July 15, 1958 L. T. STOYKE ET AL 2,843,162

LIQUID DISPENSING NOZZLE AND ADAPTER THEREFOR

Filed Oct. 26, 1956 4 Sheets-Sheet 1

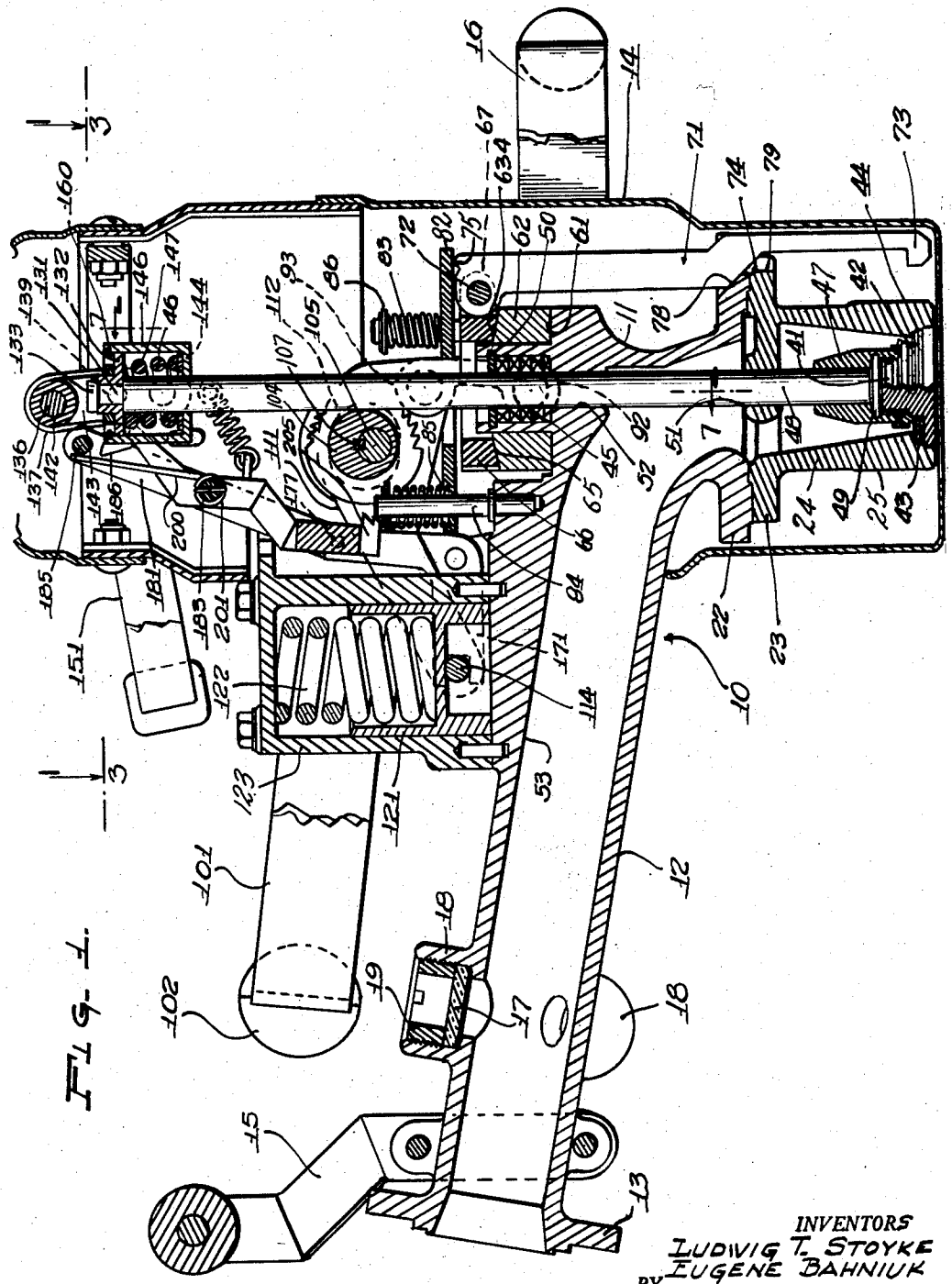


FIG. 1

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LIQUID DISPENSING NOZZLE AND ADAPTER THEREFOR

