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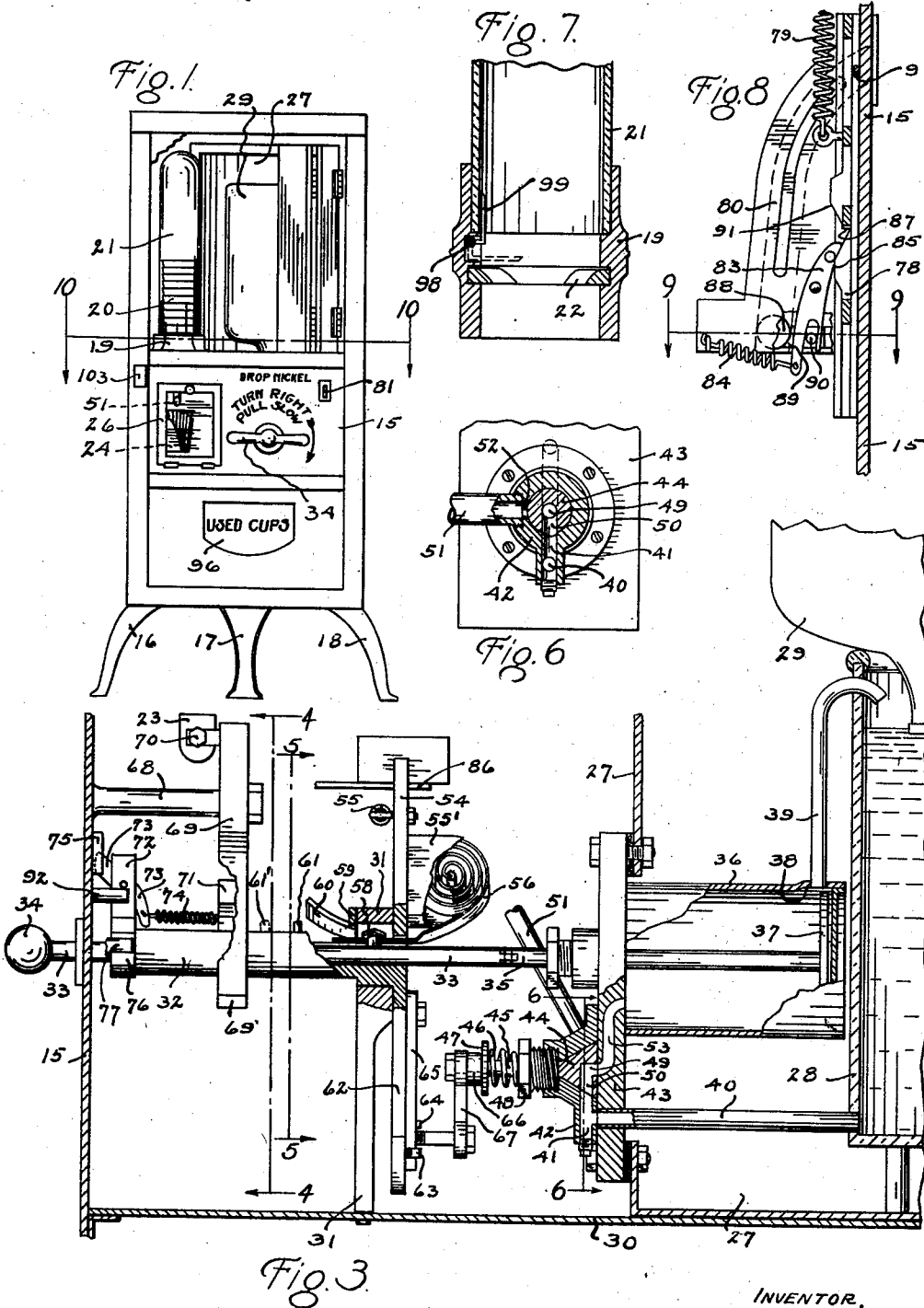
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1,785,316

