April 1, 1958 H. F. RIPLEY 2,828,782

ELECTRONIC AUTOMATIC LIQUID PUMP CONTROL

Filed April 19, 1954 2 Sheets-Sheet 1

Fig. 1.

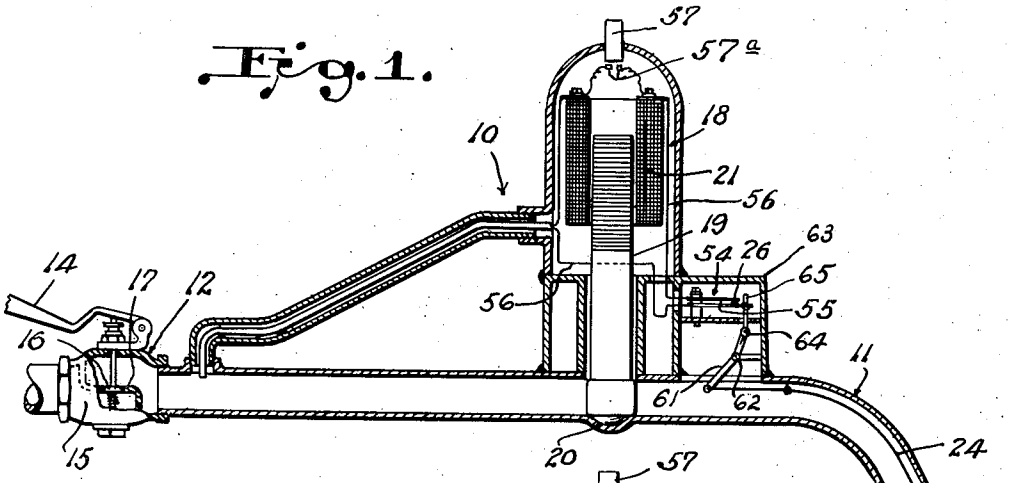


Fig. 2.

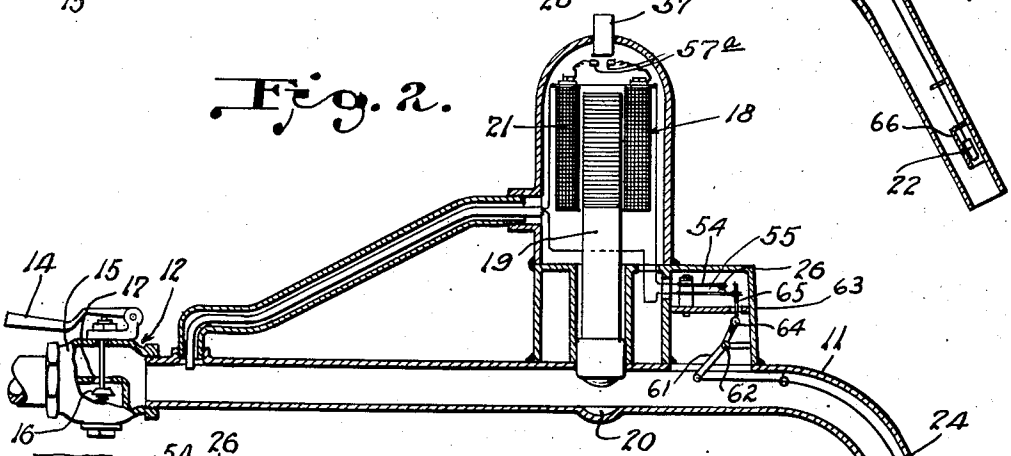


Fig. 3.

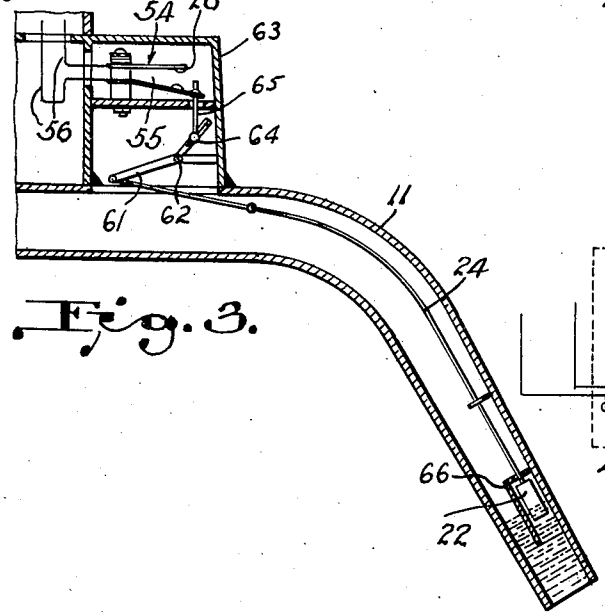
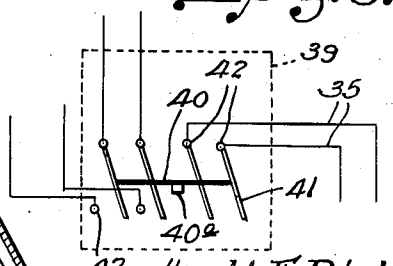


Fig. 5.