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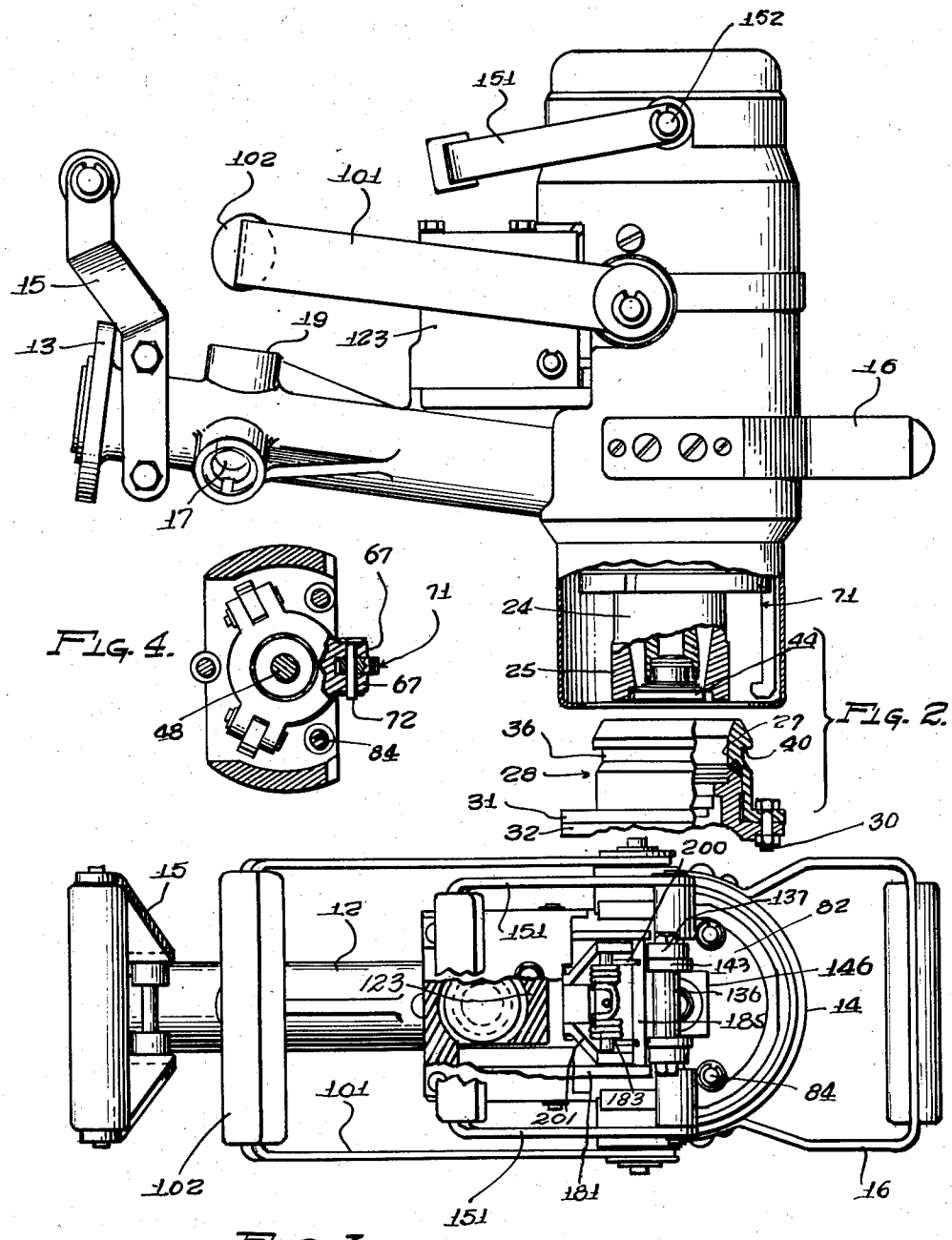



FIG. 4.

FIG. 2.

FIG. 3.

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LIQUID DISPENSING NOZZLE AND ADAPTER THEREFOR

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FIG. 6a.

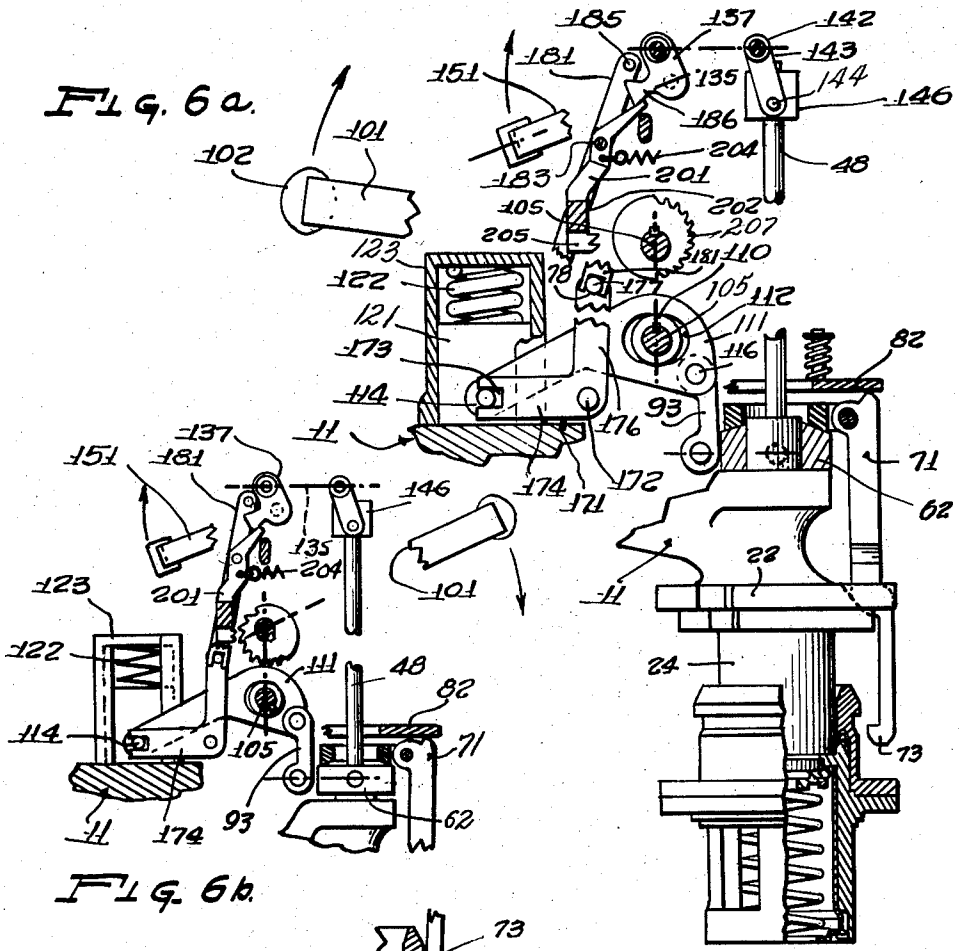



FIG. 6b.

