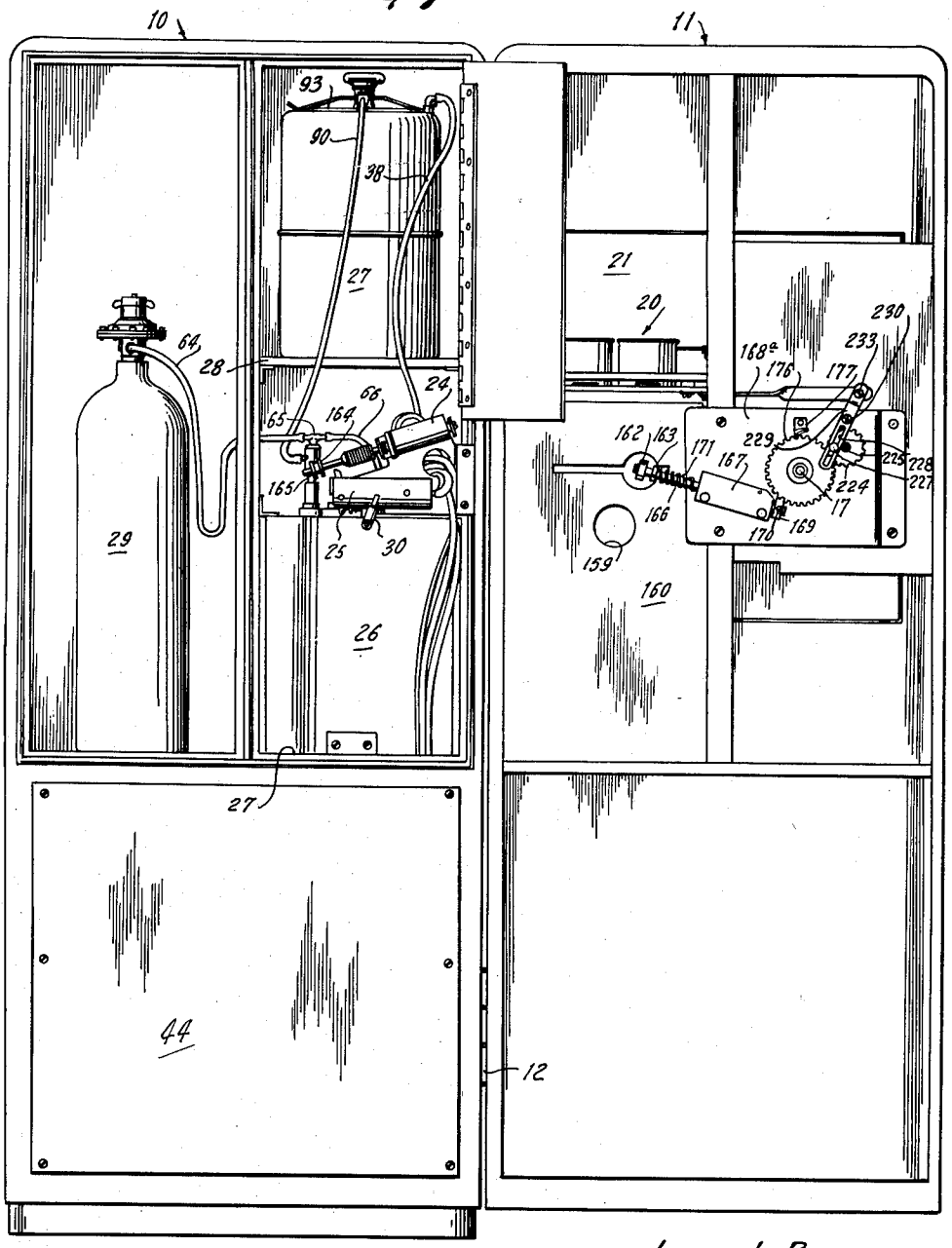
May 29, 1956 J. J. BOOTH 2,747,782

MACHINE FOR VENDING BEVERAGE IN CUPS

Filed June 9, 1951 6 Sheets-Sheet 1

Fig. 1



JACK J. BOOTH
INVENTOR.

BY

ATTORNEY

May 29, 1956 J. J. BOOTH 2,747,782

MACHINE FOR VENDING BEVERAGE IN CUPS

Filed June 9, 1951 6 Sheets-Sheet 2

Fig. 2

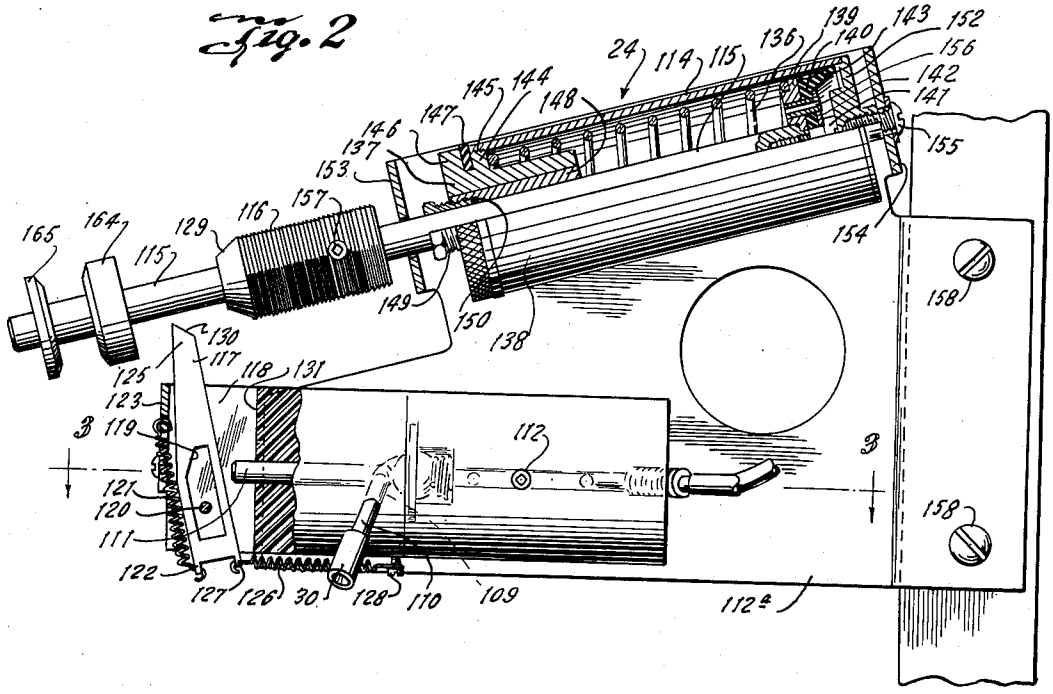


Fig. 3

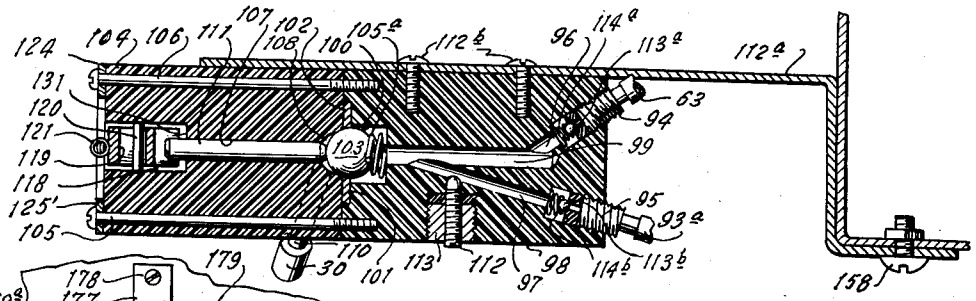
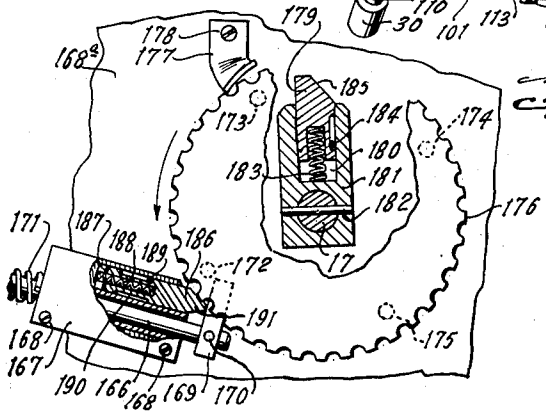


Fig. 6



JACK J. BOOTH
INVENTOR.

