

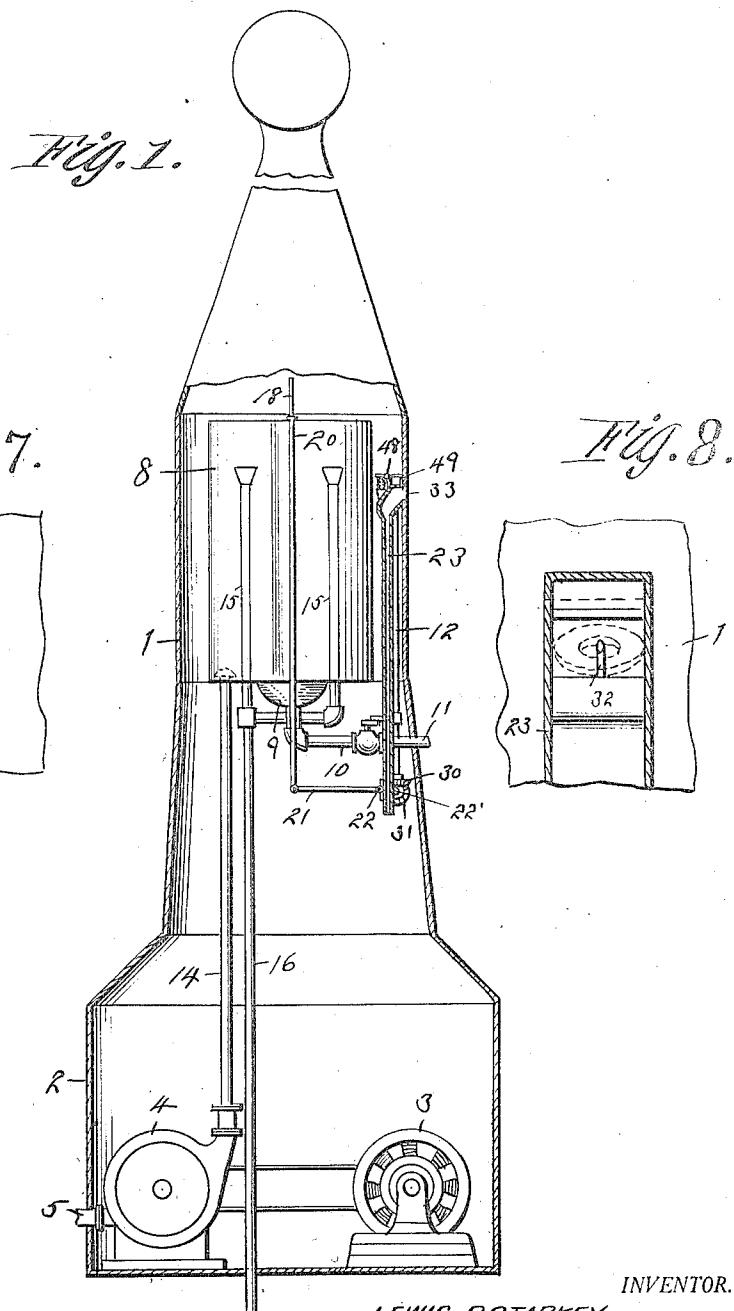
Nov. 29, 1927.