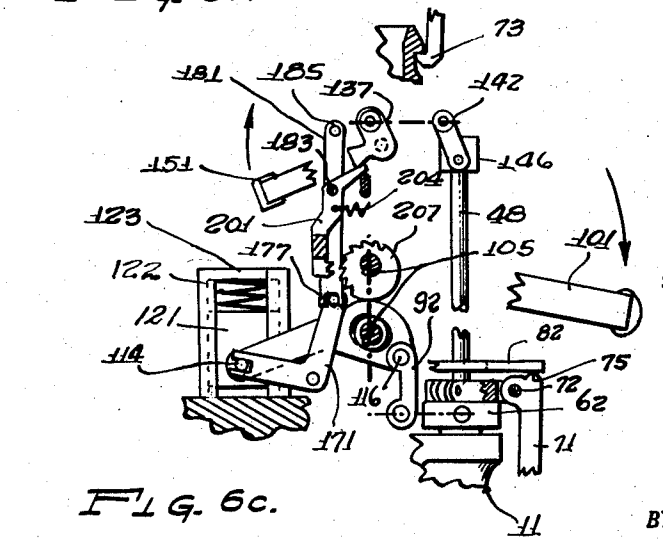
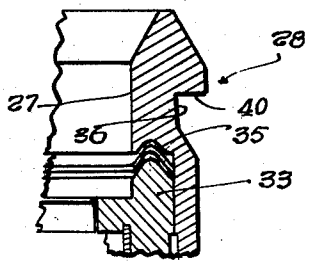



FIG. 6c.

FIG. 5.




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FIG. 6d.

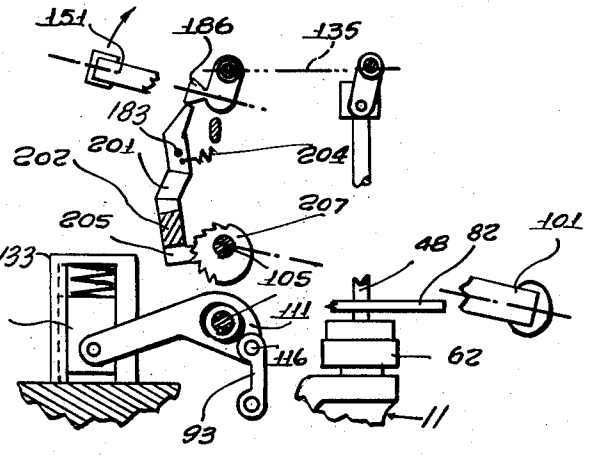



FIG. 6e.

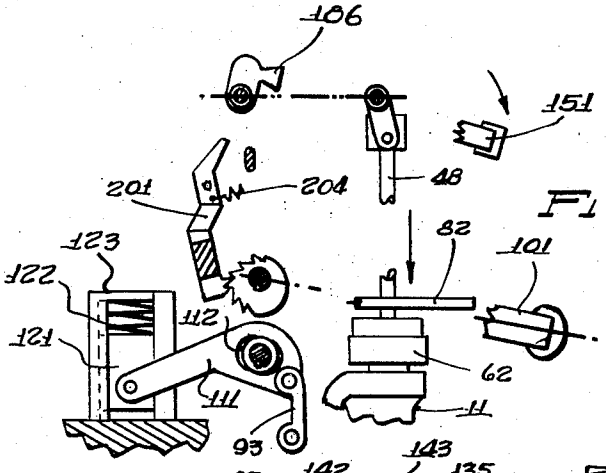



FIG. 7.

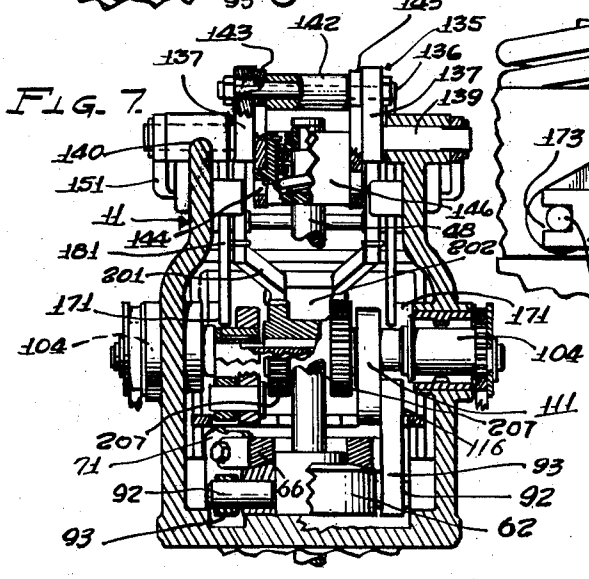
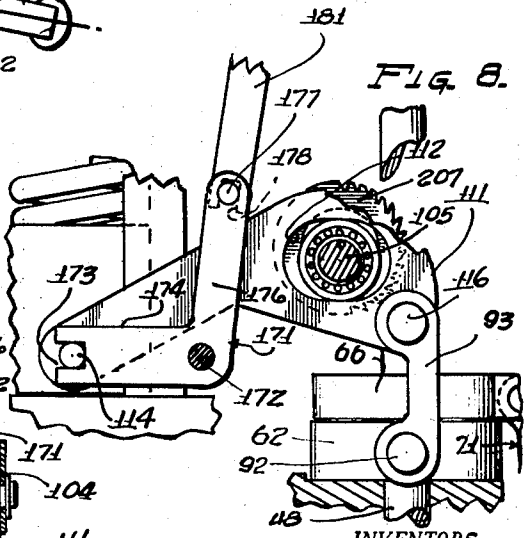



FIG. 8.




