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2,996,217

PIVOTED-SHELF MERCHANDISING MACHINE

Filed Dec. 24, 1958

3 Sheets-Sheet 1

Fig 2

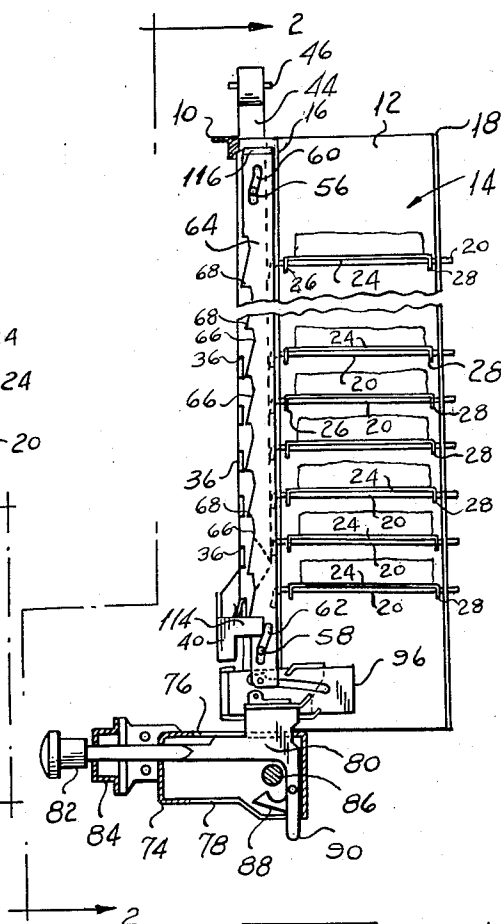
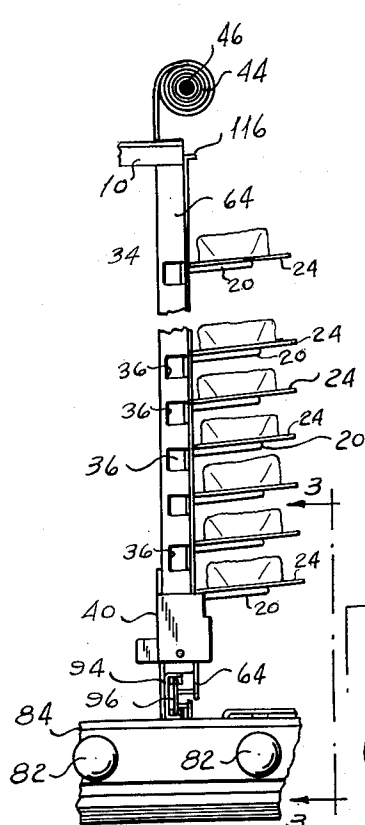


