

Jan. 13, 1942.

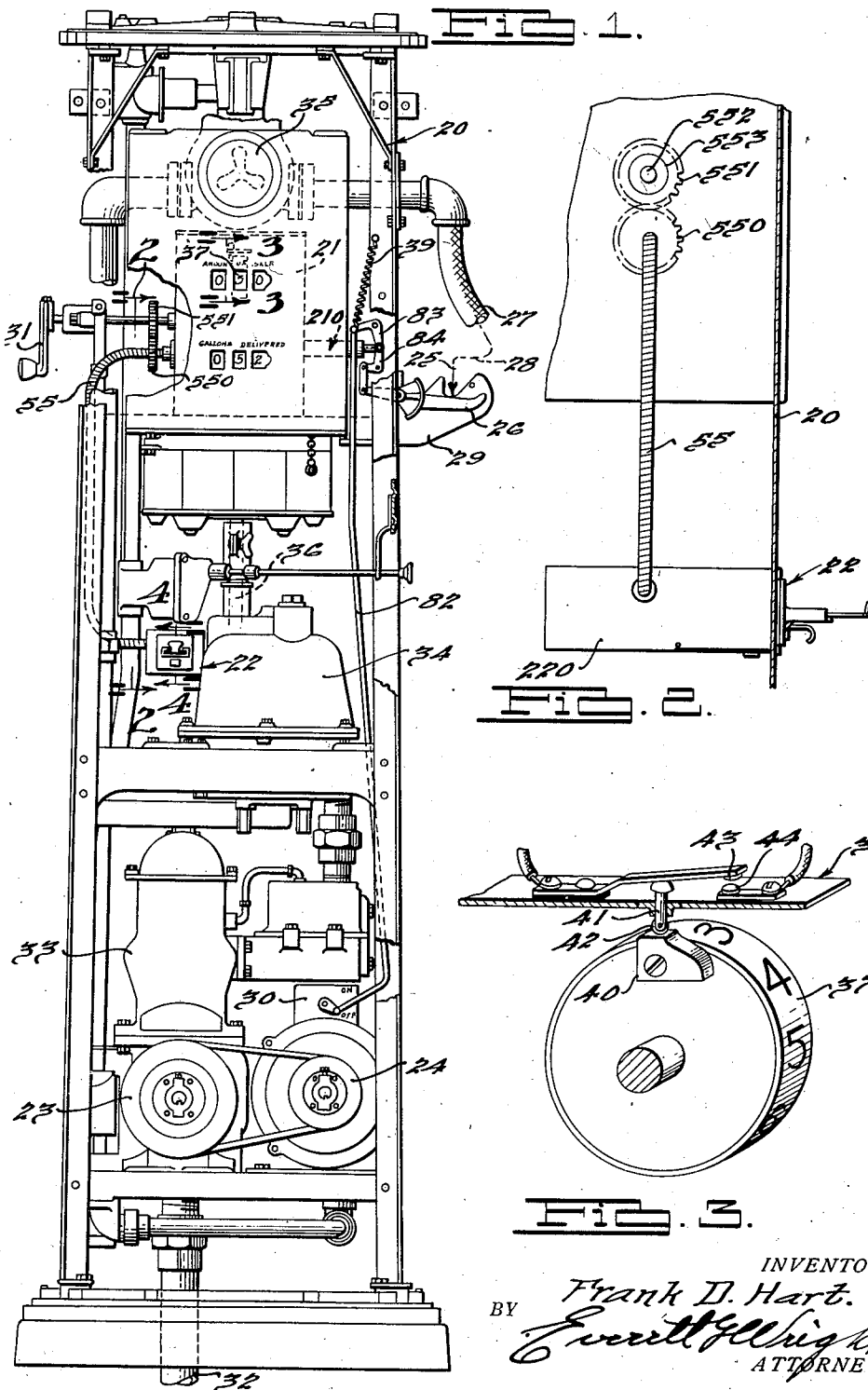
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2,269,937

