June 17, 1952 R. R. FREDRICK 2,601,205

ARTICLE DISPENSER CONTROL UNIT

Filed April 4, 1947 2 SHEETS—SHEET 1

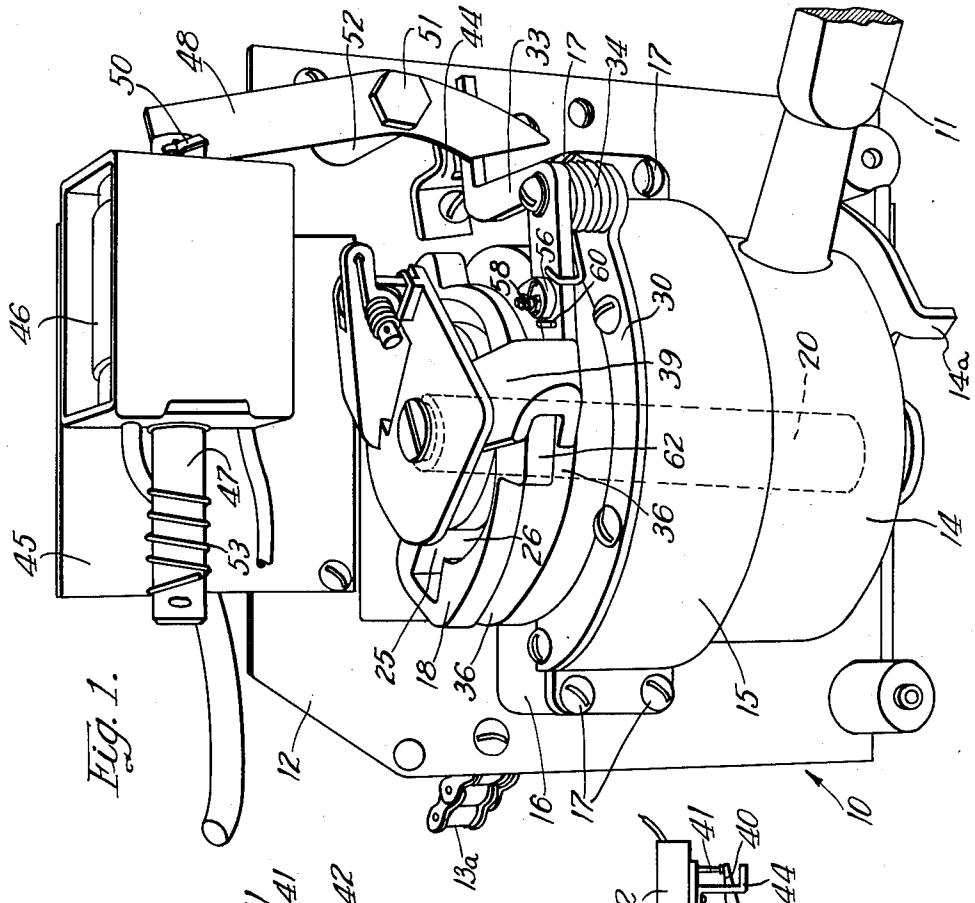


Fig. 1.

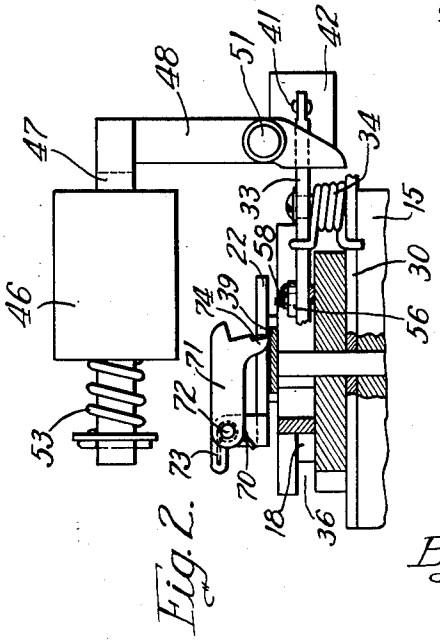


Fig. 2.