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United States Patent Office

2,843,162

Patented July 15, 1958



2,843,162

# LIQUID DISPENSING NOZZLE AND ADAPTER THEREFOR

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Application October 26, 1956, Serial No. 618,573

7 Claims. (Cl. 141—346)

This invention relates to a nozzle construction for transferring liquid from a source of supply into a receptacle. In particular it refers to a nozzle adapted for the transfer from a receptacle of liquids which are injurious and corrosive as for example, acids, together with an adapter adapted to form a part of the receptacle.

Applications for a nozzle of the foregoing class are found, for example, in the chemical industry and in fueling various types of rocket-propelled missiles, e. g. those consuming nitric acid as a component of the propellant. Consequently a need has arisen for a nozzle which is arranged to be detachably secured to an adapter or neck forming a part of the filling opening of the transferee receptacle and which incorporates means to insure against spilling of the acid with consequent serious damage to adjacent parts and hazard to the attendants. Likewise, means must be provided to prevent passage of liquid through the nozzle into the receptacle unless and until assurance is had that the nozzle is secured against accidental dislodgment. Furthermore, provision must be made to insure that when the nozzle is detached, following use, its valve opening is sealed, to avoid dripping or flow outside the receptacle with consequent similar possibilities of damage and injury.

Accordingly one of the principal objects of the invention lies in providing a nozzle for transferring liquid, particularly an injurious liquid, from one receptacle to another which may be detachably secured, by a lockable mechanism, to a novel form of neck attached to a transferee receptacle and be proof, during transfer of the liquid, against inadvertent or foolhardy dislodgment.

Another object resides in providing a nozzle as aforesaid wherein liquid flow therethrough may not be initiated unless the locking mechanism is positively in a safe condition, namely, with the nozzle locked to the adapter of the transferee receptacle.

Still another object is to provide a nozzle characterized as aforesaid together with a cooperating neck forming part of the transferee receptacle whereby the nozzle may be safely locked in dispensing position with respect to the neck and sealed therewith.

A further object is to provide a detachably securable nozzle including an interlock in which detachment is precluded unless the valve opening of the nozzle is positively closed.

An additional object is to provide a novel seal between the nozzle and neck which will maintain a fluid-tight joint notwithstanding severe laterally-applied forces, as for example, strain due to the weight of a hose of which the nozzle is the terminus.

Another object is to provide a nozzle operable in accordance with the foregoing objects but which incorporates simple, compact mechanism which adds very little to the overall dimensions of the conventionally manually-held nozzle.

Other objects and advantages will become apparent from the ensuing description which, taken with the accompanying drawings, illustrate a preferred form of the invention.



In these drawings:

Fig. 1 is a cross section taken substantially on a longitudinal, vertical, mid-plane of a nozzle organization in accordance with the invention;

Fig. 2 shows a side elevation of the nozzle and an adapter or neck for the receiving vessel adapted to cooperate therewith;

Fig. 3 is a top plan view of the nozzle of Fig. 2 with certain parts broken away;

Fig. 4 is a cross section taken on the line 4—4 of Fig. 1;

Fig. 5 is a cross section to show details of the seal between the nozzle and neck of the receiving vessel;

Figs. 6*a* to 6*e* are schematic views, not strictly conventionally delineated, to illustrate the operational sequence;

Fig. 7 is a cross section taken substantially in a vertical plane through the valve stem; and

Fig. 8 is a detail of certain parts associated with the detachable securing mechanism.

Regarded in one aspect the invention comprehends the provision of a nozzle having an exit end or thimble arranged for reception in a necked portion or adapter forming an appendage of the vessel to which the liquid is being transferred and with which the thimble may be sealed. After and if the thimble is properly inserted in the adapter a handle is operated to manipulate a plurality of hooked pawls into locking engagement with an external flange or shoulder of the adapter whereby the nozzle is secured to the same. If the parts are engaged properly the pawls may be actuated to adapter-engaging position; then additional mechanism is rendered effective to release a flow-controlling lever which may then be operated to open a poppet-type valve normally obturating the dispensing opening and liquid flow may thus be initiated and terminated. If, due to human error, the detachably securing means have been improperly operated the flow-control mechanism continues inoperative and the operator must rectify the condition of faulty securement before he can proceed. Upon termination of flow mechanism functions to prevent detachment of the nozzle from the adapter unless flow has been fully arrested by closure of the valve.

In another aspect means are provided to render it impossible to open the valve unless the nozzle is, in fact, properly secured to the adapter. Stated otherwise the invention mechanism is fully proof against carelessness or horseplay such as an attempt to open the valve while the nozzle is removed from its precise operating relation with the adapter.

In another aspect the adapter includes a seal of novel form for maintaining fluid tightness between the nozzle and adapter notwithstanding the application of cantilevering forces.

