July 28, 1970 F. A. WILSON 3,521,681

FLUID DISPENSING NOZZLE

Filed March 11, 1968 2 Sheets-Sheet 1

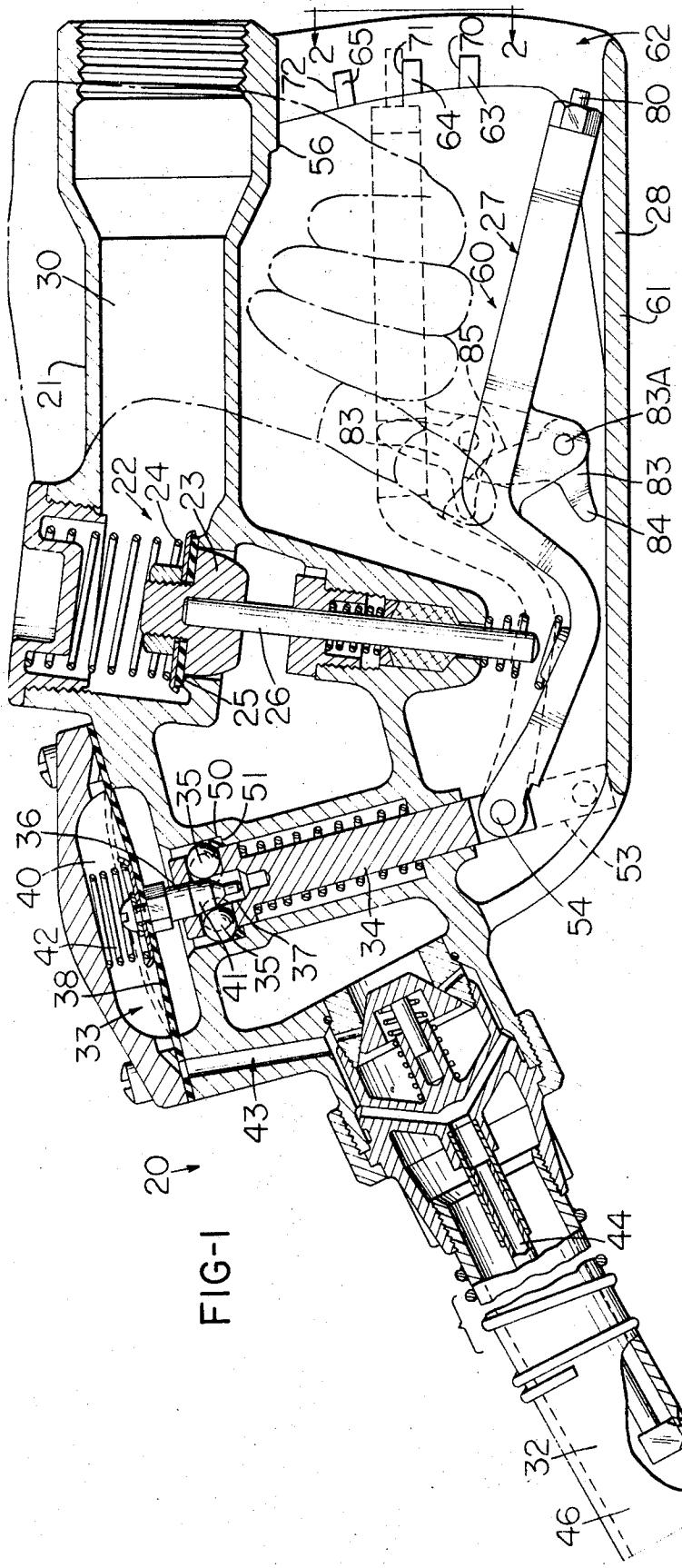


FIG-1

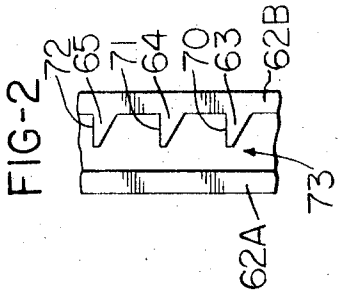


FIG-2

INVENTOR
FRED A. WILSON