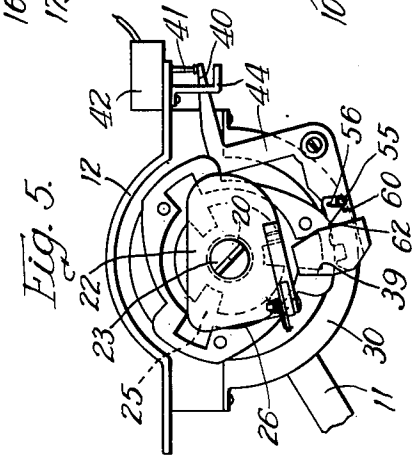


Fig. 5.

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ARTICLE DISPENSER CONTROL UNIT

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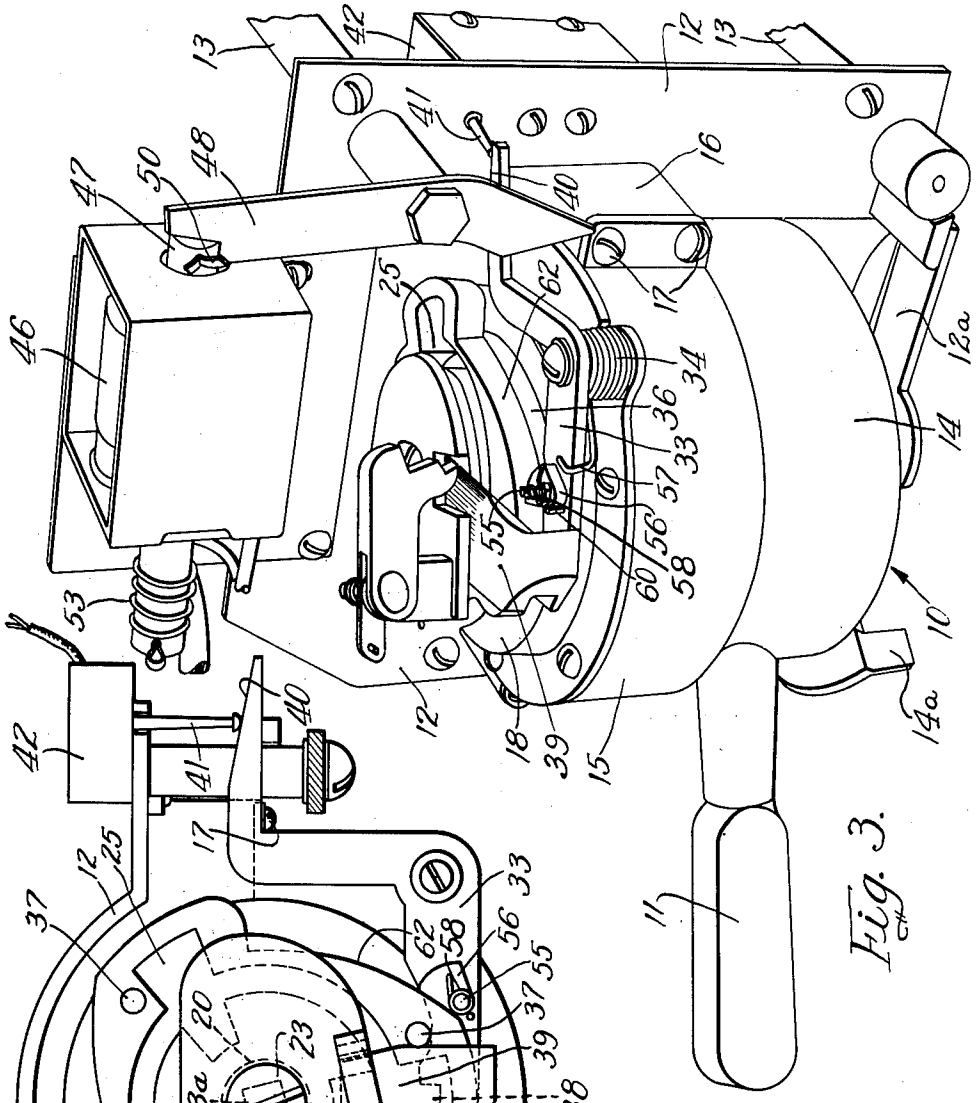


Fig. 3.

