

[54] **COIN PAY-OUT MEANS FOR COIN CHANGERS**
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[73] Assignee: **Coin Acceptors, Inc.**, St. Louis, Mo.
[22] Filed: **July 17, 1970**
[21] Appl. No.: **55,855**

3,140,765	7/1964	Sundblad et al.	133/2 X
1,123,296	1/1915	Hibner	133/2
3,181,678	5/1965	Adverstick et al.	194/9
1,465,409	8/1923	Baur	133/5 B

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[52] U.S. Cl. 133/2, 133/5
[51] Int. Cl. G07d 1/06
[58] Field of Search 133/2, 5 B

[56] **References Cited**
UNITED STATES PATENTS

3,048,181	8/1962	Quinn	133/2
3,435,833	4/1969	Tanaka	133/2
3,359,993	12/1967	Tryon et al.	133/2
3,175,670	3/1965	Offutt et al.	194/10
2,571,596	10/1951	Meredith et al.	133/2 X

[57] **ABSTRACT**
A coin changer with provisions for paying out coins of different denomination has slide members for discharging the change coins singly from storage tubes. The slide members are actuated by individual cams on a common drive shaft, selectively, under the control of an electromagnetic latch device that locks or releases the coin pay-out slides as determined by the amount of over-payment deposited in the changer.

2 Claims, 4 Drawing Figures

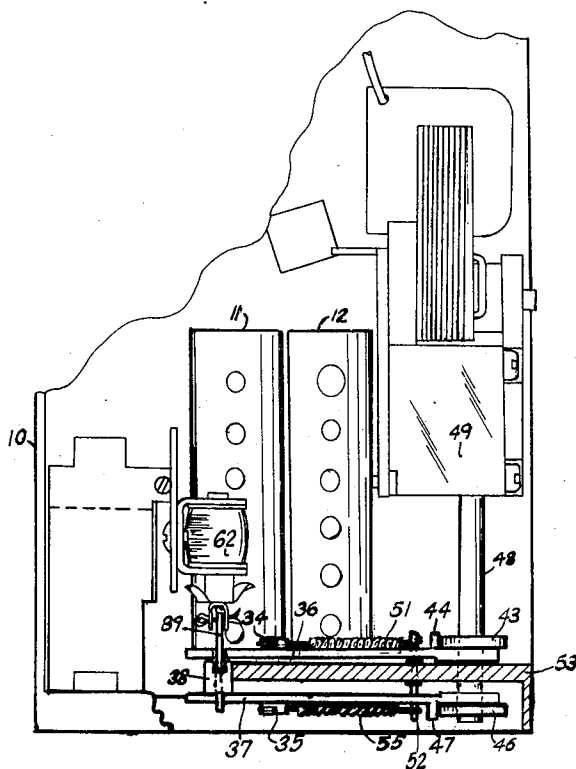
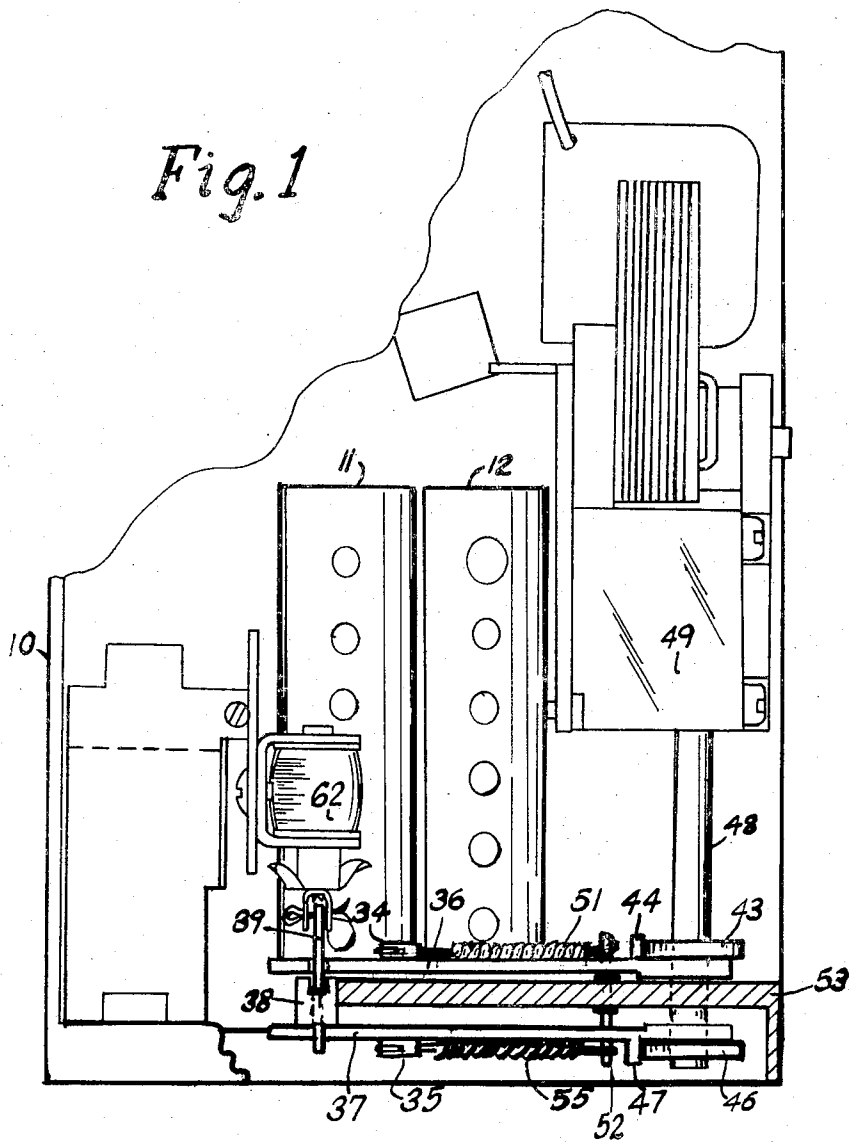