1,650,882

L. P. STARKEY

SELF OPERATING FILLING STATION

Original Filed Oct. 21, 1920 5 Sheets-Sheet 1



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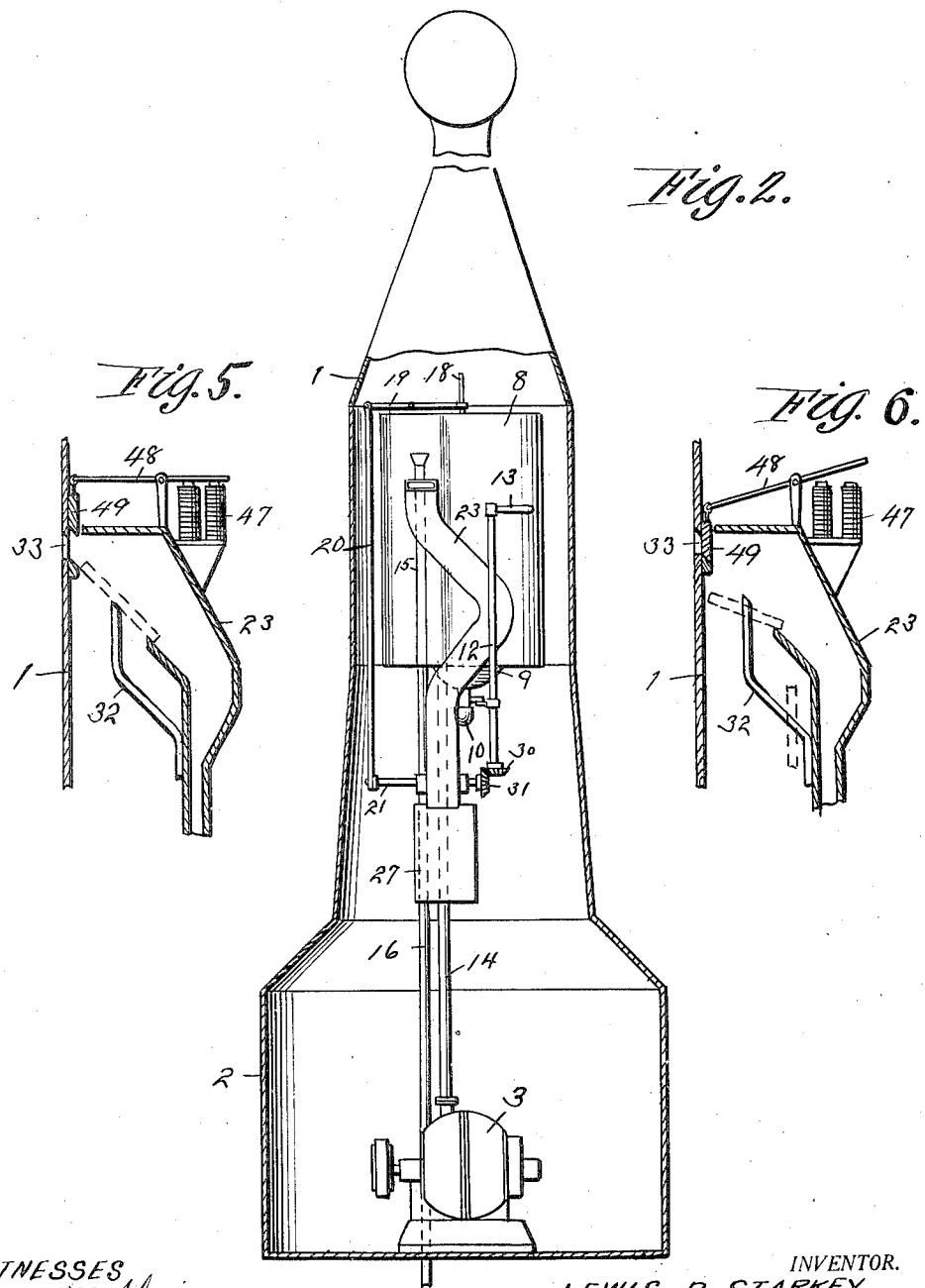
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Original Filed Oct. 21, 1920 5 Sheets-Sheet 2



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SELF OPERATING FILLING STATION

