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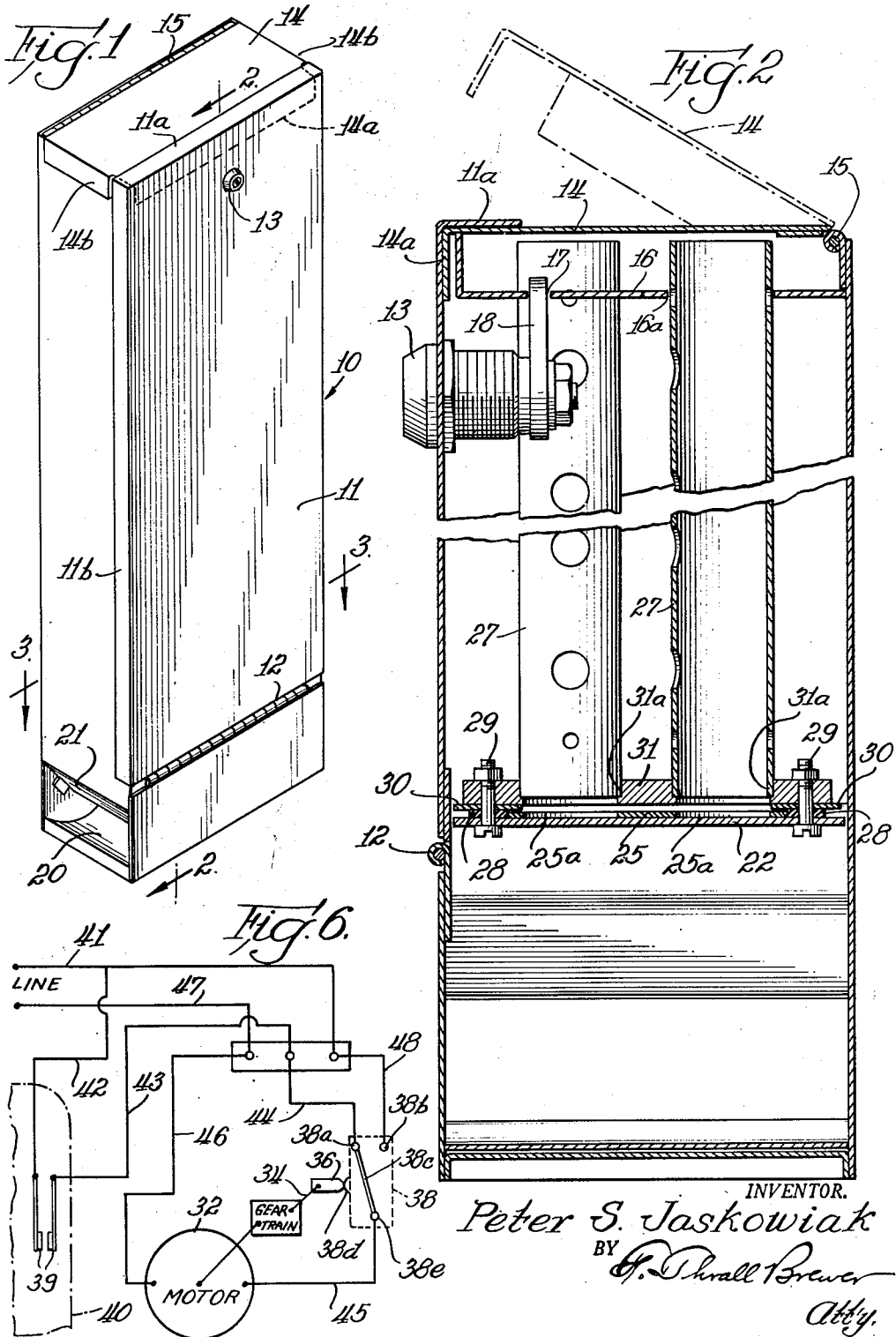
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AUXILIARY COIN CHANGING MACHINE