COIN CONTROLLED LIQUID DISPENSING APPARATUS

Filed Feb. 16, 1940

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

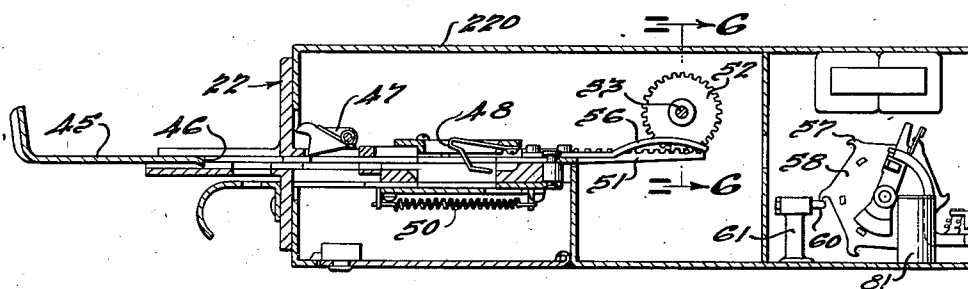


FIG. 4.

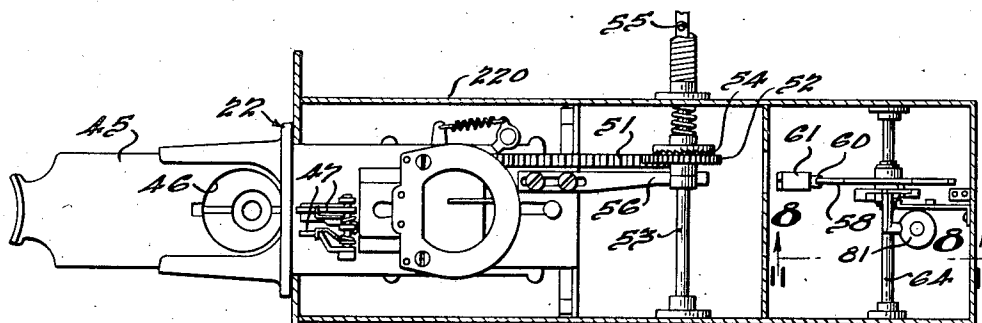


FIG. 5.

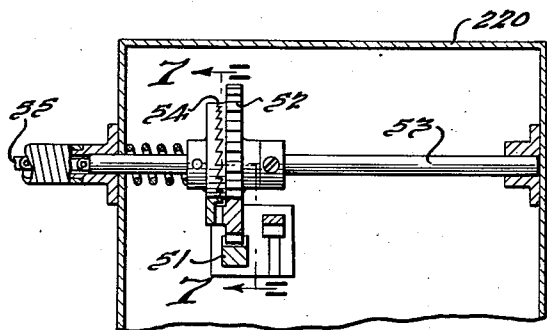


FIG. 6.

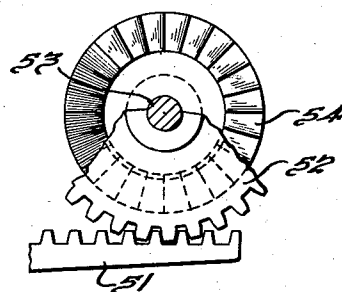


FIG. 7.

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3 Sheets-Sheet 3

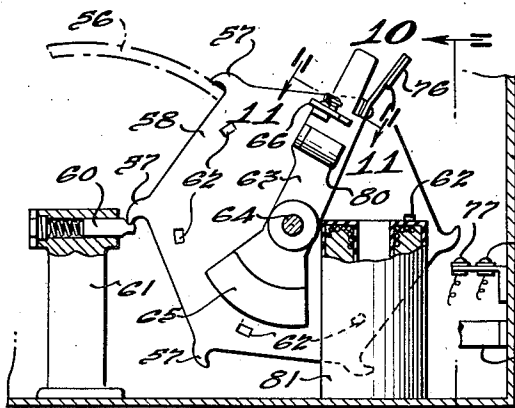


FIG. 8.

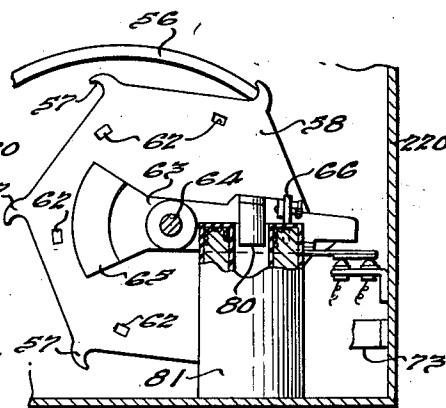
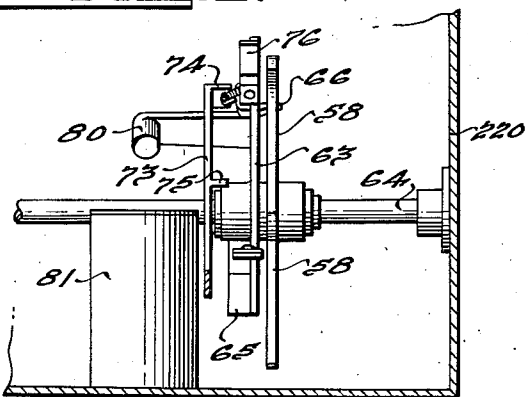


FIG. 9.



