May 22, 1956 K. E. R. ROSENBLOM 2,746,589

COIN OPERATED LIQUID CONTROLLER

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FIG. 1

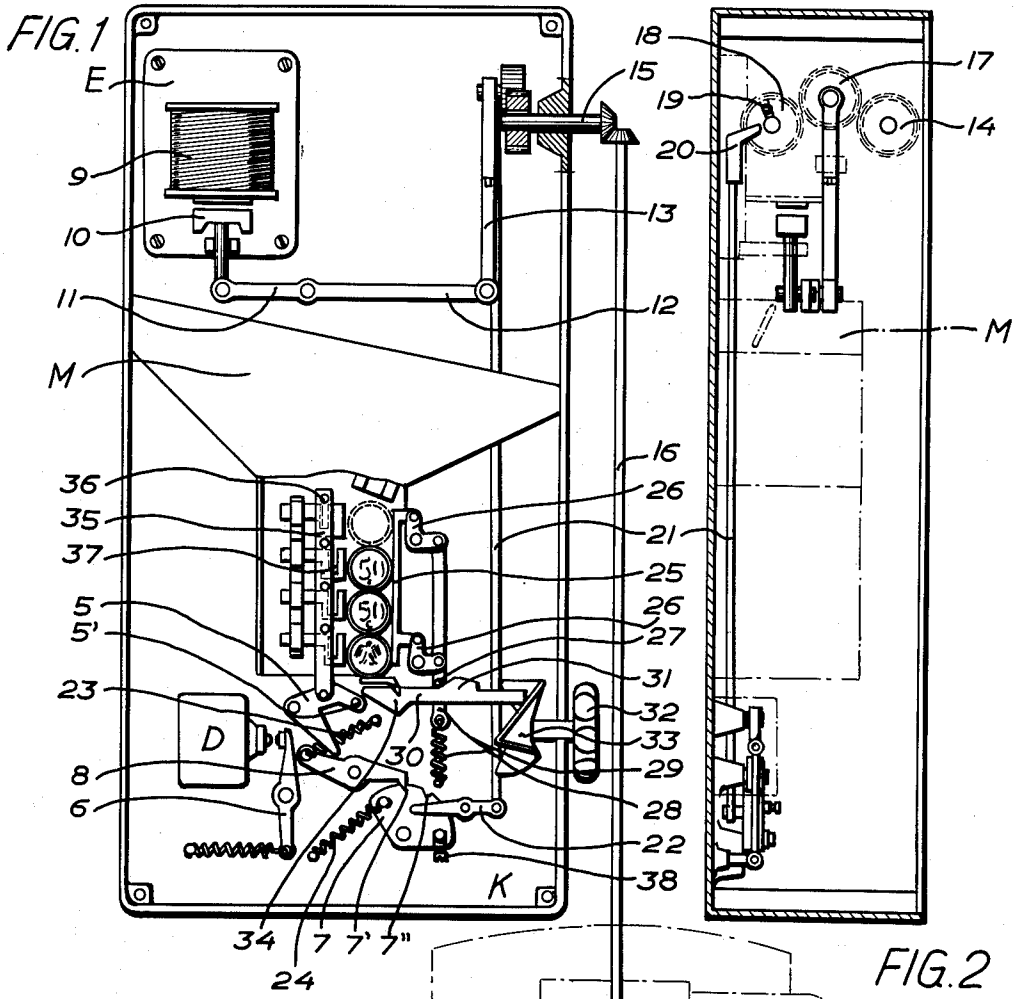
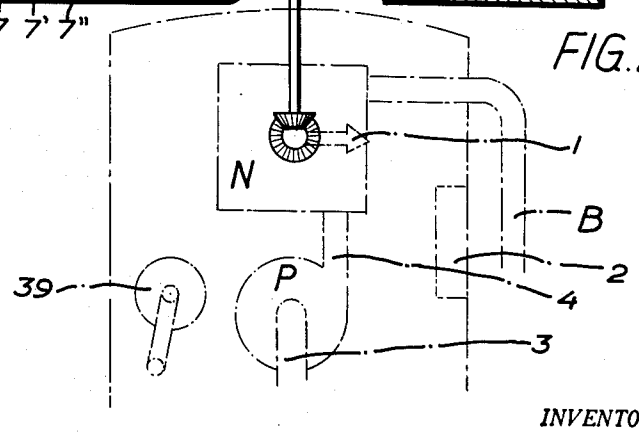


