July 4, 1933. M. H. RICHARDSON 1,916,530

VENDING MACHINE

Filed Dec. 3, 1930 4 Sheets-Sheet 1

Fig. 1

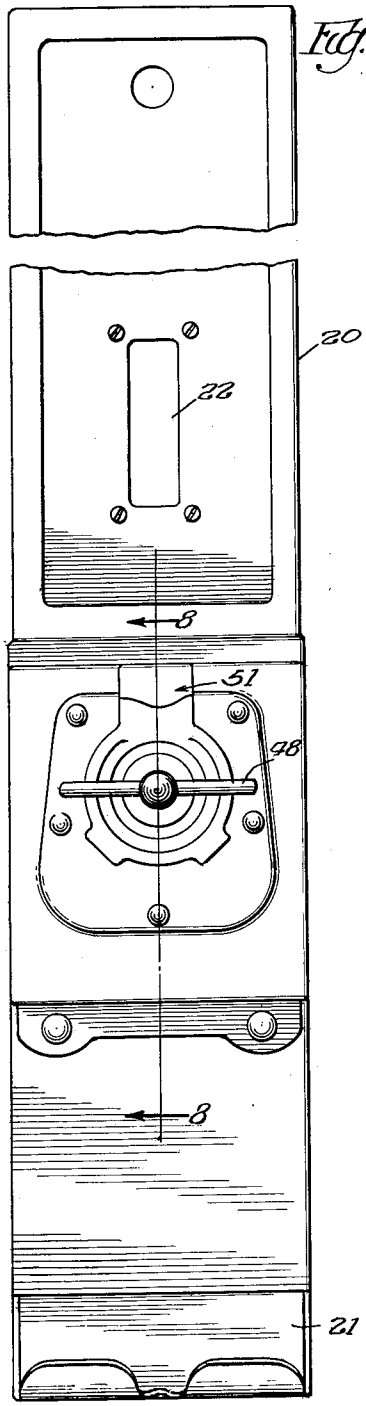


Fig. 15

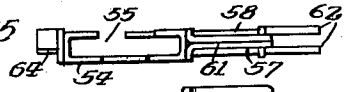
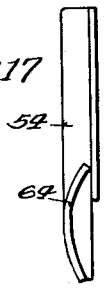


Fig. 17



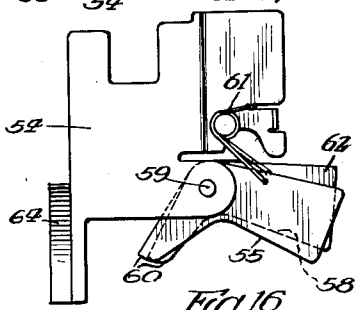
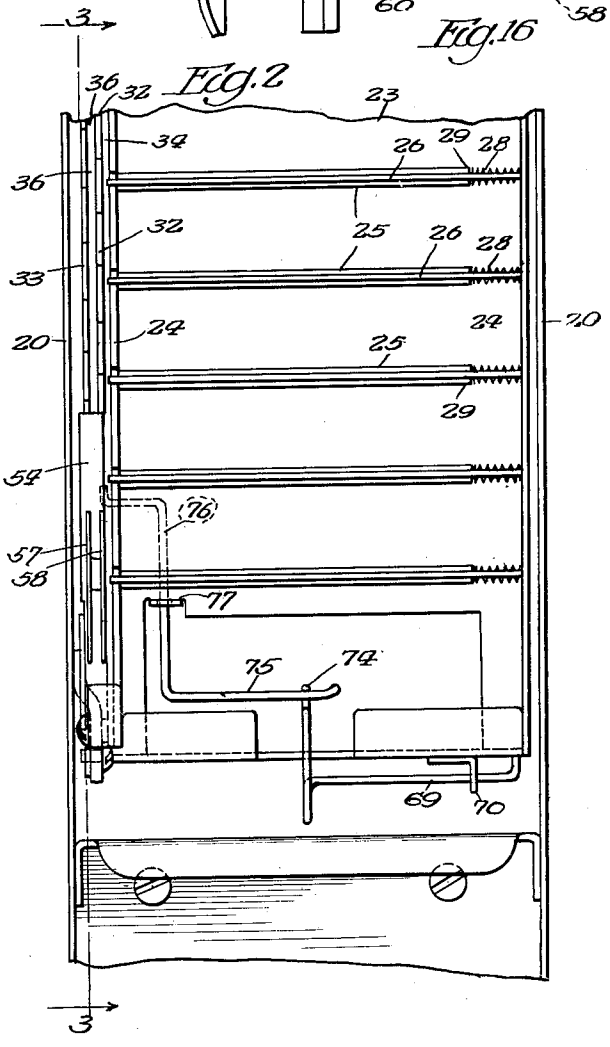