BY Kinney & Schenk
HIS ATTORNEYS

July 28, 1970 F. A. WILSON 3,521,681

FLUID DISPENSING NOZZLE

Filed March 11, 1968 2 Sheets-Sheet 2

FIG-3

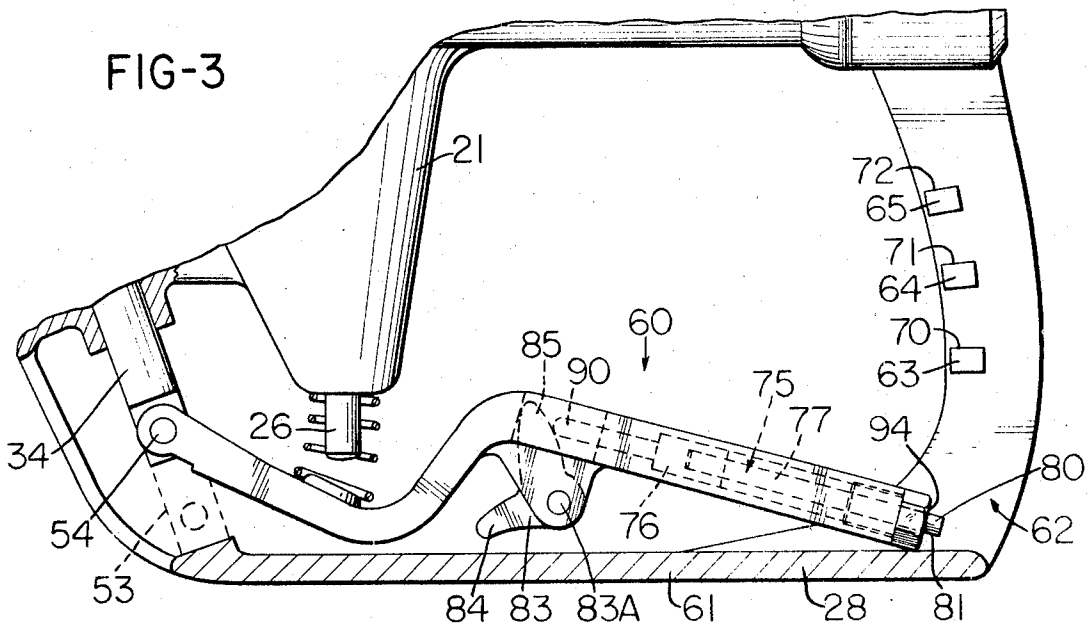
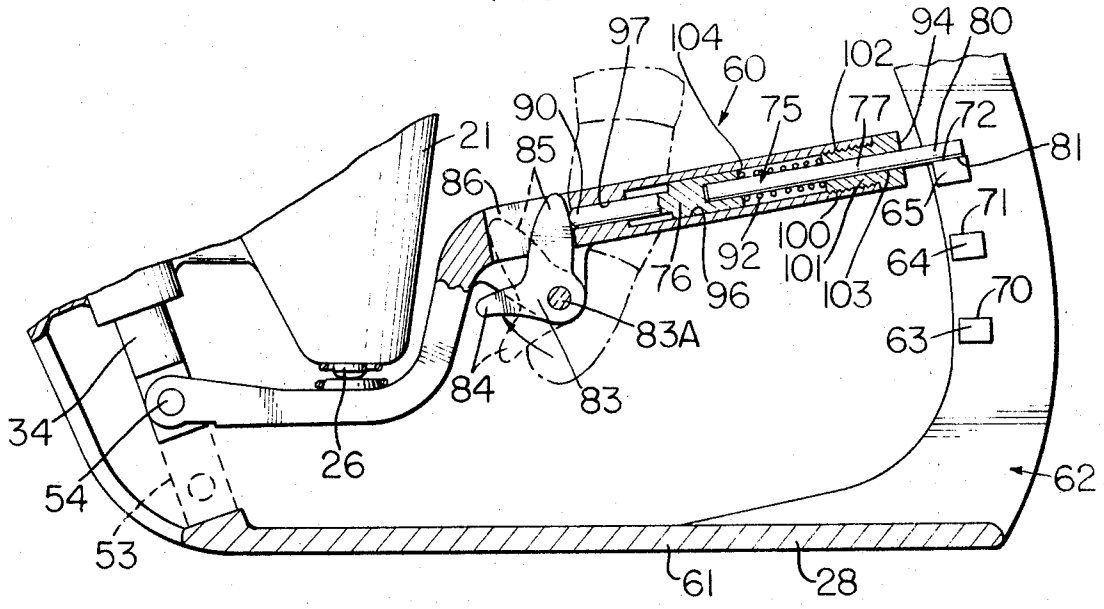


