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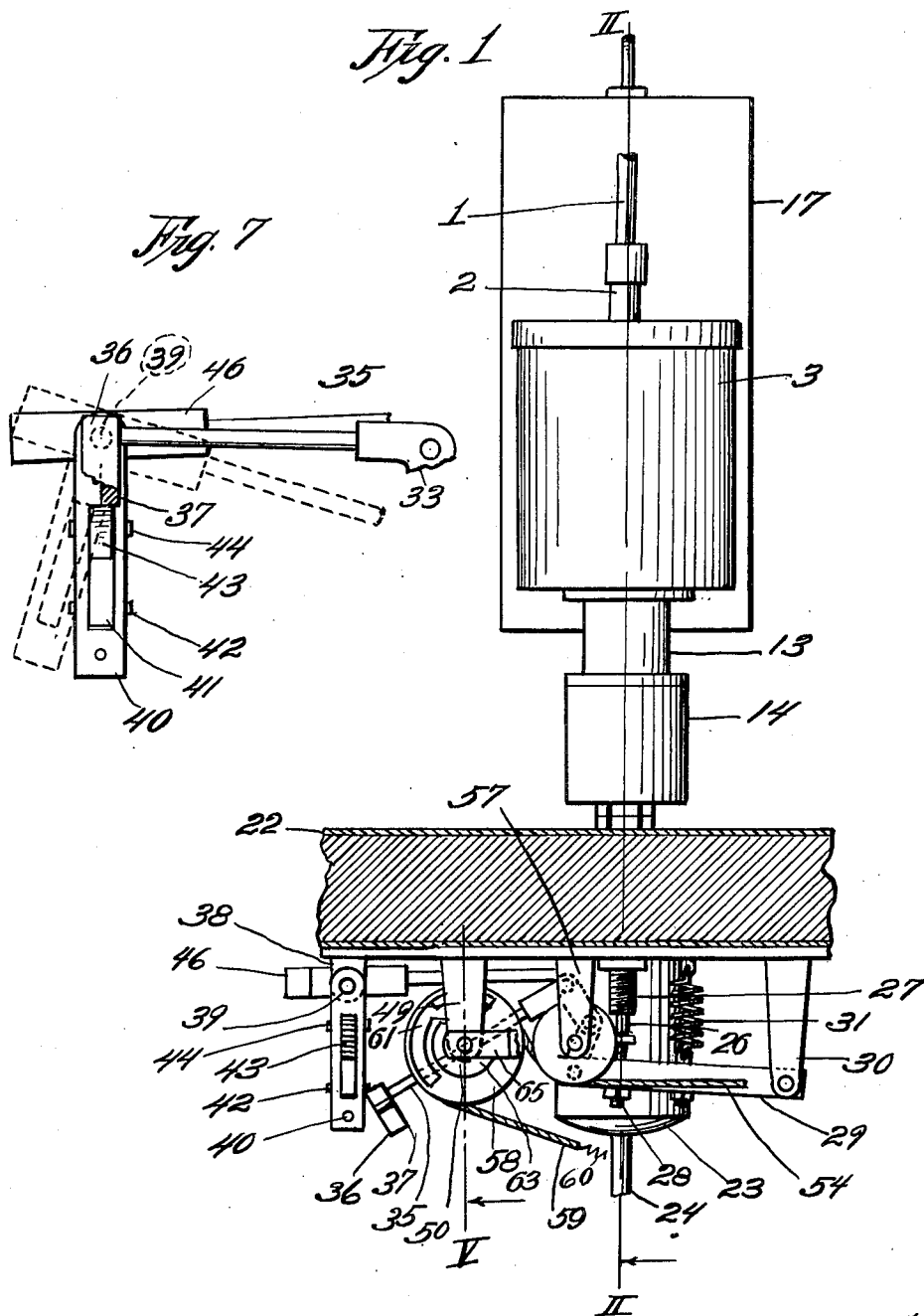
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A. B. WALTERS ET AL

