

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7 Claims. (Cl. 141—225)

This invention relates generally to nozzles for dispensing liquids and more particularly to automatic dispensing nozzles adapted to be opened manually and automatically shut off by condition responsive means.

Although automatic dispensing nozzles are known, their principal use has been connected with the filling of ordinary motor vehicle tanks where the tank capacity is relatively small, on the order of 15 to 20 gallons, and in such use the dispensing nozzle is in use for relatively short periods of time particularly if less than a full tank supply is to be dispensed. Today there are many instances wherein large receptacles or tanks must be filled in a relatively short time. For example, modern diesel locomotives employed by railroads have fuel tank capacities which are very large and which must be filled quickly during brief stop-overs in order not to interfere with operating schedules. To meet the large volume requirements, liquid must be dispensed at high velocities and pressures and an operator frequently finds it necessary to have a plurality of dispensing nozzles operating at a given time in order to fill the tanks within the allotted time. A very difficult and ever present problem is that of filling the tank quickly and then quickly stopping the flow of fluid before the tank overflows. This problem is aggravated in instances where a plurality of tanks are to be filled by a single attendant or operator and, of course, any overfilling of tanks where fuel is being dispensed presents a serious fire hazard. This problem is further aggravated in certain rough types of service where tank gauges may easily become broken or inoperative due to the difficult service conditions such as those encountered in locomotive use. In certain instances, because of the high velocities and pressures involved in dispensing the fluid, it often is necessary to securely fasten the discharge end of a dispensing nozzle to a coupling or adaptor member which is permanently secured to a tank to be filled thereby rendering it impossible for an operator to observe the level of the liquid within the tank. Accordingly, it is an object of this invention to provide an improved automatic dispensing nozzle for obviating the above mentioned difficulties.

Another object of the invention is to provide an automatic dispensing nozzle having improved automatic means for shutting off fluid flow therethrough in response to a condition of the fluid being dispensed.

Another object of the invention is in the provision of an automatic dispensing nozzle adapted for handling high rates of flow, which can be opened manually against high fluid pressures tending to keep the valve in closed position, is provided with automatic shut-off means operable to cause the dispensing valve to close in response to a condition of the fluid being dispensed thereby, and is provided with means for automatically limiting the rate of closure of the dispensing valve to avoid hydraulic shock of the type sometimes referred to as "water-hammer."

Still another object is in the provision of an improved automatic dispensing nozzle having improved means for latching the dispensing valve in an open position when it has been manually opened.

Another object is in the provision of improved means for unlatching an automatic dispensing nozzle from its latched position which is either manually operable or automatically operable in response to a condition of the liquid being dispensed by said nozzle.

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Still another object is in the provision of an improved latching and unlatching means which is positive in its latching function, reliable in operation, and in which frictional forces are minimized.

5 A further object of the invention is to provide an improved automatic fueling nozzle with means whereby the maximum rate at which fluid may be dispensed thereby can be controlled with considerable accuracy and yet can be changed to a different maximum rate quickly and easily.

10 Still another object of the present invention is to provide an improved automatic dispensing nozzle that is mechanically simple, easy to assemble, is strong and sturdy and therefore suitable for rough usage, and is economical to manufacture.

Other objects and advantages will be evident from the following description taken in connection with the accompanying drawings in which:

FIG. 1 is a cross-sectional view of an automatic nozzle 20 embodying the invention;

FIG. 2 is an end view, partly broken away, of the nozzle of FIG. 1;

FIG. 3 is an enlarged view of the latching means of FIG. 1 in latched position;

25 FIG. 4 is an enlarged view, similar to that of FIG. 3, but with the latched means shown in a different position and on the point of latching or unlatching; and

FIG. 5 shows a modification of the sensing means illustrated in FIG. 1.

30 It is to be understood that the present invention is not limited to the structural details or the particular arrangement of the various parts herein shown, as devices embodying the present invention may take other forms. It is also to be understood that the phraseology and terminology herein employed are for the purposes of description and not of limitation.