BY

ATTORNEY

May 29, 1956 J. J. BOOTH 2,747,782

MACHINE FOR VENDING BEVERAGE IN CUPS

Filed June 9, 1951 6 Sheets-Sheet 3

Fig. 5

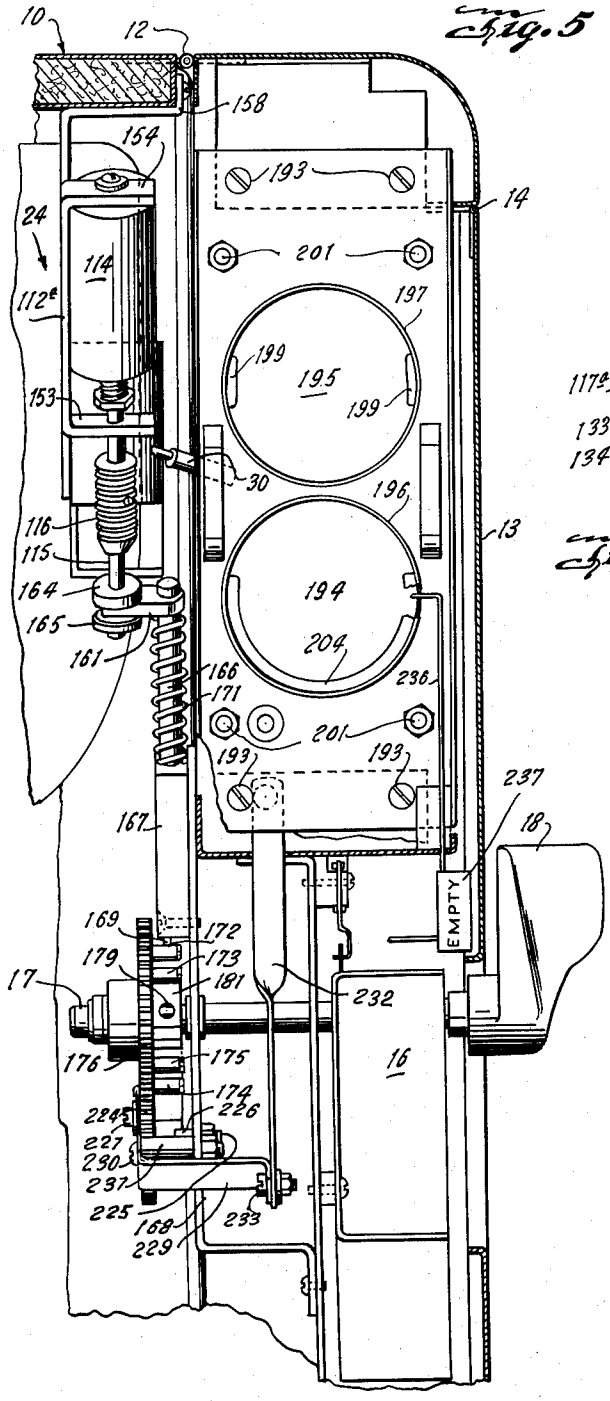


Fig. 4

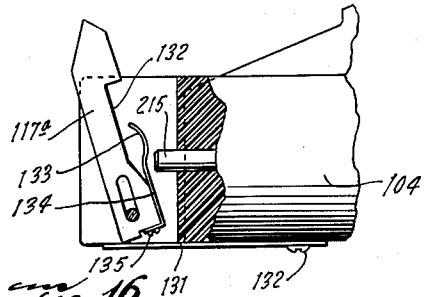
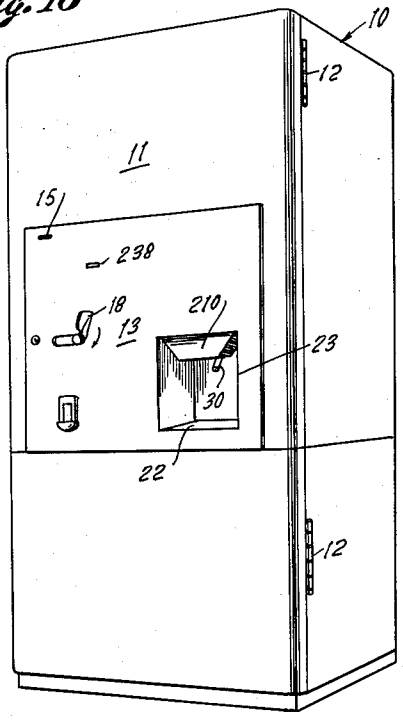


Fig. 16



JACK J. BOOTH
INVENTOR.

BY

ATTORNEY

May 29, 1956 J. J. BOOTH 2,747,782

MACHINE FOR VENDING BEVERAGE IN CUPS

Filed June 9, 1951 6 Sheets-Sheet 4

Fig. 7

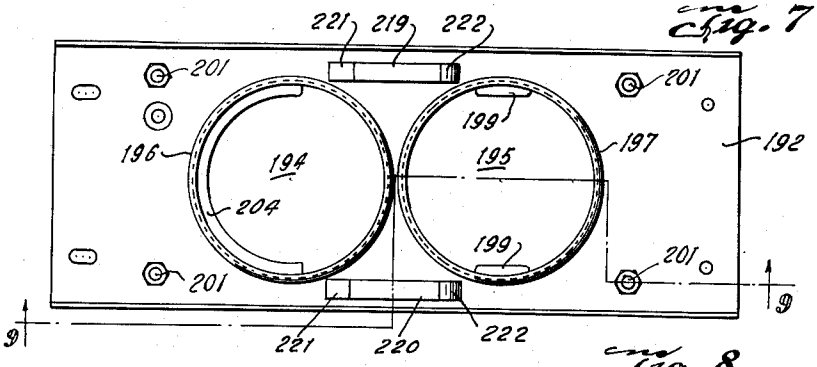


Fig. 8

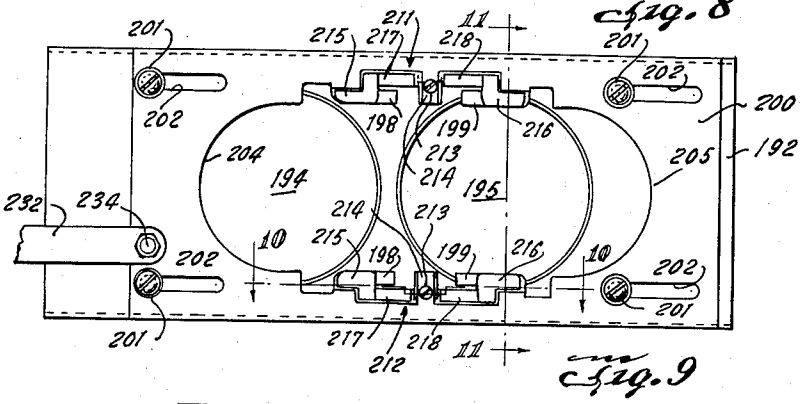


Fig. 9

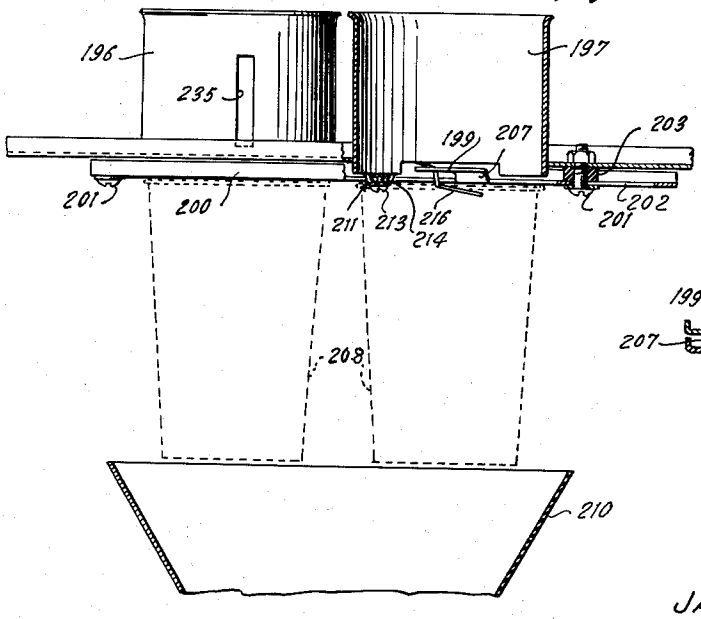


Fig. 11

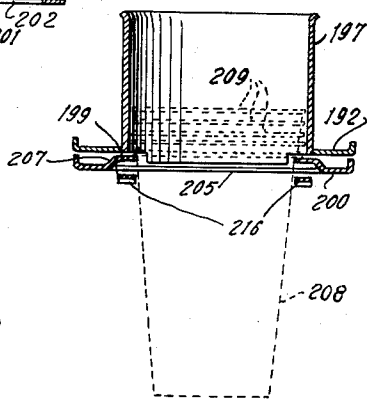
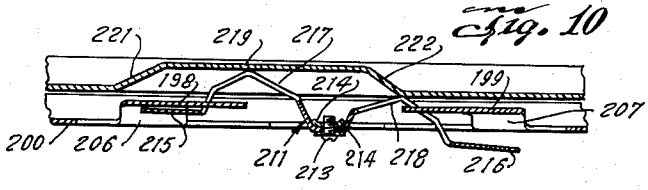


Fig. 10



JACK J. BOOTH
INVENTOR.

