

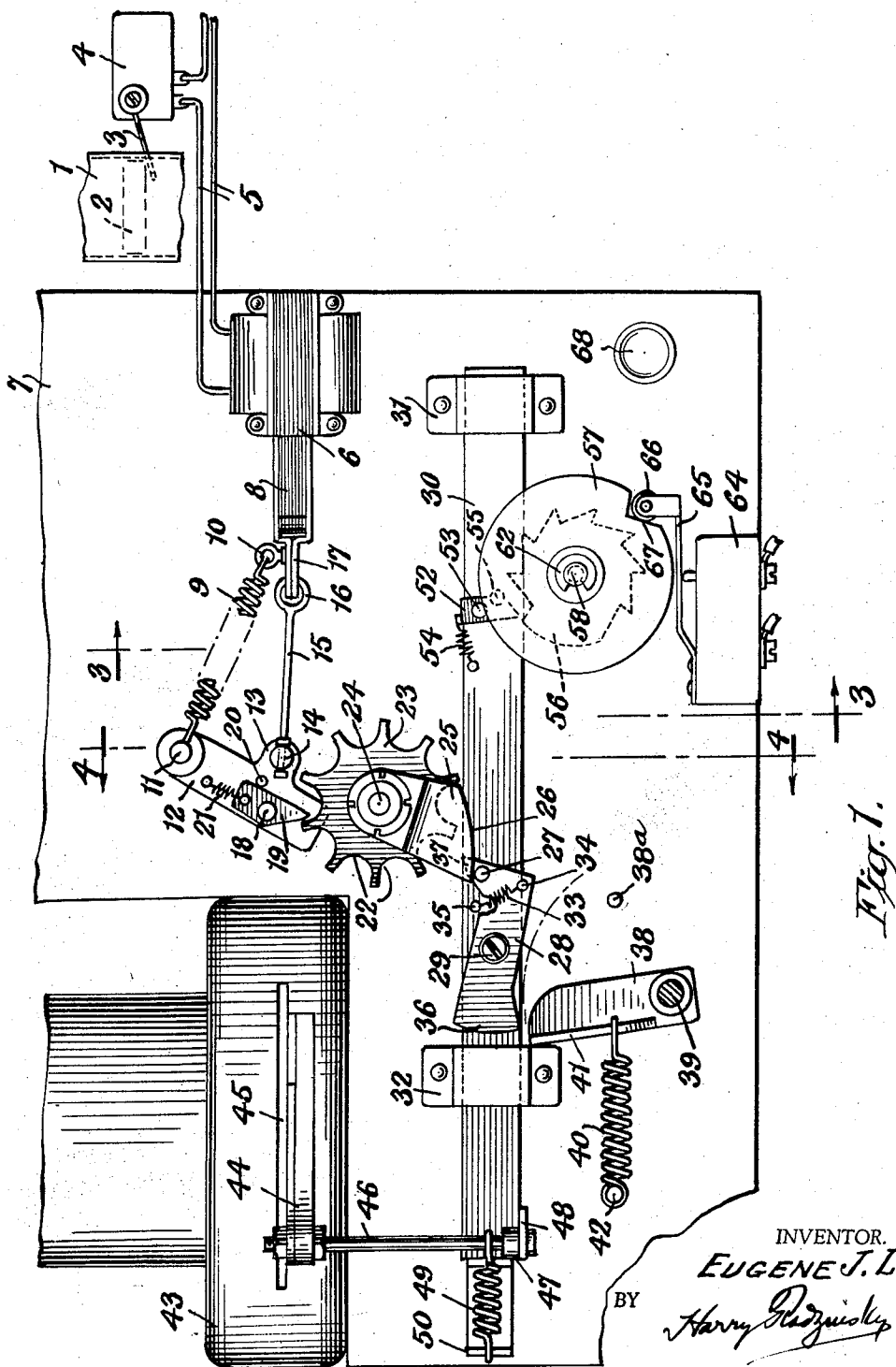
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VENDING MACHINES