Fig. 1



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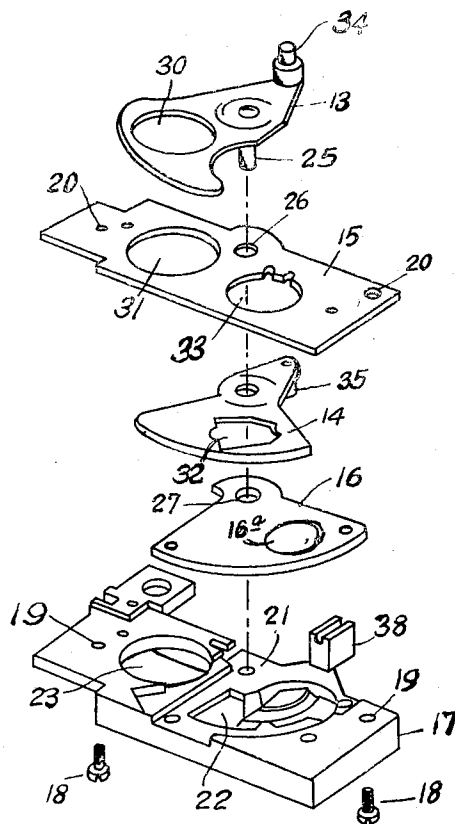
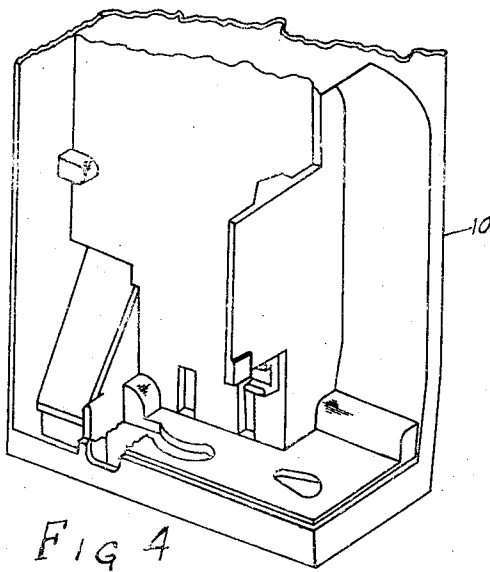
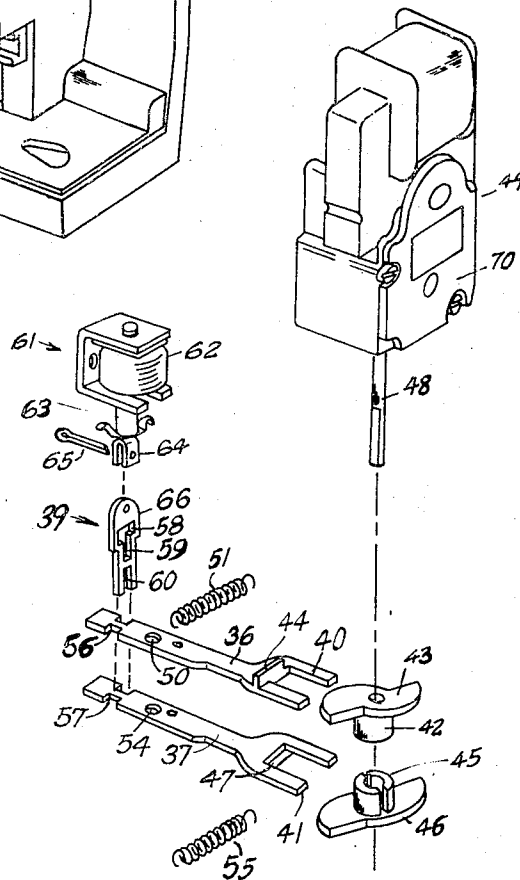


