

May 12, 1964

A. ROBILLARD

3,132,732

COIN OPERATED VENDING MACHINE

Filed Feb. 27, 1962

2 Sheets-Sheet 1

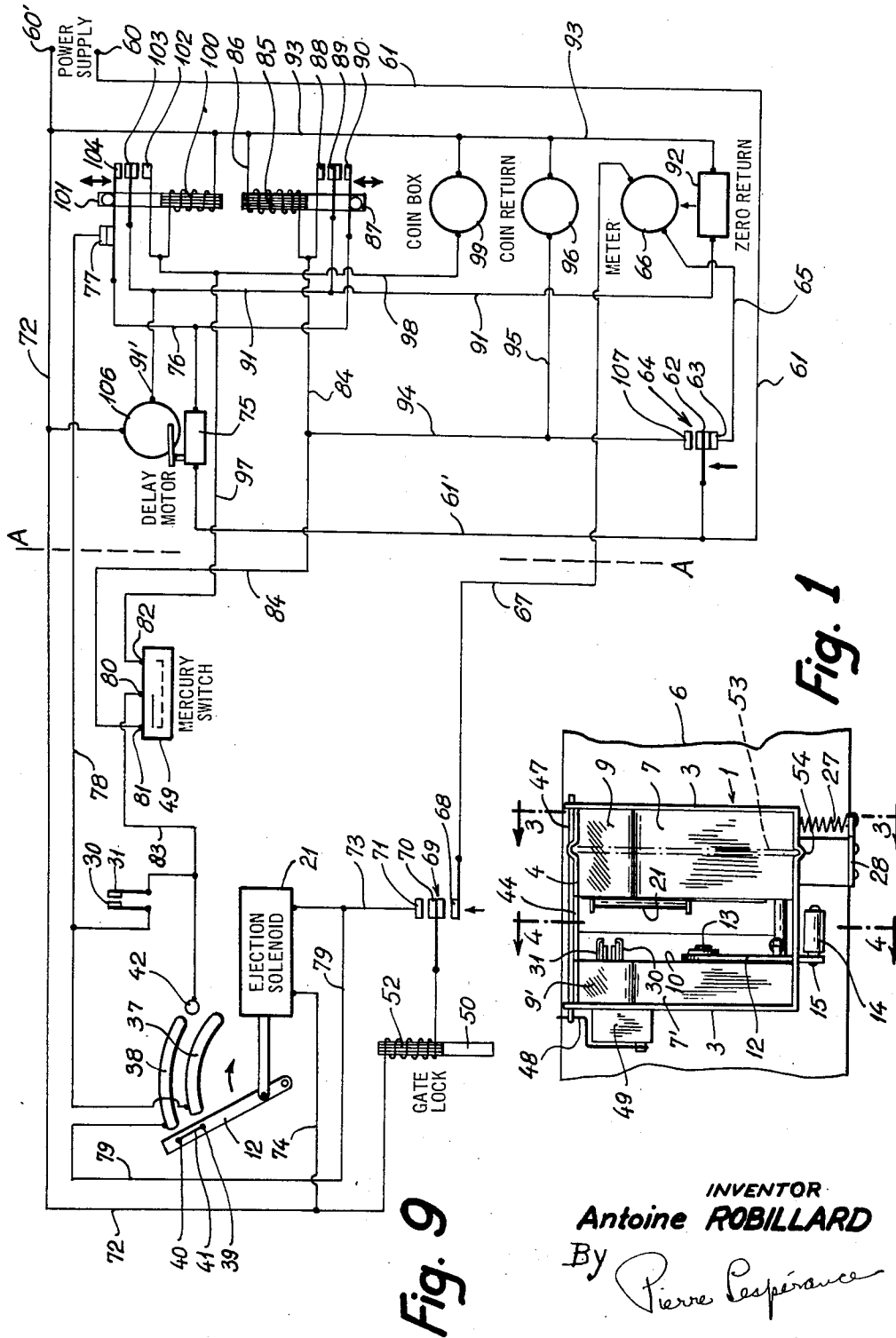


Fig. 1

Fig. 9

INVENTOR
Antoine ROBILLARD
By *Pierre Desperance*

AGENT

May 12, 1964

A. ROBILLARD

3,132,732

COIN OPERATED VENDING MACHINE

Filed Feb. 27, 1962

2 Sheets-Sheet 2

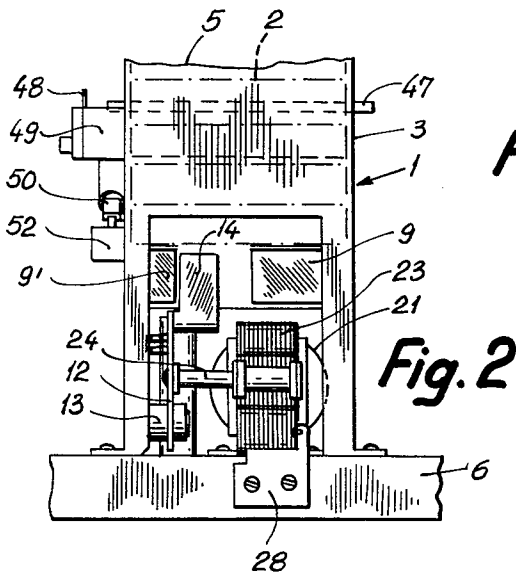


Fig. 3

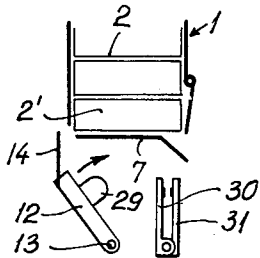
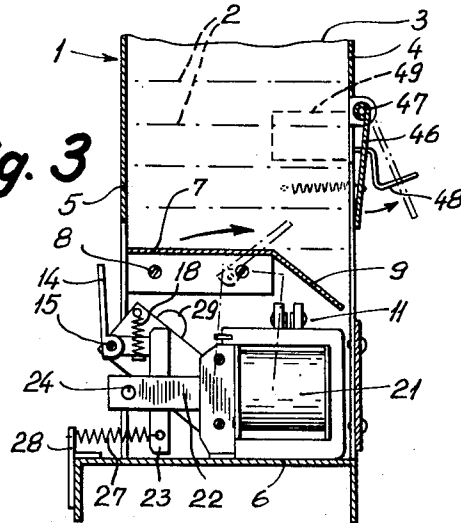


Fig. 5

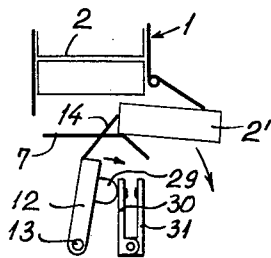


Fig. 6

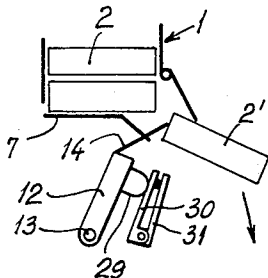


Fig. 7

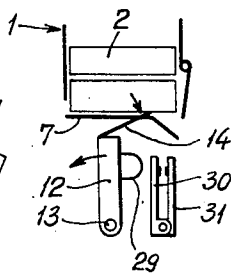


Fig. 8