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2. Sheets-Sheet 1



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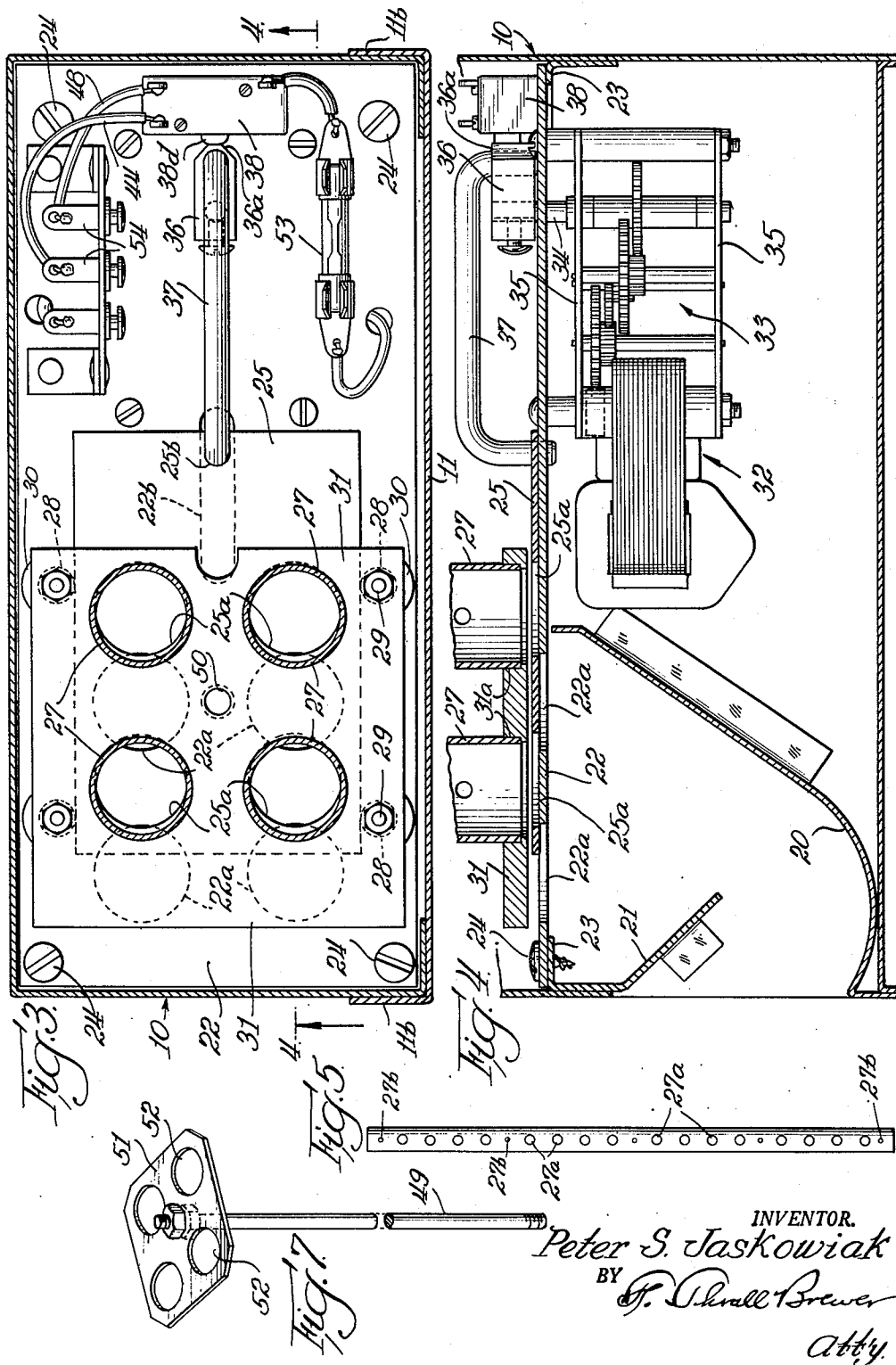
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2 Sheets-Sheet 2



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AUXILIARY COIN CHANGING MACHINE

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2 Claims. (Cl. 133—2)

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This invention relates to improvements in auxiliary coin changing machines.

