Aug. 29, 1933. G. U. BRAKE 1,925,043

LIQUID DISPENSING APPARATUS

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Fig. 1

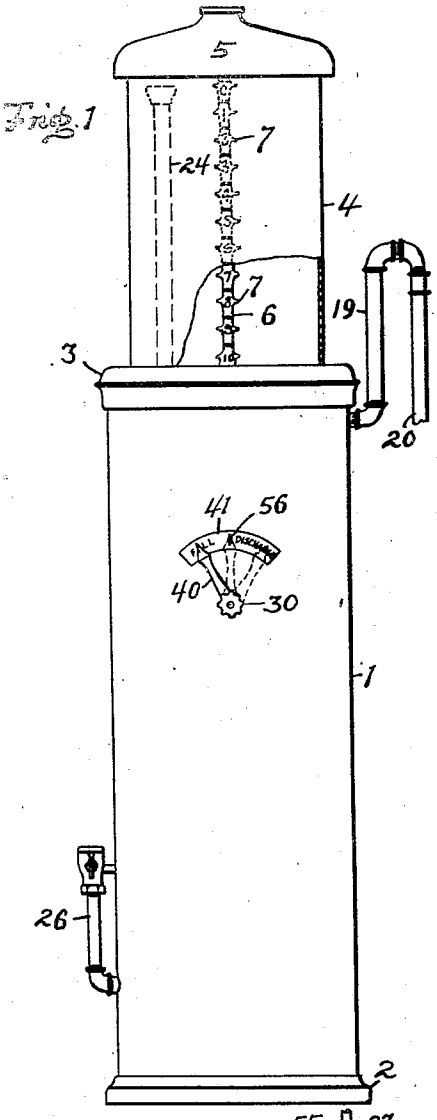


Fig. 2.

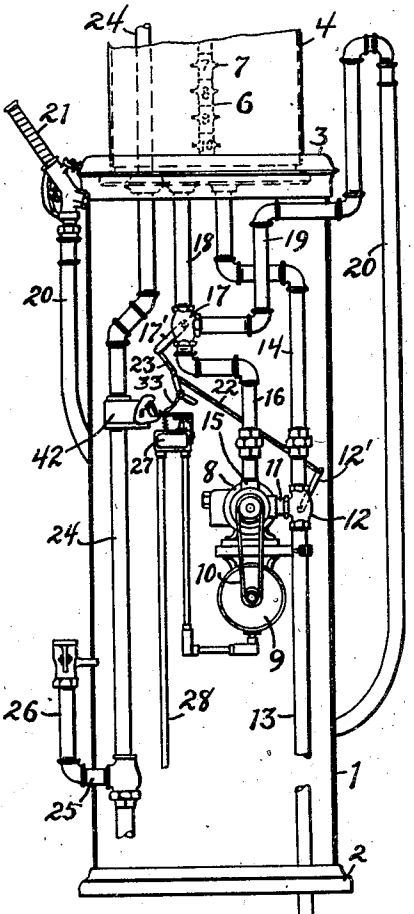


Fig. 3.

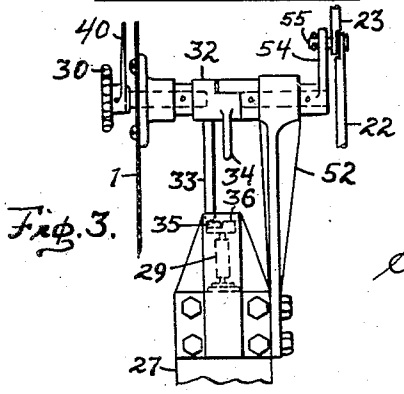
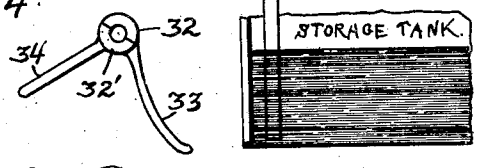


Fig. 4.



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LIQUID DISPENSING APPARATUS

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Fig. 5.