LIQUID DISPENSING DEVICE

Filed April 10, 1929

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

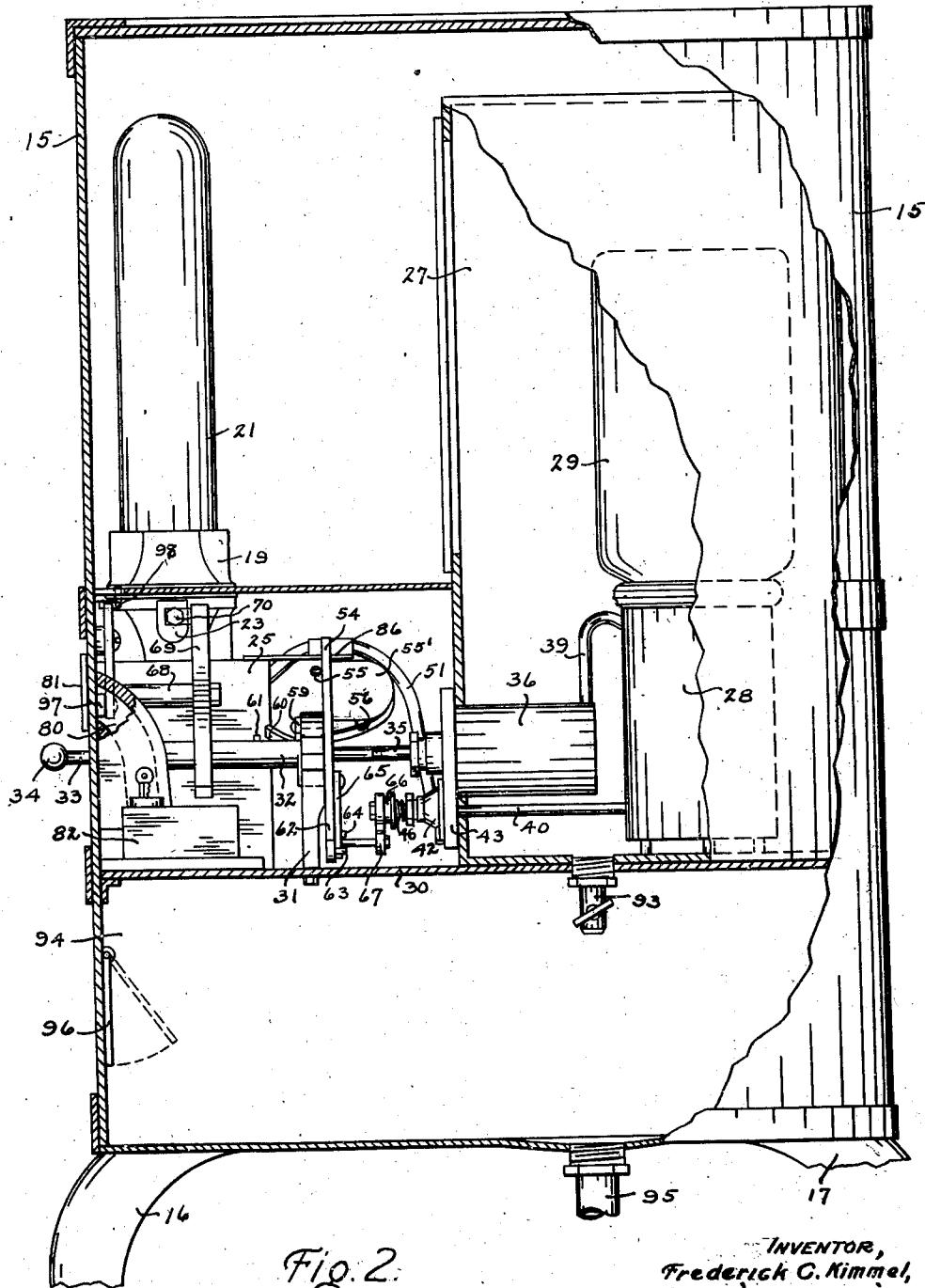


Fig. 2.

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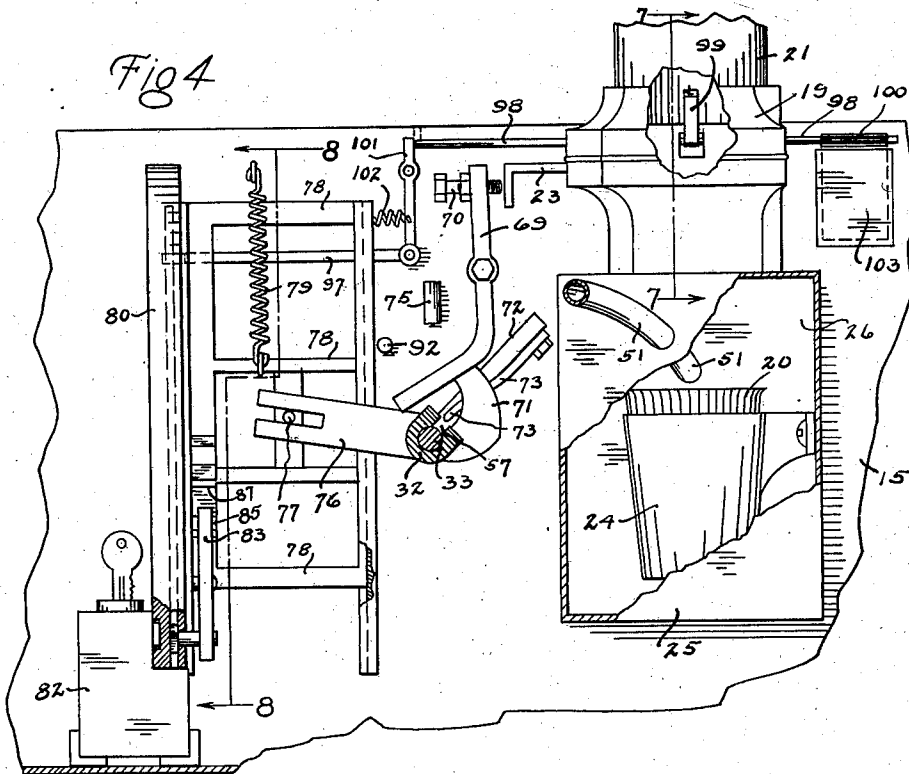
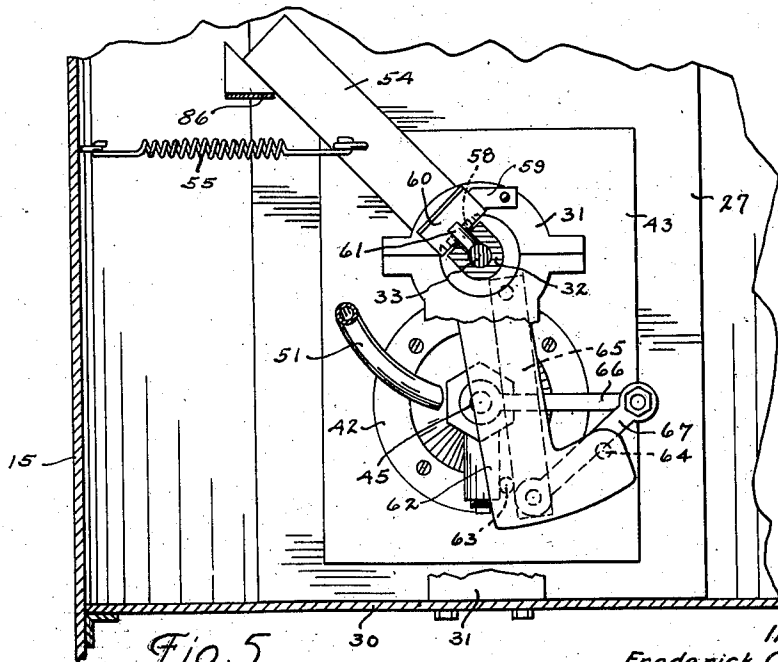
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4 Sheets-Sheet 3



