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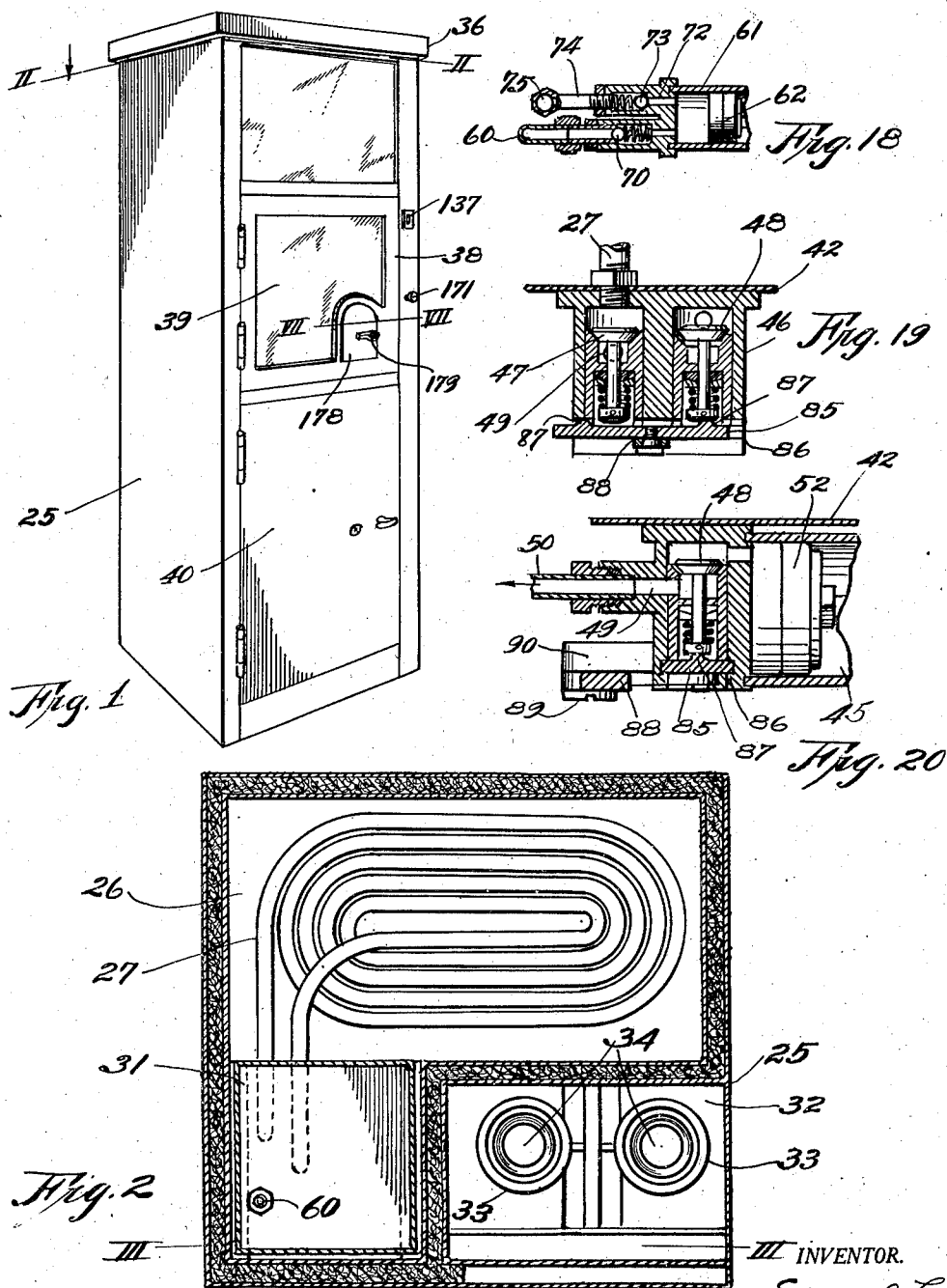
E. J. LIND

1,746,597

SODA WATER DISPENSING MACHINE

Filed Oct. 11, 1926

6 Sheets-Sheet 1



Witness:

R. Hamilton

BY 178 179

Edward J. Lind
Thorpe & Ward

ATTORNEYS

Feb. 11, 1930.