Fig 1

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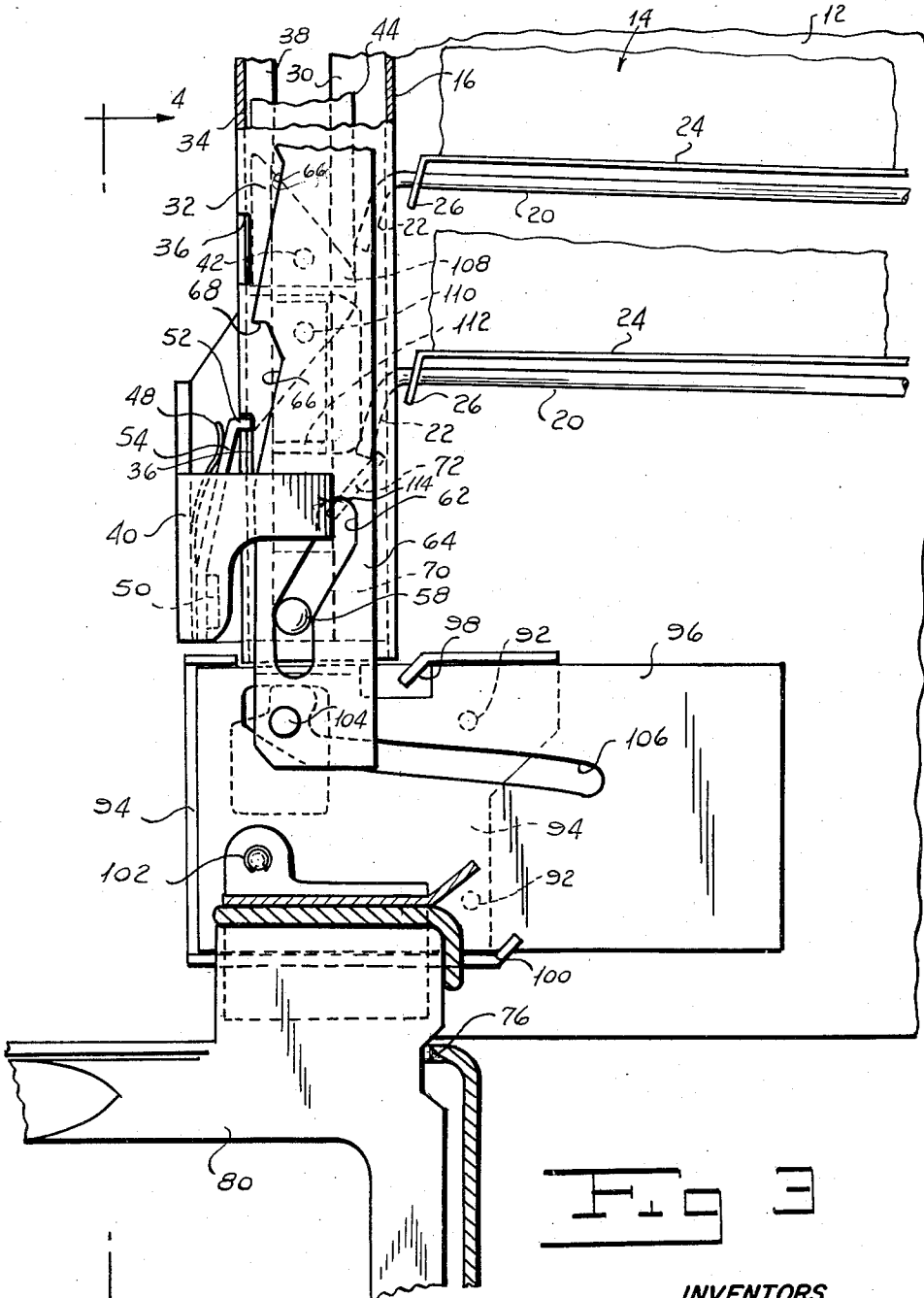


