

Nov. 20, 1951

R. B. PRESSLER

2,575,562

HYDRAULIC REGISTER RESETTING APPARATUS

Filed March 5, 1947

2 SHEETS—SHEET 1

Fig. 1

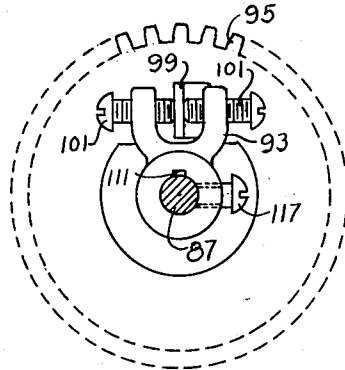
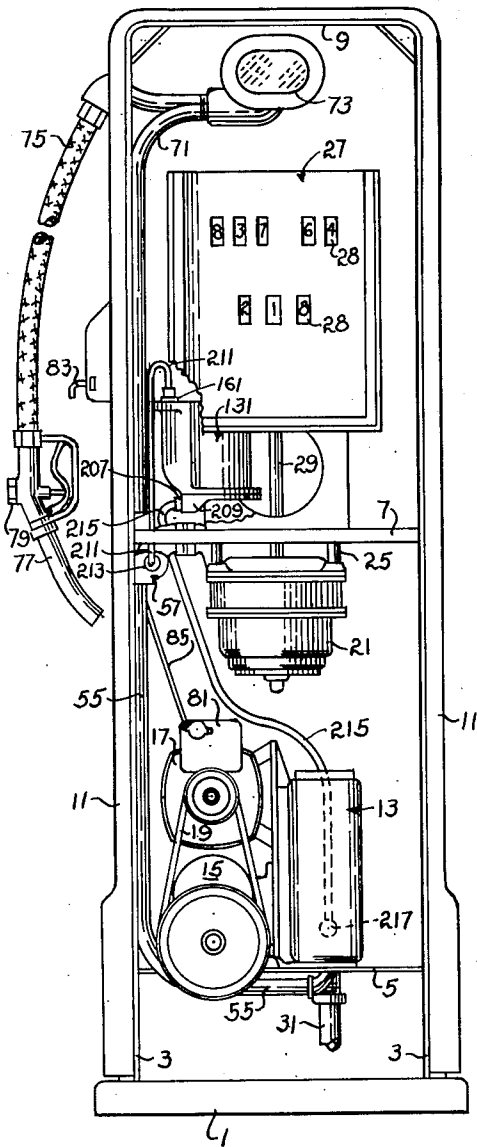


