This invention relates to coin-controlled vending machines for liquids and it is an object of the invention to provide a mechanism of simple, practical and novel construction for dispensing liquid automatically measured from a source of supply, in quantities corresponding to the denomination of a deposited coin by which the mechanism is energized. Another object of the invention is to produce a mechanism of the above described character which is operated by an electric current in circuits controlled by the deposited coin. A further object is to prevent the discharge of the measured liquid while the measuring mechanism is in operation and to automatically permit of said discharge after the operation is completed, and still another object is to cause the release of the deposited coin and thereby discontinue the measuring operation, by the accumulation of surplus liquid after the required quantity has been measured off. The invention further contemplates the selective apportionment of different quantities of the liquid in accordance with the denomination of the inserted coins, and another aim of the invention is to provide in connection with the means for releasing the deposited coin, hereinabove referred to, a novel mechanism to move the part of said means by which the coin is normally retained. Other objects of the invention mostly relating to details of construction will be fully brought out in the course of the following description made with reference to the accompanying drawings which illustrate an embodiment of my invention in simple and practical form.

In the drawings in the several views of which corresponding parts are similarly designated,

Figure 1 represents in diagrammatic form, the assemblage of the cooperating elements included in the invention;

Figure 2 is a partially sectional elevation of the coin-controlled vending apparatus in its preferred form;

Figure 3 an enlarged detailed view of the coin releasing mechanism with the parts thereof in the position they occupy while the coin is being released; and

Figure 4 an enlarged section taken on the line 4—4, Figure 2.

Referring to the drawings, the improved vending machine comprises a hollow pedestal 5 upon which is supported a measuring chamber 6 preferably made of glass and in cylindrical form. The chamber is closed at its top by means of a removable cover 7 and it contains in connection with openings in its bottom, a plurality of upright pipes which by overflow determine the level of the measured liquid.

The pipes are preferably made of telescoping sections for their longitudinal adjustment in accordance with the fluctuations in the market price of the gasoline, oil or other liquid dispensed in the operation of the machine.

In the construction shown in the drawings, the measuring chamber is equipped with three pipes 8, 9 and 10 of different lengths to measure quantities of liquid to the value of one dollar, fifty cents and twenty-five cents respectively.

The openings in the bottom of the measuring chamber communicate with a float chamber 12 formed immediately beneath the same and the last mentioned chamber has near its top an air inlet 13, and in its bottom a bleed opening 15, in connection with a pipe 14 for the return of the surplus liquid which enters the chamber through the overflow pipes, to the source of supply.

The source as shown in Figure 1 of the drawings, consists of a tank 16, which is buried beneath the surface of the walk or road upon which the pedestal is erected, and which is provided with a filler tube 17 projecting to or above said surface.

A pipe 18 extending to the bottom of the tank connects with the suction opening of a rotary pump 19 installed inside the hollow pedestal in connection with an electric motor 20. A pipe 21 connects the egress port of the pump with an inlet opening in the bottom of the measuring chamber 6 and the latter has a discharge opening 22 normally closed by a valve 23. The outlet 22 of the measuring chamber connects with a nipple 24 for the attachment of a flexible conduit 25 through which the liquid discharged from the chamber is conducted to the gaso- lene tank of an automobile or other receptacle. The coins by which the apparatus is actuated are inserted through slots 26, 26a and 26b in the front of the pedestal into chutes such as shown at 27, through which they pass to a receptacle 28.

The passage through the chutes is how-
ever normally obstructed by one of a pair of opposed contact members connected at opposite sides of a break in the electric circuit of the motor as will hereinafter be more fully described.

The contact member 29 which obstructs the passage of the coins through the chutes, consists in the form shown in the drawings of three plates 30 insulated from each other and from the sides of the chutes and having their upper edges beveled to provide an obstructive incline with which the coins dropping through the chutes, engage.

