Dec. 12, 1950 G. M. WILCOX ET AL 2,533,654

COIN COLLECTING AND REGISTERING APPARATUS

Filed April 16, 1945 3 Sheets-Sheet 1

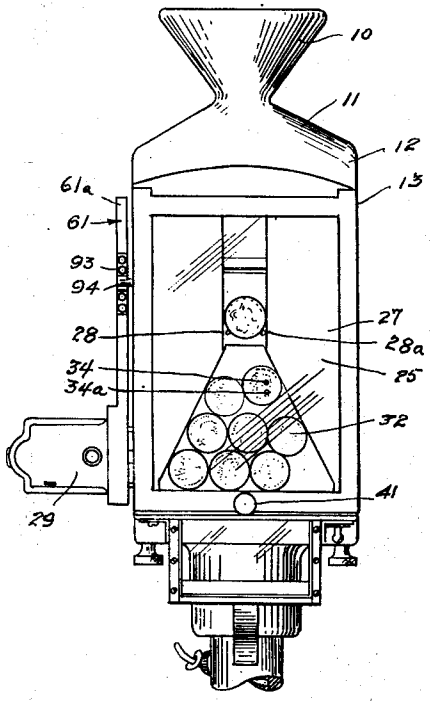


Fig. 1

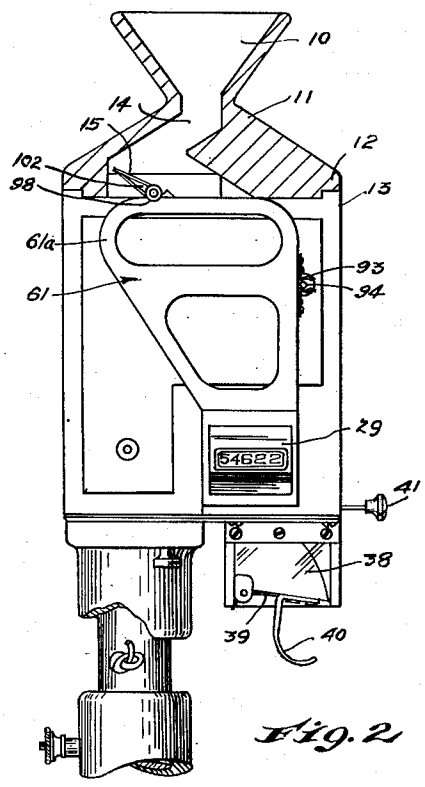


Fig. 2

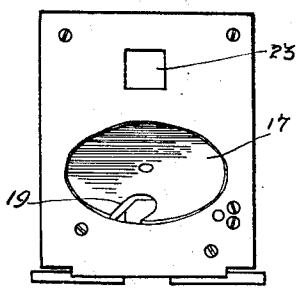


Fig. 3

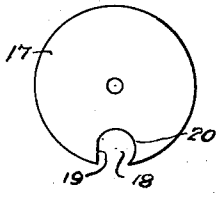


Fig. 4

INVENTORS
Granville M. Wilcox
BY Walter S. Johnson
Nathaniel Frucht
Attorney

Dec. 12, 1950 G. M. WILCOX ET AL 2,533,654

COIN COLLECTING AND REGISTERING APPARATUS

Filed April 16, 1945 3 Sheets-Sheet 2

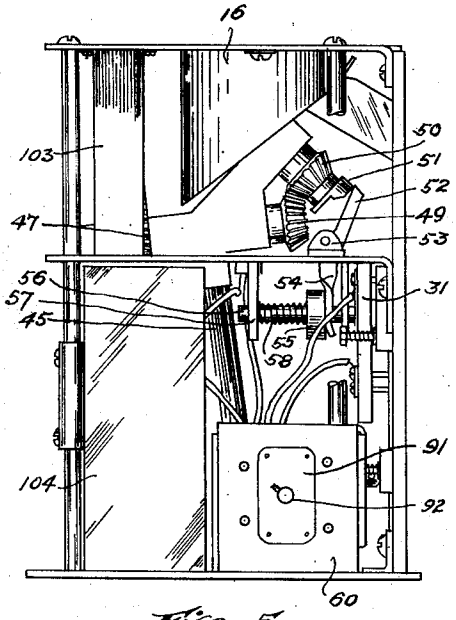


Fig. 5

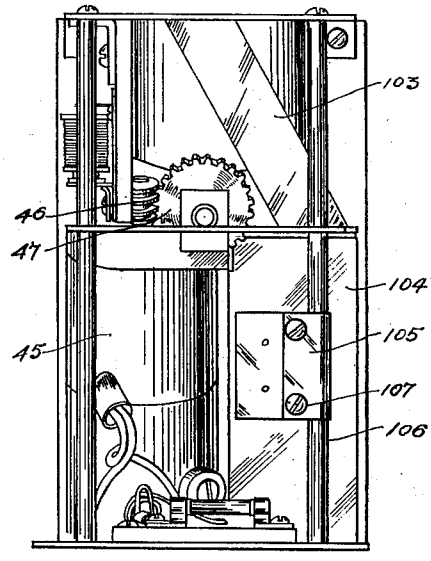


Fig. 6

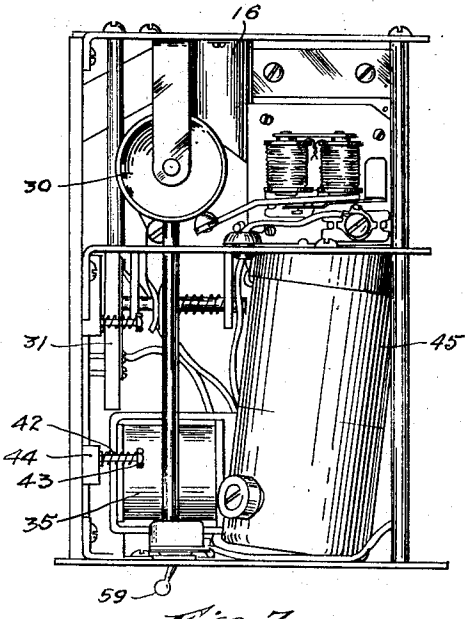


Fig. 7

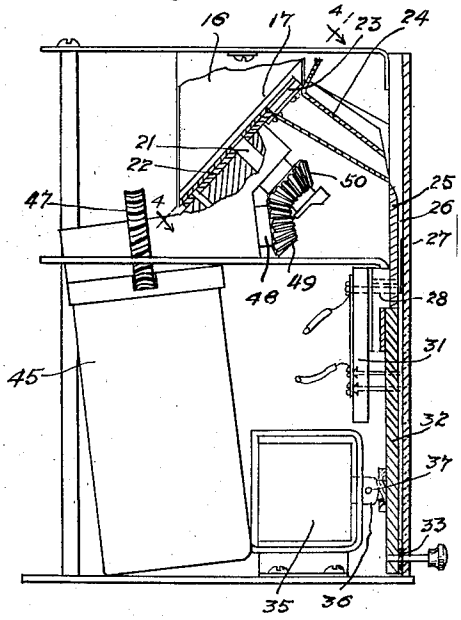


Fig. 8

INVENTORS
Granville M. Wilcox
Walter S. Johnson
BY Nathaniel Trucht
Attorney

Dec. 12, 1950 G. M. WILCOX ET AL 2,533,654

COIN COLLECTING AND REGISTERING APPARATUS

Filed April 16, 1945 3 Sheets-Sheet 3

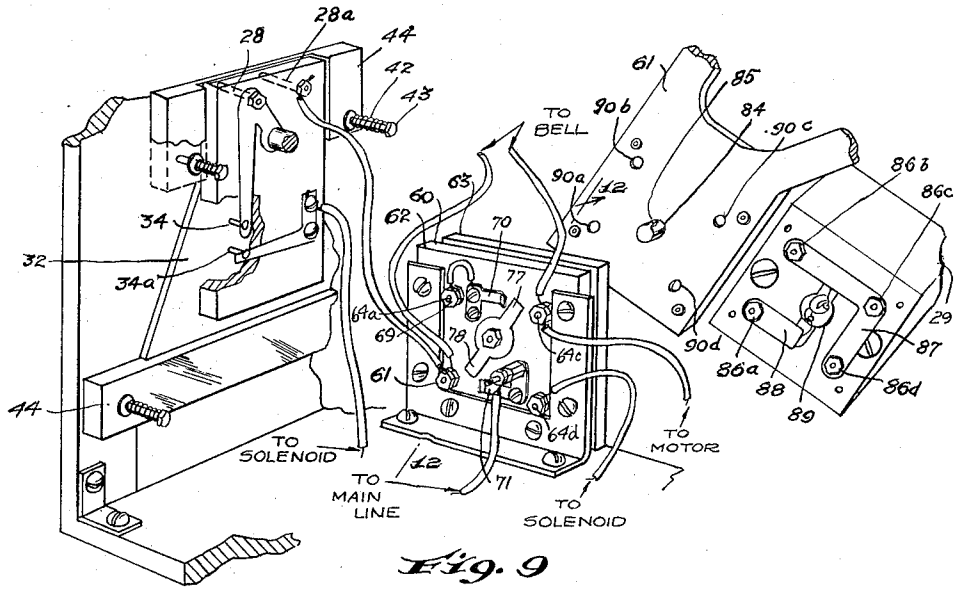


Fig. 9

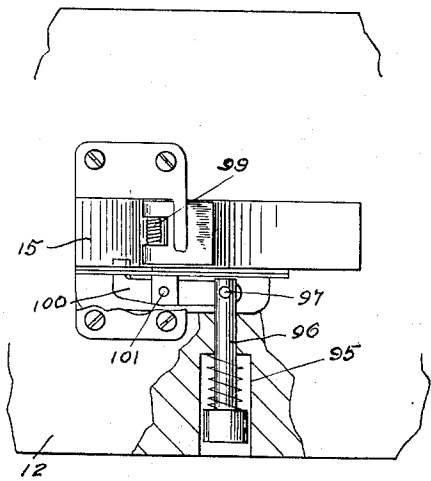


Fig. 10

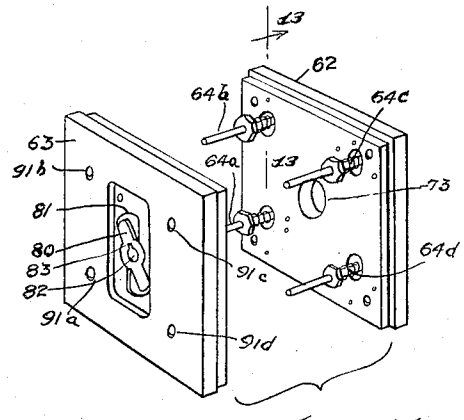


Fig. 11

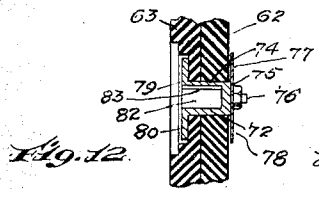


Fig. 12