Fig. 6

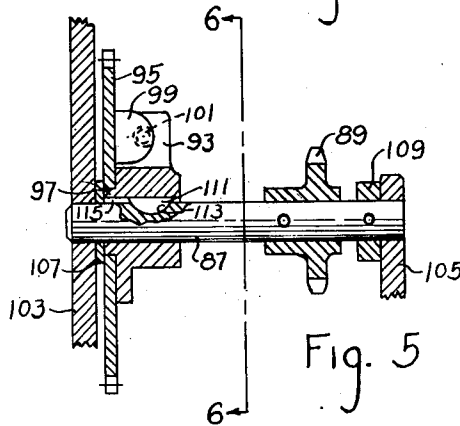


Fig. 5

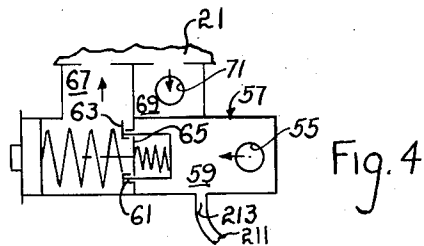


Fig. 4

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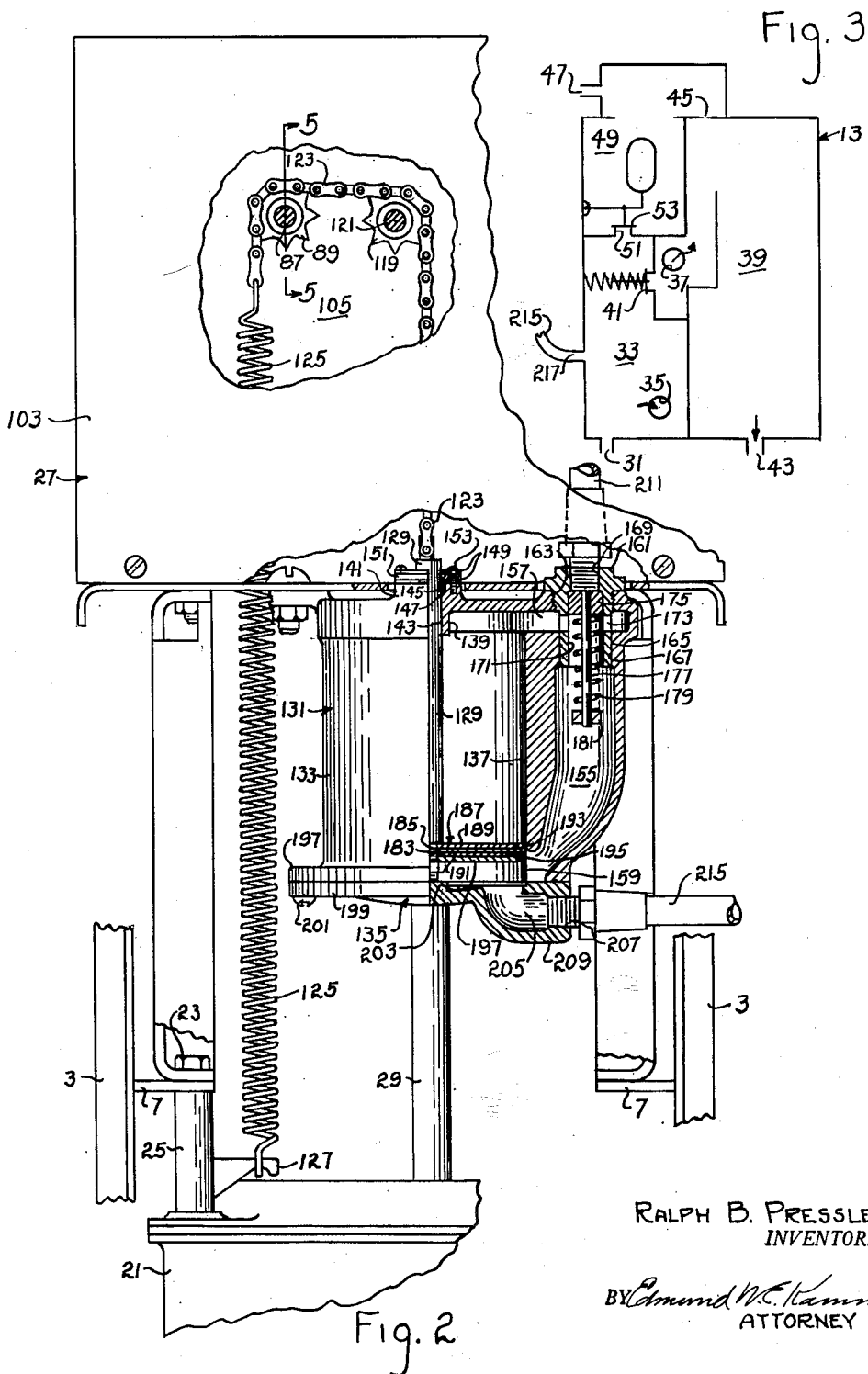
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HYDRAULIC REGISTER-RESETTING APPARATUS

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2 SHEETS—SHEET 2



UNITED STATES PATENT OFFICE

2,575,562

HYDRAULIC REGISTER RESETTING
APPARATUSRalph B. Pressler, Fort Wayne, Ind., assignor to
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8 Claims. (Cl. 222-33)

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This invention relates to an hydraulic apparatus for resetting the register of a gasoline dispenser; more specifically, it relates to an hydraulic cylinder, and a valve, which is responsive to the pressure in the flow line for the operation of the cylinder and resetting of the register at the start of the delivery operation.