FIG-4



INVENTOR
FRED A. WILSON

BY Kinney & Schenk

HIS ATTORNEYS

United States Patent Office 3,521,681 Patented July 28, 1970

3,521,681

FLUID DISPENSING NOZZLE

Fred A. Wilson, Erlanger, Ky., assignor to Dover Corporation, Cincinnati, Ohio, a corporation of Delaware

Filed Mar. 11, 1968, Ser. No. 712,107
Int. Cl. B65b 1/30; B67d 5/37
U.S. Cl. 141—209 10 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a fluid dispensing nozzle of the type used to dispense liquids such as gasoline, or the like, wherein such nozzle has improved latch means for holding an actuating level comprising such nozzle in an open position to enable leaving the nozzle unattended.

BACKGROUND OF THE INVENTION

Many presently used fluid dispensing nozzles of the type used to dispense gasoline, or the like, usually have provisions for latching the actuating lever for each nozzle in an open position to allow flow through the nozzle while leaving such nozzle unattended. However, the latches provided on presently used nozzles are difficult to actuate, often require that an operator use both hands to achieve such latching, and in many instances protrude outwardly of the peripheral outline of the nozzle so as to be susceptible to be readily engaged inadvertently and unlatched or caught on an operator's clothing to thereby create unnecessary problems during the dispensing of fluid through such present nozzles.

SUMMARY

This invention provides an improved fluid dispensing nozzle having latch means which are easy to latch in position using only one hand and provide a positive latching which holds a fluid nozzle positively open until such time as automatic shutoff means comprising the fluid nozzle is actuated. The improved latch means of this invention utilizes friction surface means to hold such latch means in an open position and has a trigger for actuating the latch means which is actuated by a force applied essentially in the same direction as the force used to actuate an actuating lever for such nozzle.

Other details, uses, and advantages of this invention will become apparent as the following description of the embodiment thereof presented in the accompanying drawings proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings show an exemplary embodiment of this invention, in which

FIG. 1 is a view of an exemplary fluid dispensing nozzle with parts in section and parts broken away and particularly illustrating such nozzle being actuated open using one hand and the improved latch means of this invention comprising such nozzle being actuated utilizing the index finger of the one hand;

FIG. 2 is a fragmentary view essentially on the line 2—2 of FIG. 1;

FIG. 3 is a view with parts in section and parts broken away, particularly illustrating the actuating lever of the nozzle of FIG. 1 in its lower position prior to actuation thereof and illustrating by dotted lines the arrangement of improved latch means of this invention carried within the rear end portion of the actuating lever of FIG. 1; and

FIG. 4 is a view with parts in section and parts broken away, particularly illustrating the actuating lever latched in its fully open position and the manner of extending the latch means to hold the actuating lever in such fully open position.

DESCRIPTION OF ILLUSTRATED EMBODIMENT

In the exemplary embodiment of this invention illustrated in FIG. 1 of the drawings, an improved fluid dispensing nozzle such as a gasoline dispensing nozzle **20** is illustrated. Dispensing nozzle **20** is comprised of a main housing means or body **21** having normally closed valve means indicated generally by the numeral **22** supported within body **21**.

Valve means **22** comprises a poppet valve **23** which is normally urged closed by a spring **24** against a cooperating seat **25** provided in housing **21**. Poppet valve **23** has a stem **26** fixed to the lower end thereof. The lower end of stem **26** is normally engaged by a suitably pivoted lever **27** to override spring **24** and thus open valve means **22**.

The pivoted lever **27** used to open valve means **22** will be described in more detail subsequently in this specification; however, lever **27** is provided with a suitable lever guard **28** which extends beneath main housing **21**. The lever guard **28** may be a separate unit suitably fastened in position or may be formed as an integral part of housing **21**. The lever guard is so constructed and arranged that lever **27** is confined within the peripheral outline of guard **28**.