Turning now to Figs. 1 to 3 the invention nozzle 10 comprises a body 11 having a laterally extending tubular branch 12 which is provided, at its distal end, with a flange 13 of any convenient form for attaching the nozzle to a hose or other conduit communicating with the source of supply of the liquid to be transferred. A U-shaped carrying handle 15 of any suitable form, including a metal grip, is secured to the branch 12 and a similar handle 16 is secured to the shroud 14, enclosing the operating mechanism, to assist in handling the assembly. If desired one or more viewing windows 17 of synthetic sapphire may be provided in hollow bosses 18 extending radially of the branch 12 and therein retained by an annular threaded collar 19, whereby flow of fluid may be observed.

The body 11 includes a flange 22 to which is attached the complemental flange 23 of a thimble 24 having a faced enlargement 25 adapted to be received in a bore 27 of an adapter 28. This latter is flanged at 31 and is bolted at 30 to a companion flange 32 forming an appendage of the vessel into which the liquid is transferred.

In order to provide an efficient seal between the enlargement 25 and the adapter 28 (Fig. 5) an annular part 33 extends outwardly of the flange 32 and has a V-shaped, male outer edge upon which is seated a plurality of nested, resilient, metal rings or seals 35. These rings are V-shaped in radial cross section to correspond with the edge of the part 33 and are retained by a shoulder 36 having a V-shaped, female, radial cross section to retain the rings in operative position when the bolts 30 are tightened. While the sealing means just described is preferred where the ambient temperature is low, say to —65° F. it is somewhat expensive. Consequently if extreme temperatures are not expected to be encountered then a conventional seal may be substituted, e. g. an O-ring of some suitable elastomer. As shown, a portion of each lip protrudes internally of the thimble. Thus upon intromission of the thimble 24 with the adapter 28 a flexible and tight joint is provided by those portions of the lips of the rings which frictionally engage the surface 25. Moreover, due to the locking effect of the pawls which engage the thimble 24 with the adapter and because of the floating type of seal presented by the rings 35 any tendency to cocking or inclination of the nozzle due to the weight of the hose and other parts exerting eccentric loading on the assembly is without harmful effect.

The valve 41 includes a gasket 42 adapted to seat against a shoulder 43 of a port 44 whereby to seal the port during such times as the nozzle is idle and to prevent dripping following withdrawal of the nozzle from dispensing relation with the adapter 28. Ultimate closing force is exerted by a compression spring 46 to which further reference will be made hereinafter. The valve 41 also includes a threaded nut 47 arranged to retain the stem 48 through the medium of a head 49 of the latter. The stem and valve disc provide a universal joint type of action in both the closed and open positions of the valve. This is accomplished by providing play between the nut 47 and disc 41. Stem 48 is provided at its lower end with a termination 49 which has spherical upper and lower surfaces. Thus, any misalignment can be accommodated and the valve may be tight both in closed and open positions. As will appear movement to open position results in a thrust action against another valve in the adapter. Thus cocking of the latter and consequent irregular wear may be avoided. Moreover, by this arrangement the abutting faces on valve disc 41 and on the adapter valve disc may both be flat thereby minimizing trapping of acid. In devices for handling dangerous fluids it is important that voids wherein the fluid may lodge be eliminated to the greatest practical extent in order that spillage upon disengagement be minimized. The valve and stem are guided in bores 51 and 52 in the body 11. Chevron packing 45 retained by insert 50 functions to seal the stem 48 with respect to the passage 53 providing communication between port 44 and a hose (not shown) attached, in any preferred manner, to the flange 13. The packing is subjected to pressure by a compression spring bearing on a disc which latter is exposed to the pressure of fluid in the passage 53. Thus increase in pressure of the fluid is instrumental in tightening the packing.

As alluded to hereinbefore the invention nozzle includes means for positively locking the nozzle into liquid-transferring position before the valve 41 may be opened to any degree whatsoever. Such locking means will now be described.

An annular shoulder 61 of the body 11 receives an annular seating ring 62 having an upper surfaces 63 of spherical radius. Seated on the surface 63 and having a surface 65 congruent therewith is a spider 66 having a plurality of radially extending pairs of ears 67, e. g. three pairs, equally spaced peripherally. Between each a pair of ears, a pawl or latching finger 71 is freely pivoted at one end on a pivot 72. Each finger 71 comprises a hooked distal end 73, a camming incline 74 and 75 which, during actuation of the pawls, acts as a fulcrum. The several inclines 74 are arranged to cooperate in a camming manner with a frusto-conical surface 78 of the body 11. Lateral guiding of the several fingers is effected by slots 79.

Positioned above the fingers 71 is an operating disc 82 adapted to bear on the several projections 75 under the urging of compression springs 83 to pivot each pawl radially inwardly into cooperation with the individual cam surface 78. Each spring is received over an individual guide post 84 secured in the body 11 and passing through apertures in the disc 82 for guiding the same. The springs are retained by counterbores 85 at the bottom and by washers 86 and spring rings 87 at the top.

Ring 62 is provided with a pair of diametrically opposite studs 92—92 (Fig. 7) to which the links 93—93 are pivotally connected. At this juncture it will have become evident that with the parts in the position of Fig. 2 and assuming the nozzle 25 inserted within the adapter 28, upward movement of the ring 62 will carry with it the spider 66 and the disc 82. If the nozzle is not properly seated on the adapter the sequence is otherwise and will be described hereinafter. This movement combined with the force of the springs 83 will swing the fingers 71 radially inward to carry the hooked ends 73 thereof beneath a shoulder 40 defined on a peripheral flange of the adapter 28 whereby to positively lock the nozzle to the adapter. During upward movement of the pawls the surfaces 74 and 78 will permit the necessary inward swinging movement of the fingers to occur and vice versa, to cam the fingers outwardly into released position upon reverse actuation of the ring 62.