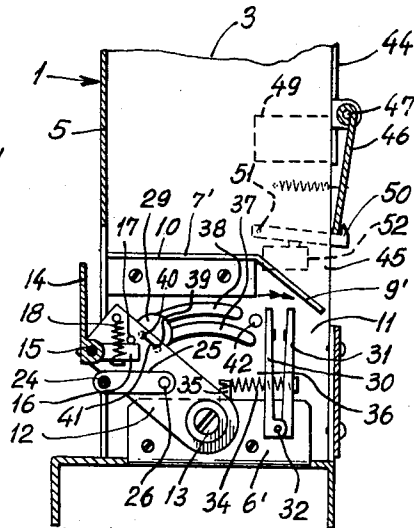


Fig. 4

INVENTOR
Antoine ROBILLARD
By *Pierre Lesperance*

AGENT

1

3,132,732

COIN OPERATED VENDING MACHINE

Antoine Robillard, 8601 Casgrain St., Montreal, Quebec, Canada, assignor of thirty-three and one-third percent to Come Letourneau, and thirty-three and one-third percent to Yves Barrette, both of Montreal, Quebec, Canada

Filed Feb. 27, 1962, Ser. No. 175,944

3 Claims. (Cl. 194-2)

The present invention relates to a coin operated machine for vending small articles, and more particularly cigarette packs and other similar products in standard size containers and which can be stacked.

