

July 16, 1957

B. H. BAIRD

2,799,173

CONTROL MEANS FOR VENDING MECHANISMS

Filed May 11, 1953

2 Sheets-Sheet 1

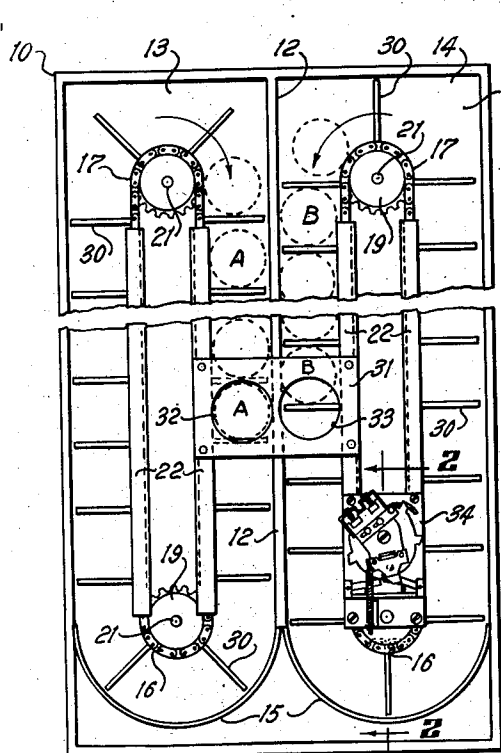


Fig. 1

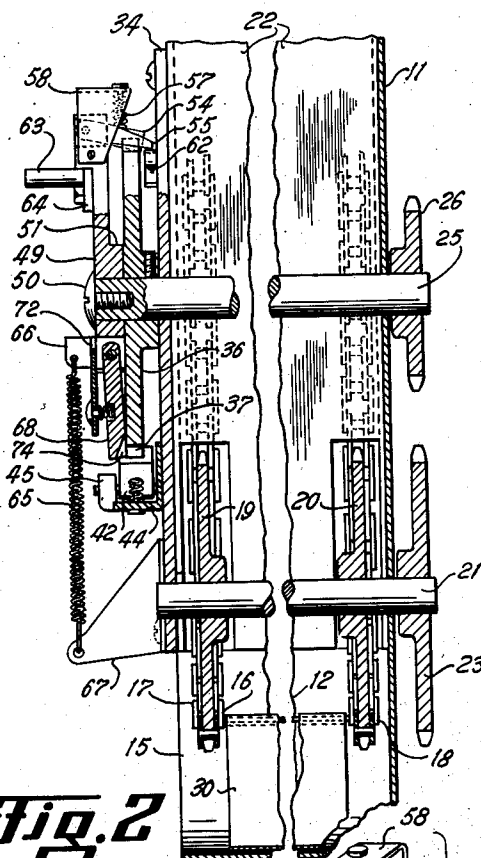


Fig. 2

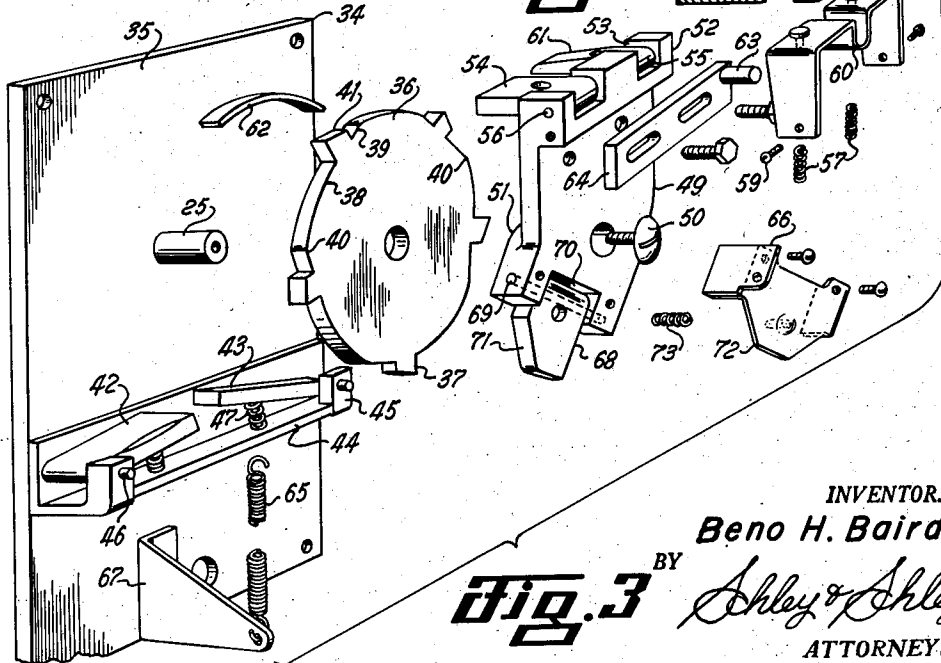


Fig. 3

INVENTOR.
Beno H. Baird

BY *Ashley & Ashley*
ATTORNEYS

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2 Sheets-Sheet 2

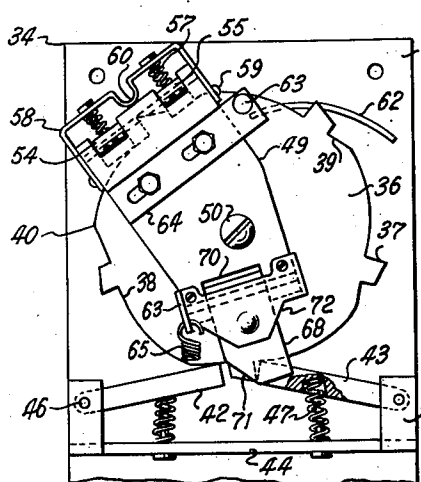


Fig. 4

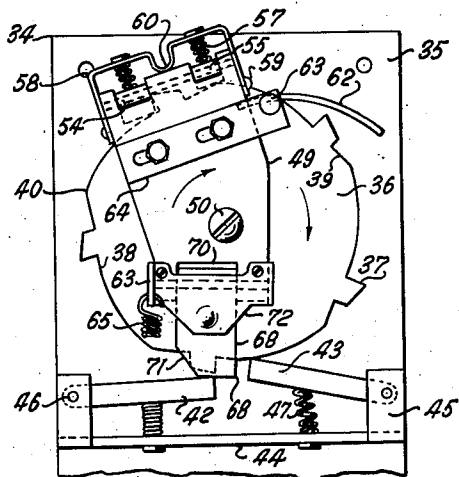


Fig. 5

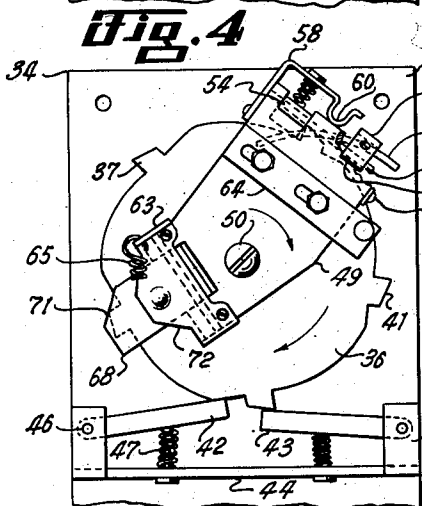


Fig. 6

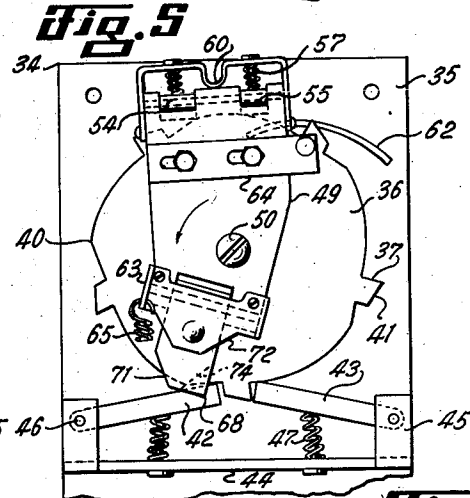


Fig. 7

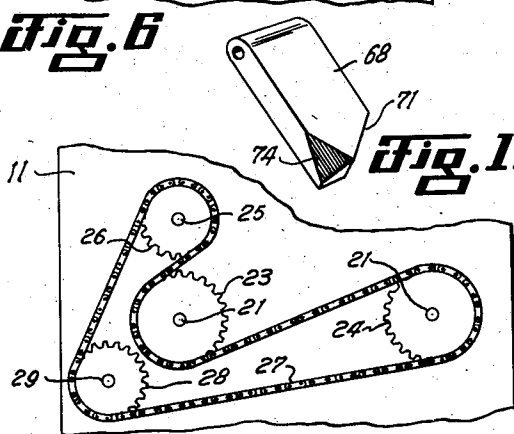


Fig. 9

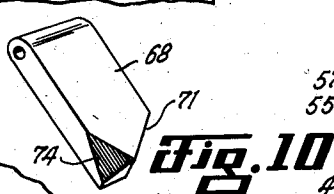


Fig. 10

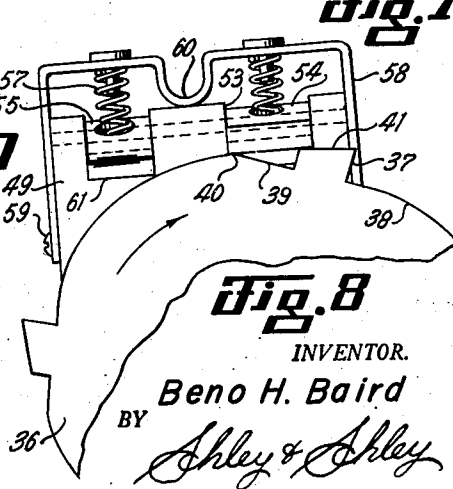


Fig. 8

INVENTOR.
Ben H. Baird
BY
Shley & Shley
ATTORNEYS

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2,799,173

CONTROL MEANS FOR VENDING MECHANISMS

Beno H. Baird, Dallas, Tex., assignor to Atlas Metal Works, Dallas, Tex., a corporation of Texas

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5 Claims. (Cl. 74—152)

This invention relates to new and useful improvements in control means for vending mechanisms.

One object of the invention is to provide improved control means for vending mechanisms of economical construction and efficacious, simple operation.

A particular object of the invention is to provide improved control means for vending mechanisms which is so constructed that the movement of bottled or other packaged articles toward a common discharge point may be positively and smoothly regulated with minimum jarring and shaking.

