Jan. 5, 1932. B. L. FRY 1,839,840

VENDING MACHINE

Filed Nov. 18, 1929 4 Sheets-Sheet 1

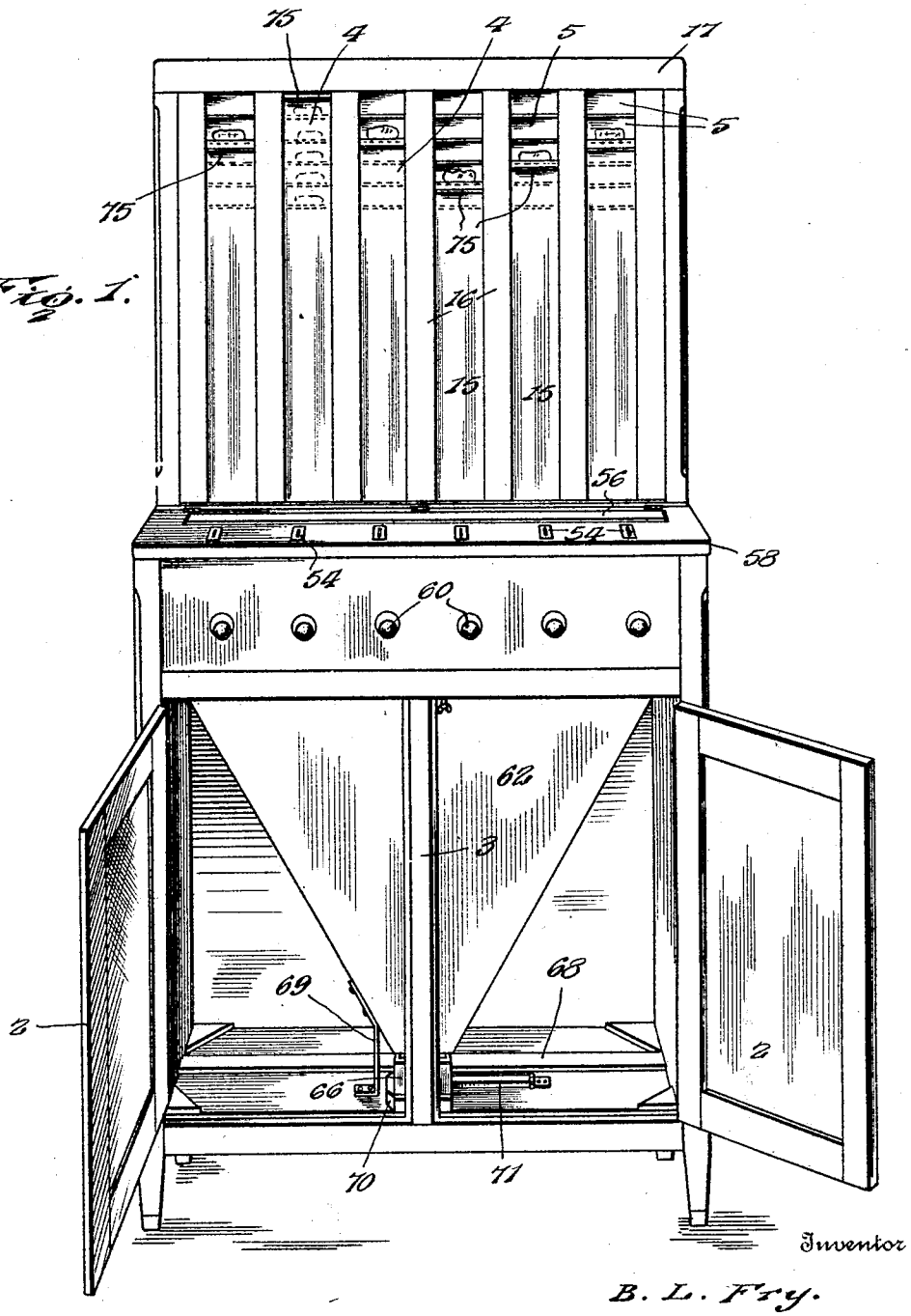


Fig. 1.

Inventor

B. L. Fry.

By Lacey & Lacey, Attorneys

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Fig. 1.