The general object of the present invention resides in the provision of a machine of the character described comprising several chutes disposed side by side, each adapted to receive a stack of cigarette packs or other articles to be dispensed and characterized by the provision of article ejecting means of simple and improved construction which takes up a minimum of room and which are provided for each chute, the ejection means of each chute being independent of those associated with the other chutes, whereby malfunctioning of one chute does not put the entire machine out of commission.

Another object of the present invention resides in the provision of a machine of the character described in which means are provided whereby the chutes can receive cigarette packs or other articles of different sizes.

Yet another object of the present invention resides in the provision of a machine of the character described which occupies a minimum space relatively to the number of cigarette packs or other articles which can be stored in the machine.

Another object of the present invention resides in the provision of a machine of the character described which is provided with means for preventing its operation in a manner other than through the insertion of the required amount of money.

The foregoing and other important objects of the present invention will become more apparent during the following disclosure and by referring to the drawings, in which:

FIGURE 1 is a top plan view of one unit of the machine in accordance with the invention;

FIGURE 2 is a partial back elevation of said unit;

FIGURE 3 is a section taken along line 3-3 of FIGURE 1;

FIGURE 4 is a section taken along line 4-4 of FIGURE 1;

FIGURES 5, 6, 7 and 8 are schematic side elevations showing the operation of the unit; and

FIGURE 9 is a schematic representation of the controlling electrical circuit.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, the machine in accordance with the invention comprises several units disposed side by side and each constituted by a chute 1 vertically disposed for receiving a stack of cigarette packs 2 or the like articles, and comprising at its lower end means for ejecting the lowermost cigarette pack of the stack. The chute consists of a tube of any desired height and of rectangular cross-section having lateral walls 3, a front wall 4 and a back wall 5. The chute is vertically secured at its lower end to a base 6 which is common to several chutes 1 disposed side by side, only one chute being illustrated in the drawings.

Bottom plates 7 and 7' of unequal width are secured to lateral walls 3 by means of bolts or rivets 8. These bottom plates form the bottom of the chute proper, have forward downwardly inclined portions 9 and 9' respec-

2

tively and are spaced from each other in order to form a slot 10 extending from front to back of the chute.

Plates 7 and 7' define between themselves and the base 6 a compartment 11 for receiving the ejection means which consist of a lever 12, the lower end of which is pivotally mounted by means of a bolt 13 secured to a struck out flange 6' upstanding from base 6. Lever 12 pivots in a vertical plane between a retracted position shown in FIGURES 3 and 4 and a limit ejecting position shown in dotted lines in FIGURE 3. During this pivotal movement, the upper end of lever 12 passes just underneath bottom plates 7 and 7'.

A finger 14 is pivoted at 15 to the upper end of lever 12 adjacent the rearward corner thereof and is provided with an integral extension 16 at right angles to finger 14 and disposed alongside plate-like lever 12 and adapted to abut against an abutment stud 17 secured to lever 12 whereby finger 14 can pivot forwardly with respect to lever 12 but is spring urged into its normal position in which extension 16 abuts abutment stud 17 under the action of a tension spring 18, one end of which is attached to extension 16 and the other end of which is attached to lever 12.

Finger 14 is adapted to pass through slot 10 and project above plates 7, 7' in order to engage the rear edge of the lowermost cigarette pack 2' of a stack of cigarette packs 2 disposed within chute 1, and directly supported on plates 7, 7'. During the ejection movement, finger 14 pushes on the lowermost pack 2' forwardly as shown in FIGURES 5, 6 and 7. During return retracting movement of lever 12, finger 14 pivots forwardly and slides underneath the new cigarette pack 2 which has dropped and is now directly supported by plates 7 and 7'. Finger 14 again takes its normal position under action of spring 18 when it has cleared the rear edge of pack 2, at the back of the machine.

A solenoid 21 is secured to base 6 within compartment 11 at the side of lever 12, and, when fed with electric current, attracts a plunger 22 slidable within a bore of the laminated armature of solenoid 21, and provided with a laminated head 23.

The external back end of plunger 22 is provided with a transverse rod 24 which extends towards lever 12 and is connected thereto by means of link 25 pivoted to the lever at 26 and pivoted to the rod 24 at its other end.