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4 Sheets-Sheet 4

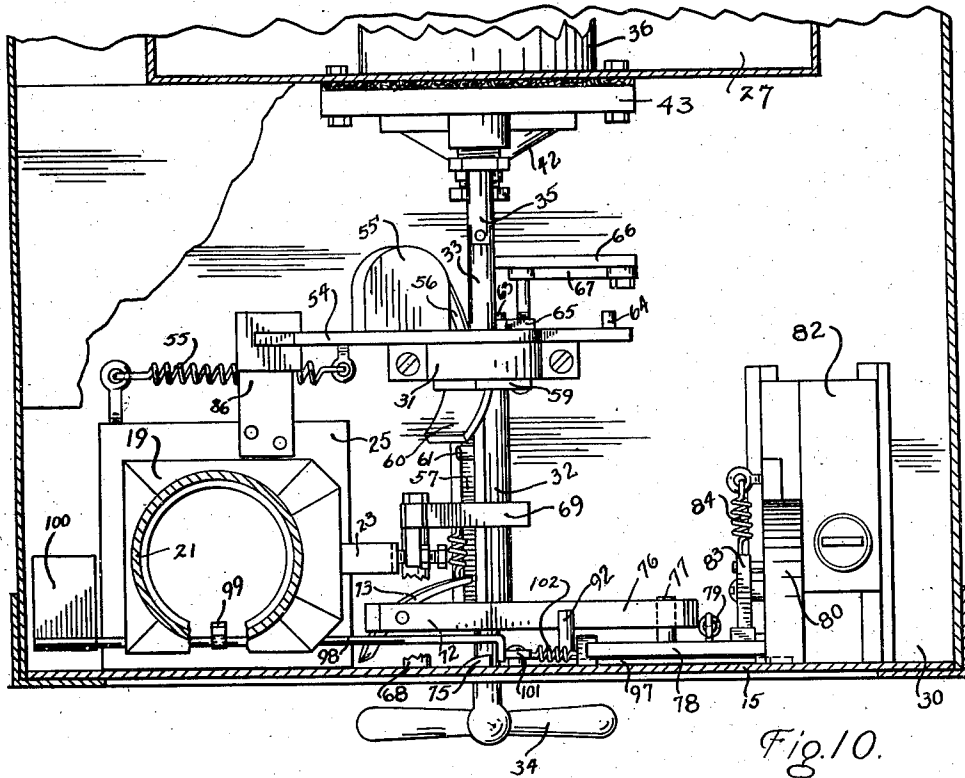


Fig. 10.

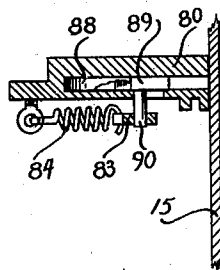


Fig. 9.

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UNITED STATES PATENT OFFICE

FREDERICK C. KIMMEL, OF COLUMBUS, INDIANA

LIQUID-DISPENSING DEVICE

Application filed April 10, 1929. Serial No. 354,092.

This invention relates to means for vending liquids and particularly to coin controlled means for withdrawing a fixed amount of a liquid from a source of supply and placing that amount in a container ready for consumption.

The primary object of the invention comprises the providing of a self-contained unit which is stocked with a supply of cups or containers held in a sanitary manner and a supply of some liquid drink whereby, upon inserting a suitable coin into the unit, a cup may be discharged from the supply, and made accessible from the outside of the unit and a definite amount of the liquid then poured into the cup, and the unit automatically prepare itself for the next serving of a drink upon the insertion of the second coin. Many other objects will become apparent by the description of the invention in reference to the accompanying drawings, in which—

Fig. 1, is a front elevation of the vending machine;

Fig. 2, a fragmentary side elevation of the machine on an enlarged scale;

Fig. 3, a fragmentary side elevation of the principal operating mechanism;

Fig. 4, a vertical section on the line 4—4 in Fig. 3;

Fig. 5, a vertical section on the line 5—5 in Fig. 3;

Fig. 6, a vertical section on the line 6—6 in Fig. 3;

Fig. 7, a vertical section on the line 7—7 in Fig. 4;

Fig. 8, a vertical section on the line 8—8 in Fig. 4;

Fig. 9, a horizontal section on the line 9—9 in Fig. 8; and

Fig. 10, a horizontal section on the line 10—10 in Fig. 2.