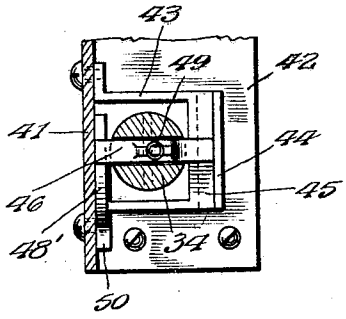


Fig. 2.

Inventor

B. L. Fry.

By Lacey & Lacey, Attorneys

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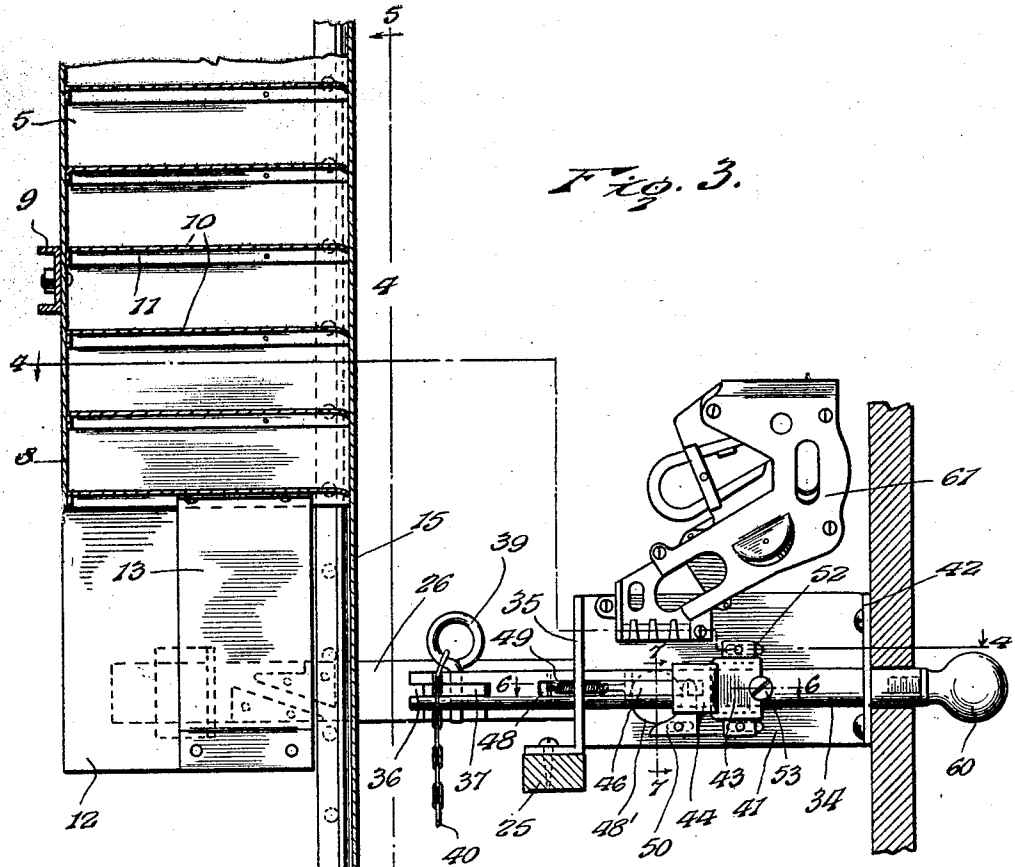


Fig. 3.

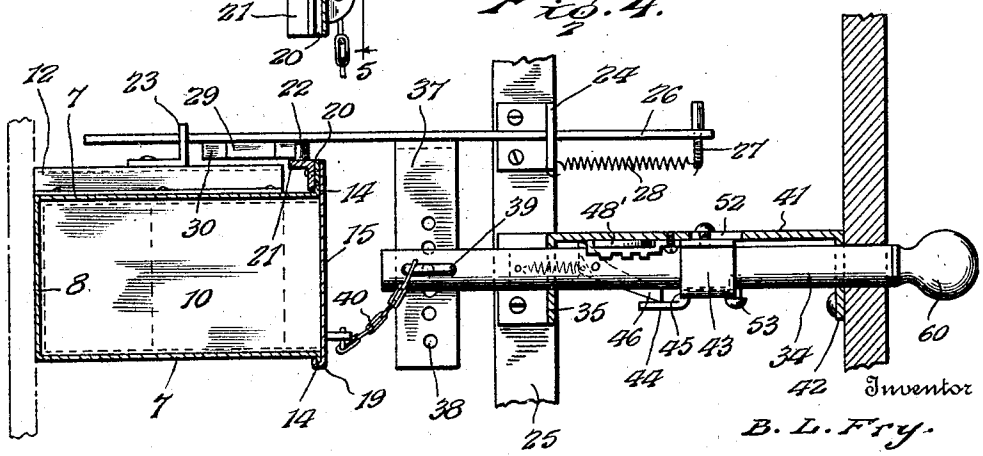


Fig. 4.