A return tension spring 27 is attached to head 23 of plunger 22 at one end and to a plate 28 at its other end, the said plate 28 being secured to the rear face of base 6. When solenoid 21 is fed with electric current, plunger 22 moves forwardly and produces forward pivotal movement of lever 12 through the intermediary of pivoted link 25 which enables the pivotal movement of the lever 12 even if plunger 22 moves in a rectilinear horizontal path. When electric current is cut off from solenoid 21, plunger 22 and lever 12 return to their rest retracted position under the action of spring 27.

Lever 12 is provided at its front edge with an abutment ear 29 adapted to abut against an electrical contact arm 30 in order to cause contact between said arm 30 and another contact arm 31 of an electric switch. Arms 30 and 31 are pivoted at their lower ends at 32 to flange 6'. Arms 30 and 31 are normally out of contact under action of a coil spring mounted around pivot 32, but the two arms can pivot forwardly and are returned to their normal vertical position under action of a return spring 34 attached to arm 31 at the front end thereof and to a stud 35 secured to flange 6'. The switch constituted by arms 30 and 31 is closed only during the latter forward portion of the trajectory of lever 12.

An insulating plate 36 is mounted in compartment 11 and lines the inside face of the lateral wall 3 adjacent lever 12 and supports two curved contact bands 37 and

38 which are concentric with pivot 13 of lever 12. Contact buttons 39 and 40 are secured to but electrically insulated from lever 12 and are united together by a wire 41. Said buttons 39 and 40 are adapted to slide on bands 37 and 38 and make electrical contact therewith. A contact stud 42 is also secured to insulating plate 36 spacedly from the front end of upper contact band 38. Buttons 39 and 40 are out of contact with bands 37 and 38 in the retracted position of lever 12. This arrangement forms an electric switch which in conjunction with electric switch 30, 31 serves for the electric control of the mechanism in the manner to be described hereinafter in conjunction with the electric circuit shown in FIGURE 9.

Front wall 4 of chute 1 is provided from top to bottom with a slot 44 to facilitate insertion of a stack of cigarette packs within chute 1. Moreover, front wall 4 is cut just above plates 7 and 7' to form a transverse ejection slot 45 for the lowermost cigarette pack. A closing gate 46 is pivoted on a transverse rod 47 at the front of chute 1 just above transverse opening 45 and partially closes said opening 45, its bottom marginal portion being in the path of the lowermost cigarette pack to be ejected, whereby when said pack is ejected, gate 46 pivots forwardly and upwardly to allow passage of said pack and actuates an arm 48 of a single pole double throw mercury switch 49 mounted on the side of chute 1. Closure gate 46 can be locked in closed position by means of a hook lever 50 pivoted to lateral wall 3 at 51 and which is lowered by means of a solenoid 52, when the latter is fed with electric current.

Chute 1 illustrated in the drawings, and more particularly in FIGURE 1 is of dimensions such as to receive standard size cigarette packs for instance of twenty-five cigarettes of Canadian format, but if it is desired to dispense and sell smaller size cigarette packs, say of twenty cigarettes, it is only necessary to insert a vertical plate 53 in V-shaped aligned vertical grooves 54 made in the front and back walls 4 and 5 of chute 1, as shown in FIGURE 1.

In the drawings, grooves 54 are positioned for receiving cigarette packs of twenty cigarettes of Canadian format. However, additional V-shaped grooves 54 can be provided nearer slot 10 for insertion of a plate 53 in order to again decrease the cross-sectional area of chute 1 in order to receive cigarette packs of a format generally used in the United States. Thus, chute 1 can be utilized for different formats of cigarette packs by adding a plate 53 in the desired set of grooves 54.

FIGURE 9 illustrates the electric circuit used in the machine in accordance with the invention. In the circuit, all elements on the left hand side of vertical line A—A are repeated for each unit, that is for each chute 1 and its associated ejection means hereinabove described. All elements on the right hand side of vertical line A—A are common to all the units of the machine.

Alternating electric current is supplied by a source connected at 60, 60' and travels through wire 61, closed contacts 62, 63 of a push button electric switch 64 for coin return, wire 65, switch of coin meter 66, this switch being closed when the required amount of coins has been inserted in the machine, wire 67, and movable contact 68 of a push button switch 69 associated with a particular chute 1.

