Jan. 6, 1959 C. E. DENLINGER 2,867,249

METHOD AND APPARATUS FOR DISPENSING LIQUIDS

Filed March 22, 1956 3 Sheets-Sheet 1

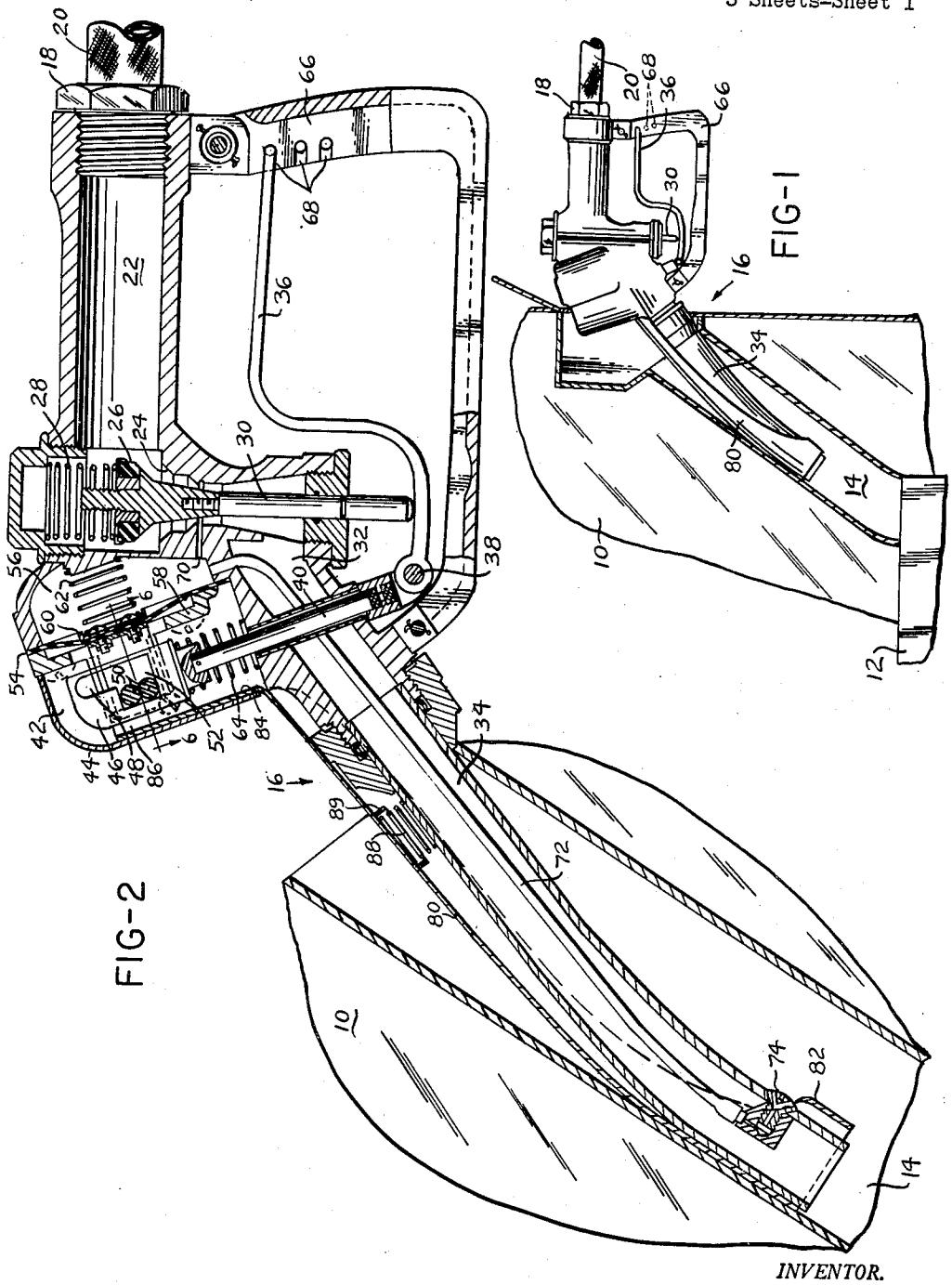

FIG-1

FIG-2

INVENTOR.
CARL E. DENLINGER
BY Toulmin & Toulmin
ATTORNEYS

