Sept. 26, 1961 W. S. TANDLER ET AL 3,001,669

VENDING AND DISPENSING DEVICE

Original Filed Nov. 18, 1950 3 Sheets-Sheet 1

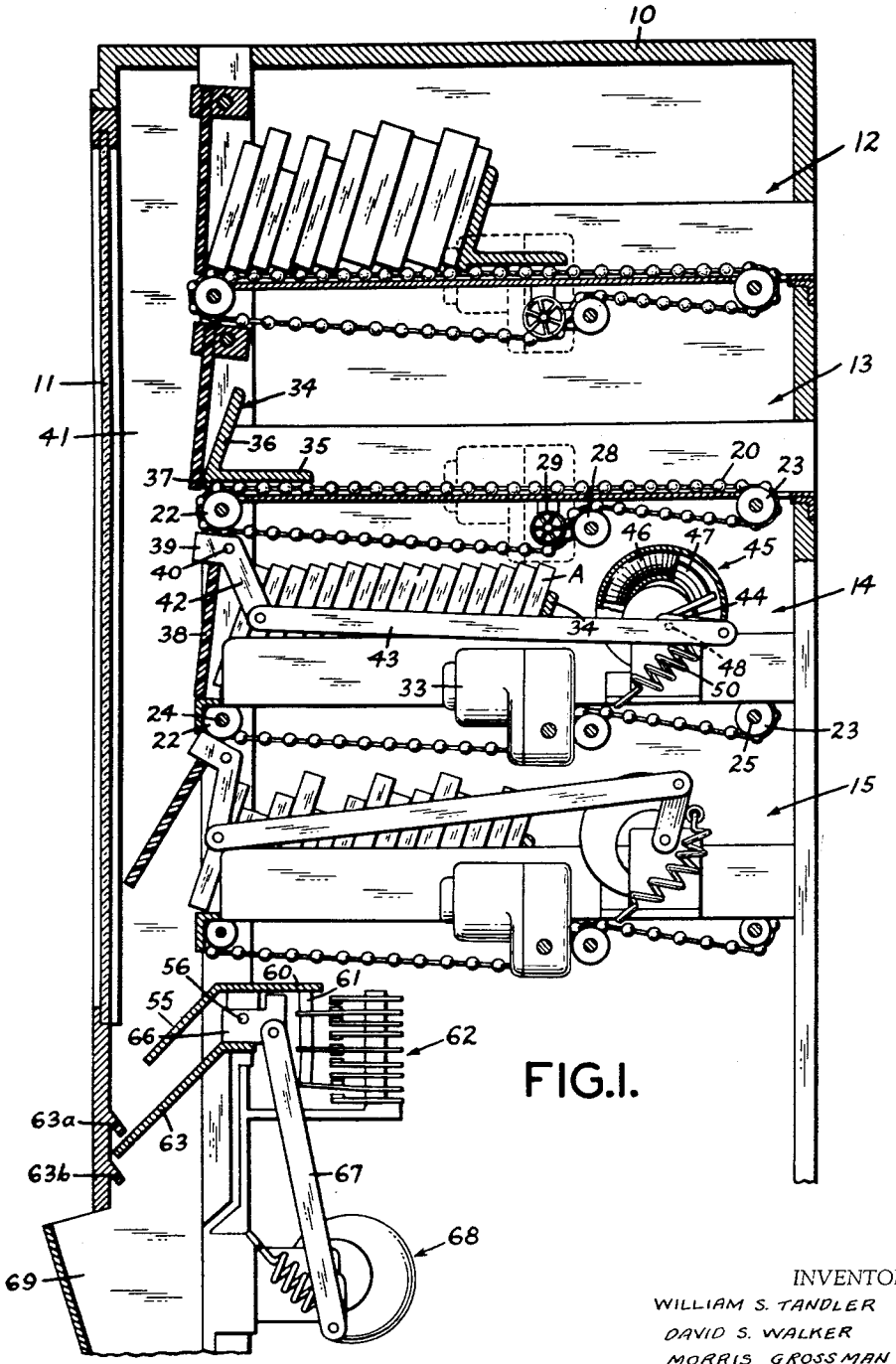


FIG.I.

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VENDING AND DISPENSING DEVICE

Original Filed Nov. 18, 1950 3 Sheets-Sheet 2

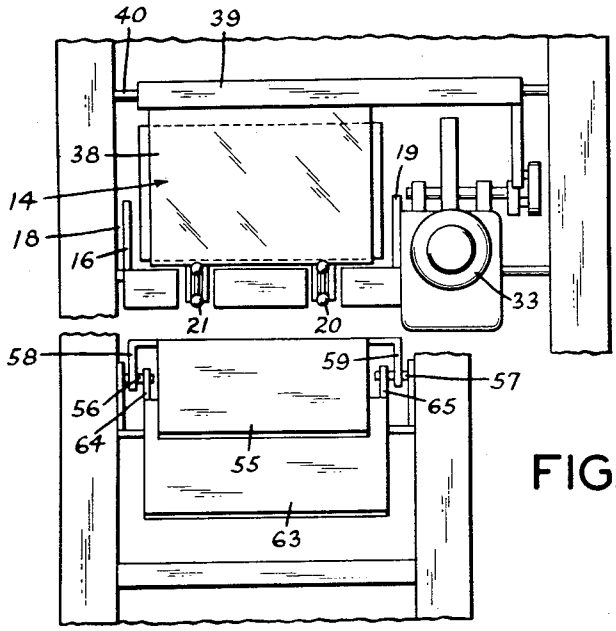


FIG.2.