Vending machines for various products are in use which are designed for operation upon the insertion of coins of particular denominations. For example, some beverage vending machines vend beverages upon insertion of five cent pieces and other machines vend drinks or other commodities upon insertion of dimes or coins of large denominations. The sale of some products from vending machines might be increased by setting an intermediate or more equitable price, as for example, seven cents or eight cents, rather than a dime or a cent or two less than multiples of five cents in cases where two dimes or a quarter are required for operation as at present. In referring to vending machines, music vending machines in the form of automatic phonographs or the like are intended to be included.

The principal object of the present invention is to provide an improved change maker adapted to be attached to or associated with a vending machine for dispensing change in the form of a certain number of coins and which is operable to dispense such coins as change upon initiation of the operation of the vending machine by the insertion of a coin or coins of a prescribed value.

Another object of the invention is to provide a change making mechanism which, upon actuation, dispenses a given number of coins, which number may easily be changed whenever the price charged for the vended commodity changes, as for example from seven cents to eight or to six cents.

An additional object of the invention is to provide a coin dispensing mechanism which is motor operated for one dispensing cycle for dispensing a selected number of coins and provided with a control circuit for the motor which is initially closed by an electrical impulse from an associated commodity vending machine.

A further object of the invention is to provide in a coin dispensing apparatus, an improved coin slide mechanism adapted to handle coins of normal thickness, worn or thin coins, and coins which may be somewhat imperfect, such as slightly bent coins, and which mechanism can readily be freed of excessively deformed coins which may in rare instances lodge within the mechanism.

Another object of the invention is to provide improved cabinet and coin holding structures for a change making mechanism which facilitate servicing the mechanism and the replenishing of the supply of coins in coin holding tubes, as

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well as the removal of coin holding tubes when desired.

Other objects of the invention relate to various features of construction and arrangement of parts which will be apparent from a consideration of the following specification and accompanying drawings, wherein:

Figure 1 is a perspective view of a casing for the improved change maker for use in conjunction with a commodity vending machine, not shown;

Fig. 2 is a broken enlarged sectional view taken substantially on a line 2—2 of Fig. 1, and illustrating two coin holding tubes and a coin dispensing slide within the casing and locking means for the casing;

Fig. 3 is an enlarged sectional view taken substantially on a line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken substantially on a line 4—4 of Fig. 3;

Fig. 5 is an elevational view of a coin holding tube in detached relation;

Fig. 6 is a schematic diagram of the control circuit of the motor; and

Fig. 7 is a detached perspective view of a support for the upper ends of the coin tubes which is adapted for use with the dispensing mechanism in instances where the latter is placed within a commodity vending machine and the casing shown in Fig. 1 is not employed.

In the drawings which show a change maker which is illustrative of the present invention, a casing for the mechanism is indicated generally by numeral 10. Preferably it is of sheet metal construction having a door 11 hinged at 12 to the casing and provided with a key operable lock 13 adjacent the upper end. When the door is unlocked and swung downwardly access is provided to the interior of the cabinet. As shown in Fig. 2, the casing has a lid 14 hinged at 15 to the rear of the casing. The lid or cover 14 is provided with a depending flange 14a on the edge opposite the hinge and side flanges 14b which seat over the exterior of the upper end portion of the side walls of the casing when the lid is closed. The door 11 has an upper flange 11a which overlies the adjacent portion of the closed lid for preventing the opening of the lid when the door is closed. The door also is shown with a side flange 11b. The upper portion of the casing is provided with a horizontal partition or false top 16 welded or otherwise secured in position and constituting a support for the upper ends of coin holding tubes as later described. The partition 16 is provided with a slot 17 for receiv-

ing a latch member 13 of the key operable lock 13 carried by the door 11, whereby when the lid is down the door may be closed and locked; the lid likewise being locked in closed position by the overlying flange 11a of the door.