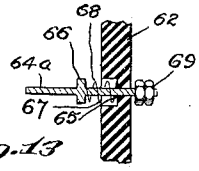


Fig. 13

INVENTORS
Granville M. Wilcox
Walter S. Johnson
BY Nathaniel Trucht
Attorney

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UNITED STATES PATENT OFFICE

2,533,654

COIN COLLECTING AND REGISTERING APPARATUS

Granville M. Wilcox, Lincoln, and Walter S. Johnson, Providence, R. I., assignors to Max L. Grant, Providence, R. I.

Application April 16, 1945, Serial No. 588,694

3 Claims. (Cl. 235—32)

1

The present invention relates to apparatus for collecting and registering coins, and has reference to a novel construction which has special advantages for general use and is particularly suitable for use in busses and trolley cars.

The principal features of the novel construction include a large mouth hopper into which the coins may be freely dropped, mechanism for transferring the inserted coins in sequence to a registering device and for conducting the registered coins to a display arrangement so that the coins are individually displayed, and a receptacle which receives the displayed coins and from which they may be removed by the conductor. In addition, an auxiliary coin receiver is provided for receiving the deposited coins if the registering apparatus is out of order or inoperative or is otherwise desired by-passed, and the indicator of the registration is arranged as a detachable unit.

The principal object of the present invention is to provide an improved apparatus for collecting and registering coins.

Another object of the invention is to utilize a wide mouth hopper for facilitating deposit of coins, and thus reduce the time required for coin collection.

Still another object of the invention is to individually transfer the deposited coins to an inspection passageway wherein each coin is individually displayed, the coins then being automatically transferred to another compartment where they are displayed as a group until released.

A further object is to provide a simple and effective mechanism for diverting the deposited coins to an auxiliary coin receiver whenever the registering apparatus is inoperative or is desired by-passed, the auxiliary coin receiver not being accessible to the operator.

An additional object is to detachably mount the coin registration indicator, whereby each operator is responsible for his own indicator.