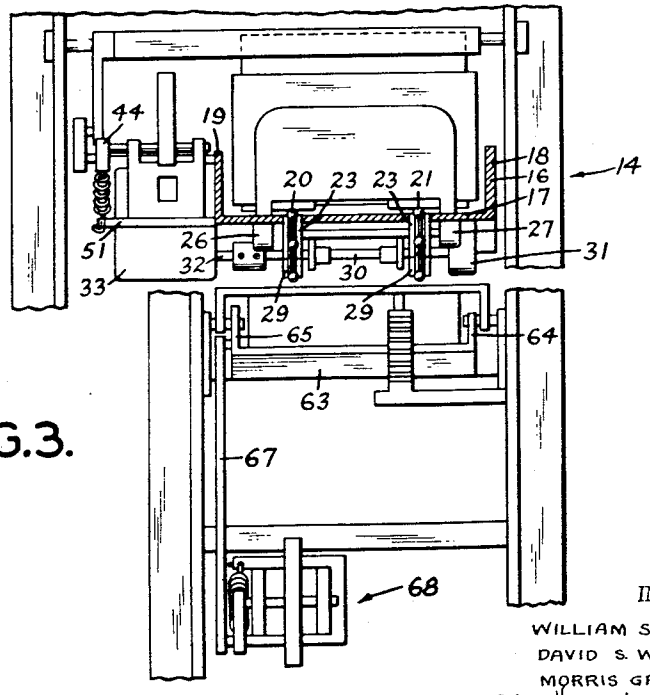


FIG.3.

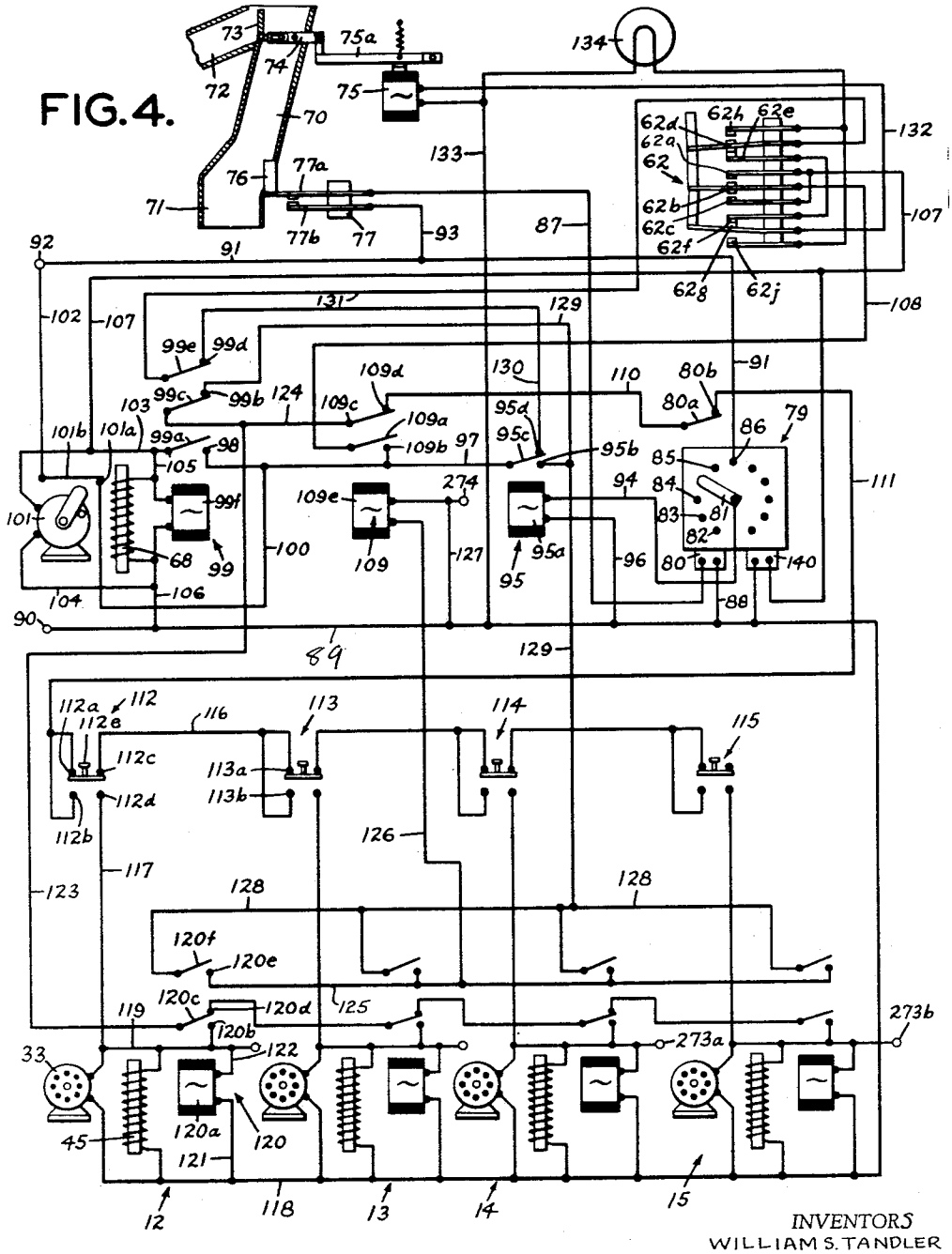
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VENDING AND DISPENSING DEVICE

Original Filed Nov. 18, 1950 3 Sheets-Sheet 3

FIG. 4.