Original Filed Oct. 21, 1920 5 Sheets-Sheet 3

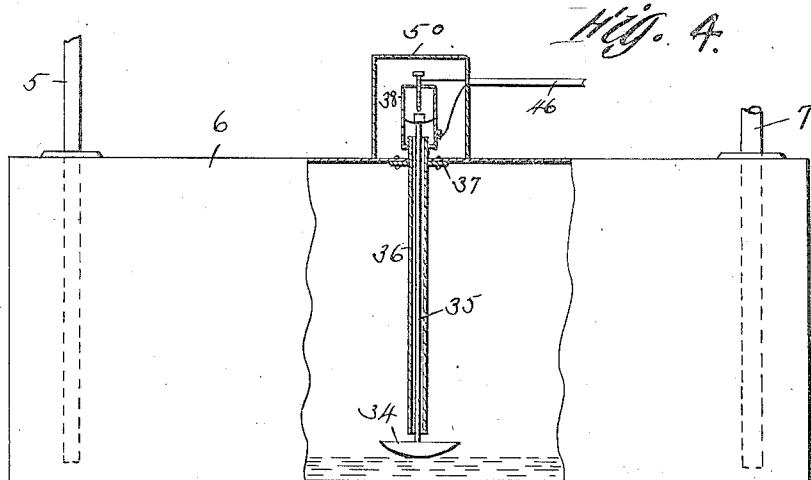
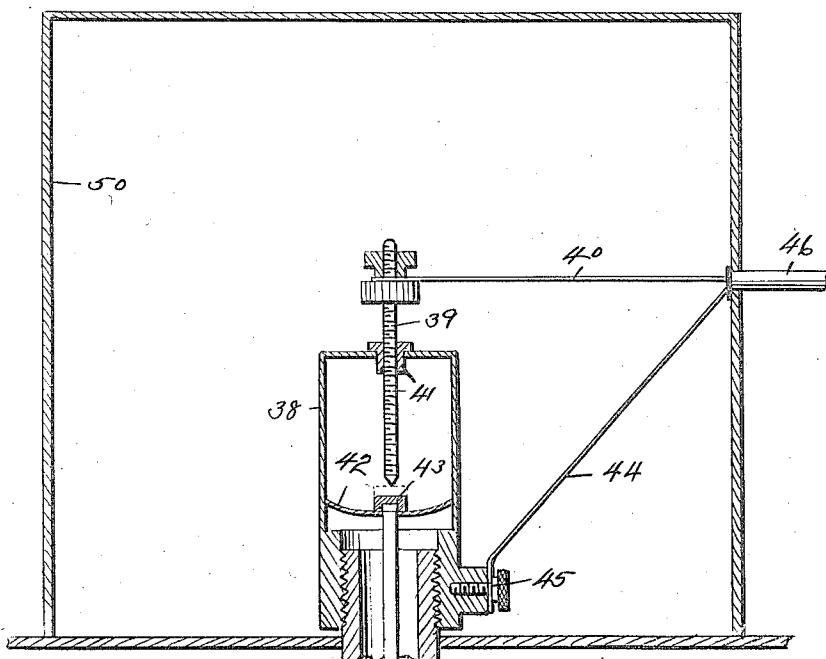


Fig. 3.