BY

ATTORNEY

May 29, 1956 J. J. BOOTH 2,747,782

MACHINE FOR VENDING BEVERAGE IN CUPS

Filed June 9, 1951 6 Sheets-Sheet 5

Fig. 12

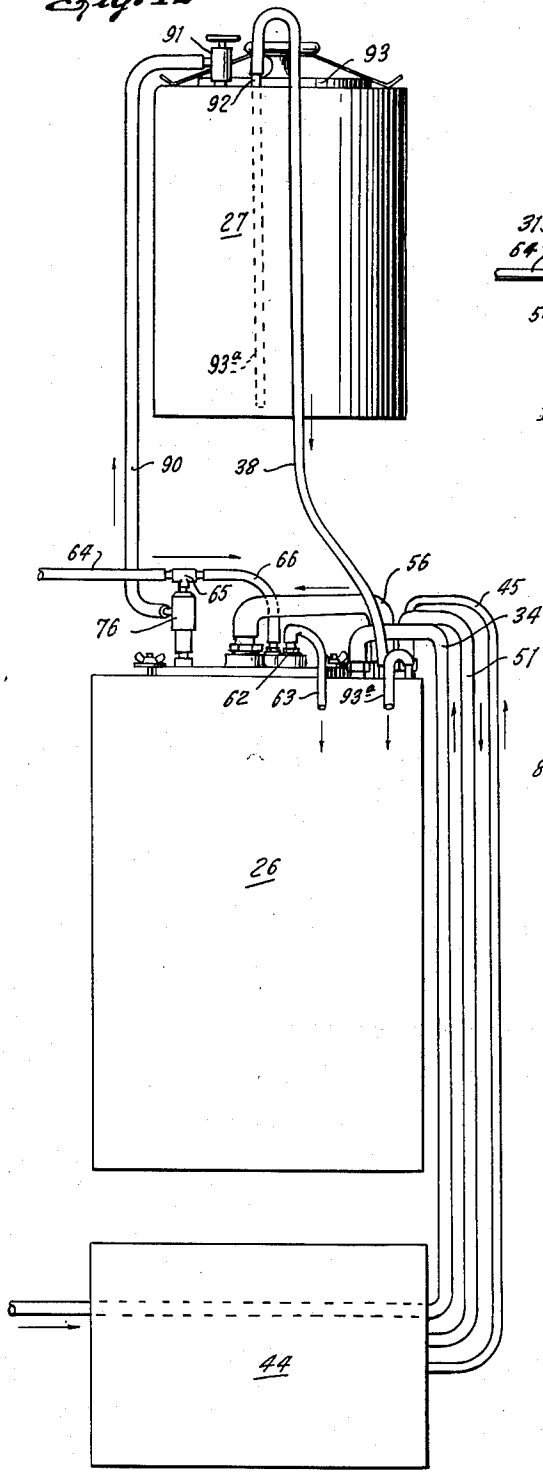


Fig. 13

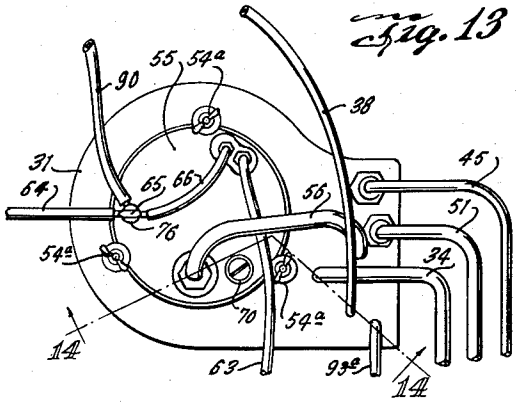
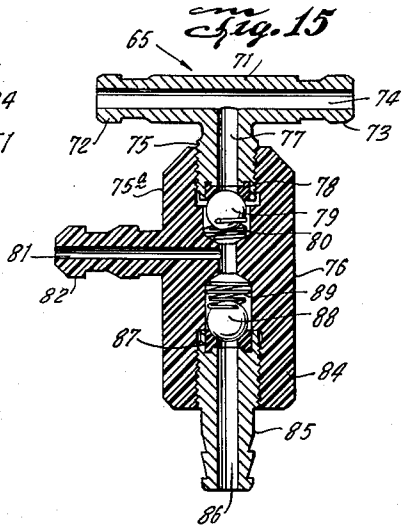


Fig. 15



JACK J. BOOTH
INVENTOR.

BY

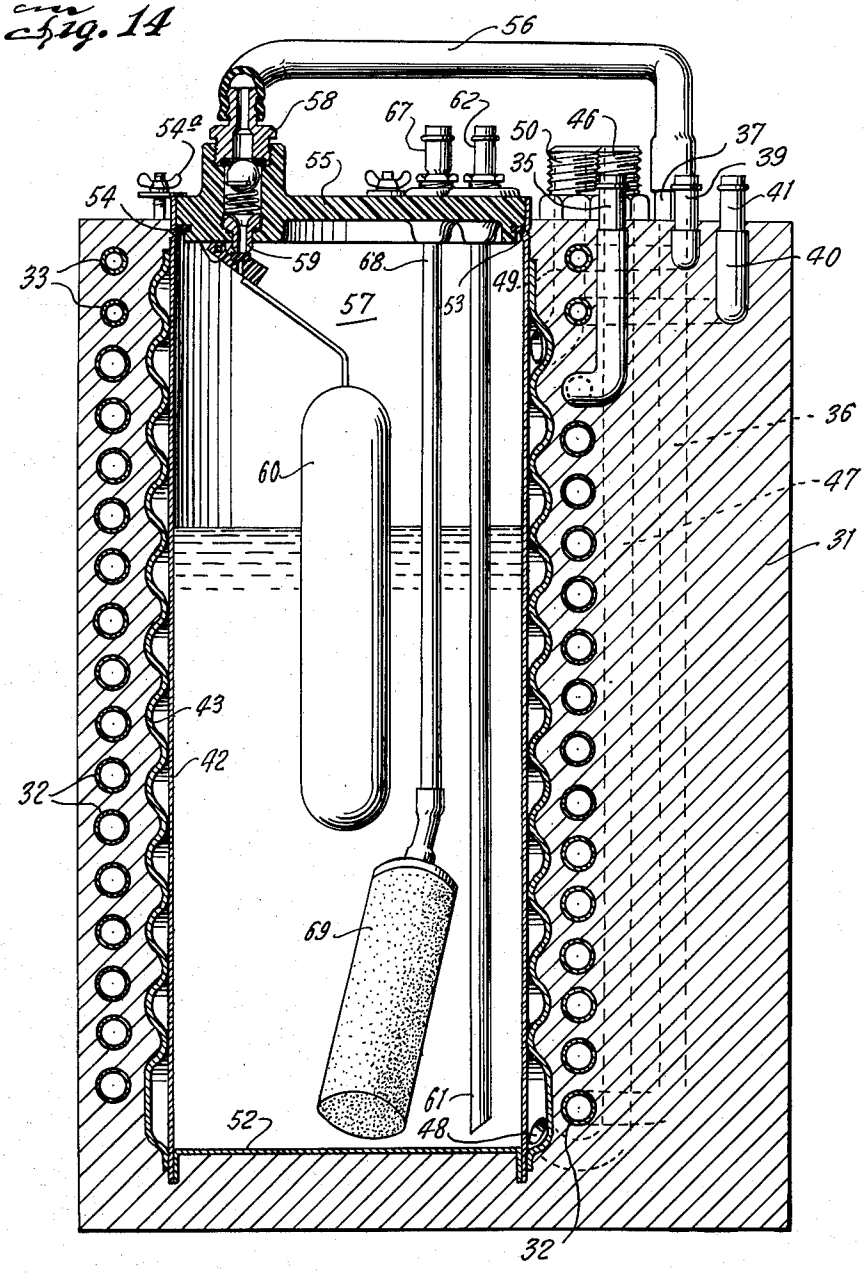
ATTORNEY

May 29, 1956 J. J. BOOTH 2,747,782

MACHINE FOR VENDING BEVERAGE IN CUPS

Filed June 9, 1951 6 Sheets-Sheet 6

Fig. 14



JACK J. BOOTH
INVENTOR.

BY

ATTORNEY

United States Patent Office 2,747,782 Patented May 29, 1956

2,747,782

MACHINE FOR VENDING BEVERAGE IN CUPS

Jack J. Booth, Dallas, Tex.

Application June 9, 1951, Serial No. 230,779

12 Claims. (Cl. 226—46.6)

This invention relates to drink vending machines and more particularly to a machine for vending a soft drink in an open receptacle such as a paper cup.

In many installations it is desirable to vend a predetermined quantity of a single flavor carbonated drink in an open receptacle such as a paper cup. The drink must be composed of a predetermined quantity of properly carbonated cold water and a predetermined quantity of cold syrup. The machine for dispensing the paper cup from a reservoir of cups, carbonating the water, mixing the carbonated water and the syrup in predetermined quantities, and delivering the mixed drink into the dispensed paper cup should be of simple design to reduce maintenance and repair servicing. Complex mechanisms dependent upon the functioning of complex electrical circuits by the actuation of numerous switches, solenoids, and the like which inevitably give difficulty, interrupt service, and require frequent costly repairs and maintenance should not be employed in such drink vending machines. It is desirable that such machines be entirely mechanical in operation with the customer providing the force necessary to dispense the paper cup and to actuate carbonated water and syrup mixing and delivery mechanism. In addition, it is desirable to provide a mechanism for quickly carbonating the water upon initiation of operation of the apparatus and maintaining the water in a properly carbonated condition as long as the machine is in use.

Accordingly, it is an object of this invention to provide a new and improved machine for dispensing a predetermined quantity of a drink in an open cup.

It is another object of this invention to provide a new and improved mechanically operated machine for dispensing a predetermined quantity of a drink in an open cup.

It is still another object of the invention to provide a new and improved means for carbonating water.

It is a further object of the invention to provide a new and improved means for quickly carbonating a supply of water to a predetermined degree and thereafter maintaining it properly carbonated.

It is a still further object of the invention to provide a new and improved carbonating system for use in vending machines having a supply of water and a supply of syrup, which are mixed to provide a carbonated drink, in which the carbon dioxide which is applied to the syrup to maintain it under pressure is first passed through the water unless the pressure of the carbon dioxide on the syrup falls below a predetermined value.

It is another object of the invention to provide a new and improved means for mixing predetermined quantities of water and syrup to form a drink of predetermined volume.

It is another object of the invention to provide a new and improved mechanically operated means for mixing predetermined quantities of water and syrup to form a drink of predetermined volume.

It is a further object of the invention to provide a new and improved dispensing device for dispensing cups alternately from two columns of stacked cups.

It is a still further object of this invention to provide a new and improved means for dispensing the lowermost cup from a vertical stacked column of cups.

It is yet another object of this invention to provide a new and improved means for dispensing the lowermost cup from a vertical stacked column of cups with a positive downward thrust.

It is a still further object of this invention to provide a new and improved mechanical means for dispensing a cup from a vertical stack of cups and delivering a predetermined quantity of a drink into the dispensed cup by the actuation of a single lever.