The mechanism for actuating the ring 62 will now be described.

A U-shaped locking lever 101 including a grip 102 spans the device and at its ends is united for rotation with a pair of eccentrics 104 carried in bearings in the body 11. A shaft 105 is secured to the eccentrics commonly by a key 107. Consequently when handle 101 is rotated from the position shown over an angle of approximately 180° clockwise the eccentric will rotate to the same extent. Shaft 105 carries a pair of roller bearings 110—110 (Fig. 8) upon which are respectively engaged a pair of levers 111—111 by means of flat oval slots 112—112 in the latter fitted over the roller bearings. Thus, upon rotation of the shaft 105 and by reason of the eccentric mounting thereof the rollers 110—110 are given an orbital motion to oscillate the arms 111—111 about an axis provided by a pin 114 which has controlled vertical displacement but no consequential horizontal displacement. Accordingly the slots 112—112 provide the necessary clearance for orbital motion of the rollers 110—110. The free end of each arm 111 carries a stud 116 receiving the upper end of an associated one of the links 93—93.

The pin 114 is resiliently retained in a normal position as shown in Fig. 1 by mounting the same in a shoe 121 biased by a compression spring 122 received in a housing 123.

Movement of the pawls 71 into latching position has already been described. Locking of the pawls in such position will now be detailed. Subsequently detailed consideration will be given to the valve opening mechanism and the safety interlock.

At this juncture it is necessary to point out that, in the interests of clear exposition, operational views Figs. 6*a* to 6*e* are somewhat schematic. Some resort has

been had therein to "exploded" representation to eliminate what might otherwise have proved difficult to interpret if closely fitted and overlapping parts had been drawn in conventional orthographic projection.

In Fig. 6*a* the nozzle is shown intromitted with the adapter but not locked. Handle **101** is to the left and is now rotated clockwise to the right over an angle of approximately 180° (Fig. 6*b*). Shaft **105** and its thereon carried roller bearings **110—110** are moved orbitally in accordance with the offset of the eccentric supports **104—104** of the shaft whereby to operate the levers **111** to raise the links **93**. Thus the ring **62** is raised thereby to lift the pawls **71**. Concurrently the disc **82**, assisted by the springs **83**, urges the pawls inwardly and such motion is compounded by the pawls sliding on the inclines **78**. As a result the hooked ends, during their upward movement, engage under the shoulder **40** of the adapter **28** during the terminal portion of rotation of the handle **101**. (Fig. 6*c*) The proportions and dimensions of the parts are so determined that, during the terminal portion of rotation of the handle, and only when the pawls are in full latching position, further movement of the levers **111** is exhibited as upward movement of the pin **114**. Movement of the pin **114** continues until the handle is rotated to the point where the eccentric supports **104—104** cross the dead center position. The remaining small arc of actuation of the handle **101** will then compress the spring **122** and the pawls are thereby placed in counteracting relation with such spring force to retain the nozzle and adapter in secured position. A high lever multiplication is provided so that, with only moderate turning effort applied to the handle, approximately 1700 pounds of upward pull is developed. Holding force of this magnitude may be necessary in cases where the opposing reaction due to the weight of the extending connected hose, together with any other forces tending to detach the nozzle from the adapter, may otherwise be sufficient to cause accidental separation while the valve is in open position. Moreover, the parts are so designed that the whole excursion of the handle **111** may be slightly more than 180° in order that the "locked" position of the handle may correspond to a position beyond "dead center." Consequently the handle **111** is urged into its right hand or locked condition (Fig. 6*c*) against handle **16** and is proof against release under the ordinary unintentional shocks which may be encountered during use. Spring **122** is preferably given a spring constant as large as possible consistent with ready manipulation of the handle **101**.

Treating the action of the levers **111** and spring **122** somewhat analytically it is to be observed that, during that portion of movement of the handle **101** corresponding to what may be termed a "locating" of the pawls **71** in adapter-engaging position as compared to a "locking" of the pawls, the levers **111** have a fulcrum at the pin **114**, a force applied at the rollers **110—110**, and a load applied at the pins **116**. However as locking force is being applied to the pawls the fulcrum shifts to the pins **116**, the applied force continues at the rollers **110—110** and the load is transferred to the pin **114**, namely compression of the spring **122**. Unless shoe **121** is lifted by some predetermined amount the interlock between the nozzle-securing mechanism and the valve-opening mechanism is not released. Such feature has been introduced to avoid the hazard of a condition which could otherwise occur namely: opening of the valve when the nozzle is lying idle or is not completely in operative position with respect to the adapter.

By utilizing a pawl-actuating ring comprised of parts **62** and **66** separated along a surface which is a segment of a spherical surface the latter can rock or shift on the former to allow self-adjustment of the hooked end of the several pawls and therefore a locking force which is uniformly applied about the periphery of the adapter.



As alluded to in the foregoing means are provided to prevent the valve **44** from being opened until the handle **101** is in its full locked position (Fig. 6*c*). Such means are sometimes referred to herein as the safety interlock and will now be described.