UNITED STATES PATENT OFFICE

2,269,937

COIN CONTROLLED LIQUID DISPENSING
APPARATUS

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Application February 16, 1940, Serial No. 319,221

5 Claims. (Cl. 221—101)

This invention relates to gasoline pumps and particularly to coin controlled gasoline pump mechanisms which enable customers to obtain measured quantities of gasoline on a serve-self basis.

Gasoline pumps for service station use employing accurate measuring, computing and registering devices and automatic interlock means to prevent fraud on customers of service stations have become in general use. Such pumps require attendants and, in most communities other than in the large cities, it has been found unprofitable to operate gasoline service stations 24 hours a day, the service stations generally being closed between 11 p. m. and 7 a. m. Nevertheless, much touring and trucking is done at night and in the early morning hours and service station owners, particularly in the smaller towns and communities, desire accurate, inexpensive means for dispensing fuel on a serve-self basis.

With the foregoing in view, the primary object of this invention is to provide simple, inexpensive and tamper-proof means adaptable to modern measuring, computing and registering gasoline pumps for converting the said pumps from manual to automatic coin controlled operation without the necessity of re-building the pumps.

Another object of the invention is to provide in combination with manually operated automatic computing electric gasoline pumps, coin controlled means for operating the pump to dispense gasoline in an amount equal in value to the coin employed.

Other objects of the invention will become apparent by reference to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevational view of the mechanism of a manually operated automatic computing and registering electric gasoline pump having a coin controlled dispensing means embodying the invention incorporated therewith.

Fig. 2 is a fragmentary skeletonized elevational view taken on the line 2—2 of Fig. 1 showing the mechanical connection employed between the coin slide and the computer.

Fig. 3 is an enlarged view in perspective showing the computer operated circuit breaker employed to shut off the pumping operation upon delivery of gasoline in an amount equal in value to the coin required to release the coin slide.

Fig. 4 is a vertical sectional view through the coin slide and switch means operated thereby which closes and holds the pumping circuit closed

until such pumping circuit is opened by the computer operated circuit breaker disclosed in Fig. 3.

Fig. 5 is a top plan view of the construction disclosed in Fig. 4 with the housing top removed.

Fig. 6 is an enlarged fragmentary vertical sectional view taken on the line 6—6 of Fig. 4 showing ratchet means employed for permitting manually controlled operation of the gasoline pump without interference from the coin slide mechanism.

Fig. 7 is a vertical sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is an enlarged vertical sectional view of the coin slide operated switch means employed shown in an "off" position, the latch trip being broken away for clearness.

Fig. 9 is a vertical sectional view similar to Fig. 8 showing the coin operated switch means in an "on" position, the latch trip being broken away for clearness.

Fig. 10 is a vertical sectional view taken on the line 10—10 of Fig. 8, the latch trip being shown.

Fig. 11 is a detailed view part in section and part in elevation taken on the line 11—11 of Fig. 8 showing latch mechanism mounted on the counterweighted arm of the coin slide operated switch in engagement with the switch arm carrier plate which enables the switch arm to be moved to a closed position by said carrier plate responsive to movement of the coin slide.

Fig. 12 is a detailed view part in section and part in elevation of the switch arm latch mechanism unlatched from the switch arm carrier plate upon the closing of coin slide operated switch.

Fig. 13 is a wiring diagram of the illustrative embodiment of the coin controlled gasoline dispensing apparatus disclosed in Figs. 1 to 12 inclusive.

Fig. 14 is a vertical sectional view showing the control means employed between the computing and registering mechanism and the pump motor switch.

Fig. 15 is a detailed cross sectional view taken on the line 15—15 of Fig. 14.

