The present invention relates to dispensing devices or vending machines and more particularly to a novel device or vending machine for dispensing bottles or the like.

Dispensing devices or vending machines for bottles of beverage or the like should have a large storage capacity and the storage compartment should be so constructed and arranged that the bottles will be prevented from jamming during the vending or dispensing operations. Moreover, the dispensing device or vending machine should positively prevent the discharge of more than one bottle during any one dispensing or vending operation and its operation should require a minimum expenditure of effort.

Accordingly, it is an object of the invention to provide a new and improved dispensing device or vending machine for bottles or the like.

It is another object of the invention to provide a new and improved dispensing device or vending machine having a large storage compartment with means whereby the articles stored for dispensing are prevented from jamming.

It is still another object of the invention to provide a new and improved dispensing or vending mechanism for dispensing or vending bottles or the like wherein the weight of the bottles trips or actuates the dispensing means.

It is a further object of the invention to provide a new and improved dispensing or vending mechanism, the operation of which is actuated or initiated by the weight of the article such as a bottle to be dispensed and having novel locking or latching means for retaining the dispensing mechanism against actuation until released for selectively dispensing the articles.

Briefly stated, the new and improved dispensing device or vending machine comprises a cabinet having a storage compartment provided with a plurality of racks inclined toward a central well. The racks are adapted to support bottles or the like articles and to release them into the central well. A pair of rotatable vaned members disposed beneath and at the opposite sides of the well cooperate with a central portion to successively discharge the lowermost bottle or article in the well as the vanes are progressively rotated. A locking or latching device including a toothed wheel and a pair of pivotally movable pawls limit the degree of rotation of the vanes each time the locking or latching device is actuated or initiated for dispensing a single bottle or article. The weight of the bottles or articles in the well resting upon the vaned members causes these vaned members to rotate to discharge or dispense a single bottle or article each time the locking or latching device is actuated.

For a better understanding of the invention reference may be had to the following description taken in connection with the accompanying drawing and its scope will be pointed out in the claims.

In the drawing, Fig. 1 is a perspective view of a preferred embodiment of the novel dispensing or vending machine;

Fig. 2 is a rear or interior view of the central front wall or door of the cabinet of the dispensing device shown in Fig. 1;

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 4 and viewed in the direction of the arrows, with some portions shown broken away;

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 3 and viewed in the direction of the arrows, with some portions shown broken away;

Fig. 5 is an enlarged vertical sectional view taken on the line 5—5 of Fig. 4 and viewed in the direction of the arrows, the view showing the locking mechanism in the operative position;

Fig. 6 is a sectional view similar to Fig. 5 but showing the locking mechanism in another operative position; and

Fig. 7 is a fragmentary rear plan view showing the manner in which the vaned members are connected for simultaneous rotary movement.

Referring now more particularly to the disclosure in the drawings, and to the novel illustrative embodiment therein shown, the dispensing device 10 comprises a storage cabinet 11 having a rear wall 12, side or end walls 13 and 14, and a front wall providing a door or closure 15 pivotally or hingedly mounted on the wall 14 along one vertical edge by means of hinges or the like 16. A catch or latch 17 of any conventional type is provided on the other vertical edge of the door or closure 15 to engage with the side wall 13 for holding the front door or closure in closed position.

The cabinet has a pair of inclined lower shelves 18 and 19 (Fig. 3) which slope downwardly toward a central, vertically arranged opening or well 20 in the cabinet. Each of the shelves is provided with a pair of angle members 21 and 22 (Fig. 4) on which bottles or the like A shown in dotted outline may rest and roll downwardly into the central well 26. These shelves and angle members form the lowermost storage racks in the cabinet.

Additional wire racks 23 are spaced apart vertically over the shelves 18 and 19 and they also incline downwardly and inwardly toward the well 20. These racks 23 are substantially U-shaped with the ends bent outwardly to form oppositely extending projections 24 and the extreme ends then bent downwardly to form the stop portions 25. The racks 23 at the opposite sides of the compartment in the cabinet 11 are pivotally mounted on the interior of the side walls 13 and 14 by elongated bars or straps 26 which are rigidly secured or affixed to the walls by welding or in any other conventional or suitable manner. The bars or straps 26 are provided with spaced bent or curved portions 27 for receiving and through which the ends of the racks extend so that the opposite projections 24 are pivotally held between the side walls and the curved or bent portions 27 so that the downwardly bent bight portions 28 of the racks 23 may pivot or swing upwardly. The stop portions 25 limit the downward pivotal movement of the racks 23 to that shown in Fig. 3.