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3,001,669

VENDING AND DISPENSING DEVICE

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Continuation of application Ser. No. 196,428, Nov. 18, 1950. This application Nov. 19, 1957, Ser. No. 697,389
13 Claims. (Cl. 221—12)

This invention relates to improvements in vending machines and it relates more particularly to improved forms of coin- controlled devices for vending or dispensing, selectively, packaged articles such as candy, boxes of hosiery, bottled and canned goods.

This application is a continuation of our copending application Serial No. 196,428, filed November 18, 1950, now abandoned.

Vending machines embodying the present invention are characterized by a simplified drive mechanism for advancing and discharging the articles one by one in response to insertion of coins into the machine and the manual actuation of a control switch or push button.

The vending machines are constructed and arranged to prevent the discharge or dispensing of more than one article so that "jack potting" of the articles in the dispensing means is prevented and positive advancing and discharge of the articles is assured.

More particularly, the dispensing units embodying the present invention are characterized by a supporting member upon which a plurality of articles of the same or different shapes and sizes are supported. The supporting member or tray carries a pusher member which supports the articles in substantially upright position for discharge one by one at the end of the support or tray.

The pusher member is advanced by means of one or more bead chains which are supported by means of pulleys driven by electric motors to advance the chains in the direction to discharge the articles from the end of the support or tray. The pusher member rests upon the support or tray and has portions which engage between beads of the chain so that the pusher member is advanced positively but neverthless can be lifted out of contact with the chain and placed any place along the length of the tray or support thereby greatly facilitating the loading of the trays with articles to be dispensed. Moreover, loose but positive engagement of the pusher member with the chain enables the chain to move relative to the pusher member if the latter or the articles advanced by it should jam in the machine thereby avoiding damage to the machine.

The control of the dispensing operation, that is, termination of a dispensing operation is generally similar to that disclosed in the Tandler et al. Patent No. 2,500,437 dated March 14, 1950, in that the discharge of the article causes it to actuate a switch when falling from the tray to stop the driving motor. As further safeguards to the operation of the machine, the several units are provided with discharge gates which are normally locked in a position to prevent the discharge of an article and are opened only when a corresponding pusher member is activated to advance the articles for discharge. Also, the discharge chute is provided with a gate which is normally locked in a closed position to prevent the unauthorized removal of articles from the several units except when an

article is to be dispensed. At this time the trap gate is swung to an open position to permit the article to fall through the discharge chute into a receptacle or bin from which the article can be removed by the purchaser.

The dispensing device may include any of several different types of locking units for the trap gate and the other gates of the device and also includes interlocking controls whereby only one of the pusher members may be advanced at a time. The mechanism also includes means for preventing operation of the device should the trap gate be jammed or wedged open.

The dispensing device may be constructed and arranged to supply or vend a different article from each unit or it may be arranged so that all of the units are used to dispense the same article and the pusher members associated with these units are operated in sequence so that all of the articles are discharged from one unit before the pusher member of another unit is activated by insertion of the necessary coins.

The mechanism may also be provided with a change making circuit and associated mechanism whereby upon insertion of the designated coins, the article and the proper amount of change are returned to the purchaser.

The vending devices of the type described generally above are highly satisfactory for discharging and vending such articles as boxes of hosiery, inasmuch as each unit may be filled with boxes of hosiery of a predetermined size and color and when a plurality of banks of such units are provided, a very large variety of sizes and colors of hosiery or the like may be handled and vended without substantial supervision except for the refilling of the units at intervals.

For a better understanding of the present invention reference may be had to the accompanying drawings in which:

FIG. 1 is a side view of a typical vending machine embodying the present invention with portions of the housing and supports or trays and associated mechanism shown in section and with parts removed to better illustrate the invention;

FIG. 2 is a front view of the device broken away to disclose one dispensing tray and the trap plate and dispensing chute gate;

FIG. 3 is a view in elevation of the rear of one of the trays and illustrating the trap gate and the flap for actuating stop switch;

FIG. 4 is a diagrammatic view of the electrical circuit for the dispensing device illustrated in FIGS. 1 to 3.

For purposes of illustration, the invention will be described with reference to a dispensing device which is suitable for the dispensing of boxes, containing hosiery or the like, and only one bank of four vertically aligned dispensing units will be described although it will be understood that there may be more or fewer dispensing units in a vertical bank and that any desired number of banks arranged vertically or horizontally may be provided as required.