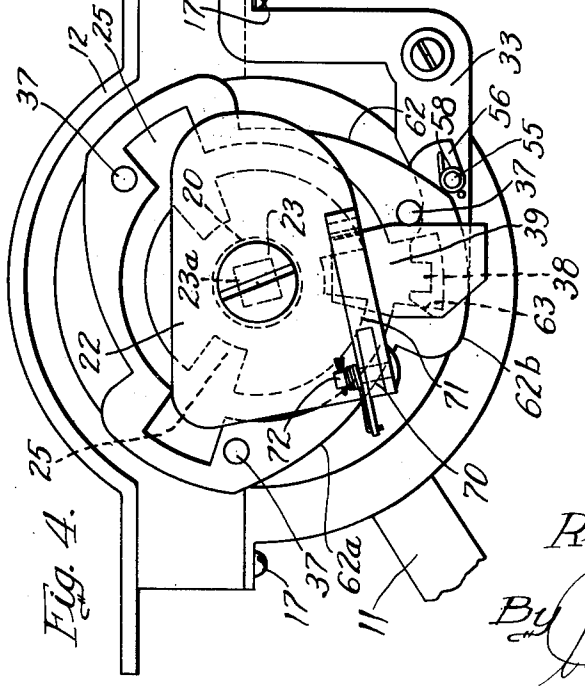


Fig. 4.

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UNITED STATES PATENT OFFICE

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ARTICLE DISPENSER CONTROL UNIT

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Application April 4, 1947, Serial No. 739,409

6 Claims. (Cl. 74—126)

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This invention relates generally to article vending machines or dispensers and more particularly to an improved apparatus for controlling the operation of a coin actuated manually operated dispenser.

Manually operated vending machines for packaged articles such as the bottled beverage dispensing apparatus shown in the application of William S. Connell, Paul F. Boettcher, and Carl M. Holmen, Serial No. 549,146, filed August 12, 1944, now Patent No. 2,435,177, reference to which is hereby made, usually employ a reciprocable lever for driving the dispensing mechanism. In these devices the drive mechanism is adapted so that either the hand operated lever is locked against movement or its movement is not transmitted to the dispensing mechanism until a valid coin has been deposited.

The application of Milton C. Taylor, Serial No. 716,351, filed December 14, 1946, now abandoned, reference to which is hereby made, discloses a dispenser control apparatus wherein a lever transmits oscillatory motion to a shaft which is normally free to rotate independently of a cylinder having gear teeth linked to the dispensing mechanism. When a valid coin is deposited in the apparatus it passes through various detectors and chutes and drops into a slotted receptacle in the cylinder. With the coin in this position an arm carried by the shaft strikes against the coin on the return oscillation of the handle, causing the cylinder to rotate with the handle driving the dispensing mechanism to deliver a bottle to the vendee.

In certain instances it has proved desirable to provide an automatic change making device in an article vending machine such as will receive a coin of a larger denomination than the purchase price of the article and return appropriate change to the vendee as well as dispense an article. For example, a dispenser vending five cent articles equipped with a change maker will receive either a twenty-five cent piece or a dime and dispense a single article simultaneously returning respectively twenty cents or five cents to the vendee.

Automatic change makers are usually of the type which receive a coin and return as change the difference between the cost of the article and the coin deposited, producing an electric current of short duration for operating relays which control the dispensing mechanism. Thus ordinary change makers are readily adaptable for use with electrically driven dispensing mechanisms, but heretofore have not been readily adaptable to manually powered dispensers.

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One object of this invention is to provide a manually powered dispensing apparatus which, instead of receiving a coin, must receive an electrical impulse, before being operable to dispense an article.

Another object is to provide a dispensing apparatus having a manually rotatable member and an independently rotatable driven member, which members are coupled together for rotation to deliver an article each time a solenoid is energized.

Another object is to provide an article dispenser control unit wherein manual oscillation of a shaft member is transmitted through a pivotally mounted arm to a driven member when the arm is in one of two positions, the position of the arm being controlled by a solenoid.

Another object is to provide a control unit adapted to be controlled by an electrical impulse from a coin receiving device which will produce a second electrical current, which second current may be used to operate mechanism to prevent additional coins being deposited in the receiving device.

A further object is to provide an electrically actuated dispensing mechanism control unit which may be readily converted in the field to a purely mechanical coin actuated unit.

Other and additional objects will be apparent to those familiar with the art on reading the following specification in conjunction with the drawings and the appended claims.

In the drawings:

Fig. 1 is a perspective view of the control unit of this invention.

Fig. 2 is a side elevation of a portion of the unit with the handle in the forward position.

Fig. 3 is a perspective view of the unit with the handle in a forward position at the start of the dispensing stroke.

Fig. 4 is a top view of the dispensing unit having the solenoid removed.

Fig. 5 is a top view of the dispensing unit in another position.