LIQUID PROPORTIONING, MIXING, AND DISPENSING MACHINE

Original Filed Sept. 17, 1923

3 Sheets-Sheet 1



Witness
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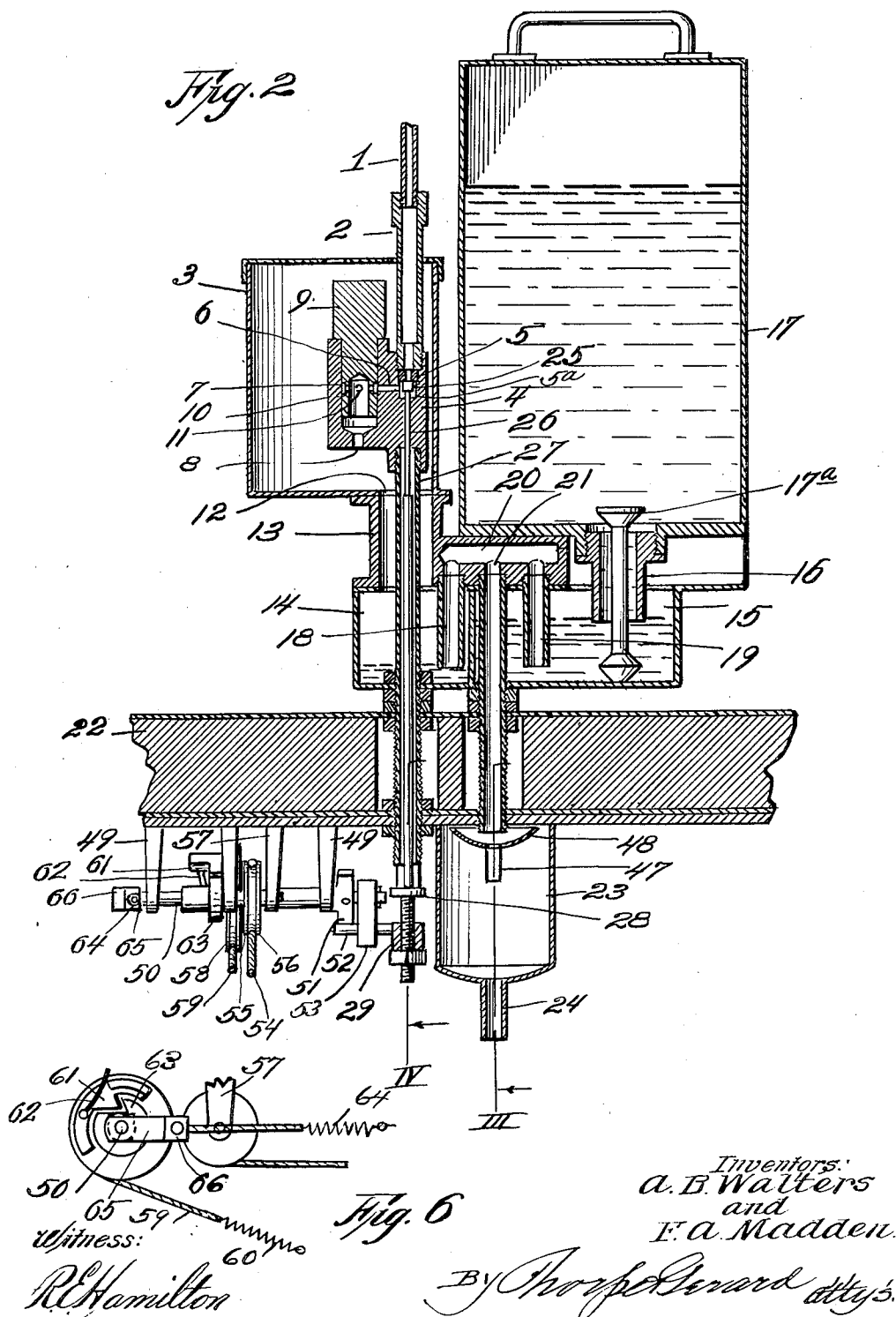