Referring now to the drawing, the dispensing nozzle comprises a body portion 10 adapted to be connected by means of a threaded coupling 11 to a supply hose or conduit (not shown). Within body portion 10 is disposed 40 a suitable self-closing valve 12 for controlling the flow of fluid which may enter the body from the supply conduit. Valve 12 may be of any suitable type, and is preferably equipped with snubber means for preventing hydraulic 45 shock, or "water-hammer," incident to sudden valve closing movement. Such self-closing valves and associated hydraulic snubber means are known and, for the purposes of the present invention, may be of the general type disclosed in U.S. Patent No. 2,527,760—Piquerez.

50 The dispensing nozzle is provided with a handle 13 extending substantially parallel to the body portion 10 and is suitably secured thereto by an arm 14. So that valve 12 may be opened manually, a valve operating lever 15 is pivoted on a pin 16 positioned to the right of the 55 upper extremity of stem 24 in the drawing. Pin 16 and the upper extremity of stem 24 are positioned so that operating lever 15 will be substantially parallel to handle 13 when the valve is in an open position as illustrated in FIG. 1. To open the valve, the operator grasps handle 60 13 and the portion of operating lever 15 lying to the right of pivot 16 in one hand and opens the valve by raising lever 15 toward handle 13. The forward portion of the valve operating lever lying to the left of pin 16 forms an arm 17 the free end of which is provided with a latching sheave 18 mounted for rotation on a fulcrum 65 pin 19 for reasons which will appear as the description proceeds.

An abutment shoulder 20 is provided on the lower surface of arm portion 17 and is adapted for engagement 70 with the upper end of valve stem 24. The lower end of valve stem 24 abuts against a shoulder portion 21 of a lever member 22 which is pivoted at 23 and is provided

with another abutment portion 25 for engaging stem portion 26 of valve 12.

In order to relieve the operator of the duty of manually holding the nozzle open during a dispensing operation, a latch 27 is pivotally mounted by means of a fulcrum pin 28 on an upstanding projection 29 at the forward or left-hand end of body 10. Latch 27 is provided with an upstanding finger portion 30 by which it may be manually moved from a latched to an unlatched position or vice versa. Finger portion 30 projects through an opening in nozzle guard 31 which is a part of handle 13 and extends from the forward end thereof downwardly across the left-hand portion of valve body 10. The inner edge of latch 27 is provided with a notch portion 32 thus providing a shoulder or surface 33 for engaging latch sheave 18 when the free end of arm portion 17 is positioned within the notch portion 32, as illustrated in FIG. 1. It is to be noted that shoulder or surface 33 does not "hook" latch sheave 18 but, on the contrary, provides a smooth flat surface in a plane substantially parallel to arm portion 17 for engaging sheave 18 when operating lever 15 is raised and latch 27 is in a latched position. The upward pressure exerted on lever 15 by stem 24 under normal filling or dispensing operations is sufficient to maintain the latch in latched position. Yet, when operating lever is raised and latch 27 is in latched position, as illustrated in FIG. 1, sheave 18 is so located with respect to fulcrum pin 28 and shoulder or surface 33 that a relatively small amount of rotational movement of latch 27 in a counter-clockwise direction about fulcrum 28 is sufficient to release sheave 18 and allow valve 12 to close.

Means are provided whereby latch 27 is automatically released when a container being filled is either full or has been filled to a preselected liquid level. To this end, a chamber portion 34 is provided in body 10 and is closed at one side thereof by a flexible diaphragm member 35 secured in place by means of a cap 36. Disposed on the inner and outer surfaces of the diaphragm are a pair of cup-shaped washers 37, 38 which provide means for mounting a diaphragm stem 39, washer 37 providing an abutment against the inner surface of cap 36 and washer 38 providing a seat for a compression spring 40. Diaphragm stem 39 extends outwardly through a bore 42 provided in cap 36. The left-hand end portion of stem 39 is provided with a grooved portion 41 to receive a lower bifurcated end portion of a latch trip lever 43 which forms a connection between stem 39 and latch 27, lever 43 also being bifurcated at its uppermost end and pivoted to fulcrum pin 28 as in latch 27.