A typical dispensing device may include a casing or housing **10**, the shape and construction of which may be varied widely depending upon the articles handled and the variety of articles to be dispensed. As illustrated, the casing **10** is generally rectangular in shape and is provided with a glass front panel **11** through which several dispensing units **12**, **13**, **14**, and **15** are visible. All of the dispensing units are alike so they will be described herein with reference to units **13** and **14**. The dispensing unit

14, for example, includes a generally channel-shaped tray or supporting member 16 provided with a flat base or bottom 17 and up-standing side flanges 18 and 19. One of these flanges may be mounted for adjustment toward and away from the other if desired, to accommodate articles of different sizes. Alternatively shim members may be placed in the tray to hold the articles snugly therein. The individual trays or supports 16 may be mounted within the casing 10 in any desired way and preferably are open at the back of the machine so that the articles A may be introduced into the trays from the back of the casing. The bottom of the tray 16 supports the upper flight of a pair of bead chains 20 and 21 which are supported by means of idler wheels or pulleys 22, 23, at the front and back of the tray respectively. The idler pulleys are supported by means of the shafts 24 and 25 which are supported rotatably in bearing lugs 26 and 27 at the front and rear of the tray 16. The lower flights of the chains 20 and 21 are looped over idler pulleys 28 at about the middle of the tray and beneath bead chain sprockets 29 which are suitably corrugated to engage the beads and advance the chains positively. As best shown in FIG. 3, the sprockets 29 are mounted on a cross shaft 30 having its right-hand end rotatably mounted in a lug 31 suspended from the tray and its left-hand end coupled to the drive shaft 32 of an electric motor 33 which is suspended in the casing and preferably fixed to the side flange 19 of the tray 16. The motor 33 thus serves to move the upper flights of the chains 20 and 21 to the left as viewed in FIG. 1.

The upper flights of the chains 20 and 21 engage and advance a pusher member 34 which includes a flat base flange 35 and a rearwardly inclined supporting flange 36 which bears against the rearmost article A and supports it in a substantially upright position. The leading edge of the base plate 35 has a downwardly extending flange portion 37 which engages between the beads of the bead chain and is advanced positively thereby during movement of the chains. The pusher member 34, may, however, be lifted up out of engagement with the chains and moved any place along the tray to facilitate the refilling of the tray. When the unit is empty, the pusher 34 is advanced sufficiently to disengage the flange portion 37 from the chains.

Each of the trays also is provided with a gate flap 38 at the discharge end of the tray. The gate flap, as illustrated, may consist of a sheet of glass or transparent plastic and may be flat or shaped to fit against the face of the leading article A on the tray. Also, if desired, the flap may be formed of a plurality of rods which are adjustable in their spacing to permit the unit to be loaded from the front. The upper edge of the gate 38 is secured in a cross bar 39 which is pivotally supported on a cross shaft 40 extending between the sides of the casing 10 and permitting pivotal movement of the flap 38. The flap is normally retained in a position to prevent the discharge of articles from its corresponding tray but can be swung upwardly into the position shown in FIG. 1 (unit 15), to permit loading of the tray from the front and to permit articles to be discharged into the area or chute 41 between the panel 11 and the leading ends of the units. To open the gate, the cross bar 39 is provided with a downwardly and rearwardly extending lever 42 which is connected by means of a link or connecting rod 43 to a lever 44 of a rotary solenoid motor 45. The solenoid motor 45 includes an arcuate coil 46 which receives an arcuate armature 47 mounted on the shaft 48 which also supports the lever 44. When the coil 46 is energized, the armature 47 is drawn into it thereby rotating the lever 44 in a counterclockwise direction and swinging the flap 38 outwardly toward the panel 11 in a clockwise direction. When the coil 46 is de-energized, the lever 44 is swung in a clockwise direction by means of the spring 50, which is connected between the lever 44 and a laterally extending flange 51 on the solenoid motor 45. The lever 44 is so positioned with respect to the armature 47 that when it is in its retracted position, the axis of the lever is inclined below the horizontal and the right-hand end of the link 44 is past dead center position so that the gate or flap 38 is locked against outward movement while the coil 46 is de-energized.

When any of the motors 33 is set into operation, the related coil 46 is likewise energized so that the flap 38 swings open and the bead chain is advanced to discharge an article over the lefthand end of the corresponding tray. The article then falls down through the chute 41 and strikes the switch trap plate 55 which projects out partially across the chute 41. The plate 55 is supported by means of a pair of stub shafts 56 and 57 and a pair of downwardly extending flanges 58 and 59. The shafts 56 and 57 project from opposite sides of the casing at the sides of the chute 41. The plate 55 has a rearwardly extending portion 60 which engages the upper plunger 61 of a multiple contact switch 62 which, as described hereinafter, is connected in a circuit to stop the motor 33 and reset the machine for another dispensing operation.

Directly below the switch trap plate 55 is a trap gate 63 which is similar in shape to the plate 55 but extends substantially completely across the chute 41. The end of the gate is close to a pair of spaced flanges 63*a*, 63*b* projecting inwardly from the front panel to aid in preventing access to the articles through the chute 41. The gate 63 likewise is supported on the shafts 56 and 57 by means of upwardly extending lugs 64 and 65. The lug 65 has a rearward extension 66 which is connected by means of a link 67 to a solenoid motor 68 like the solenoid motor 45 described above. The motor 68 is energized by the falling article moving the plate 55 and causing actuation of the switch 62 simultaneously with the motor 45 and the motor 33 of any tray so that the trap gate 63 swings out of the path of the falling article and allows it to fall into the delivery receptacle or bin 69 from which the article can be removed by the purchaser. The solenoid motor 68 restores the trap gate 63 to closed position at the conclusion of a dispensing operation and this gate is locked shut in the same way as the gate 38, to prevent access to the trays through the delivery receptacle 69.