Fig. 16

Fig. 2



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Fig. 3

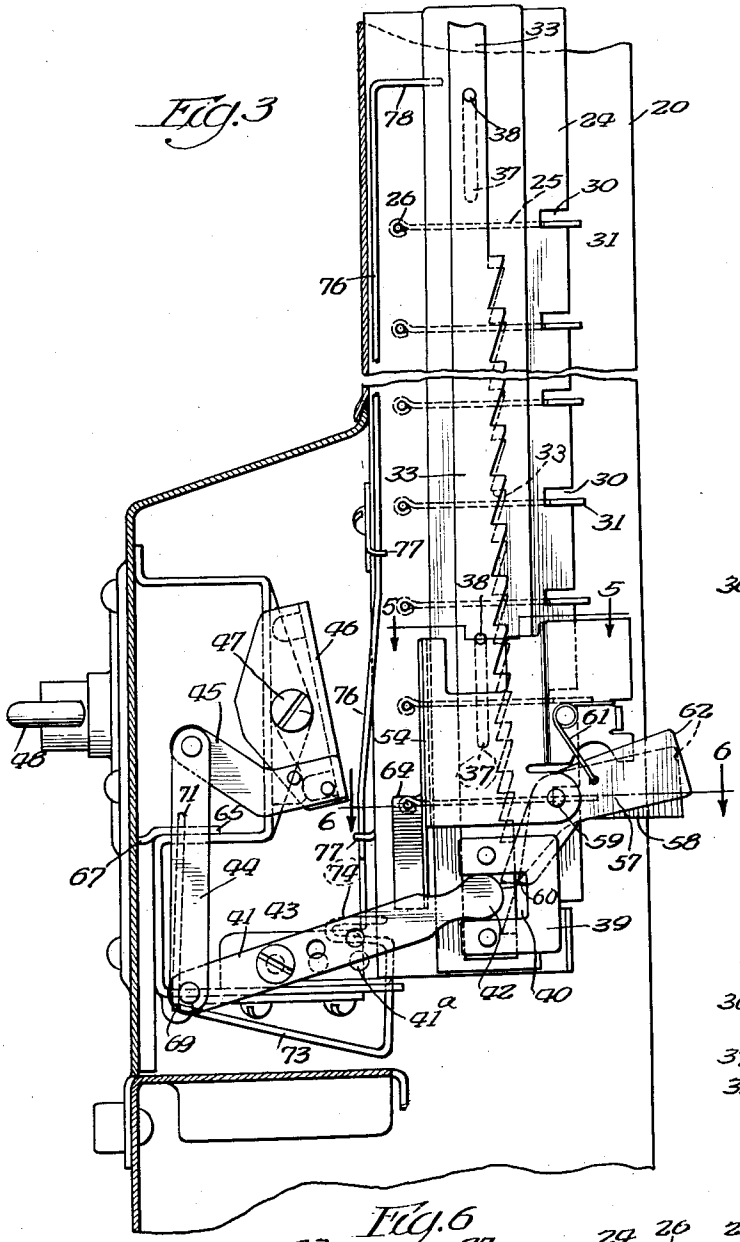


Fig. 4

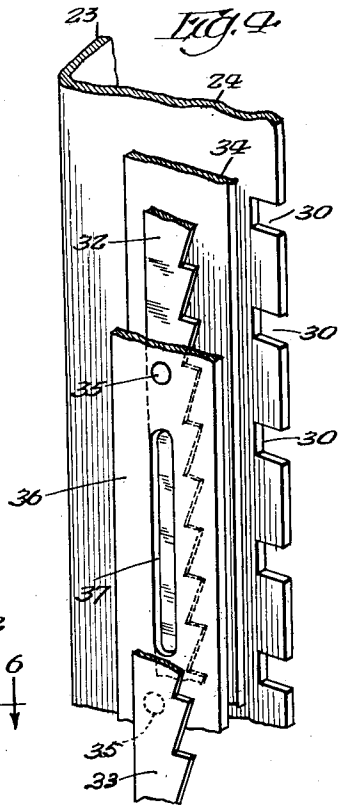


Fig. 5

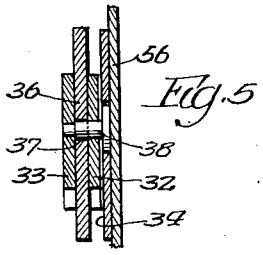


Fig. 6

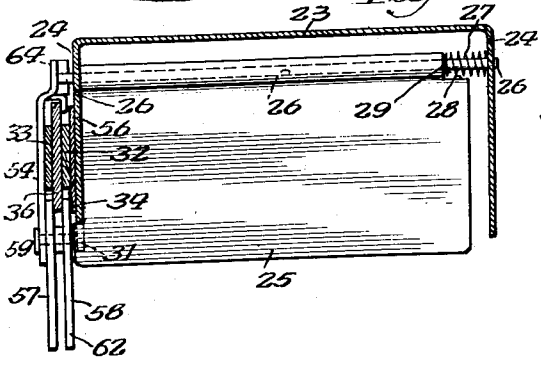
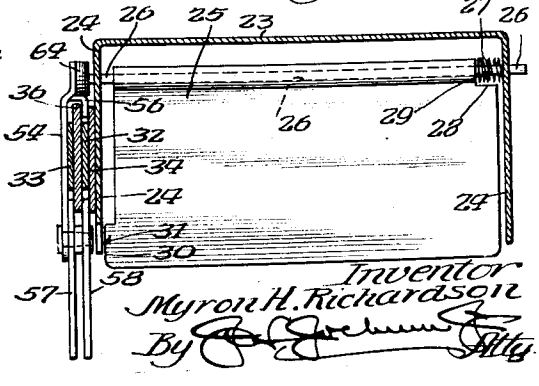


Fig. 7



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Fig. 8.