E. J. LIND

1,746,597

SODA WATER DISPENSING MACHINE

Filed Oct. 11, 1926

6 Sheets-Sheet 2

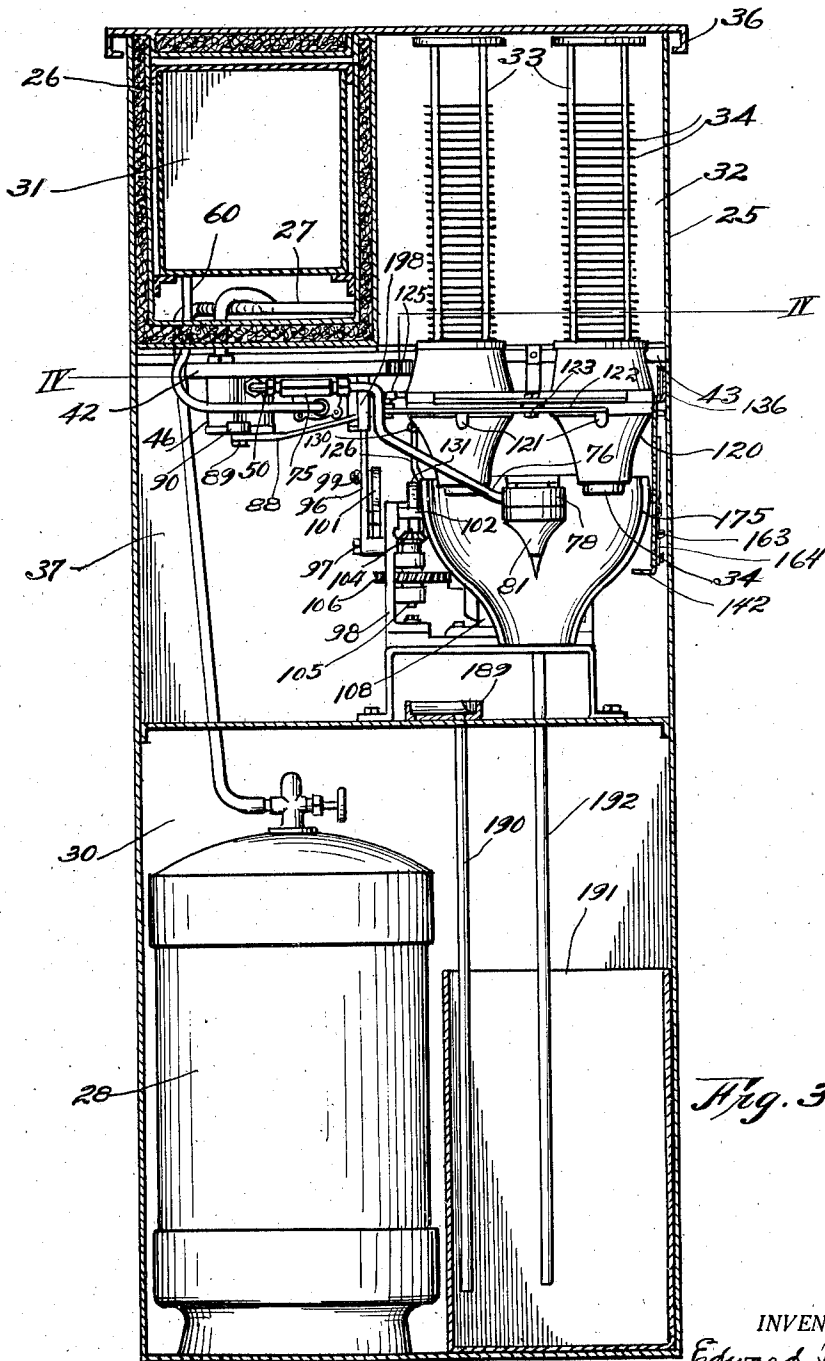


Fig. 3

Witness:

R. Hamilton

INVENTOR.

Edward J. Lind

BY *Thorpe & Genard*

ATTORNEYS.

Feb. 11, 1930.

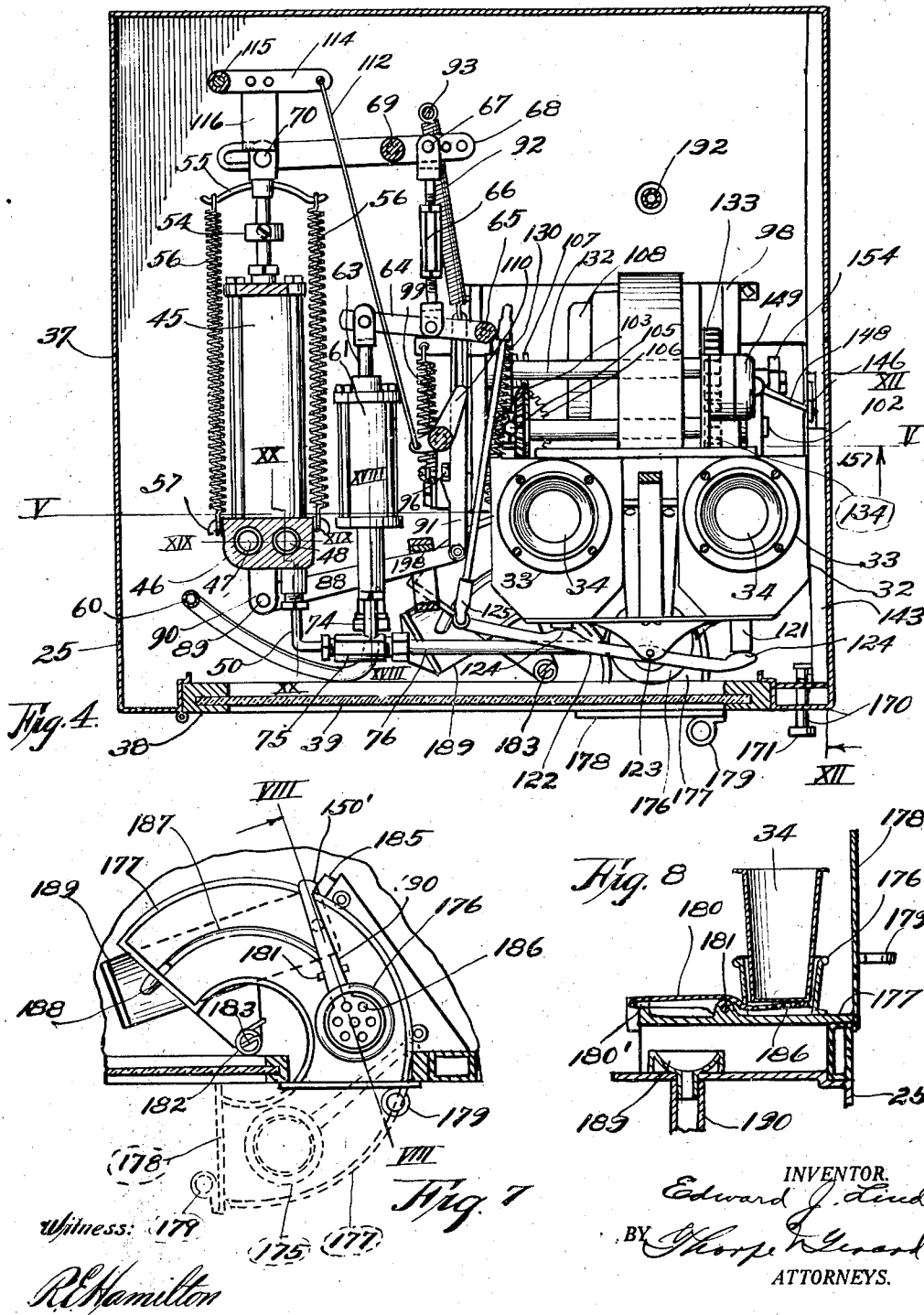
E. J. LIND

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SODA WATER DISPENSING MACHINE