At its upper extremity the valve stem **48** is necked at **131**, passed through the hub of a disc **132** and provided with a head **133** to unite the same (Fig. 1). A crank **135** (Fig. 7) includes a crank pin **136**, cheeks **137—137** and bearing studs **139—139** rotatably supported in bosses **140—140** of the body **11**. The crank pin **136** carries a rotatable sleeve **142** including a pair of depending arms **143—143** apertured at their lower ends to engage over respective studs **144—144** protruding from opposite sides of a spring block **146** (Fig. 1). This latter is arranged for sliding movement in guides **50** formed in the body **11**, and receives the disc **132** and compression spring **46** interposed therebetween. The guides **50** are required to avoid lateral deflection of the stem **48** which otherwise would cause sticking of the valve.

A valve operating handle **151** of U-shape straddles the device and is secured at its ends to the bearing studs **139—139** of the crank **135** for rotation thereof. Thus, rotation of the handle **151** clockwise from the position shown in Fig. 1 will actuate the crank **135** in the same sense whereby, through the sleeve **142** and its thereto secured arms **143—143**, the spring block **146** is moved downwardly. As such movement proceeds a ring **160** secured internally of the cylinder **146** moves against the disc **132** thereby thrusting the rod **48** and its valve **41** together with the adapter valve to "open" position. For reasons which will appear it is necessary that the handle **151** be carried to its extreme right hand position, namely, as shown in Fig. 6*e*.

As alluded to hereinbefore another of the important features of the invention is the provision of means which disables the mechanism by which the device is locked to the adapter **28** whenever the valve **41** is open whereby detachment of the nozzle during liquid flow is rendered impossible and the hazards of spilled fluid thereby obviated. Such means will now be described.

Referring to Fig. 8 a pair of bell cranks **171—171** are pivoted at **172** in the body **11** and each has a slot **173** in the arm **174** thereof engaged over the respective opposite ends of a pin **114** secured transversely of the shoe **121** whereby movement of the latter in the manner heretofore detailed effects rocking of the cranks. At the distal end of the other arm **176** there is a pin **177**, the respective ones of which are engaged in respective slots **178—178** in the lower end of respective levers **181—181**. These latter are supported for rotation on a shaft **183** (Fig. 1) and also jointly carry a rod **185** spanning the crank cheeks **137—137**. Each cheek **137** is provided with a lug **186** cooperative with the rod **185** in the following manner.

Upon rocking movement of the levers **111—111** about the alternative fulcrum, i. e. pins **116—116** the left end thereof (Fig. 6*c*) lifts the cylinder **121** and its pin **114** to rock the bell cranks **171—171** clockwise. Thus the levers **181—181** are rocked counter-clockwise and the rod is shifted from the position of Fig. 6*a*, namely interposed in the path of the lugs **186—186**, to the position of Fig. 6*c* namely, out of the path of the lugs. In the absence of movement of the left end of the lever **111** the rod **185** will remain in the path of the lugs thereby prohibiting rotation of the crank **135** and the valve cannot, therefore, be opened. Stated otherwise, unless the nozzle is locked to the adapter the left end of the lever **111** will remain in its lower position thereby maintaining the valve opening mechanism in locked condition. In particular it will be observed that the relation of rod **185** to lugs **186—186** is such that only a few degrees of movement of the crank **135**, and hence of the handle **101** is allowed until the lugs abut the rod to forestall any further move-

ment. Such small amount of rotation is limited and tends to cause preloading of the valve spring **46** thereby increasing the pull required to set the valve disc **42** against the seat **44**. As is the case with manipulation of the locking handle **101**, the valve handle **151** and its crank is arranged to rotate over the dead center position so that the valve handle may be secured in either direction without the necessity of continually applying force to the handle. It is necessary to rotate the handle approximately 30° before the pre-load on the spring **46** is relieved. Only upon further rotation of the handle will the valve be shifted to "open." If any attempt is made to maintain any intermediate (unsafe) position of the valve handle the same will be opposed by the spring force and will, therefore, not only warn the operator of the presence of an unsafe condition but will, if persisted in, prove exhausting to the operator.

Accordingly, through the use of the invention arrangement it is impossible to open the valve **41** or to reduce the spring load before the locking mechanism comes into play. By the same token it is necessary to allow some clearance between the lugs **186—186** and the rod **185** to permit resumption of the original relative position of the parts (Fig. 6*a*) upon completion of an operating cycle.

At this juncture it is appropriate to note that, with the parts in the position of Fig. 1 the valve is maintained closed by the bias of the spring **46** and not by the action of several articulated parts which, as they wear, will develop looseness thereby to result in poor fit of the valve **41**.

However, in order to further minimize backlash which might cause displacement of the rod **185** during the locked condition a torsion spring **200** (Fig. 1) is included in the interlock arrangement. Such spring is fitted over the pivot **183** and its ends bear respectively on an abutment **210** of the shaft **183** and upon the rod **185**. By including this additional precautionary measure wider manufacturing tolerances may be allowed.

Proceeding now to that feature which disables the locking mechanism when the valve **41** is open another pair of levers **201—201** are united by a block **202** for joint rotation upon the shaft **183**, and biased for counterclockwise rotation by a pair of springs **204—204**. At the lower end the block **202** is provided with a pair of multiple toothed pawls **205—205** adapted to engage the members of a pair of complementally toothed wheels **207—207** formed on the ends of a drum **208** keyed to the shaft **105** and therefore rotatable by the locking handle **101**.