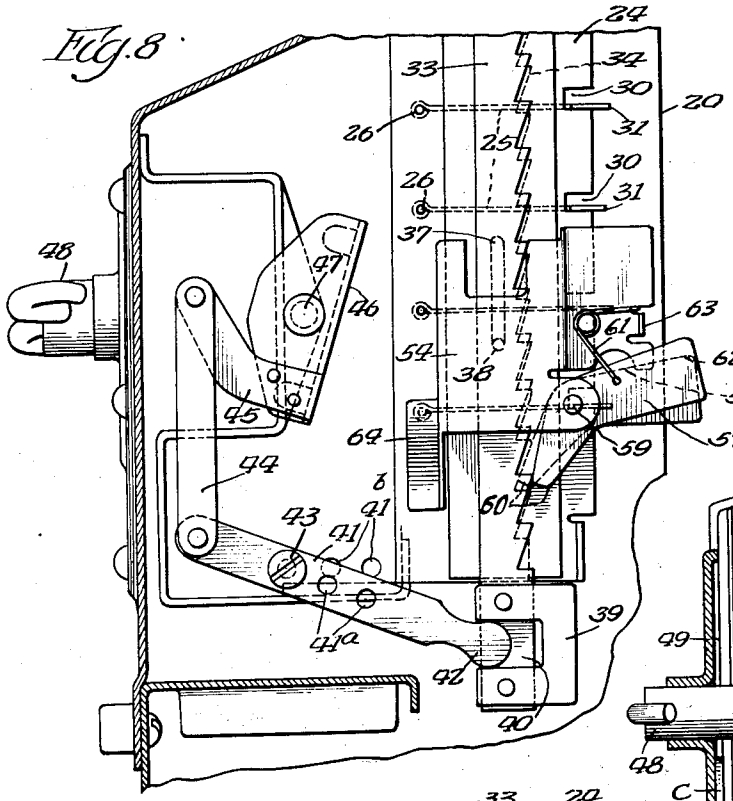


Fig. 9

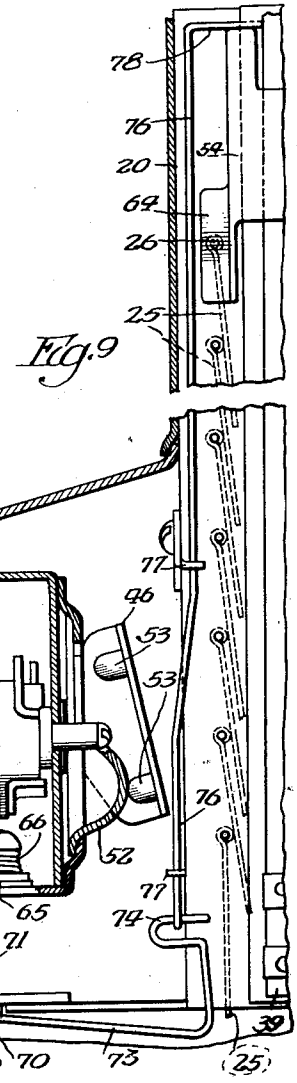
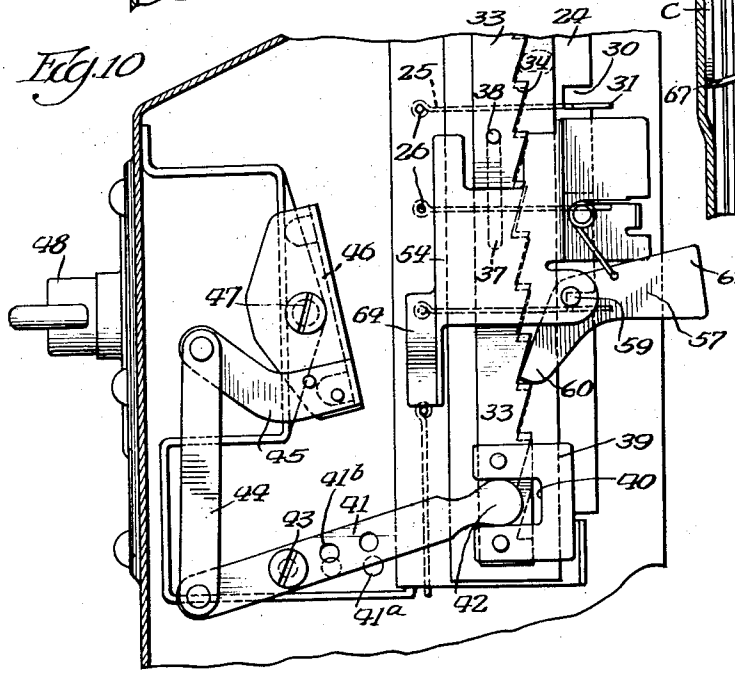