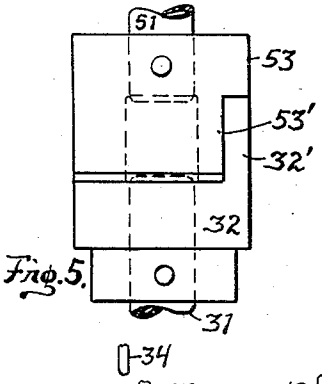


Fig. 14.

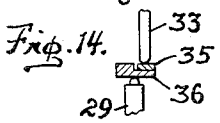


Fig. 6.

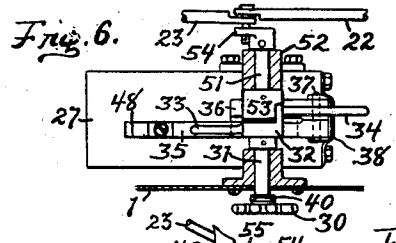


Fig. 8.

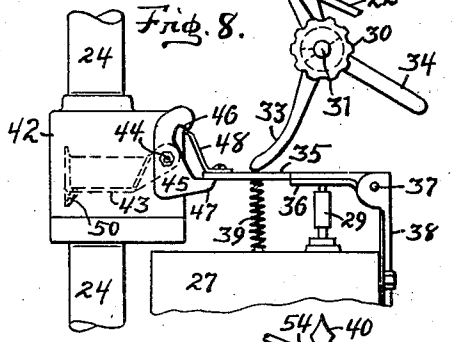


Fig. 7.

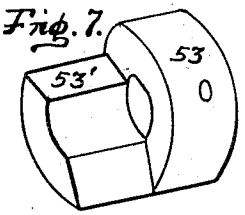


Fig. 9.

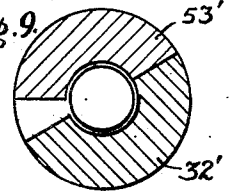


Fig. 11

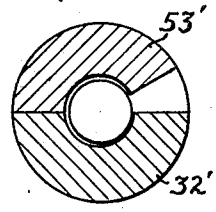


Fig. 15.

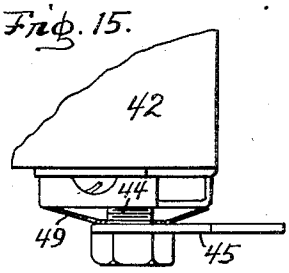


Fig. 10.

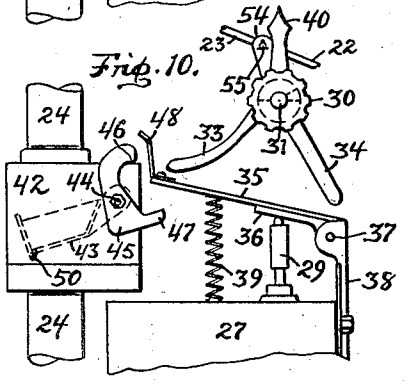


Fig. 16.

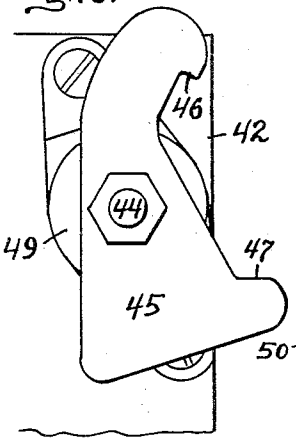


Fig. 12.

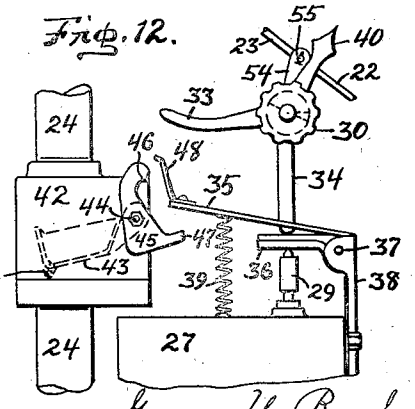
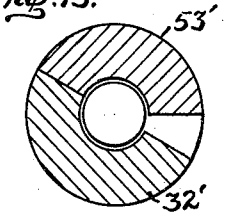


Fig. 13.