When pressure is applied on the ejection switch 69 in accordance with the arrow in order to obtain a cigarette pack of the desired brand, contacts 68, 70 and 71 close whereby solenoid 52 of the closure gate 46 is actuated and pivots hook 50 downwardly whereby the closure gate 46 is released. The circuit of the gate lock solenoid 52 is completed by wire 72 connected to terminal 60' of the electric supply. Moreover, when ejection switch 69 is closed, the circuit to the ejection solenoid 21 is completed by wires 73, 74 and 72.

As soon as ejection lever 12 starts its forward ejection movement, contact buttons 39 and 40 close the electric

circuit between bands 37 and 38 which form part of a holding circuit whereby even if the operator immediately releases ejection push button switch 69, the circuit to the ejection solenoid 21 remains closed by means of the following circuit: wires 61, 61', normally closed switch 75, wire 76, normally closed switch 77, wire 78, contact band 37, contact buttons 39, 40, contact band 38, wires 79, 73, ejection solenoid 21, wires 74, 72, and terminal 60'. At the end of its stroke, ejection lever 12 opens the circuit between bands 37 and 38, whereby ejection solenoid 21 is no longer actuated but before the return of lever 12, the latter closes the circuit between band 37 and contact stud 42. At this instant, if chute 1 is empty, no cigarette pack 2 will be ejected whereby mercury switch 49 will remain in its position in which contacts 80 and 81 will be closed and contact 82 will remain open. The following circuits are thus completed: terminal 60, wires 61, 61', normally closed switch 75, wire 76, normally closed switch 77, wire 78, contact band 37, contact stud 42, wire 83, contacts 80, 81 of mercury switch 49, wire 84, the solenoid of the coin return relay 85, wire 86, wire 93 and terminal 60'; the solenoid of the coin return relay 85 actuates its plunger 87 which closes contacts 88, 89, and 90. Contacts 88, 89 and 90 complete the circuit for continuing energization of the solenoid of relay 85 which holds the contacts 88, 89 and 90 in closed position after opening of contacts 37 and 42. Closed contacts 89 and 90 complete the circuit: wire 91, zero return relay 92 of coin meter 66, wire 93; and terminal 60'. Simultaneously, the circuit: wires 84, 94, 95, coin return relay 96, wire 93, and terminal 60' is completed. Thus, coins are automatically returned to the operator when chute 1 is empty and no cigarette pack has been ejected. Simultaneously, meter 66 has been returned to zero. The solenoid of holding relay 85 is actuated as long as switch 75 remains closed. The latter opens after a delay of about five seconds under action of delay motor 106, the circuit of which is closed at contacts 88 and 89. This circuit comprises: wires 91, 91', motor 106, wire 72, terminal 60'. This enables functioning of the coin return relay 96 a sufficient time for all the money to be returned.

When chute 1 contains cigarette packs and ejection of a cigarette pack has taken place under action of ejection lever 12, closure gate 46 has pivoted whereby mercury switch 49 now has its contacts 80 and 82 closed and the following circuit is completed: terminal 60, wires 61, 61', switch 75, wire 76, switch 77, wire 78, contact band 37, contact stud 42, wire 83, contacts 80, 82, wire 97, wire 98, coin box relay 99 for the transfer of the coins into the coin box, wire 93, and terminal 60'. The following circuit is also completed: wire 97, holding relay 100, wire 93, and supply 60'. Holding relay 100 actuates its plunger 101 which closes the three contacts 102, 103 and 104 and opens contacts 77; holding solenoid 100 thus maintains its contacts in closed position after opening of contacts 37, 42 and 77 by the circuit: terminal 60, wires 61, 61', switch 75, wire 76, contacts 104, 103, 102, solenoid of relay 100, wire 93, and terminal 60'. The circuit for the coin box 99 thus remains completed as long as switch 75 does not open. This opening takes place after a delay of about five seconds, by means of delay motor 106 which then opens switch 75. Therefore, it will be seen that the circuits either for the relay which actuates the mechanism for the transfer of the money into the coin box or for the relay which actuates the mechanism for the return of the coins to the operator, remain closed during a certain time, for instance five seconds, even after the return of ejection lever 12 into its original position. The ejection of a cigarette pack causes also the return of the meter to zero by means of the zero return relay 92.