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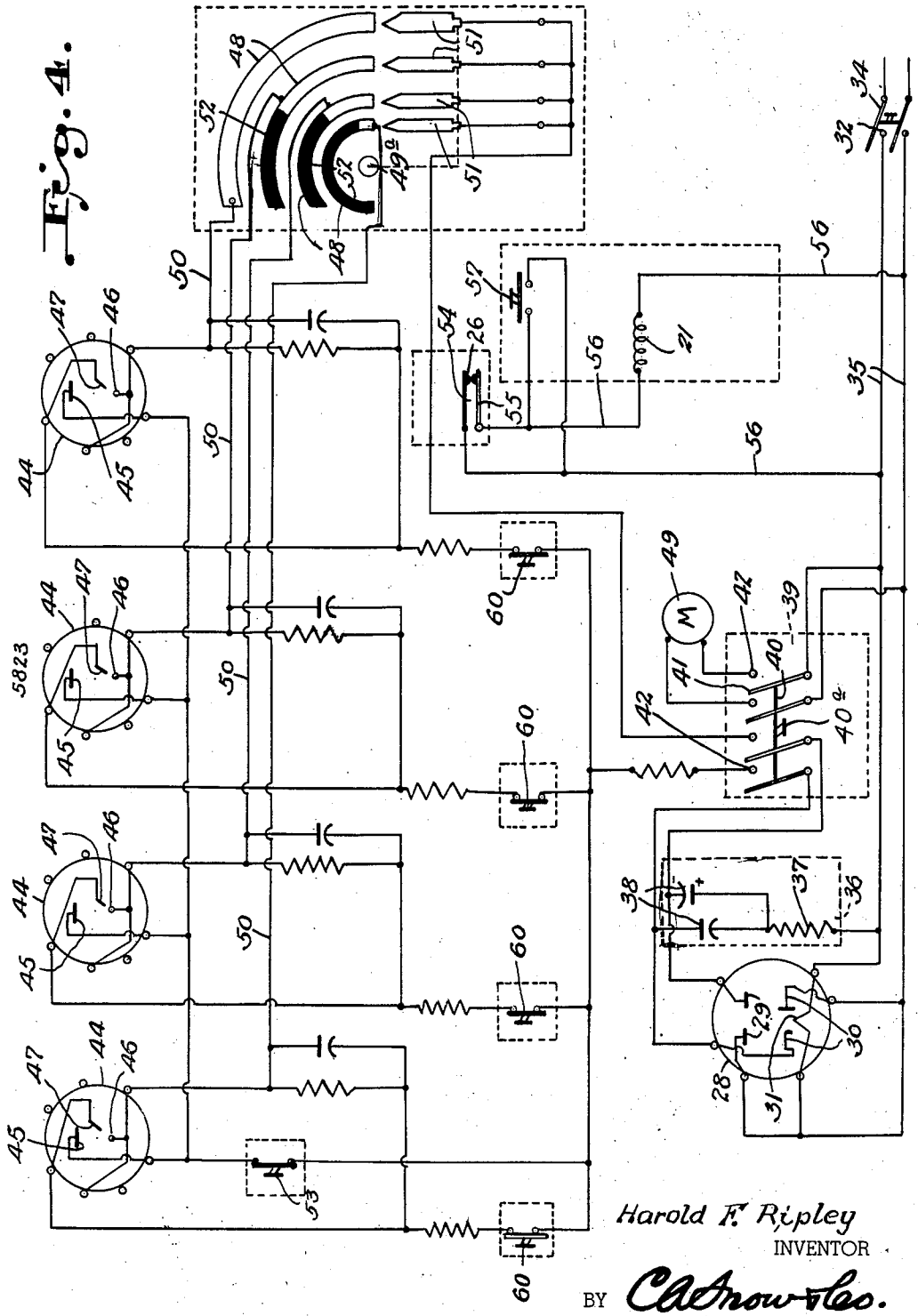
BY C. A. Snow & Co.
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Fig. 4.



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2,828,782

ELECTRONIC AUTOMATIC LIQUID PUMP CONTROL

Harold F. Ripley, Pine City, N. Y.

Application April 19, 1954, Serial No. 424,075

1 Claim. (Cl. 141—216)

This invention relates to a pump control and more particularly to an electronic automatic liquid pump control.

It is an object of this invention to provide an electronic automatic liquid pump control of the kind to be more particularly described hereinafter for use in conventional gasoline pumps to provide for the accurate dispensing of gasoline according to the quantity or cost of the gasoline as it is regulated on the pump.