Filed Oct. 11, 1926

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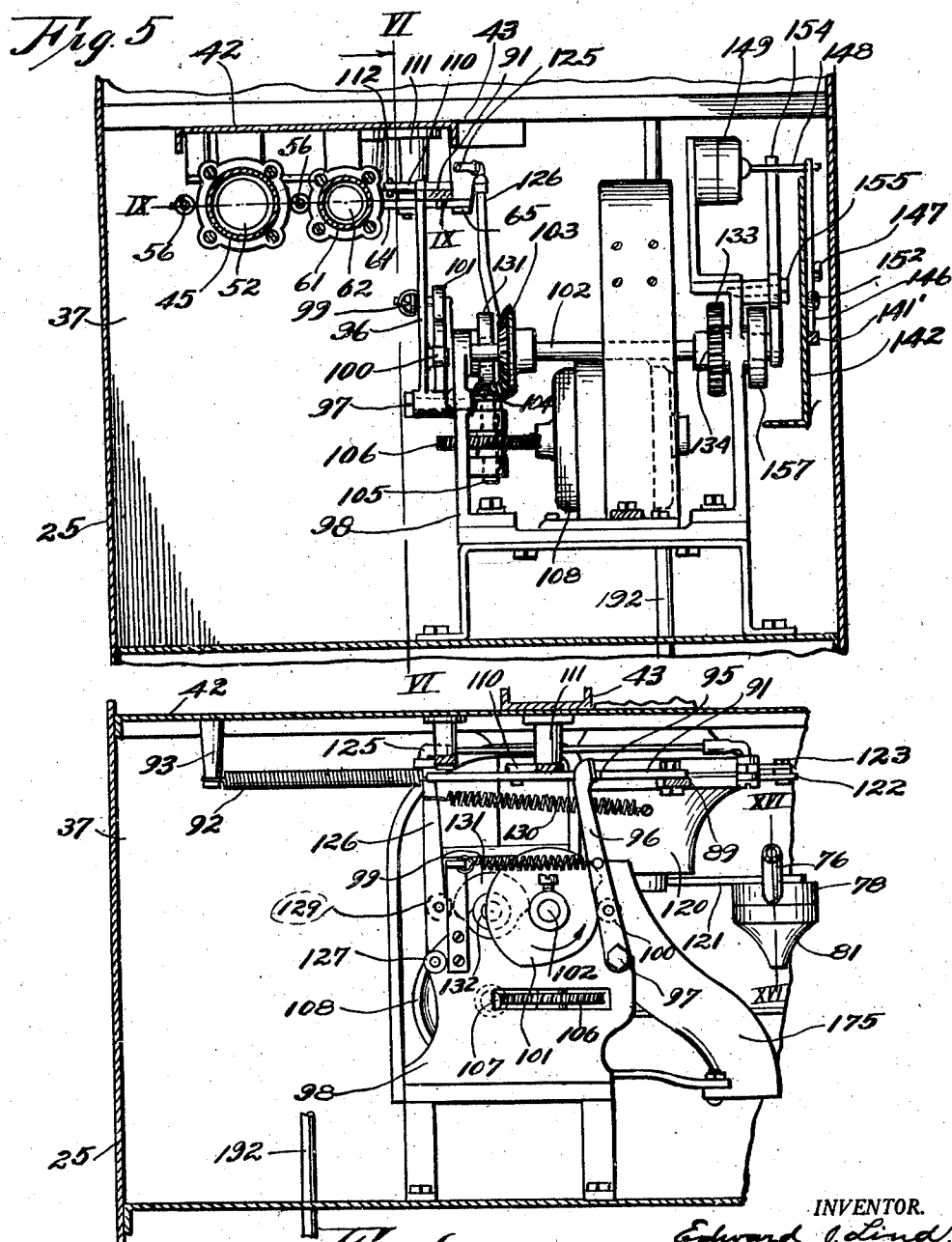
E. J. LIND

1,746,597

SODA WATER DISPENSING MACHINE

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6 Sheets-Sheet 4



Witness:

R. Hamilton

Fig. 6

INVENTOR.

Edward J. Lind.

BY

Thompson & Good.

ATTORNEYS.

Feb. 11, 1930.