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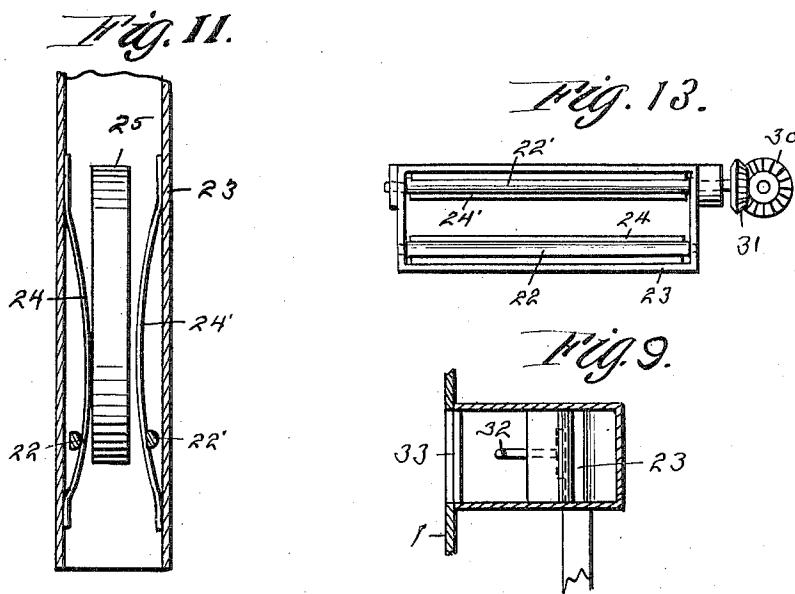
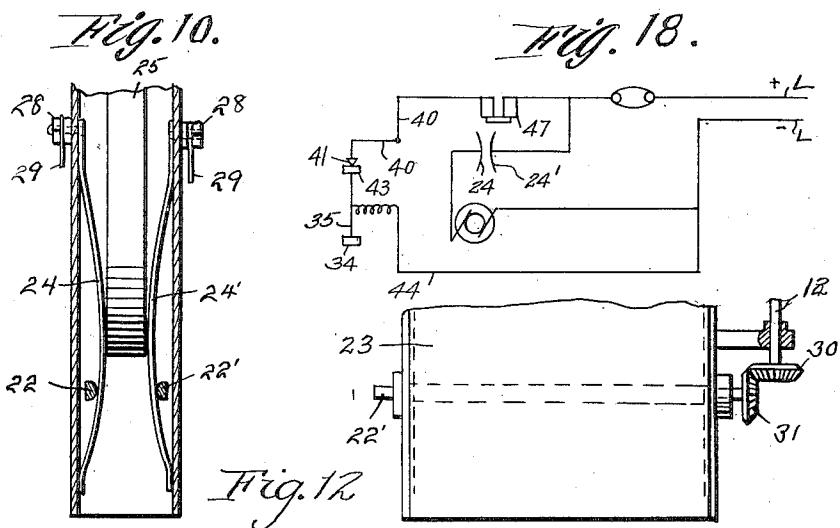
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SELF OPERATING FILLING STATION

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Fig. 14.

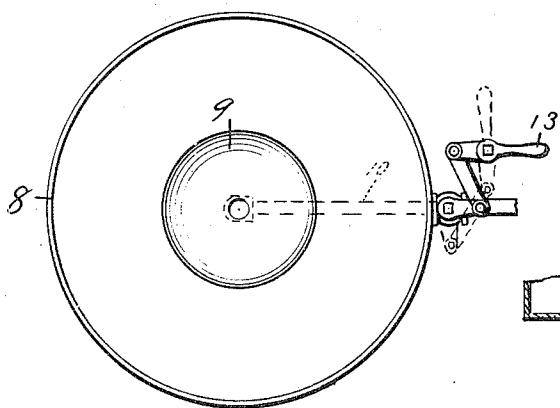


Fig. 15.

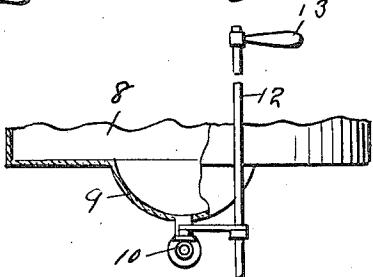
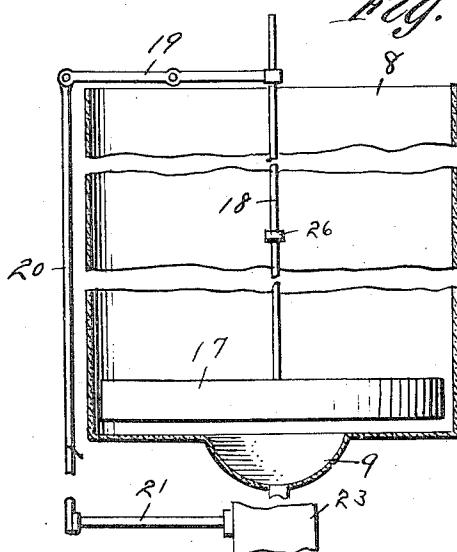


Fig. 16.