A passage **30** is provided in housing **21** and such housing has means such as threads or the like at the entrance to passage **30** for connection of nozzle **20** to a flexible hose, or the like, which in turn is connected to a source of gasoline through a gasoline metering pump. A fluid discharge conduit **32** is also suitably connected to the discharged end of nozzle **20** and upon actuating lever **27**, with nozzle **20** inserted in a gasoline tank, for example, stem **26** and hence poppet **23** is raised upwardly allowing gasoline to flow through passage **30** and out of nozzle **20** through its discharge conduit **32**.

Gasoline dispensing nozzle **20** includes automatic shutoff means enabling leaving nozzle **20** unattended. The automatic shutoff means shuts off the flow of gasoline through nozzle **20** once an associated gasoline tank has been filled so that the discharge end portion of conduit **32** is submerged by gasoline.

The automatic high-level shutoff means used in nozzle **20** is of a known type and is designated within nozzle **20** generally by the numeral **33**. Shutoff means **33** comprises a telescoping cylindrical plunger **34** mounted within housing **21** for axial movement within confined limits. Plunger **34** has radial openings in one end portion thereof, shown in the upper end portion in this example, and a plurality of balls **35** carried within such radial openings for radial movement toward and away from the elongated axis of plunger **34**. The balls **35** operate to hold the plunger **34** in a raised position upon being uregd radially outwardly by a cooperating stem **36** extending through a blind bore **37** in the central portion of plunger **34** as will be presently described.

Stem **36** is suitably centrally fastened to a diaphragm **38** which is carried within housing **21** to define a pressure chamber shown at **40**. Stem **36** has a tapered portion illustrated at **41** which serves as cam surface means adapted to engage balls **35**. A balance spring **42** is provided on the top side of diaphragm **38** for controlling the extent of movement of such diaphragm and hence the movement of tapered portion **41** and balls **35**.

Nozzle **20** also has a separate passage means designated generally by the numeral **43** and extending from a location adjacent the terminal discharge end of discharge conduit **32** so that it is in flow communication with pressure chamber **40**. Passage means **43** is comprised of a plurality of suitably interconnected integral passages each extending through an associated portion of nozzle **20**. The lower end portion of passage means **43** is defined by a section of separate tubing **44** supported within dis-

charge conduit 32 and tubing 44 has an open end portion or open end 45 extending through conduit 32 adjacent its discharge end as shown at 46 so that open end 45 is submerged once an associated tank is nearly filled.

During a normal filling operation, with a tank not yet full, the pressure within chamber 40 is such that tapered portion 41 urges balls 35 outwardly so that they engage an O-ring or seat ring 50 supported on a shoulder 51 provided in housing 21, thus holding plunger 34 in its raised position. This is the solid line position shown in FIG. 1.

As the tank or container is filled during such normal filling operation, liquid submerges the terminal end portion of arcuate discharge conduit 32, also submerging open end 45 of tubing 44 to cause a reduction in pressure in the entire passage means 43. Because passage means 43 is in flow communication with chamber 40, the reduced pressure is also present in chamber 40 which causes diaphragm 38 to move upwardly to the dotted line position of FIG. 1 causing balls 35 to roll toward each other to the dotted line position shown and thereby releasing or unlocking plunger 34 from its raised position as held by balls 35 being seated against seat ring 50.

As plunger 34 is released it telescopes downwardly or drops to a lower dotted line position shown at 53 in FIG. 1 and thereby drops a pivot pin 54 carried at its lower terminal end.

Pivot pin 54 supports one end of lever 27 for pivoting movement thereabout. With pivot pin 54 dropped to position 53, the upper portion of lever 27 strikes housing 21 at 56 upon being actuated making it physically impossible for lever 27 to contact the terminal end of rod 26 and allow flow through poppet assembly 23. It will be appreciated that once the mechanical assembly associated with plunger 34 drops to position 53 spring 24 immediately urges poppet assembly 23 closed.

The automatic shutoff means described in connection with nozzle 20 operates in an efficient manner with the fluid dispensing nozzle manually held within an associated tank while holding lever 27 open as well as with the nozzle 20 left unattended and utilizing the improved latch means of this invention, which is designated generally by the reference numeral 60 and which is to be presently described.