Fig. 10



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VENDING MACHINE

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Fig. 11

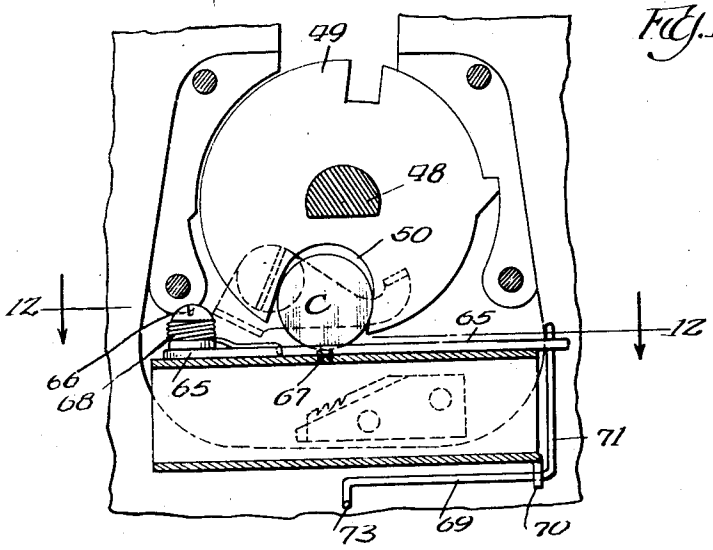


Fig. 12

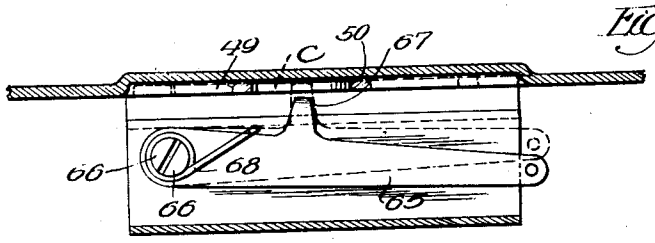


Fig. 14

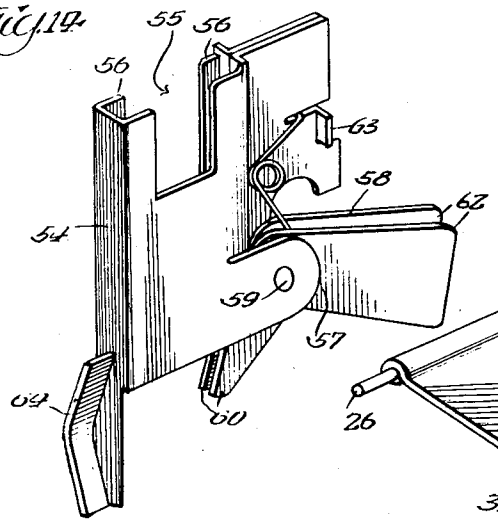
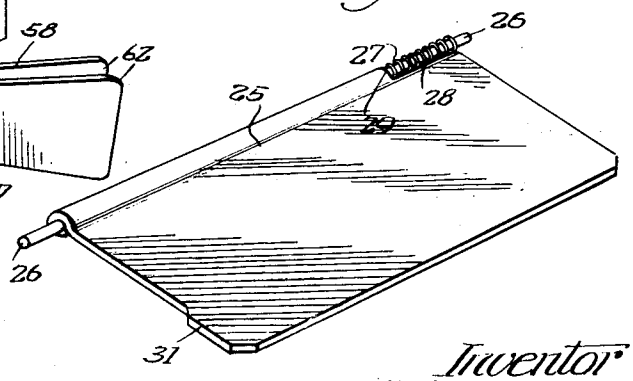


Fig. 13



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By
Atty.

Patented July 4, 1933 1,916,530

UNITED STATES PATENT OFFICE

MYRON H. RICHARDSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO ADVANCE MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

VENDING MACHINE

Application filed December 3, 1930. Serial No. 499,629.

This invention relates to improvements in vending machines of the type in which the articles to be vended are arranged in a column consisting of supports arranged one above the other and properly spaced to receive articles therebetween, each of the supports holding its respective article or articles, and one of the objects of the invention is to provide an improved machine of this character in which the supports are pivotally mounted and are provided with locking or retaining means for maintaining them against pivotal action.

A further object is to provide improved means which upon the insertion of a proper coin or token, may be operated to successively unlock or release the supports by bodily shifting them to render the locking or retaining means inactive, to allow the support to tilt to discharge the article or articles supported thereby, the supports being successively released or unlocked and tilted by the successive insertion of a proper coin or token until the machine is emptied.

