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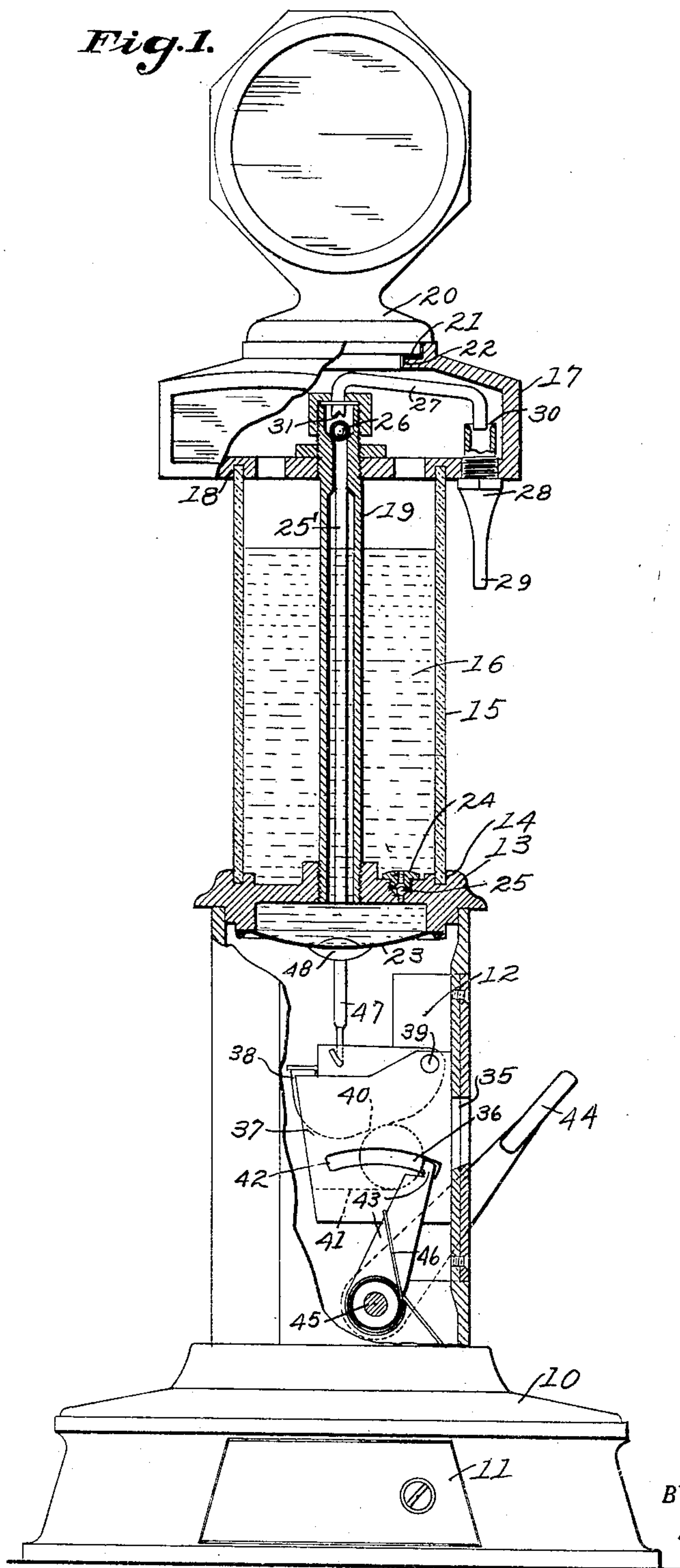
R. W. VAN SCHYNDLE ET AL