FIG. 2

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COIN PAY-OUT MEANS FOR COIN CHANGERS

BACKGROUND OF THE INVENTION

The present invention relates to coin changers for vending machines, and has particular reference to improvements in pay-out or change return means for such apparatus. More specifically, the invention has to do with improved provisions for returning change in coins of either of two denominations when money deposited in the changer exceeds the sales price of the article to be vended. For example, for a 15 cent vend a dime will be returned when a quarter is deposited and a nickel will be returned when two dimes are deposited.

Coin changers having means for returning coins in more than one denomination have heretofore been known and made available to the trade. Prevailing changers of this type, designed for use in vending machines, are relatively complicated. They occupy considerable space in the changer housing making for crowded conditions therein which hamper servicing of the equipment. The dual coin return means of the present invention is simpler, requires less space, less service attention and, in general, is more reliable and trouble-free than existing dual coin return mechanisms.

SUMMARY OF THE INVENTION

In the pay-out means, coin tubes and pay-out slides similar to those known and heretofore used in coin changers are employed. Such means include coin tubes and pay-out slides located at the lower ends of the tubes. The invention hereof is primarily identified with means for selectively controlling the actuation of the pay-out slides. Such means include slide actuating links, one connected to each slide, arranged for end-wise reciprocating movement by cams mounted on a common drive shaft. A keeper element locks the drive links alternatively when moved from one position to another by means of a solenoid controlled by coin switches in the changer.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary view, partly in section, illustrating the pay-out means of the present invention;

FIG. 2 is an exploded view illustrating the component parts of a coin slide-out mechanism;

FIG. 3 is an exploded view illustrating the component parts of coin slide-out actuating and locking mechanism, and

FIG. 4 illustrates the lower portion of a changer housing with the pay-out means removed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Coin changers of the kind to which the pay-out mechanism hereof is applicable are illustrated and described in U.S. Pat. Nos. 3,175,670 and 3,181,678. Briefly, such changers have mechanisms for rejecting slugs and unacceptable coins and for separating acceptable coins according to their denominations. Acceptable coins travel downwardly in predetermined paths through the changer, and during their descent, they trip coin switches and finally drop, either into coin tubes for use in making change, or, when the tubes are filled, into a cash box. A stepper or counting device receives pulses from the coin switches and programs the mechanism for paying out correct change when the sums de-

posited exceed the sales price of the vending merchandise.

The present invention relates to the change pay-out means, and such will be described with reference to a changer designed to return a nickel when two dimes are deposited for a 15 cent sale, or a dime when a quarter is deposited for a 15 cent sale.