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Patented Aug. 29, 1933 1,925,043

UNITED STATES PATENT OFFICE

1,925,043

LIQUID DISPENSING APPARATUS

George U. Brake, Fort Wayne, Ind., assignor to Tokheim Oil Tank and Pump Company, Fort Wayne, Ind., a corporation of Indiana

Application January 20, 1933. Serial No. 652,673

9 Claims. (Cl. 221—100)

This invention relates to improvements in liquid dispensing apparatus in which definite quantities of liquid are drawn from a storage tank, measured and displayed, and thereafter delivered to patrons through operation of a motor-driven pump.

One of the objects of the invention is to expeditiously supply patrons with liquid, such for example, as gasoline for use in automobiles, after the quantity of the liquid to be delivered has been displayed.

Other objects and advantages of the invention will appear in the following description.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which:—

Fig. 1 is an elevation of a structure in which the invention is embodied;

Fig. 2 is a fragmentary elevation shown partially in cross-section projected from Fig. 1;

Fig. 3 is a detail view showing a side elevation of manually operated control mechanism for the apparatus;

Fig. 4 is a detail view showing a rear elevation of the driving clutch member for the control mechanism;

Fig. 5 is a detail plan view showing the clutch for the control mechanism;

Fig. 6 is a plan view of the manually operated controlling mechanism, parts being in section;

Fig. 7 is a detail isometric view of the driven clutch member;

Fig. 8 is an elevation of the manually operated control mechanism in position for the filling operation;

Fig. 9 is a detail view of the clutch mechanism in vertical section as disposed during the filling operation;

Fig. 10 is a vertical elevation of the manually controlled operating mechanism in neutral position;

Fig. 11 is a detail view of the clutch mechanism in vertical section as disposed after the filling operation;

Fig. 12 is an elevation of the manually operated controlling mechanism as disposed during the dispensing operation;

Fig. 13 is a detail view of the clutch mechanism in vertical section as disposed during the dispensing operation;

Fig. 14 is a detail view of the switch operating levers in transverse section and parts operatively associated therewith;

Fig. 15 is a detail plan view of the trip mechanism for controlling one of the switch operating levers, a portion being in section; and

Fig. 16 is a side elevation projected from Fig. 15.

The illustrative embodiment of the invention consists of a hollow pedestal 1 having a base 2 at its bottom and a capital 3 at its top. A glass measuring vessel 4 is mounted upon the capital and is closed at its top by a dome 5. The vessel has associated therewith a gauge 6 having indicating members 7 thereon by which is ascertained by observation through the wall of the vessel the varying quantity of liquid contained in the vessel during the operation of the apparatus.

The glass measuring vessel is supplied with liquid by means of a pump 8 operated by an electric motor 9 connected therewith through the medium of a driving chain 10. The suction inlet 11 of the pump is connected with a two-way valve 12 of usual construction that is arranged in line with a suction pipe having two branches 13 and 14. The branch 13 extends into a storage tank (not shown), such as is ordinarily located underground and used in connection with liquid fuel dispensing apparatus, so that when said two-way valve 12 is in one of its positions liquid from the storage tank is withdrawn therefrom upon operation of the pump. The branch 14 of the suction pipe has communication with the lower end of the measuring vessel 4 so that when said two-way valve 12 is in its other position liquid from the measuring vessel 4 is withdrawn therefrom upon operation of the pump.

The discharge outlet 15 of the pump is connected by a pipe 16 with a second two-way valve 17 that is connected with the lower end of the measuring vessel 4 by a supply pipe 18, and has also connected therewith a dispensing pipe 19 terminating with a distributing hose 20 provided with a manually operated valve controlled discharge nozzle 21.

The two-way valve 12 has an operating arm 12′ and the two-way valve 17 also has an operating arm 17′ oppositely disposed respecting the arm 12′, and said arms are connected by means of a pair of links 22 and 23 arranged so that turning movement of one of said valves is accompanied by corresponding opposite turning movement of the other of said valves. Thus, when the valve 12 is positioned to connect the suction line 13 with the inlet 11 of the pump, the branch 14 of the suction line is shut off and the valve 17 is then positioned to connect the discharge outlet 15 of the pump with the measuring vessel through the medium of the pipes 16 and 18, and the dispensing pipe 19 is shut off. When said valves are thus disposed, upon operation of the pump, the measuring vessel

is supplied with liquid from the storage tank. When said valves are adjusted to their respective opposite positions, the branch 13 of the suction line is shut off the vessel 4 and the suction inlet 11 of the pump are connected; the supply pipe 18 is shut off; and the discharge outlet 15 of the pump and the dispensing pipe 19 are connected. When the valves are thus disposed, upon operation of the pump, liquid from the measuring vessel 4 is drawn through the branch 14 into the pump and from thence expelled through the pipes 16 and 19, hose 20 and the manually operated nozzle, discharge through the nozzle 21 being more or less in volume accordingly as the nozzle valve is manipulated.