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3 Sheets-Sheet 2

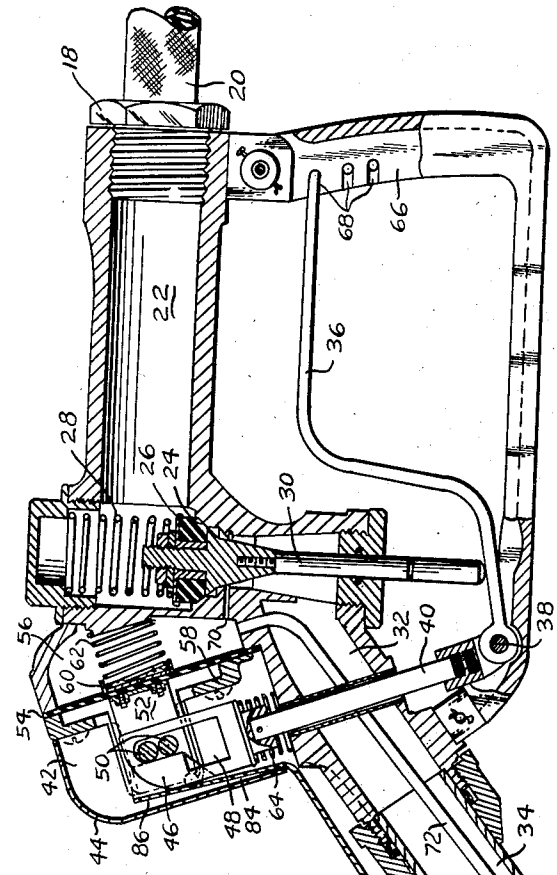


FIG-3

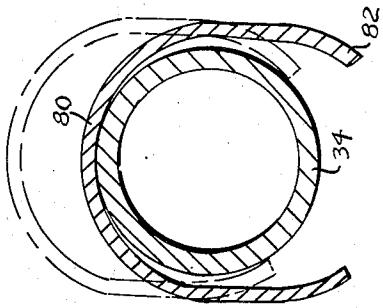


FIG-5

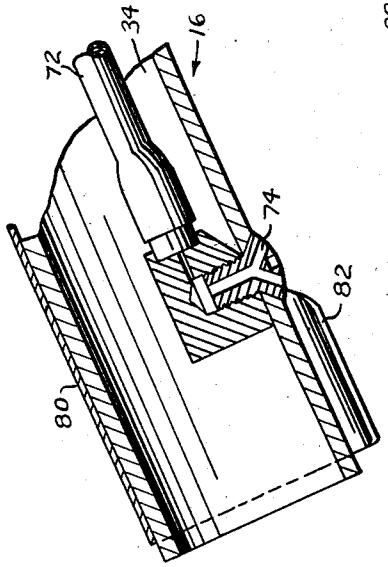
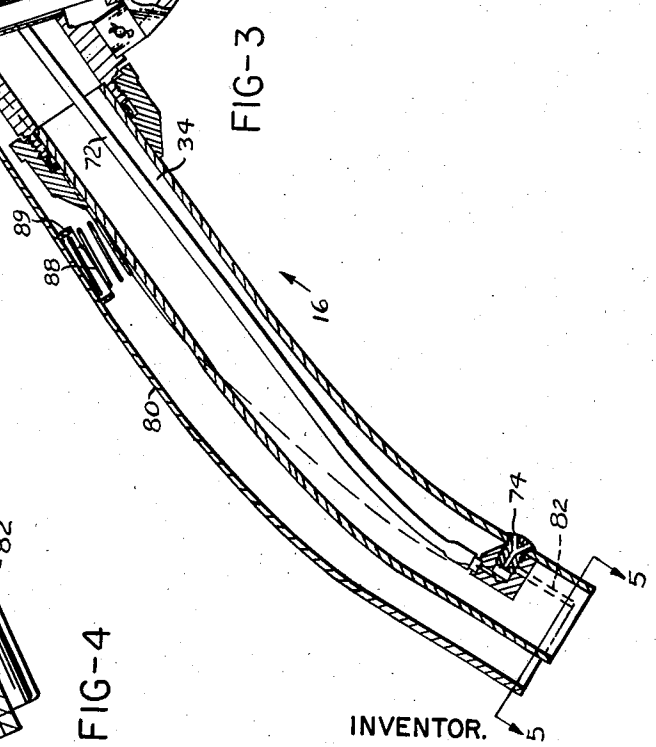