FIG. 3

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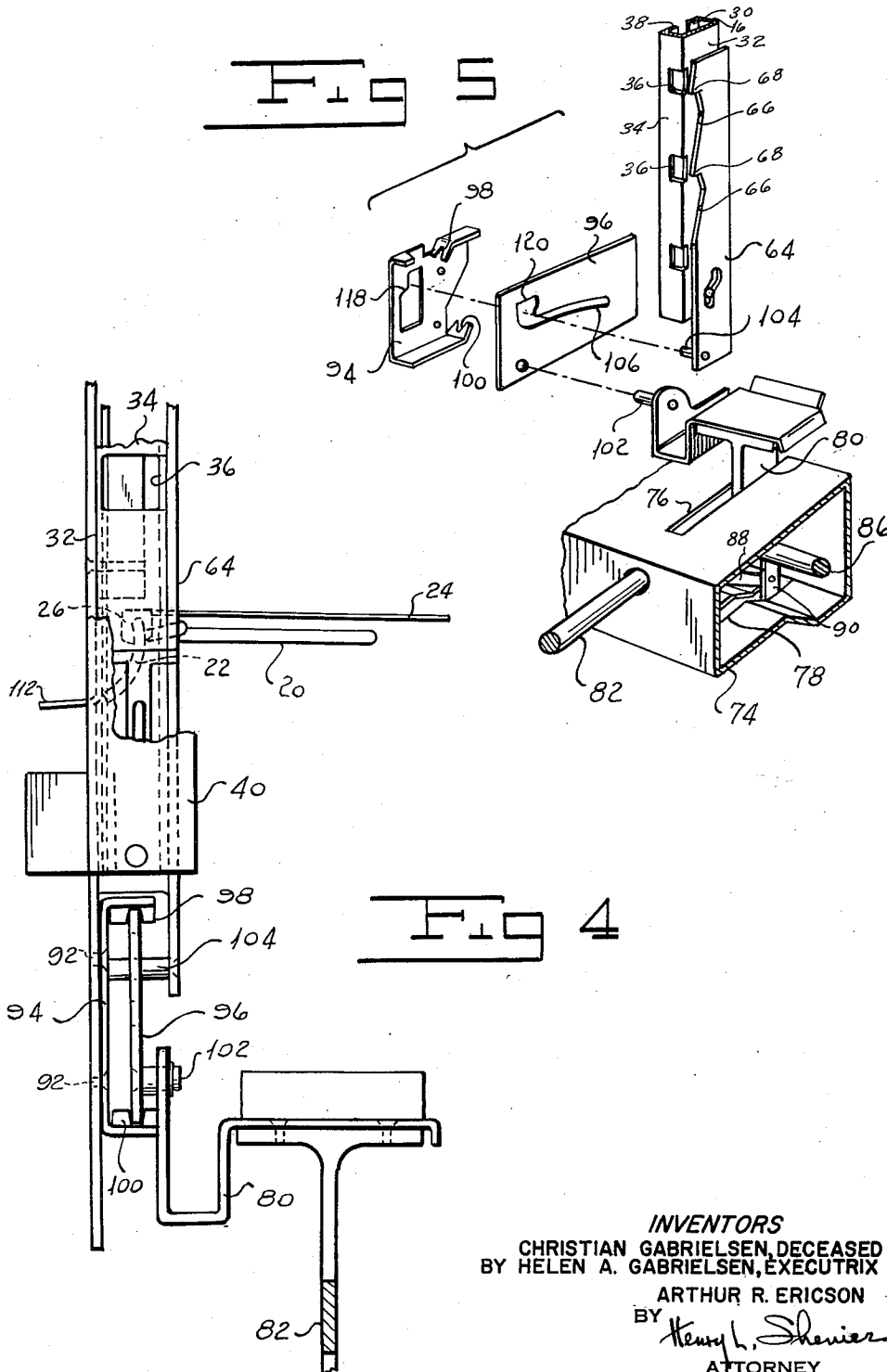
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3 Sheets-Sheet 3



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PIVOTED-SHELF MERCHANDISING MACHINE

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3 Claims. (Cl. 221-90)

Our invention relates to a pivoted-shelf merchandising machine and more particularly to an improved pivoted-shelf merchandising machine which is simpler in construction and which is more certain in operation than are machines of the prior art.

Patent No. 2,565,766, issued August 29, 1951, to Christian Gabrielsen et al. for an Automatic Merchandising Machine, discloses a machine in which a series of vertically arranged pivoted shelves normally are supported by a flexible tape in positions at which they may support articles of merchandise. An actuating bar carries lugs which cooperate with a pin on the flexible tape. A cam carried by a pull bar adapted to be freed in response to the deposit of coins in the machine actuates a follower on the reciprocable bar to drive the bar to move the tape sequentially to release the shelves. The bar actuating cam is secured to the pull bar which in turn is slidably supported on the machine frame. While this machine operates to dispense the articles carried by the shelves in sequence, owing to the fact that the weight of the shelves and the articles carried thereon acts on the flexible tape which must be moved to release a shelf, the machine requires a stout pull for its operation.