2,851,189

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3 Sheets-Sheet 1



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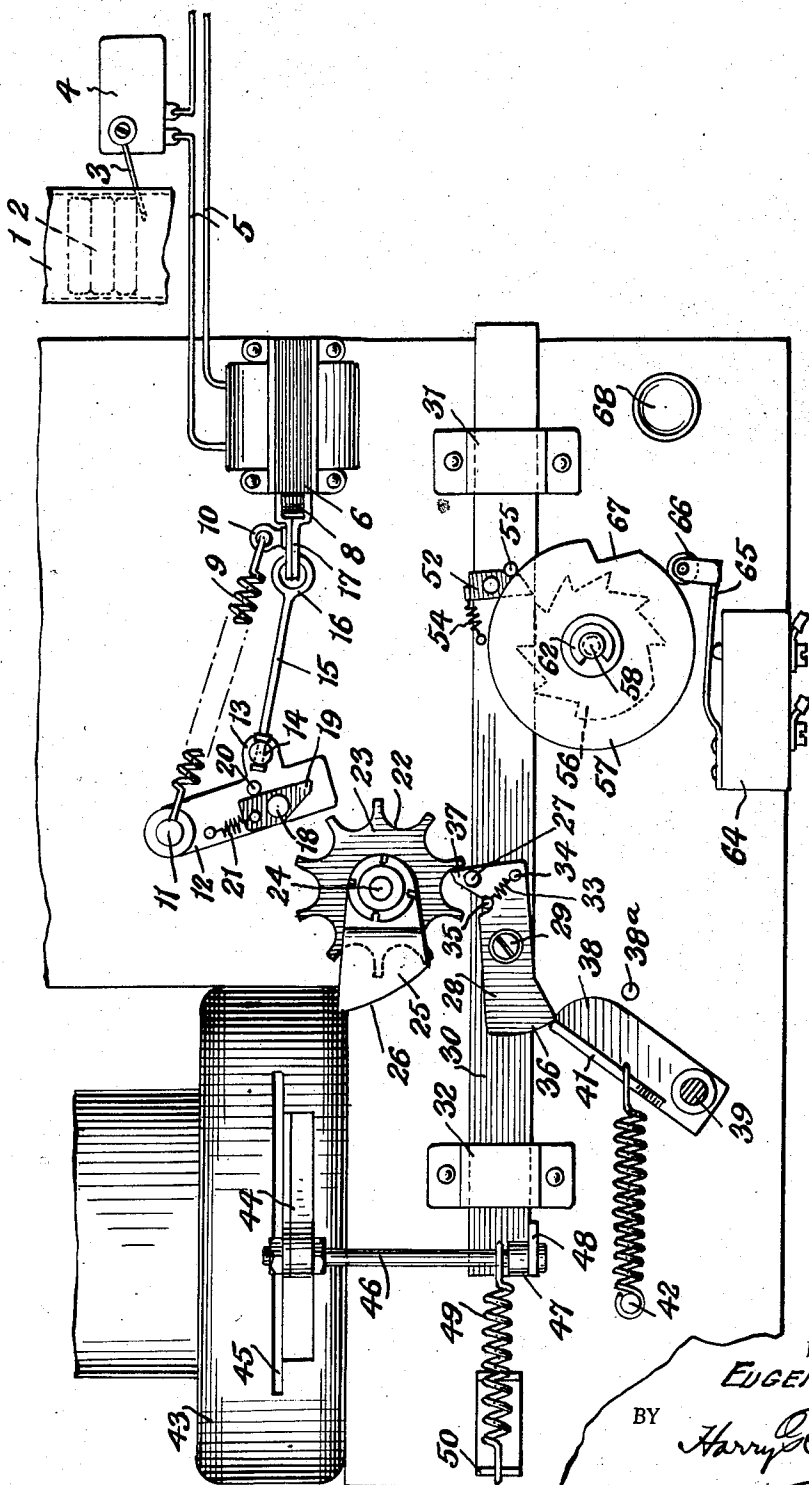


Fig. 2.