The invention is disclosed herein in connection with one of the several types of electric manually operated computing and registering gasoline pumps now well known in the art and in general use. The coin slide mechanism shown is likewise a part of the prior art. Obviously, the instant invention may be applied to like and similar gasoline pumps and employ various other coin slide mechanism.

Referring now to the drawings wherein like numerals refer to like and corresponding parts throughout the several views, the embodiment of the invention disclosed therein comprises, in general, an electric manually operated automatic computing and registering gasoline pump 20 to the computing and registering mechanism 21 of which novel coin slide operated vending means 22 is applied in the novel and facile manner hereinafter described in detail without major alteration to the mechanism of the said pump 20 or the computing and registering mechanism 21 thereof.

The said electrically driven manually operated automatic computing and registering gasoline pump designated by the numeral 20 in Fig. 1 is old in the art and generally comprises a pumping unit 23 driven by an electric motor 24 which runs continuously when a hand operated manually closed valved delivery nozzle diagrammatically indicated by the arrow 25 in Fig. 1 is lifted from the motor switch control lever 26, the said normally closed valved nozzle 25 being connected to the end of the delivery hose 27 as indicated by the dot and dash lines 28. When the pump is not in use, the said nozzle 25 is hung on the hook 29 and maintains the motor switch 30 in its "off" position by depressing the motor switch control lever 26. Suitable control means 210 is provided between the motor switch control lever 26 and the computing and registering mechanism 21 which prevents the motor switch control lever 26 from raising unless the computing and registering mechanism 21 has been set to zero by the re-set handle 31 after any gasoline whatsoever has been pumped and the nozzle 25 hung on the hook 29.

Gasoline is pumped by the said electrically driven manually operated automatic computing gasoline pump 20, after the computing and registering mechanism 21 is re-set to zero, from an underground tank through a suction line 32 and the pumping unit 23, through an air eliminator 33, meter 34 and visual tel-gage unit 35, and out the delivery hose 27 through its normally closed valved nozzle 25 when the said valved nozzle is manually opened; the said computing and registering mechanism 21 being mechanically driven from the said meter 34 through the vertically disposed shaft 36.

Referring now especially to Fig. 3, the centrally disposed rotatable dial 37 of the "Amount of sale" register indicated in Fig. 1 is shown in conjunction with a circuit breaking switch 38 adapted to be operated thereby. A cam lug 40, suitably secured to a side of the rotatable dial 37, projects beyond the periphery thereof and elevates a cam follower pin 41 when the reading indicated in the window of register 21 corresponds with the value of a coin adapted to be inserted in the coin slide mechanism 22. The cam follower pin 41 is preferably provided with an anti-friction roller means 42 adapted to contact the cam lug 40. Elevation of the cam follower pin 41 by the lug 40 causes a leaf spring contact 43 to be separated from a fixed contact 44 or switch 38 to break the circuit in which the said switch 38 is included.

Reference may now be had to Figs. 1, 2 and 4 to 7 inclusive which depict the general arrangement of the coin slide mechanism 22 and parts operated thereby. The coin slide mechanism 22 includes a coin slide element 45 provided with a coin aperture 46 adapted to receive a coin, for example, a half dollar, in the present arrangement. The coin slide mechanism 22 is provided

with the usual dogs and other fraud preventing devices, indicated generally by 47, for preventing the use of fraudulent coins, a coin ejection spring 48, and a coin holder reset spring 50. The coin slide mechanism is of the general type indicated in the Tratsch et al. Patent No. 2,053,503, although it is to be understood that any suitable similar type of coin slide mechanism may be employed. The inner end of the coin slide element 45, the right hand end as viewed in Figs. 4 and 5, is provided with a rack 51 adapted to operate a gear 52 rotatably journaled upon a shaft 53 and through a ratchet means 54 operates such shaft and a flexible shafting 55 which leads to and operates the registering mechanism 21 and the gears 550 and 551. The gear 551 is mounted on its shaft 552 through a slip clutch 553. The ratchet means 54 is provided to permit manual operation of the registering means 21 by means of the reset handle 31 without interference with the coin slide mechanism 22.

The same end of the coin slide element 45 is provided, adjacent rack 51, with a spring strip 56 adapted during inward reciprocation of the coin slide element to engage one of the projections 57 on a switch arm carrier plate 58 which rotates the latter one-sixth of a revolution. As indicated in Fig. 4, the spring strip 56 rotates the carrier plate 58 one-sixth of a revolution in a clockwise direction and at this time a spring pressed detent 60 mounted in a suitable holder 61 prevents counterclockwise rotation of the carrier plate 58 during retraction of the coin slide element 45.