In the dispensing of gasoline, it is required that the register which displays the gallons dispensed in a transaction and/or the total sale price be reset before a succeeding transaction takes place so that the second customer will be assured that the gallons and price displayed represent the gasoline which has been delivered to him.

It is an object of this invention to perform the resetting function very rapidly as soon as the dispenser is started so that there will not be the opportunity of dispensing liquid before resetting has been completed.

Another object of the invention is to insure that the activating piston is returned each time to its initial position.

Yet another object of the invention is to insure that a full stroke of the resetting mechanism will be had.

Still another object of the invention is to provide a control mechanism for the piston which will be dependable in operation.

These and other objects will become apparent from a study of this specification and the drawings which are attached hereto and are made a part hereof and in which:

Figure 1 is an elevation with parts broken away of a dispensing apparatus fitted with an hydraulic resetting apparatus.

Figure 2 is an elevation, partly in section, of the resetting apparatus and showing the cylinder, piston, control valve and other parts.

Figure 3 is a diagrammatic view of the air separator.

Figure 4 is a diagrammatic view of the meter manifold and the check and relief valve.

Figure 5 is a sectional view of the register resetting drive taken substantially on line 5-5 of Figure 2.

Figure 6 is an end view of the zero stop adjusting means taken on the line 6-6 of Figure 5.

Referring now to Figure 1, the numeral 1 indicates a base to which are attached corner frame members 3, between which extend various cross-members 5, 7 and 9. A housing 11 is also provided over the frame.

Mounted on cross-member 5 is an air separator 13 to which is attached a pump 15 and a motor 17 which drives the pump through a belt

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19. A meter 21 is suspended from the cross-members 7 by means of studs 23 and spacers 25 and drives a register 27 by means of a suitable connection 29. The register may be either a simple gallons indicating register or a computing register which displays unit price and cost of sale, as well as the number of gallons, through openings 28 in a dial.

Referring now to Figures 1 and 3, the suction pipe 31 is connected to the supply tank (not shown) and to a chamber 33 of the air separator 13. An outlet 35 connects with the inlet of pump 15 and the pump outlet communicates with a port 37 in the separation chamber 39. A by-pass valve 41 affords passage for liquid between the outlet and inlet sides of the pump when excessive pressure is created in the system to prevent stalling the motor. A liquid outlet 43 leaves the bottom of chamber 39 while a restricted gas outlet 45 at the top of the chamber leads to a vent line 47 and a chamber 49 which has a port 51, controlled by a float valve 53, leading into the suction chamber 33.

Liquid from outlet 43 passes by way of pipe 55 into the meter manifold 57. As shown in Figures 1 and 4, the inlet chamber 59 has a port 61 which is closed by a spring pressed check valve 63 which contains a spring pressed relief valve 65. Beyond the port 61 is a chamber 67 which communicates with the inlet port of the meter. The meter outlet communicates with the chamber 69 to which is connected the discharge pipe 71, sight glass 73, hose 75 and nozzle 77, which is provided with a manually operable self-closing valve 79.

A switch 81 which is actuated from hose hook 83 by linkage 85, controls the operation of the motor. The usual interlock mechanism which prevents operation of the switch 81 prior to resetting is entirely omitted so that the switch is operable at will.

Referring now to Figures 2, 5 and 6, and, particularly to Figure 5, the shaft 87 has a sprocket 89 fixed to it. A yoke 93 is also fixed to shaft 87 and a gear 95 is rotatably mounted on the hub 97 of the yoke and has an ear on tab 99 projecting between the arms of the yoke for engagement by adjusting screws 101 threadedly engaged in said arms.