Like characters of reference indicate like parts throughout the several views in the drawings.

I form a housing 15 mounted preferably on the three legs 16, 17 and 18 so as to prevent rocking when standing on uneven floors. At one side, within the housing 15, I mount a cup holder 19 on which rest a plurality of vertically nested cups 20 within a glass en-

closing tube 21. Now the holder 19 contains a slide 22, Fig. 7, which, when moved by the arm 23 travelling toward the holder 19, Figs. 2, 3 and 4, permits a single cup 20 to drop through the holder and be caught in an upright position in the bracket 24, Fig. 4, which bracket is mounted within the box 25 secured to the back side of the front wall of the housing 15. A door 26 opens downwardly to permit access to within the box 25 from the front side of the housing. The exact mechanism in the holder 19 is not here shown in detail since its structure is well known to those versed in the art and not here constituting invention.

In the back part of the housing 15 is formed a refrigerator compartment 27, Figs. 1, 2, and 3, and a receptacle 28 is mounted therein over which a bottle 29 containing the liquid to be dispensed is inverted so that the neck of the bottle will extend down into the vessel whereby a fixed level of the liquid will be maintained in the receptacle by reason of the liquid flowing from the bottle until a vacuum is produced within the bottle and a balance is reached against the atmospheric pressure on the surface of the liquid in the receptacle.

The refrigerator compartment 27 is carried on an intermediate floor 30.

Mounted on this floor 30 between the front of the compartment 27 and the front of the housing 15 is a standard 31 in the upper end of which is revolvably carried the horizontally disposed rocker shaft 32, Figs. 2 and 3, the shaft being supported at its rear end in the standard. This shaft 32 is hollow, and the rod 33 slidably passes through the shaft 32 to extend by its forward end on through the housing wall and beyond to carry thereon the operating handle 34. The rear end of the rod 33 extends beyond the shaft 32 and interconnects axially with the plunger rod 35 which in turn passes rearwardly through a stuffing box into the cylinder 36 and is fixed therein to the plunger 37.

The cylinder 36 has an enlargement 38 at its upper rear end to form a by-pass around over the plunger 37, and a pipe 39 leads from this enlargement 38 and discharges into the

receptacle 28 above the liquid level therein, Fig. 3. From the side of the receptacle 28 toward its bottom leads a pipe 40 to discharge into a vertical passage 41 within the plate 42 which is carried on the block 43 which in turn is fixed to the compartment 27, the cylinder 36 being supported thereon. The plate 42 has a conical boring from its rear side into which the passage 41 discharges.

A cone 44 is slidably fitted into the conical boring in the plate 42 and has a stem 45 passing out forwardly from the plate to have a compression spring 46 carried between the washer 47 and the packing nut 48 to compressively hold the cone 44 in contact with the wall of the boring. This cone 44 has a central horizontal passage 49 entering from its rear face, and this passage 49 is intercepted by a transverse passage 50 bored through from the outside wall of the cone.

A discharge pipe 51 has one end fitted into a port 52 bored through the plate 42 into the conical boring therein at a distance around from the discharge opening of the passage 41. The pipe 51 leads from the port 52 around and into the box 25 and terminates by an end properly directed to discharge into a cup 20 that may be held in the bracket 24.

Referring to Figs. 3 and 6, the cone 44 is here positioned to permit liquid to flow from the receptacle through the pipe 40, the vertical passage 41, the horizontal passage 49, and thence upwardly through a passageway 53 in the block 43 into the cylinder 36 in front of the plunger 37, the plunger 37 being normally positioned at the rear of the cylinder whereby the incoming liquid will force air on up and out the pipe 39.

The rocker shaft 32 is cut through longitudinally along one side to form a slot opening 57 (Fig. 4) onto the rod 33 therein. An arm 54 extends upwardly from the rear end of the rocker shaft 32 and is pulled over toward the side of the housing where the cup holder 19 is located by a spring 55. On the back face of the arm 54 is fixed a box 55' in which a ribbon spring 56 is mounted and held by one end. The other end of the spring 56 is carried around and fixed to the rod 33 over the slot 57 by the cap screw 58, Fig. 3. To prevent premature movement of the rod 33 with its affixed parts to the rear, a latch 59 is pivoted to the forward side of the standard 31, Figs. 3 and 5, to drop by gravity down into contact with the rocker shaft 32 over the slot 57 in front of the head of the cap screw 58 so that forward movement of the rod 33 is thereby prevented by the head striking the back face of the latch. The forward side of the latch 59 is formed to have an upturned lip 60.