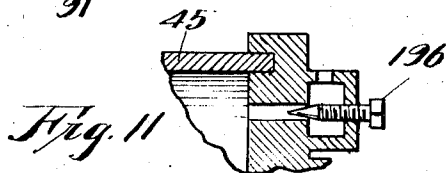
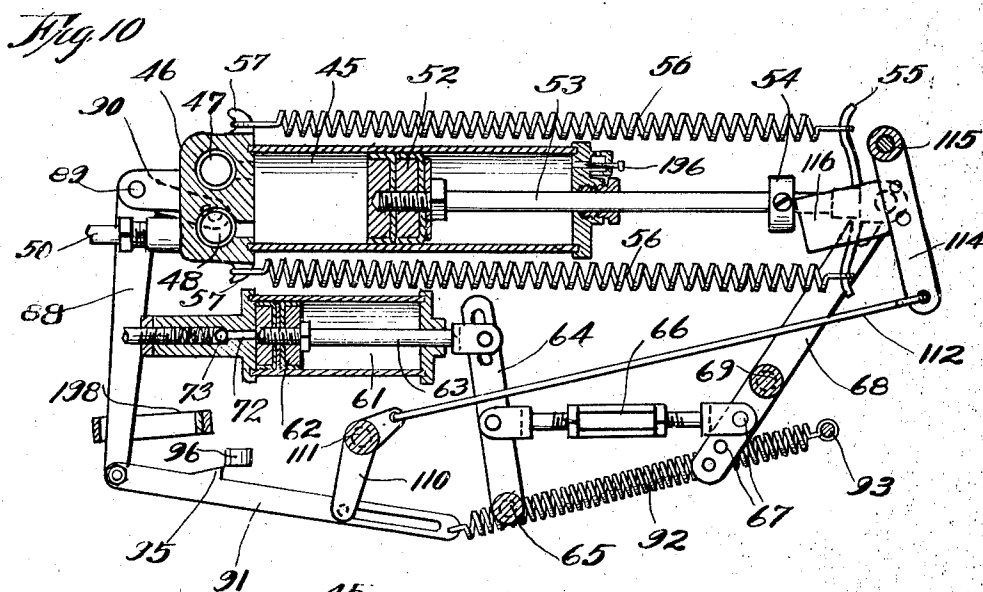
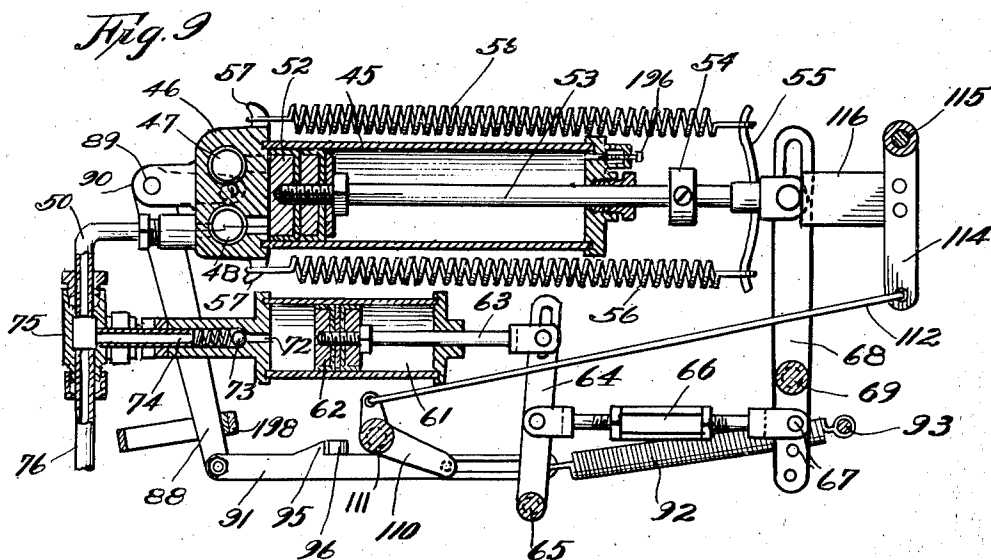
E. J. LIND

1,746,597

SODA WATER DISPENSING MACHINE

Filed Oct. 11, 1926

6 Sheets-Sheet 5



Witness:

R. Hamilton

INVENTOR.
Edward J. Lind,
BY *Thos. R. Leonard*
ATTORNEYS.

Feb. 11, 1930.

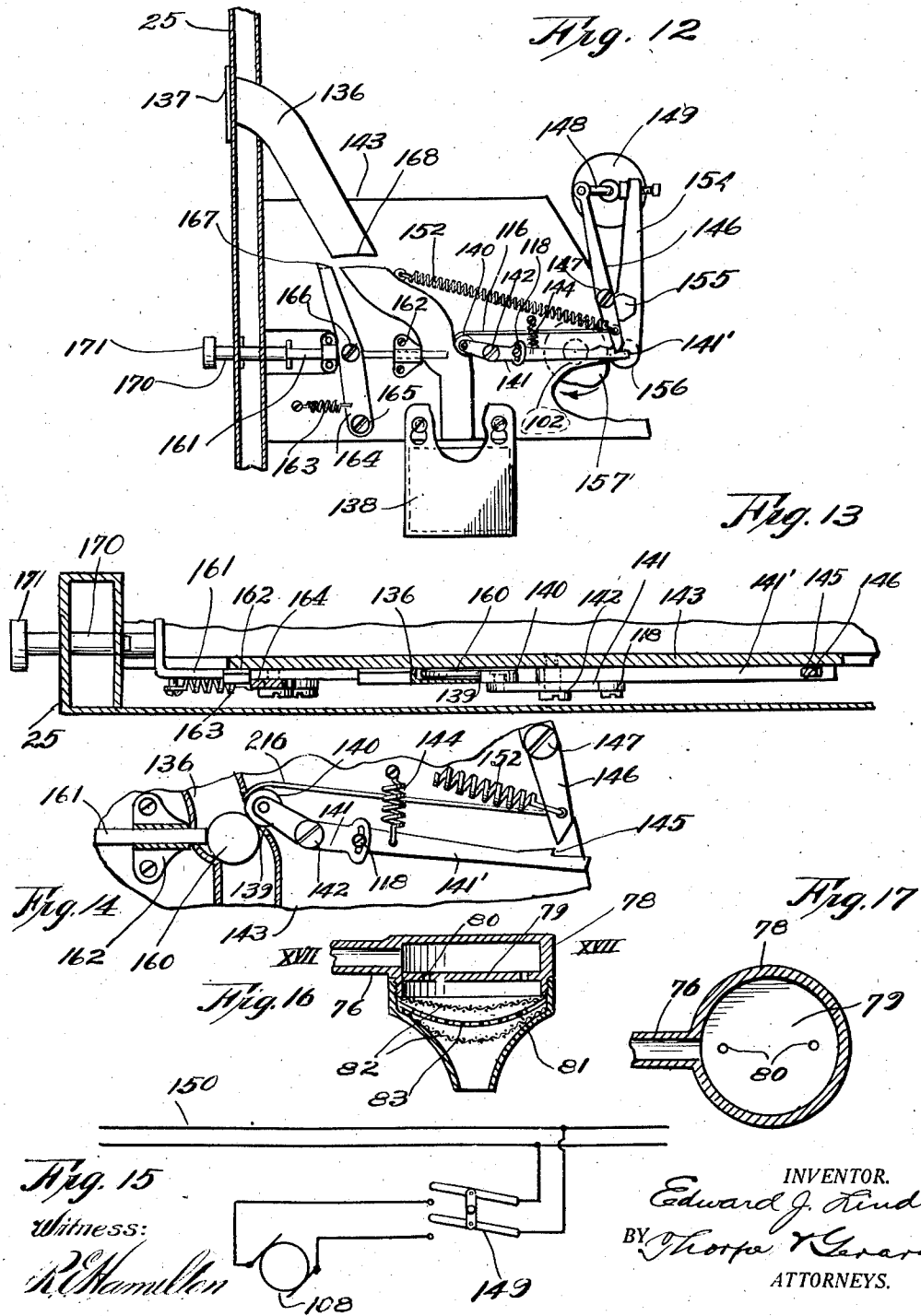
E. J. LIND

1,746,597

SODA WATER DISPENSING MACHINE

Filed Oct. 11, 1926

6 Sheets-Sheet 6



UNITED STATES PATENT OFFICE

EDWARD J. LIND, OF KANSAS CITY, KANSAS

SODA-WATER-DISPENSING MACHINE

Application filed October 11, 1926. Serial No. 140,810.