An overflow pipe line 24 extends up through the pedestal and into the measuring vessel 4, the upper end thereof being open and terminating at the level of the uppermost indicating member 7. The lower end of the pipe line is connected with the said storage tank at the top thereof so that any overplus of liquid supplied to the measuring vessel automatically flows back into the storage tank.

In connection with the overflow pipe 24 is a branch 25 provided with a riser 26 adapted to receive the end of the nozzle 21 whereby the vessel may be emptied of its content back into the storage tank through the dispensing hose when so desired.

Manually operated controlling mechanism is provided for adjusting the two-way valves 12 and 17 which also has means in connection therewith for automatically operating a switch 27 through which current is supplied to the motor 9, the conductors (not shown) for which, are conveniently arranged in a suitable conduit 28 and connected with the motor and source of energy, and the switch is connected in the circuit in the usual manner.

The switch 27 is of any suitable construction, preferably of that type having an operating stem 29, which, upon being depressed causes closing by the switch of the motor circuit, and opening of the circuit when the pressure upon the stem is relieved.

The manually operated control mechanism consists of a hand-wheel 30 provided with an operating shaft 31 that extends from the exterior of the pedestal through the wall thereof and has secured upon its inner end a driving clutch member 32, the shaft being mounted in the pedestal so as to have oscillating movement upon its axis as the hand-wheel is turned. The driving clutch member 32 has two radially disposed arms 33 and 34 that extend divergently with respect to each other in separate planes spaced axially apart and which are adapted to have operative engagement separately with corresponding levers 35 and 36 at different periods in the turning movement of the operating shaft 31. The levers 35 and 36 are mounted upon a common pivot 37 in a bracket 38 that extends upwardly from the switch 27. The lever 36 has bearing contact with the top of the operating stem 29 for the switch, and the lever 35 overlaps said lever 36 so that when the lever 35 is moved downwardly said switch stem is likewise moved downwardly through the medium of the intervening lever 36.

The lever 35 is sustained normally in its uppermost position by means of a spring 39 and is moved downwardly through operative engagement of the arm 33 upon manipulation of the hand-wheel 30 in one direction. When the hand-wheel is turned in the opposite direction the arm 33 is moved from engagement with the lever 35, and then the arm 34 has operative engagement with the lever 36, which causes the switch stem 29 to be depressed and the switch is closed when said arm is so depressed. Thus, when the hand-wheel 30 is turned to one of its extreme positions (Fig. 8) the switch is closed through the medium of the arm 33, lever 35, lever 36, and the stem 29. When the hand-wheel is turned to its opposite extreme position (Fig. 12) the switch is closed through the medium of the arm 34, lever 36 and the stem 29.

The arms 33 and 34 are so divergently disposed that operative engagement of the arm 33 with the lever 35 occurs at a period in the turning movement of the shaft 31 apart from that when the arm 34 has engagement with the lever 36. When the hand-wheel 30 is turned to an intermediate position (Fig. 13) the levers 35 and 36 are then free from engagement with their complemental operating arms 33 and 34 and consequently the switch is then open.

The shaft 31 has secured thereon, externally with respect to the pedestal, an index 40 and upon the face of the pedestal adjacent the said index is secured a scale 41 bearing indicia by which the position of the operating shaft is ascertained by the operator.