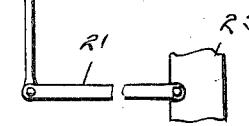
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Fig. 17.



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UNITED STATES PATENT OFFICE.

LEWIS P. STARKEY, OF FORT COLLINS, COLORADO, ASSIGNOR TO THE STARKEY AUTOMATIC PUMP COMPANY, OF FORT COLLINS, COLORADO, A CORPORATION OF COLORADO.

SELF-OPERATING FILLING STATION.

Application filed October 21, 1920, Serial No. 418,612. Renewed February 14, 1927.

The present invention has reference to dispensing machines and relates more particularly to devices for dispensing gasoline, oil, or any other liquid.

5 It aims to provide an improved type of dispensing machine automatically operated, preferably by electricity and containing means for automatically cutting off the supply mechanism after a predetermined 10 amount of liquid has been supplied to the distributor.

An additional object is to provide means associated with the check or coin guide for coacting with the check to complete an electrical circuit whereby the feeding mechanism may be energized to feed the required 15 amount of liquid or gasoline to be withdrawn; the release of the check and the stopping of the mechanism being automatically 20 accomplished.

An additional object is to provide a vending machine having means provided for automatically closing the coin slot and preventing the insertion therethrough when the 25 liquid supply has been exhausted or diminished to a material degree, thereby preventing the insertion of checks or coins through the slot and preventing the internal mechanism from being set in motion unnecessarily 30 and without producing the required amount of liquid.

An additional object is to provide improved means for preventing the operation 35 of the mechanism through the insertion of slugs, or spurious coins, particularly those having a central opening, such as washers or the like; the means provided being such as tends to spear the washers or other perforated coin when inserted in the coin guide 40 whereby they are all removed from the coin guide and collected for subsequent removal.

With the above and other objects in view, the invention may be said to reside generally 45 in the details of construction, combination and arrangement of parts as will be herein- after more fully pointed out, reference being had to the accompanying drawings wherein

50 Figure 1 is a side elevation partly in section of a vending machine constructed in accordance with the principles of the invention.

Figure 2 is an end or front view thereof partly in section facing toward the coin slot.

Figure 3 is an enlarged view of the contact box carried by the supply tank.

Figure 4 is a view of the tank and box on 55 a reduced scale.

Figures 5, 6 and 7 illustrate the check excluding means for closing the door to the coin slot.

Figures 8 and 9, together with Figures 5 60 and 6 illustrate the means for removing the washers or spurious coins inserted through the slot.

Figures 10 and 11 are vertical cross sectional views of the coin slot or check guide, 65 disclosing the spring contact or check retarders.

Figure 12 is a front elevation and

Figure 13 is a bottom view, both of which disclose the check release means.

Figure 14 is a bottom plan view of the distributor bowl showing the outlet or valve discharge mechanism.

Figure 15 is a view partly in section taken through the lower end thereof.

Figure 16 is a vertical sectional view of the distributor bowl, showing the float operated check release or circuit breaker, and

Figure 17 discloses the manner in which the operating levers and links of the circuit breaker are relatively connected.

Fig. 18 is a diagrammatic view showing the wiring connections for the device.

The mechanism of the machine is enclosed within a hollow or upstanding body or casing 1 in the form of a standard having an enlarged supporting base 2 within which is contained a motor 3 and a pump 4 driven by the motor. The pump is connected by means of pipes 5 to a suitable source of supply, preferably in the form of a tank 6 which may be buried in the ground at a place convenient to the machine. This tank contains the gasoline or other liquid to be dispensed through the distributing mechanism of the vending machine in a manner to be hereinafter explained. The contents of the tank are replenished through the filling pipe 7.