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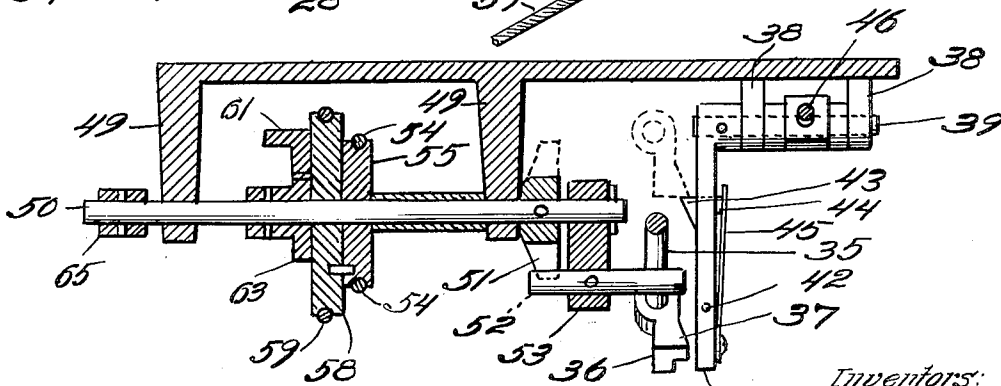
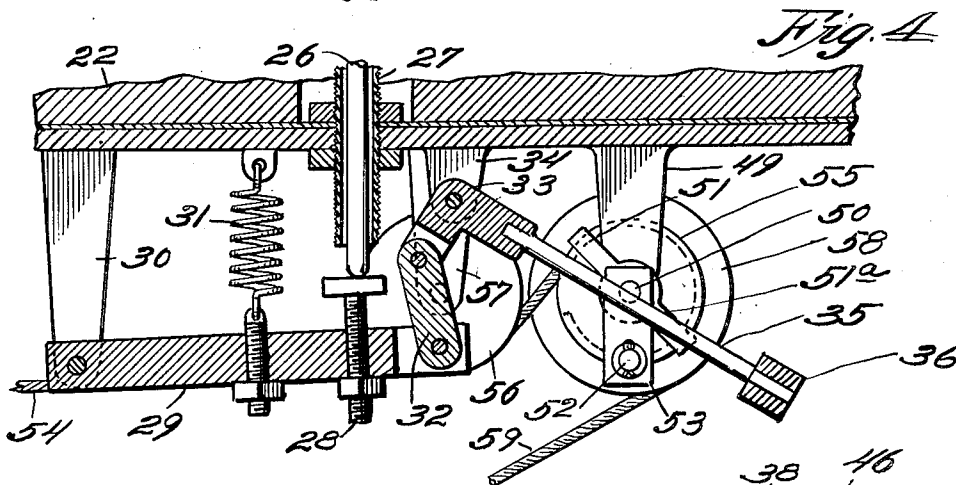
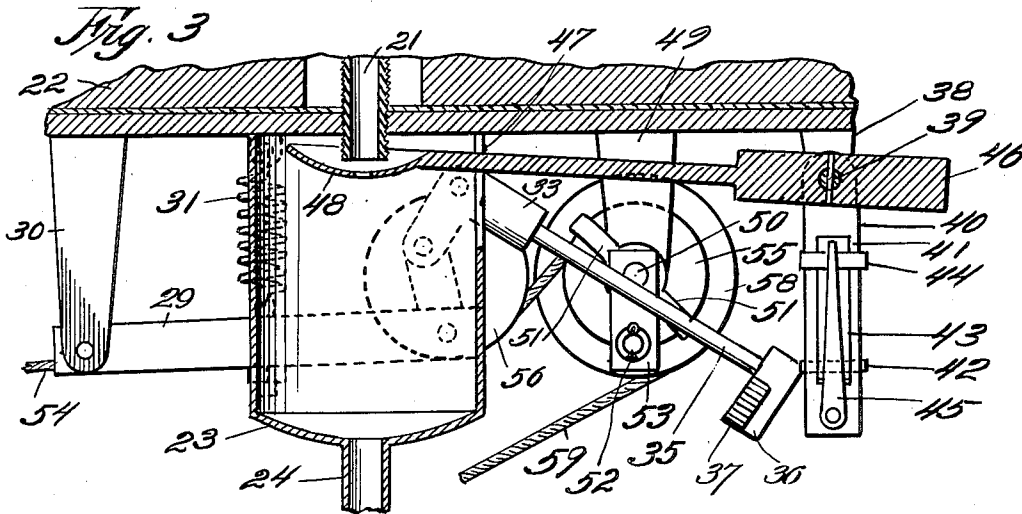
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UNITED STATES PATENT OFFICE.