The other opposite contact member 31 consists of an abutment plate pivoted as at 32 and normally extending in a substantially vertical position to cooperate with the inclined edges of the plates 30 in obstructing the downward movement of the coins through the chutes. The three plates 30 are of different widths to vary the distances of their inclined edges from the abutment plate in accordance with the diameters of the different coins by which the apparatus can be operated. Thus, the chute 27 is adapted to receive a silver dollar, the chute 27* a half dollar or fifty cent piece and the chute 27" a quarter or twenty-five cent piece.

The coins after having performed their function of bridging the gaps between the respective contacts to complete the circuit by which the motor is energized, are released to continue their passage to the coin receptacle by retraction of the abutment plate to a position substantially parallel to the inclined edges of the contact plates as shown in Figure 3. The plate 31 is for this purpose connected with a retraction mechanism consisting of a toggle joint composed of pivotally connected members 33 and 34 one of which is pivotally attached to the abutment plate.

The other member is fulcrumed on a stationary part of the pedestal as shown at 35 in Figures 1 and 3. It carries at its free end a weight 36 which yieldingly holds the members in their normal aligned position and it is furthermore provided with a pivoted dog 37 normally supported upon a pin 38 for cooperation with a detent 39 on the vertically movable core 40 of a solenoid 41. When by energization of the solenoid the core moves upwardly the detent passes the dog without affecting the position of the toggle joint but when subsequently the solenoid is deenergized and the core falls to its original position the detent by engagement with the dog causes the joint to flex as illustrated in Figure 3 and thereby retracts the abutment plate to permit of the movement of the coin along the inclined surface of the respective contact plate to pass through the corresponding chute into the coin-receptacle 28.

After the detent 39 has released the dog by further downward movement of the solenoid-core, the weight 36 returns the members of the toggle joint to their original aligned position, in which a stop 42 limits the movement of the member 34 and prevents the members from being carried by the said weight 36 beyond their aligned position. A spring 78 at the lower end of the core 40, fastened to a relatively stationary support 79, aids in returning the core to its original position after the solenoid is deenergized.

The valve 23 which as stated hereinbefore, normally closes the discharge opening 20 in the bottom of the measuring chamber, is connected with the core of a solenoid 43 and valves 44 and 45 normally closing the openings in the bottom of the chamber, connecting respectively with the half dollar tube 29 and with the quarter tube 10, are by means of levers 46 and 47 connected to the cores of solenoids 48 and 49.

A lever-switch 50 is connected with the core of the before mentioned solenoid 41 of the contact retraction element of the mechanism and a second lever-switch 51 of the two point type is actuated by a solenoid 52 controlling the circuits of the motor and the solenoid 49 which operates the discharge valve.

A float 53 in the float chamber 12 beneath the measuring chamber, has a central stem 54 which through the medium of a lever 55 operates a switch 56 which controls the circuit of the solenoid 41 of the coin-release element of the invention. A line wire 57 connected with a pole of a source of electricity shown at 58 in Figure 1 is connected in one side of the field of the motor by a conductor 59, it is furthermore connected to the contact plate 30 of the “dollar” chute 27 by a wire 60 including a resistance 61, and it connects with the windings of the solenoids 41, 43, 48 and 49 by conductors 62, 63, 64 and 65 respectively.

The opposite pole of the source of electricity is connected with the solenoid 52 by a conductor 66 and with the movable contact member of the switch 50 controlled by the solenoid 41, through the medium of a conductor 67.

The opposite, stationary contact of the last mentioned switch is electrically connected to the movable member of the switch 51 controlled by the solenoid 52, by means of a wire 68 and the two stationary contacts of the same switch connect respectively with the opposite side of the motor field and with the solenoid 43 of the discharge valve 25 by conductors 69 and 70. A push button switch 71 in the last mentioned conductor places the discharge of the measured liquid under the control of the purchaser.

The ends of the coils of the solenoids 48 130
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and 49 opposite to those connecting with the line wire 57 are connected to the respective contact plates 30 of the coin-controlled circuit breaker of the apparatus by means of conductors 72 and 73, and the movable abutment plate 31 of the circuit breaker is connected with the solenoid 52 of the switch 51 by a conductor 75.