The overflow line 24 has connected therein a chamber 42 in which is located a trip or bucket 43 that is mounted upon a horizontal shaft 44 so as to have vertically swinging movement in the chamber, and upon one end of said shaft, externally with respect to said chamber, is secured a catch 45 that is provided at its top with an overhanging hook 46 and at its bottom with a projecting lug 47. The outer end of the lever 35 when swung downwardly has engaging relation with the lug 47 on said catch which causes turning movement of the shaft 44 and consequent elevation of the bucket 43 in said chamber 42 (Fig. 8). Upon the outer end of the lever 35 is secured an upwardly extending finger 48, that when the lever 35 is moved to its lowermost position, becomes engaged with the hook 46 while the bucket is in elevated position. A friction member 49 is disposed upon the shaft 44 between the catch 45 and the adjacent wall of the chamber 42 whereby turning movement of said shaft is frictionally restrained so that the bucket is normally inert. Thus, when the lever 35 is moved by the arm 33 into switch-closing position the lever is there held until its finger 48 is released from engagement with the hook 45 (Fig. 10) which occurs automatically after the measuring vessel 4 has been filled and overflow takes place down through the overflow line 24, causing the bucket 43 to become filled with the overflowing liquid, whereupon the bucket swings downwardly causing the release movement of the catch 45. The bucket 43 has in its bottom a drain opening 50 through which the liquid accumulated in the bucket gradually escapes.

The operating mechanism has an oscillating shaft 51 mounted in a bracket 52 located adjacent the switch 27, and has upon one end a driven clutch member 53 provided with an engaging jaw 53' that is operatively associated with the jaw 32' on the driving clutch member 32. The jaws of said clutch members are so proportioned as to provide angular lost motion to a limited extent between the clutch members which permits limited independent back-turning move-

ment of the operating shaft 31 to its neutral or intermediate position by manipulation of the hand-wheel 30.

The oscillating shaft 51 has mounted thereon a crank 54 that is operatively connected with the links 22 and 23 by its wrist-pin 55 so that as the shaft 51 is actuated, the valves 12 and 17 are adjusted accordingly.

The dispensing pipe 19 preferably extends upwardly to a point located externally with respect to the pedestal a sufficient distance above the capital to insure convenience in handling the dispensing hose as when applying the nozzle to the point of final delivery.

In operating the appliance the hand-wheel 30 is turned to one of its extreme positions, as shown in Figs. 1 and 8, so that the lever 35 is depressed by the arm 33 into switch-closing position. Thereupon, the bucket 43 is raised to its uppermost position through the medium of the catch 45 which is actuated by engagement of the lever 35 with the lug 47 on the catch when the lever is depressed. When the hand-wheel 30 is thus turned the valves 12 and 17 through the medium of the driven clutch member 53, shaft 51, crank 54 and links 22 and 23, become so adjusted that communication is established between the underground reservoir and the pump, and between the pump and the measuring vessel. The hand-wheel 30 is then turned backwardly until the index 40 reaches its neutral position 56 (Figs. 1 and 10). The lever 35, however, is detained in switch-closing position by the engagement of the hook 46 on the catch with the finger 48 on said lever, and while thus detained operation of the motor and the pump driven thereby continues and the measuring vessel becomes filled to overflowing and the surplus passes down through the overflow line, whereupon, the bucket 43 becomes filled with the overflow liquid and is thereby moved downwardly causing the release of the detained lever 35 and consequent re-opening of the motor switch 27. Thus, the measure filling operation is automatically terminated and a predetermined quantity of liquid is established in the measuring vessel.

In dispensing the liquid from the measure, the operating handle is turned to its opposite extreme position (Fig. 12), whereupon, the valves 12 and 17, through the medium of the clutch members and the operatively associated connecting links 22 and 23, become so adjusted that communication is established between the measuring vessel 4 and the pump and between the pump and the discharge line 19, and coincidentally the previous connections between the underground reservoir, the pump and the supply pipe 18 are shut off, and the switch is closed through action of the arm 34 and lever 36, causing operation of the pump. While the valves are thus adjusted and the pump continues operation, the liquid previously supplied to the vessel is drawn therefrom through the branch 14 by the action of the pump and dispensed through the discharge line 19 and hose 20 upon opening of the nozzle 21.

The quantity of liquid as it is dispensed is determined by observing the level of liquid, in the measure, which is lowered to an extent dependent upon the amount of liquid that is let out through the nozzle 21, and by holding the nozzle valve open until the liquid level reaches a predetermined one of the indicating members and then closing the valve, the delivery of the liquid in definite quantities is regulated as desired.