A pin 61 is secured in the rod 33 to project outwardly through the slot 57 in the rocker shaft 32 and is located forwardly of the latch 59. By reason of this pin 61 projecting through the slot 57 rotation of the handle 34

will cause the rocker shaft 32 to rotate with the rod 33. At the rear end of the rocker shaft 32 is an integral downwardly extending lever 62, Figs. 3 and 5, which is widened out at its lower end to carry the two stop pins 63 and 64 in spaced apart relation. A lever 65 is pivoted to the lever 62 near its upper end and hangs downwardly in sliding contact over the lever 62 to have its lower end confined to movement between the two pins 63 and 64. A lever 66 is fixed to the stem 45 of the cone 44, and the outer end of the lever 66 is interconnected with the lower end of the lever 65 by the link 67.

A post 68 fixed on the front wall of the housing 15, Fig. 3, carries a lever 69 pivotally thereon. The lever 69 has an upper arm extending normally vertically from the post 68 and has an adjustable screw 70 transversely passed through its upper end to have the screw substantially in contact with the end of the arm 23. The lever 69 also has a lower arm which is bent around to pass over the rocker shaft 32 and rest on a cam 71 fixed on the rocker shaft in such a manner that rocking of the shaft will rock the lever 69 to cause it to push on the arm 23.

At the extreme forward end of the rocker shaft 32 is an arm 72 normally directed upwardly and over toward the box 25. To the under side of the arm 72 is pivotally secured a pawl 73 which has its upper end carried toward the front wall of the housing 15 by reason of the spring 74 pulling back on the lower end, the spring having its rear end secured to the forward side of the cam 71.

A lug 75 is fixed on the housing wall in the path of the pawl 73 and has an inclined face toward the pawl so that should the rocker shaft 32 be rotated the pawl 73 may slide up over the lug 75 and drop down on the opposite side to prevent opposite rotation of the shaft 32 until the pawl 73 may be released from along a side of the lug. The lower end of the pawl 73 extends downwardly and around behind the arm 72 and terminates just over the slot 57 in the shaft 32.

The arm 76 extends from the extreme forward end of the shaft 32 away from the arm 72 but at an angle thereto and has a slotted outer end into which is entered a pin 77 which is fixed in a vertically sliding carriage 78 normally pulled upwardly by the spring 79. A coin chute 80 leads from a coin slot 81 downwardly along the carriage 78 to discharge into a removable coin box 82 locked into position at the under side of the chute. On the side of the chute 80 toward the carriage 78 is pivoted a pawl 83 Fig. 8, having a spring 84 rocking the pawl toward the carriage. The end of the pawl toward the carriage normally rests upon the shoulder 85 which shoulder is there positioned by reason of the pull of the spring 55 causing the arm 54 to strike the stop 86 which controls the

travel of the forward arm 72, and in turn controls the upward travel of the carriage 78 by reason of the interlocking pin 77. The spring 79 cooperates with the spring 55 in maintaining the position of the parts as described.

Just above the shoulder 85 is a notch 87 into which the pawl 83 would normally drop should the handle 34 be turned in an attempt to rock the shaft 32, and since the carriage 78 could not then be moved downwardly any farther, rotation of the handle 34 is prevented.

Should a coin 88, Fig. 8, be dropped down the chute 80, the coin 88 will be stopped near the lower end of the chute by the bar 89 which projects into the chute just far enough to stop a coin of the proper size.

This bar 89 is slidably guided to be moved toward and away from the chute by means of a pin 90 extending from the side of the bar 89 into the slotted lower end of the pawl 83. With the coin 88 against the bar 89, the pawl 83 may not rock into engagement with the notch 87 so that the handle 34 may then be turned to revolve the shaft 32 and carry the carriage 78 downwardly and the carriage then does not interfere with rotation of the shaft. As the carriage 78 is pulled downwardly by the arm 76, the upper end of the pawl 83 comes into contact with the outwardly and upwardly sloping face on the underside of the shoulder 91 which is formed to carry the pawl 83 outwardly so as to move the bar 89 toward the carriage and away from the coin 88 to permit the coin to drop past the bar and into the coin box. A stop 92 on the forward wall of the housing in the path of the arm 72 limits the rotation of the shaft 32 in a clockwise direction.

Ice may be placed in the compartment 27 and around the receptacle 28 to keep the liquid at the desired temperature, and water from the ice may be drained through the valve 93 down into the lower compartment 94 and out the drain pipe 95. A door 96 gives access to the lower compartment through which empty cups may be thrown into the compartment 94.

From the above description it is to be seen that the mechanism is completely locked against operation until a coin is inserted through the slot 81 since the handle 34 may not be pulled outwardly by reason of the head of the screw 58 striking the latch 59, and the handle may not be rotated by reason of the arm 76 being held through the pin 77 on the carriage 78 by the pawl 83 dropping into the notch 85 upon the slightest movement of the handle 34.

Another safeguard is provided in the form of the horizontally sliding rod 97, Figs. 2, 4, 8 and 10, which is mounted to be reciprocated to have an end enter the coin chute 80 and pass across the opening therethrough so as to prevent insertion of a coin in the slot 81.

The rod 97 is only moved to this position in the chute when the supply of cups 20 is exhausted so that liquid will not be discharged from the pipe 51 when there is no cup to receive it.