The distributing mechanism includes a 100 large container or bowl 8 having a discharge tip 9 formed at the bottom and draining into the discharge pipe 10 which projects exteriorly of the bowl 8, thus forming a nozzle or outlet 11. For all ordinary purposes the 105 nozzle may terminate in proximity to the side wall of the casing, but when the machine is used for vending gasoline etc. suit-

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able filling hose may be attached to the nozzle and employed for conducting the gasoline to the gas tank of the automobile. Manually operated valve means are provided for controlling the drainage of the liquid from the distributing container and consists in a valve operating rod 12 disposed upon the interior of the casing and supported vertically through suitable bracket means so as to turn readily when moved by means of the handle 13. The handle 13 would ordinarily project through a suitable slot formed in the side wall of the casing, thus being accessible from the outside. The valve would normally be closed to prevent any of the fluid from draining out of the container until the valve is opened by the vendor. Liquid is supplied to the container through the pump supply tank 6 when in communication with the container as shown and any excess over and above the amount to be ordinarily distributed at one operation of the machine is returned through the overflow pipes 15-15 which drains into the return pipe 16 running back to the supply tank. The overflow pipes are preferably adjustable so as to be raised or lowered for increasing or diminishing the capacity of the container to any predetermined amount so as to conform to price fluctuations. Mounted within the container is a float 17 carried by a vertically disposed rod 18 slidably inserted through one end of a pivoted lever 19 supported above the top of the container and connected by a link bar 20 to the operating arm 21 of a cam rod 22. This cam rod extends transversely across one side of the check or coin guiding tube 23 and is arranged adjacent one of the free ends of a flat spring 24. There are two of such springs and cam rods provided as indicated at 22' and 24' respectively. The springs bulge inwardly toward each other and are normally spaced apart to obstruct the passage of a coin of predetermined denomination, such as is shown at 25. The cams 22 and 22' normally engage the inner surfaces of the springs to keep them at the required distance apart and by turning the cams so that their flat sides are in contact, the springs are permitted to separate from each other by their inherent resiliency and thereby widen the space between them to release the coin.

By reason of this construction it will be readily seen that when the float reaches a predetermined height that the manipulation of the pivoted lever 19 and link bar 20 will actuate the operating arm and consequently move the transversely extending cam rod 22 and thus permit of the release of the coin 25. In addition and in order to prevent possible fraud a second coin releasing arrangement is provided, whereby when the handle 13 is actuated the rod 12 will rotate the transverse cam rod 22 simul-

taneously with the opening of the valve in the outlet pipe 11, consequently the release of the coin will be effected either when the liquid level reaches a predetermined height or when the liquid is dispensed from the container 8. Reverting back to the float device, it will be noted that the float rod or stem 18 is provided with an adjustable collar 26 which may be made rigid with the rod at any desirable point and provides an abutment which when contacting with the lever 19 upon the upward rise of the float will pivot the lever so that the arm 21 is moved to turn the cam rod 22 for releasing the spring 24 and permitting the check to drop into the money box 27.

The check grips or springs 24 and 24' also constitute electrical contacts and are respectively connected to binding posts 28-28 to which are connected current wires 29-29 leading to motor 3. As the metallic check or coin 25 is deposited into the coin tube and becomes clutched between the contacts 24 and 24' an electrical circuit is completed which actuates motor 3 for driving the pump 4 and causing a flow of liquid to the various supply pipes and into container 8. As float 17 rises with the level of the liquid in the container, the abutment of stop 26 with lever 19 actuates the check release mechanism whereby the cam rod 22 is turned to release spring 24 from engagement with check 25, whereby the latter is free to drop downwardly into the money box. The dropping of the check immediately breaks the electrical circuit, deenergizing motor 3 and stopping pump 4 whereupon the supply of liquid to the container is immediately cut off. The liquid within the container is now ready for distribution and may be drained off merely by turning valve handle 13 in the proper direction. It will thus be seen that the depositing of the check within the coin tube completes the electrical circuit whereupon the liquid feed mechanism is actuated for supplying a predetermined amount of liquid to the distributor; the float member 17 automatically breaking the circuit and operating the check release when the fluid in the container has reached the predetermined amount.