Latch 27 is provided with two downwardly extending ears 44 and 45 disposed on opposite sides of trip lever 43 and below fulcrum pin 28. Ears 44 and 45 are spaced apart sufficiently so that when latch 27 is in latched engagement with latch sheave 18 there will be no mechanical interference between trip lever 43 and ear 45 and, yet, are spaced sufficiently close together so that latch 27 may be rotated about fulcrum pin 28 sufficiently to release latch sheave 18 without mechanical interference between trip lever 43 and ear 44.

Within body portion 10 and downstream from or at the discharge side of valve 12, means are provided which serve a plurality of purposes. For example, such means cooperates with other means, presently to be described, in order to produce vacuum or pressure forces which act on diaphragm 35 to actuate trip lever 43 responsive to preselected conditions, provide simple and yet accurate means for controlling the maximum flow rating of the dispensing valve, thus assuring uniformity in flow characteristics of different valves of the same type and size, or, serve to allow changing the maximum flow rating of a given valve, quickly, easily, and inexpensively.

All of the foregoing functions and advantages and others are achieved by the provision of a ring-like member 46 threadedly secured within the discharge portion

of body 10. The ring-like member 46 is provided with a cylindrical bore 47, the bore being stepped to provide an enlarged bore portion 48 adjacent the outer end of the ring-like member. As illustrated in the drawings, bore 47 is of a diameter substantially equal to and complementary with the inner bore 49 of body 10, the junction between bore portion 47 and bore portion 48 providing a shoulder 50. The outer surface of ring-like member 46 is provided with a threaded portion 51 for threadedly engaging the inner surface of body portion 10. The innermost end of ring-like member 46 is provided with a surface 52 of somewhat reduced diameter from that of threaded portion 51 and is adapted to be received within a stepped offset portion 53 provided on the inner surface of body 10. An O ring, or other suitable sealing means 54 is housed in a groove provided in surface 52 and thus provides sealing relationship between the mating surfaces of ring-like member 46 and body portion 10. A second O ring or sealing means 55 is positioned in a second groove provided in the outer surface of the ring-like member 46 adjacent the enlarged threaded end portion 51 and provides an additional seal between the ring-like member and body portion 10. The outer surface 56 of the ring-like member is also provided with a reduced diameter while the discharge opening in body portion 10 is enlarged so as to provide a space between outer surface 56 of the ring-like member and the inner threaded surface 57 or discharge port of body portion 10. A transversely extending notch 58 is provided in the ring-like member 46 for engagement by a suitable tool to facilitate insertion and removal of the ring-like member. Threaded portion 57 of body 10 provides means to receive and engage a suitable fixture, hose, or other conduit means adapted to be connected to the tank or container to be filled.

Communication is established between chamber 34 and bore portion 48 adjacent shoulder 50 by the provision of passageway 59 in body portion 10 and terminating at the stepped offset 53. A cooperating passageway 63 is provided in ring-like member 46 and extends upwardly from shoulder 50 and beyond the upper or inner extremity of threaded portion 51 so as to communicate with passageway 59 and the annular space between the stepped offset 53 and the corresponding mating shoulder of ring-like member 46 which is tapered somewhat. Also communicating with passageway 59 and 63 is a third passageway 62 within body portion 10, the outermost threaded portion 61 thereof forming a socket 60 adapted to receive one end of a hose, tubing, or other conduit means 64, preferably flexible and having a free or distal end portion. The other end of conduit means 64 may be inserted into a tank to be filled, either through a fill pipe or a separate opening and terminating at the desired predetermined filling level of such tank. The precise manner in which conduit means 64 is connected to the tank forms no part of the present invention and accordingly is not illustrated. Such connection can be made, for example, as illustrated in FIG. 10 of Rafferty Patent 2,818,091.