The present invention relates to vending or dispensing apparatus, and aims to provide a novel form of vending machine, preferably of the coin-controlled type, adapted for the dispensing of liquid, such as soda water, with additional provision for the feeding of a suitable cup into filling position.

Accordingly, I have devised an improved machine by the operation of which, in response to an appropriate coin control, a cup may be fed into filling position, and thereafter a suitable mixture of soda water ingredients may be discharged into the cup by the soda water dispensing mechanism forming a part of the apparatus and also subject to the coin controlled mechanism.

Preferably, the embodiment of the apparatus which I employ in practice comprises a pair of magazines each containing a supply of the cups, and cup-dispensing mechanism whereby the cups are delivered alternately from said magazines, in response to successive operations of the liquid dispensing means.

The operation of the soda water vending mechanism is so timed as to feed the syrup or equivalent material into the cup prior to the feeding of the carbonated water, and for this purpose the action of the syrup feeding means is arranged to take place in response to the operation of the means for dispensing the carbonated water, whereby a proper time relation is secured as regards the sequence of operation of these dispensing mechanisms.

It is further sought to provide an apparatus of the character indicated in which a motor is utilized for operating the liquid dispensing means as well as the cup dispensing mechanism, in their proper sequence, combined with coin controlled means for starting and stopping the motor between successive operations of said liquid dispensing means and cup dispensing mechanism.

The invention further comprises a vending cabinet construction, in which is included a door for the delivery compartment, together with automatic door latching means for maintaining the door locked until the cup to be delivered is charged with its soda water con-

tents, whereby the weight of the filled cup effects the automatic unlatching of the door.

With these general objects in view, as well as various other objects, such as improvements in the control for the motor and its operating connections, the mixing nozzle for the discharge of the syrup and the carbonated water into the cup, and other improved features of construction, the invention will now be described by reference to the accompanying drawings illustrating one form of apparatus which I have devised for embodying the proposed features of improvement and effecting the desired functions, after which those features and combinations deemed to be novel will be particularly set forth and claimed.

In the drawings:—

Figure 1 is a perspective view showing an apparatus constructed in accordance with the present invention;

Figure 2 is an enlarged horizontal sectional view, representing a section on the line II—II of Figure 1;

Figure 3 is a vertical sectional view, representing a section on the line III—III of Figure 2, but omitting the delivery door operating mechanism;

Figure 4 is an enlarged horizontal sectional view, representing a section on the line IV—IV of Figure 3;

Figure 5 is a vertical sectional view of the central portion of the apparatus, the section being on the line V—V of Figure 4;

Figure 6 is a vertical sectional view of the same portion of the apparatus, the section being on the line VI—VI of Figure 5;

Figure 7 is an enlarged sectional detail view of the delivery compartment door, representing a section approximately on the line VII—VII of Figure 1;

Figure 8 is a vertical sectional detail view, representing a section on the line VIII—VIII of Figure 7;

Figure 9 is an enlarged horizontal sectional detail view illustrating the carbonated water and syrup dispensing cylinders and their operating connections, the view being taken on the line IX—IX of Figure 5;

Figure 10 is a sectional view similar to

that shown in Figure 9, but illustrating the parts in different operative relation;

Figure 11 is an enlarged sectional detail view of a portion of the rear end of the carbonated water cylinder, illustrating the supplementary vent valve used for regulating the action of said cylinder;

Figure 12 is a vertical sectional detail view, showing the coin control mechanism, whereby the operation of the motor is controlled, the view being a section on the line XII—XII of Figure 4;

Figure 13 is an enlarged horizontal sectional view of the same coin control parts as appear in Figure 12;

Figure 14 is a fragmentary elevation showing a portion of the coin chute and adjacent parts of the coin control connections, with the latter in different operative relation to illustrate the release of the switch latching element;

Figure 15 is a diagrammatic view, illustrating the motor circuit and its operating switch element;

Figure 16 is an enlarged sectional detail view of the mixing nozzle for the syrup and carbonated water, said view representing a section on the line XVI—XVI of Figure 6;

Figure 17 is a horizontal section, taken on the line XVII—XVII of Figure 16; and

Figures 18, 19 and 20 are enlarged sectional detail views of the valve structures for controlling the intakes and outlets of the carbonated water and syrup cylinders, said views representing sections taken on the lines XVIII—XVIII, XIX—XIX and XX—XX respectively of Figure 4.

Referring now to the drawings in detail, these illustrate an apparatus comprising a cabinet 25 in the top of which is located a refrigerating compartment 26 (see Figure 2) containing the coils 27 leading from a tank 28 for furnishing a supply of soda water under pressure to the liquid dispensing mechanism, said tank 28 being located in a lower compartment 30 of the cabinet 25, as shown in Figure 3. The refrigerating compartment 26 also accommodates a syrup tank 31, and in this top portion of the cabinet is also provided a compartment 32 for accommodating a pair of magazines 33 each providing a supply of the cups 34 which are dispensed and filled with the soda water to be vended by the vending mechanism, as hereinafter explained. The cabinet 25 is provided with the usual hinged cover 36 affording access to the refrigerating compartment.