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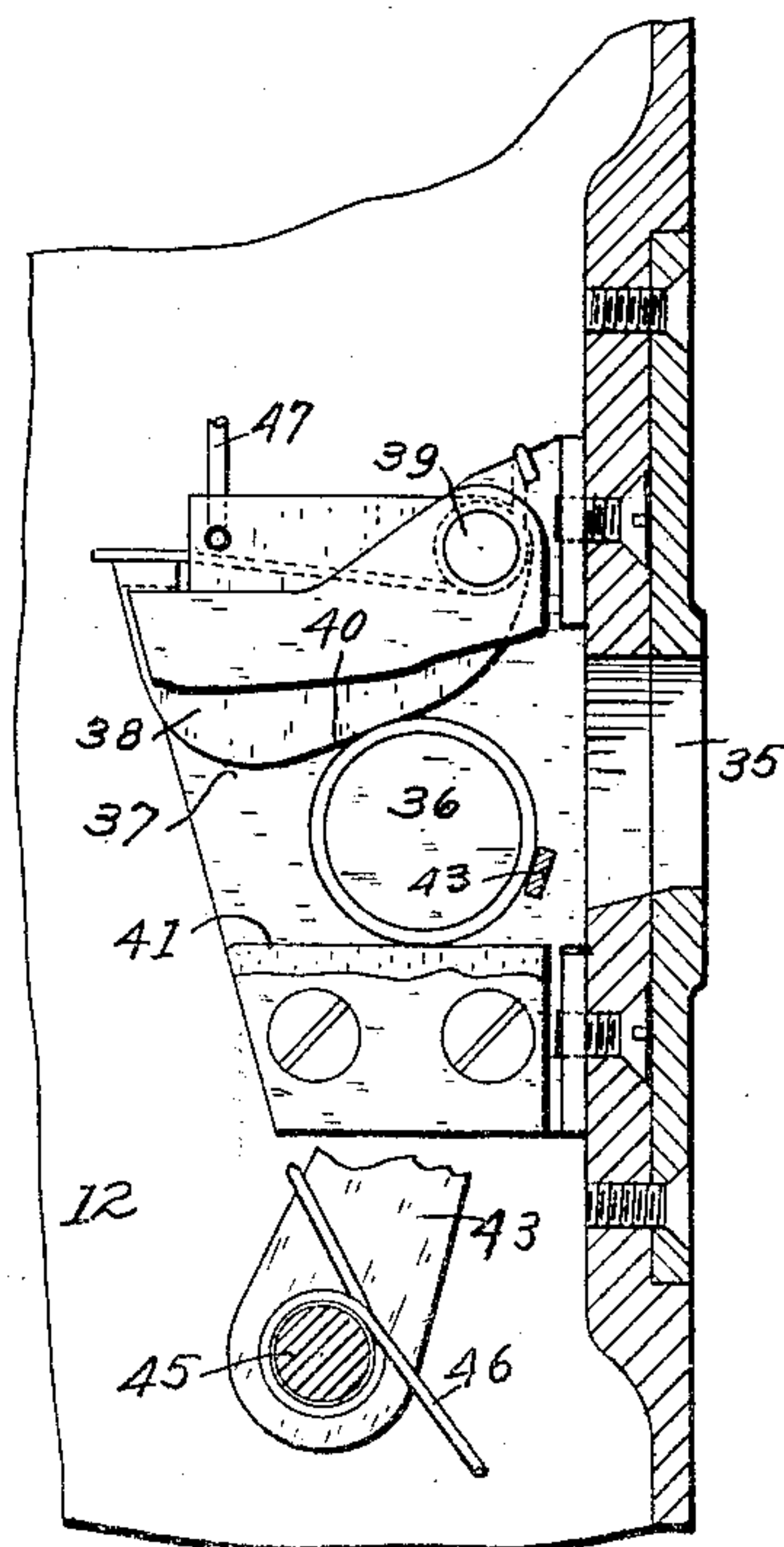
LIQUID DISPENSING DEVICE

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*Fig. 1.*



*Fig. 2.*



INVENTOR.  
*Raymond W. Van Schynde*  
 and  
*Winton D. Lankin*  
 BY  
*Erwin Wheeler & Woodard*  
 ATTORNEYS



## UNITED STATES PATENT OFFICE

RAYMOND W. VAN SCHYNDLE AND WINTON D. LANSING, OF GREEN BAY, WISCONSIN,  
ASSIGNORS TO VAN-LANSING NOVELTY CO., OF GREEN BAY, WISCONSIN

## LIQUID DISPENSING DEVICE

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Our invention relates to improvements in liquid dispensing devices.

Among the objects of the invention are to provide a liquid dispensing device which may be controlled by a coin or other suitable operating device and capable of accurately dispensing the liquid; to provide a liquid dispensing device which will not drip or lose liquid after the dispensing action is complete; to provide a dispensing device which may be coin operated and controlled and which, through the coin mechanism, cannot be made to "repeat" on the use of a single coin.

A further object of our invention is to provide a reservoir and dispensing pump so arranged that a dispensing pipe is directed through the reservoir to an altitude for gravity dispensation.

In the accompanying drawing, we have shown a present preferred embodiment of the invention, wherein

Figure 1 shows a side elevation of a dispensing device with portions cut away to exhibit details of construction.

Figure 2 is a detail of a coin operating mechanism.

Like parts are identified by the same reference characters throughout the several views.