The above-described dispensing device is provided with an electric circuit which enables the dispensing operation to be controlled by the introduction of coins into the machine and the manual actuation of selection switches corresponding to any selected dispensing unit. The circuit is provided with controls for assuring the return of coins if the purchaser inadvertently actuates a switch corresponding to a tray which is empty or too many coins are introduced into the coin slot. Also, coins are refused if the trap gate is jammed open, and the machine is prevented from operating and a warning signal is given.

A typical control circuit is illustrated in FIG. 4. The dispensing machine includes a coin slot 70 having a coin receptacle 71 at its lower end and a coin return passage 72 which returns coins to the purchaser at the front of the machine. The coins are diverted from the main coin chute 70 by means of the coin return flap 73 which is pivotally supported below the junction of the coin return passage 72 and the chute 70 and is connected by means of pivoted lever 74 to the armature 75*a* of the coin return solenoid 75. Also projecting into the coin chute 70 to be struck and deflected by a coin falling therethrough is a plunger 76 carried by the upper member of a normally opened pair of switch contacts 77*a* and 77*b* of the coin counting switch 77. The coin counting switch 77 is connected, in a manner to be described, to an accumulating switch 79 which is provided with a coil and ratchet mechanism 80 for displacing a rotary contact member 81 step by step over a series of contacts 82, 83, 84, 85, and 86 of the accumulator. The circuit also in-

cludes the control switch **62** actuated by the switch trap plate and the several motors **33**, **45**, and **68** associated with the dispensing units **12**, **13**, **14**, **15**, and the discharge chute **41**.

The connections between these several elements and other associated mechanisms are as follows. The upper contact **77***a* of the coin counting switch is connected by means of a conductor **87** to one terminal of the accumulator solenoid **80**, the other terminal being connected by the conductors **88** and **89** to one power terminal **90** of the system.

The contact **86** or any other selected contact **82** to **85**, etc. of the accumulator **79** is connected by means of conductor **91** to the other terminal **92** of the power supply as is also, by means of the conductor **93**, the lower contact **77***b* of the switch **77**. The switch blade **81** of the accumulator **79** is connected by means of a conductor **94** to the coil **95***a* of the relay **95**, the opposite terminal of which is connected by the conductor **96** to the power line **89** and the terminal **90**.

The relay **95** has a pair of normally open contacts **95***b* and **95***c*, the contact **95***c* normally engaging a third contact **95***d* of the relay.

The contact **95***c* is connected by means of the conductor **97** to one contact **98** of the relay **99** and also by means of the conductor **100** to the contact **101***a* of a timer switch **101**. The other normally closed contact **101***b* of the timer switch is connected by means of the conductor **102** to the terminal **92**.

Another normally opened contact **99***a* of the relay **99** is connected by means of the conductor **103** to one terminal of the timer switch motor **101**, the other terminal being connected by means of a conductor **104** to one terminal of the relay coil **99***f* and to the solenoid coil of the trap gate solenoid **68**. The opposite terminals of the coil **99***f* and the coil of the trap gate solenoid **68** are connected to the conductor **103** by conductor **105**. The conductor **104** is also connected by conductor **106** to the conductor **89** and the power terminal **90**.

The conductor **103** is connected by means of a conductor **107** to contact **62***a* of the switch **62** which is normally out of contact with the movable contact **62***b* of the switch. The latter contact is connected by means of a line **108** to the normally opened contact **109***a* of the relay **109**. The contact **109***a* cooperates with the contact **109***b* which is connected to the conductor **97**.

The contact **62***a* is also connected to the normally opened contact **62***c* of the switch.

The relay **109** also includes a pair of normally closed contacts **109***c* and **109***d*. The contact **109***d* is connected by means of a conductor **110** to the contact **80***a* of the accumulator solenoid **80** and through the contact **80***b*, and a conductor **111** to the opposite contacts **112***a*, **112***b* of the manual selecting switch **112** for the dispensing unit **12**. The opposed contacts **112***c* and **112***d* are connected respectively to the push buttons **113**, **114**, and **115** and to the motor **33**, as follows. The contact **112***c* is connected by means of a conductor **116** to the parallel-connected contacts **113***a*, **113***b* of the switch **113**.

The contact **112***d* is connected by means of a conductor **117** to one terminal of the motor **33**, the opposite terminal of which is connected by means of a conductor **118** to the conductor **89** and the power terminal **90**. One terminal of the coil of the solneoid motor **45** is connected by the conductor **119** to the conductor **117**. The other terminal of the coil is connected to the conductor **118**.

The arrangement of the switches **112**, **113**, **114** and **115** as described above, is such that when, for example, the switch button **112***e* is depressed, the circuit through the remaining switches **113**, **114**, **115** is opened and they are rendered ineffective to start their respective motors. Contact of the switch button with the contacts **112***b* and **112***d* closes the motor circuit and places the motor **33** of the unit **12** into operation in a manner presently to be described.