A further object of the invention is to provide a tamper-proof mounting for the detachable indicator, having special interlocking connections with the indicator.

Another object of the invention is to provide a detachable indicator which is of special size and shape designed to positively identify the indicator at all times.

Still another object is to provide a coin collector which eliminates waste of time and energy in collecting and registering coins and in recording the registrations.

With the above and other objects and advantageous features in view, the invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings,

2

and more specifically defined in the claims appended thereto.

In the drawings;

Fig. 1 is a front elevation of an illustrative apparatus embodying the invention;

Fig. 2 is a side view of Fig. 1;

Fig. 3 is a top plan view, the hopper being removed;

Fig. 4 is a plan view of the transfer disk, on the line 4—4 of Fig. 8;

Fig. 5 is a right side view of the operating mechanism, the outer casing and the hopper being removed;

Fig. 6 is a front view of Fig. 5;

Fig. 7 is a left side view of Fig. 6;

Fig. 8 is a view similar to Fig. 5, parts being removed for clearness and other parts being in section;

Fig. 9 is a detail perspective view showing the arrangement and positioning of the parts for completing the electrical connections for the illustrated apparatus;

Fig. 10 is an enlarged bottom detail view of the hopper, parts being broken away;

Fig. 11 is a perspective detail of the indicator panel parts;

Fig. 12 is a sectional detail on the line 12—12 of Fig. 9; and

Fig. 13 is a sectional detail on the line 13—13 of Fig. 11.

General statement of operation

The invention will be explained by describing the normal movement of a deposited coin and then disclosing an illustrative mechanism for accomplishing the described movement, it being understood that the drawings disclose a preferred apparatus for carrying out the purposes of the invention.

Referring to Figs. 1 and 2 of the drawings, the coins or tokens are deposited by the patrons within the wide mouth funnel 10 of a hopper 11, which as illustrated has a square base 12 for mounting on a casing frame 13. The coin passes from the funnel 10 into an angularly positioned passageway 14 and impacts on a shelf or panel 15, which is held in the position shown in Fig. 2 for normal operation but is movable as hereinafter described for emergency conditions. The coin now falls into a cylindrical chamber 16, see Figs. 5 and 8, and rests on an angularly positioned rotatable disk 17 which forms the base of the chamber 16.

The disk 17, see Fig. 4, has a cut-out portion 18 which has a straight side 19 and a curved side 20, and is keyed to the upper end of a rotatable shaft 21, whereby the disk sweeps around in a counter clock-wise direction over a stationary seat 22, and picks up and moves the lowermost deposited coin upwardly until it drops into a coin

channel 23 which has a guide plate 24 mounted in the upper portion thereof to keep the coin generally horizontal.

The coin passes from the channel 23 over the edge of a vertical plate 25 and into a vertical channel or recess 26, see Fig. 1, being confined within the channel 26 by a glass plate or the like 27 which is mounted in the frame 13, and coming to rest on two metal contact pins 28 and 28a, one of the pins being grounded and the other connected to a source of current, as hereinafter described.

When the coin contacts the two pins 28 and 28a it closes an electric circuit which moves a registration indicator 29, see Fig. 2, and also rings a bell 30, see Fig. 7. The two pins 28 and 28a are mounted in a movable block 31, which moves back and forth automatically in timed relation to the rotation of the transfer disk 17 to release the coin, which then drops down in front of a triangular plate 32, see Fig. 1, to rest between this plate and the glass 27, the spacing being just sufficient to accommodate one coin therebetween. The lower edges of the vertical plate 25 are extended as illustrated to close the sides of the triangular space.

The coin now rests on a ledge 33, see Fig. 8, which is attached to the plate 32, and successive coins drop down into the triangular space, edge to edge, until a coin is positioned so as to be contacted by two pins 34, 34a, which are also mounted in the movable block 31 and which are also moved back and forth as the block moves. When the two pins 34, 34a are contacted by the coin an auxiliary electric circuit is closed, as hereinafter explained, and the solenoid 35, see Figs. 7 and 8, is actuated to pull the solenoid core 36 inwardly; since the solenoid core is attached to the back of the triangular plate 32 by a hinge connection 37, see Fig. 8, the triangular plate is pulled back and the entire group of displayed coins drops into a receptacle 38, see Fig. 2, which has a hinged spring pressed base 39 operable by the operator to release the coins when he presses on a trigger finger 40 attached to the base 39.