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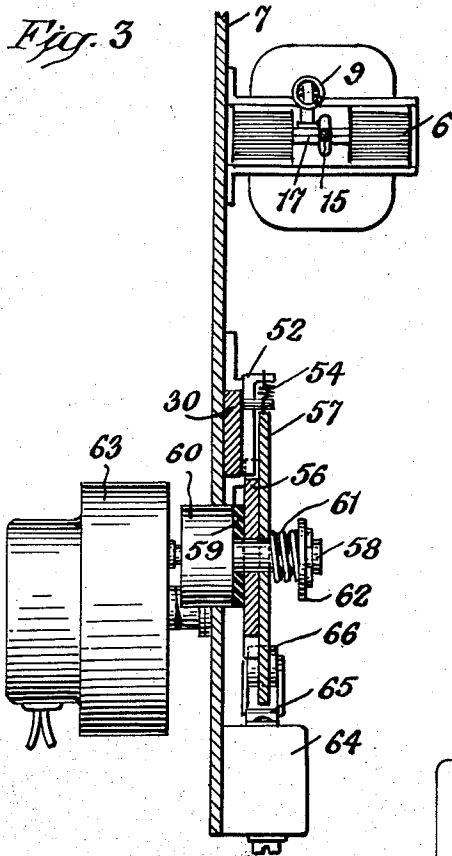
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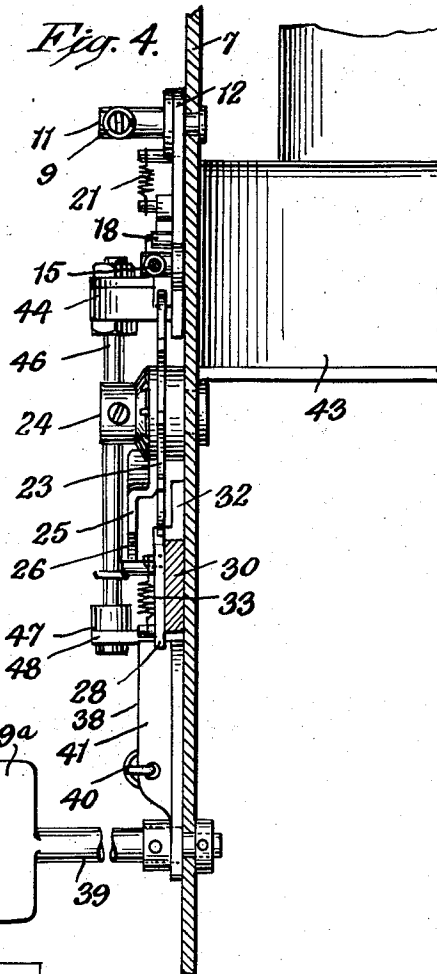
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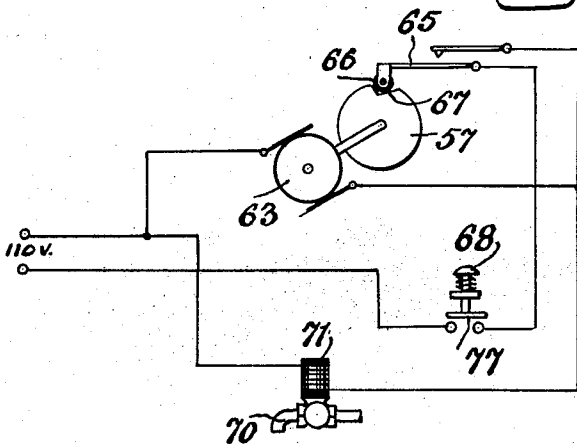
*Fig. 3*



*Fig. 4*



*Fig. 5*



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## VENDING MACHINES

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12 Claims. (Cl. 221—93)

This invention relates to vending machines, and more particularly to a type in which a succession of different articles or materials will be rendered available to a purchaser in required sequence upon insertion of one or more coins into the apparatus. Reference is particularly made to an apparatus by which ingredients for making a beverage, such as coffee, chocolate, cocoa or the like, a cup for containing the beverage, and a fluid, such as water of the required temperature, will be successively made available in proper sequence for the purchaser.

It is one of the objects of the invention to provide an apparatus for dispensing both cups and predetermined quantities of a fluid, such as hot water, which apparatus can be readily applied or attached to a well known type of package vending machine, thereby materially extending the usefulness of such machine and enabling it to co-operate in the dispensation of materials for making beverages.

