Feb. 9, 1926. 1,572,338

L. E. WAITE

LIQUID DISPENSER

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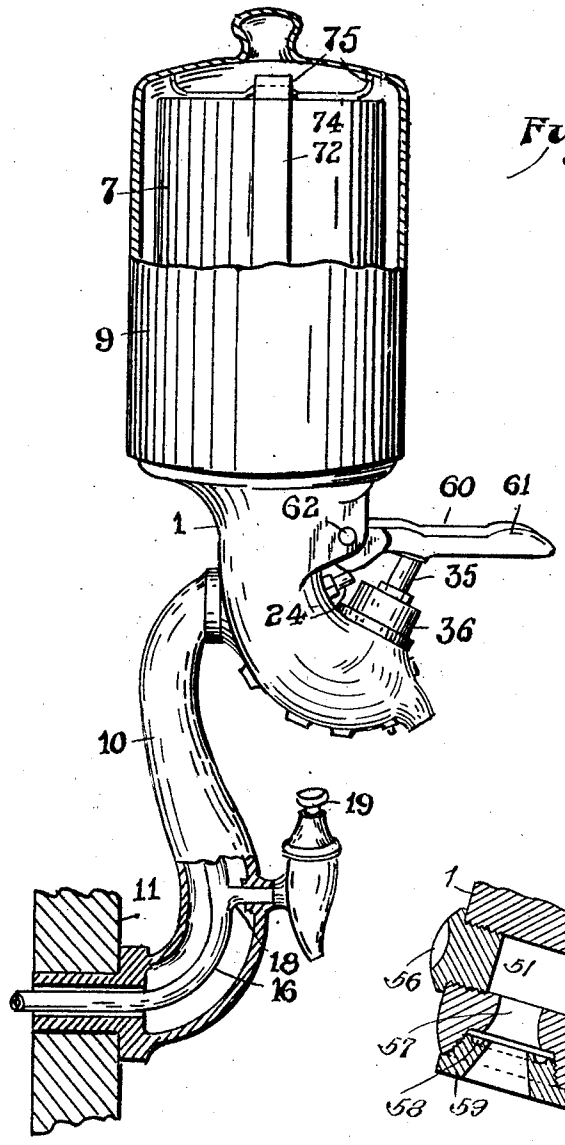
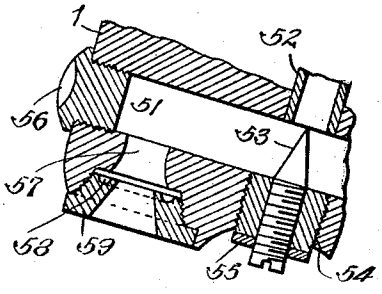


Fig. 1

Fig. 9.