ARTHUR B. WALTERS AND FRANK A. MADDEN, OF KANSAS CITY, MISSOURI, ASSIGNORS TO SODA SERVICE CORPORATION, OF KANSAS CITY, MISSOURI, A CORPORATION OF MISSOURI.

LIQUID PROPORTIONING, MIXING, AND DISPENSING MACHINE.

Application filed September 17, 1923, Serial No. 663,128. Renewed June 14, 1924.

To all whom it may concern:

Be it known that we, ARTHUR B. WALTERS and FRANK A. MADDEN, citizens of the United States, and residents of Kansas City, county of Jackson, State of Missouri, have invented a certain new and useful Improvement in Liquid Proportioning, Mixing, and Dispensing Machines, of which the following is a complete specification.

This invention relates to mixed-drink dispensing machines, and more especially to apparatus for use with a paper-cup dispenser and a coin controlled mechanism whereby a person is enabled to draw his own "drink" by the insertion of the proper coin and moving of a handle or the like, and the primary object of the invention is to provide a mechanism whereby carbonated water from one source and syrup from another source may, in fixed proportions, be measured, mixed, and delivered from a nozzle as a finished "drink" without human agency other than that necessary to set the mechanism in operation.

Another object is to provide means for automatically regulating the rate of flow of the carbonated water regardless of the pressure thereof, to insure the delivery of a fixed quantity of such water and, mixed therewith, of a fixed proportionate quantity of syrup. A still further object is to provide means whereby the operator upon effecting the functioning of the mechanism, immediately loses control as regards the possibility of obtaining more than a set quantity of the "drink," through one cycle of operations of the mechanism.

With these objects in view the invention consists in certain novel and useful features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which:—

Figure 1 is an elevational view of mechanism embodying the invention, a shelf of a cabinet enclosing the mechanism, being shown in section.

Figure 2 is a vertical section on the line III—III of Figure 1.

Figure 3 is a fragmentary section on the dotted line III of Figure 2.

Figure 4 is a fragmentary section on the dotted line IV of Figure 2.

Figure 5 is a fragmentary section on the dotted line V of Figure 1.

Figure 6 is an elevational view of part of the mechanism.

Figure 7 is a detail view to show more clearly certain operative parts.

Referring now to the drawings in detail, 1 indicates a tube leading from the cooling coil of a pressure tank (not shown) containing carbonated water. The tube is coupled to the upper end of a stand pipe 2 depending into tank 3. Within the tank and connected to pipe 2, is a casing 4 having a downwardly-facing valve seat 5, and an upwardly-facing seat 5^a, and leading from the casing 4 between the valve seats, is a passage 6 in communication with a cylinder 7 having a restricted discharge opening 8 at its lower end in communication with the tank 3. A hollow piston 9 fits in and closes the upper end of the cylinder and is provided externally with a channel 10, and a series of ports 11 extending from the channel to the interior of the piston which is open at its lower end. The tank 3 has a discharge opening 12 at its lower end in communication with a conduit 13 opening into a receptacle partitioned to provide a water chamber 14 and a syrup chamber 15, the former being in communication with the conduit 13. A valve cage 16 open at each end, depends into the open chamber 15 from the bottom of a syrup tank 17, which is otherwise air-tight, so that syrup cannot accumulate in chamber 15 above the lower end of the valve cage.

A valve 17^a extends slidably through the valve cage and is adapted to close the upper end of the said cage against escape of syrup from the tank, until the latter is in operative position, the length of the valve stem being such that when the tank is in position, the valve is unseated through its stem resting on the bottom of chamber 15, so that syrup can flow down through the cage into the compartment 15 until it seals the lower end of the cage, a variation in the height of such end of the cage providing for an increase or decrease in the quantity of syrup to be dispensed at a single operation mixed with the carbonated water.

A water pipe 18 extends upward from the lower part of chamber 14 and a similar syrup pipe 19 extends upward from the chamber 15 into a siphon chamber 20, and extending downward from said siphon chamber is a discharge pipe 21, the said pipe preferably extending through a partition or shelf 22 of the cabinet (not shown) containing the mechanism, the shelf serving as a support for the tanks and connections. A cup 23 underlies said shelf to receive the discharge from pipe 21, and is provided with a discharge pipe or nozzle 24 for delivering the mixed "drink" to a paper cup or the like, (not shown) accessible from the exterior of the cabinet.

A valve 25 is normally seated against the valve seat 5, to close communication between the supply of carbonated water and the piston and cylinder. The valve is mounted upon the upper end of a rod 26 extending down through the casing 4, and a protecting tube 27 leading by preference, to a point below the shelf 22, and said rod rests upon an adjusting screw 28 mounted in a rocker bar 29 pivotally supported at one end by fixed hanger brackets or arms 30. A retractile spring 31 connects the rocker bar with a fixed point of the machine and is adapted to hold the valve seated with a pressure sufficient to resist that of the carbonated water.