The lower portion of the casing 10 is provided with a coin receptacle 20, as shown in Fig. 4, into which dispensed coins are deposited by my improved mechanism, so that such dispensed coins are accessible as change to the customer of the associated commodity vending machine. A guard 21 extends transversely of the receptacle and prevents ready access to the superjacent coin dispensing mechanism.

A transverse plate 22, constituting a part of the dispensing mechanism, as well as a support for other parts thereof, is shown in Fig. 4 as being secured to ears or lugs 23 by screws 24. A coin dispensing slide 25 is located on the plate 22 and is provided, in the structure illustrated, with four coin apertures 25a of a size to receive coins to be dispensed as change. For the purpose of simplicity, it may be assumed that each aperture is of a diameter freely to receive a one-cent piece. The slide 25 is arranged for reciprocation upon the plate 22 for carrying coins deposited in apertures 25a by coin tubes 27 to the left, as viewed in Fig. 4, for release into the receptacle 20 through apertures 22a in plate 22.

The slide 25 is guided for linear movement by guides in the form of washers 28 held in place by bolts 29 (Fig. 2). The washers 28 are slightly thicker than the slide 25 and the latter is thinner than perfect or unworn one cent pieces. Over the washers 28 are washers 30 of greater diameter and which extend over the longitudinal edges of the slide 25 to retain the latter against substantial upward movement while permitting free sliding action thereof. Positioned on the washers 28 is a tube supporting base 31 in the form of a plate and having, in the form shown, four counter bored openings 31a for receiving the lower ends of, and removably supporting four coin tubes 27, the upper ends of which extend through, and are supported in, four openings 16a in the partition or false top 16. Each opening 16a is aligned vertically with one of the openings 31a whereby the tubes are supported in vertical position, but are removable from the casing through openings 16a when the lid 14 is in fully open position. The washers 28 and 30 support the base 31 from the plate 22a a distance greater than the usual overall thickness of bent or warped coins which thus can be handled by the mechanism. The nuts of the bolts are at the upper surface of the base for easy accessibility should it become necessary to release the base to free a stuck coin.

The tubes 27 are of a diameter for holding coins in stacked relationship and each is longitudinally aligned (in the direction of reciprocation of the slide 25) with, but offset from, one of the coin discharge passages 22a in the plate 22. The coin receiving openings 25a of the slide are adapted each to receive one coin from the stack of coins (not shown) in its respective tube, and when the slide has been moved to the left a full stroke by the slide actuating means hereinafter described, each coin in a coin receiving opening 25a will drop through a registering passage 22a in the plate 22 into the receptacle 20. Hence, if four tubes 27 are employed and all are supplied with coins, each stroke of the slide from right to left, as viewed in Fig. 4, will effect the dispensing of four coins. If less than four coins are to be dispensed in making change, the proper number of

tubes only will be employed or only such number of tubes will be supplied with coins. Hence if the coin required to be inserted in an associated commodity vending machine for operation thereof is ten cents, but the cost of an article is six cents, the four tubes 27 will be used in the change maker and upon actuation of the slide 25 following an initiating impulse imparted to the actuating mechanism from the vending machine four one cent pieces will be dispensed. It will be seen that use of the present improvements as described makes very simple the matter of dispensing the proper change and that changes in price of the vended commodity merely requires the use of the proper number of tubes or supplying the proper number of coins.

The tubes 27, as illustrated in Fig. 5, preferably are provided with sight openings 27a through which the number of coins therein can readily be observed by a service man. The tubes also are provided with smaller openings 27b through which suitable pins (not shown) may be passed for retaining coins in a tube during handling. Thus a coin filled tube carried by the service man may be used in supplying coins to a tube or tubes in a change maker by holding such filled tube in registration with a tube 27 in the casing after the lid 14 has been opened, and by removing the lower pin of the filled tube coins will gravitate quickly into the tube to be replenished. By means of pins in each of the five openings of a replenishing tube, a service man can, by removing the lowermost pin, discharge a given number of coins in one tube of the device and by successively removing the next upper pins after he shifts the replenishing tubes to proper positions over the other tubes 27, the same number of coins can be discharged into the other tubes.