A further object is to provide improved means rendered active by the support unlocking or releasing means to prevent the coin or token from being deposited into the machine when it is emptied of articles, and for causing the coin to be returned to the operator.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention, and in which

Figure 1 is a front elevation of a machine of this character constructed in accordance with the principles of this invention.

Figure 2 is a rear elevation partly broken away and with parts omitted.

Figure 3 is a sectional view taken on line 3—3, Figure 2.

Figure 4 is a detail perspective view of a portion of the ratchet mechanism and of the support retaining or locking means.

Figure 5 is a detail sectional view taken on line 5—5, Figure 3.

Figure 6 is a sectional view taken on line 6—6, Figure 3.

Figure 7 is a view similar to Figure 6, with the parts in another position, and showing the support unlocked or released.

Figure 8 is a view similar to Figure 3, showing the parts in another position, and taken on line 8—8, Figure 1.

Figure 9 is a view partly in elevation, partly in section, with parts omitted and with parts broken away, showing the coin operating mechanism and the means for preventing the deposit of the coin into the machine, and to insure its return to the operator when the machine is emptied.

Figure 10 is a view similar to Figure 8, showing the parts in another position.

Figure 11 is a view partly in elevation and partly in section of the coin controlled mechanism.

Figure 12 is a sectional view taken on line 12—12, Figure 11.

Figure 13 is a perspective view of one of the supports.

Figure 14 is a perspective view of the traveling member for releasing or unlocking the supports.

Figure 15 is a top plan view of Figure 16.

Figure 16 is a side elevation of the traveling member for releasing the supports.

Figure 17 is a left hand end elevation of Figure 16, with parts omitted.

Referring more particularly to the drawings the numeral 20 designates an enclosing casing of any desired size and configuration having a discharge outlet 21 for the articles to be vended, and within one of the walls of the casing is arranged an opening covered by a transparent closure 22, thereby rendering it possible to view the articles in the casing.

Removably secured within the casing is a supporting frame or structure comprising a back wall 23 and side walls 24 and this frame or supporting structure is of a size and configuration to fit readily within the casing 20 and to be removed therefrom through the

open back of the casing after the closure has been removed.

Pivotally mounted between the walls 24 of the supporting structure are supports 25 and these supports are mounted upon a pivot member to which the support is secured. The ends 26 of the pivot member project beyond the lateral edges of the support and a coil spring 27 encompasses one of the projecting portions 26 and is seated in a cut away portion or recess 28 in the edge of the support, so that one end of the spring will rest against a shoulder 29 on the support and the other end of the spring will engage one of the walls 24 of the supporting structure as shown more clearly in Figures 2 and 13. The supports 25 are of a length considerably less than the width of the supporting structure or the space between the walls 24 so that the supports may be bodily moved in directions lengthwise of the axis of the pivot member 26, the ends of the pivot member being journaled in suitable bearings in the walls 24.

In one of the walls 24 there is provided a series of notches or openings 30 and projecting from the adjacent edge of each of the supports 25 is a formation or extension 31 of a shape that it will enter one of the recesses or notches 30 in the wall 24, the spring 27 serving to move the support 25 in a direction to cause the projection 31 to enter the notch 30 and thereby temporarily lock or hold the support in a substantially horizontal position to support the article or articles which are deposited thereupon.

When, however, it is desired to deliver the articles from the machine the support 25 is bodily shifted in a direction to move the projection 31 out of the notch or recess 30 and against the stress of the spring 27, with the result that the support will then fall by swinging about the pivot formed by the pivot member 26 with the walls 24.

As the support thus falls the article will fall therefrom to be delivered to the operator through the opening 21.

Any suitable means may be provided for thus releasing the supports, but a simple and efficient means embodies a pawl and ratchet mechanism, the same consisting preferably of two racks 32—33 extending lengthwise of one of the walls 24 and in close proximity thereto, one of the racks 32 being disposed in close proximity to the outer face of the wall 24 and being spaced therefrom by a suitable spacing member 34, and the rack 32 is held against longitudinal movement in any suitable manner, preferably by means of fastening devices 35 which pass through a member 36 that forms a spacing member between the racks 32 and 33.

This member 36 is provided with any suitable number of slots 37 therein running lengthwise thereof and are of any desired length according to the extent of movement which it is desired to impart to the movable rack 33.

Carried by the rack 33 are pins or projections 38 which enter the slots 37 and guide the rack 33, any suitable means being provided for holding the rack 33 against lateral separation with respect to the rack 32.

Secured to the lower end of the rack 33 is a member 39 having a bifurcation 40 therein and into which bifurcation one end of a lever 41 projects, the extremity of the lever in the bifurcation being preferably rounded and of a size to fit the bifurcation. The lever 41 is pivotally mounted intermediate its ends as at 43 and connected to the other end of the lever is a link 44 which is connected to an arm 45 that in turn is connected to a member 46 which is adapted to rock about a pivot 47.