It is another object of this invention to provide an electronic automatic liquid pump control of this kind which is relatively easy to install on a conventional fuel pump and may be procured at an economical cost. The pump control may be varied at the will of an owner for dispensing the liquid from the pump accurately by measuring between the quantity and cost of the dispensed liquid which may be gasoline for automobiles.

It is yet another object of this invention to provide an electronic automatic liquid pump control of this kind which will prevent the spilling of the fuel from its nozzle when the tank being filled is substantially full, or when back pressure occurs in the tank.

Other and further objects and advantages of the invention will be hereinafter described and the novel features thereof defined in the appended claims.

In the drawings:

Fig. 1 is a longitudinal section, partly broken away, of a filling nozzle constructed according to an embodiment of my invention with the discharge valve closed.

Fig. 2 is a longitudinal section, partly broken away, with the discharge valve open.

Fig. 3 is a longitudinal section of the discharge valve control mechanism.

Fig. 4 is a diagrammatic wiring diagram of the electronic circuits in the pump control.

Fig. 5 is a schematic wiring diagram of the circuit under the control of the operator.

Referring now more particularly to the drawings the numeral **10** designates generally an electronic automatic liquid pump control constructed according to an embodiment of this invention and it is particularly designed for gasoline pumps as found in service stations at the present time.

The electronic automatic liquid pump control is provided with a nozzle **11** with a manual valve **12** at one end thereof, the manual valve including a handle **14** which is mounted on the top of the valve body **15**. The handle **14** is connected to a valve core **16** which is engaged with an open seat **17** for stopping or restricting the flow of liquid from the pump to the nozzle **11** where it is distributed to a fuel tank or the like.

Aside from the manually controlled valve **12** there is provided an electromagnetic or solenoid valve **18** which is automatically controlled by the selection of the operator. The electromagnetic valve **18** has a valve core **19** which is adapted to engage in a valve seat **20** when the flow of liquid through the nozzle is to be stopped and the valve core core is drawn upwardly away from the valve seat **20** by an electromagnet coil **21** which is electrically operated under the control of the electronic means to be further described herein.

The electronic means comprises a rectifier tube **28** having plates **29** therein with cathodes **30** and a cathode heating element **31** working with the cathodes to provide sources of electrons which will be collected on the plates **29** from the source of electric supply designated generally in the drawings, by the conductors connected to the right side of switch **34**. An on-off switch **34** is connected between the (A. C.) supply and the rectifier tube **28** by leads **35** so that electrons are provided in the rectifier tube between the cathodes **30** and the plates **29**.

As the rectifier changes the alternating current (A. C.) to direct current (D. C.) a double filter **36** is provided to smooth out (D. C.) current pulsations. The filter **36** comprises a resistor **37** and condensers **38** connected in series between one of the alternating current leads **35** and the direct current output.

The pump motor **49** is also directly connected to the (A. C.) power supply by a manual 4 pole control switch **39** having movable contacts **41** fixed thereon and fixed contacts **42** to be engaged by the contacts **41** at which time the pump motor **49** is energized and the output of the rectifier tube is connected to the D. C. circuits at the same time. The contacts **41** are movable and are connected together by a bar **40**. A button or operator **40a** is carried by the bar **40** so that the contacts **41** may be moved to closed position. Switch **39** may be operatively connected with valve lever **14**, and this lever may include releasable latching means (not shown) for holding the lever in valve opening position.

Control tubes 5823 designated by the reference numeral **44** are directly connected to the rectifier tube by way of the control switch **39** and each of the control tubes **44** has a plate **45**, a cathode **46** and a starter electrode **47** therein so that each one of the control tubes **44** may be separately fired.

Commutator strips **48** are electrically connected to the tubes **44** by leads **50** so that when one of the control tubes **44** is fired the discharge of liquid from the nozzle **11** may be accurately controlled by the selected tube. Brushes **51** are mounted in a conventional rotatable brush holder (not shown) and attached directly to the shaft **49a** of a computer. The brushes **51** engage on the commutator strips **48** and the commutator strips **48** are secured at a conventional insulated support (not shown) and are different in length as far as their conductive qualities is concerned, the effective length of the commutator strips **48** being determined by the amount of insulation **52** on each of the strips. One of the commutator strips **48**, and its connected tube, is particularly designed for filling a tank to capacity from the nozzle **11** and the other commutator strips and their respective tubes will provide for a lesser amount of liquid to be discharged from the nozzle **11** past the electromagnetic valve **18**.