The particular embodiment of our invention shown in the drawing is one wherein the liquid dispensing device is in its general outline and construction a gasoline dispenser, which we have made up in the form of a miniature filling station pump, although it will be obvious from the description hereinafter set forth that many uses for our device in other liquid using mechanism may be found.

We provide a hollow base 10 to receive coins and hold them within the locked door 11, and a compartment 12 mounted thereon for the reception of a coin controlled mechanism. The top 13 of this compartment 12 is channeled at 14 to receive a circular glass reservoir 15 for the reception of liquid 16 to be dispensed. The reservoir 15 is surmounted by a cap 17 which is likewise channeled at 18 to receive the top of the reservoir. Ex-

tending between the top 13 and the cap 17 is a supporting column 19 which is hollow and threaded at either end into the body of the top 13 and cap 17 respectively, to the end that the said members 13 and 17 may be drawn tightly together to press the reservoir 15 into the channels 14 and 18 to make liquid tight connection. A removable head 20 provided with a gasket head 21 is so formed as to have a bayonet connection at 22 with the cap 17.

Housed within the underside of the top 13 we have provided a diaphragm pump 23, which is adapted to receive liquid from the reservoir through a fitting 24. A ball check 25 is provided to permit flow of liquid into the diaphragm pump and to prevent return of liquid to the reservoir. From the top of the pump a small pipe 25' extends upwardly through the column and through a ball check fitting 26 to a dispensing pipe 27 in the cap 17. This dispensing pipe extends laterally to a point where it enters a funnel 28 extending downwardly through the cap and terminating in a nozzle 29.

It will be particularly noted that there is actually no mechanical connection between the dispensing pipe 27 and funnel 28 since an opening to the air must be provided at 30 to break an otherwise perfect siphon through the connections indicated.

Attention is likewise called to the fact that the dispensing pipe is notched at 31 to prevent the ball of the ball check 26 from shutting off the opening into the dispensing pipe 27 when the ball is in uppermost position.

Attention is now directed to the controlling or operating mechanism for the diaphragm pump. This mechanism preferably is constructed to utilize an operating device for insuring the dispensing at each operation of a predetermined quantity only of liquid. Such operating device may assume various forms, and may be connected to or separate from the dispensing device structure. In the present preferred embodiment of the invention, provision is made for utilization of coins for controlling and operating the dispensing mechanism. A coin slot 35 in the side wall of the compartment 12



is provided for the reception of a coin 36, which will normally drop from the coin slot into the position indicated in the drawing. In this position the coin is housed within a slot in a coin receiver 37, the top part of the slot comprising an actuator 38 pivotally mounted at 39 and provided with an angularly disposed lower face 40. The lower part of the slot at 41 is substantially horizontal as indicated. In the side wall of the coin receiver is an arcuate opening 42 to permit of entry of a coin actuator 43 to be operated by a handle 44 outside the wall of the compartment 12 and connected with the actuator 43 by means of a shaft 45.

Normally the coin actuator and the handle are in the position shown in the drawing since a spring 46 is provided to maintain them in that position.

Between the pump actuator 38 and the diaphragm 23 we provide a rod 47 pivotally interlocked with the actuator and flexibly connected to the diaphragm at 48.

The operation of our device is as follows:

A coin 36 dropped through the slot 35 will assume the position shown in the drawing, from which it may be moved forwardly in the coin slot by coin actuator 43 when the handle 44 is arcuately moved upon the shaft 45.

As the coin 36 advances beneath the pump actuator 38, the actuator is raised pivotally about its axis 39 to cause the rod 47 to move upwardly and collapse the diaphragm 23 into the recess in the top 13. The motion of these various parts continues until the coin has passed beyond the pump actuator 38 and is dropped into the coin receiver in the base 10 behind the locked door 11.

Liquid that has been advanced from the reservoir through the check valve 25 into the pump is, by the movement above described, forced through the small pipe 25', through the ball check 26, into the dispensing pipe 27 from which the liquid is dispensed into the funnel and through the nozzle into any receptacle or pipe desired.

It will be noted that the lower surface 40 of the actuator 38 is so angularly disposed to the floor 41 of the coin slot that from the time it is initially actuated by the coin actuator 43, the angle of incidence between the curved surface of the coin and the lower surface 40, and between the coin and the floor 41 is such that the coin will not retract. It is therefore impossible for a manipulator of the machine to gain through the use of one coin, more than the equivalent of one thrust of the actuator 38. The coin will only advance as it is thrust by the actuator and no recoil thereof can be gained through the release of the actuator 43 or other manipulation of our device. This feature is described and claimed in our copending application Serial No. 500,240, filed Dec. 5, 1930, which application is a division of this application.