Referring now by characters of reference to the drawings, FIG. 1 shows components of the pay-out mechanism in assembly. Such parts, located in the lower end portion of the changer housing 10, include a coin tube 11 for holding nickels and a coin tube 12 for holding dimes, these being arranged in side-by-side relation. The open lower ends of the tubes communicate with a coin slide-out mechanism of known type, the components of which are best illustrated in FIG. 2. These include a nickel pay-out slide 13, a dime pay-out slide 14, a fixed plate 15 between the pay-out slides 13 and 14, a fixed plate 16 underlying the dime pay-out slide 14 and a base member 17 on which the above designated components are mounted. The parts are held in assembly by screws 18 which pass through holes 19 in base 18 and threaded in holes 20 of the plate 15. The fixed plate 16 has a dime-sized opening 16a. It fits snugly in a corresponding recess 21 in the upper surface of the base 17 in overlying relation to a sloping surface that leads to a bottom opening 22, and thence to a coin return chute (not shown). Base 17 is also provided with a second opening 23 that communicates with a nickel return chute (not shown).

The nickel pay-out slide 13 has a depending stub shaft 25 which extends through and rotates in openings 26 and 27 in the fixed plates 15 and 16 respectively, and through hole 28 in slide 14 to provide a pivot for that slide. Pay-out slide 13 has an opening 30 which, when slide 13 in in normal or stand-by position, is located out of register with an opening 31 in fixed plate 15, so as to confine the coins in the tube when the machine is idle. Similarly, opening 32 in dime slide 14 is normally out of register with opening 33 in plate 15. An upstanding post 34 on slide 13 and a depending post 35 on slide 14 are coupled respectively to drive links 36 and 37 (FIGS. 1 and 3).

Referring to FIGS. 1 and 2, base 17 is provided with an upstanding part 38 having a vertical passage constituting a guideway for a latch element or keeper 39 for the drive links 36 and 37.

As best appears in FIG. 3, the drive links 36 and 37 each have bifurcated end parts and with spaced legs 40 and 41, respectively. The legs 40 of link 36 straddle the hub 42 of ram 43 which normally acts against an upstanding follower lip 44 on the said link. Similarly, legs 41 of link 37 straddle hub 45 of cam 46 which normally acts against a depending follower lip 46 on line 37. The cams 43 and 46 are shown as each having two lobes in 180° relationship so that one complete revolution of a cam would normally produce two forward and two return strokes of its related drive link. The cams may also be of single lobe variety.

Both cams 43 and 46 are mounted on the shaft 48 of a drive motor 49, energized through and controlled by a stepper or counting device (not shown) to which reference has heretofore been made.

Drive link 36 has an opening 50 through which extends the post 34 on the nickel pay-out slide 13, post 34 constituting a crank pin through which reciprocating movement of link 36 is transmitted to the slide 13

to rotate or oscillate that member about its axis 25. A tension spring 51 has one end secured to the projecting upper end of the crank pin 34, and the opposite end anchored to an upstanding part of a pin 52 that extends fixedly through a horizontal end wall 53 of the changer housing.

In similar fashion, the depending post or crank pin 35 on the dime pay-out slide projects downwardly through opening 54 in driven link 37, and tension spring 55 has one end secured to crank pin 35 and the opposite end anchored to a depending part of fixed pin 52.

It will appear that the springs 51 and 55 act on the crank pins, and through those pins act on the drive links in a direction tending to move those parts toward the cams. Hence, when the drive links are free of latch means, to be subsequently described, the follower lips of the drive links will be held by the spring in contact with the camming surfaces of the cams. Cam rotation will then cause the links to drive the pay-out slide forwardly and the springs will impel the slides and links in the reverse or return direction. With each cycle of a pay-out slide, (a forward and a return stroke), a coin will be discharged from its associated coin tube.

The pay-out slides are susceptible of movement, as above described, only when the drive links 36 and 37 are free of the latch element or keeper 39. As best appears in FIG. 3, the drive links are provided near their forward ends with attenuated neck portions 56 and 57. Keeper 39 has a T-shaped opening comprised by horizontal top passage 58 of sufficient width to accommodate the full width of drive link 36, and a vertical passage 59 of width to accommodate only the neck portion 56 of the link 36. A vertical slot or passage 60 is sized to accommodate the neck portion 57 of link 37.