FIG-4



INVENTOR.
CARL E. DENLINGER
BY Toulmin & Toulmin
ATTORNEYS

Jan. 6, 1959 C. E. DENLINGER 2,867,249

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Filed March 22, 1956

3 Sheets-Sheet 3

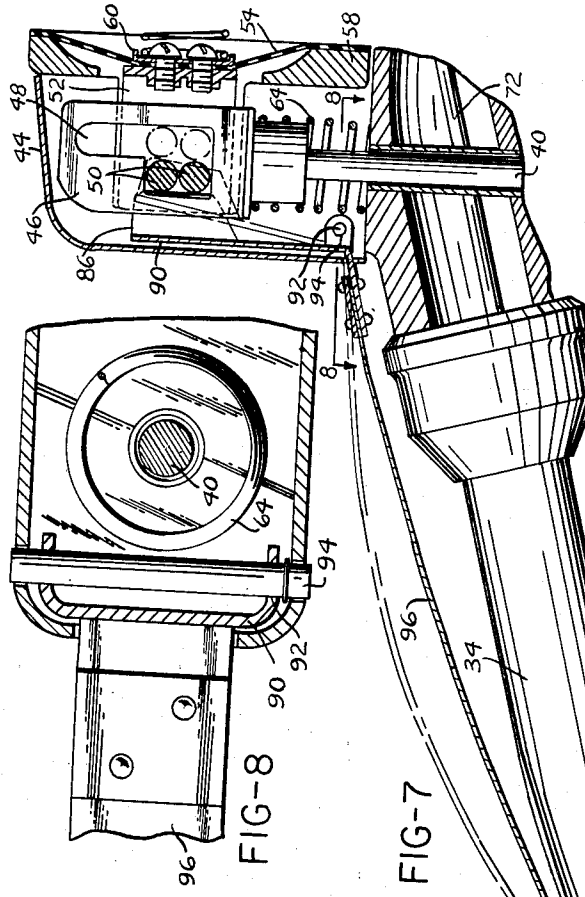

FIG-8

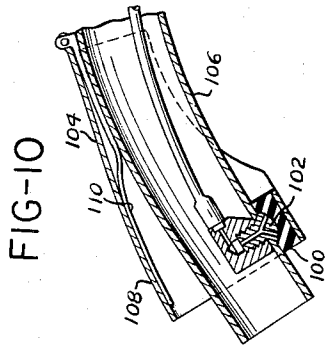

FIG-10

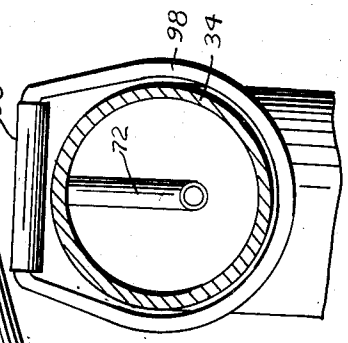

FIG-9

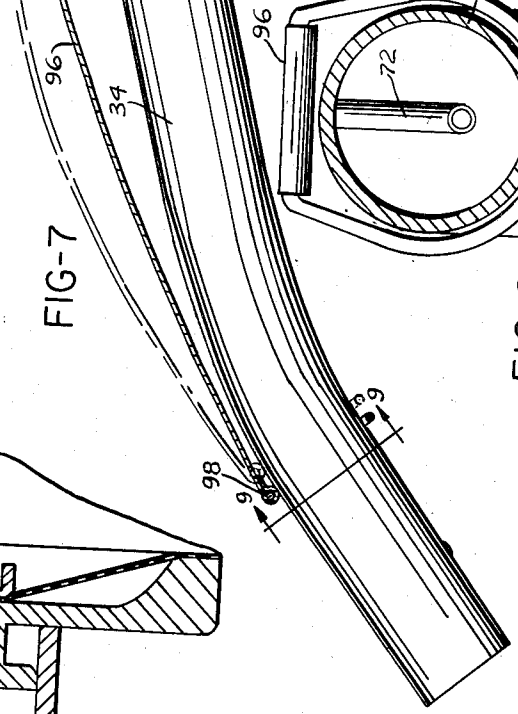

FIG-7

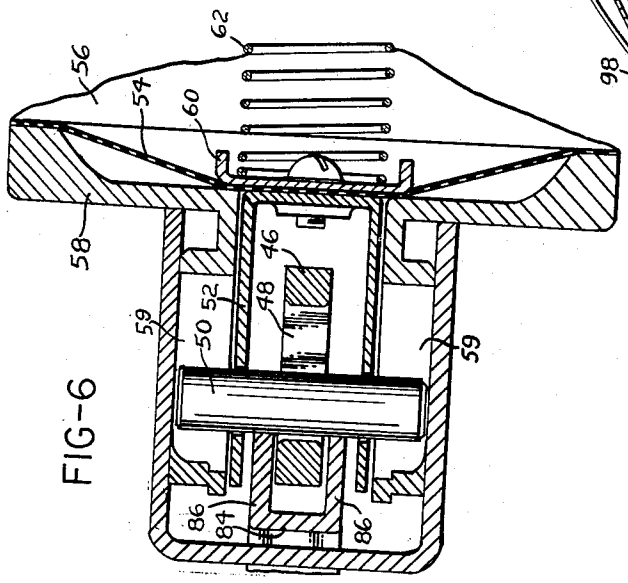

FIG-6

INVENTOR.
CARL E. DENLINGER
BY Toulmin & Toulmin

ATTORNEYS

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METHOD AND APPARATUS FOR DISPENSING LIQUIDS

Carl E. Denlinger, Dayton, Ohio, assignor to Buckeye Iron & Brass Works, Dayton, Ohio, a corporation of Ohio

Application March 22, 1956, Serial No. 573,239

3 Claims. (Cl. 141—208)

This invention relates to dispensing devices such as nozzles for gasoline dispensing pumps, and is particularly concerned with automatic nozzles of this type which are adapted for latching open and then automatically closing when the tank being supplied with gasoline is filled.

Nozzles of this type are known and a particularly satisfactory type of construction thereof is shown in the Davis Patent 2,320,033. A disadvantage of these nozzles, however, resides in the fact that it is necessary to either close the valves manually or for the tank being supplied with gasoline to become completely filled, whereupon the valves automatically trip closed. Obviously this involves the disadvantage that if the nozzle is left open accidentally it will remain open and discharge gasoline which might create an extreme hazard.

Similarly, if, for some reason, an automobile whose tank is being filled with gasoline moves away from the gasoline pump, as might occur if the car crept due to the car having automatic transmission, the nozzle would be pulled from the tank opening and continue to discharge.

For the foregoing reasons there are many localities where such hose nozzles are not acceptable to the local safety groups, and the advantages of the automatic nozzle arrangement is thus lost in these regions.

A primary object of the present invention is to overcome the drawbacks referred to above and provide a nozzle arrangement of the automatic type which cannot be opened or maintained open except when it is in the filling opening of the tank.

Another object of the present invention is the provision of an automatically closing nozzle which will also close automatically upon the nozzle being withdrawn from the filling opening of the tank.

A further object of the present invention is the provision of a filling nozzle with an automatic shutoff which cannot be opened except when the nozzle is in the filling opening of the tank.

A still further object of the present invention is the provision of a method of dispensing gasoline and the like in which the hazard of accidentally spilling gasoline, due to an improper functioning nozzle, is substantially limited.