The free end of the rocker bar 29 is connected to a toggle, comprising a member 32 pivoted to said bar and a member 33 pivoted to supporting ears or hangers 34, and projecting from the member 33 is a lever 35 equipped with head 36 provided with a beveled tooth 37. A pair of fixed ears 38 constitute bearings for a shaft 39 extending parallel with the axis of rocker bar 29, and said shaft 39 is provided at one end with a depending crank arm 40 having a longitudinal slot 41 bridged at the lower end by a pivot 42 upon which is mounted a catch 43. The tooth of the catch is of beveled type so that it can be engaged and repressed by the beveled tooth of head 36 when the lever 35 is swung upward in a manner hereinafter explained. The catch is provided with a stop arm 44 to limit the projection of its tooth from the crank arm 40, and a spring 45 attached to the crank arm, holds the catch with its tooth yieldingly projected as indicated in Figure 5, in the path of the tooth 37. A lever 46 keyed on shaft 39 and adapted for vertical movement, extends through a vertical slot 47 in cup 23, and terminates at its inner end in a perforated spoon 48 underlying the discharge end of pipe 21. The opposite end of said lever is of sufficient weight to normally hold the spoon elevated, as indicated in Figure 3, with the crank arm 40 in such position that the tooth 37 must engage and repress tooth

43 in the upward movement of lever 35, the spring 45 returning the tooth 43 immediately to position so as to underlie the tooth 37 and thus retain the lever 35 in its elevated position, as indicated by the elevated position of the head 36 in dotted lines in Figure 5. It will be understood that to swing the lever 35 upwardly as explained, it is necessary to impart downward swinging movement to the rocker bar and to accomplish this the following mechanism is provided.

A shaft 50 extending parallel with shaft 39, is journaled in a pair of fixed arms 49, and is equipped near one end with a pair of opposite radial arms 51, 51^a, the former being adapted for engagement with one end of a cross pin 52 secured in an arm 53 pivoted on shaft 50, the other end of pin 52 being adapted under the rotation of said shaft, to engage lever 35 and raise it to the elevated position referred to and shown in Figure 7.

To effect rotation of shaft 50 as explained and in the direction indicated by the arrow, Figure 4, a pull cable 54 is secured to a grooved pulley 55 journaled on shaft 50, the cable also engaging an idler pulley 56, journaled in fixed lugs 57. The cable is operable by a lever or the like, (not shown) but accessible at the exterior of the cabinet. A second grooved wheel 58 is rigid with pulley 55, and attached to wheel 58 is a cable 59, connected to a retractile spring 60 for a purpose hereinafter explained.

A pawl 61 is pivotally mounted on the pulley or wheel 58, preferably the latter, as shown, and a spring 62 holds the pawl in yielding engagement with a ratchet wheel 63 rigidly mounted on shaft 50, so that when cable 54 is pulled the said shaft shall be turned sufficiently to tension a retractile spring 64, by the revolution of a crank arm 65 rigidly secured to the shaft 50, said spring being connected to a block 66 swivelled to said crank arm. The tension of said spring at the outer end of the crank arm passes the axis of the shaft under the pull on cable 54, effects continued revolution of the crank and shaft and thus causes arm 51 to engage and lift lever 35 and effect the opening of valve 25, this occurring regardless of the fact that the pull on cable 54 is continued. The catch 43, as explained, latches the lever 35 in its elevated position until the discharging "drink" trips said catch and permits the spring 31 to reseat the valve and restore the said lever to its normal or lowered position, it being noted that the valve 25 is upon seat 5^a while the water is flowing from the coil, to prevent leakage through pipe 27.

The turning of the pulley 55 and wheel 58 by the pull cable 54, operates cable 59 on wheel 58, to tension retractile spring 60 connected at its opposite ends to said spring and a fixed point, so that when the pull on the cable 54 is released, the pulley and wheel

shall be returned by the reaction of spring 60 to normal position and thus set the pawl for engagement with the ratchet wheel when cable 54 is pulled to effect the discharge of a second "drink."