The downwardly bent bight portion 28 of each rack provides a stop that prevents bottles A resting on the next lower rack from passing into the central well 20 as long as bottles rest on the upper rack and prevent upward pivotal movement of the upper rack. In addition, if bottles are in the well and adjacent thereto they contact the bight portions of lower racks to interfere with and prevent such lower racks from pivoting or swinging upwardly. When no bottles rest on an upper rack 23 or in the well 20 contacting the bight portion of an upper rack,
the bottle on the next lower rack 23 contacting the bight portion of the rack directly thereabove, cams this up-wardly as it descends into the well. In this man-ner the shafts 55 and 56 rotate so as to pass the other lower rack 23 which will be dispensed before the bottles on the lower racks can pass into the central well. Since the bottles in each rack are held in place until all the bottles in higher racks pass or are discharged into the well and descend past the bight portion of such lower racks, jamming of bottles in the cabinet is most effectively prevented.

If desired, the racks 23 can be made of very resilient spring steel so that the free ends can be rigidly instead of pivotally secured to the side walls, the racks flexing up-wardly as the bottles on the racks therebelow roll down. The necks of bottles A held on each rack are supported by downward inclined rods 29 which are pivotally held on the side walls by bars or straps 30, one of which can be seen in Fig. 4. Each bar or strap 30 is rigidly secured or affixed to its side wall by welding or in any other conventional or suitable manner. The rods 29 have their bent portions 31 held between the transverse curved or bent portions 32 of the bar or strap 30 and the associated side wall 13 or 14. Stop portions 33 limit the down-ward movement of the rods 29 by engaging or abutting the associated side wall.

The door or closure 15 has a depressed or indented central vertical portion 34 (Figs. 1, 2, 3 and 4) which closes one side of the central well 20 and against which engage the bottoms of the bottles A disposed in the well. The opposite side portions 35 and 36 extend outwardly or forwardly of the central portion 34 and are provided on the interior thereof with a plurality of inclined angle members 37 suitably affixed thereto and which serve as guides since they engage the bottoms of the bottles dis-posed in the racks. The cabinet 10 is preferably tilted slightly forward so that the bottles on the racks tend to slide toward the door or closure and engage the guides.

The upper wall 12 and the rear edges of the side walls 13 and 14 are secured to and supported at their lower ends upon a rear plate 38 while the front edges of the side walls are secured to and supported upon a front plate 39 (Figs. 1 and 4). The cabinet walls may be secured to the rear and front plates 38 and 39 by welding, bolting, or other securing means and in any conventional manner. The rear and front plates rest upon and are secured to a pair of leg brackets 40 and 41, each in the form of an inverted U having a horizontal connecting angle member 42 and 43, respectively, and depending legs 44 and 45, 46 and 47, respectively. The plates may also be secured to the leg brackets by welding or other suitable anchoring means.

An inverted T-shaped partition or dividing member 48 extends between the front and rear plates 38 and 39 (Fig. 3) below the shelves 18 and 19 and its vertical shank or stem 49 extends upwardly to a point substantially level with the lower edges of a pair of dividing guide plates 50 and 51 which also extend between the front and rear plates. The guide plates extend downwardly from the inner and lowermost edges of the shelves and serve to define the lower portion of the central well 20. These guide plates and the dividing member 48 are rigidly se-cured or anchored to the front and rear plates by welding or in any other suitable manner.

A pair of horizontally arranged shafts 52 and 53 are journaled in the front and rear plates 38 and 39 and extend opposite sides of the dividing member 48. These shafts 52 and 53 are provided with vaned members 54 and 55, respectively, which are rigidly secured to the shafts and of substantial length (Figs. 3 and 4). The rear ends of the shafts 52 and 53 extend beyond the rear plate 38 and are provided with sprockets 56 and 57 (Fig. 3). A third sprocket 58 is rotatably mounted on a shaft 59 which is jour-naled in the rear plate 38 and in the lower end of a bracket 60 whose upper end is secured to the rear wall by a bolt or other securing means 61. A chain 62 extends about the sprockets 57 and 58 and engages the upper portion of the sprocket 56 on the shaft 52 so that the shafts 52 and 53 will always rotate simultaneously but in opposite directions.