Reference may now also be had to Figs. 8 to 12 inclusive, which show switch and interlock mechanism operated by the carrier plate 58. The carrier plate 58 is provided with six rectangular slots 62, each one adjacent but slightly in advance of a projection 57, the slots being arranged equidistantly of the axis of the carrier plate. A counterweighted switch arm 63 is rotatably journaled upon the same shaft 64 with the carrier plate 58, the carrier plate and switch arm being free to rotate relative to each other except as limited by mechanism presently to be described. The switch arm 63 is provided with a counterweight 65 which tends at all times to return the switch arm to the position indicated in Fig. 8. A latch element 66 is pivotally connected to the switch arm 63 by means of a pivot pin 67 and is normally thrown to the latched position indicated in Fig. 11 or the unlatched position indicated in Fig. 12 by means of a snap spring 68. The spring 68 is arranged in tension condition between a fixed point 69 and switch arm 63 and a lug 70 provided on the latch element 66 to maintain the latch element in either one or the other of the two indicated positions. The detent portion of the latch element 66 projects through a suitable opening 71 provided in switch arm 63. The latch element 66 is provided with a tail piece 72 adapted to contact latch trip lugs arranged in its path for throwing the latch member to one or the other of the indicated positions.

The latch 66 is thrown from one position to the other by means of a latch trip element 73 fixed to the housing 220 of the coin slide mechanism 22 and provided with a pair of latch trip lugs 74 to 75. The latch trip lug 74 is provided at the end of the latch trip element 73 and, as indicated in Fig. 11, would throw the latch element 66 into latched condition coupling carrier plate 58 to the switch arm 63 when the switch

arm rotates in a counterclockwise direction to the position indicated in Fig. 8. The latch trip lug 75, as indicated in Fig. 12, throws the latch element 66 to unlatched condition when the switch arm rotates in a clockwise direction to the position indicated in Fig. 9. A bridge contact 76 in the form of a spring leaf is mounted at the end of the switch arm 63 opposite the counterweight 65 and is adapted to bridge a pair of contacts 77 and 78 stationarily mounted on the housing 220 of the coin slide mechanism 223, all of these contacts being insulated from their supporting elements. A soft iron core 80 is fixed to the switch arm 63 as indicated in Figs. 8, 9, 10 and 13.

A solenoid coil 81 is secured to the housing 220 of the coin slide mechanism 22 in position to receive the soft iron core 80 when the switch arm 63 is thrown to the position indicated in Fig. 9. Energization of the coil 81 will maintain the switch arm 63 in the position indicated in Fig. 9. Referring to Figs. 1 and 13, a link 82 connects the main motor switch 30 with one end of one of a pair of bell cranks 83 and 84, the bell cranks being connected together and to the control means 210 which is operated by the registering mechanism 21 to prevent operation of the main motor switch 30 except when the registering mechanism has been zeroized after any gasoline has been pumped and the nozzle 25 hung on hook 29. This mechanism is controlled by the reset handle 31 and is conventional in gasoline pump practice.

Referring to Fig. 13, power is supplied from a suitable source of electrical energy to the motor 24 by means of a pair of power lines 85 and 86. The power line 85 extends through one side of a main switch 87, through circuit breaking switch 38, through the other side of the main line switch 87 and then through the main motor switch 30 and windings of the motor 24 to the other power line 86. A conductor 88 extends from the power line 85 through contacts 77 to 78 bridged by contact 76 when the switch arm 63 is thrown to the position indicated in Fig. 9 and thence through the primary winding 90 of a transformer 91 and to the other power line 86. The circuit 94 of the secondary coil 93 of said transformer 91 includes the winding of solenoid 81. A conductor 95 includes a switch 96 and extends from the power line 85 to the main motor switch 30 for the purpose of shunting the circuit breaker switch 38 by closing the switch 96 when an attendant operates the gasoline pump 20.