It is another object of the invention to provide a mechanism by means of which paper cups may be successively dispensed, with the means for causing the dispensing of each cup being operative to control a switch by which the subsequent dispensing of a predetermined amount of the fluid will be had.

It is an object of the invention to provide means by which a number of cups may be successively dispensed and the amount of liquid to be thereupon dispensed shall be regulated according to the delivered number of cups.

With these, and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawings, wherein an illustrative embodiment of the invention is disclosed,

Fig. 1 is a front elevational view of the improved dispensing mechanism in its normal position of rest;

Fig. 2 is a similar view, but showing the parts in the position which they assume for the dispensing of a cup with the fluid-dispensing means freed for the dispensing of a predetermined quantity of fluid upon closing of a manually-operated switch;

Fig. 3 is a sectional view, taken substantially on the line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a sectional view, taken substantially on the line 4—4 of Fig. 1, looking in the direction of the arrows, and

Fig. 5 shows the electrical circuit for controlling the flow of the fluid.

The apparatus illustrated in the drawing is primarily, although not necessarily, designed for attachment or connection to some known type of package or article-vending apparatus by means of which, on the insertion of one or more coins, an article or package will be dispensed. Since such type of machine is known in many forms, the mechanism thereof is not herein shown and described, except to state that the element shown at 1 indicates a delivery chute forming part of, or connected to a machine from which the articles are successively dispensed. At 2 is

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shown one of the articles, which might be a packet or a container enclosing the dry ingredients for making a cup of coffee or other beverage. When such article has been freed for delivery out of the vending machine, it is arranged to pass and contact with a trigger or finger 3 constituting the actuating member of a micro-switch 4 which controls, by means of the wires 5 extending from a source of current, the energization of a solenoid 6 mounted on a base plate 7 attached to the vending apparatus. In the normal or inoperative position of the apparatus, the core 8 of the solenoid is held in its extended position as shown in Fig. 1, by means of a coil spring 9 having one end attached to an eye 10 secured to the core 8 and having its other end attached to the fixed pivot pin 11 on which an arm 12 is pivotally mounted. The arm 12 is formed with a lug 13 from which a stud 14 extends, and one end of a link 15 is adjustably connected in the stud while the other end of the link is formed with a loop 16 extended through eyes 17 provided at the end of the solenoid core 8.

Pivotally mounted at 18 on the arm 12 is a pawl 19, normally held in the position shown in Fig. 1 and against a stop pin 20 provided on the arm 12, by means of the coil spring 21. The pawl 19 is adapted for engagement with the notches 22 provided in the edge of a ratchet wheel 23 rotatively mounted on a stud shaft 24 secured to and extending from the base plate 7. This arrangement is such that upon each pivotal swing of arm 12 under the action of the solenoid and from the position shown in Fig. 1 to that shown in Fig. 2, the pawl 19 engaging in one of the notches 22 will rotate the ratchet wheel 23 in a clockwise direction for a predetermined distance. Carried by the ratchet wheel 23 is a cam member 25 which, in the position of rest of the apparatus as shown in Fig. 1, has its cam edge 26 engaging against a laterally-extending pin 27 projecting from the face of a pivoted locking member on latch 28. Said locking member or latch 28 is pivoted at 29 on the face of a sliding bar 30 which is slidable in guides 31 and 32 mounted on the face of the base plate 7. A coil spring 33 has one end attached to a pin 34 on the locking member 28 and has its other end fastened to pin 35 provided on the sliding bar 30. The spring 33 normally tends to pivot the locking member on pivot pin 29 in a manner to cause its forward end or nose 36 to be brought down to the position shown in Fig. 2 whenever the ratchet wheel 23 has been rotatively moved to an extent to cause the cam 25 to be swung sufficiently to permit upward swing of the rear end of the locking member as shown in Fig. 2. When the apparatus is in its position of rest as shown in Fig. 1, the cam, in its lowered position, maintains the locking member raised. It will be noted that at the rear end of the locking member 28, there is provided a tooth 37 which tends to rotate the ratchet wheel 23 backwardly or in a counter-clockwise direction when the sliding bar 30 is moved to the right.