FIG. 2



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FIG. 3

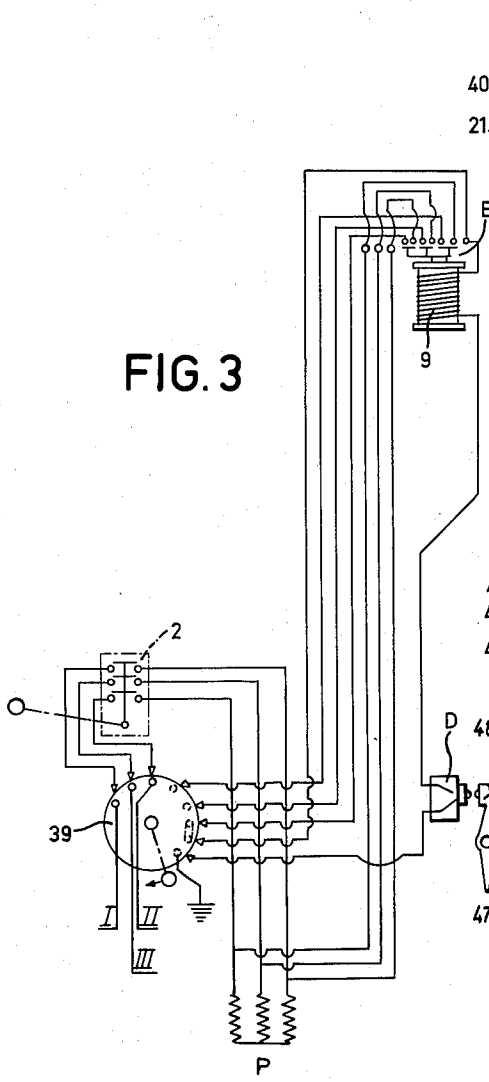


FIG. 4

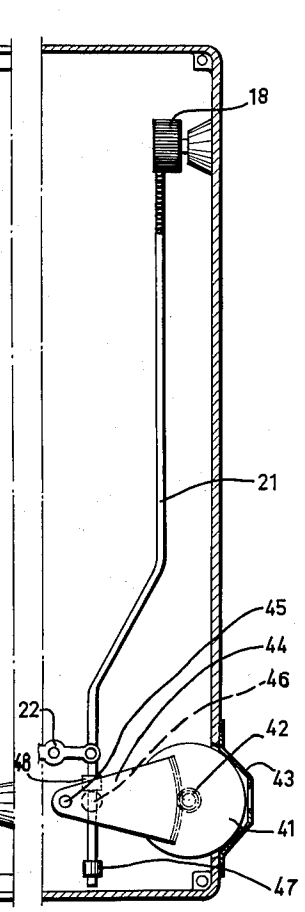


FIG. 5

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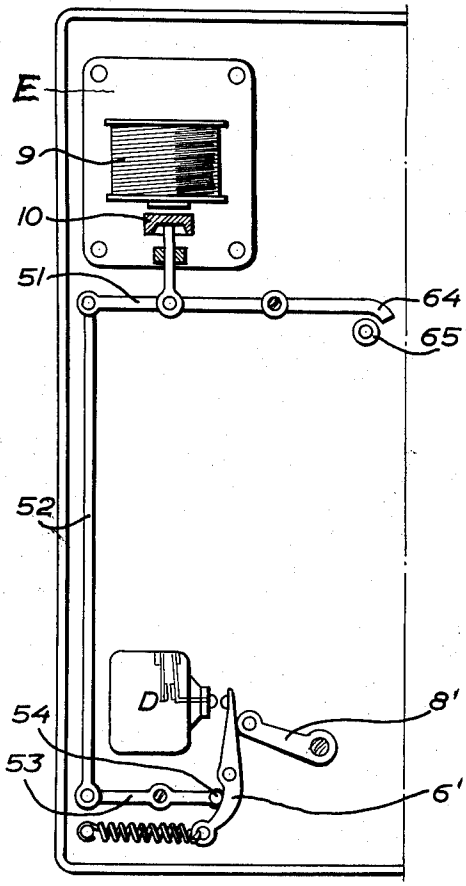