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Fig 2

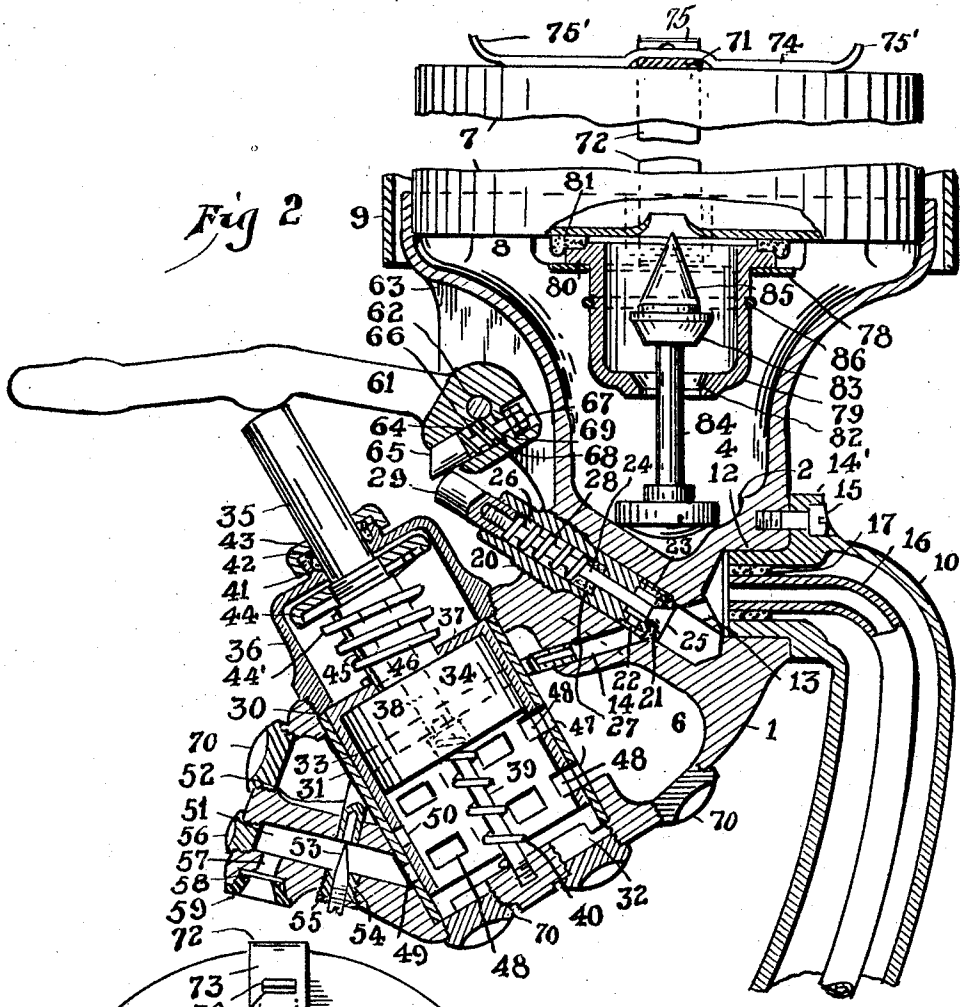
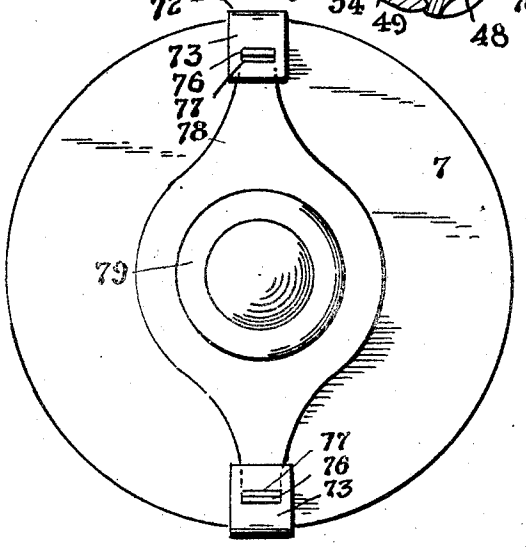