At 38 is shown a pivoted lever, which is pivotally mounted on the shaft 39 and which shaft may extend to the outside of the casing in which the described mechanism is contained and may be provided with a knob or handle 39a (Fig. 4) by which the lever 38 may be swung from the position shown in Fig. 1 to that shown in Fig. 2. A coil spring 40 has one end attached to a flange 41 on the lever 38 and has its other end attached to a pin 42 on the base plate 7, and said spring 40 normally holds the lever 38 in its retracted position, or that shown in Fig. 1. A stop pin shown at 38a limits the swing of lever 38 in an opposite direction.

At 43 is shown a cup-delivery device of known construction, and such device is constructed to deliver a cup upon each movement of an operating arm 44 movable in a slot 45 formed in the casing of the cup dispensers. Said arm 44 is connected to the upper end of a rod 46 having its lower end secured at 47 in a lug 48 extending laterally

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from the sliding bar 30. This arrangement is such that upon each movement of the arm 44 to the right by the sliding movement of the bar 30 in that direction, a cup will be dispensed from the cup-dispenser 43. The coil spring 49 which retracts bar 30 as well as the arm 44 has one end attached to the rod 46 and has its opposite end attached to a lug 50 mounted on or formed out of the base plate 7, and the spring 49 tends to retract the sliding bar 30 to the position of Fig. 1 while swinging the cup-dispensing arm 41 to its retracted position also shown in Fig. 1.

Mounted on the sliding bar 30 is a pawl 52, pivoted at 53 on said bar, and the coil spring 54 normally tends to hold the pawl 52 against a stop pin 55 provided on the bar 30. The pawl 52 is adapted to engage with a ratchet wheel 56 secured to a notched disk 57 and rotative in company with the disk and with a shaft 58 on which the disk and ratchet wheel are mounted and to which they are frictionally coupled. The ratchet wheel 56 and disk 57 are mounted as shown in Fig. 3, wherein they are frictionally held against a rubber facing 59 provided on a drum 60 secured on the shaft 58. The ratchet wheel 56 and the notched disk 57 are held against the facing 59 by a coil spring 61 arranged around shaft 58 between the disk 57 and the washer 62 at the end of shaft 58. This arrangement permits the disk and ratchet wheel to be driven as a unit in one direction by the shaft 58 and to be mechanically moved in an opposite direction independently of the shaft by the pawl 52 as it is carried to the left of Fig. 2 by the pull of spring 49. The shaft 58 extends from an electric motor 63 mounted at the rear of the base plate 7 and arranged to be set in operation for predetermined periods through the medium of two switches, one of which is shown at 64 and the other at 77. Said switch 64 is controlled by an arm 65 which carries a roller 66 at its free end and said roller contacts the periphery of the disk 57. When the roller 66 is engaged in a notch 67 formed in the periphery of the disk 57, the arm 65 is in its raised position so that the switch is at this time in open condition and will so remain as long as the roller is located in the notch, and the circuit to the electric motor 63 will be open not only because of the fact that switch 64 is open but because of the fact that the manually controlled switch 77 is also open. The switch 77 is controlled by a push button 68 which requires maintenance of finger pressure on it in order to keep this switch closed.

Both of the switches 64 and 77 not only control the operation of the electric motor 63; but also control the flow of fluid to be dispensed. This will be clear from Fig. 5, wherein the dispensing faucet or tap for the hot water or other fluid is shown at 70, the same being operated by a solenoid valve 71. From the wiring diagram therein shown, it will be apparent that while the roller 66 carried by the switch arm 65 is in the notch 67, the switch 64 will be open and at this time manual closure of switch 77 will have no effect on either the operation of motor 63 or the solenoid valve 71. However, whenever the roller 66 is out of the notch 67 and rests against the periphery of disk 57, switch 64 will be closed and the dispensing of fluid will be had by finger pressure maintained upon push button 68 to keep switch 77 closed. Thus, while both switches 64 and 77 are closed the disk 57 will be slowly rotated clockwise for a given period of time to bring the notch 67 to a position to engage the roller 67 and permit rising of the switch arm 65 to secure "off" position of switch 64. When this occurs the flow of water or other fluid from the faucet 70 will cease, and a predetermined quantity of the liquid will have been dispensed from the faucet 70.