Inventor
B. L. Fry.

By Lacey & Lacey, Attorneys

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VENDING MACHINE

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Fig. 5.

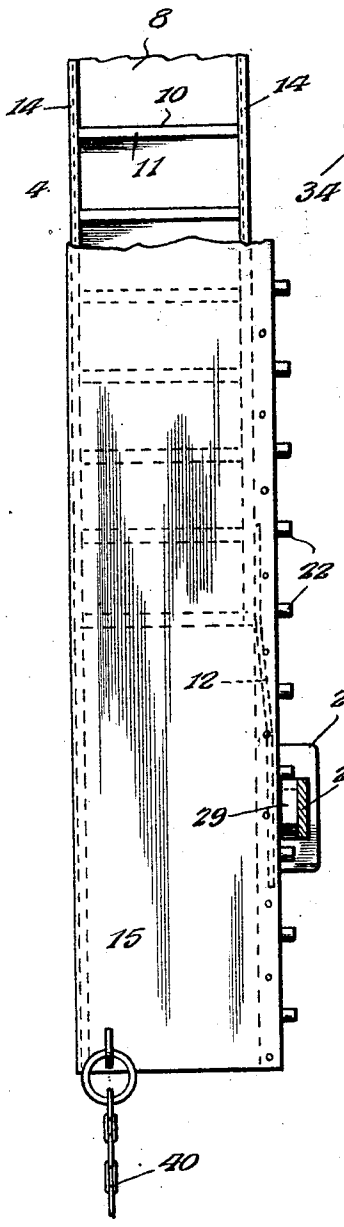


Fig. 6.

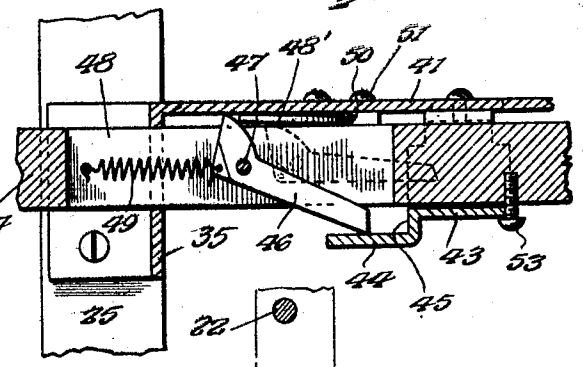


Fig. 8.

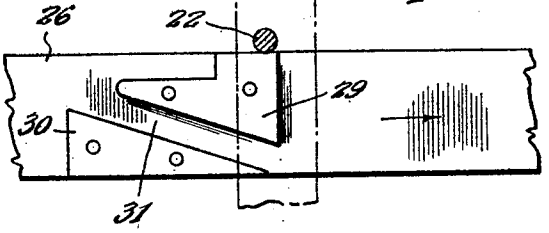


Fig. 9.

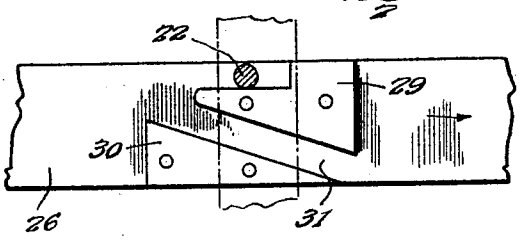
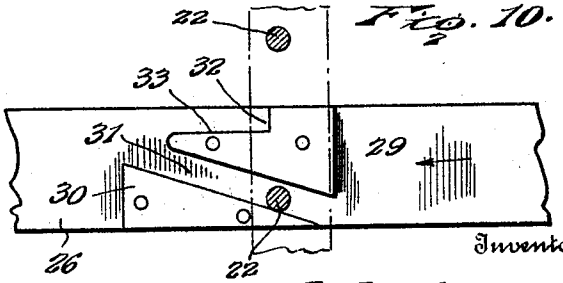


Fig. 10.