The carbonated water begins to flow immediately the valve 25 is unseated and the quantity delivered to the tank 3 is always the same, because if it flows at a greater velocity than can be accommodated by the restricted discharge opening 8 of the cylinder, it accumulates in the latter and raises the piston until the supply is cut off through the passage 6. As a result a uniform quantity of the water is always delivered to chamber 14, sufficient to overflow pipe 18 and enter the vacuum chamber and pass down through the discharge pipe 21. As this action occurs, a vacuum is produced to draw syrup from chamber 15 up through pipe 19 and such syrup mixes with the carbonated water and flows therewith as a mixed "drink" through the pipe 21, the flow ceasing as the water siphon is broken at the lower end of pipe 18. The impact of the mixed "drink" on the spoon, depresses the same and thereby rocks shaft 39 and swings the crank-arm 40 to withdraw the tooth of catch 43 from the path of lever 35, and as this occurs the tensioned spring 31 reelevates the rocker bar and through the toggle, lowers the said lever, the relevation of the rocker bar effecting the re-seating of the valve on seat 5, it being noted that this action occurs immediately after the discharge of the mixed "drink" begins, and that the discharge continues thereafter until the vacuum is broken, as above explained.

As hereinbefore stated this mechanism is peculiarly appropriate for use with coin-controlled mechanism, as with the use of such control it is necessary to relax cable 54 before it can again be pulled for effecting a repetition of the operation described, it being understood however, that the operation of the invention is not dependent on association with coin-controlled mechanism or automatic means for disposing a cup or the like under the discharge nozzle.

It will be apparent that the invention is susceptible of modification in various particulars within the principle of construction and mode of operation involved, without departing from the spirit and scope of the appended claims.

We claim:

1. In a machine of the character described, a chamber having a discharge opening and a pair of intake openings, a receptacle holding a liquid to a level for sealing one of the intake openings and means for supplying another liquid from a different source, to overflow the other intake opening and the discharge opening and thereby

produce a vacuous condition in said chamber and siphonic action from the receptacle, until the siphonic action is broken by the exposure of the said other intake opening to the entrance of air through the exhaustion of the supply of liquid to said opening.

2. In a machine of the character described, a chamber having a discharge opening and a pair of intake openings, a receptacle holding a liquid to a level for sealing one of the intake openings and means for supplying another liquid from a different source, to overflow the other intake opening and the discharge opening and thereby produce a vacuous condition in said chamber and siphonic action from the receptacle, and means to automatically cut off the supply of the vacuum-producing liquid to expose the said other intake opening to the admission of air to break the siphonic action.

3. In a machine of the character described, a chamber having a discharge opening and a pair of intake openings, a receptacle holding a liquid to a level for sealing one of the intake openings and means for supplying another liquid from a different source, to overflow the other intake opening and the discharge opening and thereby produce a vacuous condition in said chamber and siphonic action from the receptacle, and means actuated by the discharge of liquid from the vacuum chamber, to cut off the supply of the vacuum-producing liquid to expose the said other intake opening to the admission of air to break the siphonic action from the said receptacle.

4. In a machine of the character described, a pair of receptacles for different liquids, a chamber having a pipe depending into each receptacle, and a discharge pipe, means for charging one receptacle with liquid to a level intermediate the length of the pipe depending into such receptacle, and means for supplying liquid to the other receptacle to a plane higher than the upper ends of the other depending pipe and said discharge pipe.

5. In a machine of the character described, a pair of receptacles for different liquids, a chamber having a pipe depending into each receptacle, and a discharge pipe, means for charging one receptacle with liquid to a level intermediate the length of the pipe depending into such receptacle, means for supplying liquid to the other receptacle to a plane higher than the upper ends of the other depending pipe and said discharge pipe, and means actuated by discharging liquid to automatically determine the quantity of liquid supplied to said other receptacle.

6. In a machine of the character de-

scribed, a pair of receptacles for different liquids, a chamber having a pipe depending into each receptacle, and a discharge pipe, means for charging one receptacle with liquid to a level intermediate the length of the pipe depending into such receptacle, means for supplying liquid to the other receptacle to a plane higher than the upper ends of the other depending pipe and said discharge pipe, and means for automatically determining the quantity of liquid necessary to be supplied to said other receptacle to reach the said plane, regardless of the rate of flow from the point of supply.