From the foregoing, the operation of the described apparatus will now become apparent. When one or more coins are deposited in the package vending machine to which the herein-described apparatus is attached and of which it forms a part, a package 2 will be dispensed.

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For example, the package 2, when being delivered from the vending apparatus, will contact the trigger 3 and momentarily close the switch 4. This will cause energization of the solenoid 6, causing the core 8 thereof to be retracted toward the right as shown in Fig. 2.

When the solenoid 6 is energized, its core 8 will be drawn toward the right and through the link 15, it will swing the arm 12 in a counter-clockwise direction. As the arm 12 is so moved, the pawl 19 carried by it will engage the ratchet wheel 23 and will rotate the same clockwise and for a predetermined distance and sufficient to so elevate the cam 25 that said cam will permit the locking member 28 to have its rear or toothed end slightly elevated and thus have its forward nose 36 moved downwardly to an extent as to cause the operating lever 38 to impinge against the nose 36 when said operating lever is manually rotated by manipulation of the handle 39a. As the operating handle 39a is turned to swing the lever 38 to the right, the lever 38, engaging against the nose 36 of the locking member, and which is at this time acting as an abutment, will cause the slidable bar 30 to be slid lengthwise through its guides 31 and 32 toward the right. This sliding movement of the bar 30 will move the arm 44 on the cup-dispenser 43 in a manner to cause one of the cups to be delivered from the dispenser to the customer. Movement of the bar 30 as above described will also cause ratchet wheel 23 to be moved counter-clockwise by engagement of tooth 37 with one of the teeth of the ratchet wheel as shown in Fig. 2. When manual pressure is relieved on handle 39a and the slidable bar 30 is moved to the left by the action of spring 49, the pawl 52 carried by the bar 30 engages one of the teeth on the ratchet wheel 56 and causes said wheel and the disk 57 attached to it to be rotatively moved independently of shaft 58 for a predetermined distance in a counter-clockwise direction, thus moving the notch 67 away from the roller 66 and causing the switch 64 to close. As bar 30 is moved to the right, the tooth 37 on the locking member 28, engaging one of the teeth of the ratchet wheel 23 will rotate the ratchet wheel 23 for a predetermined distance backwardly or in a counter-clockwise direction and for substantially the same distance that the ratchet wheel was previously rotated in an opposite direction by the pawl 19, to therefore restore the cam 25 to locking position shown in Fig. 1. Thereafter the handle 39a and lever 38 connected thereto can be freely turned without causing any movement of the slidable bar 30 until another package 2 has again caused the solenoid 6 to be energized.

It will, at this point, be noted that the purchaser has now received as many packages 2 of the beverage-making ingredients as he has paid for by the deposit of a suitable sum of money, and has conditioned the apparatus to reserve one cup for each purchase. Each successive purchase of one of the packages 2 conditions the apparatus to reserve one cup by moving the cam member 25 one notch in a clockwise direction. Then, each time that knob 39a is turned to the right to release a cup, the cam member 25 is moved one notch nearer to the position shown in Fig. 1 in which position the locking member 28 is located out of the path of swing of lever 38. The apparatus has also been conditioned to dispense a given amount of hot water or other required fluid, for switch 64 has now been closed and it will remain closed for the period of time required for the disk to rotatively travel to bring its notch 67 into engagement with roller 66. The disk will start such travel as soon as the circuit to motor 63 is closed. To close the circuit to the electric motor 23, all that the said purchaser is required to do is to operate the push button 68, holding his finger against it to keep switch 77 closed until the disk 57 in its travel brings its notch 67 into engagement with the roller 66. If the purchaser at any time while drawing the water in the manner above pointed out releases his pressure on the push button 68 the flow of

water or other liquid will cease as will movement of the disk 57. On again pressing the button 68 and holding the finger against it, the flow of water will be resumed and will continue until the notch in the disk reaches the roller 66. Thus, the user is always assured of a definite amount of the fluid even if he removes his finger from the button one or more times before his cup is filled.