In addition to holding diaphragm 35 in place, cap 36 cooperates with the diaphragm to form a chamber 65 which chamber is vented to the atmosphere by a port 66. Under normal filling conditions, the pressure in chamber 34 is atmospheric or substantially so because communication is established between chamber 34 and the atmosphere by means of connecting passageways 59, 62, port 60, and conduit means 64. Therefore, since atmospheric pressure exists on both sides of flexible diaphragm 35, compression spring 40 urges the diaphragm toward the left, as illustrated in FIG. 1, and holds the diaphragm and its associated stem 39 in the position shown in FIG. 1 even though the device may be subjected to accidental impact or jarring and thus prevents accidental unlatching.

To operate the dispensing nozzle, the operator grasps

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the nozzle by handle portion 13 and manually raises the operating lever 15 toward the handle portion. When this is done abutment shoulder 20 engages the upper end of stem 24 thereby causing it to be forced downward, thus causing valve 12 to be moved to the right to its open position. When valve operating lever 15 is so raised, it automatically becomes latched in its raised position by the action of latch 27 with shoulder 33 engaging sheave 18 in the position illustrated in FIGS. 1 and 3. Further details of the automatic latch means and its operation will be apparent as the description proceeds. Valve 12 is thereby held in its open position until latch 27 is released manually or automatically in a manner to be described presently.

Once valve 12 has been opened so that liquid is being dispensed, the action of the fluid flowing past shoulder 50 creates a low pressure region in the vicinity of shoulder 50 thereby tending to reduce the pressure in chamber 34 through the cooperation of passageways 59 and 63. However, since chamber 34 is also vented to the atmosphere by means of passageways 59, 62, port 60 and conduit means 64 during normal filling operations, the pressure within chamber 34 is not substantially reduced and the action of spring 40 holds flexible diaphragm in the position illustrated in FIG. 1 in the manner described heretofore. Thus it will be seen that when the nozzle is placed in latched position as described above, the operator may leave the nozzle and attend to other duties with the assurance that the latching means may not become unlatched accidentally and that fluid will continue to be dispensed until valve 12 is closed either by manual action or because the latching means has become unlatched by virtue of the automatic unlatching features.

Automatic unlatching occurs when the level of the liquid in the tank or container to which the nozzle has been connected reaches a predetermined level. When the level of the liquid reaches the open end of the conduit means 64, thereby interrupting the communication of the free end of conduit means 64 with the atmosphere, the previously described reduced pressure which occurs in the region of shoulder 50 causes a substantial reduction of pressure in chamber 34 so that the atmospheric pressure acting on the left hand surface of diaphragm 35 through port 66 is sufficient to overcome spring 40 and cause the diaphragm to move to the right. When diaphragm 35 moves to the right, its associated stem 39 also moves to the right, thereby causing tripping lever 43 to rotate about pivot 28 in a counter-clockwise direction. The spacing between ears 44 and 45, as heretofore noted, is sufficient to permit latch 27 to be in a latched position illustrated in FIG. 1 without mechanical interference between tripping lever and ear 45. However, when lever 43 is rotated counter-clockwise about pin 28 the clearance between lever 43 and ear 45 is first taken up and lever 43 then engages ear 45 and thereby causes it to rotate latch 27 also in a counter-clockwise direction about pivot 28, thereby releasing sheave 18 and operating lever 15 thus allowing valve 12 to close automatically under the action of the liquid pressure forces acting upon it and upon the action of its biasing spring. When either the dispensing nozzle or the free end of conduit means 64 is disconnected from the tank or container which has been filled, communication between chamber 34 and the atmosphere is reestablished and spring 40 will again cause diaphragm 35 and its associated pin 39 to move to the left and to the position illustrated in FIG. 1.