The member 46 is adapted to be rocked about its pivot by any suitable coin controlled mechanism through the medium of an operating handle 48 and to the operating handle is connected a coin carrying disc 49 having a check or coin seat 50 therein. When a coin of a proper denomination is deposited through the inlet opening 51 (see Figure 1) into the check or coin seat 50 of the disc 41, and the handle 48 operated, the check carrying disc will be rotated so as to invert the check seat 50 to permit the coin to drop therefrom and into the machine. During this operation the member 46 will be rocked by means of a cam 52 which co-operate with projections 53 on the member 46 and this member 46 will, through the medium of the lever 41 and the connections between the lever and the member 46, cause the rack 33 to be moved first in one direction and then in the other direction, according to the direction of movement of the member 46.

The numeral 54 designates a sleeve having an open side 55 with inwardly projecting flanges 56 and this sleeve encompasses the member 36 so that the flanges 56 pass beneath the latter and into the opening 55 the rack 32 projects so that when the sleeve 54 is mounted upon the member 36 it may be moved longitudinally thereof. The rack 33 also passes through the sleeve 54.

Carried by the sleeve 54 are dogs or pawls 57—58 which are pivotally mounted as at 59, the ends 60 of which respectively engage and co-operate with the teeth of the racks 32—33, and springs 61 co-operate with the respective dogs so as to move the ends of the dogs into contact with the rack.

The extremities of the dogs may be shaped to form finger engaging portions by means of which the dogs may be moved about the pivot 59 against the stress of the springs 61 until they engage stops 63, to move the active ends of the dogs into positions that they will not engage the teeth of the rack, thereby permitting the sleeve 54 with the dogs 57—58

to be freely moved lengthwise of the member 36 and with respect to each of the racks 32—33.

Carried by the sleeve 54 is a cam shaped projection 64 which when the sleeve 54 is mounted upon the member 36, will, as the sleeve is moved along the guide or support 36, contact with the projecting end of the pivot member 26 of the respective supports 25, the said ends of the pivots projecting a sufficient distance beyond the wall 24 so as to be engaged by the cam. As the sleeve 54 is moved upwardly the cam 64 will contact with the projecting pivot members of one of the supports 25 to shift the support bodily in a direction lengthwise of the axis of the pivot member and thereby move the projection 31 of such support out of the notch or recess 30 to release the support and allow the same to fall about the pivot.

After the cam 64 has passed out of contact with the pivot member 26 of the last support and when it is desired to refill the machine, it is only necessary to lower the sleeve 54 and then raise the supports 25 with the finger until the projection 31 comes into alinement with one of the notches 30, at which time the spring 27 will expand and will force the support 25 bodily in a direction that the projection 31 will enter one of the notches 30.

It will be noted that there is a double pawl and ratchet mechanism and as one of the racks, to-wit: the rack 32 is stationary, and the rack 33 is movable by the oscillation of the lever 41, it will be manifest that as the nose of the dog 57 is held in contact with one of the teeth of the rack 33, and the nose of the other dog 58 is normally moved in a direction to engage with the teeth of the rack 32, when the lever 41 is moved to raise the rack 33, the sleeve 54 and cam 64 will be correspondingly raised through the medium of the dog 57 and this will cause the nose of the dog 58 to ratchet over the teeth of the rack 32 so long as the sleeve 54 is being raised.

When the lever 41 is moved in the opposite direction to lower the rack 33, the sleeve 54 will be held against such lowering movement by the engagement of the dog 58 with one of the teeth of the rack 32, but the rack 33 will be lowered, thereby causing the teeth of the rack 33 to ratchet or slip over the nose 60 of the dog 57 until the rack has reached the limit of its lowering movement. Upon the next operation of the lever 41, the rack 33 will be again raised and this will raise the sleeve 54 to ratchet the latter one step further and thereby release or unlock another one of the supports 25 to allow the latter to fall.

This ratcheting or step by step movement of the sleeve 54 will continue so long as the lever 41 is operated and will cause the sleeve 54 to travel throughout the length of the rack 32 until the uppermost support 25 has been released. At that time the machine will be emptied of articles.

In order to prevent a further operation of the machine by the insertion of a coin therein, after the machine is emptied, means are provided to prevent such operation and to return the coin to the operator.

To that end there is provided a lever 65 (see particularly Figures 11 and 12) pivotally mounted at one end as at 66 and provided with a finger 67 which is adapted to be positioned beneath the coin in the seat 50 when the latter is inverted so as to prevent the coin from falling out of the seat. A spring 68 tends normally to move the finger 67 to a position that the coin will fall from the seat when the latter is inverted.

A shaft 69 is mounted in a suitable bearing 70 and has connected with it an arm 71 which is connected to the lever 65 by passing through a suitable opening in the lever.