Figs. 14 and 15 disclose a preferred construction of the control means 210 which prevents left hand pivotal movement of the bell crank levers 83 and 84 whereby to prevent the throwing of the main motor switch 30 until the registering means 21 is zeroized. A piston 211 connected by a pivot 2111 to the bell crank levers 83 and 84 is reciprocatingly mounted in the housing of the control means 210 and is splined at 2110 to prevent turning therein. A rotatable shaft 213 is mounted for rotation in the housing of the control means 210 by a split disc 214. The said shaft 213 has a gear 215 keyed thereon and fixed thereto by means of a washer 216 and nut 217. The said gear 215 meshes with a gear 218 keyed on the shaft 219 of the registering means 21 by means of which the registering means 21 rotates the shaft 213 as it registers and returns the said shaft 213 to the same position when it is zeroized. The inner end of the shaft 213 is suitably notched at 2130 except at its flat side 2131 which is positioned at the top when the reg-

istering mechanism 21 is zeroized. A spring detent 212 fixed to the inner end of the piston 211 cooperates with the notched shaft 213 when the registering means 21 is not zeroized whereby to prevent the motor switch 30 from being thrown.

In the operation of the present coin controlled pump, a half-dollar inserted in the coin receiving apparatus 46 of slide element 45 permits inward throw at the latter, which inward throw of the coin slide element 45 through rack 51, gear 52, ratchet 54 and flexible shafting 55 causes rotation of the dial 37 of the registering means 21 and zeroizes this dial with reference to the window therefor. This conditions the control means 210 so that it cannot block movement to the left of the pivotal connection between bell cranks 83 and 84 and removal of nozzle 25 from the hook 26 then allows the retraction spring 39, indicated in Fig. 1, to elevate the link 82 and throw the motor switch 30 to the "on" position. The switch 38 is closed at this time and at all times except when the numeral 5 of dial 37 registers with its window at which time the cam 40 and cam follower 41 separates contacts 43 and 44 to break the motor drive circuit. The inward throw of the coin slide element 45 also causes the spring strip 56 to engage one of the projections 57 on the switch arm carrier plate 58 and rotate the latter one-sixth of a revolution. The switch arm carrier plate 58 through one of its notches 62 and the latch element 66 causes a corresponding clock-wise rotation of the counterweighted switch arm 63 and brings the bridge contact 76 across the fixed contact 77 and 78 thus completing the motor circuit as well as completing the circuit through the primary coil of transformer 91. Since the secondary coil 93 of transformer 91 is in the circuit 94 which includes the winding of solenoid 81 and the core 80 fixed to switch arm 63 is disposed within the winding of solenoid 81, the switch arm 63 is maintained in a position indicated in Fig. 9 and fluid may be dispensed through the valved delivery nozzle 25.

As the liquid is thus dispensed, the meter 34 through shaft 36 operates the registering mechanism 21 until the numeral 5 of dial 37 is brought into registry with the window therefor and cam lug 40 elevates cam follower 41 and breaks the contacts 43 and 44 to open the motor circuit. After the delivery nozzle 25 has been replaced on the hook 26 which would throw the main motor switch to the "off" position, the control means 210 then prevents left hand movement of the pivotal connection between bell crank levers 83 and 84 and the main motor switch 30 cannot be thrown until the registering means 21 has been zeroized. For night operation the reset lever 31 is removed and the shaft covered, or a cover is locked over the entire reset handle 31. After the registering mechanism 21 has rotated, the dial 37 can be zeroized only by inserting another half-dollar in the coin slide element 45 and throwing the latter to its innermost position. This causes a repetition of the previously described operation and dispenses another measured quantity of fuel from the pump 20. In the event that less than fifty cents worth of fuel is dispensed before another fifty cent coin is used in operating the coin slide, the slip clutch 553 permits the gear 551 to turn after the registering mechanism 21 has been zeroized; this permits full inward throw of coin slide 45.

As many changes may be made in the above

described construction and many apparently widely different embodiments of the invention may be had without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. In a coin operated dispensing apparatus including the combination of a source of liquid supply, liquid dispensing means, a meter for measuring the amount of liquid dispensed through said dispensing means, a pump for causing flow of liquid from said source through said meter and said dispensing means, a motor for operating said pump, registering means operated by said meter for indicating the amount of liquid dispensed and the cost thereof, and means connected to said dispensing means for initiating operation of said motor, the sub-combination comprising means for rendering said last-named means ineffective to initiate operation of said motor except when said registering means is in zeroized condition, a coin slide mechanism for zeroizing said registering means, means operable by said registering means for stopping said motor when a predetermined amount of liquid has been dispensed, and means operable by said coin slide for maintaining said motor in operation until stopped by said means for stopping said motor operated in response to operation of the registering means when a predetermined amount of liquid has been dispensed.