An important object of the invention is to provide improved vending control means having a rotatable toothed member and coacting latch means for holding a vending mechanism in adjusted positions together with a lever member having means coacting with the teeth of the toothed member and with the latch means to impart rotation to said toothed member for actuating the vending mechanism while preventing accidental rotation in either direction.

Another object of the invention is to provide an improved vending control mechanism, of the character described, wherein the latch means includes a pair of spring-pressed elements coacting to hold the toothed member against rotation in either direction, the lever member having means for releasing one of the latch elements upon rotation of said lever member to permit rotation of said toothed member therewith, the members being connected to prevent rotation of said toothed member relative to said lever member during disengagement of said latch element.

A further object of the invention is to provide an improved vending control mechanism, of the character described, wherein the spring-pressed latch elements are opposed and coact with a common tooth of the toothed member, the lever member having a pair of spaced, spring-pressed elements coacting with another common tooth of said toothed member to connect the members, one of the latch elements being releasable to permit reverse rotation of said lever member relative to said toothed member.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, wherein an example of the invention is shown, and wherein:

Fig. 1 is a front elevational view of the upper portion of a vending unit of the conveyor type having control means constructed in accordance with the invention,

Fig. 2 is a transverse, vertical, sectional view, taken on the line 2—2 of Fig. 1, showing the relation of the control means to one of the conveyors or vending means of the unit,

Fig. 3 is an exploded, perspective view of the control means,

Figs. 4, 5, 6 and 7 are front elevational views, partly

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in section, showing the sequence of operation and relative positions of the control lever, toothed member and other elements,

Fig. 8 is a rear elevational view showing the relation of the control lever and its dogs to the toothed member,

Fig. 9 is a rear elevational view of a portion of the unit and its chain and sprocket drive,

Fig. 10 is a rear perspective view of the spring-pressed pawl.

In the drawings, the numeral 10 designates the upright, rectangular frame of a vending unit which is rectangular in cross-section and which includes a back wall 11 having an upright, medial partition 12 projecting forwardly therefrom to provide a pair of parallel storage compartments 13 and 14. The bottoms of the compartment are formed by transversely curved members or bars 15 extending downwardly from the partition 12 to the sides of the frame. An endless conveyor 16 is disposed in each compartment and includes front and rear endless chains 17 and 18 supported by front and rear sprockets 19 and 20 carried by transverse shafts 21 at the upper and lower ends of the compartment. The shafts 21 are suitably journaled between the back wall 11 and the front of the unit, and spaced, upright frame members 22 extend between the flights of the front chains 17 and their sprockets 19. As will be explained, the conveyors coact and function as vending means.