Connected also with the shaft 69 is an arm 73 (see Figures 2 and 3) which is provided with a hook shaped portion 74 that engages over the end 75 of a rod or member 76 mounted to move in suitable guides 77 and which member 76 extends lengthwise of the racks. The upper extremity 78 of the rod 76 is deflected so as to stand within the path of the advancing movement of the sleeve 54. This deflected extremity 78 of the rod 76 is so disposed that when the sleeve 54 assumes a position that the cam 64 will engage and shift the uppermost support 25 to release the latter, the end of the sleeve 54 (see particularly Figure 9) will engage the deflected portion 78 of the rod 76 and shift the latter longitudinally, thereby acting upon the arm 73, rocking the shaft 69 and forcing the finger 67 of the lever 65 into a position beneath the edge of the coin in the seat 50 of the check carrier 49 to prevent the coin from dropping from the seat and thereby insuring the coin's return to the operator.

Thus it will be seen that when the machine becomes emptied, the lever 65 will be automatically shifted and it will be impossible to deposit a coin into the machine.

After the sleeve 54 has reached the limit of its upward movement, and all of the supports 25 have been released and have swung about their pivots 26 into the position shown in dotted lines in Figure 9, the sleeve may be returned to the bottom of the rack 32 by raising the ends 62 of the dogs 57—58, after which the sleeve may be moved to its starting position.

The supports 25 may then be raised in any suitable manner so as to cause them to be locked into operative and supporting positions.

It is thought that the operation of this device will be clearly understood from the foregoing, but briefly stated it is as follows.

Upon the deposit of a coin into the machine the handle 48 may be operated to rock the lever 41 from the position shown in Figure 8 to the position shown in Figures 3 and 10, and during this rocking movement of the lever 41, the sleeve 54 with the cam 64 thereon will be moved by the movable rack and with respect to the stationary rack 32. During this movement the cam 64 will engage one of the pivots 26 to shift the respective support 25 bodily to unlock or release the latter so that the weight of the article thereon will cause the shelf to fall and deliver the article to be vended.

When the lever 41 is moved in the opposite direction or to the position shown in Figure 8, the movable rack 33 will be lowered while the sleeve 54 will be held against such movement by reason of the dog or pawl 58 engaging one of the teeth of the stationary rack 32. Upon the next movement of the lever 41 back to the position shown in Figure 3, the sleeve 54 will be advanced one step of movement, thereby tripping or releasing the next support.

This operation will continue until all of the supports have been tripped or released, at which time the end of the sleeve 54 will engage the deflected extremity 78 of the rod 76 to shift the lever 65 against the stress of the spring 68 and thereby position the finger 67 so that the coin cannot fall from the coin or check seat 50 of the check carrying member 49.

The sleeve 54 may be returned to its normal position by tripping both of the dogs 57 and 58 and then moving the sleeve bodily towards the ends of the racks.

The bodily movement of the rack 33 is limited by the pins or projections 38 in the slots 37 of the member 36.

The mechanism may be adjusted so as to vary the distance of movement of the member or sleeve 54 upon the operation of the lever 51 and with the same coin controlled or detector mechanism, by providing the lever 41 with a series of openings 41^a. The support upon which the lever is mounted may also be provided with additional openings 41^b to correspond with the openings 41^a so that by removing the pivot pin or member 43 and inserting the same in either of the registering openings 41^a—41^b, the fulcrum of the lever will be changed and the extent of movement of the end 42 of the lever will be varied.

This is advantageous as it renders it possible to adjust the tripping mechanism so that it will be necessary to impart any desired number of ratchet movements before a support will be tripped. That is, so that it will require the insertion of more than one coin before an article will be delivered, or in the event of a cheaper article being vended, the trip mechanism or sleeve 54 may be moved to trip or release more than one support on each step of its ratchet movement.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. In a vending machine a plurality of article supports mounted for swinging movement about fixed pivots, locking means for maintaining them against such movement, and means for successively and bodily sifting said supports in directions lengthwise of their pivots to render the respective locking means inactive to permit the supports to swing about their pivots.

2. In a vending machine a plurality of article supports mounted for swinging movement about their pivots, locking means for maintaining them against such movement, and means for successively and bodily shifting said supports in directions lengthwise of their pivots to render the respective locking means inactive to permit the supports to swing about their pivots, the last said means embodying a member adapted to be intermittently advanced.

3. In a vending machine a plurality of article supports mounted for swinging movement about fixed pivots, locking means for maintaining them against such movement, means for successively and bodily shifting said supports in a direction lengthwise of the axis of the pivot to render the respective locking means inactive to permit the supports to swing about their pivots, the last said means embodying a member adapted to be intermittently advanced, and pawl and ratchet mechanism for advancing the member.

4. In a vending machine a plurality of article supports mounted for swinging movement about fixed pivots, locking means for maintaining them against movement about their pivots, means for successively and bodily shifting said supports in directions lengthwise of their pivots to render the respective locking means inactive to permit the supports to swing about their pivots, and resilient means operating to render said locking means active when the respective supports are moved about their pivots in a direction to position the supports to receive and hold an article.