The operator may release the coins manually into the receptacle 38 by pressing a push rod 41 which is secured to the triangular plate 32, see Fig. 8. The triangular plate is returned to normal position by the pressure of spaced coil springs 42, see Fig. 7, which are mounted on fixed pins 43 in transverse bars 44, see Fig. 9, the transverse bars being secured at their ends within the casing frame.

The operating mechanism

Referring now to Figs. 5 to 8, the operating mechanism includes an electric motor 45 which is preferably angularly mounted in the casing frame, as illustrated, and which drives a worm 46 meshed with a worm gear 47; a shaft 48 is keyed to the gear 47 and drives a bevel gear 49 which in turn drives a bevel gear 50 keyed to the transfer disk shaft 21. The shaft 21, see Fig. 5, has an end cam 51 which periodically engages the end of a lever 52, pivotally mounted in a fixed support bracket 53, and the other end 54 of the lever 52 engages a stop 55 secured to a shaft 56 which is mounted to slide in fixed supports 57.

The shaft 56 is secured to the movable block 31 which carries the pins 28, 28a and 34, 34a, and is normally held outwardly by a coil spring 58 which is mounted on the shaft 56 between the left bracket or support 57 and the stop 55, whereby the periodic movement of the lever 52 in timed relation to the rotation of the transfer disk causes a to and fro movement of the block 31 and the pins 28, 28a and 34, 34a mounted therein. The supply of electric current to the motor 45 is controlled by a manually operable switch 59, see Fig. 7, of usual type.

Fig. 9 discloses the electrical connections, which are designed to prevent unauthorized operation of the mechanism. The panel 60, see Fig. 5, on which the registration indicator carrier 61 is detachably mounted, is made in two sections; the rear section 62 carries the wiring, and the front section 63 detachably receives the indicator carrier 61 as hereinafter described.

Referring now to Figs. 11 and 13, the rear section 62 has four contact pins 64a, 64b, 64c and 64d slidably mounted in bores 65, the forward end of each contact pin having an enlarged head 66 and the bores 65 being recessed as indicated at 67 to seat a spring 68 which resiliently urges the contact pin forwardly. Wire retaining nuts 69 are threaded on the rear ends of the contact pins to receive the wires, see Fig. 9, and two contact springs 70, 71 are provided, the spring 70 being wired to one contact pin as illustrated, and the spring 71 being connected to a source of electrical power.

A switch 72, see Fig. 12, is rotatably mounted in a central opening 73 in the rear section 62, and includes a hub 74, a switch 75 mounted on a rear extension 76 of the hub and having two oppositely directed blades 77, 78 adapted to engage the contact springs 70, 71, and a forward flange 79 having two diametrically opposed arms 80, see Fig. 11, adapted to swing in sector openings 81, the rear panel being recessed to receive a cover plate as hereinafter described. The hub 74 is bored as indicated at 82, and has a keyway 83, to receive a projection 84 mounted on the rear of the indicator carrier 61 and provided with an end key 85 to seat in the keyway 83.

The indicator 29, see Fig. 9, has four contacts 86a, 86b, 86c and 86d, the contacts 86b, c and d being connected by a right angled plate 87, as illustrated, and the contact 86a also having a plate 88, the plates being wired to the indicator through a central passageway 89. The indicator carrier 61 is provided with four openings 90a, b, c and d and the front panel section 63 has aligned openings 91a, b, c and d through which the ends of the contact pins 64a, b, c and d extend to engage the indicator contacts 86a, b, c and d when the parts are in assembled relation. A cover plate 91 having a keyed opening 92 shaped to receive the projection 84 and its key 85, see Fig. 5, is set into the panel recess.

When the two panel sections 62, 63 are secured together, as by screws or the like, and the indicator 29 is secured to the carrier 61 with screws or the like, the indicator carrier is readily mounted on the panel 60 by setting the projection 84 into the panel opening 92 and the switch bore 82 so that the key 85 seats in the keyway 83. In this position, the carrier is at an angle to the panel, and may be swung to the right for locking in place, the key 85 now being in back of the cover plate and the forward edge of the carrier having a spring clamp 93 which engages a stop pin 94, see Figs. 1, 2, mounted on the frame 13.