The middle portion of the cabinet forms a compartment 37 for the liquid and cup dispensing mechanisms and actuating means therefor, as hereinafter more fully described, a door 38 (see Figure 1) affording access to said compartment 37 and having a glass panel 39 through which the mechanisms and their operation may be viewed. A door 40 is also

provided at the front of the lower compartment 30.

Referring now more particularly to Figures 4, 9 and 10, the soda water dispensing means comprises mechanism which is carried by a plate 42 supported by cross channels 43 extending across the cabinet between the compartments 26 and 37 (see Figure 3). This mechanism comprises a carbonated water dispensing cylinder 45 provided with a valve head 46 in which is mounted a pair of spring-actuated and normally closed valves, the valve 47 controlling communication between said cylinder and the refrigerating soda water coils 27, and the other valve 48 serving normally to close the outlet passage 49 from the cylinder, leading to the outlet pipe 50 (Figure 20). In the cylinder 45 is mounted a plunger 52 carried by a piston rod 53 provided with a collar 54 and cross bar 55, the latter being connected by a pair of coil tension springs 56 with suitable projections 57 from the valve head 46 (Figure 9). As thus arranged, the springs 56 tend normally to hold the plunger 52 in forward or water-discharging position as shown in Figure 9.

The syrup supply tank 31 is provided with an outlet pipe 60 (Figure 3) leading to a syrup measuring and dispensing cylinder 61 (Figures 9, 10 and 18) provided with a plunger 62 carried by a piston rod 63 pivotally and slidably connected with a lever 64 one end of which is fulcrumed on a fixed pin 65 depending from the plate 42. Intermediate its ends the lever 64 is pivotally connected with adjustable turnbuckle rod 66, which in turn is pivotally connected, as indicated at 67 to one end of a lever 68 fulcrumed on a fixed pin 69 depending from the plate 42, and the other end of said lever 68 is slidably and pivotally connected to the outer end of the piston rod 53 (Figures 9 and 10). By means of these connections, it is apparent that the rearward or retracting movement of the plunger 52 within the cylinder 45 effects the operative or impelling stroke of the plunger 62 within the syrup cylinder 61, whereas the advance or impelling stroke of the plunger 52 operates to effect the retracting or suction stroke of the plunger 62 for filling the cylinder 61 with a charge of the syrup. The connection 60 from the tank 31 communicates with the cylinder 61 by way of a spring check valve 70 which normally closes communication between said cylinder and the pipe 60, but opens to admit a supply of the syrup in response to the suction stroke of the plunger 62; on the working or impelling stroke of the plunger 62, the syrup is discharged by way of an outlet passage 72 held normally closed by a spring actuated check valve 73 but opening under the pressure imparted by the action of the plunger 62 to discharge the syrup into an outlet connection 74 leading to a union 75 connecting the outlet pipe 50 from the cylinder

45 with a discharge pipe 76 leading to the cup filling position where the pipe 76 is provided with a carbonated water and syrup mixing nozzle (Figures 3, 16 and 17). This mixing nozzle comprises a casing 78 formed with a partition 79 having perforations 80 for dividing or distributing the flow of liquid to opposite sides of the casing, the lower side of which is threaded for the attachment of a nozzle member 81 within which is fitted a pair of screen elements 82 and an intermediate perforated disk 83, the purpose of which is not only to screen the liquid but also to intimately mingle the liquids and thus produce as perfectly uniform or homogenous mixture as possible.

The means for controlling the valves 47 and 48 of the carbonated water cylinder 45 comprises a slide member 85 mounted in guide-ways 86 within the valve head 46 and formed with projecting bosses 87 adapted for alternatively actuating said valves as required for admitting a charge of carbonated water to the cylinder 45 and allowing the discharge of the same on the working stroke of the plunger therein (see Figures 19 and 20). The slide member 85 is engaged by one arm of a bell crank lever 88 pivoted at 89 within a bracket 90 projecting from the valve head 46, the other arm of which lever 88 is pivotally connected to a latch link 91, said link having attached thereto a coil tension spring 92, one end of which is connected with a fixed pin 93 depending from the plate 42. The pull of the spring 92, acting through the link 91 and lever 88, maintains the slide member 85 normally in the position required for maintaining the valve 47 closed and the outlet valve 48 opened, as illustrated in Figure 9.

The link 91 is formed with a catch lug 95 adapted, in the position of said link illustrated in Figure 9, for engagement by the upper end of a lever 96 pivoted at a fixed point 97 (see Figures 3 and 6) provided by the framework 98 mounted within the intermediate compartment 37 of the cabinet. The lever 96 is held retracted by a coil spring 99 for maintaining a roller 100, carried by said lever, in engagement with a cam element 101 on one end of a shaft 102 journaled in bearings provided by said framework 98. The shaft 102 also carries a bevel gear 103 in mesh with a bevel pinion 104 on a short vertical shaft 105 which carries a worm gear 106 actuated by a worm element 107 carried by the shaft of a suitable electric motor 108. On completion of the operative movement of the link 91 in response to the action of the lever 96 as moved by the cam member 101, the catch element 95 of the link 91 is disengaged from said lever 96 by the operation of a tripping mechanism comprising a lever 110 pivoted upon a fixed pin 111 depending from the plate 42, said lever 110 being pivotally and slidably connected with said link

91, and also connected by means of a link 112 with a lever 114 pivoted upon a fixed pin 115 depending from said plate 42 and also carrying a projection 116 extending in position for engagement by the collar 54 on the piston rod 53 at the end of the retracting movement of the plunger 52, as illustrated in Figure 10. By means of this construction it is apparent that when the cylinder 45 has become charged with the carbonated water by the opening of the valve 47, whereby the springs 56 have been placed under tension as shown in Figure 10. The tripping of the lug 95 from the lever 96 releases the plunger 52 and its connections to the action of the spring 56, whereupon this spring action produces the opposite movements of both plungers 52 and 62, respectively, through the connections which have been described.