5. In a vending machine a series of article supports mounted by one edge for swinging movement about fixed pivots, a shiftable member, one end of the pivots of said supports projecting into the path of movement of said member, means for intermittently advancing said member, an upright adjacent

one edge of said supports, interengaging locking means between the upright and the respective supports to maintain the latter against movement about their pivots, and means tending normally to bodily shift the supports in one direction lengthwise of the pivots thereof to cause the locking means to become active, the said member operating to bodily shift the supports in the opposite direction lengthwise of the pivots thereof and against the stress of the third recited means to render the locking means inactive to permit the supports to swing about their pivots.

6. In a vending machine a series of article supports mounted by one edge for pivotal movement about fixed pivots, a shiftable member, one end of the pivots of said supports projecting into the path of movement of said member, means for intermittently advancing said member, the said means embodying pawl and ratchet mechanism, an upright adjacent one edge of said supports, interengaging locking means between the upright and the respective supports to maintain the latter against movement about their pivots, and means tending normally to bodily shift the supports in a direction lengthwise of the pivots thereof to cause the locking means to become active, the said member operating to bodily shift the supports lengthwise of their pivots and in the opposite direction against the stress of the third recited means to render the locking means inactive to permit the supports to swing about their pivots.

7. In a vending machine a series of superposed article supports mounted to swing on fixed pivots, means for locking said supports against such movement, a member adapted to be intermittently advanced to successively and bodily shift said supports lengthwise of their pivots to render the said locking means inactive to permit the respective supports to swing about their pivots, means for intermittently advancing said member, the last recited means embodying two racks one of which is stationary and the other being bodily shiftable, spring controlled pawls carried by said member and cooperating with the respective racks, and means for moving the said shiftable rack.

8. In a vending machine a series of superposed article supports mounted to swing about fixed pivots, means for locking said supports against such movement, a member adapted to be intermittently advanced to successively and bodily shift said supports lengthwise of their pivots to render the said locking means inactive to permit the respective supports to swing about their pivots, means for intermittently advancing said member, the last recited means embodying two racks one of which is stationary and the other being bodily shiftable, spring controlled pawls carried by said member and co-operating with the respective racks, and means for moving the said shiftable rack, the latter operating to intermittently move the said member along the said stationary rack.

9. In a vending machine a series of superposed article supports mounted to swing about fixed pivots, means for locking said supports against such movement, a member adapted to be intermittently advanced to successively and bodily shift said supports lengthwise of their pivots to render the said locking means inactive to permit the respective supports to swing about their pivots, means for intermittently advancing said member, the last recited means embodying two racks one of which is stationary and the other being bodily shiftable, spring controlled pawls carried by said member and co-operating with the respective racks, and coin controlled mechanism for moving the said shiftable rack.

10. In a vending machine, a plurality of article supports each of which is mounted for movement about a fixed pivot, locking means for maintaining the supports against movement about said pivots, and means for successively and bodily shifting said supports in directions lengthwise of the axes of their pivots to render the locking means inactive to permit the supports to swing about their pivots, the last recited means embodying a member adapted to be successively advanced with respect to the supports, and means for intermittently advancing said member.

11. In a vending machine, a plurality of article supports each of which is mounted for movement about a fixed pivot, locking means for maintaining the supports against movement about said pivots, means for successively and bodily shifting said supports in directions lengthwise of the axes of their pivots to render the locking means inactive to permit the supports to swing about their pivots, the last recited means embodying a member adapted to be successively advanced with respect to the supports, and means embodying double pawl and ratchet mechanism for intermittently advancing said member.

12. In a vending machine, a plurality of article supports each of which is mounted for movement about a fixed pivot, locking means for maintaining the supports against movement about said pivots, means for successively and bodily shifting said supports in directions lengthwise of the axes of their pivots to render the locking means inactive to permit the supports to swing about their pivots, the last recited means embodying a member adapted to be successively advanced with respect to the supports, means embodying double pawl and ratchet mechanism for

intermittently advancing said member, one of said ratchets being bodily movable with relation to the other ratchet, and means for moving the said movable ratchet member.

13. In a vending machine, a plurality of article supports mounted to swing about fixed pivots and shiftable lengthwise of their pivots, locking means for maintaining them against such movement, a releasing element for shifting the supports lengthwise of their pivots to render the locking means inactive to permit the supports to swing about their pivots, and means for imparting a step by step advancing movement to the said element, the last recited means embodying mechanism adapted to be set whereby the extent of the steps of advancing movement of the said element may be varied.

14. In a vending machine, a plurality of supports mounted to swing about fixed pivots and shiftable lengthwise of their pivots, locking means for maintaining them against such movement, a releasing element for thus shifting the supports to render the locking means inactive to permit the supports to swing about their pivots, and means for imparting a step by step advancing movement to the said element, the last said means embodying mechanism adapted to be set to vary the number of steps of advancing movement of the said element, necessary after one of said locking means is rendered inactive, to render the next succeeding locking means inactive.

In testimony whereof I have signed my name to this specification, on this 22nd day of November, A. D. 1930.

MYRON H. RICHARDSON.