Patent No. 2,652,304, issued September 15, 1953, to Christian Gabrielsen for a Candy Merchandising Machine, discloses an improved machine of the pivoted-shelf type in which an escapement bar mounted for fore-and-aft or transverse movement and for concomitant longitudinal movement is operated to permit a traveler to move in steps sequentially to release the shelves. This patent discloses a complicated linkage responsive to the operation of the pull bar for moving the escapement bar in a longitudinal direction while permitting it to shift transversely of itself in a fore-and-aft direction with reference to the machine to release the traveler. We have found that while this machine successfully delivers articles of merchandise, the aggregate lost motion resulting from the required tolerance in the linkage pivots and connections enables a dishonest person to hold the linkage in an intermediate position and to jar or otherwise apply shock forces to the machine to release the traveler for two or more steps to obtain more than a single article in response to the deposit of a sum in coins equal to the price of only a single article of merchandise.

We have invented a machine of the pivoted-shelf type which is an improvement over the machines described in the patents above. Our machine has an easy pull. It includes an extremely simple operating mechanism having very little lost motion so that it cannot be held in an intermediate position at which shocks may be applied to the machine to cause the traveler to move through more than a single step upon the deposit of a sum in coins equal to the purchase price of a single article. The operating mechanism cannot be forced without the exertion of a pull beyond the strength of most men. Our machine has an extremely simple mechanism for locking the operating mechanism when all the shelves of a column have been released to empty the column.

One object of our invention is to provide an improved pivoted-shelf merchandising machine which is simpler in construction and more certain in operation than are machines of the prior art.

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Another object of our invention is to provide an improved pivoted-shelf merchandising machine having an operating mechanism with little lost motion so that only a single article can be obtained upon deposit in the machine of coins aggregating the purchase price of an article.

A further object of our invention is to provide an improved pivoted-shelf merchandising machine which cannot be forced to deliver merchandise without deposit of the purchase price.

Still another object of our invention is to provide an improved pivoted-shelf merchandising machine having an extremely simple means for locking the operating mechanism when the supply of articles is exhausted.

Other and further objects of our invention will appear from the following description.

In general, our invention contemplates the provision of a merchandising machine of the type disclosed in Patent No. 2,652,304, referred to hereinabove, in which a simple cam plate slidable on the machine frame is actuated by the pull bar to operate the escapement bar directly through a pin riding in the cam slot of the plate. Both the cam plate and the escapement bar are mounted for movement directly on the machine frame so that the only possibility of any lost motion exists between the cam plate and the pin carried on the bar. No tolerance build-up can occur as in the complicated linkage of Patent No. 2,652,304 and no lost motion can result from mounting the cam directly on the pull bar which is relatively loosely mounted on the machine frame as in Patent No. 2,565,766. We provide our machine with a simple pin carried by the escapement bar which moves into an offset portion of the cam plate slot to immobilize the cam plate in response to movement of the escapement bar when all shelves have been dumped.

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

FIGURE 1 is a side elevation of our improved pivoted-shelf merchandising machine, with parts shown in section.

FIGURE 2 is a front elevation of our improved pivoted-shelf merchandising machine, taken along the line 2-2 of FIGURE 1.

FIGURE 3 is a fragmentary sectional view of our improved pivoted-shelf merchandising machine taken along the line 3-3 of FIGURE 2 and drawn on an enlarged scale.

FIGURE 4 is a fragmentary sectional view of our improved pivoted-shelf merchandising machine taken along the line 4-4 of FIGURE 3.

FIGURE 5 is an exploded fragmentary view of the operating mechanism of our improved pivoted-shelf merchandising machine.