As shown in Figs. 2 and 9, the lower shafts extend through the back wall and have sprockets 23 and 24 fixed on their rear projecting ends. A drive shaft 25 and sprocket 26 are connected by an endless chain 27 to the sprockets 23 and 24 for transmitting rotation to said sprockets and their shafts, and an idler sprocket 28 mounted on a stub shaft 29 meshes with said chain for reversing the direction of rotation of said sprockets 23 and 24. Due to the arrangement of the chain 27, the conveyors are driven in opposite directions whereby their inner flights travel downwardly. Suitable shelves or trays 30 extend transversely between and connect the front and rear chains 17 and 18 of each conveyor 16 for supporting bottled or other packaged articles. The shelves 30 of one conveyor are offset or staggered relative to the shelves of the other conveyor, whereby the articles supported by one conveyor are offset or staggered with relation to the articles supported by the other conveyor as shown by the dotted lines A and B. A plate 31 extends between and is secured to the intermediate portions of the inner frame members 22 of the compartments so as to overlie the partition 12 and the inner flights of the conveyors, and has a pair of horizontally-alined openings 32 and 33, one for each conveyor, to permit access to and removal of the articles therethrough. Since the articles A of one conveyor are offset relative to the articles B of the other conveyor, said articles B are misaligned with the opening 33 when one of said articles A is alined with the opening 32 and one of said articles B is alined with said opening 33 when said articles A are misaligned with said opening 32 whereby only one article may be removed at a time. The vending unit is adapted to be mounted in a conventional cabinet (not shown) having a service door in alinement with the access openings.

For controlling operation of the conveyors 16 and vending of the articles, a mechanism 34 is provided and includes a base plate 35 overlying and secured to the frame members 22 of one of the compartments immediately above its lower shaft and sprocket 19. As shown in Figs. 2 and 9, the drive shaft 25 extends through and between the plate 35 and back wall 11 and has a ratchet wheel or toothed member 36 fixed on its forward end in overlying relation to said plate. A plurality of spaced, radial projections or teeth 37 are provided on the periphery of the wheel 36, shown as being in the form of a disk,

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by recessing or relieving said periphery on each side of each tooth at 38 and 39. Each counter-clockwise recess 38 is gradual and of appreciable length, while each clockwise recess 39 is abrupt, of short length and directed inwardly at a greater angle (Figs. 3-8). As will be more fully explained, a cam or raised portion 40 is formed clockwise of each recess 39 and merges into the recess 38. Although subject to variation, five teeth are suitable and the outer end 41 of each tooth is bevelled or inclined clockwise toward the adjacent cam 40 whereby the projection of said cam and the clockwise edge of the tooth is substantially equal.

A pair of opposed, spring-pressed pawls or latch elements 42 and 43 are provided for preventing rotation of the wheel in either direction by engaging in the recesses 38 and 39 and confining one of its teeth therebetween. The latch elements are pivotally supported below the wheel by a forwardly-directed, horizontal flange 44 at the lower portion of the plate 35 having upstanding lugs 45 at its end portions for receiving transverse pivot pins 46 upon which said elements are journaled. A suitable coiled spring 47 is confined between the flange 44 and each latch element whereby the latch elements are urged upwardly into engagement with the periphery of the wheel. The clockwise latch element 42 is of greater width than the opposed element 43 so as to extend forwardly of the wheel and, as will be explained, is adapted to be depressed for releasing the confined tooth to permit clockwise rotation of said wheel.

For imparting rotation to the ratchet wheel 36 and its shaft 25 to drive the conveyors 16, a lever or operating member 49 overlies said wheel and is rotatably mounted on the forward extremity of said shaft by an axial screw or fastener 50 screw-threaded in said shaft extremity. An annular boss or hub 51 spaces the lever from the wheel. The lever 49 is arced or curved laterally whereby its upper end extends obliquely to its lower end, preferably toward the left, so that said upper end overlies the upper left-hand tooth and the lower left-hand tooth is disposed therebetween. A forward, overhanging shoulder 52 is provided by increasing the thickness of the upper end of the lever and a pair of spaced, transverse slots 53 are formed in the shoulder for pivotally supporting a pair of coaxing, rearwardly-directed lock elements or dogs 54 and 55 upon a common pivot pin 56. The dog 54 is arranged to engage the recess 38 with the clockwise recess 39 being engaged by the dog 55 whereby the dogs coact to confine a tooth therebetween and lock the lever against rotation relative to the ratchet wheel. The spacing between the dogs, however, is greater than the width of each tooth to permit limited rotative movement of the lever relative to the wheel.