Fig. 6



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Fig. 5

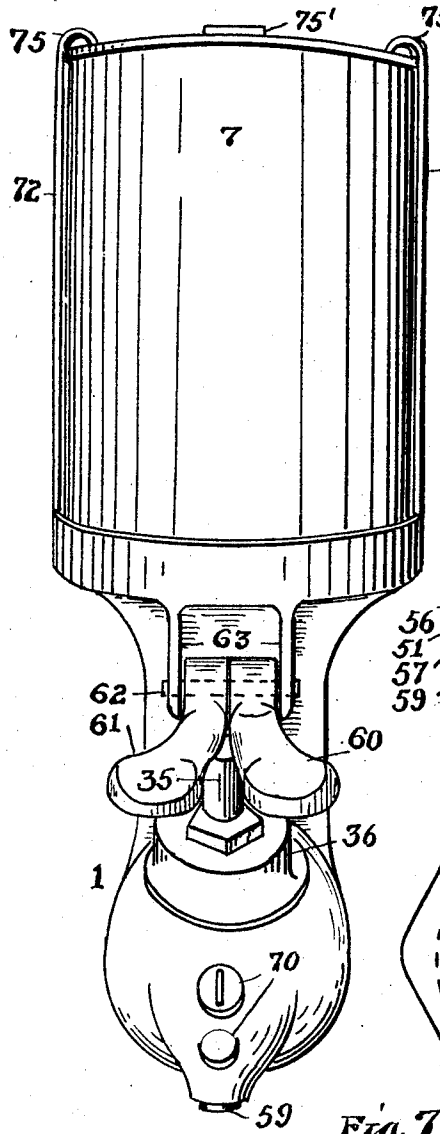


Fig. 3

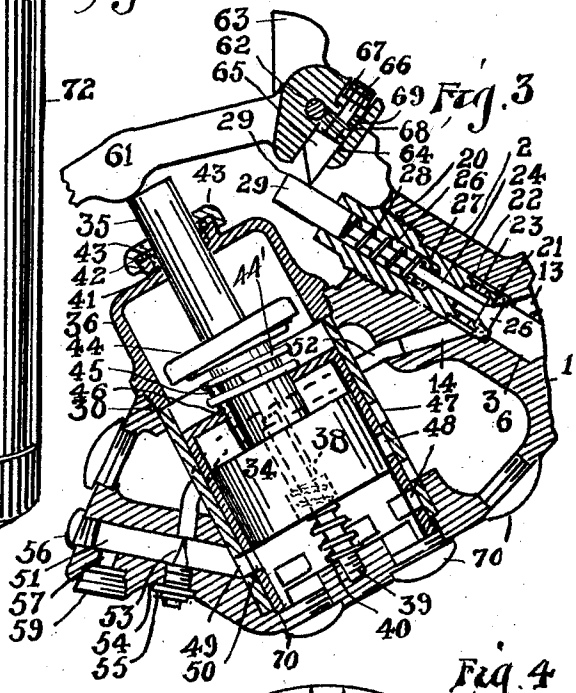


Fig. 4

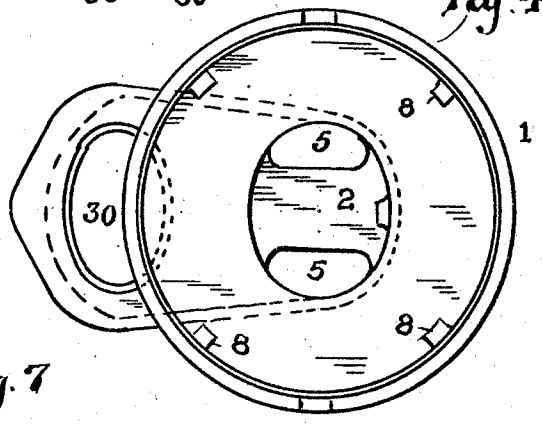


Fig. 7

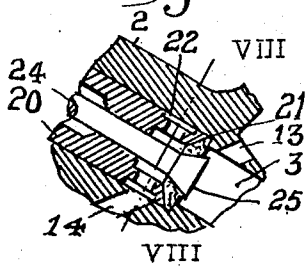
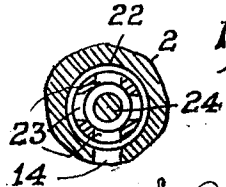


Fig. 8



INVENTOR

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Patented Feb. 9, 1926. 1,572,338

UNITED STATES PATENT OFFICE.

LORENZO E. WAITE, OF TOLEDO, OHIO, ASSIGNOR TO THE TOLEDO MILLING MACHINE COMPANY, OF TOLEDO, OHIO, A CORPORATION OF DELAWARE.

LIQUID DISPENSER.

Application filed July 28, 1924. Serial No. 728,618.

To all whom it may concern:

Be it known that I, LORENZO E. WAITE, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Liquid Dispensers, of which the following is a specification.

My invention relates to liquid dispensers and its principal object is to dispense, at the will of its operator, a single article, for example, liquid chocolate, alone; or plural liquids intimately mixed, for example, chocolate and water. Another object is to dispense the articles and the ingredients in measured quantities. Another object is to provide improved details in mechanical construction and combinations thereof whereby the dispensing may be cheaply and efficiently effected. Other objects appear here nafter.

Referring to the accompanying drawings, Fig. 1 is a perspective view of a liquid dispenser embodying my invention, parts being in section; Fig. 2, an enlarged central vertical section of Fig. 1, parts being broken away; Fig. 3, an enlarged portion of Fig. 2, showing the parts in a different position from that shown in Fig. 2; Fig. 4, a top plan view of the main casing; Fig. 5, a front elevation of my liquid dispenser with the cover removed; Fig. 6, a bottom plan view of a liquid-containing can assembled with the can puncturing and valve-attachment; Fig. 7, an enlarged view of a fragment showing the parts adjacent to the valve 25; Fig. 8, a cross-section on the line VIII—VIII on Fig. 7; and Fig. 9, an enlarged sectional view of the nozzle 59 and adjacent parts.

On the drawings, 1 designates a hollow casting of irregular shape, but approximately L-shaped. The front and rear wall portions of the casting are connected by the bridge 2 having a downward and rearwardly inclined opening 3. The hollow of the casing above the bridge is marked 4; the hollows at the sides of the bridge are marked 5; and the hollow below the bridge is marked 6.