Another important feature of our improved automatic dispensing nozzle is in the provision of an automatic latching means whereby valve 12 is automatically latched in open position when an operator manipulates operating lever 15 to its raised position. A blind hole 67 is provided in latch trip lever 43 slightly below and adjacent the notch which forms the upper bifurcation thereof. Blind hole 67 is sufficiently close to the bottom portion of said notch that it does not extend substantially below

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ear 44 of latch 27. Seated in hole 67 is a compression spring 68 which bears against ear 44. The action of compression spring 68 urges ear 44 and thus latch 27 in a clockwise direction relative to pivot pin 28.

When diaphragm 35 and its associated pin 39 are in the position illustrated in FIG. 1, as they are in a normal filling operation and when the dispensing nozzle is ready to begin a filling operation, compression spring 68 takes up the lost motion or most of it between lever 43 and ears 44 and 45 of latch 27 and tends to rotate the latch in a clockwise direction relative to pivot pin 28 until such rotation is prevented because ear 45 engages trip lever 43.

When an operator raises operating lever 15, latch sheave 18 is lowered, sheave 18 first engaging the rounded upper surface of latch 27 thereby forcing it to rotate in a counter-clockwise direction relative to fulcrum pin 28 and against the action of compression spring 68. When operating lever 15 is fully raised, sheave 18 begins to enter notched portion 32 of latch 27, at which time compression spring 68 forces latch 27 to rotate in a clockwise direction about pivot pin 28 so that shoulder 33 engages sheave 18, as best shown in FIG. 3, thereby automatically latching valve 12 in an open position and holding it in such position until latch 27 is tripped manually or is automatically tripped by virtue of the action of flexible diaphragm 35, stem 39, and trip lever 43 in a manner previously described.

As noted heretofore, when the filling of the tank or container has proceeded so that the level therein reaches a predetermined level, the level of the liquid reaches the open end of conduit means 64 and interrupts communication with the atmosphere to produce sufficient reduction of pressure in chamber 34, thus causing diaphragm 35 to move to the right with its associated stem 39 and causing the trip lever 43 to rotate about pivot 28 in a counter-clockwise direction. As noted heretofore, when operating lever 15 is secured in latched position, the relative positions of trip lever 43, latch 27 and sheave 18 are as shown in FIG. 3. As illustrated in FIG. 3, the center of pivot 19 is disposed substantially directly above the center of pivot 28 and shoulder 33 is tangent to the surface of sheave 18 and disposed substantially at right angles to a line connecting the centers of pins 19 and 28. Thus it will be apparent that any slight force tending to cause rotation of trip lever 43 in a counter-clockwise direction relative to pivot 28 causes trip lever 43 to engage lower ear 45 and rotate latch 27 in a counter-clockwise direction relative to pivot 28. When this occurs, the relative positions of latch 27 and sheave 18 are illustrated in FIG. 4, and it will be apparent to those skilled in the art that the strong action of spring 12 tending to close the valve and force stem 12 and arm portion 17 carrying sheave 18 upward, produces a component of force which also tends to rotate latch 27 in a counter-clockwise direction relative to pivot pin 28 and thus assists the tripping action exerted by trip lever 43. Thus it will be apparent that the latching action is positive, as illustrated in FIG. 3, and, because there is rolling contact between shoulder 33 and sheave 18, the adverse effects of frictional forces are minimized and in addition the relative disposition of the elements employed for latching purposes is such that forces are produced which assist the tripping and unlatching operation. Thus, the automatic latching feature is positive and reliable in its operation and, when tripped automatically, does not require the production of excessive vacuum force in order to trip the valve to closed position.

A modification of the embodiment of FIG. 1 is illustrated in FIG. 5. The embodiment of FIG. 5 is particularly useful in instances where the tank to be filled is not suitable for use with a sensing connection or conduit means 64 such as is illustrated in FIG. 1 and is intended for use in filling tanks of large capacity where high rates of flow must be handled and where, at the

same time, there exists a need for an automatic shut-off feature to avoid over filling or an over flow of liquid as is the case when the liquids being dispensed is fuel which thereby presents a serious fire hazard.