Connected in parallel with the solenoid motor **45** between the conductors **118** and **119** is a relay **120** which serves to establish a holding circuit to the motor **33** and the solenoid motor **45**, as follows. The coil **120***a* is connected by means of a conductor **121** to the conductor **118** and by the conductor **122** to the conductor **119** which is connected to the conductor **117**. A contact **120***b* is connected to the conductor **119**. A movable contact **120***c* of the relay **120** is connected by means of the lines **123** and **124** to the relay contacts **109***c* and **99***c*. A third fixed contact **120***d* of the relay **120** is connected to the movable contact of a corresponding relay associated with the motor of the dispensing unit **13** and so forth. The relay **120** has another fixed contact **120***e* which is connected by means of a conductor **125**, the conductor **126** to the coil **109***e* of the relay **109**, the opposite terminal of which is connected by the conductor **127** to the conductor **89** and the terminal **90**.

The movable contact **120***f* of the relay **120** is connected by means of the conductor **128**, which connects all of the movable contacts corresponding to contact **120***f* of the relays of the units **13**, **14**, and **15**. To complete the motor circuit, a conductor **129** connects the relay contact **95***b* to the conductor **128**.

The conductor **129** is also connected to the fixed relay contact **99***b* which normally engages with the movable contact **99***c* of the relay **99**.

The contact **95***d* of the relay **95** is connected by the conductor **130** to the fixed contact **99***d* of the relay **99** which is normally in engagement with the movable contact **99***e*, the latter being connected by the conductor **131** to the movable contact **62***d* of the switch **62**. The contact **62***d* normally engages the contact **62***e* which is connected to a lower contact **62***f* of the switch. This contact normally engages the movable contact **62***g* which is connected to one terminal of the coin return solenoid **75** by the line **132**. The other terminal of the solenoid **75** is connected by the lines **133** and **89** to the terminal **90**. The conductor **133** also is connected to one terminal of a warning lamp **134**, the other terminal of which is connected to the upper and lower open contacts **62***h* and **62***j* of the switch **62**.

The sequence of operations during dispensing operation is as follows. Assuming that a dispensing operation will take place only after the insertion of a series of coins, for example, five quarters and that the accumulator arm **81** is in engagement with the dead contact **82** of the accumulator, the insertion of a coin in the coin chute **70** will momentarily close the contacts **77***a* and **77***b* of the switch **77** which completes a circuit through the accumulator relay **80** as follows. Terminal **92**, conductor **91**, conductor **93**, contacts **77***b*, **77***a*, conductor **87**, relay coil **80**, conductors **88**, **89** to terminal **90**. The impulse produced by closing of the switch **77** advances the movable switch blade **81** one step to contact **83** and momentarily opens contacts **80***a* and **80***b*. Should a coin stick on the coin switch **77** or the coin switch chute, the contacts **80***a*, **80***b* remain open, thereby de-energizing the solenoid **75** and preventing acceptance of coins or initiation of the vending cycle. As each coin is inserted, the accumulator contact **81** is stepped forward one space until it engages the contact **86** or any other contact connected to line **91**. At this time, the following circuit is created. Terminal **92** and conductor **91**, contact **86**, movable switch contact **81**, conductor **94**, relay coil **95***a*, conductor **96**, conductor **89** to terminal **90** thereby energizing the relay coil **95** and moving the relay contact **95***c* out of engagement with contact **95***d* and into engagement with **95***b*. The relay **95** performs the two functions of operating the lock out relay **75** to reject extra coins inserted into the coin slot **70** and of setting up the selecting circuit. The coin reject relay is normally energized

through the closed contacts 95c, 95d and de-energized to reject coins when the contacts 95c and 95d disengage.

The circuit for energizing the coin reject relay 75 is as follows. Terminal 92, conductor 102, timer switch contacts 101b, 101a, conductor 100, conductor 97, contacts 95c, 95d, conductor 130, contacts 99d, 99e, conductor 131, switch contacts 62d, 62e, 62f, 62g, line 132, solenoid 75, conductor 133, line 89 and terminal 90. When the solenoid coil 95 is energized, the contacts 95c and 95d open to open the circuit through the coin return solenoid 75. The armature 75a then moves upwardly to move the flap across the coin chute so that the coins will be returned through the return chute 72.

The second function of the relay 95 is attained by closing of the contacts 95c and 95b. The selecting circuit can now be traced through these contacts. Assume that the purchaser wishes the item in the dispensing unit 12, he presses the selector push button 112e, which is the actuating button for the operation of the unit 12. The contacts 112a and 112c open, disconnecting the remaining switch buttons and the contacts 112b and 112d close, energizing the relay 120, and the motors 33 and 45 through the following circuit. Terminal 92, line 102, contacts 101b, 101a, lines 100, 97, contacts 95c, 95b, conductor 129, normally closed contacts 99b, 99c, conductor 124, normally closed contacts 109c, 109d, conductor 110, closed contacts 80a, 80b, line 111, contacts 112b, 112d, line 117, motor 33, line 118, line 89 to terminal 90. At the same time, the solenoid motor 45 and the relay 120 in parallel with the motor 33 are energized. If the contacts 80a and 80b are open due to jamming of the switch 77, the motor 33 cannot be started. Once the relay 120 is energized the contact 120c engages the contact 120b and the contact 120f engages the contact 120e thereby forming a holding circuit through the line 123 to conductor 124 so that the motor continues to operate even though the push button 112e is released. The opening of the contacts 120c, 120d interrupts the holding circuit for the other units 13, 14, and 15.