Briefly stated, the new and improved machine of the invention for vending a soft drink in an open receptacle includes a source of carbon dioxide under pressure, a syrup container and a refrigerated carbonator of the general type disclosed in Patent No. 2,498,524. The carbon dioxide under pressure is supplied to the carbonator to carbonate the water contained therein and to force the carbonated water to flow through a mixing and dispensing valve when the latter is opened. The carbon dioxide is supplied to the syrup container to force the syrup to flow through cooling coils in the carbonator and also through the mixing and dispensing valve. In the present machine, the carbonator is connected to the syrup container so that in normal operation the gas passing to the syrup container must first bubble through the water in the carbonator. This insures a more thorough carbonation of the water than that obtained in the device disclosed in the cited patent and expels some foreign gases from the carbonator each time a drink is dispensed. A valve is provided in the carbon dioxide supply line which permits carbon dioxide to flow directly to the syrup container whenever the pressure in the syrup container falls below a predetermined value. This feature enables the pressure in the syrup container to be built up very quickly after the container is opened for refilling or other reasons.

The device for mixing predetermined quantities of carbonated water and syrup includes a mixing and dispensing valve having a mixing chamber which is connected to the syrup container and the carbonator by suitable ducts. The outlet of the mixing chamber is closed by a spring biased ball valve which may be opened by the actuation of a valve rod. The syrup and carbonated water are kept under substantially constant pressures so that the amount of drink dispensed each time the valve rod is actuated varies directly as the length of time the valve rod is held in actuated position. A timing means actuated by an operating lever operated by the customer is employed to hold the valve rod in actuated position for a predetermined length of time each time the lever is operated. The operating lever is unlocked, each time a coin is inserted in a coin operated device, for limited movement to set the timing means in operation. Suitable locking means are provided to insure that a complete cycle of operation of the mixing and dispensing device must take place upon the operation of the operating lever before another cycle of operation can take place.

The operating lever of the device is also mechanically connected to the cup dispensing means of the machine of the invention to dispense a cup alternately from two vertical stacks of cups to place the dispensed cup below the outlet nozzle connected to the outlet of the mixing and dispensing valve. The cup dispensing means includes a stationary plate provided with a pair of apertures through which the lowermost cups of the two stacks are allowed to drop alternately each time a slide mounted on the stationary plate is moved by the operating lever.

Springs mounted on the slide plate are employed to force the lowermost cup downward to insure that the lowermost cup will drop even if it tends to adhere or stick to the next cup nested in it.

For a better understanding of the invention, reference may be had to the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawing,

Figure 1 is a front plan view of the drink vending machine with the front door in open position;

Figure 2 is a front elevational view of the mixing and dispensing valve and the timing mechanism with parts broken away;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a sectional view of a modified form of the mixing and dispensing valve actuating mechanism;

Figure 5 is a sectional top plan view of the mechanical linkage connecting the operating lever to the timing mechanism and of the cup dispensing mechanism;

Figure 6 is an elevational view of a portion of the mechanical linkage connecting the operating lever to the timing mechanism;

Figure 7 is a top plan view of the cup dispensing mechanism;

Figure 8 is a bottom plan view of the mechanism shown in Figure 7;

Figure 9 is a partly sectional view taken on the line 9—9 of Figure 7 and showing the cup positioning chute positioned beneath the cup dispensing mechanism;

Figure 10 is a sectional view taken on the line 10—10 of Figure 8;

Figure 11 is a sectional view taken on the line 11—11 of Figure 8;

Figure 12 is a diagrammatic showing of the carbonator, the syrup container and their connecting elements;

Figure 13 is a top plan view of the carbonator;

Figure 14 is a vertical sectional view of the carbonator, taken along the line 14—14 of Figure 13;

Figure 15 is a sectional view of a coupling provided with check valves; and

Fig. 16 is a front and side elevational view of the vending machine.

The illustrated preferred embodiment of the invention for vending a soft drink in an open receptacle includes an insulated cabinet 10 having a front door 11 extending across the entire width of the cabinet and mounted on the cabinet by hinges 12. The door 11 has a central opening closed by a panel 13 which is mounted on the door by a hinge 14. The panel 13 has a coin slot 15 through which coins may be inserted to operate a conventional coin actuated mechanism 16 having an operating shaft 17 which can be rotated through 90 degrees by means of the handle 18 each time a coin is inserted through the slot 15 into the coin operated mechanism 16. A linking mechanism connects the operating shaft 17 to a cup dispensing mechanism 20 which drops the lowermost cup from a vertical stack of cups stored in an appropriate space or magazine 21 in the door onto a platform 22 accessible to the customer through an aperture 23 in the front panel 13. The operating shaft 17 is also connected to a timing device 24 which holds open a mixing and dispensing valve 25 for a predetermined length of time to deliver a predetermined quantity of a mixture of cooled carbonated water and cooled syrup to the cup dropped onto the platform 22. The carbonated water is supplied to the valve 25 from a carbonator 26 and the syrup is supplied to the valve 25 from a syrup tank 27. The carbonator and the syrup tanks are disposed on suitable ledges 27 and 28, respectively, provided in the cabinet 10 and are supplied with carbon dioxide from a bottle 29 also disposed on the ledge 27. The carbon dioxide maintains the water in the carbonator 26 and the syrup in tank 27 under pressure so that the water and syrup will be forced through the mixing and dispensing valve and the nozzle 30 whenever the valve is opened.

Carbonator

The water which is mixed with syrup from the tank 27 to form the mixed drink must be properly cooled and carbonated before it reaches the valve 25. The degree of carbonation of the water is of critical importance since inadequate carbonation will result in a flat, insipid drink. The water should therefore be cooled properly before the drink is mixed since a greater amount of CO_2 can be absorbed by cold water than warm water. In addition, provision should be made to bubble CO_2 through the water in the carbonator each time some water is withdrawn. Provision should also be made to drive off any foreign gas in the carbonator since it also affects the degree of carbonation of the water.

The carbonator 26 is similar to that disclosed in the patent to Booth, No. 2,498,524, having a metal casting 31 in which are embedded two coils, a water coil 32 and a syrup coil 33. No attempt has been made in the drawing to identify the individual turns of spirals of the two coils. The syrup coil 33 has two turns while the water coil 32 has many more turns. Water is delivered to the water coil 32 from any suitable source of water through a supply pipe 34 which is connected to a fitting 35 on the exposed end of the water coil 32. The water travels downwardly through the water coil 32 and thence upwardly through an outlet pipe 36 which terminates in a fitting 37 extending above the casting 31. The syrup from the tank 27 is delivered to the syrup coil 33 through a conduit 38 which is connected to a fitting 39 on the exposed end of the syrup coil. The syrup travels downwardly through the syrup coil 33 and thence upwardly through an outlet pipe 40 which terminates in a fitting 41.

The central portion of the casting 31 is hollow and grooved in a spiral fashion so that the inner cylindrical wall member 42 and the shell 43 which abut each other continuously along a spiral line form in effect a spiral coil through which freon or other refrigerant gas may travel upwardly. The freon gas is delivered from the refrigerating unit 44 through a conduit 45 to a fitting 46 on the exposed upper end of a pipe 47 which extends vertically through the casting and connects at 48 with the shell 43. The freon gas flows upwardly through the spiral coil formed by the wall member and the shell and back to the refrigerating unit through a pipe 49, a fitting 50 on the exposed end of the pipe 49 and a conduit 51 connected to the fitting 50. The freon gas in expanding cools the casting and therefore the water and syrup. A suitable thermostat, such as the one shown in the Patent No. 2,498,524 may be fastened to the casting to control the refrigerating unit and maintain the temperatures of the water and syrup delivered from the carbonator at predetermined values.

The inner cylindrical shell 42 is of a noncorrosive metal such as stainless steel as is its bottom 52. Adjacent the upper edge of the shell 42 is formed an inwardly extending flange 53 which serves to form a seat for a gasket 54 on the plastic carbonator top 55 which closes the upper end of the shell. The carbonator top is held in air tight position in the cylindrical shell by clamps or fasteners 54*a* secured in the top of the casting 31 with the gasket 54 compressed against the flange 53.

After being precooled in the water coil 32 the water passes through a conduit 56 attached to the fitting 37 and is discharged into the central chamber 57 through a check valve 58 and a valve 59 controlled by a float 60 disposed in the chamber 57 and pivotally hung on the carbonator top 55. The float 60 and valve 59 control the level of the water in the carbonator chamber 57. The water passes from the chamber 57 through an outlet pipe 61 secured to and passing through the carbonator top 55. The top of the outlet pipe is provided with a fitting 62 to

which is connected a conduit 63 which conducts water from the outlet pipe to the mixing and dispensing valve 25.

Carbon dioxide from the tank 29 is introduced into the carbonator chamber 57 through a conduit 64, a coupling 65, a conduit 66 connected between the coupling and a fitting 67 having a reduced orifice and a check valve (not shown) and through a gas inlet pipe 68 connected to the fitting 67. A gas dispenser 69 is connected at the lower end of the gas inlet pipe 68 to distribute the gas uniformly throughout the body of water in the carbonator chamber 57.

A snifter valve 70 is secured to the carbonator top 55 and is controlled by a float valve (not shown) disposed in the carbonator chamber. The snifter valve 70, and its manner of operation has been described and illustrated in Patent No. 2,498,524. It will not, therefore, be described in detail. Indeed all the features of the carbonator described to this point have been substantially disclosed in the cited patent. In brief, plain water is injected into the carbonator chamber through the valve 59 controlled by the float 60. The float 60 closes the valve 59 when the water rises to a predetermined level in the chamber. Simultaneously with the injection of water, carbon dioxide gas passes through the reduced orifice and check valve of fitting 67, the gas inlet pipe 68 and through the gas dispenser 69 whence it bubbles upwardly through the water in the chamber. The water is carbonated by the gas which bubbles through it and also by the gas which collects between the surface of the water and the carbonator top.