The gear 95 drives the register resetting mechanism shown in U. S. Patent No. 2,229,370 issued to W. M. Carroll on January 21, 1941, which is preferably used for the register 27. The gear 95 of this application is identified by the numeral 205 in the Carroll patent.

The shaft 87 is journaled in the register frame

members 103 and 105 and a spacer 107 is mounted on the shaft 87 between the frame member 103 and the gear 95. A collar 109 is pinned to the shaft 87 on the inside of frame member 105 to prevent the shaft from moving to the right as viewed in Figure 5. The key 111 engages the mating keyways 113 and 115 in the shaft 87 and the yoke hub 97 and this, with set screw 117, prevents motion of the shaft to the left and relative rotation of the yoke and shaft.

Figure 2 shows an idler sprocket 119 mounted on a shaft 121 which is also journaled in the frame members 103 and 105. A chain 123 is passed over both of the sprockets. The one end of the chain is fastened to a spring 125 which in turn is hooked under a projection 127 welded to one of the spacers 25. The other end of the chain is hooked to the end of a piston rod 129 of an hydraulic cylinder 131.

The hydraulic cylinder is comprised of a body 133 which is open on one end and a bottom head 135. The body has a cylindrical bore 137 extending up from the bottom. An internal boss 139 extends down into the body and is substantially on the center line of the bore. A second boss 141, slightly larger in diameter than the boss 139, extends upwardly from and coaxially therewith. A hole 143 extends through both bosses into the bore and provides a bearing for the rod 129. Packing 145, preferably in the form of a toroid, is placed in the counterbore 147 in sealing relation with the rod. Metal plates 149, fitting the rod, are placed over the counterbore and a felt wiper 151 is compressed between the metal plates to exclude dirt. The plates and the wiper are held in place by screws 153 which engage threaded holes in the boss 141.

A cavity 155 in the body extends in from the top at one side of the bore 137 and is connected to the bore by the upper port 157 and the lower port 159. A valve body 161 screws into a threaded opening 163 in the cylinder body and has a sleeve 165 which passes beyond the port 157 of the body and seals in a bore 167 in the cavity 155. The valve body has a tapped hole 169 extending from the top into the bore 171 of the sleeve. Ports 173 are formed in the sleeve in line with the port 157. The juncture of the tapped hole 169 and the bore 171 provides a stop for the upward movement of the valve 175 which is mounted on the end of the shaft 177 and urged upward to close the hole 169 by the spring 179. A cross-bar 181 disposed in the cavity 155 but which does not seal off the cavity, serves as a guide for the lower end of the shaft 177 and as a support for the spring. It will be noted that when the valve is in its uppermost position that the valve is above the ports 157, 173.

The lower end 183 of the piston rod 129 is reduced in diameter to form a shoulder and the end is threaded. The threaded portion passes through centrally located holes designated by the numeral 185 in the circular piston 187. The piston is comprised of an upper follower 189 of Bakelite or similar material and slightly less in diameter than the bore 137, the piston leather 191 having an upturned peripheral flange 193 which engages the bore 137, an intermediate follower 195 which is identical to the upper follower 189, and a metal follower 197 which is smaller in diameter than the followers 189 and 195. A nut holds the piston assembled on the stem.

A flange 197 extends around the bottom of the cylinder body and mates with a flange 199 on

the head 135. Screws 201 extend through clearance holes in the flange 199 and engage threaded holes in the flange 197 to secure the head to the body.

A circular boss 203 rises a short distance from the inner surface of the slightly dished head 135 and serves as a bottom stop for the piston 187. An outlet port 205 formed in the head terminates in a tapped hole 207 in the boss 209.

A tube 211 provides a liquid connection between the inlet port 213 (Fig. 4) of the meter manifold 57 and the threaded hole 169 of the valve seat 161 in the hydraulic cylinder 131.

A second tube 215 connects the cylinder outlet boss 209 with the opening 217 in the suction side of the air separator 13 (Fig. 3).