FIG. 6

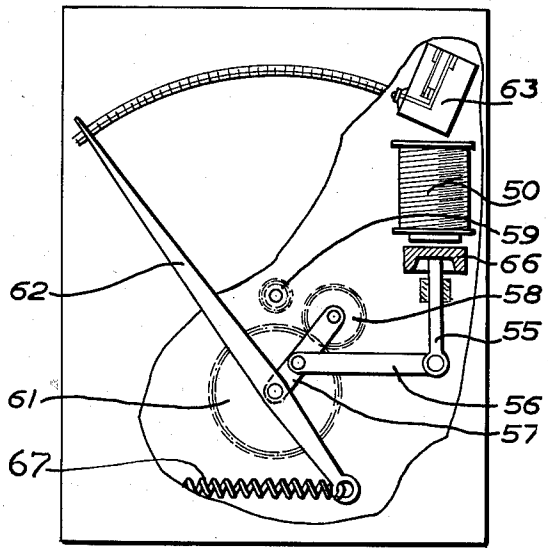


FIG. 7

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COIN OPERATED LIQUID CONTROLLER

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4 Claims. (Cl. 194—13)

A matter of current interest to liquid retailing stations, such as gasoline, oil and like stations, is the possibility of furnishing for instance car drivers with fuel by means of a coin-controlled, and thus in a certain way self-operated, liquid dispensing apparatus, and this especially when the station is closed down or is overwhelmed with work. Despite the progress of the technique, many problems have so far remained unsolved as regards the manufacturing costs of such a coin-controlled liquid dispensing apparatus and its reliability in operation.

The object of the present invention is to render a solution of these problems, which is satisfactory from a practical point of view, and to provide a device which can be applied both to all motor driven or manually operated liquid dispensing apparatus already existing and to such apparatus to be manufactured. By way of example, it may be applied to gasoline pumps.

The main features of the invention is that the release member of the coin automaton can actuate, direct or indirect, an electrical contact means, preferably a micro-switch, with a swingable contact arm, provided in the electric circuit to an electromagnet coil in a switch, a so-called contactor, the latter being connected in the electric circuit to the motor of a liquid pump and having at the same time its armature mechanically connected, via a lever system, to a gear wheel or the like, which can be caused to engage and disengage a gear provided on a shaft system leading from the liquid flow indicator of the liquid dispensing device or from some other delivery point, for instance from a usual liquid amounts counter in a gasoline pump. Said gear wheel is furthermore in connection with a breaking means which also, in counteraction to said release member of the coin automaton, actuates the micro-switch to interrupt the current of the electromagnet coil when the liquid flow indicator has accomplished a full revolution, corresponding to, for instance, 1 gallon of dispensed liquid. A preferred design of said switch means comprises a spring-actuated rocker arm, one end of which is actuated by said release member, while its other end engages with one out of two edge notches provided in a spring-actuated cam disc rockable by a lever. It is furthermore preferred in this device to have the main coin channel of the coin automaton arranged centrally and to provide at the bottom of the device coin collectors communicating with the coin automaton.

To prevent any unwarranted utilization of a usual gasoline pump equipped with an additional apparatus according to the invention, the normal switch of the pump and the contactor may be connected in parallel to the electric cables of the pump motor and to different points of a turn type switch or the like, to which the ingoing main cables are connected. Consequently the main cables will supply current to the pump motor, in one position of the turn type switch via the normal switch and, in another position of the turn type switch, via the contactor. In the latter case, the micro-switch is connected to the magnet coil of the contactor via a special tapping point in the turn type switch.

An embodiment of a liquid dispensing apparatus with coin automaton according to the present invention is described in the following text and illustrated in the accompanying drawings, in which:

Fig. 1 is a front view of the liquid dispenser with a front wall removed,

Fig. 2 is a side view of the same apparatus with a side wall removed, and

Fig. 3 is a connection diagram.

Figs. 4 and 5 show a modification of the device in side views forming right angles with one another.

Figs. 6 and 7 show a modified embodiment.