In order to provide a means of stopping the flow of liquid through the nozzle in case of over-filling or back pressure in the tank, a float switch **54** is connected in one end of the nozzle, the end of the nozzle which will protrude into the tank to be filled, and the float switch **54** has contacts **26** and **55** therein which are connected by leads **56** which are in series with one side of the (A. C.) line to the electromagnetic valve **18** which will open the circuit to the electromagnetic valve **18** and allow the valve to close, stopping the flow of liquid through the nozzle at the time when the tank being filled has been filled to its maximum desired amount. The said float switch **54** would not only open its contacts when the tank is full, but would also open its contacts in response to back pressure in the tank. Some tanks can be filled at a greater rate than others. Often a tank is being

filled too fast, back pressure builds up, some of the gasoline remains in the neck of the tank and some of the gasoline runs over. When said back pressure builds up, with the applicant's device, the gasoline remaining in the said neck, opens the float switch 54, closing electromagnetic valve 18 momentarily and avoids spilling of the gasoline. The manual push button switch 57 will protrude from the housing of the electromagnetic valve 18 and is electrically connected by leads 57a in parallel with the contacts on switch 54 to provide a means of energizing the electromagnetic valve 18 in case electronic control is out of working order, or only a small amount of liquid is desired.

In the float switch asembly described above, there is provided a float 22 which is responsive to the level of the liquid both in the tank and in the end of the nozzle 11 which protrudes therein. A stiff wire 24 is connected at one end of the float 22 and the other end to one end of a rock lever 61 which is pivoted between the ends thereof as at 62 in switch housing 63. The other end of lever 61 is pivotally and slidingly mounted as at 64 to a bar 65 which is carried by contact 55 of switch 54. Float 22 is disposed in a forwardly opening float housing 66 which is positioned close to the discharge end of nozzle 11.

A normally closed push button 53 is also provided in the (D. C.) control circuit to the plates of all the 5823 tubes 44 which will open the plate circuit and de-energize any tube that has been fired. The switch 53 provides a manual means whereby the electronic control may be manually cut off at any point in the dispensing operation.

In the use and operation of the electronic automatic liquid pump control 10, the station attendant will open his station by closing or turning on the on-off switch 34. When a customer comes into the station and states the amount of gasoline he desires in his tank the attendant closes switch 39, energizing pump motor 49 and connecting the output of the rectifier tube 28 to the D. C. circuits; presses push button 60 relating to amount desired by customer; places nozzle into tank and regulates the amount of flow into tank by the manual valve 12.

If the customer desires a lesser quantity than a full tank the attendant presses a button 60 for closing the circuit of one of the other control tubes 44 whereby only a certain amount of fluid is led to the tank before the electromagnetic valve 18 closes. The length of the time required for closing of the electromagnetic valve will then be dependent upon the length of the commutator strip 48 which is in the circuit connected to the selected tube and operatively connected to one of the brushes 51. All of the brushes 51 are carried by a brush holder which may be of conventional design, the brush

holder being not shown in the drawings. When the tank has been filled the float switch 54 will be opened and will open the (A. C.) circuit to the electromagnetic valve 18 stopping the flow of gasoline through the nozzle 11. It is noted that push buttons 60, control tubes 44, and the circuits constitute selective means for controlling the pump to automatically pass a selected amount of liquid through said nozzle. Also the float operated switch constitutes automatic means for controlling said pump to stop passage of liquid through said nozzle when a tank becomes full before the selected amount of liquid is passed through said nozzle.

While the specific details of one embodiment of this invention have been herein shown and described, the invention is not confined thereto as changes and alterations may be made without departing from the spirit and scope thereof as defined in the appended claim.

I claim:

In a fuel pump, a dispensing nozzle, a normally closed manual valve carried by said nozzle, a solenoid valve carried by said nozzle and normally urged to closed position, a housing encompassing said solenoid valve and fixed relative to said nozzle, a switch housing extending from said first housing and communicating with said nozzle, a normally closed switch in said switch housing connected to said solenoid valve, a rock lever pivoted between the ends thereof in said switch housing, a forwardly opening float housing in said nozzle closely adjacent the discharge end thereof, a float in said float housing, a relatively stiff wire connecting said float with one end of said rock lever, a bar pivotally connected between said switch and the other end of said lever, and selective means for discharging a predetermined quantity of fuel through said nozzle, said latter means being in circuit with said solenoid valve for selectively energizing said valve.

References Cited in the file of this patent

UNITED STATES PATENTS

1,149,256	Godfrey	Aug. 10, 1915
1,607,899	Long	Nov. 23, 1926
1,996,944	Witter	Apr. 9, 1935
2,130,687	Lachmund	Sept. 20, 1938
2,326,415	Titus	Aug. 10, 1943
2,361,837	Gilmore	Oct. 31, 1944
2,585,821	Mueller	Feb. 21, 1952
2,614,185	Henry	Oct. 14, 1952
2,663,477	Bendz	Dec. 22, 1953
2,692,923	Ash	Oct. 26, 1954
2,729,382	Weber	Jan. 3, 1956