During the initial stages of the filling of the chamber with water, the float of the snifter valve 70 will keep the snifter valve open. This permits air and gas to discharge freely through the orifice of the snifter valve until the water rises to a predetermined level and raises the snifter valve float thus closing the snifter valve.

The carbonator, water and carbon dioxide supply controls described above are substantially the same as those described in the Patent No. 2,498,524. In order to increase the amount of carbon dioxide gas which is bubbled through the water in the carbonator chamber each time a drink is dispensed, the carbon dioxide supplied to the syrup tank is normally not supplied directly to the syrup tank as in the cited patent but must first pass through the water in the carbonator. To accomplish this, the coupling 65 has a T-member 71 whose ends 72 and 73 are adapted to be connected to conduits 64 and 66, respectively so that carbon dioxide gas passes through the bore 74 into conduit 66 and thence to the gas inlet pipe 68. The dependent leg 75 is externally threaded to engage in the internally threaded bore in the upper end 75*a* of the T-shaped valve body 76. The dependent leg has a bore 77 and an annular recess which receives a gasket 78. A ball 79 is biased upwardly by the spring 80 to press against the gasket 78 and prevent gas from passing from the bore 77 to the bore 81 in the horizontal fitting or leg 82 of the valve body. The bore of the lower end 84 of the valve body is internally threaded to engage the externally threaded end of a fitting 85 which has a bore 86 and an annular recess which receives a gasket 87. A ball 88 is pressed downwardly against the gasket 87 by a spring 89. The spring 89 is a weak spring so that a small difference in pressure between the bores 86 and 81 will raise the ball 88 and permit gas to pass from the bore 86 to the bore 81. The spring 80 on the other hand is a strong spring so that a relatively great difference in pressure between the bores 77 and 81 is needed to move ball 79 downwardly and permit gas to pass from the bore 77 to the bore 81.

A conduit 90 is connected between fitting 82 of the coupling 65 and the carbon dioxide inlet fitting 91 of the syrup tank 27 through which gas may enter into the top portion of the syrup tank 27. The syrup tank also has a syrup outlet fitting 92 which connects with a syrup outlet pipe 93*a* whose lower end is disposed adjacent the bottom of the syrup tank. The conduit 38 connects the fittings 92 and 39 so that syrup forced out of the tank 27 by the pressure of carbon dioxide gas passes through the syrup coil 33 and is cooled before it is delivered to the mixing and dispensing valve 25.

Assuming now that the machine is in operation, each time the valve 25 is opened to vend a drink carbonated water will be forced out of the carbonator chamber 57 due to the pressure exerted by the carbon dioxide from the gas bottle 29. Simultaneously, a quantity of syrup is forced out of syrup tank 27 into the syrup coil 33 so that a quantity of cooled syrup is delivered to the mixing and dispensing valve through the conduit 93*a*. Since the amount of syrup in the syrup tank is decreased by the amout delivered to the mixing and dispensing valve, the pressure in the tank 27 will be lowered. Additional carbon dioxide must therefore be delivered to the syrup tank. The lowering of the pressure in the syrup tank will result in a greater difference in pressure between the bores 81 and 86 so that the ball check valve 88 will be lifted from the gasket 87 and will allow gas from the upper portion of the carbonator chamber 57 to pass through bores 86 and 81 into the conduit 90 and thence into the syrup tank. Since gas is thus allowed to escape from the upper portion of the chamber, the pressure in the chamber will now decrease and an additional supply of carbon dioxide gas will flow through the inlet pipe 68 and the dispensers 69 into the chamber. It will be seen now that the amount of carbon dioxide gas bubbling through the water will now be determined not only by the quantity of the water delivered from the carbonator chamber each time a drink is vended but also by the quantity of syrup delivered. This additional amount of gas which is forced to bubble through the water in the carbonator chamber each time a drink is vended causes the water to be carbonated to a greater degree. In addition, it provides for the removal of stale gas and air, which affects the taste of the drink, from the carbonator chamber. This stale gas and air moves to the syrup tank where it has no action on the syrup which would cause a change in the flavor of the drink.

If the top 93 of the conventional syrup tank 27 is removed to allow refilling of the tank with a fresh supply of syrup and if the top 93 is then replaced, the pressure in the tank 27 will be very low. If carbon dioxide gas could enter into the syrup tank only from the carbonator chamber 57, a long period of time would elapse before the pressure in the syrup tank raises to the proper value since the flow of carbon dioxide into the chamber is limited by the restricted orifice of the fitting 67. In order that the machine be brought quickly to proper operating condition, the ball check valve 79 has been provided. With the pressure in the syrup tank 27 very low, a great difference in pressures exists between the bores 74 and 81. As a result, the ball check valve is moved downwardly allowing carbon dioxide gas to move directly from the conduit 64 into the conduit 90 without first passing through the carbonator chamber. A large quantity of carbon dioxide is thus delivered to the syrup tank when the pressure in tank 27 is abnormally low. Once the pressure in the syrup tank 27 increases toward the normal value, the pressure difference between the bores 81 and 74 decreases to such an extent that the biasing spring 80 will again hold the ball check valve 79 in closed position against the gasket 78. Any additional carbon dioxide delivered to the syrup tank must now be supplied from the carbonator chamber.

The pressure of the carbon dioxide supplied from the gas bottle 29 to the conduit 64 may be maintained constant by the use of any conventional pressure regulator valve.

The water from the carbonator chamber 57 and the syrup from the syrup coil 33 are delivered to the mixing and dispensing valve 25 through the conduits 63 and

93*a* which are connected to nipples 94 and 95 threaded in the bores 96 and 97, respectively, of the valve body 98. The bores 96 and 97 communicate with a central bore or mixing chamber 99 which is enlarged to form a valve chamber 100. A further enlargement 101 provides a recess which receives a gasket 102 serving as a valve seat for the ball valve 103. The gasket 102 is held in place in the recess by an abutting body 104 which is rigidly secured to the valve body 98 by screws 105 and 106. The ball valve 103 is biased toward the gasket by a spring 105*a*. The abutting body is also provided with a bore 107 which is enlarged at one end to form a concave recess 108 into which may project a portion of the ball valve 103. An offset bore 107 in the abutting body 104 communicates with the concave recess. The reduced end 110 of the nozzle 30 is press fitted into the offset bore. A reciprocable rod 111 is slidingly disposed in the bore 107 with its inner end abutting the ball valve 103 and its outer end projecting beyond the abutting body. The rod 111 when moved inwardly displaces the ball valve from the gasket and allows fluid to pass from the mixing chamber 99 to the offset bore 109 and thence through the nozzle 30 into a cup or other receptacle. The valve body 98 is rigidly secured to a supporting plate 112*a* by screws 112*b*. The bodies 98 and 104 are preferably made of transparent plastic.

Since both the water in the carbonator chamber 57 and the syrup in the syrup tank 27 are kept under substantially constant pressure, the amount of the mixed drink allowed to flow out of the nozzle 30 each time the rod 111 is reciprocated depends on the length of time the ball valve 103 is held open and the effective orifice of the bore or mixing chamber 99. The proportion of syrup to water is regulated by the needle valve 112. The needle valve is threaded in a sleeve 113 which in turn is threaded in the valve body 98. Ball check valves 113*a* and 113*b* biased by suitable springs 114*a* and 114*b*, respectively, are provided to prevent reverse flow of the water and syrup, respectively.

The length of time the ball valve 103 is held in open position each time the operating handle 18 is actuated is controlled by the timing device 24, which includes a dash pot assembly 114 having a reciprocable rod 115 on which is mounted a serrated sleeve 116. Each time the rod 115 is reciprocated, the serrated sleeve 116 engages an actuating lever 117, which is yieldably mounted on the abutting body 104, and causes it to move the reciprocable rod 111 inwardly to open the ball valve 103 and hold it open for a predetermined period of time.

The valve actuating lever 117 is disposed in a slot 118 in the abutting body 104 and is provided with a slot 119 through which passes a transverse pin 120 rigidly mounted on the body 104 and extending through the slot 118. The lever 117 is biased toward an upward position by a spring 121 having an end attached to an ear 122 of the lever 117 and its other end to the top middle portion 123 of a bifurcated member having legs 124 and 125' which is secured to the abutting body 104 by the screws 105 and 106. The middle portion 123 closes the end of the slot 118 and limits the outward movement of the upper end 125 of the actuating lever 117. The upper end 125 is biased toward outward position by a spring 126 having an end secured to an ear 127 on the actuating lever 117 and the other end to a screw 128 threaded in a suitable bore in the abutting body 104. As a result of this yieldable mounting of the actuating lever 117, when the rod 115 is moved outwardly, to the left in Figure 2, the actuating lever will move outwardly when first contacted by the beveled edge 129 of the serrated sleeve 116 until its outward movement is stopped by the middle portion 123. Continued outward movement of the rod 115 will cause the actuating lever 117 to move downwardly against the resistance of the spring 121. The serrations of the serrated sleeve will then pass over the end 125, this movement being facilitated by the gradual slope of the face 130 of the end 125. The motion of rod 115 will cease while the end 125 is still in contact with the serrated sleeve. When the rod 115 moves inwardly, the end 125 will also move inwardly against the resistance of the spring 126 and in this inward movement will contact the outer end of the reciprocable rod 111 and move it inwardly thus causing the ball valve 103 to be moved into open position. The end 125 will continue moving inwardly until it contacts the inner end 131 of the slot 118 which will stop further inward movement of the end 125. The serrations of the sleeve 116 will now slide past the end 125 of the lever 117, the lever moving downwardly against the bias of spring 121 as each serration moves past the end 125 and depresses it. The lever 117 will be held in its most inward position until the rod 115 moves so far inward that the beveled edge 129 of the sleeve 116 will pass the end 125. At this time the spring 126 will cause the lever 117 to move outwardly and the spring 121 will cause it to move upwardly. When the actuating lever 117 is released for outward movement, the spring 105*a* and the pressure of the water and syrup will move the ball valve 103 to closed position. This cycle of operation is repeated each time a drink is vended.