Operation

When it is desired to dispense gasoline from the pump, shown in Figure 1 of the drawings, the nozzle 77 is removed from the hose hook 83 and with valve 79 of the nozzle in closed position, the hose hook 83 is pulled out to throw the switch 81 to its on position, which in turn will start the motor 17. The motor will rotate the pump 15 which will draw the gasoline from the storage tank (not shown) through the suction pipe 31 into chamber 33 of the air separator 13 and through port 35 (Fig. 3) to the suction side of the pump, which will discharge the gasoline through the port 37 (Fig. 3) into the separation chamber 39. With the nozzle valve 79 closed, pressure will build up in the separation chamber sufficient to open the by-pass valve 41 permitting the liquid to return to the chamber 33.

The pump pressure is transmitted through the air separator outlet 43 by way of pipe 55 into the inlet chamber 59 of the meter manifold 57, and through port 213 and tube 211 to the valve 175 which is depressed against the action of spring 179 to open the port 173. At the same time the vacuum created by the pump is applied to the lower side of the valve 175 through conduits 155, 205, 215, port 217 and chamber 33, to assist in the movement of the valve. This permits passage of the liquid through port 157 into the bore 137 at a point above the piston 187, which is at rest against the lower face of boss 139. The piston 187 will move downward in the bore until it is stopped by the threaded end of rod 129 striking the face of boss 203. The downward movement of the piston is assisted by the application of the pump suction to the lower side thereof by means of port 205 and line 215. The downward movement of the piston will carry with it the chain 123 and will extend the spring 125. The chain passing over the sprockets will rotate the sprockets 89 and 119 in a clockwise direction as viewed in Figure 2 and the rotation of the sprocket 89 will be transmitted through shaft 87 to the yoke 93, which is secured to the shaft 87 by key 111 and set screw 117. The yoke drives the resetting gear 95 through the screws 101 and the tab 99. As stated above, since the gear 95 is a portion of the reset mechanism, the yoke 93 and screws 101 in the yoke and the tab 99 on the gear 95 provide a means for adjusting the reset so that the fixed downward stroke of the piston will reset the register wheels exactly to the zero mark in the dial openings 28.

After the reset is completed the nozzle valve 79 is placed in the gasoline tank and delivery of the gasoline is started by opening the nozzle valve 79. At this time, the by-pass valve 41 will close or partially close depending on the

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rate of flow or the liquid being dispensed, and the meter manifold check valve 63 will open to permit the liquid to pass from chamber 59 to chamber 67 and into the meter 21. After being metered the liquid passes through the meter manifold chamber 69, the pipe 71, the sight glass 73, the hose 75 and out through the nozzle.

The movement of the meter will rotate shaft 29 which is connected to drive the register 27 and advance the number wheels to show the gallons delivered and their sale price.

After completion of the delivery the hose hook 93 is pushed in to stop the motor 17 and the pump 15. This will relieve the pressure on the valve 175 and the spring 177 will urge the valve upward to close the hole 169. The spring 125 will pull downward on the chain and revolve the sprockets 89 and 119 in a counterclockwise direction, as viewed in Figure 2, which will exert an upward pull on the piston 187 through the rod 129 and the liquid in the bore 137 above the piston will not have to be returned to the chamber 33 of the air separator by way of ports 157, 173, 155 and 205, tube 215 and the opening 217 in the suction side of the separator but will simply by-pass from one side of the piston to the other through port 157, chamber 155 and port 159. This prevents an excessive accumulation of liquid in the float chamber 49 of the air separator and in vent pipe 47 so that no liquid can be discharged to atmosphere. The boss 139 serves as a stop for the return stroke of the piston.

The return stroke of the piston will revolve the sprocket 89 and the number wheel reset shafts approximately 390 degrees in a direction reverse to the resetting movement. The additional 30-degree movement over the 360-degree reset stroke is a safety measure to insure resetting of all the number wheels.