The rear portions of the dogs 54 and 55 are urged downwardly or inwardly into engagement with the periphery of the wheel 36 by suitable coiled springs 57 overlying the rear portions of said dogs and confined by an angular plate 58 secured to the upper end of the lever 49 by suitable screws or fasteners 59 in overlying spaced relationship. A medial flange 60 depends from the plate so as to bear against the shoulder 52. While the dog 54 is substantially rectangular, the dog 55 is of greater length and angular so as to have a depending portion 61 projecting below said dog 54 and rearwardly of said dog 54 and the ratchet wheel (Fig. 2). An arcuate or curved cam 62 is mounted on the upper right-hand corner of the plate 35 for engagement by the depending portion 61 to lift the dog 55 out of the path of the tooth confined by the dogs (Fig. 6). The block 58 has a post 63 carried by an adjustably mounted plate 64 for connection with an external operating member (not shown). As will more fully appear hereinafter, clockwise rotation of the lever is adapted to be transmitted to the ratchet wheel by the dog 54 and reverse relative rotation of said lever is permitted by the lifting of the dog 55 by the cam 62. The

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dog 54 is of a width greater than the length of the recesses 39 and, due to the provision of the wheel cams 40 and the bevelled tooth ends 41, said dog rides over the adjacent counter-clockwise tooth upon reverse relative rotation of the lever. For constantly urging the lever in a counter-clockwise direction with the dog 55 engaging the confined tooth and the dog 54 spaced therefrom, a coiled tension spring 65 is connected between an ear 66 carried by said lever and a bracket 67 mounted on the lower portion of the plate below the flange 47.

In order to depress the latch element 42 and release the ratchet tooth engaged therewith for permitting clockwise rotation of the wheel 36 with the lever, a depending, spring-pressed pawl or release element 68 is pivotally mounted on a transverse pin 69 in a slot 70 formed in the lower end of said lever. The lower left-hand or clockwise corner of the pawl 68 is bevelled or inclined as shown at 71 for depressing engagement with the outer, upper end of the latch element upon clockwise rotation of the lever 49. Due to the relative rotation of the lever permitted by the space between the dogs 54 and 55 being greater than the width of the tooth confined therebetween, the latch element 42 is depressed out of the path of the tooth engaged therewith by the pawl 68 prior to engagement of said dog 54 with said confined tooth. As a result, the latched or lowest tooth is released to permit clockwise rotation of the ratchet wheel with the lever (Fig. 5). A suitable plate 72, which carries the ear 66, overlies the slot 70 and the inner portion of the pawl for confining a coiled spring 73 which bears against and constantly urges said pawl rearwardly against the wheel for engagement with the latch element 42. The spring-pressed pawl is adapted to pivot forwardly or outwardly to clear the latch element upon reverse rotation of the lever, and preferably has an inclined or bevelled inner surface 74 at its lower right-hand or counter-clockwise corner for engaging said element and directing said pawl outwardly.

The normal or non-operating position of the control mechanism 34 is shown in Fig. 4, and the ratchet wheel 36 is locked against rotation by the lowest of its teeth 37 being confined between the latch elements 42 and 43. Upon clockwise rotation of the lever 49, the bevelled corner 71 of the pawl 68 strikes the forwardly-projecting, upper end of the latch element 42 so as to depress said element out of the path of the confined or lowest tooth (Fig. 5). This relative rotation of the lever is permitted by the dog 54 being spaced from the upper left-hand tooth which is confined between said dog and the dog 55. Simultaneously with the release of the lowest tooth, the dog 54 rides into the recess 38 and engages the upper left-hand tooth so that the ratchet wheel is rotated clockwise with the lever to drive the conveyors 16 through the shaft 25, sprocket 26, chain 27, sprockets 23, 24 and 28, lower shafts 21, lower sprockets 19 and 20 and chains 17 and 18. Continued rotation moves the dog 55 into engagement with the cam 62 so as to lift said dog out of the path of the dog-confined tooth (Fig. 6). During this rotative movement, the wheel is locked against rotation relative to the lever by the coaction of the dogs. Upon lifting of the dog 55, the adjacent counter-clockwise or lower right-hand tooth strikes and depresses the latch element 43 so as to move into confinement between the latch elements. Consequently, the ratchet wheel is held against rotation in either direction, while the lever is free to rotate in a counter-clockwise or reverse direction under the influence of the spring 65. As shown in Fig. 7, the pawl 68 rides over the latch element 42 during this relative rotation of the lever due to the bevelled surface 74 as well as the spring-pressed, pivotal mounting of said pawl. Since the dog 54 is of a width greater than the length of the recess 39, said dog bridges said recess and engages the bevelled end 41 of the adjacent counter-clockwise or lower left-hand tooth before riding off of the adjacent clockwise cam (Fig. 8). Due to its narrow width, the dog 55 may ride into the recess 39 and into