At the base of each of the cup magazines 33 is provided a cup dispensing device indicated generally by the reference numeral 120, this device comprising a cup dispensing mechanism of well known form and not herein shown in detail, the same including a reciprocating member 121, each operation of which effects the delivery of a cup from the corresponding magazine. The apparatus which I have devised is arranged to effect delivery of the cups 34 alternately from said magazines, by corresponding alternate operation of the slide members 121, for which purpose I provide a lever 122 pivoted at 123 (see Figure 4) and formed with the lobe portions 124 maintained in respective engagement with the outer ends of said slide members 121. One end of the lever 122 is pivotally connected with one end of a link 125, the other end of which is pivotally connected with the upper end of a lever 126 (see Figures 5 and 6). This lever 126 is fulcrumed at 127 in the framework 98, and is provided with a roller 129 which is maintained, by the action of a spring 130 connected to the upper end portion of the lever 126, in constant engagement with a cam element 131 carried by one end of a cam shaft 132 which is journaled in bearings provided by said framework 98. The other end of the shaft 132 is provided with a gear 133 driven by a pinion 134 on the corresponding end of the shaft 102, as shown in Figures 4 and 5.

The operation of the motor is controlled by a suitable coin operated or controlled mechanism which comprises a coin-chute 136 having an opening 137 for the insertion of a coin at the front of the cabinet (see Figure 1), the lower end of the chute being adapted to discharge the coins, after operation of the coin control, into a suitable receptacle 138 (Figure 12). Near its lower end, the chute 136 is provided with an opening 139 into which projects a roller 140 carried by the end of a lever 141 which is pivoted at 142 to a

vertical frame piece 143 and maintained by said roller 140 in position for presenting the latter normally in coin intercepting position within the chute 136 as represented in Figure 12. A detent lever 141' is also pivoted at 142 and connected by a pin and slot connection 118 with the lever 141, and a spring 144 is provided which tends automatically to lift the lever 141' to engage its tooth 145 with the lower end of a lever 146, pivoted at 147 to the frame piece 143 (see Figure 12), the upper end of which lever 146 is pivotally connected to the operating element 148 of a suitable snap switch 149 of well known commercial form, for controlling the circuit through the motor 108. In Figure 15 is illustrated a diagram of the circuit 150 and its connections with the motor 108, including the arrangement of the switch element 149 just referred to. When the lever 146 is released by disengagement of its lower end from the lever 141, a coil tension spring 152 operates to rock the lever 146 and thereby throw the switch element 148 into position for closing the switch 149, and hence the circuit through the motor 108. The circuit through the motor 108 thereupon remains closed until the switch element 148 is thrown in the opposite direction, which is accomplished by the operation of a lever 154 pivoted at 155 to the frame piece 143, the upper end of which lever is adapted for operative engagement with said switch element 148, whereas its lower end is provided with a roller 156 adapted to be engaged by a cam member 157 secured to one end of the shaft 102.

As already indicated, when a coin 160 is dropped into the chute 136, its descent is arrested by the detent roller 140, at which point of the chute I provide a sliding plunger rod 161 mounted for horizontal sliding movement in guide brackets 162 with one end of said rod adapted to be projected into the chute 136 for engagement with the coin 160. The rod 161 is maintained normally retracted by the action of a coil spring 163 connected with a lever arm 164 pivoted at 165 to the frame piece 143, and also to the rod 161 as indicated at 166 in Figure 12. The upper end of said lever arm 164 is provided with a laterally projecting knife portion 167 designed to be moved through a slot 168 in the coin chute 136 with the object of severing any cord or string device which might have been attached to a coin for recovering the same through the slot 137. A second plunger rod 170 is mounted for sliding movement through the front wall of the cabinet 25 where it is provided with an external knob 171 for engagement by the customer or other operator, the inner end of said rod 170 extending into operative engagement with the front end portion of the rod 161.

The cups 34 as discharged by the dispensing devices 120 are received by a Y-shaped

chute or guide 175 and thereby delivered into a cup holder 176 (see Figures 7 and 8). This cup holder 176 is mounted upon the upper face of a curved platform 177 projecting from the inner face of a relatively small delivery compartment door 178, which is also provided with the exterior handle 179. The platform 177 is provided with a latch element 180 pivotally mounted, as indicated at 181, with one end of said latch member projecting into the cup holder 176 in position for engagement by the bottom of the cup 34. The door 178 is maintained in normally closed position by the action of a spring 182 associated with the pivot 183 serving as a support for the combined door 178 and its platform 177. In closed position, the latch member 180 operates automatically to lock the door by the engagement of the shouldered end 180' of the latch with a catch lug 185 adapted for engagement by said latch member when in this position. The weight of a cup 34 is insufficient to disengage the latch from its locked relation with the catch 185, but the weight of the cup, with its contents, when substantially filled, is sufficient for unlatching said latch member from the catch 185, and thereby permits the customer to open the door into the position illustrated by the broken lines in Figure 7. That end of the latch member which projects within the cup holder 176 is suitably perforated with drain openings 186, and a drain channel 187 is provided from the cup holder 176 to the inner end of the platform 177, where a drain outlet 188 is provided, the same being adapted to discharge, in any position of the platform, into a drain trough 189 which is provided with an outlet pipe 190 leading into the waste receptacle 191 mounted in the lower compartment 30 of the cabinet. A similar drain pipe 192 is provided from the refrigerating compartment 26, for conducting the waste water therefrom into said receptacle 191.