The lever guard 28 is a substantially L-shaped lever guard which has one leg portion designated by the reference numeral 61, which in the illustration of FIG. 1 is shown arranged substantially horizontally, and another leg portion designated by the numeral 62 which extends upwardly from the rear end of the horizontal leg portion 61 toward the main portion of the nozzle 20. The lever guard 28 has supporting ledge means shown as a plurality of three supporting ledge means designated respectively by the reference numerals 63, 64, and 65. Each of the supporting ledge means 63, 64, and 65 has friction surface means provided in the top portion thereof and designated respectively by the reference numerals 70, 71, and 72 and for a purpose to be described in detail subsequently.

As seen particularly in FIG. 2 of the drawings, the vertical leg portion 62 of lever guard 28 is comprised of two substantially parallel and spaced apart portions designated by the numerals 62A and 62B. The supporting ledge means 63, 64, and 65 of this example of the invention are shown as being suitably fixed to the ledge portion 62B and so that a space designated by the numeral at 73 is provided between the outer tip of each ledge means 63–65 and the oppositely arranged leg 62A so as to enable the rear end portion of a slidable member 75 comprising the latch means 60 to be moved upwardly therealong essentially in an unobstructed manner and to enable such member to be supported on a selected ledge means 63, 64, or 65, as desired. Each of the ledge means 63, 64, and 65 cooperates with other components of the latch means 60 to enable latching the actuating lever 27 at a low flow position or condition when utilizing ledge means 63, at a medium flow position when utilizing ledge means 64, and at a high flow position when utilizing ledge means 65.

The improved latch means 60 of this invention is carried by the actuating lever 27 and in this example is carried within the rear end portion of the actuating lever 27. In particular, it will be seen that latch means 60 comprises the previously mentioned sliding member 75 which is supported for sliding movement within the rear end portion of the actuating lever 27 and the member 75 is normally urged in a manner to be subsequently described in detail toward a retracted position away from ledge means 63–65 and toward the forward end of the actuating lever 27.

The previously mentioned member 75 comprising latch means 60 is comprised of two parts or sections shown as a forward part 76 and a rear part 77. The outer end portion of member 75 and in particular the outer end portion of part 77 is designated by the reference numeral 80 and is provided with cooperating friction surface means 81. The cooperating friction surface means 81 is adapted to be placed upon friction surface means 70, 71, or 72 to hold the latch means 60 in a low flow, medium flow, or high flow condition respectively upon actuating the lever 27 upwardly in the manner illustrated in FIG. 1 and extending the member 75 outwardly.

The member 75 is extended outwardly or moved to an extended position by a trigger which is designated by the numeral 83 and which is supported for pivoting movement about a pivot pin 83A carried by the actuating lever 27. The trigger 83 is a substantially L-shaped trigger having one leg portion 84 which is adapted to be engaged by a finger such as the index finger of a hand used to actuate lever 27 and another leg portion 85 which extends within a substantially rectangular elongated slot 86 provided in the forward end portion of the lever 27.

As will be apparent from FIGS. 3 and 4 of the drawings, the actuating lever 27 is actuated by moving it upwardly, as viewed in the drawings, and simultaneously with the application of force necessary to move the lever upwardly the leg 84 of trigger 83 is engaged by an index finger and force is applied thereagainst substantially in the same direction as the force required to move the lever 27 upwardly to thereby cause trigger 83 to pivot about its pivot pin 83A and cause its leg portion 85 to engage the forward end portion 90 of part 76 comprising member 75 and thereby urge the member 75 outwardly from within the actuating lever 27 to a position which enables the bearing surface 81 provided on the outer end portion 80 to engage a desired ledge means to provide the desired flow setting through the nozzle 20 while leaving such nozzle unattended and with its discharge conduit inserted in an associated tank, for example.

The member 75 is normally urged to a retracted position within lever 27 by a compression spring 92 which is carried within the rear end portion of the lever 27 and in a manner as will be described in detail subsequently. Thus, it is necessary to override compression spring 92 in order to extend member 75 and its outer end portion 80 outwardly of the rear end shown at 94 of the actuating lever 27.