A rod 98 is rotatively passed through the holder 19 and has an arm 99 fixed thereto to swing from a horizontally disposed position as indicated by dash lines in Fig. 7, to a vertical position as there shown in solid lines, in which vertical position, cups 20 may slide therepast and at the same time prevent the arm 99 from dropping over to the horizontal position. On one end of the rod 98 is a flag 100 which is held in a horizontal position when the arm 99 is held vertically. The other end of the rod 98 has its end bent around horizontally forwardly to form a bearing surface against which the upper end of the rocker lever 101 may bear compressively by reason of the spring 102 tending to rock the lever thereagainst. The lower end of the lever 101 is pivotally connected to the rod 97.

Now when the supply of cups becomes so low as to permit the arm 99 to drop over by reason of the torsional pull on the rod 98 of the horizontally extending flag 100, the bent end of the rod 98 is rocked away from the lever 101, which action permits the spring 102 to rock the lever 101 to slide the rod 97 into the coin chute 80, and allow the flag 100 to drop down behind the window 103. When the cup supply is replenished, the lever 102 is again reset against the end of the rod 98.

The operation of the machine is described as follows. A coin 88 is first inserted in the slot 81 and it rolls down the chute 80 until it strikes the end of the bar 89. The handle 34 is then turned as far as it will go to the right, during which rotation, the rocker shaft 32 has likewise been rocked by reason of the pin 61 being in the slot 57 until the lever 72 has been brought up against the stop 92 and the pawl 73 has dropped behind the lug 75 so as to prevent the shaft 32 from being rocked backwardly to its original position.

While the shaft 32 is being rocked, the carriage 78 is moved downwardly by the arm 76 carrying the pin 77 therealong, the coin 88 preventing movement of the pawl 83 toward the carriage, until the rocker shaft 32 is brought to a stop, whereupon the coin 88 is dropped from the chute 80 into the coin box 82, all as above described. During the rocking of the shaft 32, the lever 69 has been rocked by the cam 71 to press the arm 23 so as to cause a cup 20 to be dropped into the bracket 24.

The rocking of the shaft 32 has also caused the arm 62 to have been rocked to carry the pin 63 away from the lever 65 and after an interval of motion brought the pin 64 up against the lever 65 to have carried the lever

65 along with the arm 62 during the rest of its travel. During this last travel the cone 44 has been rocked to have carried the passage 50 around from its initial registry with the passage 41 to register with the port 52. The rotation of the rod 33 causes a like rotation of the rod 35 and plunger 37.

Since the latch 59 is pivoted to the standard 31, the head of the screw 58 is rocked away from its initial position in reference to the latch when the shaft 32 is rocked, and the latch 59 is so formed, that when the shaft 32 has been rocked to its limit, the head of the screw 58 is free to be moved forwardly with travel of the rod 33 without interference from the latch, the head having been brought around from behind the lip 60 of the latch. The use of the pins 63 and 64 as above described permits a delayed action on the cone 44 in reference to rotation of the shaft 32, whereby a difference in amount of rotation may be secured therebetween.

The cup 20 having been deposited in the bracket 24 under the discharge end of the pipe 51, the handle 34 is then pulled outwardly from the housing 15 to overcome the pull of the spring 56 and cause the plunger 37 to force the liquid within the cylinder 36, to discharge through the passages 53, 49, 50, and port 52 into the pipe 51, and therefrom into the cup 20.

The resistance of the spring 56 against jerking of the handle 34, and the by-pass 38 around the plunger 37 prevents a sudden surge of liquid from the end of the pipe 51 so that from the beginning to the end of the pull on the handle, a steady flowing stream of liquid is maintained. Referring to Fig. 3, the pin 61 may be positioned along the rod 33 in a number of positions, such for example as at the position indicated by the dash lines 61', for the purpose of fixing the amount of liquid to be discharged from the cylinder 36. By moving the pin 61 forwardly, the amount discharged is decreased.

As the handle 34 is pulled outwardly, the pin 61 is carried along by the rod 33 in the slot 57 until it presses against the lower end of the pawl 73, to rock the pawl sufficiently to raise its outer end clear of the lug 75 whereupon the pull of the spring 55, assisted by the pull of the spring 79, at once throws the arm 54 around against the stop 86, rocking the shaft 32 back to its initial position and turning the cone 44 back to permit the cylinder 36 to be again filled with liquid. It is to be noted that the pipe 51 extends upwardly from the plate 42 sufficiently to prevent liquid from flowing over into the cup 20 before the plunger 37 moves.

The spring 56 slides the rod 33 along backwardly through the shaft 32 and accordingly carries the plunger 37 back to the end of the cylinder 36, any liquid behind the plunger 37 being discharged through the

pipe 39 until the bypass 38 is reached. The head of the screw 58 is carried back by the rod 33 to press against the lip 60 of the latch 59, and the angle of the lip 60 is such that the lip is raised by passage of the head thereunder to permit the latch 59 to be raised and then dropped in front of the head when the rod 33 reaches its rear limit of travel.

All of the mechanism is then in its original initial position ready to be reoperated.

While I have here shown and described my invention in the form as now best known to me, it is obvious that many structural changes may be made from that form without departing from the spirit of the invention, and I therefore do not desire to be limited to that form, nor any more than may be required by the following claims.