The stationary and movable contact members of the float-controlled switch 56 are connected respectively with the coil of the solenoid 41 by a wire 74 and with the pole of the source of electricity opposite to that connecting with the line wire 57, by a conductor 75.

I desire it understood that while the different electrical connections have been shown in the drawings in metallic circuits, principally to facilitate the description of the operation by the current flow, the connections may be partially made through the ground.

With the parts of the mechanism in their normal condition of rest, the switches 56 and 71 are open, the switch 50 is closed, the circuit of the solenoid 43 is closed in the switch 51, the motor circuit is broken in the same switch, and the toggle joint of the coin-release mechanism is in the position in which its members are alined and the dog 37 extends above the detent 39 of the solenoid core as shown in Figure 1.

When either a fifty cent piece or a twenty-five cent piece is inserted through the respective slot in the front of the machine, its movement to the coin-receptacle is obstructed by engagement between the inclined edge of the respective contact plate 30 and the abutment plate 31. The coin thus positioned closes the circuit of the motor by energization of the solenoid 52 of the switch 51 as follows:

Commencing at the source of electricity, the wire 66, the windings of the solenoid 52, the conductor 76, the abutment plate 31, the inserted coin shown at 77, the contact-plate 30 engaging therewith, the respective wires 72 or 73 connected to the solenoid 43 or to the solenoid 49 as the case may be, the windings of the solenoid and the conductor 64 or the conductor 65 connecting with the line wire 57.

The energization of the solenoid 52 reversed the position of the contact lever of the switch 51 with the result that the motor circuit is closed as follows: Commencing at the source 58, the line wire 57 the conductor 59, the motor field, the conductor 69 connected in the switch 51 with the conductor 68, the closed switch 50, and the wire 67 connecting with the opposite pole of the source.

The reversal of the switch 51 also broke the circuit of the solenoid 43 so that the purchaser can not open the valve 23 for the discharge of gasoline from the receiver 6 by closing the circuit in the push button 71, while the motor is in operation. The pump 10 driven by the motor, draws liquid from the source of supply 16 to the receiver until the liquid level in the latter passes the mouth of the overflow tube corresponding with the denomination of the deposited coin, when by the flow of the surplus liquid through the tube into the float chamber 12, the float is raised to re-open the motor circuit as will later be described.

The coin bridging the gap between the contact members 30 and 31 of the circuit breaker, energized the corresponding solenoid 48 or 49 as stated hereinbefore, and the consequent downward movement of the core of the solenoid lifted the valve in the bottom of the corresponding overflow tube with the result that the liquid supplied to the receiver will pass to the float chamber only after it has risen above the mouth of the tube corresponding with the coin inserted in the machine. The lifted float closes the circuit of the solenoid 41 in the switch 56, the current flow being along a path which commencing in the line wire 57 includes the conductor 62, the windings of the solenoid 41, the conductor 74, the switch 56 and the conductor 75 connecting with the pole of the source opposite from that with which the wire 57 connects.

The energization of the solenoid 41 causes the switch 56 to open and the consequent break between the conductors 67 and 68 opens the motor-circuit with the result that the operation of the pump is discontinued.

The energization of the solenoid furthermore caused its core 40 to move upwardly until the detent 39 is above the dog 37 of the toggle joint and when subsequently the float is returned to its original position by the liquid in the float chamber leaking through the bleeder pipe 14, the switch 56 is reopened and the solenoid 41 deenergized with the result that the core 40 is returned to its original position by gravity and by contraction of the spring 78.

The flexure of the toggle joint causes the contact plate 31 to move about its pivot 115 thereby releasing the coin which passes through the chute 27 into the receptacle 28.