After the dispensing operation is completed, the hand-wheel is turned back until the index is posed at the neutral point 56, whereupon the arm 34 is moved out of engagement with the lever 36 permitting the switch to open, and thus stopping the motor. During the interim between the filling operations the bucket 43 becomes drained and is then in readiness for the next filling operation.

The relative arrangement of the several parts of the apparatus is such as to afford compactness of the general structure. For instance: The pedestal may be materially shorter than those ordinarily provided for gasoline dispensers of the "visible" type, so that the measuring vessel is supported in position for observation approximately upon the level of the operator's normal point of vision. This feature is advantageous both in operating and installing the apparatus, as the operator is enabled to more readily and accurately determine the quantity of gasoline in the measure, and the apparatus is adaptable for installation beneath shelters that are too low for accommodation of dispensers of the usual height.

I claim:

1. In a liquid dispenser, a pedestal, a transparent measure on said pedestal provided with liquid level indicating means, an overflow pipe for said measure, a pump, a supply pipe connecting the discharge port of the pump with said measure, a dispensing pipe terminating in a flexible hose provided with a manually operated valve-controlled nozzle, a two-way valve connected in the supply pipe and with said dispensing pipe, a suction pipe one end of which is connected with said measure at the bottom thereof, its opposite end being adapted for connection with a source of liquid supply, a second two-way valve connected in the suction pipe and with the intake port of said pump, an electric motor operatively associated with said pump, a spring-restrained switch connected in the motor circuit, an actuating means for said switch, a catch automatically engageable with said means for holding said means in switch-closing position, a trip interposed in the overflow pipe line operatively connected with said latch to cause release of said switch closing member upon overflow from said measure, manually operated control mechanism including a handle therefor and provided with members for closing said switch when said handle is turned to either of its extreme positions, and connections between said mechanism and said two-way valves so arranged that when said handle is moved to one of its extreme positions said two-way valves are adjusted so that upon operation of the pump said measure is filled with liquid from the source of supply by the pump, and when said handle is moved to its opposite extreme position and the pump is operated liquid is drawn from said measure by the pump and expelled through the dispensing pipe upon opening of the nozzle.

2. In a liquid dispenser, a pedestal, a transparent measure mounted on said pedestal provided with a liquid level indicating means and an overflow pipe, a pump, a supply pipe connecting the discharge port of the pump with said measure, a dispensing pipe terminating in a flexible hose provided with a manually operated valve-controlled nozzle, a two-way valve connected in the supply pipe and with said dispensing pipe, a suction pipe one end of which is connected with the measure at the bottom thereof, its opposite end being adapted for connection with a source of liquid supply, a second two-way

valve connected in the suction pipe and with the intake port of said pump, an electric motor operatively associated with said pump, a spring-restrained switch connected in the motor circuit, manually operated control mechanism including a handle and provided with members for closing said switch when said handle is turned to either of its extreme positions, and connections between said mechanism and said two-way valves so arranged that when said handle is moved to one of its extreme positions said two-way valves are adjusted so that upon operation of the pump said measure is filled with liquid from the source of supply by the pump, and when said handle is moved to its opposite extreme position and the pump is operated liquid is drawn from said measure by the pump and expelled through the dispensing pipe upon operating of the nozzle.

3. In a liquid dispenser, a pedestal, a transparent measure on said pedestal, a pump, a supply pipe connecting the discharge port of the pump with said measure, a dispensing pipe, a two-way valve connected in the supply pipe and with said dispensing pipe, a suction pipe having communication at one end with said measure at the bottom thereof, its opposite end being adapted for connection with a source of liquid supply, a second two-way valve connected in the suction pipe and with the intake port of said pump, means for actuating said pump, manually operated control mechanism having connections with said two-way valves so arranged that when moved to one of its operating positions said two-way valves are thereby so adjusted that upon operation of the pump said measure is filled with liquid from the source of supply by the pump, and when moved to its opposite operating position and the pump is operated liquid is drawn from said measure by the pump and expelled through the dispensing pipe.