The upstanding member of the casing and the hollow 4 therein has the shape of a funnel or an inverted bell, the upper end thereof inclosing the lower end of the can 7 which stands on the internal lugs 8 projecting inwardly from the inner face of the casting a short distance below the upper end of the latter. The can is enclosed above and laterally by the cover 9 which also encloses the upper end of the casting.

I prefer to support the casting by the hollow bracket 10 having its lower end connected to any suitable support, as 11, and its upper end connected to the rear face of the casting opposite the bridge 2. The bracket has its upper portion projecting laterally into the recess 12 in the casting, this recess communicating with the inner end of the opening 3 through the passage 13. A short distance above the passage 13 there is a bore 14 in the lower side of the bridge 2, the bore leading from the opening 3 to the hollow 6. The bracket has the flange 14′ which lies against the outer face of the casting, to which it is secured by the screws 15. The fit of the bracket to the casting is such as to prevent any fluid escaping from the recess 12 to the rear face of the casting.

The hollow of the bracket has the tube 16 extending from one end to the other and having its outer or lower end connected with a supply of water under pressure, or with carbonated liquid, or the like. The upper or inner end of the tube is packed off from the hollow of the bracket by the annular packing 17. The tube 16 discharges into the inner end of the recess 12. The tube 16 has the branch tube 18 below the casting 1. A valve 19 controls the dispensing of fluid from the branch tube.

A sleeve 20 is screwed into the open upper end of the opening 3, and its lower end rests upon the annular valve seat 21 supported on a shoulder just below the bore 14. The portion of the sleeve opposite the inlet of the bore is provided with a circumferential recess 22, from which a number of radial openings 23 lead to the interior of the sleeve. The hollow in the sleeve 20 is provided with the valve-stem 24 having at its lower end the valve 25 closing the valve seat 21 from below. The internal diameter of the sleeve opposite the radial passages 23 is enlarged so that the liquid passing the valve 25 may pass the valve-stem and have access to the radial passages. The hollow in the sleeve fits the valve-stem for a short distance beyond the recess 22 and then widens out into the larger bore 26. The lower end of the bore 26 has the packing 27 to seal the bore

from the liquid in the lower end of the sleeve. A coil spring 28 surrounds the valve-stem and has its lower end resting on the packing and its upper end against the inner end of the plug 29 screwed onto the upper end of the stem 24 to retain the spring and to adjust its tension or the pressure of the valve 19 on its seat 21.

The upper face of the lower portion of the casting below the bend of the L-shape has a large opening 30 directed downwardly and rearwardly. The hollow stationary member 31 of a sleeve or cylindrical valve has its upper end surrounded by the wall of the opening 30 while the lower end extends into the recess 32 in the inner face of the opposite wall of the casing. Slidable within the stationary member 31 and with a close fit therein is the hollow movable cylindrical member 33 of the sleeve valve. The plunger or piston 34 fits the inner face of the sleeve member 33 and has the operating rod or stem 35 extending up for some distance diagonally beyond the surrounding portion of the casting 1. The upper end of the movable sleeve members 31 and 33 are engaged by the cap 36 screwed into an enlarged portion of the opening 30. The outer end of the sleeve member 33 has the integral closure 37 provided with a hole for the stem 35. A bore 38 is made from the lower face of the plunger for the rod 39 screwed into the inner face of the casting centrally of the sleeves 31 and 33. A coiled spring 40 surrounds the rod 39 and has one end pressing on the inner face of the casting and its upper end against the upper end of a recess in the bottom of the plunger and coaxial with the bore 38. This spring unless prevented holds the sleeve 33 against the cap 36 and the plunger against the closure 37 as shown in Fig. 2.

The stem 35 projects beyond the outer end of the cap 36 which is provided with the packing ring 41 on which rests the follower 42 pressed down by the screw cap 43 on cap 36 to adjust the packing to a fluid-tight fit with the stem. 44 is a collar screwed on the stem 35 a little below the outer end of the cap 36. A coiled spring 44′ surrounds the stem and presses against the closure 37 and the collar 44. The stem 35 is prevented from rotating by having a rib 45 slidable in a notch 46 in the said closure. The two sleeve members 31 and 33 have a number of inlet openings 47 and 48, respectively, which, when the parts are as shown in Fig. 2, register with each other and form a direct passage for fluid in the hollow 6 into the interior of the movable sleeve member 33, these openings being below the plunger 34.