It is also an object of the present invention to provide an atttachment which can be placed on a conventional automatic shutoff nozzle to convert the same to a nozzle having the characteristics of the present invention, namely, one which can be opened and will remain open only when in the filling opening of the tank.

These and other objects and advantages of this invention will become more apparent upon reference to the following specification taken in connection with the accompanying drawings, in which:

Figure 1 is a more or less diagrammatic perspective view showing a nozzle according to the present invention mounted in the filling opening of a gasoline tank;

Figure 2 is an enlarged sectional view showing the nozzle as it appears in the filling opening of the tank and with the nozzle latched open;

Figure 3 is a view similar to Figure 2 but showing the nozzle snapped closed upon being removed from the filling opening of the tank;

Figure 4 is a fragmentary view showing the port near the discharge end of the nozzle that becomes covered when the gasoline rises in the filling neck to a point where it is desired to close off the nozzle in normal operation;

Figure 5 is a cross sectional view indicated by line 5—5 on Figure 3 showing the manner in which the mechanical trip lever, according to the present invention, embraces the spout of the nozzle;

Figure 6 is a sectional view indicated by line 6—6 on Figure 2 showing the construction of the latching mechanism forming a part of the structure of the present invention;

Figure 7 is a side view partly in section showing a modified structure according to the present invention;

Figure 8 is a sectional view indicated by line 8—8 on Figure 7 showing a pivotal inner connection between some of the parts of the device;

Figure 9 is a cross sectional view indicated by line 9—9 on Figure 7 showing the manner in which the mechanical trip device engages the spout of the nozzle; and

Figure 10 is a view of a modication showing a different manner in which the nozzle can be tripped closed within the purview of the present invention.

Referring to the drawings somewhat more in detail, Figure 1 shows a fragment 10 of a car having a gasoline tank 12 with a filling neck 14. Filling neck 14 is adapted for receiving a nozzle, generally indicated at 16, through which gasoline is supplied to the tank.

Referring now to Figure 2, it will be observed that nozzle 16 comprises a connection at 18 with a supply hose 20 leading from a pump of any suitable tank. Connection 18 communicates via passage 22 with a valve seat 24 adapted for being closed by a valve 26 spring-urged in its closing direction by spring 28. Valve 26 has a stem 30 extending sealingly out the bottom of the body of the valve for movement of the valve member in its opening and closing directions.

On the opposite side of valve seat 24 from passage 22, the passage through the valve body communicates, as at 32, with an elongated tubular discharge spout 34 that extends into the filling opening 14.

According to the present invention movement of stem 30 to open valve member 26 is accomplished by the hand lever 36 which is pivotally connected at 38 with a support member in the form of movable stem 40. Stem 40 extends upwardly through the valve body and has its upper end located within compartment 42, which may be closed by a cover 44. On its upper end stem 40 carries a block 46 having a generally L-shaped slot 48 therein.

Located within the L-shaped slot is a pair of rollers 50 mounted on a carrier 52 that is connected with a diaphragm 54 that is clamped in sealing relation over a vacuum compartment 56 by a clamp member 58. On the side of diaphragm opposite carrier member 52 is a plate 60 that is engaged by one end of a pressure spring 62, the other end of which bears against the valve body. It will be evident that spring 62 serves to urge carrier 52 leftwardly so that whenever block 46 is in its upper position, rollers 50 will drop into the laterally extending leg of the L-shaped slot therein, and thereby prevent downward movement of member 46 or stem 40 which is connected therewith. This latches the support member in effective position.

Member 58 is arranged to receive and guide the ends of rollers 50 and to sustain thrusts thereon by virtue of slot means 59, as will best be seen in Figure 6. Compression spring 64 is located beneath block 46 and urges it upwardly so that when the said block and rollers

occupy their Figure 2 position upward movement of the right end of lever **36** will bring about upward movement of stem **30** and valve member **26** to open the nozzle.

According to this invention the guide **66** around lever **36** is preferably provided with apertures or notches **68** for receiving the end of lever **36** for latching it in a plurality of positions representing different degrees of opening of the valve.