It will thus be apparent that I have devised a practical and efficient apparatus for carrying out all the desired objects of the invention, and while the operation of the same will be easily understood in the light of the foregoing description, a brief summary of one cycle of the operation may be set forth. On inserting a coin 160 through the opening 137 into the chute 136, the coin is caught by the detent roller 140 and held until the operator pushes in the plunger 170, thus rocking the lever 141 and releasing the switch detent lever 146. The spring 152 thereupon operates the lever 146, thus actuating the switch element 148 and closing the motor circuit. The motor will then continue to operate for one revolution of the shaft 102, or until the cam element 157, rotating in the direction of the arrow in Figure 12, will rock the lever 154, which again actuates the switch 148 and opens the motor circuit. During this operation, a half revolution

lution is imparted to the shaft 132 which actuates the cup dispensing mechanism of one of the cup magazines 33, this operation being effected by means of the cam element 131 operating the lever 126 and its connection to the lever 122; and thereby actuating one of the slide members 121, the other slide member 121, of the other cup magazine, being actuated by the opposite movement of the lever 122 taking place in the next succeeding operation of the vending apparatus. Whichever cup dispensing device is operated, a cup is delivered into the chute or guide 175, and by it discharged into the cup holder 176 in the position shown in Figure 8. The rotation of the shaft 102 and the cam element 101 carried thereby, further actuates the lever 96 which is engaged with the link 91 forming part of the mechanism for actuating the valves of the carbonated water cylinder 45. This valve operation is effected in opposition to the pull of the spring 92, as already explained. The valve 47 of the cylinder 45 being open, carbonated water is admitted thereto, resulting in rearward or retracting movement of the plunger 52 against the tension of the springs 56. In this connection it may be explained that at the conclusion of the last preceding cycle of the operation of the machine, a retracting movement has taken place of the plunger 62 of the syrup cylinder 61, leaving said cylinder supplied with the proper charge of syrup for the succeeding vending operation. Hence, in the movement just described of the plunger 52, the plunger 62 of the syrup cylinder is actuated in a forward direction, as required for the discharge of its contents into the liquid conduit 76. This feeding of the syrup into the discharge conduit in advance of the carbonated water is of advantage, since it is well known that the syrup is of a viscous consistency and sluggish in its movement, and the flow thereof is accelerated by the action of the carbonated water flow following up the movement of the syrup material, thus completely washing out the conduit in an obvious manner. As the collar 54 on the piston rod 53 reaches the rearward limit of its movement, according to its adjustment along said rod 53, it comes into engagement with the plate 116 projecting from the arm 114, and producing a rearward swinging movement of said arm, and thereby through its connection with the link 91 disengaging the lug 95 from the lever 96, as represented in Figure 10. The plunger 52 is now free to move in response to the pull of the springs 56, on its working or impelling stroke, for effecting the discharge of the contents of the cylinder 45 past the outlet valve 48, it being recalled that the release of the link 91 from the lever 96 has also released the spring 92 and effected a return of the valve slide 85 to initial position, with the valve 48 open and the valve 47 closed. The working stroke of

the plunger 52 simultaneously effects the suction stroke of the plunger 62, so that at the end of this operation the latter plunger is again in the position illustrated in Figure 9, having drawn a new charge into the cylinder 61 ready for the next succeeding vending operation. In this connection it may be explained that provision is made for adjusting the charging volume of the cylinder, this provision referring to the turnbuckle connection 66 between the levers 64 and 68, whereby the stroke of the plunger 62 is conveniently varied, whereas the adjustment of the collar 54 provides for varying the time of the tripping operation of the connection between the link 91 and lever 96, and correspondingly the time of operation of the valves of the cylinder 45.

The speed or rate of charging operation of the cylinder 45 may also be conveniently regulated by means of a supplementary vent valve 196 provided at one end of the cylinder 45, the adjustment of which valve serves to regulate the speed of the plunger in response to the carbonated water pressure, it being understood that the faster this plunger movement the greater will be the gaseous content of the charge admitted to the cylinder whereas the slower this plunger movement, due to a more nearly closed position of said valve 196, the smaller will be the percentage of gas admitted,—so that the proper or desired extent to which the mixture is charged with the gas may be readily secured by the manipulation of this valve.

A wire detent element 216 is attached to the lever 146 and projects at its free end in the opening 139 for successively intercepting and retaining the coins in the event of more than one being dropped down the chute at one time. Thus the proper operation of the apparatus by each of such coins is not interfered with.

A suitable buffer element 198 (see Figure 9) is provided for engagement by the arm 88 under the pull of the spring 92 after the tripping of the connection between the link 91 and lever 96.

After the syrup charge and the carbonated water have passed down through the conduit 76 into the mixing nozzle 78, they are here screened and most thoroughly intermingled, and finally discharged as a perfectly homogeneous mixture into the cup 34; the combined weight of the cup and its contents now effects the unlocking of the latch member 180, whereupon the customer or operator may open the door and remove the cup from its holder 176.

The succeeding operations are simply a repetition of the foregoing steps, the only variation being that the cup dispensing mechanisms are alternately operated, that is to say, two cups being vended for each complete rotation of the shaft 132.

While I have illustrated what I now regard as the preferred form of embodiment of the apparatus, I desire to be understood as expressly reserving the right to make all such changes or modifications as may fairly fall within the scope of the appended claims.

What I claim is:

1. Apparatus of the character described comprising a pair of fixed cup dispensing magazines, a cup dispensing mechanism associated with each of said magazines for feeding cups into filling position, a motor provided with connections for alternately actuating said dispensing mechanisms, and means also actuated by said motor for feeding a mingled charge of liquids into each cup after reaching filling position.

2. In apparatus of the character described, a cabinet provided with a door, a platform rigidly associated with said door, cup dispensing means for releasing a cup into filling position upon said platform, means for feeding a liquid into the cup when in filling position, and automatic door latch means actuated into unlatched relation by the weight of the filled cup on said platform.

3. A liquid dispensing machine comprising a pair of fixed cup-dispensing magazines, a cup-dispensing mechanism associated with each of said magazines and operative to feed a cup therefrom into cup-filling position, a motor provided with connections for alternately actuating said dispensing mechanisms, and means actuated by each operation of the motor for feeding a liquid into each cup after it reaches filling position.

4. A dispensing apparatus comprising a liquid dispensing cylinder having a plunger and an inlet valve and a discharge valve, spring elements acting to hold said valves normally in closed position, means for actuating said valves comprising a slide having spaced bosses adapted to engage and operate said valves for first moving the inlet valve into open position while leaving the discharge valve closed and thereafter actuating said discharge valve into open position while permitting closing movement of the inlet valve, and means operating automatically at the end of the filling stroke of the plunger for reversing the movement of said slide.

In witness whereof I hereunto affix my signature.

EDWARD J. LIND.