The contacts 120e, 120f complete the energizing circuit for the relay 109 through the timer switch contacts 101b, 101a, contacts 95c, 95b, lines 129, 128, contacts 120f, 120e, line 125, line 126, relay coil 109e, conductor 127, conductor 89 to the terminal 90. Contacts 109d, 109c, now open the selector button circuit so that no further selections may be made. The contacts 109a and 109b close when the holding relay 109 is energized.

The article to be dispensed is then forwarded in the dispensing unit 12 driven by the motor 33. Inasmuch as the transparent retaining flap 38 is held open by the solenoid motor 45, the package is discharged into the chute 41 and falls until it hits the plate 55 of the trap switch 62 thereby actuating the switch 62 and causing the contacts 62a and 62b to close which thereby energizes the relay coil 99 through the now closed relay contacts 109a and 109b. This circuit is as follows. Terminal 92, line 102, timer switch contacts 101b, 101a, conductors 100, 97, contacts 109a, 109b, conductor 108, contact 62b, contact 62a, conductor 107, conductor 103, conductor 105, relay coil 99f, conductor 106 to terminal 90. The contacts 98, 99a form part of the holding circuit for this relay, by-passing the contacts 109a, 109b and the switch contacts 62a, 62b.

Connected in the holding circuit, in parallel with the relay 99 are a trap solenoid 68, the timer switch motor 101 and the accumulator reset coil 140. The trap solenoid opens the trap gate 63 so that the article drops into the receptacle 69 for delivery to the customer.

The timer motor 101 runs until it opens the contacts 101a and 101b opening this circuit and de-energizing the relay 99, the accumulator resetting coil 140 and the trap solenoid 68. Thus, the de-energizing of the solenoid 68 closes the trap gate 63. The timer switch controls the period that the trap gate 63 is open.

When the coil 140 is energized it resets the accumulator switch 79 to its zero position thereby opening contacts 81, 86 and de-energizing the relay 95.

The timer switch 101a, 101b situated as it is in the holding circuits of the relay 120 (contacts 120b and 120c) and relay 109 (contacts 120f, 120e) de-energizes both of these relays. The circuit is now in its normal starting position and is ready for the reception of coins to begin the sequence of operations described above.

If the trap gate 63 remains open for any reason at the end of the cycle, the switch 62 is actuated and the emergency light 134 goes on because of the following circuit. Terminal 92, line 102, timer contacts 101b, 101a, relay contacts 95c, 95d, relay contacts 99d, 99e, line 131, switch contacts 62d, 62h, emergency light 134, lines 133, 89, to terminal 90.

If a wedge is inserted between the switch plate and trap in an attempt to inactivate the trap, the switch 62 is fully depressed thereby closing the contacts 62b, 62c, the contacts 62j, 62g and opening of the contacts 62f, 62g. The closing of the contacts 62b, 62c resets the accumulator 79 if the relay 109 is energized. Closing the contacts 62j, 62g lights the light 134. Opening the contacts 62f, 62g prevents further insertion of coins by deactivating the coin reject solenoid 75.

It will be seen that we have accomplished the objects of our invention. We have provided a merchandising machine which is constructed to prevent the unauthorized discharge of articles from the machine. A gate associated with each respective unit of the machine prevents discharge of articles from the unit by tilting or jarring the machine. The delivery chute gate of our machine normally prevents access to the delivery chute. Our machine is arranged to prevent "jack-potting." Each dispensing unit of the machine is constructed to permit the unit to be loaded in a rapid and expeditious manner.

It will be understood that certain features and subcombinations 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. In a vending machine, the combination of an elongated supporting member, a pair of pulleys adjacent to each opposite end of said supporting member, endless bead chains supported by said pulleys and having flights above and below said supporting member, said flights above the supporting member engaging and supporting articles thereon for movement along said supporting member, means to drive said bead chains in the same direction, a pusher member resting by gravity on said chains, means on said pusher member detachably engaging said bead chains to connect said pusher member to said chains to be advanced by the latter toward one end of said supporting member, a gate member pivotally mounted above said one end for movement into a first position in front of said articles to prevent their discharge from the supporting member and into another position out of the path of the articles to allow them to be discharged at said one end, in succession, a motor for actuating said gate member, means normally urging said gate member to said first position, manually actuated means to initiate operation of the chain driving means and said motor, and means responsive to discharge of an article from said supporting member to stop said chain driving means and de-energize said motor and render said urging means effective to move said gate member to said first position.

2. In a vending machine, the combination of an elongated supporting member having an upper surface to support a row of articles, a pair of endless bead chains having flights above and below said surface, pulley means

supporting said chains for movement lengthwise of said support, a pusher member resting on said surface and having means releasably engaging flights of said chains above said surface, means to drive said chains in the same direction to move said pusher member toward one end of said supporting member to discharge articles, in succession, at said one end of said supporting member, manually operated means to energize said driving means, a gate member mounted above said supporting member adjacent to said one end thereof for pivoting movement into and out of a position preventing discharge of an article at said one end of said supporting member, a solenoid motor having a movable armature connected to said gate member to move the latter out of said position when said motor is energized, means normally urging said gate member to said position, and means responsive to said manually operated means for energizing said solenoid.