If switch 64 for the return of the coins is actuated before switch 69 for the ejection of a cigarette pack, the following circuit is completed: terminal 60, wire 61, contacts 62 and 107, wires 94, 95, coin return relay 96, wire

93 and terminal 60'. The coin return relay 96 is actuated during a certain time by means of the holding relay 85, of switch 75 and delay motor 106, the following circuits being completed:

(1) Wires 94, 84, holding relay 85, wire 86, terminal 60'.

(2) Contacts 88, 89 and 90 being closed, contacts 88 and 89 complete the circuit to the delay motor 106 by means of wires 91, 91', motor 106, wire 72, and terminal 60'.

(3) As long as switch 75 is not opened by delay motor 106, the three following circuits are completed:

(a) terminal 60, wires 61, 61', switch 75, contacts 90, 89, zero return relay 92, terminal 60';

(b) contacts 89, 88, solenoid of holding relay 85, terminal 60';

(c) contacts 89, 88, wires 84, 94, 95, coin return relay 96 and terminal 60'.

Contacts 30 and 31 are connected in parallel with contacts 37 and 42 and, as the latter, do not close until after the end of the active stroke of ejection lever 12 to actuate either the coin return relay 96 or the coin transfer relay 99; thus, they have the same function as switch 37, 42, whereby the transfer of the money into the money box is effected only when a cigarette pack has been positively ejected or that it has been positively ascertained that there is no cigarette pack within chute 1. Thus, one or the other of switches 37, 42, or 30, 31, can be utilized or both together for additional safety.

While a preferred embodiment in accordance with the present invention has been illustrated and described, it is understood that various modifications may be resorted to without departing from the spirit and scope of the appended claims.

What I claim is:

1. A coin-operated vending machine for cigarette packs and other articles of standard size and which can be stacked, comprising a chute for receiving a stack of articles to be sold, a base on which said chute is mounted, a bottom for said chute disposed above said base, said bottom having a slot, the lowermost article of said stack resting on said bottom, a lever pivoted at its lower end under said chute on a pivot fixed with respect to said base for ejecting and return pivotal movement in a vertical plane, a finger pivoted at the upper end of said lever and passing through said bottom slot to engage the lowermost article of said stack and eject the same from said chute during ejection movement of said lever, said finger pivoting into a retracted position with respect to said lever under the new article resting on said bottom during return

movement of said lever, a solenoid and an associated plunger mounted on said base, linking means between said plunger and said lever, an electric circuit for feeding electricity to said solenoid and including switch means controlled by insertion of coins into the machine, and additional switch means and a holding circuit for said solenoid, said additional switch means consisting of an insulating plate disposed parallel to said lever and of two spaced curved metal bands secured to said insulating plate and concentric with the pivot of said lever, two interconnected contact studs mounted on said lever and in sliding contact with said two bands during ejecting movement of said lever and closing the circuit between said two bands, said two bands being connected to said holding circuit, whereby closing of the latter by said contact studs causes continuing ejecting movement of said lever once said movement is started.

2. A machine as claimed in claim 1, further including a closure gate pivoted on the front wall of said chute in the ejection path of the lowermost article of the stack whereby said closure gate is upwardly pivoted during ejection of said article, and a switch actuated by said closure gate and connected into said electric circuit, said circuit further including electrical means for the return of the coins and the transfer of the coins into a coin box depending on whether the chute is empty or contains articles to be sold, said closure gate switch controlling said last named electrical means.

3. A machine as claimed in claim 2, further including a switch operated by said ejection lever at the end of its active ejecting stroke, said last named switch consisting of two contact arms pivoted at their lower ends and normally biased into open position and closing under action of said ejection lever at the end of its active stroke, said last named switch being connected to said electrical means for controlling return of the coins, or the transfer of the coins into a coin box.

References Cited in the file of this patent

UNITED STATES PATENTS

663,726	Carlen	Dec. 11, 1900
727,260	Baldwin	May 5, 1903
1,268,564	Grover	June 4, 1918
1,617,689	Ramsey	Feb. 15, 1927
2,330,186	Jetseck et al.	Sept. 21, 1943
2,363,724	Ford	Nov. 28, 1944
2,607,463	Saigh	Aug. 19, 1952
2,693,299	Gross	Nov. 2, 1954
2,735,580	Galin et al.	Feb. 21, 1956