With the parts in the position of Fig. 6*a* the levers **201** are positioned with their upper ends below the respective lugs **186** and are biased into abutment therewith by the springs **204**. Thus the pawls **205** are withheld from the wheels **207** and the shaft **105** is free for rotation. Subsequently, when the handle **151** is rotated to open the valve the lugs **186** (Fig. 6*d*) are rotated away from the position at which they block the levers **201** and these latter are therefore freed for rotation under the bias of the springs **204**. Pawls **205** then become engaged with the teeth of the wheels **207** thereby to lock the same and the shaft **105** against rotation. Consequently the device may not be unlocked until the valve is closed by return movement of the handle **101** and the parts cooperative therewith. That is to say, return movement of the lugs **186** is effective to return the pawls **205** to disengaged position by clockwise actuation of the levers **201**.

Although the wheels **207** are shown toothed over half of the circumference thereof it will be understood that only a few of the teeth are involved in the locking function.

From the foregoing it will have become clear that we have provided a valve which is, for all practical purposes, proof against tampering and unsafe operation. In one design in accordance with the principles of the invention a pulling force of approximately 1700# is required to force the pawls **71** from engaged position while the interlocks are effective.

While we have shown a particular embodiment of our invention, it will be understood, of course, that we do not wish to be limited thereto since many modifications may be made and we therefore contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of our invention.

We claim:

1. A liquid dispensing nozzle adapted for liquid transfer to a vessel having a filling opening provided with a fixed abutment comprising: means for engagement with the abutment for detachably securing the nozzle in the opening, a lever for operating said means between engaged and disengaged positions with respect to the abutment, said means being connected to one end of said lever to constitute the load applied thereto, the other end of said lever being the fulcrum and connected to a shiftable member for movement therewith, bias means normally urging said shiftable member toward a fixed position in the same direction as the direction of the load, means for applying input force of opposite direction to the lever intermediate its ends, a valve, means for operating said valve between open and closed positions respectively for initiating and terminating flow of liquid through the nozzle, means under the control of said shiftable member for locking the valve against movement to open position while the shiftable member is in said fixed position, whereby unless said abutment engaging means is engaged with the abutment there is absent the load which will counterbalance the force of the bias means thereby to permit said bias means to maintain a fixed position of the shiftable member and to maintain said valve locking means effective whereas upon positive engagement of the abutment engaging means with the abutment the input force is effective as to a fulcrum at the said one end of the lever and the shiftable member becomes the load to displace against its spring bias to release the valve locking means.

2. A liquid dispensing nozzle adapted for transfer of liquid to a vessel having a filling opening provided with a peripheral flange comprising: a plurality of pawls spaced apart about said flange having a part for engagement with the flange for securing the nozzle to the vessel, means for actuating said pawls between engaged and disengaged positions, a lever for operating said pawl actuating means, one end of said lever being the fulcrum and the other end thereof being connected to said pawl actuating means, a spring urging said fulcrum end of said lever to a normal position of rest, means for applying force to the lever intermediate its ends, a valve including bias means for normally maintaining a closed position thereof, means for opening said valve for passage of liquid through the nozzle and means for locking the valve-opening means against opening movement operatively connected to the fulcrum end of said lever whereby unless said pawls are subjected to the reaction consequent upon positive engagement thereof with the flange said fulcrum remains fixed upon actuation of the pawl-actuating means but upon said positive engagement being effected the distribution of forces on the lever is such as to overcome said spring to impart movement to said fulcrum end to release the valve locking means.

3. The combination in accordance with claim 2 wherein said pawl-actuating means imparts a compound radial and axial movement to said pawls between engaged and disengaged positions thereof.

4. The combination in accordance with claim 3 further characterized in that the nozzle has a body part and said pawl and body part are respectively provided with cooperative camming surfaces for translating movement of the pawl in the direction of the force applied thereto into movement radially and axially of the flange to cause engagement therewith by forces exerted mutually orthogonally.

5. A liquid dispensing nozzle adapted for detachable securement to an apertured portion of a receiving vessel having an abutment comprising: means for engagement and disengagement with the abutment for detachable securement of the nozzle, valve means for initiating and terminating liquid flow through the nozzle, a stop member operatively associated with the valve means and having a defined excursion between end limits as the valve is operated between open and closed positions, a pawl movable into and out of the path of the stop member for respectively prohibiting and permitting operation of the valve means when the detachably securing means is respectively disengaged and engaged, said valve means including a lost motion connection to provide for clearance between the pawl and stop member during their relative movement in order that the pawl may clear the stop member during pawl movement to releasing position before the valve may be opened and vice versa.

6. In an organization for transferring liquid from a source to a receptacle means comprising: a hollow, cylindrical nozzle adapted for insertion into a complemental hollow, cylindrical portion forming a liquid receiving opening of the receptacle, conduit means for feeding



liquid from the source to the nozzle and attached laterally thereto whereby to induce angular misalignment of the respective axes of the nozzle and receptacle portion, and means for providing a snug, resilient seal intermediate the nozzle and receptacle portion upon introduction of one into the other comprising a plurality of rings of resilient material mounted in the wall of the receptacle portion, each ring having a lip protruding into the interior of the portion for frictional engagement with the exterior of the nozzle, and clamping means on said receptacle portion for gripping said rings.

7. The combination in accordance with claim 6 wherein said rings each have a substantially V-shaped radial cross section and are nested, said receptacle portion including complementally shaped male and female V-portions for clamping said rings between them, and means for securing said portions in claimping relation.

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