Inventor

B. L. Fry.

By Lacey & Lacey, Attorneys

Patented Jan. 5, 1932 1,839,840

UNITED STATES PATENT OFFICE

BENJAMIN L. FRY, OF ST. LOUIS, MISSOURI, ASSIGNOR TO NATIONAL SALES MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI

VENDING MACHINE

Application filed November 18, 1929. Serial No. 408,082.

This invention has for its object the provision of a compact and efficient mechanism whereby a vending machine may be operated with certainty and with ease and without liability of the parts to bind at any stage in the operation. The invention is applicable more particularly to that type of vending machines in which there is a column of compartments each containing an article to be sold and in which there is provided means for successively uncovering the front end of the several compartments in order to permit removal of the merchandise placed therein. The invention is illustrated in the accompanying drawings and will be hereinafter first fully described and then more particularly defined in the appended claims.

In the drawings:

Figure 1 is a perspective view of a vending machine embodying my present improvements,

Fig. 2 is a vertical section through the machine taken from front to rear,

Fig. 3 is an enlarged detail vertical section more specifically showing the operating mechanism,

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 3,

Fig. 5 is a transverse section taken on the line 5—5 of Fig. 3,

Fig. 6 is an enlarged horizontal section on the line 6—6 of Fig. 3,

Fig. 7 is an enlarged detail vertical section on the line 7—7 of Fig. 3, and

Figs. 8, 9 and 10 are enlarged details showing different steps in the operation of exposing the merchandise which is to be sold.

In carrying out the present invention, there is provided a cabinet having a base portion 1 which is closed at its front side by doors 2 hinged at the ends of the cabinet and arranged to meet a jamb 3 at the center of the front, the doors being provided with suitable locks the key to which will be in the possession of the owner of the machine. The upper portion of the cabinet provides a plurality of columns 4 each containing a series of compartments 5 in each of which is placed one article or package which is offered for sale. The back of this upper portion of the cabinet is closed by doors 6 which are also equipped with key-controlled locks so that access to the cabinet by unauthorized persons will be prevented. The several columns, as shown most clearly in Fig. 4, are each stamped from sheet metal into substantially U form defining side walls 7 and a back wall 8 connecting the side walls and constituting a permanent rear closure for the column. The several columns are secured to a rigid back frame 8′ formed of angle bars shaped to fit closely within the upper portion of the cabinet and reinforced by cross bars 9 of channel formation, as shown. All the columns and the back frame are assembled outside the cabinet and then inserted through the back of the same so as to be handled as a single unit. The back frame may be secured within the cabinet by any preferred means. The compartments are defined by shelves 10 of proper form and dimensions to fit between the side walls 7 and against the back wall 8 of a column and they are likewise formed of sheet metal having depending flanges 11 formed at their edges whereby they may be riveted to the side walls and the back wall of the column, the shelves, of course, being spaced preferably equi-distantly through the entire height of the column. An extension 12 is secured to one side wall of the column and depends below the same to provide a support for the operating slide hereinafter more fully described. There is also an angle brace 13 disposed below and secured to the bottom shelf 10 and said extension 12 so as to impart rigidity to the slide support, as will be understood. The side walls of each column are deflected outwardly at their front edges to form flanges 14 constituting guides and tracks for a closure 15 which is common to the entire column of compartments and, between adjacent closures, dividing strips or panels 16 are secured to the frame to cover the side edges of the closures and impart a neat finish to the cabinet. A fixed top 17 is secured over the upper end of the cabinet so as to prevent access to the compartments through the same and this top may be ornamented in any desired manner. It will be noted upon reference to Fig. 2 that the panels 16 are secured

in place by long bolts 18 which extend therefrom to and through the cross braces 9 and are held by nuts mounted on their rear ends and turned home against said braces, as shown. In this manner access to the front of the compartments is positively prevented unless the proper coin for the operation of the machine has been deposited.