In case a number of successive purchases of the ingredient packages 2 and cups therefor are had without drawing the water or liquid supply for such number of cups, the amount of water to be dispensed will be accumulated by the successive movements of the disk 57 bringing the notch therein farther away from the roller 66. Thus, in a case of this kind it will be apparent that the travel of the disk to bring its notch into engagement with the roller will be extended to such an extent that the flow of the fluid will be multiplied and one after another of the purchasers can fill his cup by merely placing it under the tap and pressing the button 68 until each cup is filled, each of the successive purchasers being assured that he will secure a full cup of the fluid.

Having described a single embodiment of the invention, it is obvious that the same is not to be restricted thereto, but is broad enough to cover all structures coming within the scope of the annexed claims.

What I claim is:

1. In a vending apparatus for connection to a package-dispensing machine, a supply of packages in said machine a switch having means for causing it to be closed by delivery of a package from the stack, means controlled by said switch for dispensing a cup, a time-switch for controlling liquid dispensing in predetermined quantities, the cup-dispensing means being operative to cause said time-switch to function for a predetermined time for each cup dispensed.

2. In a vending apparatus for connection to a package dispensing machine, a supply of packages in said machine cup-dispensing means, an electric circuit operative to control the operation of said cup-dispensing means, said circuit including a switch having means for causing it to be closed by emergence of each package from the supply in said machine, a time-switch for controlling a flow of liquid in predetermined quantities, and means controlled by operation of the cup-dispensing means for causing the time switch to function for a predetermined time each time that a cup is dispensed.

3. A vending apparatus comprising, a switch having trigger means by which said switch is closed by the passage of a vended article, a solenoid caused to be energized by the closing of said switch, a slidably-movable member, a cup-dispenser connected thereto and caused to dispense a cup by movement of said member in one direction, a locking element for preventing sliding movement of the slidable member, means operated by the solenoid for freeing said locking member, a manually-operable element for moving the sliding member when the locking element is freed, a time-switch caused to be closed when the slidable member is moved in one direction, fluid-supply means, an electrical circuit for causing operation of the fluid-supply means, the time-switch being included in said circuit, means for driving the time switch and a manually-operated switch for closing the circuit to the time-switch driving means and to the fluid-supply means.

4. A vending apparatus comprising, a switch having trigger means by which it is closed by the passage of a vended article, a cup-dispenser and a fluid-dispenser, an operating element for the cup-dispenser, locking means for preventing movement of said operating element, a solenoid controlled by the triggered switch, said solenoid being effective to release the locking means when the switch is closed, a time-switch and an electric motor for driving the same, an electric circuit for operating said motor and also for operating the fluid-dispenser, means carried by the operating element for closing the time-

switch, and a manual switch also in said electric circuit and adapted to close said circuit to the motor and to the fluid-dispenser.

5. A vending apparatus comprising, a cup-dispenser, a movable element for operating the cup-dispenser, a manually-rotated shaft having a member for moving the movable element to cause dispensing of a cup, a latch for engagement by the member to cause movement of the element, locking means for normally rendering the latch inoperative, electrically-controlled means operative upon the locking means to position the latch for engagement by the member and cause movement of the element when the member is manually moved, a fluid dispenser, a time-switch for controlling the operation of the fluid-dispenser, means by which the time-switch is closed by movement of the movable element and is set to remain closed for a predetermined period, and a manually-controlled switch in circuit with the time-switch for closing circuit to the fluid-dispenser while the time-switch is closed.

6. A vending apparatus comprising, a cup-dispenser, a movable element for operating the cup-dispenser, a manually-rotated shaft having a swinging arm for moving the movable element to cause dispensing of a cup, a latch for engagement by the arm to cause movement of the element when the arm is pivotally moved, cam means for normally rendering the latch inoperative, electrically-controlled means operative upon the cam to cause the latch to be positioned for engagement by the arm and to cause movement of the element when the arm is manually moved, a fluid-dispenser, a normally-open time-switch for controlling the operation of the fluid-dispenser, means by which the time-switch is closed by movement of the movable element and is set to remain closed for a predetermined period, an electric motor for the time-switch and a manually-controlled switch in circuit with the motor of the time-switch for closing circuit to the fluid-dispenser and motor while the time-switch is closed.