Fig. 1 shows a liquid controller according to the invention as used in combination with a usual gasoline pump (indicated by chain-dotted lines), which is assumed to have the standard equipment, viz. a pump P, an indicator dial N with counter and a liquid flow indicator **1** as well as a delivery hose B and a usual gasoline pump switch **2**. A feed line **3** to the pump and a discharge line **4** from the pump are shown diagrammatically. The latter M designates a coin automaton and the figure **5** is the common-type release member of the automaton. Said release member co-operates with one end of a spring-actuated rocker arm **8** which forms part of a breaking means **7, 8**, the other end of the arm **8** engaging with one out of two edge notches **7'** and **7''** provided in a rockable cam disc **7** actuated by the spring **24**. The first-mentioned end of said rocker arm **8** actuates, by influence of said release member **5** and against the action of the spring **23**, the swingable, spring-actuated contact arm **6** of a micro-switch D, the function of which will be explained later on. The cam disc **7** is furthermore provided with an adjustable pin **38**, which can be actuated by a swingable arm **22** connected to one end of a pull **21**, whose other end is provided with a bend or the like **20**. The latter is, in its turn, actuated by a settable pin **19** in a gear wheel **18**, which is releasably engaged by another gear wheel **17** that is connected, via a lever system **13, 12, 11**, to the armature **10** of an electromagnet **9** in a switch, a so-called contactor E.

The gear wheel **17** is also in releasable engagement with a gear **14** on a shaft system **15, 16**, which is driven from the liquid flow indicator **1** or, if desired, from some other suitable driving source, by way of example from a usual liquid amount counter (not shown in the drawing).

In the embodiment shown, the coin automaton M (Fig. 1) is arranged centrally. It comprises a coin tester **25**, the angular arms **26** of which are pivoted to the spring-actuated arm **29**. A pin **27** provided on the latter can be actuated by the cam **31** on the arm **30**, which in turn can be influenced by the cam **33** of the release hand wheel **32**. During the latter part of the motion of the arm **30**, its cam **34** co-operates with the pin **5'** of the release member **5**, thereby moving the pins **36** of the arm **35** down into the grooves **37**, provided the correct number and value of coins have been inserted in the coin automaton.

As will appear from Fig. 3, the before-mentioned micro-switch D is connected to the circuit of the electromagnet coil **9** in the contactor E, which in turn is connected to the electric circuit to the pump motor P. According to the diagram, the usual switch **2** of the gasoline pump or the like and the contactor E are connected in parallel to the electric cables of the pump motor P, but to different points of a turn type switch **39** (which may be replaced by some other switch covering the same functions), to which the ingoing main cables, in this embodiment three 3-phase cables I, II, III are connected. Consequently in the position indicated in full lines in Fig. 3

current will be fed via the switch 2 to the pump motor directly, while with switch 39 in the dash-dot-indicated position current is fed to the pump motor P via the contactor E, the micro-switch D in the latter case being connected to the magnet coil 9 of the contactor E via a special tapping point in the turn type switch 39.

Thus, when the proper value of coins is inserted in the coin automaton, the release member 5 will actuate the rocker arm 3, the latter in turn connecting the micro-switch D via the contact arm 6, whereby the electric circuits to the electromagnet 9, the contactor E and the pump motor is closed. Simultaneously with the pump motor starting, the armature 10 will, by its upwards movement and via the lever system 11, 12, 13, bring the gear wheel 17 into engagement with the wheels 14 and 18, whereby the rotation of the wheel 14 is transmitted to the wheel 18. When the liquid flow indicator has accomplished a full revolution, corresponding to a delivery of for instance one gallon of liquid, the pin 19 of the wheel 18 will actuate the bend 20, and via the members 21, 22, 38, 7, 8, and 6 the micro-switch D will be disconnected and the electric circuit thus be interrupted. The pump motor will stop and the gear wheel 17 will be disengaged from the wheels 14 and 18.

To meet any variations in the liquid price without having to alter the coin automaton, a regulation of the dispensed quantity of liquid may be obtained by exchanging bend 20 of the pull rod 21 with a rack 40 meshing with the gear wheel 18 and by placing a fixed abutment 48 on the pull rod at any convenient point of the rod length, see Figs. 4 and 5. Said abutment 48 is adapted to cooperate with an adjustable stop member 46 limiting the downward movement of the pull rod. The stop member 46 is located on a toothed sector 44 pivoted about a fixed pin 45 in the apparatus. The toothed sector is vertically swingable and meshes with a gear wheel 42 on a drum 41 which is rotatably mounted within the apparatus and has a scale showing for instance the current price per gallon of gasoline. Said scale being exposed through a sight glass 43 in the wall of the apparatus. It will be obvious that a turning of the drum 41 will elevate or lower the stop member 46 and thus change the angular adjustment of the gear wheel 18 necessary for releasing the micro-switch D via the members 18, 21, 22, 38, 7, 8 and 6.