The control unit 10 is preferably mounted inside the front access door of a vending machine (not shown) so that the handle 11 protrudes through an opening in the door and is accessible to the vendee. The unit is supported on a mounting plate 12 carried by four bosses 13 projecting outwardly from the inner wall (not shown) of the vending machine. A drive chain 13a (Fig. 1) extends from the unit 10 through the plate 12 and to the dispensing mechanism (not shown). In the application Serial No. 716,351, Figs. 1 and 2 show the location of a manually operated

control unit inside a bottled beverage dispenser cabinet.

The preferred form of the control unit 10 (Fig. 1) comprises the handle 11 secured to a cylinder 14 which is rotatably supported at its upper end in the bearing members 15 and 16. The front member 15 is secured to the rear member 16 and both to the mounting plate 12 by the screws 17. Rotation of the cylinder 14 is limited to an angle of slightly more than 120 degrees by a pair of stops 14a which engage the lower portion 12a of the mounting plate 12.

A second cylinder 18, rotatable independently of, and of lesser diameter than the cylinder 14, is also supported by the members 15 and 16. An axial shaft shown by broken lines at 20 in Figs. 1 and 5 is rotatably supported in the cylinder 18 and extends downwardly into a hollow space (not shown) within the cylinder 14. An overload clutch (not shown) within this space couples the cylinder 14 to the shaft 20. The purpose of the clutch is merely to protect the control unit 10 in the event of jamming or sticking of the dispensing mechanism. A plate 22 is secured to the top of the shaft 20 by means of the screw 23. Rotation of the plate 22 with respect to the shaft 20 is prevented by the square section, indicated at 23a in Fig. 4, machined in the top of the shaft 20 which is received into a corresponding square hole in the plate 22.

The groove 26 and radial slots 25 are provided so that the unit may be readily converted to a coin coupled unit by replacing the plate 22 with a lug plate, as described in the Taylor application Serial No. 716,351, and providing suitable coin chutes.

A cover plate 30, removable for access into the bearing member 15, is secured to the top side of this member 15 and supports a pivot pin carrying the actuating lever 33. The spring 34 urges this lever 33 against the cylinder 18. The upper portion of the cylinder 18 has a groove 36 cut into its periphery. One end of the lever 33 rides in this groove 36. Three pins 37 (Fig. 4) extend downwardly through the groove 36. A cutout portion 38 in the end of the lever 33 serves to lock the cylinder in position when one of the pins 37 is aligned opposite the end of the lever 33 and the lever 33 is inserted into the groove 36.

The end of the lever 33 is bent upwardly, above the cutout portion 38, and inwardly to form a knife-like projection 39 which fits into the space between the top of the cylinder 18 and the plate 22. The other end of the lever 33 is cut on an angle to form a cam face 40 which acts against the plunger 41 of the switch 42. This switch 42, which is opened when the plunger 41 is extended and closed when it is forced inwardly, is connected in series with a solenoid (not shown) which operates a blocking device in the coin changer to prevent a second coin's passing through until the article, purchased by the first coin has been dispensed. A stop 44 secured to the mounting plate 12 extends to a point on the opposite side of the lever 33 from the cam face 40 serving to limit movement of the lever 33 in the clockwise direction and prevents the lever 33 from exerting a drag on the cylinder 18 by holding the lever 33 slightly away from the cylinder 18.

A smaller mounting plate 45 is supported on the top of the mounting plate 12 and supports a solenoid 46. The movable plunger 47 (shown in the unenergized position in Fig. 1) of the solenoid 46 is linked to the end of a lever 48 by a cotter pin 50. This lever 48 pivots about a bolt 51 secured in the boss 52 extending forwardly from the mounting plate 12. The lower end of this lever 48 is disposed so as to strike the side of the lever 33 and causes it to be rotated in the counterclockwise direction each time the solenoid 46 is energized. This solenoid 46 is preferably connected to a switch (not shown) in the coin changer mechanism which is closed to energize the solenoid 46 each time a coin is deposited in the changer. The spring 53 coiled around the end of the plunger 47 serves as an elastic stop to check the motion of the plunger 44 when the solenoid 46 is energized and to return it when the current supply ceases.