The closure 15 is an elongated plate having one edge formed into a re-entrant flange 19 slidably fitting around the flange 14 at one side of the column and having a bead or strip 20 secured upon its rear side along its opposite edge, an angle bar 21 being secured against said bead, as clearly shown in Fig. 4. The bead or strip 20 is of the same thickness as the coacting flange 14 and the angle bar 21 is so disposed that one edge engages behind said flange and thereby holds the closure 15 slidably in position on the column. Projecting laterally from the angle bar 21 are spaced studs or pins 22 which are set apart a distance corresponding to the height of the compartments in the column to which the closure is applied. Upon the side of the extension 12 is secured a guide loop or bracket 23 and alined with said guide bracket 23 another bracket 24 is secured upon a cross bar 25 which is located within the cabinet in advance of the column and near the top of the base portion 1 of the cabinet. The guide brackets 23 and 24 are constructed with vertically extending slots receiving a slide 26 which cooperates with the projections 22 to effect uncovering of a compartment and permit withdrawal of the contents of the same. The slide 26 projects forwardly beyond the front guide 24 and at its front extremity is provided with a projection 27 of any convenient form to which is secured one end of a retractile spring 28, the opposite end of said spring being attached to the bracket 24, as clearly shown in Fig. 4. On the side of the slide 26 which is presented to the adjacent column and near the rear end of said slide there are secured or formed a pair of cooperating lugs or projections 29 and 30, said lugs or projections being of a general triangular form and having their confronting edges spaced apart to define a passageway 31, the purpose of which will presently appear. The lug or projection 29 is disposed somewhat forwardly of the lug or projection 30, the latter being also disposed below the former, as clearly shown in Figs. 8, 9 and 10, and the upper forward lug has its upper edge at its extreme forward portion flush with the upper edge of the slide but is formed with a shoulder 32 at an intermediate point in its length thereby defining a shelf or ledge 33. The lower edge of the lower rear lug or projection is flush with the lower edge of the slide, as shown, this arrangement facilitating the proper location of the respective lugs, as will be understood.

When the machine has been stocked and placed in display and selling position, all of the closures 15 are at the extreme upper limits of their movements and each closure completely covers the front ends of all the compartments in the corresponding column. In this position the lowest stud or pin 22 rests on the upper forward edge of the lug 29, the slide being then in its rearmost position illustrated in Figs. 3, 4 and 8. If the slide be drawn forward, the stud 22 will drop behind the shoulder 32 and rest upon the ledge 33, thereby preventing an immediate return movement of the slide and frustrating any effort which might be made to operate the slide so as to permit the withdrawal of more than one article for a single fee. Inasmuch as the slide cannot be pushed rearwardly, it must be drawn forward to a greater extent and this forward movement is continued until the projection 22 clears the rear end of the ledge 33 and drops onto the upper edge of the lower lug 30. When this stage of the operation has been reached, the forward movement of the slide will be arrested and if no further movement were imparted to the slide, the contents of the compartment could not be removed inasmuch as the vertical movement so far imparted to the closure has been just enough to permit it to drop one-half the height of the compartment. The closure can only move in a vertical plane and, consequently, it will be supported in this half open position by the pin or stud resting on the upper inclined edge of the lug 30 until the slide is permitted to retract which action will occur under the influence of the spring 28 when the pulling force upon the slide has been released. The rearward movement of the slide will, of course, permit the stud or pin 22 to ride downwardly on the upper edge of the lug 30 and fully uncover the compartment and the stud will clear the lug 30 just as the next stud or pin 22 above reaches the upper edge of the lug 29 and of the slide, as will be understood upon reference to Figs. 8, 9 and 10. It will thus be seen that, at each operation of the slide, the closure is given a step by step movement which will permit it to fully uncover the uppermost covered compartment and will limit its movement to the uncovering of said compartment.

To operate the slide 26, there is provided a plunger 34 with the rear end of which the slide is connected and there are also provided means whereby the plunger will be inoperative until a coin of the proper denomination has been deposited. The plunger is slidably mounted in the front wall of the cabinet and in a guide bracket 35 secured upon the cross bar 25, and the rear end of the plunger is formed with a notch or slot 36 which receives a coupling arm 37 secured rigidly to the side of the slide 26 and pro-