A modified embodiment of the controller apparatus according to the invention is shown in Figs. 6 and 7. In this embodiment the coin automaton (M) and the starting mechanism cooperating therewith including hand wheel (32), cam (33) actuating arm (30) and swingable release member (5) are the same as in Fig. 1 and the release member (5) (not shown) actuates the lever 8' corresponding to the arm 8 in Fig. 1 which in turn operates the spring actuated contact arm 6', the lower end of which is slightly curved to form a cam cooperating with a roller 54 mounted at the end of a lever 53. When the contact arm 6' actuates the micro-switch D and closes the same, current flows as before through the magnet coil 9 of the contacter E, which in turn closes the electric circuit to the electric pump D and attracts the armature 10, which is linked to a lever 51, the one end of which is connected to the aforementioned lever 53 by means of a link rod 52, while the other end 64 of said lever 51 is adapted to prevent engagement between a zeroizing key and the zeroizing spindle 65.

In series with the contactor magnet coil 9 there are connected another electric magnet 50 and a further micro-switch 63, the latter normally keeping the circuit closed. When the contact arm 6' actuates the micro-switch D, current also flows through the magnet coil so that the armature 66 of said magnet is attracted and causes the armature rod 55 to move upwardly, the lower end of this rod 55 is by means of a link rod 56 connected to a swingable arm 57 pivoted on the shaft of a measuring cog wheel 61 and carrying at its outer end an intermediate gear 58 continuously engaging the measuring wheel 61. At moving the rod 55 upwardly, the intermediate gear 58 is swung into further engagement with a gear 59 secured to the shaft of the rotating liquid flow indicator 1 of the dispensing apparatus and thus the measuring wheel 61 becomes rotated in dependence on the quantity of liquid discharged. The measuring wheel 61 carries an indicator arm 62 which by means of a pressure spring 67 is returned to zero position as soon as the intermediate wheel 58 is not in engagement with the gear 59. The indicator arm 62, when swung in the clockwise direction in Fig. 7 due to the rotation of the gear 59 in turn depending on the liquid discharge by means of the operating pump P, actuates at any suitable point of its stroke the other micro-switch 63, which is adjustably mounted to be set at any suitable point along a scale or the like indicating the volume of liquid dispensed, so that the electric circuit through the closed micro-switch D, the contactor coil 9 and the magnet coil 50 is broken. At this moment the armature 10 of the contactor E is released so that it drops down and returns lever 53 to original position thereby releasing the pressure on micro-switch D. At the same time the magnet 50 releases its armature 66 so that the intermediate gear 58 is caused to disengage the gear 59. Thereby all parts return to their original positions ready for starting a new dispensing operation.

Obviously the above described device may be varied in many ways without abandoning the spirit of the invention.

I claim:

1. In a coin operated liquid dispensing apparatus, the combination of a pump having an electric motor, a liquid discharge conduit connected to the outlet of said pump, a liquid flow meter in said discharge conduit and of the type having a shaft rotating in dependence on the volume of liquid passing through said meter, a contactor controlling the supply of electrical energy to said pump motor, a coin operated switch controlling the energizing circuit of said contactor, means for breaking said energizing circuit of said contactor, said means including a rotatable member, a clutch coupling temporarily coupling said rotatable member to said rotating shaft of said liquid flow meter, and means including an electromagnet for controlling said clutch, said electromagnet having a winding connected in the energizing circuit of said contactor.

2. In a coin operated liquid dispensing apparatus, the combination as claimed in claim 1, wherein said means for breaking said energizing circuit of said contactor includes means for restoring said coin operated switch.

3. In a coin operated liquid dispensing apparatus, the combination as claimed in claim 1, wherein said contactor and said electromagnet have a common magnet.

4. In a coin operated liquid dispensing apparatus, the combination as claimed in claim 1, wherein said means for breaking said energizing circuit of said contactor includes adjustable abutment members permitting changing of the liquid volume dispensed.

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