The member 75 is carried within a bore 96 provided in the rear end portion of lever 27 and bore 96 is a substantially right circular cylindrical bore having a reduced diameter portion provided concentrically therewith and defining its forward end portion and designated by the reference numeral 97. The rear end portion of lever 27 also has female threads 100 provided therein and such threads are adapted to threadedly receive threads 102 of a plug 101 which is fastened to lever 27. Plug 101 has a central cylindrical bore 103 which is adapted to receive and support part or section 77 of member 75 for sliding movement therealong. The sections 76 and 77 of member 75 are suitably fastened together as by a press-fit, or the like, and it will be seen that the construction and arrange-

ment thereof is such that a shoulder **104** defines the rear portion of section **76** and extends outwardly of section **77**.

The member **75** comprised of its sections **76** and **77** suitably fixed together is inserted within right circular cylindrical bore **96** and so that the forward end portion **90** of section **76**, which is of reduced diameter, extends through opening **97** and extends into the rectangular slot **86** provided in lever **27**. The compression spring **92** is then installed in position and upon threading the plug **101** in position the compression spring is compressed so that it continuously urges member **75** and in particular the forward end portion **90** of section **76** within elongated slot **86** and into engagement with leg portion **85** of trigger **83**.

Thus, it will be appreciated that in order to extend the sliding member **75** outwardly from within the handle **27** it is necessary to actuate trigger **83** so that its leg portion **85** pushes against end portion **90** and overrides the compression spring **92** to urge friction surface **81** outwardly so that it can be engaged on an associated friction surface **70, 71,** or **72**, as desired, depending upon the flow condition at which the latch means is to be set.

Upon inserting nozzle **20** within an associated tank to leave it unattended trigger **83** is actuated upon actuating lever **27** so as to place friction surface means **81** on a selected friction surface means **70, 71,** or **72** depending upon the rate of fluid flow desired through nozzle **20**. At this point a maximum area of contact is provided between friction surface means **81** and the associated friction surface means of the selected ledge means. This maximum area of contact helps assure that even with spring **92** tending to urge member **75** inwardly such member will be held firmly latched in the selected position.

Once the fluid level in the associated tank reaches the point that it submerges the discharge end portion of conduit **32**, the telescoping plunger **34** telescopes outwardly, downwardly as viewed in FIG. 1, to the dotted line position **53**. As this happens the area of contact between the friction surface means **81** and the selected friction surface means **70, 71,** or **72** is substantially reduced so that as fluid flow through the nozzle **20** is stopped by the automatic shutoff means the compression spring **92** substantially instantaneously returns the sliding member **75** to its normally retracted position and the lever **27** assumes the position illustrated in FIG. 1. This feature assures that once the lever **27** of nozzle **20** is to be actuated again it is simply lifted and the trigger actuated again thereby overriding the compression spring **92** to place friction surface **81** of outer end portion **80** on another selected ledge means to again latch the nozzle open and allow flow through nozzle **20** while leaving it unattended.

The improved latch means of this invention utilizes sliding friction together with the force of compression springs in the nozzle **20** to hold the sliding member **75** in its extended position prior to actuation of the automatic shutoff means and further the unique construction and arrangement of the latch means and its associated trigger **83** is such that the direction in which the force is applied to actuate lever **27** and the direction in which the force is applied to actuate the trigger **83** is the same making it simple and comparatively easy for an operator to utilize the latch means **60** of this invention with one hand even while wearing a glove on the one hand thereby making it possible to readily and simply operate the nozzle **20** even in cold weather.

Terms such as "upwardly," "downwardly", "inwardly," "outwardly," "rear," "front," and the like, have been used in this specification for ease of description and to correspond to the arrangement of the various component parts as illustrated in the drawings and such terms should not be considered as limiting the scope of this invention in any way.

While a present exemplary embodiment of this invention has been illustrated and described, it will be recognized that this invention may be otherwise variously embodied and practiced within the scope of the following claims.