In Figure 4 is shown a modified form of the means for biasing the lever 117*a* upwardly and outwardly. A leaf spring 131 is secured to the abutting body 104 and extends beneath the lower end of the lever. The inner edge of the lever is cut away as at 132 to receive the upper arcuate end 133 of a leaf spring 134 which is secured to the bottom of the lever by a screw 135. The leaf spring 134 serves to open the ball valve with a snap action. The closing pressure of the liquid in the mixing chamber on the ball valve 103 is greatest when the ball valve is closed so that when the lever 117*a* is moved inwardly, the spring 134 yields as its arcuate end 113 contacts the outer end of the rod 115. The spring continues to bend until enough force is exerted on the rod 115 to move the ball valve 103 slightly. This slight opening causes the closing force of the liquid pressure to decrease sufficiently that the spring 134 moves back quickly to its original unbent position. This unbending movement causes the ball valve 103 to open very quickly, i. e., with a snap. Snap opening of the ball valve is desirable since the carbonated mixture tends to form foam as it flows past small openings such as that formed by the slow opening of the ball valve.

The rod 115 is caused to move inwardly by the strong spring 136 disposed between the stopper 137 closing one end of the cylindrical shell 138 of the dash pot 114 and the piston 139 rigidly secured to the inner end of the rod 115. An annular packing 140 abuts the piston 139 and is secured to the rod by bolt 141 which passes through registering apertures in a washer 142, the packing 140 and the piston 139 and engages in a threaded bore in the inner end of the rod 115. The packing 140 has an outwardly extending annular flange 143 which engages the interior surface of the cylindrical shell 138. The stopper 137 has a threaded flange 144 which engages the threaded end 145 of the cylindrical shell and a flange 146 which holds a gasket 147 against the end of the cylindrical shell to seal against fluid leakage. A bearing 148 in the stopper 137 is provided with a gland 149 which compresses a packing 150 to seal against fluid leakage between the bearing 148 and the rod 115. The opposite end of the cylindrical shell 138 is closed by an annular member 152 secured to the shell by welding, soldering or in any other conventional manner. The dash pot 114 is mounted between and on two lugs 153 and 154 integral with the supporting plate 112*a*. The annular member 152 is secured to the lug 154 by a screw 155 which engages in a threaded bore in the annular member. The rod 115 passes through an aperture in the other lug 153 to thus support the opposite end of the dash pot 114.

The cylindrical shell is filled with a non-compressible

fluid such as that employed in hydraulic brake systems. The rod **115** can be readily moved outwardly against the resistance of the spring **136** since the outwardly extending flange **143** of the packing **140** will flex inwardly and allow fluid to move past it as the piston is moved to the left (Fig. 2). Fluid will also pass through a tube **156** of small inner diameter which extend through the annular member **139**, the packing **140** and the washer **142**. When the rod **115** is released to move inwardly under the force exerted by the spring **136**, however, the outwardly extending flange **143** will prevent passage of fluid between it and the cylindrical shell. The speed of inward movement of the rod **115** will therefore depend on the inside diameter of the tube **156** since the liquid in the cylindrical shell must move from one side of the piston to the other to allow the piston to move toward the annular member **152**. This is the conventional manner of operation of dash pots and will not, therefore be dwelt on further.

The length of the period of time during which the ball valve **103** is held in open position is determined by the position of the serrated sleeve **116** on the rod **115**. The sleeve is rigidly secured to a selected position on the rod **115** by the set screw **157** which is received in a threaded bore in the serrated sleeve. If the sleeve is placed in such a position on the rod **115** that the top end **125** of the actuating lever **117** engages the sleeve **116** at a point near the beveled edge **129** when the rod **115** is in its most outward position, the ball valve will be held open only a short time when the rod is released for inward movement under the force of the spring **136**. Conversely, if the top end **125** engages the sleeve at a point near the end opposite the beveled edge when the rod **115** is in its most outward position, the ball valve will be held open for a long time when the rod **115** is released. Thus it will be apparent that the amount of mixed drink dispensed during each reciprocatory cycle of the rod **115** can be pre-selected by adjustment of the sleeve on the rod **115** and adjustment of the needle valve **112**.

The supporting plate **112***a* is mounted on the cabinet **10** immediately in front of the cabinet door **11** by means of screws **158** so that nozzle **30** projects through an aperture **159** in a rear panel **160** immediately to the rear of the platform on which cups are dispensed to receive the drink dispensed through the nozzle. The rod **115**, when the door **11** is closed, is brought into operational relationship with a bifurcated bracket **161** having spaced legs **162** and **163** between which the rod **115** enters when the door **11** is closed. The spaced annular stops **164** and **165** rigidly mounted on the rod **115** are then disposed on either side of the bifurcated bracket **161**. The bifurcated bracket **161** is rigidly sceured to the upper end of a rod **166** which extends slidably through a bore in a block **167** which is mounted by means of screws **168** on plate **168***a* mounted to the rear of the coin operated mechanism **16**. A stop block **169** is secured to the rod **166** at the end opposite the bifurcated bracket **161** by means of a pin **170**. A biasing spring **171** is disposed about the rod **166** and its ends bear against the bifurcated bracket **161** and the block **167** to bias the bifurcated bracket away from the block.

The upper end of the stop block **169** projects above the block **167** into the arcuate path of travel of the pins **172**, **173**, **174** and **175** projecting perpendicularly from the gear **176** rotatably mounted on the operating shaft **17** so that when the gear **176** is rotated in the indicated direction one of the pins **172**—**175** engages the upper end of the stop block **169** and moves the rod **166** downward against the resistance of the spring **171** and of the dash pot **114**. The resistance of the dash pot **114** must be overcome since the bifurcated bracket **161** will move against the annular stop **165** and pull outwardly the rod **115**. When the gear is rotated through 90 degrees the pin engaging the stop block **169**, e. g., pin **172**, will first engage the stop block as it moves downwardly in its arcuated path of travel and will move it downwardly. Then pin **172** will begin to move upwardly as it follows its arcuate path of travel and will disengage from the stop block freeing the rod **166** for upward movement. This in turn will allow the rod **115** to move inwardly under the force exerted by the spring **136** of the dash pot **114**. The gear **176** is prevented from rotating in the reverse direction by a ratchet spring **177**, attached to the plate **168***a* by a screw **178**, which projects into the path of travel of the teeth of the gear so that the pin **172** will then be in the position held by pin **175** before the gear **176** was rotated 90 degrees.

The gear **176** is rotated 90 degrees each time the operating handle **18** is actuated by a pin **179** slidably mounted in a bore **180** in a block **181** which is rigidly mounted on the operating shaft **17** by a pin **182**. A spring **183** in bore **180** biases the slidable pin **179** outwardly. A pin **184** extending through the block **181** passes through a recess cut in one side of the slidable pin **179**. The pin **184** limits the longitudinal movement of the slidable pin out of the bore **180** and also prevents rotary movement of the slidable pin. The slidable pin **179** must not be permitted to rotate since the top portion of the pin which is cut at a bias, as at **185**, must be maintained in the position shown in Figure 6 so that the slidable pin will be urged downwardly by and pass beneath whichever pin **172**—**175** is in its path when the operating shaft **17** rotates in a clockwise manner as seen in Figure 6. As has been mentioned above, the coin operated mechanism **16** permits the operating shaft **17** to rotate through only 90 degrees counterclockwise (Fig. 6) when the operating handle is actuated. During this counterclockwise movement the slidable pin engages one of the pins **172**—**175**, say pin **172**, and moves it counterclockwise. The next pin **175** will, during this movement, engage the stop block **169** and move it to move outwardly the rod **115** of the dash pot **114** and then release it as the limit of the rotary movement of the operating shaft **17** is reached. When the handle **18** is released, the operating shaft will be free to move clockwise back to its original position. But before it can reach its original position the slidable pin **179** must move past the pin **173** which was moved into its path of travel and now occupies the position formerly occupied by the pin **172**. As the slidable pin **179** reaches the pin **173**, its bias cut portion **185** contacts the pin **173** which cams the slidable pin downwardly against the resistance of the spring **183**. This enables the slidable pin to move past the pin **173** and, once it moves past the pin **173**, the spring **183** will move it outwardly so that when the operating handle **18** is again actuated, the slidable pin will contact the pin **173** and thus rotate the gear **176** another 90 degrees in a counterclockwise manner.

It is desirable to lock the whole mechanism if the rod **166** and the stop block **169** have not come back to the positions shown in Figure 1 after a drink has been dispensed, for one reason or another, such as the deposit of another coin in the coin operated mechanism while the preceding drink dispensing cycle has not terminated. This is accomplished by the slidable lock pin **186** which is slidably disposed in a bore **187** in the block **167** and biased outwardly against the stop block **169** by a spring **188**. A pin **189** mounted in the block **167** extends through a portion of an annular recess **190** in the locking pin **186** to limit the outward movement of the locking pin. The front portion **191** of the locking tapers inwardly to form a cone so that when the stop block **169** is flush against the block **167**, one of the operating pins **172**—**175** which is adjacent the stop block will travel past the conical portion **191** and be allowed to engage the stop block **169**. If, however, the stop block is positioned far from the block **167**, the operating pin will abut the main portion of the locking pin which will prevent further counterclockwise movement of the gear **176**. The dispensing mechanism will now be inoperative until this condition is corrected by return of block **169** to the position shown in Figure 1.