Keeper 39 is movable vertically in its guideway by means of a solenoid device 61, comprising a coil 62, armature plunger 63, and clevis 64 connected by cotter pin 65 to the head 66 of the keeper 39. When the solenoid is de-energized, the keeper drops to a position wherein its horizontal passage 58 registers with the drive link 36 and allows that member to move freely under the influences of the cam 43 and spring 51. While in the same position, the lower portion of keeper 39 straddles the attenuated neck 57 of drive link 36 to lock that member and, hence, the dime pay-out slide, in place. When the solenoid 62 is energized, the keeper 39 is raised clear of the link 37, freeing that member and its associated pay-out slide for movement, while bringing the vertical portion 59 of the T-slot into register with the neck 56 of link 36, and thus locking that link and its associated nickel pay-out slide against movement.

The motor 49 drives the cam shaft 48 through gears within the enclosure indicated by 70. The drive assembly is suitably programmed in the present case wherein two-lobed cams are employed, to move the cams through a half revolution. The cams always stop in a "home" position, wherein the neck portions of the drive links are aligned with the keeper so that member may be freely actuated by its solenoid.

The solenoid coil 62 is in circuit with a 25 cent control switch which functions to energize solenoid 62 and the pay-out drive motor 49, and to send a vend signal

to the vending mechanism, all responsive to the action of a quarter as it travels downwardly through the changer. The energized solenoid 62 raises the latch bar or keeper 39, thus releasing the 10 cent pay-out slide for operation by the drive motor and spring while locking the 5 cent pay-out slide against movement, as heretofore described. When two dimes are sequentially deposited, a coin switch impinged by the second dime, initiates operation of the vending mechanism and the pay-out drive motor. The solenoid 62 remains de-energized and the latch bar 39 remains in its normal "down" position. The 10 cent pay-out slide is thereby locked in place while the 5 cent pay-out slide is free to operate and discharge on nickel.

I claim as my invention:

1. In a coin changer, change pay-out means comprising:

- a. a plurality of coin storage tubes, disposed in substantially side by side parallel relation,
- b. a plurality of pay-out slide means, one associated with each coin storage tube,
- c. actuating means for said pay-out slide means,
- d. locking means engageable with the slide means for selectively immobilizing said slide means,
- e. each of said pay-out slide means includes a coin-dischargeable slide plate, an elongate drive link, and a pivot means interconnecting the drive link and the slide plate,
- f. each of the drive links have locking abutment means formed thereon,
- g. said locking means includes a single keeper element adapted selectively to coact with the locking abutment means of each drive link, thereby to immobilize the selected drive link and its associated coin-dischargeable slide plate,
- h. the drive links being disposed in parallel adjacency extending substantially at right angles to the coin storage tubes, and in superimposed relation in a plane substantially parallel to the tubes,
- i. said single keeper element being arranged for movement substantially parallel to the coin storage tubes, and in a path intersecting the drive links, and
- j. the coin-dischargeable slide plates being located between the drive links.

2. The device defined in claim 1, in which:

- k. the actuating means includes a drive shaft, and cams mounted on and rotatable with said drive shaft,
- l. each of the drive links has cam abutment means at one side of its associated slide plate and toward one end of the drive link,
- m. the locking abutment means of each drive link being located at the other side of its associated slide plate and toward the other end of the drive link, and
- n. each cam coacting with the cam abutment means of one drive link, whereby to actuate the drive link not immobilized by the keeper element engageable with the locking abutment means of the immobilized drive link and thereby actuate the coin-dischargeable slide plate associated with the actuated drive link.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,738,377 Dated June 12, 1973

Inventor(s) Joseph A. Lotspeich

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, Line 12, change "nickels" to -- dimes --.
Line 13, change "dimes" to -- nickels --.
Line 23, change number "18" to -- 17 --.
Line 37, change "out of" to -- in --.
Lines 38 and 39 cancel ", so as to confine the
coins in the tube when the
machine is idle".
Line 40, change "out of" to -- in --.
Line 51, change "ram" to -- cam --.
Line 53, change number "31" to -- 37 --.
Line 54, change number "46" to -- 47 --; and
change "line" to -- link --.

Column 3, Line 21, change "ro" to -- or --.
Line 44, change number "36" to -- 37 --.

Column 2, line 36, "13 in" should read -- 13 is --.

Signed and Sealed this

Twentieth Day of September 1977

[SEAL]

Attest:

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