It will now be apparent that the bottles in the central well pass on either side of the shank or upwardly pro-jecting stem 49 of the dividing member 48 as the vane members 54 and 55 rotate in the directions indicated by the arrows in Fig. 3. The vanes of one of the members are asymmetrically disposed relative to the vanes of the other member so that bottles are dispensed or vended alternately by the two vane members. For example, in the positions shown in Fig. 3, one vane of the vane member 55 and the flange 63 of the T-shaped dividing member 48 support a bottle A. At the same time, a bottle is held between a vane of the vane mem-ber 54 and the vertical shank or stem 49 of the dividing member 48. If the shaft 53 is allowed to rotate approxi-mately an eighth of a revolution until the bottle supported by the vane member 55 will cause the vane member 55 and shaft 53 to rotate and this bottle will descend to fall onto a chute 64 of a dispensing trough and be dispensed thereby. Simultaneously, the shaft 52 will rotate approximately an eighth of a revolution until the bottle supported by it rests on the opposite flange 65 of the dividing member 48 and is retained between it and the member 54. A further one-eighth revolution of the vane members will allow the bottle supported by the vane member 54 to descend and drop onto the chute 64. In this manner, the vane members 54 and 55 dis-charge bottles alternately from the lower end of the central well.

The chute 64 has a depending rear flange 66 abutting the rear plate 38 and secured thereto by welding or in any other conventional manner. The opposite sides of the chute are welded or otherwise secured to the front plate 39. A locking device or latching mechanism 67 is provided which allows a one-eighth revolution of the vane mem-bers each time a handle 68 at the front of the cabinet is turned. The locking or latching device (Figs. 5 and 6) includes a ratchet wheel 69 provided with eight peripheral teeth 70 which are adapted to be engaged by a pair of pawls or ratchets 71 and 72. The pawl or ratchet 71 is shown integral with a pawl or ratchet lever 73 pivoted adjacent one end on a shaft 74 jour-naled in two spaced apart supporting plates 75 and 76 secured to the front plate 39 by bolts or other securing means 77. The inner supporting plate 75 is also secured to the front plate 39 by screws or the like 78.

The pawl or ratchet 72 is integral with or carried by a cam plate 79 pivoted on a stub shaft 80 jour-naled in the two supporting plates. The cam plate has an irregu-lar aperture 81 and cam surfaces 82 and 83 defining this aperture and which cam surfaces lie in planes substantially perpendicular to each other. A substantially L-shaped camming lever 84 is pivoted by means of an integral shaft 85 journaled in the supporting plates 75 and 76. The front free end of the camming lever 84 has a lateral boss or projection 86 which is adapted to engage and ride against the lower curved portion 87 of the pawl or ratchet lever 73.

The mode of operation of the locking mechanism 67 can be best understood by reference to Figs. 5 and 6 of the drawing. In Fig. 5, the pawls or ratchets 71 and 72 are shown in the positions they immediately after a dispensing operation has been completed and a bottle A has been discharged to the chute 64. The pawl or ratchet 72 has engaged one of the teeth 70 of the ratchet wheel 69 to prevent further rotation of the shafts 52 and 53. A third ratchet 71 has been cammed to the position shown by contact of the frontal edge 88 of the pawl or ratchet 71 and the ratchet lever 71.
5 73 occupy this position only momentarily since the pawl or ratchet lever will pivot downwardly under the influence of gravity to a position in which the pawl or ratchet wheel 69 and the shaft 52 are freed for further rotary movement. An accurate recess 89 is formed in one side of the pawl or ratchet lever 73 to receive the shaft 85 and thereby assure the required degree of freedom of pivotal movement of the pawl or ratchet lever.