The swinging movement of the carrier shifts the switch 72 and engages the blades 77, 78 with the contact springs 70, 71. The electrical connections are thus placed in position for operation, as the current passes through the contact spring 71, the switch blades 78, 77 and the contact pin 64b

to the indicator contacts **86***b*, *c*, and *d*. The current from contact **86***b* and plate **87** passes through the indicator, through plate **88** and contact **86***a*, and through contact pin **64***a* to pin **28***a*, and through a coin and pin **28** to ground. The current from contact **86***c* passes through contact pin **64***c* to the bell, to contact pin **64***a*, and to ground, and also through the motor to ground. The current from contact **86***d* passes through the contact pin **64***d*, through the solenoid, to pin **34***a*, and then through a coin and the pin **34** to ground.

The carrier **61** has a hand grip **61***a*, see Fig. 2, to facilitate the mounting and the swinging movement, this hand grip being preferably of large size so that concealment of the carrier and the indicator is difficult.

The emergency coin drop

When the operating mechanism is out of order or the indicator does not make proper contact, there is no transfer of coins as described and no visual display, and means are therefore provided to by-pass the deposited coins to a locked receiving box. Referring now to Fig. 10, the base **12** of the hopper has a recess **95** in which a spring pressed rod **96** is positioned, the inner end of the rod having a pin **97**. The movable shelf **15**, see Fig. 2, is swingingly mounted on a hinge pin **98** and is urged to turn from the position illustrated in Fig. 2 and close off the passage to the chamber **16** by a coil spring **99**.

The shelf **15** is movably retained in the position illustrated in Fig. 2 by a flat lever **100** which is pivotally mounted in the base of the hopper as indicated at **101**, one end of the lever **100** having a projection or finger which extends into a recess **102** in the shelf, and the other end of the lever having an opening, not shown, to receive the end of the pin **97**. When the rod **96** is pressed inwardly the pin **97** swings the lever **100** and releases the shelf, which swings over to close the entrance to the chamber **16** and to open up a by-pass passageway to a coin chute **103**, see Figs. 5, 6 which leads directly to a receiving box **104**. The box **104** cannot be removed from the casing frame by the operator, as the frame must be removed and a retainer plate **105** which is attached to the box **104** must be released from a vertical frame rod **106** around which it is secured by screws **107**.

The invention thus comprises a fare box into which coins are dropped, the coins being transferred one at a time to a display passageway in which each coin causes a registration to be made, and then passes to a display compartment in which a large number of coins are displayed with all the coins visible to the operator and the patrons, the group of coins then being automatically transferred as a group to a coin receptacle from which they may be withdrawn by the operator. If the apparatus becomes inoperative for any reason, the operator pushes a rod which places an alternative coin passageway in operation, the coins then passing into a receiver box which cannot be opened by the operator and which is not accessible for removing the deposited coins until the fare box is removed for repair and for resetting the movable shelf.

During normal operation the fare box is not removed and the operators merely remove and replace the register indicators which are issued to them, whereby the reporting and checking of the fare registrations is simplified. The wiring connections are arranged so that the electrical connections can be completed only when the proper indicator and carrier is used, as the wiring and the plate contacts of the indicator are inaccessible. Circumvention of the apparatus by use of substitute indicators or by short circuiting the connections is thus prevented.

Although a preferred embodiment of the invention has been described and illustrated, it is clear that the inventive features may be applied to other types of coin collectors, and that changes in the size, shape, arrangements and functions of the parts may be changed to suit different requirements for coin collectors, within the spirit and the scope of the invention as defined in the appended claims.

We claim:

1. In a coin collector, means for receiving deposited coins, means for automatically registering the deposited coins, means for transferring the registered coins to a coin receptacle, an auxiliary coin box, means movable to by-pass an inoperative registering means and divert deposited coins to the auxiliary coin box, and means for locking the movable by-pass means against return movement.

2. In a coin collector having mechanism for receiving and registering coins, a panel having electrical contacts for supplying energizing current to the receiving and registering mechanism and a concealed control switch movable to off and on position, and a registration indicator device removably mountable on the panel, said device and panel having cooperating parts locking the device to the panel on partial rotation thereof, said device having means engaging said control switch and operable to move said control switch to one position.

3. In a coin collector having mechanism for receiving and registering coins, a panel having electrical contacts for supplying energizing current to the receiving and registering mechanism and a concealed control switch rotatable to off and on position, and a registration indicator device removably mountable on the panel, said device having means engaging and turning said concealed control switch on completion of the mounting thereof.

GRANVILLE M. WILCOX.
WALTER S. JOHNSON.

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