To prevent the fluid from being drained off during the filling of the same and thus attempting to prevent the circuit from being broken by the float reaching the predetermined level, the lower end of the valve rod 12 is provided with a gear 30 in mesh with gear 31 fixed to the cam rod 22'. Upon pushing the valve handle 13 to open the discharge pipe 10, the cam rod 22' is automatically turned at the same time to releasing position, permitting contact spring 24' to relax and to release the check 25, as shown to advantage in Figure 11 of the drawing. Thus regardless of whether or not the cir-

cuit is broken through the rise of the float to the predetermined level, it is evident that the liquid cannot be withdrawn from the container without breaking the circuit and 5 stopping the pump, thereby cutting off further supply of liquid to the container and preventing anyone from withdrawing or obtaining a quantity greater than that which they may be justly entitled to.

10 To prevent the fraudulent operation of the machine through the depositing of spurious coins, means in the form of a belt finger, prong or spear is provided and as shown to advantage in Figures 5 and 6 of the drawing 15 comprises a rod 32 having one end fastened to the inner wall of the coin chute and bent angularly from its fixed end and upwardly from the angular portion with its pointed terminal end lying in the plane of 20 an inclined opening formed in the top of the coin chute, just inside of the coin slot 33; when the check or coins are inserted through slot 33, they pass over this inclined opening before dropping into the coin tube and 25 while the pointed end of the rod 32, which is beveled to correspond with the incline of the opening provides a support for a genuine check or coin, any spurious coins or slugs having a perforated center, such as washers 30 and the like will be caught by the rod, and guided downwardly through the opening until suspended upon the angular portion as indicated by the dotted line structure of 35 Figure 6, the angular portion providing a support for the lugs thus collected and accumulated. Any slug that is not exactly as wide as the check or coin adopted as the one for operating the mechanism, will slip on through the contact springs without being 40 retarded for completing the circuit and will not consequently start the motor. To operate the machine the required coin or check is dropped through the slot 33, slides over the end of the washer remover 32 and rolls down 45 the run-way then to the left where it drops between the contact spring, completing the electrical circuit and starting the motor, whereupon the pump will fill the bowl with 50 fluid up to the top of the adjustable overflow pipe or at other points according to price fluctuations as previously explained. The bend in the run way is to prevent tampering with wire or other instruments.

55 For the purpose of rendering the device inoperative when the supply of liquid has fallen to a low degree, check excluding means is provided and consists in providing a float 34 having its stem 35 projecting upwardly through guide tube 36, the latter being suspended within the supply tank 6 by means of supporting brackets 37. The protruding end is screw threaded into the lower 60 end of a box or tube 38 wherein an electrical contact is made, this box having a contact screw threaded downwardly through the