If the shaft 85 is now rotated clockwise by means of the handle 68 secured thereto, the curved lower surface 90 of the camming lever 84 will contact the camming surface 83 of the cam plate 79 and cause it to rotate counterclockwise about its shaft 8. This counterclockwise movement of the cam plate will move the pawl or ratchet 72 out of engagement with the tooth 70 so that it has been engaging and will allow the shaft 52 and ratchet wheel 69 to rotate in a clockwise manner. The ratchet wheel 69 will rotate considerably less than one-eighth of a revolution since the pawl or ratchet 71 is now in a position in the path of travel of the next tooth 70 which it engages. The pawl or ratchet lever 73 is prevented from pivoting by the engagement of the lateral boss or projection 86 on the camming lever 84 with the curved portion 87 of the pawl or ratchet lever.

If the handle 68 is now moved in a counterclockwise direction, the knee 91 of the camming lever 84 contacts the camming surface 82 of the cam plate 79 and pivots the cam plate in a counterclockwise direction about its shaft 80. This causes the pawl or ratchet 72 to move into the path of travel of the next tooth 70 which now causes the pawl or ratchet 71 outwardly and rotates downwardly to complete a full one-eighth revolution of the ratchet wheel and the shaft 52.

Another bottle will be discharged to the chute 64 during this latter rotation of the shaft 52 and the ratchet wheel 69. Since each vanned member 54 and 55 has four vanes, each one-eighth revolution of the shafts 52 and 53 will result in the discharge of a bottle.

It will be seen that a dispensing device or vending machine has been illustrated and described in which bottles or the like may be stored in a cabinet 11 and are prevented from jamming therein by the provision of pivoted racks 23 having depending portions 28 which prevent discharge of the bottles from any lower racks into a central well until the upper racks are emptied of bottles. It will also be seen that a pair of vanned members 54 and 55 cooperate with a dividing member 48 to discharge bottles alternately into the chute 64 when the shafts 52 and 53 are freed to rotate by a locking or ratcheting mechanism 67. Moreover, it will be seen that the weight of the bottles in the central well provides the force for rotating the vanned members and thus for operating the dispensing mechanism. Only a small force need, therefore, be employed to actuate the locking mechanism.

While a manually operated handle 68 has been shown as the means for actuating the locking mechanism, it will be apparent that other means may be employed. For example, coin operated mechanism employing solenoids may be used to actuate the shaft 85 each time a coin is inserted in the coin operated mechanism. Moreover, the number of vanes on the vanned members and the number of teeth on the disk may be varied as desired, so long as they accomplish the stated result.

Although Fig. 3 of the drawings discloses bottles only on the lower shelves and in the lower portion of the well, it will be apparent that when the present vending machine or dispensing mechanism is fully loaded all the racks 23 at each side of the cabinet and the center well 20 will be filled to adjacent the top of the cabinet. Then as bottles are dispensed from the lower portion of the well, the depth of bottles in the well is lowered to permit the upper racks to discharge bottles into the upper part of the well so that the depth of bottles in the well is lowered as the upper racks are depleted. As shown in Fig. 3, only a few of the bottles remain in the cabinet and the depleted supply will shortly need replenishing. While a preferred embodiment of the invention has been illustrated and described, it will be apparent that various changes and modifications can be made without departing from the invention, and it is intended, therefore, in the claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

1 claim:

1. In an article dispensing device for a storage cabinet having a plurality of vertically spaced racks inclining downwardly toward a vertical well in the cabinet, spaced depending guide plates defining the lower end of the well, a dividing member disposed below the well and intermediate the guide plates, a pair of vanned members rotatably mounted below the storage cabinet on opposite sides of the dividing member and spaced therefrom with the vanes on said members asymmetrically arranged, means connecting said vanned members for causing simultaneous opposite rotation of said vanned members, said vanned members and said dividing member cooperating to successively dispense articles from the vertical well each time said bottles are rotated through a predetermined arc, said articles being dispensed alternately from opposite sides of the dividing member, the weight of the articles in said vertical well tending to cause said vanned members to rotate, locking mechanism for controlling the arc of travel of said vanned members, and means for actuating said locking mechanism to release said vanned members for rotation and dispensing an article.