The release of the coin opens the circuit of the magnet 52 and concludes the cycle of operations by returning the movable member of the switch 51 to its original position thereby closing the circuit of the electro magnet 43 in said switch and permitting of the delivery of the contents of the measuring chamber by opening the valve 23 through energization of the magnet 43 when the circuit is closed by manipulation of the push button 71.

It will be evident that when a dollar is deposited in the machine to measure the
largest quantity of liquid obtainable in one operation, the circuit of the magnet 53 is closed through the connection 60, in which the resistance 61 compensates for the exclusion of the solenoids required to open the valves of the overflow pipes corresponding with the coins of smaller denominations. The constantly open pipe 8 furthermore provides a ready means for the escape of air from the measuring chamber during the filling operation and through the vent hole 15 of the float chamber 12.

Having thus described our improved vending or dispensing apparatus, it is to be understood that variations in the construction and arrangement of the parts thereof may be resorted to within the spirit of the invention as hereinabove described and defined in the hereunto appended claims.

What we claim and desire to secure by Letters Patent is:

1. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a plurality of relatively fixed overflow columns having inlets constantly open at different elevations in the measuring chamber to receive overflowing liquid rising above levels predetermined by the inlets, the columns differing in ratio to different denominations of a plurality of coins, a float chamber connecting with the columns, valves controlling the passage of surplus liquid from the columns to the float chamber, a pump to transfer liquid from the source to the measuring chamber, means adapted to be actuated by the deposit of any one of said coins, for the operation of the pump, means for opening the valves of the columns, separately in accordance with the denomination of the deposited coin, a float in the float chamber, and means actuated by movement of the float to discontinue the operation of the pump.

2. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a plurality of relatively fixed overflow columns having inlets constantly open at different elevations in the measuring chamber to receive overflowing liquid rising above levels predetermined by the inlets, the columns differing in ratio to different denominations of a plurality of coins, valves controlling the passage of surplus liquid from the measuring chamber through the columns, except one which is constantly open, a pump to transfer liquid from the source to the measuring chamber, means adapted to be actuated by the deposit of any one of said coins for the operation of the pump, means for opening the valves of the columns separately according to the denomination of the deposited coin, and float-controlled means to discontinue the operation of the pump.

3. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled outlet, a pump for supplying liquid from the source to the measuring chamber, means for the operation of the pump, including a contact element adapted to be engaged by a deposited coin, the element being movable to release the coin, and means for retraction of said member, comprising a toggle-joint connected with the member, a pivoted dog on the joint, a reciprocating member adapted for flexing the joint in cooperation with the dog, and means for the actuation of said reciprocating member.

4. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a switch controlling the circuit separated contact-members in the circuit, adapted to be bridged by a deposited coin to operate said switch and close said circuit, float-operated means to open the switch and thereby discontinue the operation of the pump, and automatic means to release the coin after the switch is opened.

5. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a switch controlling the circuit separated contact-members in the circuit, adapted to be bridged by a deposited coin to operate said switch and close said circuit, an electro-magnet to operate the switch, a circuit for the electro-magnet, a float-controlled switch in the last mentioned circuit, and means to release the coin.

In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a switch controlling the circuit separated contact-members in the circuit, adapted to be bridged by a deposited coin to operate said switch and close said circuit, an electro-magnet to operate the switch, a circuit for the electro-magnet, a float-controlled switch in the last mentioned circuit, and means to release the coin.
the last mentioned circuit, and mechanism to release the coin by movement of the movable contact member.

7. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a switch controlling the circuit separated contact-members in the circuit, adapted to be bridged by a deposited coin to operate said switch and close said circuit, one of the contact members being movable to release the coin, an electromagnet in operative connection with the switch, a circuit for said electromagnet, a float-controlled switch and an electromagnet in the last mentioned circuit, a toggle joint connected to the movable contact member, and a pivoted dog on the joint cooperative with the core of the latter magnet to flex the joint and thereby release the coin by movement of the contact member.

8. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a discharge opening, a valve normally closing the opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a switch to close the circuit by the deposit of a coin, a second switch in the circuit, an electromagnet controlling the second switch, a circuit for the electromagnet, a float-controlled switch in the last mentioned circuit, a solenoid to open the valve of the discharge-opening, a circuit for the solenoid, a normally open manual switch controlling the solenoid circuit, the first switch being connected in the circuits to break the solenoid circuit while the pump is in operation.

9. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a discharge opening, a valve normally closing the opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a switch to close the circuit by the deposit of a coin, float-controlled means to open the circuit, a solenoid to open the valve of the discharge-opening, a circuit for the solenoid, a normally open manual switch in the solenoid circuit, the former switch being in the solenoid circuit controlled by current flow through the motor circuit to open the solenoid circuit while the motor is in operation.

10. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a pump to supply liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, an electro-magnetic switch controlling the circuit, a circuit for the switch, normally separated contacts in the last mentioned circuit, adapted to be bridged by a deposited coin, a second switch controlling the motor circuit, an electromagnet for the operation of said second switch, a circuit for said electromagnet, a float-controlled switch in the last mentioned circuit, and means to release the coin by de-energization of the electromagnet.

11. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a pump to supply liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, an electro-magnetic switch controlling the circuit, a circuit for the switch, normally separated contacts in the last mentioned circuit, adapted to be bridged by a deposited coin, a second switch controlling the motor circuit, an electromagnet having a reciprocating core in operative connection with said second switch, a circuit for said electromagnet, a float-controlled switch in the last mentioned circuit, and means to release the coin by movement of said core.

12. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a discharge opening, a valve normally closing said opening, a solenoid to open the valve, a circuit for the solenoid, a normally open manual switch in the circuit, a pump to supply liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a two point switch adapted to close the motor circuit and open the solenoid circuit, an electro magnet operating the two-point switch, a circuit for the magnet, normally separated contacts in the magnet circuit, adapted to be bridged by a deposited coin, a second switch controlling the motor circuit, an electromagnet for the operation of said second switch, a circuit for the last mentioned electromagnet, a float-controlled switch in the last mentioned circuit, and automatic means to release the coin.

13. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge-opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor for the operation of the pump, a circuit for...
the motor, an overflow in the measuring chamber, a valve normally closing the outlet thereof, an electro-magnet connected with the valve to open the same, a circuit for the motor, a plurality of fixed columns having inlets at different elevations in the measuring chamber to receive overflow liquid rising above the levels predetermined by the inlets, one of the overflow columns being in constant communication with the float chamber, a valve mechanism controlled by the coin operated means for controlling the communication of the other overflow columns with the float chamber, a float in the float chamber operated by the surplus liquid passing from the measuring chamber, and means controlled by the movement of the float to discontinue the operation of the pump.

18. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge opening, an adjustable overflow column having an inlet in the measuring chamber to receive overflowing liquid rising above the inlet, an overflow chamber connecting with the column a pump to transfer liquid from the source to the measuring chamber, means adapted to be actuated by the deposit of a coin for the operation of the pump, and mechanism in the overflow chamber actuated by the overflowing liquid from the column, to discontinue the operation of the pump.

19. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge opening, an overflow column having an inlet in the measuring chamber to receive overflowing liquid rising above the inlet, a pump to transfer liquid from the source to the measuring chamber, means adapted to be actuated by the deposit of a coin for the operation of the pump, and means actuated by the overflowing liquid to discontinue the operation of the pump.

20. In coin-controlled apparatus for vending liquids, the combination with a source of liquid supply, of a measuring chamber having a valve-controlled discharge opening, a pump for supplying liquid from the source to the measuring chamber, an electric motor in operative connection with the pump, a circuit for the motor, a switch controlling the circuit, separated contact members adapted to be bridged by a deposited coin to operate said switch and close said circuit, means to open the switch and thereby discontinue the operation of the pump, and automatic means to release the coin after the circuit is opened.

In testimony whereof we have affixed our signatures.

CHARLES A. YONT.
JAMES A. FLINT.