jecting laterally therefrom to pass through said notch or slot. The arm 37 is provided with a series of openings 38 in any one of which may be engaged a lock pin or key 39 which is also inserted through the rear end of the plunger. While the machine has been designed more particularly for selling small articles, such as packaged candy, cigars or the like, it is adapted for the sale of any form of merchandise, such as packaged cereals or other commodities, and the only change that is necessary is to make the compartments of the proper dimensions to accommodate and hold the packages which are to be sold. The provision of the openings 38 permits the slide 26 to be set at varying distances from the plunger 34 and, consequently, a single size for the plunger and for the slide may be maintained but the slide and the plunger may be set apart the proper distance to accommodate packages of any width. It will be noted that a chain or other flexible connection 40 is attached to and extends between the key 39 and the lower end of the closure 15. This flexible connection provides a simple but effective stop to prevent the slide dropping entirely from the guides on which it is mounted and also prevents loss of the key or locking pin 39. It may be utilized for returning the closure to its uppermost position after restocking a column of compartments, although a lip or projection 75 at or near the upper end of the closure is provided for that purpose. When the supply of merchandise in any one column has been exhausted, the uppermost projection on the closure will be resting on the slide and the lug 29 thereon. The lug 29 will, of course, be in the path of all the lower studs or projections and consequently will normally interfere with the return movement of the closure. The key or pin 39 is, consequently, withdrawn after all the compartments have been refilled and the slide 26 is then pushed rearwardly a sufficient distance to carry the lug 29 to the rear of the line of studs or pins 22 after which the closure may be easily and quickly returned to its uppermost position by pulling upon the connection 40, as will be understood. The temporary removal of the pin or key 29 permits the slide 26 with its arm 37 to move rearwardly without disturbing the plunger 34 and without any liability, therefore, of jamming any of the parts cooperating with the plunger. After the closure has been fully raised, the slide is returned to its normal position and the key reinserted thereupon setting the machine for further operation. The arm 37, by impact with the guide bracket 24, limits the forward movement of the slide.

The guide 35 through which the plunger 34 works has an extension 41 projecting forwardly to the front wall of the cabinet and secured thereto, the securing flange 42 furnishing an additional guide for the plunger and reinforcing the front wall of the cabinet around the opening through which the plunger plays. Between the ends of the extension 41, a collar or sleeve 43 is secured thereto and this collar or sleeve encircles the plunger and is provided at its rear end with an offset tongue 44 whereby a stop shoulder 45 is produced to be engaged by the front end of a dog 46 which is mounted in the plunger. Said dog 46 is pivotally mounted at 47 within a longitudinal slot 48 of the plunger and has two arms disposed at an oblique angle to each other, as shown clearly in Fig. 6. The forwardly extending arm projects from one side of the plunger and is adapted to impinge against the shoulder 45 so that it will resist forward movement of the plunger if it be attempted to operate the same without previously depositing the required coin. The opposite end of the dog projects beyond the opposite side of the plunger toward the guide extension 41 and is adapted to impinge against the edge of an inserted coin, indicated at 48′, being yieldably held in that position by a spring 49 attached to the dog and to the plunger, as shown in Fig. 6. It will now be understood that, if no coin is in the machine, forward movement of the plunger will bring the front end of the dog against the stop shoulder 45 and thereby arrest the movement, whereas if a coin be inserted the rear end of the dog will ride against the edge of the coin and the dog will thereby be rocked, as indicated by the dotted lines in Fig. 6, so that its forward end will clear the stop shoulder 45 and permit the full forward movement of the plunger and, therefore, of the slide 26 to operate the closure 15. To support the inserted coin in the path of the dog, I provide a rest 50 which is secured to the side of the guide extension 41, as best shown in Fig. 3, the rear edge of said rest being curved so as to furnish a seat for the coin in which it will be held by the pressure exerted thereon by the dog. As the dog moves forwardly and is rocked about its pivot, it will, of course, clear the coin which, being thereby released, will roll from the rest into the coin box. In order to adjust the machine for operation by coins of the proper denomination, the rest 50 is adjustable longitudinally of the extension 41 so that it will be normally at a greater or less distance from the end of the dog 46 and this adjustable mounting may be easily attained by fitting the bolts or screws, as 51, which secure the rest in place through longitudinal slots in the guide extension as is obvious. The collar or sleeve 43 which provides the stop shoulder 44 is in like manner adjustable to accommodate different movements, as indicated at 52. The plunger is also provided with a stop 53 on its side which is adapted to impinge against the front end of the sleeve

or collar 43, as shown in Figs. 3 and 6, to thereby limit the rearward movement of the plunger and cause the parts to come to rest before the supported stud 22 has a chance to drop over the front end of the lug 29.