7. In a machine of the character described, a pipe for delivering liquid under pressure, a valve normally closing said pipe, a cylinder provided with a restricted discharge opening, means having a port normally communicating with the delivery pipe at the opposite side of the valve from the delivery pipe and with the cylinder, and means to unseat the valve to open communication between the delivery pipe and the said port; said ported means being adapted under excess pressure supplied to the cylinder to operate to close communication between the pipe and cylinder.

8. In a machine of the character described, a pipe for delivering liquid under pressure, a valve normally closing said pipe, a cylinder provided with a restricted discharge opening, means having a port normally communicating with the delivery pipe at the opposite side of the valve from the delivery pipe and with the cylinder, means to unseat the valve to open communication between the delivery pipe and the said port; said ported means being adapted under excess pressure supplied to the cylinder to operate to close communication between the pipe and cylinder, and means to secure the valve in unseated position.

9. In a machine of the character described, a pipe for delivering liquid under pressure, a valve normally closing said pipe, a cylinder provided with a restricted discharge opening, means having a port normally communicating with the delivery pipe at the opposite side of the valve from the delivery pipe and with the cylinder, means to unseat the valve to open communication between the delivery pipe and the said port; said ported means being adapted under excess pressure supplied to the cylinder to operate to close communication between the pipe and cylinder, means to secure the valve in unseated position, and means actuated by the discharge of the liquid delivered to the cylinder, to trip the valve-securing means to effect reseating of the valve and the restoration of the ported means to normal position.

10. In a machine of the character de-

scribed, a pipe for delivering liquid under pressure, a valve normally closing said pipe, a cylinder provided with a restricted discharge opening, means having a port normally communicating with the delivery pipe at the opposite side of the valve from the delivery pipe and with the cylinder, means to unseat the valve to open communication between the delivery pipe and the said port; said ported means being adapted under excess pressure supplied to the cylinder to operate to close communication between the pipe and cylinder, means to secure the valve in unseated position, and means actuated by the discharge of the liquid from the cylinder, to take up a fixed quantity of a second liquid and mix it with the first.

11. In a machine of the character described, a pipe for delivering liquid under pressure, a valve normally closing said pipe, a cylinder provided with a restricted discharge opening, means having a port normally communicating with the delivery pipe at the opposite side of the valve from the delivery pipe and with the cylinder, means to unseat the valve to open communication between the delivery pipe and the said port; said ported means being adapted under excess pressure supplied to the cylinder to operate to close communication between the pipe and cylinder, means to secure the valve in unseated position, means actuated by the discharge of the liquid from the cylinder, to take up a fixed quantity of a second liquid and mix it with the first, and means actuated by discharge of the liquid as mixed, to trip the securing means and permit the valve to be reseated.

12. In a machine of the character described, a supply pipe for liquid under pressure, a valve closing said pipe, manually-operable means to unseat the valve, means for latching it in unseated condition, means actuated by the liquid after the valve is unseated, to trip the latching means, and means to automatically reseal the valve to cut off the supply of liquid from said pipe.

13. In a machine of the character described, a supply pipe for liquid under pressure, a valve closing said pipe, manually-operable means to unseat the valve, means for latching it in unseated condition, a receptacle for another liquid, means whereby the flow of the first liquid shall effect siphonic action of liquid from the receptacle and the mixture of such liquids, means actuated by the flow of the mixed liquids to trip the latching means, and means to automatically reseal the valve to cut off the supply of the liquid from the supply pipe.

14. In a machine of the character described, a supply pipe for liquid under pressure, a valve for said pipe, a receptacle, means for automatically maintaining a liquid in the receptacle to a fixed level, a

yieldingly-actuated rocker bar for seating the valve, a shaft, yielding means for holding the shaft in and for restoring it to a certain position, manually-operable means 5 to turn the shaft a partial revolution in opposition to said yielding shaft holding and restoring means, means actuated by the shaft to trip the valve from its seat, means to latch the valve in tripped position, means 10 actuated by the liquid released by the unseating of the valve, for tripping the latching means to permit the rocker bar to reseat the valve, a ratchet wheel fixed on the shaft, a spring-actuated pawl rotatable around the ratchet wheel, and spring-actuated means to 15 return the pawl to normal position as the revolution of the shaft is automatically completed by said yielding shaft holding and restoring means.

In witness whereof we hereunto affix our 20 signatures.

ARTHUR B. WALTERS.
FRANK A. MADDEN.