top thereof and provided with an electrical wire 40 connected thereto as illustrated. Bushing 41 insulates the screw contact 39 from box 38. The float rod 35, however, is provided with a contact diaphragm 42 having a semi-contact block diaphragm 43 having its edges engaging the side walls of the contact block and provided with a center block adapted to be brought into engagement 70 with contact 39 and held as long as the liquid or fluid within the tank is above the lower open end of tube 36. The second electrical wire 44 is connected to the contact box as at 75 45 and conducts the current into the contact box from which it passes into the diaphragm 42 of the float rods and out through contact 43 and 39 when the two are together. Wires 40 and 44 are arranged within a conductor pipe 46 and are respectively connected to a magnetic coil indicated at 47 and to a line wire L. These coils are preferably arranged in the rear of the coin chute and adjacent the top edge upon which is located a pivoted armature 48, one end of which overhangs 80 the coils while the other carries a weighted door 49 adapted to be raised and lowered for opening and closing coin slot 33 according as to whether the circuit to the magnetic coil is broken or made. As long as the supply tank is filled and maintains its level 85 above the end of the tube 36, it is noted that the float will be sustained in raised position against the lower end of the pipe and that the diaphragm will be held against contact 39 so that the electric current flowing 90 through magnetic coil will cause the latter to attract the armature, so that the door will be held in an elevated position and the coin slot open. However, after the liquid within 95 the tank has fallen to such a degree as to permit contact 43 and 39 to separate, the electrical circuit will be interrupted causing the deenergizing of the magnetic coil 47 and the consequent dropping of the door to a closed 100 position over the coin slot as shown in Figures 6 and 7 of the drawing. With the slot thus closed it will be impossible for anyone to insert checks into the coin tube or in any manner to start the replenishing mechanism 105 in motion. The replenishing of the supply in the tank through the filling tube 7 will automatically cause float 34 to again bring the contacts together for completing the circuit and automatically removing the door 110 from the slot. Figure 3 shows the contact box and enclosing casing on a large scale and it will there be noted that the contact mechanism is thus suitably partitioned off from the contents of the tank so that if any flash takes place between the contacts, it 115 takes place inside of the casing or flash box 50.

120 In Fig. 18 it will be seen that a form of wiring is shown suitable for the purpose of this invention, and in that form it will be 125 130

noted that line wires L are provided, one of which is connected to the magnet 47 and by a branch wire to the contact 24', the contact 24 being connected to the motor 3 which is also connected to the other line wire as is the wire 44 running to the float contact 43.

From the foregoing it may be seen that the present invention provides a novel and improved vending machine designed to be 10 electrically and automatically operated for supplying a predetermined amount of liquid and that it can be readily adjusted to supply such liquid in any predetermined quantities. It is also provided with improved means for making it fool proof and economical in that it is automatically protected against tampering.

It should be understood that the structure illustrated may be used in connection with 20 a hand operated pump as well as with a motor driven pump.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

- 25 1. A liquid vending machine comprising a receiver, a pump for filling said receiver from an external source of supply, an electric motor operating the pump, a circuit for the motor, coin-holding means in the circuit adapted to be bridged by a coin for closing the circuit, and manually operable means cooperating with said coin-holding means and said receiver for simultaneously releasing the coin and discharging the receiver.
- 30 2. A liquid vending machine comprising a receiver, a pump for filling said receiver from an external source of supply, an electric motor operating the pump, a circuit for the motor, resilient coin-holding means in the circuit adapted to be bridged by a coin for closing the circuit, and manually operable means cooperating with said resilient coin-holding means and said receiver for

simultaneously releasing the coin and discharging the receiver.

3. A liquid vending machine comprising a receiver, a pump for filling said receiver from an external source of supply, an electric motor operating the pump, a circuit for the motor, a coin-chute, a pair of contact members in the chute, adapted to be bridged by a coin disposed between them, said members being connected at opposite sides of a break in the circuit, a float in the receiver, mechanism for adjustment of one of the contact members to release the coin by movement of the float, and manually operable means cooperative with the other member and the receiver to simultaneously release the coin and permit the discharge of the receiver.

4. A liquid vending machine comprising a receiver having a valve-controlled discharge opening, a pump for filling said receiver from an external source of supply, an electric motor operating the pump, a circuit for the motor, coin-holding means in the circuit adapted to hold a coin for closing the circuit, and hand-controllable mechanisms for adjusting the coin-holding means to release the coin and for opening the valve.

5. A liquid vending machine comprising a receiver, having a valve-controlled discharge opening, a pump for filling said receiver from an external source of supply, an electric motor operating the pump, a circuit for the motor, coin-holding means in the circuit including a resilient member adapted to be bridged by a coin for closing the circuit, and hand-controlled mechanism including means for opening the valve, and including a rotary cam acting upon the resilient member of the coin-holding means to release the coin.

In testimony whereof I affix my signature.
LEWIS P. STARKEY.