Upon referring to Figs. 1 and 2, it will be noted that the base portion of the cabinet is considerably greater in depth than the upper portion containing the selling columns, thereby producing a shelf-like structure in which are coin slots 54 alined with the respective columns whereby an intending purchaser may deposit the coin in the proper slot to effect operation of such closure as will uncover the desired merchandise. Alined with the respective columns and corresponding coin slots are display pockets 55 which are provided in the top 58 of the cabinet base between the coin slots and the columns, as shown in Fig. 2, the several pockets being covered by a panel 56 of glass or other transparent material. The pockets have a common bottom 57 which is hinged at its rear edge to the under side of the top 58 and is held in closed position to support the samples, indicated at 59, by latches 60 of any approved type. It will be understood that in each pocket is placed a sample of the articles which are offered for sale in that column in advance of which the pocket is located and, of course, the prospective customer will deposit his coin in the slot immediately in front of the selected sample. The several plungers 34 are arranged directly below the respective coin slots, as shown in Fig. 1, and each plunger is equipped with a knob or other handle 60 to facilitate its operation. The extension 41 of the guide bracket 35 has a coin chute 61 secured thereto and this coin chute extends upwardly to a point immediately below the corresponding slot 54 so that the inserted coin will be directed to the rest 50, as will be understood. This coin chute is equipped with mechanism whereby slugs or other spurious devices are rejected and turned aside so that they will not pass to the coin rest 50, the particular structure of these slug-rejecting devices being immaterial in the present invention.

Within the base of the cabinet, there is provided a hopper 62 which is constructed with a central vertical partition 63 and which at its upper end extends the full width of the cabinet so as to be disposed under all the coin chutes and adapted to receive coins therefrom. The central partition 63 divides the hopper into two compartments 64 and 65, the front compartment 64 receiving the coins and directing them into the coin box 66 which is placed upon the floor of the cabinet, as shown clearly in Figs. 1 and 2, while the compartment 65 receives the slugs and directs them into the rear box 67. The boxes 66 and 67 are preferably one integral structure and are placed upon the floor of the cabinet immediately at the rear of the jamb 3 and bearing against the jamb or an interposed block. The rear end of the box bears against a brace 68 secured upon the floor of the cabinet and extending from side to side of the same, as shown. The lower end of the hopper is supported by a bracing bracket 69 and a cleat or stop bar 70 is secured upon the floor of the cabinet adjacent the foot of said bracket. One side of the box is disposed against the cleat or stop 70, and a latch 71 is hingedly mounted upon the floor of the cabinet at the opposite side of the box and adapted to abut the same so that the box will be very firmly held in place by and between the jamb 3 at the front and the brace 68 at the back and between the stop 70 and the latch bar 71. When the box is to be removed, the latch bar 71 is easily swung upwardly to permit the box to be moved laterally so as to clear the jamb and then brought forwardly through the doorway of the cabinet.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that I have provided an exceedingly simple, compact and efficient mechanism whereby the desired operation of a vending machine may be easily attained and attempts to operate the machine so as to obtain merchandise without paying therefor will be frustrated. It will be noted that the structure provides columns of commodity-receiving compartments in which each article will be stored within a separate compartment and the removal of one article will not disturb or disarrange any other articles. The articles offered for sale are always thoroughly protected against the access of dust or other deleterious influences and the closure is so manipulated that it will expose only one compartment at a time and the manipulation of the closure is effected in such a manner that when a compartment has been uncovered the parts will have been returned to normal position and a second compartment cannot be uncovered until a second coin has been deposited. It will also be noted that the deposited coin does not operate directly upon the closure for the compartments and, consequently, the action of the closure is positive and free of uncertainty. Furthermore, the closure is not permitted to drop the full height of a compartment in one movement and, therefore, the liability of the closure to break or bend or jam any of the parts is overcome.

Inasmuch as the several compartments are separate and distinct, there is no likelihood of the candy packages sticking together which often happens when the articles are stacked on upon another in a single tier. Furthermore, the gradual or stepped movement of the closure plate allows a gentle opening movement thereof and effectually prevents damage to said closure plate and its

associated parts which would otherwise occur should the plate drop the entire distance of one compartment at each operation of the machine.

Having thus described the invention, I claim:

1. In a vending machine, a magazine including a plurality of compartments, a vertically movable plate forming a closure to all of said compartments, an actuating member located at one side of said plate and having horizontal supporting ledges and a vertically extending shoulder between said ledges and a forwardly and downwardly inclined slot below the same, and a series of vertically alined and spaced pins extending from the closure plate adapted to successively engage the ledges upon forward movement of the actuating member to permit partial downward movement of the closure and engage the shoulder to prevent rearward movement of the actuating member, the engaged pin entering the slot upon completion of the forward stroke of the actuating member to permit rearward movement thereof and a complete downward movement of the closure to expose a single compartment.