I claim:

1. In a liquid dispensing device, having a cup dispensing means, a liquid container, means for receiving and discharging a predetermined quantity of liquid from said container, a shaft mounted to be moved in rotative and axial directions, means interposed between said shaft and said cup dispensing means for operating said dispensing means upon moving said shaft in one of said directions, valve means associated with said receiving and discharging means and said shaft operated during the travel of said shaft in said one direction, and said shaft being moved in the other of said directions to cause a discharge or reception of liquid through said valve means.

2. In a liquid dispensing device, having a cup dispensing means, a liquid container, means for receiving and discharging a predetermined quantity of liquid from said container, a shaft mounted to be moved in rotative and axial directions, means interposed between said shaft and said cup dispensing means for operating said dispensing means upon moving said shaft in one of said directions, valve means associated with said receiving and discharging means and said shaft operated during the travel of said shaft in said one direction, and said shaft being moved in the other of said directions to cause a discharge or reception of liquid through said valve means, and interlocking means for preventing the movement of said shaft in the said other direction until after the movement of the shaft causing operation of said dispensing means.

3. In a liquid dispensing device, having a cup dispensing means, a liquid container, means for receiving and discharging a predetermined quantity of liquid from said container, a shaft mounted to be moved in rotative and axial directions, means interposed between said shaft and said cup dispensing means for operating said dispensing means upon moving said shaft in one of said directions, valve means associated with said re-

ceiving and discharging means and said shaft operated during the travel of said shaft in said one direction, and said shaft being moved in the other of said directions to cause a discharge or reception of liquid through said valve means, and adjustable stop means limiting the travel of said shaft during its operation of said receiving and discharging means whereby the quantity of liquid discharged may be determined at a fixed amount.

4. In a liquid dispensing device, having a cup dispensing means, a liquid container, means for receiving and discharging a predetermined quantity of liquid from said container, a shaft mounted to be moved in rotative and axial directions, means interposed between said shaft and said cup dispensing means for operating said dispensing means upon moving said shaft in one of said directions, valve means associated with said receiving and discharging means and said shaft operated during the travel of said shaft in said one direction, and said shaft being moved in the other of said directions to cause a discharge or reception of liquid through said valve means, and interlocking means for preventing the movement of said shaft in the said other direction until after operation of said dispensing means, and return means operative upon movement of said shaft in both of said directions for returning said shaft and its said associated means to their normal initial positions.

5. In a liquid dispensing device, a rocker shaft rockably supported, a central shaft carried by said rocker shaft and adapted to be moved axially therethrough, a liquid container, latch means normally preventing axial travel of said central shaft, spring means normally holding said rocker shaft in a predetermined initial position, pawl means for holding said rocker shaft in a second position against the pull of said spring means following a predetermined period of rotation of the shaft from its initial position, said central shaft being adapted to be rotated by said rocker shaft to remove said central shaft from the influence of said latch means when the rocker shaft is turned to said second position, and plunger means actuated by axial movement of said central shaft for causing a discharge of liquid received from said container.

6. In a liquid dispensing device, a rocker shaft rockably supported, a central shaft carried by said rocker shaft and adapted to be moved axially therethrough, a liquid container, latch means normally preventing axial travel of said central shaft, spring means normally holding said rocker shaft in a predetermined initial position, pawl means for holding said rocker shaft in a second position against the pull of said spring means following a predetermined period of rota-

tion of the shaft from its initial position, said central shaft being adapted to be rotated by said rocker shaft to remove said central shaft from the influence of said latch means when the rocker shaft is turned to said second position, and plunger means actuated by axial movement of said central shaft for causing a discharge of liquid received from said container, and a stop on said central shaft adapted to release said pawl means following a predetermined travel of the central shaft so as to permit said spring means to rock said rocker shaft back to its initial position.

7. In a liquid dispensing device, a rocker shaft rockably supported, a central shaft carried by said rocker shaft and adapted to be moved axially therethrough, a liquid container, latch means normally preventing axial travel of said central shaft, spring means normally holding said rocker shaft in a predetermined initial position, pawl means for holding said rocker shaft in a second position against the pull of said spring means following a predetermined period of rotation of the shaft from its initial position, said central shaft being adapted to be rotated by said rocker shaft, to remove said central shaft from the influence of said latch means when the rocker shaft is turned to said second position, and plunger means actuated by axial movement of said central shaft for causing a discharge of liquid received from said container, and a stop on said central shaft adapted to release said pawl means following a predetermined travel of the central shaft so as to permit said spring means to rock said rocker shaft back to its initial position, and means for returning said central shaft to be retained by said latch means.

8. In a liquid dispensing device, a rocker shaft rockably supported, a central shaft carried by said rocker shaft and adapted to be moved axially therethrough, a liquid container, latch means normally preventing axial travel of said central shaft, spring means normally holding said rocker shaft in a predetermined initial position, pawl means for holding said rocker shaft in a second position against the pull of said spring means following a predetermined period of rotation of the shaft from its initial position, said central shaft being adapted to be rotated by said rocker shaft to remove said central shaft from the influence of said latch means when the rocker shaft is turned to said second position, and plunger means actuated by axial movement of said central shaft for causing a discharge of liquid received from said container, and a stop on said central shaft adapted to release said pawl means following a predetermined travel of the central shaft so as to permit said spring means to rock said rocker shaft back to its initial position, and means for returning said central shaft

to be retained by said latch means, a cylinder in which said plunger reciprocates by reason of the axial travel of said central shaft, valve means interposed between said cylinder and said container normally open to permit said liquid to flow from said container into said cylinder when said rocker shaft is in its initial position, a discharge pipe, and means interposed between said rocker shaft and said valve for rocking said valve by rocking said rocker shaft to close said valve to said container whereby the said discharge of liquid is through said pipe.