It has been mentioned that the valve is of an automatic shutoff type. This is accomplished by connecting compartment **56** by passage **70** with a region beneath valve seat **24** that will be subjected to suction when the valve is open. The suction created in compartment **56**, however, is normally relieved via tube **72** that terminates in port means **74** adjacent the lower end of spout **34**.

Whenever gasoline rises in the spout to the point where it covers spout **34** the suction in compartment **56** is not relieved and it will quickly bring about rightward movement of diaphragm **54**, carrier **52**, and rollers **50** to the point where the rollers line up with the elongated vertical leg of the L-shaped slot in block **46**, whereupon compression spring **28** will overcome compression spring **64** and snap the valve closed.

According to the present invention this action of the valve is augmented by mechanical means for effecting this movement of the rollers **50**. This is done by providing a lever **80** which extends along the top of spout **34** and terminates adjacent the discharge end of the spout in a loop portion **82** that loosely embraces the spout, as will be seen in Figure 5.

At the opposite end of the spout lever **80** extends beneath the edge of cover **44**, which is preferably notched to receive the lever and a pivotal connection between the lever and cover is thereby formed. Within the cover the lever extends vertically upwardly as at **84** and terminates in a pair of arms **86** which, as will be seen in Figure 6, extend inwardly on opposite sides of slotted block **46** and are adapted for engaging the rollers **50** when they are in their Figure 2 position.

A spring **88** is provided between the spout **34** and lever **80** which has one end bearing on the spout and the other end bearing on the lever within a pocket **89** provided therefor so that lever **80** is normally urged toward the position at which it is illustrated in Figure 3. In this position it will be evident that the arms **86** move rollers **50** into their unlatched position so that the valve will snap closed.

It will be seen from the foregoing that the valve according to the present invention can only be opened when lever **80** is held down against spout **34**, as in Figure 2, and that this normally occurs only when the nozzle is located within the filling opening of a gasoline tank, and that withdrawing of the nozzle from the filling opening, either deliberately or accidentally, will cause the valve to trip closed. Accidental opening of the nozzle is practically impossible since the lever **80** would have to be held in its Figure 2 position to accomplish the opening of the valve unless it is disposed in the filling opening of the tank as illustrated.

The above described form, which is the preferred embodiment of the present invention, can readily be adapted to existing automatic shutoff valves of the type shown in the Davis Patent 2,320,033, with substantially no modification of structure, whereby the combination of the lever **80** and the compression spring therefor, as at **88**, would form a salable item, either with a special cover **44** or together with instructions for notching out an existing cover.

A modification of this invention is shown in Figures 7, 8 and 9, wherein, instead of using a stiff lever along the discharge spout of the nozzle, a flexible member is employed. In these figures an arm **90** is provided for actuating the latching rollers of the valve, and this corresponds quite closely with portion **84** of lever **80**. Arm **90**, however, is pivoted, as at **92**, to the cover of the compartment in which the latching rollers are located, as by a pin **94**. An end of arm **90** projects out the front of the cover and has attached thereto an elongated flexible leaf **96**. The outer end of leaf **96** is provided with any suitable means for retaining it slidably on the spout of the nozzle, as by means of the loop arrangement **98**.

In the Figures 7, 8 and 9 construction the leaf **96** and arm **90** normally occupy their dotted line position, but whenever the nozzle is introduced into the filling opening of the gasoline tank they will be moved to their full line position thereby permitting their rollers to shift into the position where the valve can be opened.

The method of the present invention, consisting of effecting the automatic closing of the nozzle, upon its being withdrawn from the filling opening of the tank or the like, can also be carried out by structures other than those illustrated in the drawings described above, and by instrumentalities differing in the manner in which the automatic closing of the valve is accomplished.

In an arrangement of this nature, by way of example in Figure 10, there is provided a pad **100** which is normally positioned to close off the port means **102** in the spout of the nozzle through which the suction to the chamber behind the diaphragm connected with the latching rollers is released. Pad **100** is carried on an arm **104** pivotally supported on a spout **106** of the nozzle and having an actuating projection **108** that is movable when the nozzle is placed in the filling opening of the tank to shift the pad away from the port means **102**.