Referring now to FIGURES 1 to 4 of the drawings, our machine includes a bracket 10 supported within the machine cabinet (not shown) which carries a plurality of panels 12, one of which is shown. The panels 12 divide the machine into a plurality of columns 14, one of which is shown. We form the panel 12 with a pair of vertically extending flanges 16 and 18. The flanges 16 and 18 pivotally support a plurality of horizontally extending wire supports 20 at vertically spaced locations on the panel 12. We form each wire 20 with a bent portion 22 outboard of the flange 16. Each wire 20 carries for rotation with the wire a shelf 24 supported on the wire by means of a pair of depending lugs 26 and 28 formed on the shelf. The end of each wire 20 remote from the portion 22 is straight to permit the shelf to shift laterally with respect to the flanges 16 and 18.

Each wire portion 22 is adapted to engage a vertical flange 30 extending outboard of flange 16 in the plane of

panel 12 to hold its associated shelf 24 in a position at which the shelf may support an article of merchandise. It will be appreciated that if a wire 20 is shifted to the left as viewed in FIGURES 1 and 3 to move its portion 22 to a position clear of the flange 30, the shelf may move under the influence of gravity to dump the article of merchandise supported thereon. We form a channel-shaped member 32 integrally with the flange 16. This channel-shaped member 32 includes a side 34 formed with a plurality of openings 36 and a vertical flange 38 in the plane of flange 30. We mount a traveler 40 for vertical, reciprocating movement along the U-shaped member 32. A pin 42 connects the end of a negative spring 44 to a reset cam 108. A pin 110 connects cam 108 to traveler 40. Spring 44 tends normally to coil about a shaft 46 supported in any suitable manner on the machine frame normally to urge traveler 40 to move upwardly as viewed in FIGURES 1 and 3. A leaf spring 48 supported on a pin 50 carried by traveler 40 normally urges the toe 52 of a latch 54 loosely supported on pin 50 into engagement with one of the openings or notches 36 in the side 34. Thus, the latch 54 normally holds the traveler 40 against upward movement under the action of spring 44.

Respective pins 56 and 58 ride in slots 60 and 62 formed in a traveler release bar 64 to support the bar for movement concomitantly in a vertical and in a lateral direction. We form the edge of bar 64 adjacent the side 34 with a plurality of notches 66 separating adjacent stops 68 on the bar. It will be seen that if the bar 64 moves downwardly and to the left, as viewed in FIGURES 1 and 3, the surface of a notch 66 will engage toe 52 to move the latch 54 to permit the traveler 40 to move upwardly under the action of spring 44. The traveler continues to move upwardly until toe 52 engages a stop 68. When the bar 64 moves upwardly and to the right, as viewed in FIGURES 1 and 3, in a manner to be described hereinafter, toe 52 engages the surface of side 34 and slides upwardly under the action of spring 44 until it falls into the next opening 36 above the one in which it was originally disposed.

We form the traveler 40 with a portion 70 extending within member 32 between the two flanges 30 and 38. A release cam 72 on the extension 70 is adapted to engage the portions 22 of wires 20 as the traveler 40 moves upwardly in the manner described. In the course of its upward movement, cam 72 moves the portion 22 of a wire 20 to a position at which it is out of engagement with flange 30 to permit the associated shelf 24 to drop.

Referring now to FIGURES 1 to 5, a housing 74 supported by the machine frame (not shown) is formed with pairs of slots 76 and 78 which slidably support pull members 80, one of which is shown. A respective plunger 82, supported for reciprocation in a plunger housing 84, is connected to each pull member 80 by any suitable means, such as welding. Our machine includes an operating bar 86 adapted to be freed in a manner known to the art in response to the deposit of coins in the machine to permit a pull bar to be operated. A latch 88 pivotally carried by a depending finger 90 on the pull member 80 provides a coupling between the bar 86 and the member 80 during the return stroke of the plunger 82. As is known in the art, after depositing coins aggregating at least the purchase price of an article of merchandise in the machine, the customer makes his selection by pulling plunger 82 first outwardly and then returning the plunger to its initial position.