It should also be noted that during the resetting stroke, the piston has applied to it not merely the discharge pressure of the pump but also the vacuum created by the pump.

It is obvious that various changes may be made in the form, structure and arrangement of parts without departing from the spirit of the invention. Accordingly, applicant does not desire to be limited to the specific embodiment disclosed herein primarily for purposes of illustration; but instead, he desires protection falling fairly within the scope of the appended claims.

What I claim to be new and desire to protect by Letters Patent of the United States is:

1. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stopping said pump, a meter driven by liquid flow from said pump and connected to drive the register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, a conduit directly connecting opposite ends of said cylinders, a valve mounted for movement, said valve being movable between positions in which it opens and closes said conduit, means for normally holding said valve in conduit-open position and means connecting said valve for hydraulic operation by said pump to its conduit closing position.

2. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stopping said pump, a meter driven by liquid flow from said pump and connected to drive the

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register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, a conduit directly connecting opposite ends of said cylinder, a valve mounted for movement, said valve being movable between positions in which it opens and closes said conduit, means connecting said valve for hydraulic operation by said pump to its conduit closing position, and resilient means for moving said valve to and holding it in its conduit-opening position when said pump is not operating.

3. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stopping said pump, a meter driven by said pump and connected to drive the register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, a port in each end of said cylinder, a conduit connecting said ports, an inlet port connected to the pump discharge, valve means mounted for movement between a first position for opening the conduit to connect the ports in the ends of the cylinder, and a second position for connecting the port in one end of the cylinder with the inlet port.

4. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stopping said pump, a meter driven by said pump and connected to drive the register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, a port in each end of said cylinder, a conduit connecting said ports, an inlet port connected to the pump discharge, valve means mounted for movement between a first position for opening the conduit to connect the ports in the ends of the cylinder and a second position for connecting the port in one end of the cylinder with the inlet port, said valve being adapted for movement to said second position in response to operation of said pump.

5. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stopping said pump, a meter driven by said pump and connected to drive the register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, a port in each end of said cylinder, a conduit connecting said ports, an inlet port connected to the pump discharge, valve means mounted for movement between a first position for opening the conduit to connect the ports in the ends of the cylinder and a second position for connecting the port in one end of the cylinder with the inlet port, said valve being adapted for movement to said second position in response to operation of said pump, and resilient means for restoring said valve to said first position upon stopping of said pump.

6. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stopping said pump, a meter driven by said pump and connected to drive the register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, a port in each end of said cylinder, a conduit connecting said ports, an inlet port connected to the pump discharge, valve means mounted for movement be-

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tween a first position for opening the conduit to connect the ports in the ends of the cylinder and a second position for connecting the port in one end of the cylinder with the inlet port, and means for connecting the port in the opposite end of said cylinder to the suction side of the pump.

7. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stopping said pump, a meter driven by said pump and connected to drive the register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, yieldable means for returning said piston, a port in each end of said cylinder, a conduit connecting said ports, an inlet port connected to the pump discharge, valve means mounted for movement between a first position for opening the conduit to connect the ports in the ends of the cylinder and a second position for disconnecting said ports and connecting the port in one end of the cylinder with the inlet port, said valve being disposed for movement to said second position by liquid under pressure from said pump.

8. In a liquid dispensing apparatus, the combination of a resettable register having a reset position, a liquid pump, means for starting and stop-

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ping said pump, a meter driven by said pump and connected to drive the register away from reset position, an hydraulic cylinder, a piston movable in said cylinder and connected to operate said register to reset position, a port in each end of said cylinder, a conduit connecting said ports, constantly open means connecting the first port with the suction side of the pump, an inlet port connected to the pump discharge, valve means mounted for movement between a first position for opening the conduit to connect the ports in the ends of the cylinder and a second position for disconnecting said first and second ports and connecting the second port with the inlet port, said valve being disposed for movement to said second position by liquid under the pump differential pressure.

RALPH B. PRESSLER.

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