2. In a coin operated liquid dispensing apparatus including a motor operated pump, liquid dispensing means, means associated with the said liquid dispensing means for manually initiating the operation of the said pump, a meter for measuring the amount of liquid dispensed, registering means operated by said meter for indicating the amount of liquid dispensed and the cost thereof, and coin slide mechanism, the combination of means associated with said registering means for making the means for manually initiating the operation of the said pump inoperable except when the said registering means is zeroized, means operable by said coin slide mechanism for zeroizing said registering means, means operable by the said coin slide mechanism normally rendering the said pump inoperable rendering the pump operable simultaneously with the zeroizing of the said registering means, means operable by said registering means for stopping the said pump when a predetermined amount of liquid has been dispensed, the said means rendering the said pump operable responsive to the operation of the said coin slide mechanism being releasable responsive to the operation of the means for stopping the said pump when a predetermined amount of liquid has been dispensed.

3. In a coin operated liquid dispensing apparatus including a motor operated pump, a normally open electric circuit means from a source of current to said motor, liquid dispensing means, manual switch means associated with the said liquid dispensing means for closing said circuit and initiating the operation of the said pump, a meter for measuring the amount of liquid dispensed, registering means operated by said meter for indicating the amount of liquid dispensed and the cost thereof, and coin slide mechanism, the combination of means associated with said registering means for making the manual switch means for

closing said circuit and initiating the operation of the said pump inoperable except when the said registering means is zeroized, means operable by said coin slide mechanism for zeroizing said registering means, a second switch means normally opening said electric circuit closable by the said coin slide mechanism simultaneously with the zeroizing of the said registering means, means associated with said second switch means for maintaining said switch closed when closed responsive to the operation of the said coin slide mechanism until the electric circuit closed thereby is opened, a third switch means operable by said registering means for opening the said circuit when a predetermined amount of liquid has been dispensed, the said second switch means rendering the said pump operable responsive to the operation of the said coin slide mechanism being re-opened responsive to the opening of the said third switch means when a predetermined amount of liquid has been dispensed.

4. In a coin operated liquid dispensing apparatus including a motor operated pump, a normally open electric circuit means from a source of current to said motor, liquid dispensing means, manual switch means associated with the said liquid dispensing means for closing said circuit and initiating the operation of the said pump, a meter for measuring the amount of liquid dispensed, registering means operated by said meter for indicating the amount of liquid dispensed and the cost thereof, and coin slide mechanism, the combination of means associated with said registering means for making the manual switch means for closing said circuit and initiating the operation of the said pump inoperable except when the said registering means is zeroized, means operable by said coin slide mechanism for zeroizing said registering means, a second switch means normally opening said electric circuit closable by the said coin slide mechanism simultaneously with the zeroizing of the said registering means, solenoid means for holding the said second switch means closed when closed by said coin slide mechanism, a third switch means operable by said registering means for opening the said circuit when a predetermined amount of liquid has been dispensed, the said solenoid means holding said second switch means closed being de-energized responsive to the opening of the said third switch means when a predetermined amount of liquid has been dispensed whereby to permit said second switch means to open.

5. In a coin operated liquid dispensing apparatus including a motor operated pump, a normally open electric circuit means from a source of current to said motor, liquid dispensing means, manual switch means associated with the said liquid dispensing means for closing said circuit and initiating the operation of the said pump, a meter for measuring the amount of liquid dispensed, registering means operated by said meter for indicating the amount of liquid dispensed and the cost thereof, and coin slide mechanism, the combination of means associated with said registering means for making the manual switch means for closing said circuit and initiating the operation of the said pump inoperable except when the said registering means is zeroized, means operable by said coin slide mechanism for zeroizing said registering means, a second switch means normally opening said electric circuit closable by the said coin slide mechanism simultaneously with the zeroizing of the said regis-

tering means comprising a pair of contactors, a swingable switch arm, a bridge on said switch arm normally spaced from said contactors adapted to close the circuit through said switch when urged across said contactors, solenoid means for holding said switch arm in a closed circuit position with said bridge positioned across said con-

tactors, and means movable by said coin slide mechanism for swinging said switch arm to its closed position, and a third switch means operable by said registering means for opening the said circuit when a predetermined amount of liquid has been dispensed.

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