The sleeve member 31 has the outlet opening 49 near its bottom and the sleeve member 33 has an outlet opening 50 out of registry with each other when the openings 47 and 48 are in registry, the openings 49 and 50 being in registry when the openings 47 and 48 are out of registry. The outlet opening 49 opens into the mixing chamber 51 extending longitudinally near the lower face of the casting.

A pipe 52 extends from the bore 14 to the central portion between the ends of the chamber 51. A needle or regulating pin 53 is threaded through a plug 54 screwed into the lower side of the casting, the parts being arranged so that the point of the needle stands directly opposite the outlet of the pipe 52 and the length of the needle being in the line of the discharge of fluid from the pipe. The needle is locked to the plug by the jam-nut 55. The outer end of the chamber 51 is closed by the plug 56. At the outer end of the chamber 51 is a discharge opening 57 which delivers a portion of the dispensed fluid or fluids into the annular groove 58 in the upper face of a nozzle or ring 59 screwed in the casting. The nozzle is in axial alinement with the discharge opening 57.

60 and 61 are two operating handles or levers pivoted side by side on the pin 62 held in the ears 63 in the front face of the casting 1 above the bend of the L-shape. Each lever rests on the outer end of the stem 35, so that the latter may be depressed by either lever.

The lever 61 has a bore 64 below the pivot. In this bore is the slidable dog 65 having its outer end resting on the outer end of the stem 24, this end extending forward beyond the pin 62. The dog is pressed yieldingly to its outer position by the spring 66 and held at the proper adjustment by the nuts 67 screwed on the outer end of the stem 68 of the dog and bearing against the shoulder 69 in the lever 61. The parts are preferably so arranged that when the dog rests on the plug 29 the lever 61 rests on the stem 35. When the lever 61 is pressed down both of said stems go down together, but after a certain travel the dog slips back in the bore 64 and off from the top of the plug 29, permitting the spring 28 to close the valve 25. Upon the lifting of the lever 61 to its upper limit the spring 66 pushes the dog out over the end of the plug 29, thus setting it for another dispensing operation.

The casing is provided with several screw plugs 70 which permit access to the interior for cleaning.

Before the can 7 is assembled with the machine, it is placed in a frame, to which a combined can opener and valve are attached. The frame includes a metal strip which has one portion 71 constructed to lie diametrically across one end of the can,

and two portions 72 extending from the ends of the portion 71 longitudinally along the adjacent sides of the can to the remaining end of the can, where the ends of the portions 72 are bent toward each other to form hooks 73 which overlie the remaining end of the can. The frame has also a metal strip 74 riveted to the portion 71 opposite the axial center of the can and extending at right angles to the said portion 71. The strip 74 does not exceed in length the diameter of the can. The portion 71 and the strip 74 have the feet 75 and 75′ forming a support for the frame.

The hooks 73 have the holes 76 in which the lugs 77 at the ends of the bridge 78 of elastic spring metal extend, the bridge crossing the center of the can where it is provided with an opening to receive the valve casing 79 which has a flange 80 resting on the bridge 78. This casing has one end open which is pressed against the gasket 81 lying against the end of the can. The elasticity of the bridge presses the bridge tightly against the gasket, and the gasket against the can. The remaining end of the valve casing has the opening or valve seat 82 closable by the valve 83 within the casing 79. The valve has the stem 84 extending past the valve seat 82 to such a distance that, when the can is being placed in dispensing position, the outer end of the stem engages the bridge 2 so as to stop the travel of the stem shortly before the can reaches the lugs 8. The inner end of the valve 83 carries the can piercing point 85. The parts are so proportioned that when the valve 83 is on its seat 82 the point 85 does not enter the can. The can is pierced by driving the point 85 into the can by a blow on the stem 84. The parts are proportioned so that, when the stem 84 rests on the bridge 2 and the can is on the lugs 8, the valve is off from its seat and the point 85 is partially withdrawn from the opening made by the point in the can. 86 is a spring wire seated in a groove in the casing 79 to keep the bridge 78 and the valve casing assembled before their application to the can.