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engagement with the tooth to confine said tooth between the dogs and lock the lever against rotation relative to the ratchet wheel except for the limited movement permitted by the space between said dogs (Fig. 4). As will be apparent, the articles A and B are alternately alined with the openings 32 and 33 upon successive operations of the control mechanism due to the offsetting or staggering of the conveyor shelves 30.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A vending control mechanism including, a fixed member, a coacting member overlying and rotatable relative to the fixed member, means carried by the rotatable member and engaging said fixed member to lock said members against substantial relative rotation in either direction, latch means engageable with said fixed member and releasably holding said member against rotation in either direction, means carried by said rotatable member and engageable with the latch means to release said latch means upon rotation of said rotatable means and permit rotation of said fixed member therewith, said latch means being re-engageable upon a predetermined rotation of said fixed member, means engageable with the lock means to release said lock means upon a predetermined rotation of said members and re-engagement of said latch means to permit reverse relative rotation of said rotatable member, the fixed member being toothed, said lock means including a pair of coacting elements for confining a tooth of said fixed member therebetween.

2. A vending control mechanism as set forth in claim 1 wherein the fixed member is toothed, the lock means of the rotatable member including a pair of coacting elements for confining a tooth of said fixed member therebetween, the latch means including a pair of coacting elements for confining another tooth therebetween.

3. A vending control mechanism as set forth in claim 1 wherein the fixed member has spaced peripheral teeth, the latch means including a pair of coacting spring-pressed elements for confining a tooth of said fixed member therebetween, the latch element in the direction of rotation of said fixed member being depressed by the release means of the rotatable member, said release means being spring-pressed to ride over said element upon reverse rotation of said rotatable member.

4. A vending control mechanism including, a relatively fixed member, a coacting member overlying and rotatable relative to the fixed member, means carried by the rotatable member and engaging said fixed member to

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lock said members against substantial relative rotation in either direction, latch means engageable with said fixed member and releasably holding said member against rotation in either direction, means carried by said rotatable member and engageable with the latch means to release said latch means upon rotation of said rotatable means and permit rotation of said fixed member therewith, said latch means being re-engageable upon a predetermined rotation of said fixed member, and means engageable with the lock means to release said lock means upon a predetermined rotation of said members and re-engagement of said latch means to permit reverse relative rotation of said rotatable member and wherein the relatively fixed member has teeth on its periphery, the lock means of the rotatable member including a pair of spaced spring-pressed elements for confining a tooth of said member therebetween, the spacing of the lock elements being greater than the width of the tooth to permit limited rotation of said rotatable member relative to said fixed member for engagement of the release means of said rotatable member with the latch means, the lock element in the direction of rotation of said fixed member being moved out of the path of said tooth by engagement with the other release means so as to clear said tooth upon reverse rotation of said rotatable member.

5. A vending control mechanism including, a ratchet wheel having widely spaced peripheral teeth, a pair of opposed spring-pressed latch elements engaging opposite sides of a ratchet tooth and coacting to hold the wheel against rotation in either direction, a rotatable member overlying said wheel, a pair of spaced spring-pressed dogs mounted on the member and adapted to confine another ratchet tooth therebetween so as to connect said member to said wheel, the spacing of the dogs being greater than the width of the confined tooth to permit limited relative rotation of said member, a spring-pressed pawl mounted on said member for engaging and depressing one of the latch elements to disengage said element from the engaged tooth upon relative rotation of said member and permit rotation of said wheel therewith, said latch elements being engaged by and confining the adjacent ratchet tooth to limit rotation of said wheel, and cam means engageable by one of said dogs for moving said dog out of the path of said confined tooth upon a predetermined rotation and re-engagement of said latch elements so as to permit reverse rotation of said member relative to said wheel, the other dog riding over the adjacent tooth and the pawl riding over said latch element upon such reverse rotation.

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