Any suitable means such as screws 92 or the like secure a cam plate support bracket 94 to the panel 12. Plate 96 rides in bearing slots 98 and 100 formed in bracket 94. A pin 102 on the pull member 80 provides a driving connection between member 80 and plate 96. We dispose a cam follower pin 104 carried by bar 64 in a track 106 formed in the plate 96. We so shape the cam slot 106 that as plunger 82 moves first outwardly, bar 64 is moved downwardly while at the same time being permitted to

shift laterally to the left under the action of the pins 56 and 58 disposed in slots 60 and 62. When the plunger 82 is returned to its initial position, plate 96 drives the bar upwardly while at the same time permitting it to move to the right. The driving connection between the pull member 80 and the bar 64 provided by the slot 106 has very little lost motion.

When it is desired to reset the shelves 24 after all the merchandise has been dispensed, traveler 40 is moved manually downwardly. In the course of this movement, a horizontal cam 112 carried by traveler 40 first engages the portions 22 to rotate the shelves 24 to a horizontal position. Immediately following this action, the reset cam 108 shifts the shelves laterally to the right, as viewed in FIGURES 1 and 3, to move portions 22 behind the flange 30 to retain the shelves in their erected positions.

We provide our machine with an extremely simple mechanism for locking the plunger 82 against operation when the supply of articles in the associated column is depleted. Upon successive operations of the machine, the shelves 24 are successively dumped from the lowest shelf to the top shelf. When the last shelf is dumped, the traveler 40 is permitted to move upwardly under the influence of spring 44 until an arm 114 on the traveler 40 engages a projection 116 at the top of bar 64. When this takes place, spring 44 urges the bar upwardly. We form the plate 94 with an opening 118 into which the pin 104 extends. We form the slot 106 with an enlarged portion 120 which registers with the opening 118 when the plate 96 is in its normal position before actuation. When plate 96 returns to its normal position after the top shelf has dumped its article, spring 44 pulls bar 64 upwardly to move the pin 104 into the enlarged portion 120 of slot 106. If an attempt is now made to pull plunger 82, pin 104 is caught between plate 96 and the plate 94. Owing to the fact that plate 94 is rigidly secured to the machine frame, very little motion of plate 96 is permitted, and no danger exists that money will be accepted without the delivery of merchandise.

While we have described only a single unit of our improved pivoted-shelf merchandising machine, it is to be understood that a machine will customarily include a number of selectively operable units.

In operation of our improved pivoted-shelf merchandising machine, a customer desiring to make a purchase first deposits in the machine a sum in coins aggregating at least the purchase price of the desired article to free the bar 86 in a manner known to the art. After the bar has thus been freed, the customer pulls a plunger 82, corresponding to the desired article, outwardly to move cam plate 96 to the left as viewed in FIGURES 1 and 3. In the course of this movement of the cam plate, slot 106 moves bar 64 downwardly. At the same time pins 56 and 58 cam the bar to the left as viewed in FIGURES 1 and 3 to cause the surface of a notch 66 to engage the toe 52 of latch 54 to release the latch to permit traveler 40 to move upwardly under the influence of spring 44. Traveler 44 moves upwardly until toe 52 engages a stop 68 on the bar.

The operations described above are completed during the outward movement of the plunger 82 and pull member 80. When the customer returns the plunger, bar 64 moves upwardly and to the right, as viewed in FIGURES 1 and 3, to move toe 52 into engagement with the surface of side 34 to release the latch to permit the traveler 40 to move upwardly through a further distance until latch 54 engages an opening 36 in side 34. In the course of this further movement of the traveler, cam 72 engages a portion 22 of a shelf-supporting wire 20 to move it to the left, as viewed in FIGURES 1 and 3, out of engagement with flange 30 to permit a shelf to dump its article of merchandise. The machine is now ready for the next succeeding operation.