The can is assembled with the puncturing and valve attachment. The can end is punctured by driving the stem 84 inwardly to make the puncture 87. The valve 83 is placed on its seat 82 and the can with the attachment thereon is seated on the lugs 8, the stem 84 engaging the bridge 2 a certain distance before the can is so seated, the stem being thereby lifted so as to open the valve but not enough to obstruct the puncture 87. The liquid, chocolate, for example, flows from the can down into the casing and fills the measuring valve by flowing through the registering ports 47 and 48. If chocolate only is to be dispensed the lever 60 is pressed down causing, at first, as before explained, the non-registry of the ports 47 and 48 and the registry of the outlet ports 49 and 50, and then the descent of the plunger 34 in the valve member 33, which expels the liquid into the chamber 51 whence it escapes through the opening 57 and the nozzle 59 to be received upon a dish of ice-cream or any other suitable receptacle.

In case the chocolate is to be mixed with another fluid, as water, from the pipe 16, the lever 61 is depressed. This causes the chocolate to be delivered as when the lever 60 was pressed down. At the same time the dog 65 carried by the lever 61 causes the valve 25 to be unseated, as before described, and water from the pipe 16 flows past the valve 25 and through the pipe 52 into the chamber 50 where it is injected into the chocolate as it passes to the nozzle 59. The water is spread by the needle 53 so as to be well mixed with the chocolate. The mixture is further mixed by the currents set up by the groove 58. When the lever 61 has descended to a predetermined position, the dog slips off from the plug 29, as shown in Fig. 3, to allow the valve 25 to close. When the lever is returned to its upper or normal position the dog snaps over the end of the plug, as hereinbefore explained. When the plunger ascends it creates a suction which draws fluid into the hollow member or measuring chamber 31 and also away from the nozzle 59 and back down the passage or chamber 50 so that no fluid drops from the nozzle after the plunger begins to ascend. The spring 40 returns the plunger 34 and its stem and the valve member 33 to normal positions, as shown in Fig. 2. The spring 44′ moves the member 33 down and permits the independent further movement of the stem 35 for expelling the fluid from the member 33. The tension of spring 44′ can be regulated by adjusting the collar 44 on the stem 35.

I claim—

1. In a liquid-dispensing machine, a hollow fluid-containing casing, a mixing chamber therein, a measuring chamber having an inlet from the hollow of the casing and an outlet to the mixing chamber, a valve for causing the inlet to be open or closed when the outlet is closed or open, respectively, means for forcing fluid from the measuring chamber into the mixing chamber, means for conveying a second fluid to the mixing chamber, and means for operating the forcing means and for initially operating the valve to close the inlet and open the outlet.

2. In a liquid-dispensing machine, a hollow fluid-containing casing, a mixing chamber therein, a measuring chamber having an inlet from the hollow of the casing and an outlet to the mixing chamber, a valve for closing and opening the inlet, means for forcing fluid from the measuring chamber into the mixing chamber, means for conveying a second fluid to the mixing chamber, a valve

past which the second fluid flows, and means for operating both valves and the forcing means substantially simultaneously.

3. In a liquid-dispensing machine, a hollow fluid-containing casing, a mixing chamber therein, a valved measuring chamber having an inlet from the hollow of the casing and an outlet to the mixing chamber, the inlet being open or closed when the outlet is closed or open, respectively, means for forcing fluid from the measuring chamber into the mixing chamber, means for conveying a second fluid to the mixing chamber, a valve past which the second fluid flows, means for opening the valve and for operating the forcing means substantially simultaneously, and means whereby the valve is released when the forcing means moves a predetermined distance.

4. In a liquid-dispensing machine, a hollow fluid-containing casing, a mixing chamber therein, a measuring chamber having an inlet from the hollow of the casing and an outlet to the mixing chamber, a valve for closing and opening the inlet, means for forcing fluid from the measuring chamber into the mixing chamber, means for conveying a second fluid to the mixing chamber, a valve past which the second fluid flows, a single means for operating the forcing means and the valve and a separate means for operating the forcing means only.

5. In a liquid-dispensing machine, a hollow casing to contain a fluid to be dispensed, a mixing chamber therein, means for delivering a second fluid to the chamber, a fixed sleeve valve member on the casing having inlet and outlet ports for the first liquid, a slidable sleeve valve member telescoping the fixed member and having an inlet port registering with the first inlet port when the slidable sleeve is in one position and an outlet port registering with the first outlet port when the slidable sleeve is in a second position, and means for expelling the fluid from the sleeve valve when the inlet ports are closed.