7. A vending apparatus comprising, a cup-dispenser, a slidable bar for causing dispensing of cups therefrom, a swinging arm for moving the bar in one direction and causing it to dispense a cup, a pivoted latch carried by the bar, cam means for normally maintaining the latch out of the path of swing of the arm so that the arm is normally ineffective to move the bar, electrically-operated means for moving the cam means to cause the latch to be positioned for engagement by the arm when the arm is pivotally moved to thereby cause movement of the bar, a switch controlled by a dispensed article for causing operation of the electrically-operated means, a fluid-dispenser, an electric circuit for controlling the operation of the fluid-dispenser, said circuit including a time-switch that is closed upon movement of the bar and a manually-operated switch, means carried by the bar for closing the time-switch and conditioning it for a predetermined period of operation, the circuit including an electric motor for operating the time-switch for said predetermined period when the manually-operated switch is closed.

8. In a vending machine, a supply of articles to be vended a switch having a trigger engaged and caused to close the switch by emergence of a vended article from the supply, means controlled by said switch for dispensing a cup, a time-switch for controlling the dispensing of a liquid in predetermined quantities, a manual-switch in circuit with the time-switch and operative to close said circuit while the time-switch is closed, the cup-dispensing means being operative to cause the time-switch to function for a predetermined time for each cup dispensed.

9. A vending apparatus comprising, a cup-dispenser, a slidable bar connected to the cup-dispenser for causing dispensing of cups therefrom, a manually-operated swinging arm for moving the bar in one direction and causing it to dispense a cup, a pivoted latch carried by the bar, cam means for normally maintaining the latch out of the path of swing of the arm so that the arm is ineffective

to move the bar, electrically-operated means for moving the cam means to an extent to cause the latch to be positioned for engagement by the arm when the arm is pivotally moved to thereby cause movement of the bar in one direction, spring means for retracting the bar, a switch controlled by a dispensed article for causing operation of the electrically-operated means, a fluid-dispenser, an electric circuit for controlling the operation of the fluid-dispenser, said circuit including a time-switch that is closed upon movement of the bar and a manually-operated switch, means carried by the bar for closing the time switch and conditioning it for a predetermined period of operation, the circuit including an electric motor for operating the time-switch for said predetermined period when the manually-operated switch is closed.

10. In a vending machine, a supply of articles to be vended a switch having a trigger engaged and caused to close the switch by the emergence of a vended article from the supply in the machine, means controlled by said switch for dispensing a cup, liquid-dispensing means, a time-switch for controlling the dispensing of a liquid therefrom in predetermined quantities, a manually-operated switch in circuit with the time-switch and operative to close said circuit while the time-switch is closed, an electric motor for the time-switch, said motor being operated by closure of the manual switch, the cup-dispensing means being operative to cause the time-switch to function for a predetermined time for each cup dispensed.

11. In a vending apparatus, a cup-dispenser and a fluid-dispenser, an electric circuit for controlling the operation of the cup-dispenser and the fluid-dispenser, a

movable bar carrying a latch normally maintained in an inoperative position, a manually-operative lever for engaging the latch to move the bar when the electric circuit becomes effective to position the latch in an operative position relative to the lever, a time-switch and a manually-operated switch in the circuit to the fluid-dispenser, means carried by the bar for closing the time-switch and conditioning it to remain closed for a given period, the time-switch being set in operation and the fluid-dispenser caused to operate for the given period for which the time-switch has been conditioned, upon manual closure of the manually-operated switch.

12. In a vending machine, an article outlet for articles contained in a supply stack in the machine, a cup-dispenser and a fluid-dispenser, means controlled by movement of an article from the stack through the outlet for arranging for the dispensing of a cup from the dispenser, means for operating the cup-dispenser to secure a cup therefrom, and means for permitting operation of the fluid-dispenser for a given period, the operation of the latter means being effective only after one or more cups has been dispensed.

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