A pin 55, rigidly supported in the lever 33, carries a small rotatably mounted cam follower member 56. A spring 58 secured in the top of the pin 55 tends to rotate the cam follower member 56 in the counterclockwise direction while a second pin 60 in the lever 33 limits the travel of the cam follower 56 in this direction. When the cylinder 18 is in a position with one of the projecting portions of its peripherial cam surface 62 adjacent the coin slots 25, and the follower 56 is allowed to rotate to a position against the stop pin 60, the follower 56 serves to hold the lever 33 away from the cylinder 18 by bearing against the edge of the cylinder 18 above the groove 36. As the cylinder 18 is rotated in a counterclockwise direction, the follower 56 slides along the cam surface 62, without rotation, so that the lever 33 continues to be held away until the high point of the cam surface 62 passes by the follower 56. The lever 33 then moves toward the cylinder 18, the follower member 56 resting against the pin 60. As the cylinder 18 continues to rotate, the inclined portion 62a of the surface 62 strikes the edge of the follower 56 and rotates it in a clockwise direction away from the pin 60. Since the follower 56 is rotated, the lever 33 is not forced away from the cylinder 18 until a pin 37 in the cylinder 18 reaches the inclined surface 63 on the end of the lever 33. At this time the lever 33 is forced outwardly by the pin 37 to snap inwardly a moment later when the pin 37 is turned to a position adjacent the cutout portion 38. The cylinder 18 is then locked against further rotation until the lever 33 is again forced away from the cylinder 18 by the solenoid 46 and retained in that position by the follower 56.

The plate 22 is provided with an upstanding projection 70, and a rotatable member 71 is secured to this projection 70 by a pin 72. A spring 73 urges the end of this member 71 downwardly. When the plate 22 is rotated to a position over a slot 25 in the cylinder 18 and the knife-like projection 39 on the lever 33 is withdrawn, the end of the member 71 drops into the slot 25. If the plate 22 is then rotated by turning the handle 11 in the counterclockwise direction the projection 74 on the bottom of the member 71 bears against the edge of the slot 25 and causes the cylinder 18 to be rotated with the plate 22. When the handle 11 is moved in the reverse direction the sloping back edge of the projection is cammed upwardly and the member 71 is lifted out of the slot 25.

The operation of this unit is as follows:

When a valid coin is deposited in the coin changer (not shown) it passes through the mechanism into a till, the changer being actuated to deliver coins equal to the excess deposited over the purchase price to the vendee. Simultaneously with this operation a switch in-

side the changer is momentarily closed to deliver a flow of electrical current of short duration to the solenoid **46**. When this occurs, the plunger **47** is drawn into the solenoid **46**, causing the lever **48** to be rotated about the bolt **51** in the clockwise direction.

The lower end of the lever **48** then strikes the edge of the lever **33** causing it to rotate in the counterclockwise direction withdrawing the end of the lever **33** and the knife-like projection **39** from the cylinder **18**. As the lever **33** is withdrawn, the cam follower member **56** rotates in the counterclockwise direction until stopped by the pin **60**. When the current supply to the solenoid **46** is cut off, the spring **53** returns the plunger **47** to the position shown in Fig. 1. However, the lever **33** does not return to the position shown in Fig. 1 but is held away from the cylinder **18** as shown in Figs. 3 and 5 by the cam follower **56**.

The vendee then manually moves the handle **11** to the forward position as shown in Figs. 3 and 5, transmitting this rotation through the clutch (not shown) and the shaft **20** to the plate **22** and the member **71** supported thereon. When the forward stroke is complete since the projection **39** has been withdrawn, the end **74** of the member **71** drops into one of the slots **25** cut into the cylinder **18**.

The vendee then moves the handle **11** backwardly toward the starting position. However, since the end of the lever **33** is held away from the cylinder **18** the cutout portion **38** is free of the pin **37**, the counterclockwise rotary motion of the plate **22** is transmitted through the member **71** to the cylinder **18**. Thus the cylinder **18** will be rotated through 120° as the handle **11** is returned to the starting position. This rotation is transmitted through the chain **75** (Fig. 1) to the dispensing mechanism (not shown) to deliver an article to the vendee.

As the return stroke is made, the follower **56** slides along the cam surface **62** until a high point **62***b* passes and the lever **33** moves inwardly toward the cylinder **18**. As rotation of the cylinder **18** continues, the follower rides up the inclined surface **62***a* rotating clockwise to assume the position shown in Fig. 1. When the return stroke is nearly complete, the inclined end of the lever **33** is struck by another of the pins **37** forcing the lever **33** outwardly. When the stroke is complete, the pin **37** is in alignment with the cutout portion **38** and the lever **33** snaps inwardly to lock the cylinder **18** against further rotation until another coin is deposited and the cycle is repeated.