4. In a liquid dispenser, a transparent measure and its complemental pedestal, a pump provided with means for its operation, a supply pipe connecting the discharge port of the pump with said measure, and having a two-way valve, a dispensing pipe connected with said valve, a suction pipe one end of which is for connection with a source of liquid supply and its opposite end having communication with said measure at the bottom thereof, a second two-way valve connected in said suction pipe and with the intake port of said pump, and control mechanism operatively associated with said two-way valves and arranged to adjust same selectively so that upon operation of said pump the measure is filled with liquid drawn from the source of liquid supply by the pump or the liquid in the measure is drawn therefrom and discharged by the pump out through said dispensing pipe, accordingly as said two-way valves are adjusted.

5. In a liquid dispenser, a supported transparent measure having an overflow pipe, a pump, a suction pipe having a two-way valve in line connected with the intake port of said pump, one end of which pipe is connected with the measure and the other end being adapted for connection with a source of liquid supply, a supply pipe having a two-way valve in line and connecting the discharge port of the pump with said measure, a dispensing pipe connected with the last-mentioned two-way valve, a manually operated control mechanism having connections with said two-way valves for simultaneous adjustment thereof upon manipulation of said mechanism, an electric motor for operating the pump, a switch mechanism controlling the motor circuit, and members on said control mechanism operatively associated with said switch mechanism so that the switch is closed and the pump is driven by the motor when said two-way valves are moved to either of their operative positions.

6. In a liquid dispenser having a measuring vessel provided with an overflow pipe and a pump operated means for selectively supplying the vessel with liquid and dispensing the supplied liquid therefrom, including valves for controlling the supplying and dispensing operations thereof, an electric motor operatively connected with said pump, a switch controlling the motor circuit provided with an operating stem, an actuating lever for said stem, a spring supported lever overlapping said actuating lever operably associated therewith to close said switch, a mechanism including a catch automatically engageable with said spring-supported lever to hold same in switch closing position, means associated with said overflow pipe and said catch operated by overflow liquid from said measure to move the catch from holding position, and control mechanism operably connected with said valve and having members disposed to severally engage the overlapping lever and stem actuating lever accordingly as said control mechanism is adjustably positioned.

7. In a liquid dispenser having a measuring vessel provided with an overflow pipe and pumping means for selectively filling the vessel with and dispensing liquid from the vessel, including valves for controlling the filling and dispensing operations thereof, an electric motor operatively connected with the pump for said means, a switch-closing mechanism controlling the motor circuit, and manually operated means having connections with said valves for simultaneous adjustment thereof to their respective filling or dispensing positions accordingly as said manually operated means is adjusted, and provided also with means for moving said mechanism to switch closing position when said valves are in either of their operating positions.

8. In a liquid dispenser having a measuring vessel provided with an overflow pipe and pumping means for selectively filling the vessel with and dispensing liquid from the vessel, including valves for controlling the filling and dispensing operations thereof, an electric motor operatively connected with the pump for said means, a switch controlling the motor circuit, an actuating lever for the stem of said switch, a spring-supported lever operably engageable with said actuating lever, a catch automatically engageable with said spring supported lever to detain same in switch closing position when depressed, means associated with said overflow pipe adapted to move said catch to disengaging position by the overflow liquid from said vessel through said pipe, and manually operated mechanism for simultaneously adjusting said valves and selectively actuating said levers.

9. In a liquid dispenser having a measuring vessel provided with an overflow pipe and electric motor-driven pumping means for selectively filling the vessel with and dispensing liquid from the vessel, including valves for controlling the filling and dispensing operations thereof, a switch controlling the motor circuit, an actuating lever for the stem of said switch, a spring-supported lever operably engageable with said actuating lever, a catch automatically engageable with said spring supported lever to detain same in switch closing position when actuated, means associated with

said overflow pipe and catch actuated by overflow liquid from said vessel to move said catch from engaging position, and manually operated mechanism for actuating said valves and levers, said mechanism consisting of an oscillating shaft provided with a crank connected to said valves for simultaneous adjustment thereof, an operating shaft axially alined with the first-mentioned shaft, provided with an operating handle and members for severally actuating said levers, and engaging clutch members secured respectively on said shafts so disposed as to have limited lost angular relative movement to permit said operating shaft to be turned back to its neutral position and free return movement of said spring supported lever when released from said catch while said valves are in position for the filling operation.

GEORGE U. BRAKE.