2. In a vending machine, the combination of a column of article-receiving compartments, a closure common to all of the compartments slidably mounted at the front ends of the same, an operating slide at one side of the column of compartments, vertically alined and spaced studs on the side of the closure, and cooperating elements on the side of the slide adapted to be engaged by said studs whereby to permit a partial downward movement of the closure upon forward movement of the slide and a further downward movement of the closure upon rearward movement of the slide, the last movement of the closure bringing a second stud into a position of rest upon the slide and disposing the first-engaged stud below the slide to prevent reverse movement of the closure.

3. In a vending machine, the combination with a column of article-receiving compartments, of a vertically movable closure common to all said compartments, a series of vertically alined studs on the side of the closure spaced apart corresponding to the heights of the compartments, a slide disposed at one side of the compartments, a stepped projection on the side of the slide adapted to be engaged by one of said studs whereby upon forward movement of the slide the stud will be supported temporarily at successively lower levels and will prevent rearward movement of the slide, and a second projection on the slide spaced from the first projection to define a downwardly and forwardly inclined passageway receiving said stud upon completion of the forward movement of the slide to permit rearward movement of the slide whereby the stud will be given a further downward movement and the closure will be shifted to fully uncover one compartment.

4. In a vending machine, the combination with a column of article-receiving compartments, of a vertically movable closure common to all said compartments, a series of vertically alined studs on the side of the closure spaced apart corresponding to the heights of the compartments, a slide disposed at one side of the compartments, a stepped projection on the side of the slide adapted to be engaged by one of said studs whereby upon forward movement of the slide the stud will be supported temporarily at successively lower levels and will prevent reverse movement of the slide, a second projection on the slide spaced from the first projection to define a forwardly and downwardly inclined passageway receiving said stud whereby rearward movement of the slide will be permitted and the stud will be given a further downward movement and the closure will be shifted to fully uncover one compartment, and means whereby an additional rearward movement may be imparted to the slide to clear the studs and permit a continuous return movement of the closure.

5. In a vending machine, the combination with a column of article receiving compartments, of a vertically movable closure common to all of the compartments, an actuating member for imparting a step by step downward movement to the closure to successively expose the separate compartments, a plunger at one side of and parallel with the actuating member, a coupling arm projecting laterally from the actuating member and slidably engaging the inner end portion of the plunger, and means for connecting the coupling arm to the plunger to prevent relative movement of the plunger and the actuating member.

6. In a vending machine, the combination with a column of article receiving compartments, of a vertically movable closure common to all of the compartments, an actuating member for imparting a step by step downward movement to the closure to successively expose the separate compartments, a plunger having a slotted end, a coupling arm secured to the actuating member and fitted in the slotted end of the plunger, said coupling member being provided with a plurality of openings, and a pin carried by the plunger and engaging one of the openings in the coupling arm to secure said parts in assembled position.

7. In a vending machine, the combination with a column of article receiving compartments, of a vertically movable closure common to all of the compartments, an actuating member for imparting a step by step downward movement to the closure to successively expose the separate compartments, a plunger having a slotted end, a coupling arm secured to and extending laterally from the actuating

member and fitting in the slotted end of the plunger, said arm being provided with a plurality of openings, a pin fitting through the slotted end of the plunger and engaging one of the openings, and a flexible connection between the pin and the lower portion of the closure.

8. In a vending machine, the combination with a column of article receiving compartments, of a vertically movable closure common to all of the compartments, a bracket secured to said compartments, a guide spaced from the bracket, an actuating member slidably mounted in the guide and bracket respectively for imparting a step by step downward movement to the closure to successively expose the separate compartments, a plunger, a coupling arm extending laterally from the actuating member and operatively connected with the plunger, a projection carried by one end of the actuating member, a spring forming a connection between the projection and guide, and a flexible connection between the plunger and closure to limit downward movement of the closure.

9. In a vending machine, the combination with a column of article receiving compartments, of a vertically movable closure common to all of the compartments, an actuating member for imparting a step by step downward movement to the closure to successively expose the separate compartments, a plunger, a coupling arm extending laterally from the actuating member and having an adjustable detachable connection with the plunger, a retractile spring operatively connected with the actuating member, and a flexible connection between the closure and the adjustable connection between the plunger and the actuating member.

In testimony whereof I affix my signature.

BENJAMIN L. FRY.