2. A bottle dispensing device comprising a storage cabinet for bottles and the like having an aperture for discharging bottles by gravity from the cabinet, a central well in the cabinet for receiving the bottles to be dispensed, spaced depending plates defining the lower end of the well through which the bottles drop in staggered relation, a dividing member disposed below the well and depending plates of said cabinet for causing bottles passing through said aperture to be directed to the opposite sides of the dividing member, a pair of vanned members rotatably mounted below said aperture with a vanned member at each of the opposite sides of said dividing member and spaced therefrom, the vanes on one member being asymmetrically arranged with respect to the vanes of the other member, means connecting said vanned members for causing simultaneous opposite rotation of said vanned members, said vanned members and said dividing member cooperating to dispense a bottle passing through said aperture each time said bottles are rotated through a predetermined arc of travel, said bottles being dispensed alternately from the opposite sides of the dividing member and the weight of the bottles passing through said aperture causing said vanned members to rotate, locking means for controlling the arc of travel of said vanned members, and means for actuating said locking means to release said vanned members for rotation and dispensing a bottle.

3. In an article dispensing device for a storage cabinet having a plurality of vertically spaced racks mounted in said cabinet and inclining downwardly toward a vertical well in the cabinet, a dividing member of substantially inverted T-shape disposed below the well, a pair of vanned members rotatably mounted below the storage cabinet with a vanned member at each of the opposite sides of the dividing member and spaced therefrom and the vanes on one member being asymmetrically arranged with respect to the vanes on the other, means connecting said vanned members for causing simultaneous opposite rotation thereof, said vanned members and said dividing member cooperating to dispense successive articles from the vertical well each time said vanned members are rotated through a predetermined arc of travel and with said articles dispensed alternately from the opposite sides of the dividing member with the weight of the articles in said ver-
tical well causing said vaned members to rotate, locking mechanism for controlling the arc of travel of said vaned members, and means for actuating said locking mechanism to release said vaned members for rotation and dispensing an article.

4. In an article dispensing device for a storage cabinet having a pair of vaned dispensing members mounted below a well in the cabinet and connected for simultaneous but opposite rotation and means for alternately delivering an article to be dispensed to a vaned member and rotating said member by the weight of the articles in the well, locking means for allowing said vaned members to rotate through a predetermined arc of travel each time the locking means is actuated, said locking means including a member connected to one of said vaned members for rotation therewith and provided with a plurality of teeth, a pawl lever mounted adjacent said toothed member for pivotal movement toward and away from said teeth and having a first pawl engageable with said teeth, a cam plate having a second pawl spaced from said first pawl for engaging said teeth, said cam plate being pivotally mounted adjacent said toothed member, and a cam lever operatively associated with said cam plate and said pawl lever for moving said second pawl into the path of movement of said teeth and simultaneously allowing said pawl lever to pivot to permit disengagement of said first pawl from engagement with one of said teeth, said teeth camming said first pawl out of engagement with said teeth.

5. In an article dispensing device for a storage cabinet containing a plurality of articles to be dispensed from a well and having a pair of vaned members mounted for rotation below said well and connected for simultaneous opposite rotation for alternately dispensing an article by one of said vaned members each time said vaned members are rotated through a predetermined arc of travel with the weight of the articles in said well causing said vaned members to rotate, locking means for allowing said vaned members to rotate through a predetermined arc of travel each time the locking means is actuated, said locking means including a toothed wheel connected to one of said vaned members for rotation therewith and provided with a plurality of teeth, a pawl lever mounted adjacent said wheel for pivotal movement toward and away from said teeth and having a first pawl engageable with said teeth, a cam plate having a second pawl spaced from said first pawl for engaging said teeth, said cam plate being pivotally mounted adjacent said toothed member, and a cam lever operatively associated with said cam plate and said pawl lever for moving said second pawl into the path of movement of said teeth and simultaneously allowing said pawl lever to pivot to permit disengagement of said first pawl from engagement with one of said teeth, said teeth camming said first pawl out of engagement with said teeth.

References Cited in the file of this patent

UNITED STATES PATENTS

40 1,127,215 Erwin et al. Feb. 2, 1915
40 1,301,074 Melcher Apr. 15, 1919
40 1,744,679 Sapp Jan. 21, 1930
40 2,416,728 Albrecht Mar. 4, 1947
40 2,441,289 Reilly May 11, 1947
40 2,459,715 Newman Jan. 18, 1949
40 2,480,932 James Sept. 6, 1949
40 2,511,099 Case June 13, 1950
40 2,615,773 Held Oct. 28, 1952
40 2,628,875 Ossanna Feb. 17, 1953

FOREIGN PATENTS

50 75,011 Germany Oct. 6, 1893