The cup dispensing mechanism **20** includes a top stationary plate **192** which is mounted in a horizontal po-

sition on stationary structural members of the door 11 by screws 193. The stationary plate 192 is provided with a pair of circular apertures 194 and 195 into which extend the open cylinders 196 and 197 rigidly mounted on the stationary plate in any conventional manner. Each of the cylinders 196 and 197 is adapted to hold a stack of nestled cups. Both the apertures 194 and 195 and the cylinders are of such diameter that the cups would fall through the apertures 194 and 195 if they were not supported by a slidable plate 200. The slidable plate has pairs of opposed side lips 198 and 199, respectively, and is mounted on the stationary plate 192 by means of bolts 201 which extend through circular apertures in the stationary plate and through elongated slots 202 in the slidable plate. Tubular spacers 203 on the bolts maintain the two plates in properly spaced relationship.

The slidable plate has a large substantially oblong aperture whose opposite edges 204 and 205 are substantially circular in shape and are so spaced apart that when the slidable plate 200 is in one extreme position the end edge 204 will extend beneath the aperture 194 but the other edge 205 will not be disposed beneath the aperture 195 so that all the cups in the cylinder 197 would fall through the plates were it not for the pair of side lips 199 which extend beneath the aperture 195. When the slidable plate is in its opposite extreme position the end edge 205 will extend beneath the aperture 195 and the pair of side lips 198 will extend beneath the aperture 194.

As is shown in Figures 9, 10 and 11, the side lips 198 and 199 are formed by bending appropriately shaped portions of the slidable plate 200 upwardly to form vertical members 206 and 207 and then bending the portions intermediate their ends to form the horizontal side lips 198 and 199 so that the side lips are extended in a plane parallel to and above the plane in which the end edges lie.

If stacks of nestled cups 208 provided with outwardly extending lips 209 are in the cylinders 196 and 197, the stack of cups in the cylinder 196, Figure 7 and 11, is supported on the end edge 204 which underlies the lip 209 of the lowermost cup in the cylinder 196. The stack of cups in the cylinder 197 on the other hand is supported on the side lips 199 which underlie the lip 209 of the lowermost cup in the cylinder 197. If the bottom slide 200 is now moved to the left, Figures 6–9, the side lips 198 will move beneath the second lowest cup of the stack of cups in the cylinder 196, while the end edge 204 will move from beneath the lip 209 of the lowermost cup will then be free to drop by gravity to the chute 210 which will guide its downward movement to cause it to fall upright on the platform 22 beneath the nozzle 30. At the same time the side lips 199 have moved from beneath the lowermost cup of the stack of cups in cylinder 195 but their fall is arrested by the end edge 205 which moved beneath the lip of the lowermost cup. Upon movement of the slidable plate to the right, the side lips 199 will move beneath the lip of the second lowermost cup of the stack of cups in cylinder 195 and the lowermost cup will drop by gravity to the chute 210 since the end edge 205 will move from beneath the lip of the lowermost cup. Simultaneously with this operation, the stack of cups in cylinder 196 will again be supported by the end edge 204 which moves beneath the lip of the lowermost cup as the side lips move from beneath it. In this manner cups are dispensed alternately from the stacks of cups in the cylinders 194 and 195.

It is found that the cups are sometimes firmly wedged together or are glued together by waxy substances with which the cups are sometimes coated so that the force of gravity is insufficient to cause the cup to drop even though the end edge 204 or 205 no longer supports it. It is necessary, therefore, to provide some means which will give a downward push to the lowermost cup when the end edge 204 or 205 moves out from beneath it. It is also desirable to accelerate the descent of the cup to cause it to reach the platform 22 quickly to make certain the cup is in position before the drink begins to pour from the nozzle 30.

A pair of springs 211 and 212 are disposed on opposite sides of the slidable plate 200 and are secured intermediate their ends by screws 213 to inwardly extending lugs 214 which are integral with the bottom plate. Each of the springs has an end 215 which underlies its adjacent side lip 198 and an end 216 which underlies its adjacent side lip 199. The portions 217 and 218 of the springs lying between the center portion of the spring secured to the lug 214 and the ends 215 and 216, respectively, are bent upwardly to contact raised elongated cams 219 and 220 provided at opposite sides of the stationary plate 192. The cams 219 and 220 allow the ends 215 of the springs to lie closely adjacent their associated side lips 198 when the slidable plate is in its extreme right hand position, Figures 7 to 10. When the slidable plate is moved to the left, the ends 215 remain close to the side lips 198 until the intermediate portion 217 encounters the sloping portions 221 of the cams 219 and 220. At this point the end edge 204 has moved from beneath the lowermost cup in cylinder 196. Further movement to the left will cause the ends 215 of the springs to move quickly downward thrusting the lowermost cup into the chute 210. During this movement of the bottom plate, the portions 218 of the springs have moved past the sloping portions 222 to the central raised portion of the cams so that the ends 216 will now closely underlie the side lips 199. Movement of the slidable plate 200 to the right will now similarly cause the ends 216 to give a downward thrust to the lowermost cup in the cylinder 197. The springs, therefore, insure that a positive mechanical force will be applied to the lowermost cup to cause it to move quickly into the chute 210.

In order to cause the slidable plate 200 to be moved from one extreme position to the other each time the operating handle 18 is actuated, a gear 224 is rotatably mounted on the plate 168*a*, by means of a bolt 225 which is provided with a tubular spacer 226 to keep the gear 224 properly spaced from the plate 168*a*. The gear 224 is in mesh with the gear 176 and makes a one-half revolution each time the gear 176 is rotated 90 degrees. The gear 224 has a bolt 227 which extends through a slot 228 provided in one end of a lever 229 which is pivotally mounted on the plate 168 by a bolt 230 provided with a tubular spacer 231. The other end of the lever 229 is pivotally secured to one end of a link 232 by a bolt 233. The other end of link 232 is secured to the slidable plate 200 by a bolt 234. Sufficient play is provided between the various parts connecting the gear 224 to the bottom plate 200 to prevent any binding due to the normal slight vertical displacements of the link 232 due to the normal arcuate path of travel of the belt 233 about the pivot bolt 230. It will now be apparent that the link 232, and therefore slidable plate 200 will be moved through one-half of a reciprocatory cycle each time the gear 176 is rotated 90 degrees. It will be apparent that cup dispensing mechanism 20 may be easily adapted to use with but a single stack of cups by selecting the gear ratios to cause the gear 224 to rotate a full 360 degrees each time the gear 176 is rotated 90 degrees.

It will be seen now that when the handle 18 is actuated, the operating shaft 17 will cause the gear 176 to rotate gear 224 and simultaneously draw the rod 115 of the dash pot outwardly. A cup will drop through the chute 210 to the platform 22 and then the stop block will become freed of one of the operating pins 172—175 permitting the rod 115 to be moved inwardly after the cup has been dispensed. The ball valve 103 will therefore be opened only after the cup is in place on the platform 22.

The cylinder 196 is provided with a slot 235 through which extends the end of a feeler lever 236 which, when the cylinder 196 is empty, pivots into the cylinder. The feeler lever is connected through conventional means

to the conventional coin operated mechanism **16** and prevents operation of the operating shaft whenever no cups are present in the cylinder. It may also be provided with a sign **237** which is moved before an aperture **238** in the panel **13** to indicate that the machine is empty and that a drink will not be vended if a coin is deposited in the slot **15**.

A machine for vending a mixed cooled, carbonated drink has been illustrated and described which, except for the refrigerating system, is completely mechanical in operation having no electrical switches or motors. Moreover, a simple mechanical timing device **24** has been shown for holding a mixing and dispensing valve open for a predetermined period of time to allow a drink of predetermined quantity to be dispensed into a cup or other receptacle dispensed by a mechanically operated cup dispensing means. Furthermore a new and improved system for insuring most efficient carbonation of the water used in mixing the drink has been described.

It will be apparent to those skilled in the art that various changes and modifications can be made in the described and illustrated machine without departing from the invention and it is intended therefore, in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In a mixed drink dispensing machine: a carbonator having a central chamber for holding water; a water inlet extending into said carbonator and adapted to be connected to a source of water; a gas inlet extending into said central chamber and opening adjacent the bottom of said chamber and adapted to be connected to a source of gas under pressure; a mixing and dispensing valve; a water outlet opening adjacent the bottom of said chamber and connected to said valve for delivering water from said chamber to said valve; a gas outlet adjacent the top of said chamber and provided with a check valve; a syrup tank having a gas inlet connected to said gas outlet whereby gas from said chamber is delivered to said syrup tank when the pressure difference between said carbonator chamber and said syrup tank exceeds a predetermined value; and a syrup outlet opening adjacent the bottom of said syrup tank and connected to said mixing and dispensing valve for delivering syrup from said tank to said mixing and dispensing valve.