What is claimed is:

1. A fluid dispensing nozzle for dispensing a fluid into a fluid container comprising, a main housing, valve means supported within said housing and adapted to be opened to allow fluid flow through said nozzle, said valve means including urging means normally urging said valve means closed, a fluid discharge conduit fastened in flow communication with said valve means and adapted to have its terminal end portion submerged in fluid upon filling said container, automatic shutoff means for automatically shutting off flow through said valve means as said end portion of said conduit is submerged in said fluid, said automatic shutoff means including a telescoping plunger which moves to an extended position upon actuation of said automatic shutoff means, a lever for opening said valve means having one end pivoted on said plunger, a lever guard on said main housing, said lever guard having supporting ledge means provided with first friction surface means, and latch means carried by said lever for latching said lever open upon overriding said urging means to allow fluid flow through said valve means prior to actuation of said automatic shutoff means, said latch means being adapted to be actuated using only one hand and comprising, a sliding member normally urged to a retracted position away from said ledge means, said member having an outer end portion provided with second friction surface means which is adapted to be supported on said first friction surface means, and a trigger for moving said member to an extended position to enable placing said outer end portion on said ledge means with said first and second friction surface means having a maximum contact area therebetween to mechanically latch said lever open, said maximum contact area of said friction surface means holding said member in its extended position, and upon actuation of said automatic shutoff means and movement of said plunger outwardly said one pivoted end of said lever moves therewith causing said contact area to be substantially reduced so that said sliding member is returned to its normally retracted position to thereby unlatch said latch means and enable said lever to return to its unlatched position.

2. A fluid dispensing nozzle as set forth in claim **1** in which said lever guard comprises a substantially L-shaped lever guard and said ledge means is provided in a leg of said L-shaped lever guard which is arranged transverse to and to the rear of said lever.

3. A fluid dispensing nozzle as set forth in claim **1** in which said ledge means comprises a plurality of ledge means each having an associated first friction surface means, said ledge means being arranged on said lever guard in spaced apart relation to enable latching said lever at a corresponding plurality of locations each producing a different flow condition through said nozzle.

4. A fluid dispensing nozzle as set forth in claim **1** in which, said sliding member is provided within said lever as an integral part thereof, said lever guard comprises a substantially L-shaped lever guard having a leg arranged transverse to and to the rear of said lever, and said ledge means comprises a pluraltiy of ledge means each having an associated first friction surface means, said ledge means being arranged on said leg of said L-shaped lever guard in spaced apart relation enabling latching said lever at a corresponding plurality of locations each producing a different flow condition through said nozzle.

5. A fluid dispensing nozzle as set forth in claim **1** in which said lever has a bore provided in its rear end portion, said sliding member comprises an elongated member slidably supported for movement along said bore, and further comprising a spring normally urging said member to said retracted position within said bore, said spring being overridden upon actuating said trigger to thereby urge said member outwardly from its retacted position and said trigger being pivotally supported on

said lever and actuated by a force applied thereagainst in substantially the same direction as the direction in which said lever is actuated to open said valve means.

6. A fluid dispensing nozzle as set forth in claim 5 in which, said lever has a transverse slot provided therein so that it intersects the forward end of said bore and which is adapted to receive the forward end of said elongated member therewithin, and said trigger comprises a substantially L-shaped trigger which is pivotally mounted on said lever adjacent the intersection of its leg portions and has a leg portion which is adapted to be engaged by a finger of one hand used to actuate said lever and another leg portion which extends within said slot and is adapted to engage the inner end portion of said elongated member so that upon actuating said lever by pulling said lever and said one leg portion of said trigger upwardly the leg portion of said trigger extending through said slot engages the inner end portion of said elongated member and urges it outwardly to override said spring and enable placing said second friction surface means on said first friction surface means of said ledge means.

7. A fluid dispensing nozzle as set forth in claim 6 in which said ledge means comprises a plurality of ledge means each having an associated first friction surface means.

8. A fluid dispensing nozzle as set forth in claim 6 in which said lever guard is constructed and arranged so that it confines said lever and its associated sliding member within its peripheral outline.

9. A fluid dispensing nozzle as set forth in claim 6 in which said bore comprises a right circular cylindrical bore and said member is formed of a plurality of pieces fixed together to provide a shoulder which is engaged by said spring.

10. A fluid dispensing nozzle as set forth in claim 9 in which said spring comprises a compression spring supported concentrically around the rear end portion of said member and carried within said cylindrical bore in a completely protected position.

References Cited

UNITED STATES PATENTS

3,126,925 3/1964 Boone ---------- 141—209

HOUSTON S. BELL, JR., Primary Examiner

U.S. Cl. X.R.

141—218