9. In a liquid dispensing device, a rocker shaft rockably supported, a central shaft carried by said rocker shaft and adapted to be moved axially therethrough, a liquid container, latch means normally preventing axial travel of said central shaft, spring means normally holding said rocker shaft in a predetermined initial position, pawl means for holding said rocker shaft in a second position against the pull of said spring means following a predetermined period of rotation of the shaft from its initial position, said central shaft being adapted to be rotated by said rocker shaft to remove said central shaft from the influence of said latch means when the rocker shaft is turned to said second position, and plunger means actuated by axial movement of said central shaft for causing a discharge of liquid received from said container, a movable carriage, an arm fixed to said rocker shaft and engaged with said carriage, and dog means normally engaging and preventing the movement of said carriage, and means for withholding said dog from engagement with said carriage.

10. In a liquid dispensing device, a liquid container, a cylinder adapted to receive liquid from the container, a pipe, a valve adapted to place the pipe in communication with the cylinder, a plunger rod mounted to permit axial and rotary travel, latch means normally holding said rod against axial movement, spring means yieldingly resisting rotary movement of the rod, means for releasably retaining the rod against the pull of said spring means following a rotary travel of the rod, said rod being removed from the influence of said latch means following said rotary travel, and stop means on said rod adapted to release said retaining means following a predetermined axial travel of the rod, said rod being connected with a piston in the cylinder, and means between said valve and said rod for operating the valve upon rotary motion of the rod.

11. In a liquid dispensing device, a liquid container, a cylinder adapted to receive liquid from the container, a pipe, a valve adapted to place the pipe in communication with the cylinder, a plunger rod mounted to permit axial and rotary travel, latch means normally holding said rod against axial movement,

spring means yieldingly resisting rotary movement of the rod, means for releasably retaining the rod against the pull of said spring means following a rotary travel of the rod, said rod being removed from the influence of said latch means following said rotary travel, and stop means following a predetermined axial travel of the rod, and spring means yieldingly resisting axial travel of the rod, said rod being connected with a piston in the cylinder, and means between said valve and said rod for operating the valve upon rotary motion of the rod.

12. In a liquid dispensing device, a plunger rod mounted to permit axial and rotary travel, latch means normally holding said rod against axial movement, spring means yieldingly resisting rotary movement of the rod, means for releasably retaining the rod against the pull of said spring means following a rotary travel of the rod, said rod being removed from the influence of said latch means following said rotary travel, and stop means on said rod adapted to release said retaining means following a predetermined axial travel of the rod, a cylinder, a piston within the cylinder operated by said plunger rod, a valve intercepting a passageway leading from the cylinder, an arm adapted to be moved upon rotation of said rod, and connecting means between said valve and said arm.

13. In a liquid dispensing device, a plunger rod mounted to permit axial and rotary travel, latch means normally holding said rod against axial movement, spring means yieldingly resisting rotary movement of the rod, means for releasably retaining the rod against the pull of said spring means following a rotary travel of the rod, said rod being removed from the influence of said latch means following said rotary travel, and stop means on said rod adapted to release said retaining means following a predetermined axial travel of the rod, a cylinder, a piston within the cylinder operated by said plunger rod, a valve intercepting a passageway leading from the cylinder, an arm adapted to be moved upon rotation of said rod, and connecting means between said valve and said arm, and means interposed between said arm and said connecting means for delaying operation of the valve upon rotation of the rod.

14. In a liquid dispensing device having a cup dispensing means, a liquid container, an operating shaft movable both rotatively and axially, means actuated by rotary movement of said shaft for operating said cup dispensing means, and means actuated by axial movement of the shaft to cause withdrawal of liquid from said container, both of said means being operated in sequence by rotative and axial movement of said shaft.

15. In a liquid dispenser, a liquid container, a cylinder interconnected with the

container, a rod extending from said cylinder from a plunger therewithin, a cylinder discharge pipe, a valve in the discharge pipe, an arm adapted to be swung to operate said valve upon rotary travel of the said rod, said
5 rod being adapted to be moved axially to move said plunger within the cylinder, and means for preventing axial travel of the rod until a predetermined rotary travel of the
10 rod has occurred.

16. In a liquid dispenser, a liquid container, a cylinder interconnected with the container, a rod extending from said cylinder from a plunger therewithin, a cylinder
15 discharge pipe, a valve in the discharge pipe, an arm adapted to be swung to operate said valve upon rotary travel of the said rod, said rod being adapted to be moved axially to move said plunger within the cylinder, and
20 means for preventing axial travel of the rod until a predetermined rotary travel of the rod has occurred, and releasable means holding said rod in the rotated position until a predetermined axial travel has occurred.

25 In testimony whereof I affix my signature.

FREDERICK C. KIMMEL.

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