2. In a mixed drink dispensing machine: a carbonator having a central chamber for holding water; a water inlet extending into said carbonator and adapted to be connected to a source of water; a gas inlet extending into said central chamber and opening adjacent the bottom of said chamber and adapted to be connected to a source of gas under pressure; a mixing and dispensing valve; a water outlet opening adjacent the bottom of said chamber and connected to said valve for delivering water from said chamber to said valve; a gas outlet adjacent the top of said chamber and provided with a check valve; a syrup tank having a gas inlet connected to said gas outlet whereby gas from said chamber is delivered to said syrup tank when the pressure difference between said carbonator chamber and said syrup tank exceeds a predetermined value; a syrup outlet opening adjacent the bottom of said syrup tank and connected to said mixing and dispensing valve for delivering syrup from said tank to said mixing and dispensing valve; and means provided with a second check valve connected between said source of gas and said syrup tank to supply gas under pressure to said syrup tank when the pressure difference between the syrup tank and said source of gas exceeds a second predetermined value, said second predetermined value being greater than said first mentioned predetermined value.

3. In a mixed drink dispensing machine; a source of gas under pressure; a closed syrup tank; a closed water chamber; a syrup and water dispensing means; means connecting said water chamber to said source of gas under pressure to deliver gas to said chamber below the level of the water and to keep the water in said chamber under pressure, means connecting said chamber to said valve to deliver water to said valve from said chamber; means connecting said water chamber to said syrup tank to deliver gas from said water chamber to said syrup tank when the pressure difference between said chamber and said tank exceeds a predetermined value; and means connecting said syrup tank to said valve to deliver syrup to said valve from said syrup tank, whereby gas delivered to said syrup tank must first pass through the water in said chamber.

4. The device of claim 3, and means connecting said syrup tank to said source of gas to deliver gas to said syrup tank when the pressure difference between said chamber and said source of gas exceeds a second predetermined value which is substantially greater than said first predetermined value whereby gas is delivered to said syrup tank by said last mentioned means only when the pressure in said syrup tank is abnormally low.

5. A mixed drink dispensing machine comprising a container for holding carbonated water under pressure; a container for holding syrup under pressure; a mixing and dispensing valve having a body provided with a mixing chamber; means connecting said mixing chamber to the syrup container whereby syrup may flow from the syrup container to said mixing chamber; means connecting said mixing chamber to said carbonated water container whereby water may flow from the water container to said mixing chamber, said body having an outlet opening communicating with said mixing chamber and closed by a valve; a valve rod mounted in said body for reciprocable movement and having an outer end extending beyond said body, the inner end of said rod being disposed to contact said valve and move it to open position; an actuating lever pivotally mounted on said body for limited movement toward and away from said outer end of said rod and for limited movement perpendicular to the direction of movement toward and away from said outer end of said rod; means biasing said lever away from said outer end; and a mechanical timer operatively associated with said actuating lever for engaging said lever and moving it toward said rod to move said rod inwardly against the resistance of said biasing means and open said valve, said mechanical timer holding said lever in actuated position for a predetermined period of time each time said timer is actuated.

6. A mixed drink dispensing machine comprising a container for holding carbonated water under pressure; a container for holding syrup under pressure; a mixing and dispensing valve having a body provided with a mixing chamber; means connecting said mixing chamber to the syrup container whereby syrup may flow from the syrup container to said mixing chamber; means connecting said mixing chamber to said carbonated water container whereby water may flow from the water container to said mixing chamber, said body having an outlet opening communicating with said mixing chamber and closed by a valve; a valve rod mounted in said body for reciprocable movement and having an outer end extending beyond said body, the inner end of said rod being disposed to contact said valve and move it to open position; an actuating lever pivotally mounted on said body for limited movement toward and away from said outer end of said rod and for limited movement perpendicular to the direction of movement toward and away from said outer end of said rod; a timer having a reciprocable rod mounted adjacent said actuating lever; a serrated member on said timer rod, said actuating lever having an end projecting into the path of movement of said serrated member; means yieldably biasing said end of the lever toward said timer rod and away from said valve rod, said serrated member over-riding said end of the lever and moving the lever downwardly against the resistance of said biasing means when said timer rod is moved in one direction, said serrated member engaging said end of said lever and pivoting said lever toward said outer end of said valve rod

to move said valve rod inwardly when said timer rod moves in the opposite direction until said valve is open and the limit of pivotal movement of said lever is reached, said serrated member then over-riding said end of the lever as said lever moves downwardly against the resistance of said biasing means, said actuating lever being freed to return to its original position and allow the valve to close when the continued movement of said serrated member moves it out of engagement with said end of said lever; and means for predetermining the rate of movement of said timer rod in said opposite direction.

7. A mixed drink dispensing machine comprising a container for holding carbonated water under pressure; a container for holding syrup under pressure; a mixing and dispensing valve having a body provided with a mixing chamber; means connecting said mixing chamber to the syrup container whereby syrup may flow from the syrup container to the mixing chamber; means connecting said mixing chamber to said carbonated water container whereby water may flow from the water container to the mixing chamber, said body having an outlet opening communicating with said mixing chamber and closed by a valve; a valve rod mounted in said body for reciprocable movement and having an outer end extending beyond said body, the inner end of said rod being disposed to contact said valve and move it to open position; an actuating lever pivotally mounted on said body for limited movement toward and away from said outer end of said rod and for limited movement perpendicular to the direction of movement toward and away from said outer end of said rod; a timer having a reciprocable rod mounted adjacent said actuating lever; a serrated member on said timer rod, said actuating lever having an end projecting into the path of movement of said serrated member; means yieldably biasing said end of the lever toward said timer rod and away from said valve rod, said serrated member over-riding said end of the lever and moving the lever downwardly against the resistance of said biasing means when said timer rod is moved in one direction, said serrated member engaging said end of said lever and pivoting said lever toward said outer end of said valve rod to move said valve rod inwardly when said rod moves in the opposite direction until said valve is open and the limit of pivotal movement of said lever is reached, said serrated member then over-riding said end of the lever as said lever moves downwardly against the resistance of said biasing means, said actuating lever being freed to return to its original position and allow the valve to close when the continued movement of said serrated member moves it out of engagement with said end of said lever; means for predetermining the rate of movement of said timer rod in said opposite direction; and a coin operated means for moving said timer rod a predetermined distance in said one direction when an operating handle is actuated.

8. A mechanism for opening a valve mounted in a valve body and yieldably biased toward a closed position comprising: a valve rod mounted in said body for slidable inward movement to open said valve, said rod having an outer end extending beyond said body; a lever pivotally mounted on said body for limited movement toward and away from said outer end of said valve rod; a timer having a reciprocable rod mounted adjacent said lever; a serrated member on said reciprocable timer rod, said lever having an end projecting into the path of movement of said serrated member; means yieldably biasing said end toward said timer rod and away from said outer end of the valve rod, said serrated member over-riding said end of the lever and moving the lever downwardly against the resistance of said biasing means when the timer rod is moved in one direction, said serrated member engaging said end of the lever and pivoting said lever toward said outer end of said valve rod to move said valve rod inwardly when said timer rod moves in the opposite direction until said valve is opened and the limit of pivotal movement of said lever is reached, said serrated member then over-riding said end of said lever as said lever moves downwardly against the resistance of said biasing means, said lever being freed to return to its original position and allow the valve to close when the continued movement of said timer rod moves said serrated member out of engagement with said end of the lever, and means for predetermining the rate of movement of said timer rod in said opposite direction.

9. In the device of claim 8, said last mentioned means comprising a dash pot having a piston, said timer rod being secured to said piston.

10. In the device of claim 7, said last mentioned means comprising a dash pot having a piston, said timer rod being secured to said piston.

11. A mixed drink dispensing machine comprising a container for holding carbonated water under pressure; a container for holding syrup under pressure; a mixing and dispensing valve having a body provided with a mixing chamber; means connecting said mixing chamber to the syrup container whereby syrup from the syrup container may flow to the mixing chamber; means connecting said mixing chamber to said source of carbonated water whereby carbonated water from the water container may flow to the mixing chamber, said body having an outlet opening communicating with said mixing chamber and closed by a valve; a mechanical timer for opening said valve for a predetermined period of time whereby a predetermined quantity of carbonated water and syrup is dispensed each time the timer is actuated, said mechanical timer having a reciprocable timer rod and a dash pot provided with a piston which is secured to one end of said reciprocable timer rod and is biased in one direction by a resilient means; a mechanism for moving said timer rod a predetermined distance in a direction opposite to said one direction each time an operating handle of said mechanism is actuated, said mechanism comprising an operating shaft rotatable a predetermined angular distance in one direction, a ratcheted member rotatably mounted on said operating shaft; means rigidly mounted on said shaft for rotating said member said predetermined angular distance each time said operating shaft is rotated said predetermined angular distance by actuation of said operating handle which is rigidly secured to said operating shaft, said member having projecting member movable in a circular path when the ratcheted member is rotated, a linking rod reciprocably movable in a direction parallel to the direction of movement of said timer rod, means connecting one end of said linking rod to said timer rod, a stop block on the other end of said linking rod extending into the path of movement of said projecting member over a portion of the circular path of movement of said projecting member whereby said linking rod is pulled a predetermined distance in a direction opposite to said one direction and then released each time said operating handle is actuated.

12. The device of claim 11, and a cup dispensing mechanism for dispensing a cup beneath said outlet, said cup dispensing mechanism comprising a reciprocable member, and means connecting said ratcheted member and said reciprocable member, whereby a cup is dispensed each time said operating handle is actuated.

References Cited in the file of this patent

UNITED STATES PATENTS

846,692	Parsons et al.	Mar. 12, 1907
1,654,004	Lind	Dec. 27, 1927
1,794,641	Payson et al.	Mar. 3, 1931
2,374,168	Bowman	Apr. 24, 1945
2,455,551	Booth	Dec. 7, 1948
2,462,019	Bowman	Feb. 15, 1949
2,546,695	Macgeorge	Nov. 27, 1951