6. In a liquid-dispensing machine, a hollow casing to contain a fluid to be dispensed, a mixing chamber therein, means for delivering a second fluid to the chamber, a fixed sleeve valve member in the casing having inlet and outlet ports for the first liquid, a slidable sleeve valve member telescoping the fixed member and having an inlet port registering with the first inlet port when the slidable sleeve is in one position and an outlet port registering with the first outlet port when the slidable sleeve is in a second position, means for expelling the fluid from the valve when the inlet ports are closed, and means admitting the second fluid to the mixing chamber, only when the expelling means is operating.

7. In a liquid-dispensing machine, a hollow casing to contain a fluid to be dispensed, a mixing chamber therein, means for delivering a second fluid to the chamber, a fixed sleeve valve member in the casing having inlet and outlet ports for the first liquid, a slidable sleeve valve member telescoping the fixed member and having an inlet port registering with the first inlet port when the slidable sleeve is in one position and an outlet port registering with the first outlet port when the slidable sleeve is in a second position, means for expelling the fluid from the sleeve valve when the inlet ports are closed, means admitting the second fluid to the mixing chamber, only when the expelling means is operating, and means for closing the admitting means at the close of the expelling action.

8. In a liquid-dispensing machine, a dispensing chamber for mixed fluids and an outlet nozzle therefor having an annular groove on its inner end and surrounding the outlet to receive a portion of the fluid and agitate the same.

9. In a liquid-dispensing machine, a hollow fluid-containing casing, a mixing chamber, an outlet therefor, a measuring chamber having a valved inlet from the hollow of the casing and an outlet to the mixing chamber, a plunger arranged to move in one direction to force fluid from the measuring chamber into the mixing chamber and in the opposite direction to retract fluid from the mixing chamber outlet and to suck fluid into the measuring chamber, and means for closing the inlet valve when the plunger is forcing the fluid and for opening the said valve when the plunger is moving in said opposite direction.

10. In a liquid-dispensing machine, a liquid supply means, a measuring chamber, an outlet passage from the chamber, and means operating in one direction to expel the liquid from the measuring chamber and through the outlet passage and in another direction to retract the liquid from the delivery end of the outlet passage and to suck another measure of fluid into the measuring chamber.

11. In a liquid-dispensing machine, a fluid supply chamber, a mixing chamber adapted to receive fluid from the supply chamber, an outlet passage from the mixing chamber, a passage for a second fluid, opening into the mixing chamber, and a tapered pin arranged in the mixing chamber and in alinement with the outlet of the second passage.

12. In a liquid-dispensing machine, separate elements controlling the travel of two liquids, a device actuating one of the elements, a second device actuating simultaneously both of the elements, and means whereby the second device is released from one of the said elements when the second device has moved a certain distance.

13. In a liquid-dispensing machine, separate elements controlling the travel of two liquids, a device actuating one of the elements, a second device actuating simultaneously both of the elements, and means whereby the second device is released from one of the said elements when the second device has moved a certain distance, the said means comprising a dog yieldingly held in operative position by a spring.

14. In a liquid-dispensing machine, a liquid-measuring chamber having inlet and outlet openings, a sleeve valve slidable thereon and having, when in one position inlets registering with the inlets in the said chamber, and when in another position outlets registering with the outlets in the said chamber, a plunger reciprocable in the sleeve valve to force liquid from the said chamber, a stem for operating the plunger and working through one end of the sleeve valve, a spring on the said end of the sleeve valve to force the latter to its outlet opening and inlet closing position, and a collar on the stem compressing the spring on the liquid-forcing movement of the plunger, the spring permitting the said movement after the sleeve valve has reached the said position.

15. In a liquid-dispensing machine, a liquid-measuring chamber having inlet and outlet openings, a sleeve valve slidable thereon and having, when in one position inlets registering with the inlets in the said chamber, and when in another position outlets registering with the outlets in the said chamber, a plunger reciprocable in the sleeve valve to force liquid from the said chamber, a stem for operating the plunger and working through one end of the sleeve valve, a spring on the said end of the sleeve valve to force the latter to its outlet opening and inlet closing position, a collar on the stem compressing the spring on the liquid-forcing movement of the plunger, the spring permitting the said movement after the sleeve valve has reached the said position, and means adjusting the tension of the spring.

In testimony whereof, I hereunto affix my signature this 25th day of July, 1924.

LORENZO E. WAITE.