In the event that a person reciprocates the handle **11** without first depositing a coin, the plate **22** is rotated as before, but the member **71** does not drop into a slot **25** on completion of the forward stroke because it strikes the projection **39** which has been inserted between the plate **22** and the slot **25**. On the return stroke the member **71** slides off the projection **39** onto the top of the cylinder to follow its course backwardly to the starting position.

From the foregoing it will be readily apparent, to those familiar with the art, that a simple control unit for a manually operated article dispenser has been provided. The control unit of this invention may be employed with various different types of coin receiving devices providing each is capable of closing an electric switch each time a coin is deposited.

Thus an extremely versatile basic unit has been provided which may be installed in a dispensing apparatus so that any one of a number of various accessory equipment may be used in conjunction with the unit to provide the type of service desired, with the result that an operator of vending machines equipped with the unit of this invention may modify these machines quite readily to provide coin changing operation, straight coin operation, single coin operation by electrical means, or multiple coin operation without changing the basic structure of the machine itself.

Additional modifications and changes will be readily apparent to those familiar with the art and may be made in the described embodiment without departing from the spirit of this invention whose scope is defined by the following claims.

What is claimed is:

1. In a device of the class described the combination including a rotatable element having a cam surface thereon, a lever adjacent said rotatable element, a rotatable cam follower supported on said lever disposed so as to ride on said cam surface, means for moving said lever away from said cam surface, means for rotating said cam follower to a position wherein said follower bears against a high point of said cam surface to hold said lever away from said rotatable element, said cam follower being freely rotatable only when said lever is moved away from said rotatable element, and clutch means controlled by said lever for transmitting motion from a handle to said rotatable element.

2. In a device of the class described the combination including a rotatable element having a cam surface thereon, a lever adjacent said rotatable element, a rotatable eccentric cam follower supported by a pivot pin on said lever, means for moving said lever away from said cam surface, means for rotating said cam follower to a position wherein that surface of said follower most remote from said pivot pin bears against a high point of said cam surface to hold said lever away from said rotatable element, and clutch means controlled by said lever for transmitting motion from a handle to said rotatable element.

3. A control unit comprising a cylindrical member having a plurality of depressions in the top surface thereof, means for transmitting rotation of said cylinder to a dispensing mechanism, a second member driven by an oscillatable handle, said second member being adapted to be received into one of said depressions to transmit motion to said cylindrical member, a cam surface on said cylindrical member having a high point disposed adjacent to each of said depressions, a lever disposed so as to ride on said cam surface, means for urging said lever toward said cam surface, a projection carried by said lever which projection prevents the entrance of said second member into one of said depressions except when a high point on said cam surface is adjacent said lever, and solenoid actuated means for moving said lever away from said cam surface.

4. In a device of the class described the combination including a manually oscillatory member, a rotatable element for driving an article dispensing mechanism, a lug on said member adapted to engage said rotatable element for transmitting motion thereto, a lever having a projection thereon insertable between said member and said element for preventing engagement of said lug and said element, a solenoid for actuating said lever, a cam surface on said lug coacting with the surface of said element to disengage the lug and element during the time when the oscillatory member is moved in one direction,

and means for retaining said lever in a retracted position when it has been moved to that position until such time as the rotatable element is moved.

5. In a device of the class described the combination including a solenoid, a manually operated rotatable member, means for limiting rotation of said member to less than a revolution, a rotatable element for driving a dispensing mechanism, and means receivable in a depression in said rotatable element for imparting motion of said member to said element, a lever controlled by said solenoid for preventing the reception of said means in said depression, and a surface on said lever adapted to engage said element in one position of said lever for locking said element against rotation when said lever is in the reception preventing position.

6. In a device of the class described the combination including a manually oscillatory member, means for limiting movement of said member to an angle less than a revolution, a movable

element, means for coupling said member and element together to transmit motion from said member to said element, a lever for controlling said coupling means, said coupling means being ineffective in one position of said lever, and a surface on said lever adapted to engage said element in one position of said lever for locking said element against rotation when said coupling means is ineffective.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,304,952	Peterkin, Jr., et al.	Dec. 15, 1942
2,347,425	Mageoch	Apr. 25, 1944
2,368,892	Skoog	Feb. 6, 1945