Whenever the nozzle is withdrawn from the filling opening spring **110** snaps arm **104** into position to press pad **100** against port means **102**, whereby a vacuum is quickly built up in the aforementioned compartment and causes the valve to snap closed.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions, and accordingly it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

I claim:

1. In a dispensing nozzle; a valve body having a flow passage therethrough, a valve member in the valve body normally spring-urged into position to close said passage and movable to open the passage, a lever movable for actuating said valve member, a slidably mounted support member pivotally supporting said lever having one position where the lever is effective for moving the valve member and another position where the lever is ineffective, latch means for engaging and holding said support member in its said one position, means operable for disengaging the latch means from said support member when the fluid in the tank being filled reaches a predetermined point on the discharge spout of the valve, said latch means being located on the nozzle side of the valve body and being movable toward the valve body for becoming disengaged from said support member, and means for mechanically moving said latch means into disengaging position comprising an angular element having one leg portion engaging the latch means on the side opposite the valve body and the other leg portion extending along the top of the spout of the dispensing nozzle toward the discharge end of the spout, said angular member being pivotally supported on the valve body with said other leg movable toward and away from said spout whereby introduction of the spout in the filler opening of the tank and depression of the spout portion of said angular element toward said spout will permit movement of the latch means into its engaging position.

2. In a liquid dispensing nozzle for supplying liquid to a liquid receiver through a filling opening therein; a valve body having a flow passage therethrough terminating in an elongated spout, said flow passage having a valve seat therein, a valve member spring-urged toward engagement with said seat and having a stem for lifting it off said seat, a lever associated with said stem movable

manually for lifting the valve member off the seat, means at one end of the lever for latching it in valve open position, a slidable support pivotally supporting the opposite end of said lever, said support being movable axially from a first position where the lever is effective for moving the valve member and to a second position where the lever is ineffective for moving the valve member, a spring urging the support member towards said first position with less thrust than the spring acting on said valve member in pressing the lever in the opposite direction, a latch spring-urged toward a position of engagement with said support member in its said first position and movable for releasing said member, means operable by fluid flow through the said flow passage when the said spout is immersed in liquid for moving the said latch into position for releasing said member, said latch comprising a carrier on the side of said valve body toward said spout, and a mechanical trip member pivotally supported on the valve body and having a first leg portion engaging the latch and a second leg portion extending along the spout and movable toward and away from said spout, said trip member being arranged for moving the latch into releasing position when the said second leg portion is moved away from said spout and permitting the latch to move to effective position when the said second leg portion is moved toward said spout as will occur when the spout is introduced into the filling opening and said second leg portion is depressed toward said spout, and there being spring means urging the said second leg portion away from the spout.

3. In combination with an automatic nozzle having a valve operable to open the nozzle and a trip mechanism operable when tripped to cause immediate closing of the valve, a device for mounting on the nozzle which comprises; an angular lever having an arcuate longer arm adapted for lying along the top of the spout of the nozzle and loosely embracing the said spout so as to be retained on the spout while being movable toward and away from said spout and a shorter arm having means for engaging and actuating the trip mechanism of the valve, and means on the longer arm for retaining a spring between it and the spout of said nozzle so that said spring urges said longer arm away from said spout, said trip mechanism comprising a portion external of the valve that is engaged by the shorter arm of the lever, there being a cover element mounted on the nozzle and enclosing said portion of the trip mechanism and the shorter arm of the lever, the said cover retaining the lever in assembled relation with the valve and providing a pivotal support therefor on the nozzle.

References Cited in the file of this patent

UNITED STATES PATENTS

2,110,941	Payne	Mar. 15, 1938
2,303,179	Sitton et al.	Nov. 24, 1942
2,320,033	Davis, Jr.	May 25, 1943
2,528,747	Gravelle	Nov. 7, 1950
2,547,690	Chadil et al.	Apr. 3, 1951