In FIG. 5, the greater portion of the mechanical details of the automatic dispensing valve and its latching means are the same as illustrated in FIG. 1 with only the differences being illustrated in FIG. 5 in the interests of clarity. In FIG. 5, passageway 62 is blocked by removing conduit means 64 and the insertion of a suitable plug 69 in threaded portion 61. In addition, ring-like member 46 is replaced with a modification thereof 46a having a threaded portion 56 threadedly engaging the inner threaded surface 57 of body portion 10. Ring-like member 46a carries a downwardly extending portion or spout 70 which may be integral with ring-like member 46a or, may conveniently be secured thereto by any suitable means 71, for example by welding or brazing. Ring-like member 46a and its associated spout 70 carry a sensing conduit means 64a having a lower end adjacent the distal end of spout 70 and having an upper end 64c communicating with the annular space between the stepped offset 53 of body 10 and the corresponding shoulder of ring-like member 46a. Cooperating passageway 63 extends upwardly from shoulder 50 to establish communication with chamber 34 by means of passageway 59 and the annular space between stepped offset 53 and the corresponding mating shoulder of ring-like member 46a.

In operation, spout 70 is inserted in a tank or container to be filled and the valve is opened to begin the dispensing operation in the manner described in connection with FIG. 1. During the dispensing operation and while the level of the liquid in the tank or container is below the lower end portion 64b of sensing conduit means 64a, chamber 34 is vented to the atmosphere through connecting passageways 59 and 63 and sensing conduit means 64a. Therefore, once operating lever 15 has been latched in its raised position, it will remain latched and the dispensing operation will continue automatically. However, when the level of the liquid in the tank or container is sufficiently high to cover opening 64b, communication between the chamber 34 and the atmosphere is interrupted and the action of the fluid flowing past shoulder 50 reduces the pressure in chamber 34 as described in connection with FIG. 1. When the pressure in chamber 34 is reduced by a sufficient amount to overcome spring 40, diaphragm 35 moves to the right to trip the latching means and allow valve 12 to close automatically in the same manner as described in connection with FIG. 1.

In FIG. 1 and in FIG. 5, bore portion 47 corresponds to the throat of a venturi and thus the size of this bore portion determines the maximum rate of flow that can be handled by a given valve. It is an important feature of our invention that the relationship of ring-like member 46 of FIG. 1 and 46a of FIG. 5 with the other elements employed in our improved dispensing valve is such that ring-like members 46, 46a can be quickly and easily removed and replaced. Hence, not only does our improved construction permit quick and easy replacement of the ring-like member in the event of accidental damage thereto, but, in addition, by providing a plurality of ring-like members 46, 46a each having bore portions 47 of differing diameters, a single automatic dispensing nozzle can be quickly and easily changed to handle differing rates of flow with a different nozzle capacity for each size of bore portion 47 that may be provided.

Thus it will be seen that our improved automatic dispensing nozzle is fully automatic once it has been manually opened, is sturdy, mechanically simple and is dependable in operation, and is easily converted to handle differing flow capacities.

While particular embodiments of the invention have been illustrated and described, it will be obvious that various changes and modifications may be made without departing from the invention and it is intended to cover in the appended claims all such changes and modifica-

tions that fall within the true spirit and scope of the invention.

Having thus described our invention, what we claim as new and useful and desire to secure by United States Letters Patent, is:

1. An automatic nozzle for dispensing liquid into a container comprising self-closing valve means, means including an operating lever for opening said valve means, pivotally mounted latch means, vacuum responsive means including a reciprocable member, trip means including a pivotally mounted lever connected to said member and pivotally mounted concentrically with the latch means for engaging said latch means upon movement of said member, means interposed between the pivotally mounted lever and said latch means biasing said latch means into automatic latching engagement with the operating lever upon actuation thereof to open position, and means including conduit means for creating and supplying vacuum to said vacuum responsive means for actuating said reciprocable member to trip and release said valve means when the liquid in said container reaches a preselected level.