It is to be noted that we form bar 64 with notches 66 having a sufficiently great depth such that the bar cannot

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be jarred to release the latch 54 to dispense an article of merchandise without payment.

When all the shelves of a column have been dumped in the manner described hereinabove, traveler 40 continues to move upwardly until its arm 114 engages the projection 116 to cause bar 64 to move upwardly to a position at which pin 104 is disposed in the enlargement 120 in slot 106. This movement of bar 64 is permitted by slots 60 and 62. When the pin 104 moves into enlargement 120, the associated pull bar is locked against operation.

It will be seen that we have accomplished the objects of our invention. We have provided an improved pivoted-shelf merchandising machine which is simple in construction and which is more certain in operation than are machines of this type which are known in the prior art. The operating mechanism of our machine has very little lost motion, with the result that it cannot be worked to a position at which more than a single article of merchandise can be obtained by deposit in the machine of coins aggregating the purchase price of an article. The operating mechanism of our machine is extremely rugged, with the result that it cannot be forced. Our machine includes a very simple empty-lock mechanism for locking the machine when the supply of articles of merchandise is exhausted.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of our claims. It is further obvious that various changes may be made in details within the scope of our claims without departing from the spirit of our invention. It is, therefore, to be understood that our invention is not to be limited to the specific details shown and described.

Having thus described our invention, what we claim is:

1. A merchandising machine for dispensing articles of merchandise including in combination a frame, a shelf, means pivotally mounting said shelf on said frame for movement to a first position at which said shelf may support an article of merchandise and to a second position at which said shelf dumps an article of merchandise carried thereon, means for normally retaining said shelf in said first position, means including an element for releasing said shelf-retaining means to permit said shelf to dump an article of merchandise carried thereby, means mounting said element for movement on said frame, a plate member formed with a cam slot, a cam follower member disposed in said slot, means mounting one of said members for linear movement on said frame, means mounting the other one of said members in a fixed position on said element, and means for driving said frame mounted member to move said element to release a shelf to dispense an article of merchandise.

2. A merchandising machine for dispensing articles of merchandise including in combination a frame, a plu-

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ality of shelves, means pivotally mounting said shelves on said frame for movement to first positions at which the shelves may support respective articles of merchandise and to second positions at which the shelves dump the articles of merchandise carried thereby, respective releasable means for normally retaining said shelves in said first positions, means including an element for sequentially releasing said retaining means upon successive operations of the machine, means mounting said element for movement on said frame, a plate formed with a cam slot having an enlarged portion, means including a bearing support plate having an opening for mounting said cam plate for movement on the frame, means mounting said support plate on the frame, said cam plate being normally positioned at a location at which said enlarged slot portion registers with said support plate opening, a cam follower disposed in said slot, means mounting said follower in a fixed position on said element, said follower pin extending into said opening and means responsive to the releasing of one of said shelves for moving said follower into said enlarged cam slot portion to prevent substantial relative movement between said cam plate and said support plate.

3. A merchandising machine for dispensing articles of merchandise including in combination a frame, a plurality of shelves, means pivotally mounting said shelves on said frame for movement to first positions at which the shelves may support respective articles of merchandise and to second positions at which the shelves dump the articles of merchandise carried thereby, respective releasable means for normally retaining said shelves in said first positions, a traveler, means mounting said traveler for movement on the frame, means urging said traveler to move on said frame sequentially to release said releasable means, means normally restraining said traveler against movement under the influence of said urging means, an escapement bar adapted to be actuated to release said restraining means to permit a step of movement of said traveler, a plate formed with a cam slot, means mounting said plate for movement on said frame, a cam follower disposed in said slot, means mounting said follower in a fixed position on said escapement bar, a pull bar and a rigid connection between said pull bar and said plate, said pull bar adapted to be operated to move said plate to actuate said escapement bar to permit a step of movement of said traveler.

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