3. In a vending machine, the combination of an elongated supporting member having an upper surface to support a row of articles, a pair of endless bead chains having flights above and below said surface, pulley means supporting said chains for movement lengthwise of said support, a pusher member resting on said surface and having means releasably engaging flights of said chains above said surface, means to drive said chains in the same direction to move said pusher member toward one end of said supporting member to discharge articles, in succession, at said one end of said supporting member, manually operated means to energize said driving means, a gate member mounted above said supporting member adjacent to said one end thereof for pivoting movement into and out of a position preventing discharge of an article at said one end of said support, a solenoid motor having a movable armature connected to said gate member, said armature being movable to release said gate for movement out of the position for preventing discharge of an article when said motor is energized, means normally urging said gate member to said position, and means responsive to said manually operated means for energizing said solenoid.

4. In a vending machine, the combination of an elongated support for a plurality of articles, a pusher member slidable lengthwise of said support, at least one endless bead chain detachably connected to said pusher member to advance the latter along said support toward one end thereof, a motor for driving said chain in one direction, a gate member pivotally mounted above said support adjacent to said one end for movement into and out of the path of said articles, means normally urging said gate member into the path of said articles, a solenoid motor having a movable armature and an oscillatable lever connected to said armature, a link connecting said gate member and said lever, and said lever being movable past a dead center position with respect to said link to prevent movement of said gate member out of said path when said solenoid motor is deenergized.

5. The vending machine set forth in claim 4 in which said link has an elongated slot therein and said gate member has a member engageable in one end of said slot to prevent movement of said gate member out of said path when the solenoid motor is de-energized.

6. The vending machine set forth in claim 4 in which said link is pivotally connected to said lever and said gate member for moving the latter out of said path when said solenoid motor is energized.

7. A merchandising machine including in combination a delivery chute with an opening through which an article is delivered, means for moving an article from an article supply into said chute, a gate, means mounting said gate adjacent said opening for movement to a closed position preventing communication between said opening and said supply and to an open position permitting an article to be delivered through said opening, means normally biasing said gate to said closed position, drive means responsive to presence of an article in said chute for moving said gate against the action of said biasing means to said open position, means connecting said drive means to said gate and means for rendering said drive means inoperative a predetermined time after its movement to open position.

8. A mechandising machine including in combination a delivery chute with an opening through which an article is delivered, means for moving an article from an article supply into said chute, a gate, means mounting said gate adjacent said opening for movement to a closed position preventing communication between said opening and said supply and to an open position permitting an article to be delivered through said opening, means normally biasing said gate to said closed position, means including a solenoid motor for moving said gate against the action of said biasing means to said open position, a circuit including a normally closed switch for energizing said solenoid motor in response to presence of an article in said chute and means for opening said normally closed switch after a predetermined time.

9. A merchandising machine as in claim 8 in which said means responsive to presence of an article in said chute comprises a normally open switch disposed in said chute in the path of an article moved into said chute.

10. A merchandising machine including in combination a delivery chute, a dispensing unit for advancing an article into said chute, a flap, means mounting said flap between said unit and said chute for movement between a closed position at which the flap prevents movement of an article into the chute and to an open position at which the flap permits movement of an article into the chute, means normally responsive to actuation of said dispensing unit for moving said flap to said open position to permit an article to move into said chute and means responsive to the contact by an article moving through said chute for rendering said normally responsive flap moving means inoperative.

11. A merchandising machine including in combination a delivery chute, a dispensing unit for advancing an article into the chute, a flap, means mounting said flap between said unit and said chute for movement to an open position at which the flap permits movement of an article into the chute and to a closed position at which the flap prevents movement of an article into the chute, means normally biasing the flap to said closed position, means normally responsive to actuation of said dispensing unit for moving said flap to its open position against the action of said biasing means and means responsive to contact by an article moving through said chute for rendering said normally responsive flap moving means inoperative.

12. A merchandising machine including in combination a delivery chute having an opening through which an article is delivered, an article supply, a dispensing unit for moving an article from said supply into said chute, a flap, means mounting said flap between said chute and said unit for movement to an open position at which the flap permits an article to be moved into the chute and to a closed position at which the flap prevents movement of an article into the chute, means responsive to actuation of said unit for moving said flap to its open position, a gate, means mounting said gate for movement to a closed position at which it prevents communication between said opening and said supply and to an open position at which it permits an article to be delivered through said opening, means responsive to the presence of an article in said chute for moving said gate to its open position, means responsive to contact by an article moving through said chute for moving said flap to its closed position and time delay means for moving said gate to its closed position a predetermined time after its movement to open position.

13. A merchandising machine including in combination a delivery chute having an opening through which an article is delivered, an article supply, a dispensing unit

for moving an article from said supply into said chute, a flap, means mounting said flap between said chute and said unit for movement to an open position at which the flap permits an article to be moved into the chute and to a closed position at which the flap prevents movement of an article into the chute, means responsive to actuation of said unit for moving said flap to its open position, a gate, means mounting said gate for movement to a closed position at which it prevents communication between said opening and said supply and to an open position at which it permits an article to be delivered through said opening, a feeler, means mounting said feeler in said

chute in a position to be engaged by an article in said chute, means responsive to the engagement by said feeler by an article in said chute for disabling said flap moving means and for moving said gate to its closed position.

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