2. An automatic dispensing nozzle in accordance with claim 1 wherein said valve operating lever has a sheave rotatably mounted on an end portion thereof and said pivotally mounted latch means includes a shoulder portion thereon engageable with said sheave and with said shoulder portion extending substantially parallel to said operating lever when said lever is in latched position.

3. An automatic dispensing nozzle for dispensing liquid into a container comprising self-closing valve means, means including an operating lever for opening said valve means, pivotally mounted latch means operatively associated with said lever and operable to automatically latch said valve means in open position when said operating lever is actuated to open position, vacuum responsive means including a reciprocable member, trip means including a lever connected to said member and pivotally mounted concentrically with said latch means for moving said latch means to an unlatched position upon movement of said member, and means interposed between said lever and said latch means for biasing said latch means to latched engagement with the valve opening means upon actuation of the operating lever to open position, and means including an annular member removably secured within the nozzle at the downstream side of said valve means for creating and supplying vacuum to said vacuum responsive means when the liquid in said container reaches a preselected level.

4. An automatic nozzle for dispensing liquid into a container comprising a body portion having inlet and discharge ports with a passageway therebetween, self-closing valve means within said passageway, means including an operating lever for opening said valve means, pivotally mounted latch means having a shoulder portion for engaging said operating lever in latched relation, means including a spring biasing said latch means into automatic latching engagement with said operating lever upon actuation thereof to open position, vacuum responsive means including a lever pivotally mounted concentrically with said latch means and operatively associated with said latch means and operable to trip said latch means and release said valve means, and means including an annular member removably secured within said passageway adjacent the discharge port and accessible therefrom for creating and supplying vacuum to said vacuum responsive means when the liquid in said container reaches a preselected level.

5. An automatic nozzle in accordance with claim 4 wherein said vacuum creating and supply means also includes conduit means connected to the vacuum responsive means and adapted to be connected to the container.

6. An automatic nozzle for dispensing liquid into a container comprising a body portion having inlet and discharge ports and having a passageway therebetween, self-closing valve means within said passageway, means

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including an operating lever for opening said valve means, a pivotally mounted latch means, vacuum responsive means including a reciprocable member, trip means including a lever pivotally mounted concentrically with said latch means and connected to said reciprocable member and engaging the latch means for tripping and unlatching said latch means upon movement of said member, means interposed between the pivotally mounted lever and the pivotally mounted latch means biasing the latter means into automatic latching engagement with the operating lever upon actuation thereof to open position, a venturi ring removably secured within said passageway adjacent and accessible from said discharge port, means including a passageway establishing fluid communication between said vacuum responsive means and the throat of said venturi ring, and means including conduit means connected to said fluid passageway and adapted to be connected to said container for creating and supplying vacuum to said vacuum responsive means for actuating said reciprocable member when the liquid in said container reaches a preselected level.

7. An automatic nozzle for dispensing liquid into a container comprising a self-closing valve, snubber means operatively connected to said valve for controlling the rate of closing thereof, means for opening said valve,

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means including a pivotally mounted latch for automatically latching said valve in open position when said opening means is actuated to open position, vacuum responsive means including a movable member, trip means including a lever pivotally and concentrically mounted with said latch and connected to said member for engaging the latch and moving it to unlatched position upon movement of said member, and means including conduit means for supplying vacuum to said vacuum responsive means when liquid in said container reaches a preselected level.

References Cited in the file of this patent

UNITED STATES PATENTS

1,550,738	Payne	Aug. 25, 1925
2,130,687	Lachmund	Sept. 20, 1938
2,527,760	Piquerez	Oct. 31, 1950
2,585,821	Mueller	Feb. 12, 1952
2,804,991	Burleyson	Sept. 3, 1957
2,818,889	Krause	Jan. 7, 1958
2,821,212	McCarty	Jan. 28, 1958
2,869,594	Bisgard et al.	Jan. 20, 1959

FOREIGN PATENTS

846,214	Great Britain	Aug. 31, 1960
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