While we have shown and described a present preferred embodiment of the invention, it is to be distinctly understood that the same is not limited thereto, but may be otherwise variously embodied within the scope of the following claims.

We claim:

1. A liquid dispensing device including a reservoir, a pump disposed entirely beneath the reservoir, a conduit for dispensing liquid from the pump through the reservoir, and a downwardly extending dispensing nozzle for delivery of liquid by gravity.

2. A liquid dispensing device including a reservoir, a pump beneath the reservoir, a conduit for dispensing liquid from the pump through the reservoir, and a downwardly extending dispensing nozzle for delivery of liquid by gravity, the connection between the conduit and the nozzle providing a normally unobstructed opening to prevent siphoning of liquid from the reservoir through the nozzle.

3. A reservoir for liquid, a pipe extending upwardly through the reservoir and terminating above the level of liquid in the reservoir, a pump for receiving liquid by gravity from the reservoir and forcing it through the pipe, and a transversely open fitting inaccessible from without for receiving liquid from the pipe, for delivery by gravity, whereby siphonic delivery of liquid through said fitting is prevented.

4. A reservoir for liquid, a dispensing device for liquid connected with the reservoir, a pipe for delivering the liquid, said pipe passing upwardly through the reservoir, and a bleed hole at a high point in said pipe inaccessible from without to prevent siphonic draining of the reservoir.

5. Liquid dispensing apparatus, comprising a reservoir, an imperforate diaphragm pump in communication with the reservoir, a delivery outlet, and means disposed entirely beneath the reservoir for compressing the diaphragm for delivering liquid from the reservoir to the outlet.

6. Liquid dispensing apparatus, comprising a reservoir, an imperforate diaphragm pump in communication with the reservoir, a check valve preventing liquid flow from the pump into the reservoir, a delivery outlet, and means disposed entirely beneath the reservoir for compressing the diaphragm for delivering liquid on the pump side of the check valve to the outlet.

7. Liquid dispensing apparatus, comprising a reservoir, a diaphragm pump in communication with the reservoir, a delivery outlet from the pump extending through but not in communication with the reservoir, and means disposed entirely beneath the reservoir for compressing the diaphragm for delivering liquid through such outlet.

8. Liquid dispensing apparatus, compris-



ing a reservoir, a delivery outlet, means for delivering liquid from the reservoir to the outlet, and means between such first mentioned means and the outlet providing at all times an inaccessible air bleed to prevent siphoning of liquid through the outlet.

9. Liquid dispensing apparatus, comprising a reservoir, a diaphragm pump in communication with the reservoir, a downwardly extending delivery conduit in communication with the pump, and means in the delivery conduit to prevent siphoning of liquid therethrough.

10. Liquid dispensing apparatus, comprising a reservoir, a pump in communication therewith, a delivery conduit from the pump passing through the reservoir, and means in the delivery conduit disposed interiorly of the apparatus and inaccessible from without to prevent siphoning of liquid therethrough.

11. Liquid dispensing apparatus, comprising a reservoir, a pump disposed entirely beneath the reservoir and in communication therewith, a delivery conduit in communication with the pump and extending upwardly therefrom through the reservoir, and a check valve in the delivery conduit near the top thereof for preventing liquid therein from draining back into the pump after operation of the pump.

12. Liquid dispensing apparatus, comprising a reservoir, a pump in communication with the reservoir, a check valve preventing liquid flow from the pump into the reservoir, a delivery conduit in communication with the pump and extending generally upwardly therefrom through the reservoir, a check valve in the delivery conduit for preventing liquid therein from draining back into the pump after operation of the pump, and means disposed entirely beneath the reservoir for operating the pump.

13. Liquid dispensing apparatus, comprising a reservoir, a pump in communication with the reservoir, a delivery conduit in communication with the pump and extending generally upwardly therefrom through the reservoir, a gravity discharge nozzle in communication with the conduit, and means between the conduit and discharge nozzle disposed interiorly of the apparatus and inaccessible from without to prevent siphoning of liquid through the nozzle.

14. Liquid dispensing apparatus, comprising a reservoir, a diaphragm pump beneath and in communication with the reservoir, a delivery conduit in communication with the pump and extending generally upwardly therefrom through the reservoir, a gravity discharge nozzle in communication with the conduit, and means disposed entirely beneath the reservoir for operating the pump.

RAYMOND W. VAN SCHYNDLE.  
WINTON D. LANSING.