Likewise, a pin can be placed in the lowermost opening 27b for retaining most of the coins therein prior to lifting a tube from the casing, since otherwise the coins will pass from the tube as it is lifted upwardly. This feature is of advantage, however, in that should a service man inadvertently fail to close the lid 14 before locking the door 11, the unauthorized removal of a tube or tubes will result in the coins therein being deposited upon the plate 22 or superjacent parts of the mechanism. While the change maker will not then function as intended, the coins will not fall into the receptacle 20 and a pilferer's attempt to obtain the coins will be thwarted.

The slide actuating mechanism comprises an electrical motor 32 which, through a series of speed reducing gears and pinions, indicated generally by numeral 33, operates a shaft 34. The shaft, motor and gearing are shown as constituting a sub-assembly carried by a pair of plates 35 secured by screws and spacing studs to the base plate 22. The shaft 34 is journaled in the plates 35 and extends through an aperture in the plate 22 and at the upper end carries a switch actuating cam 36 secured to the shaft by a set screw or the like. The cam 36 is provided with a vertical bore adjacent the free end of the longer arm thereof into which projects the down turned end of a slide operating link or pitman 37. The other end of the link likewise is turned down and extends through an opening 25b in the slide 25 and through a longitudinally disposed guide slot 22b in the plate 22. Hence, as the shaft 34 makes one rotation, the cam 36, by means of link 37, effects movement of the slide first to the left (as viewed in Fig. 4) a distance to effect registration of the coin passages 25a with the discharge open-

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ings 22a and then to the right to the coin retaining position shown in said figure.

The free end 36a of the cam is shaped, as shown in Fig. 3, to engage a switch actuating button or pin of a single pole double throw snap-over switch 38 of known construction. The switch is shown diagrammatically in Fig. 6, and comprises a pair of stationary contacts 38a, 38b from the former to the latter of which a movable switch arm 38c snaps quickly by spring action when the button 38d of the switch is released for outward movement by the end 36a of the cam, as the latter moves from the position shown in Fig. 6. Engagement of the button and inward movement thereof by the end 36a of the cam as the latter completes a rotation causes the arm 38c to return by spring action to the position shown in Fig. 6. A terminal for the switch arm 38c is indicated at 38e.

In the control circuit for the motor, shown diagrammatically in Fig. 6, a pair of relay contacts 39 is a part of a suitable relay or switch 40 enclosed within a closure of a vending machine and to be closed upon operation of the machine, such as by the deposit of a coin in a coin chute or by operation of a conventional coin slide. The momentary closing of the relay contacts 39 supplies actuating current to the motor 32 to start that motor. Thus, when the relay contacts 39 are closed, current from a supply line 41 flows through conductor 42, through the contacts 39, through conductors 43 and 44 to contact 38a, switch arm 38c, conductor 45 to the motor and through conductor 46 to the other supply line 47. Initial operation of the motor effects movement of the rotary shaft 34 and of cam 36 and releases the button 38d, whereupon the arm 38c is snapped to the right, as viewed in Fig. 6, into engagement with the contact 38b. In the meantime, the relay contacts 39 will have opened and current then flows from line 41 through conductor 48 to contact 38b, through arm 38c to conductor 45 to the motor and the circuit is completed through conductor 46 to the other line 47. The motor continues to operate until the cam 36 completes one rotation, whereupon inward movement of the button 38d by the cam causes the switch arm to snap back to the position shown in Fig. 6. The motor circuit is thus broken since the relay contacts 39 are then open.

It will be seen that the motor employed may operate in either direction without affecting the operation of the mechanism above described.

The change making mechanism, as above described, when housed in the casing 10 is adapted to be mounted on the exterior of the associated vending machine. However, the mechanism, without the casing, may in some instances where space is available, be mounted in the vending machine cabinet. When thus mounted, a suitable change receptacle is provided into which the coins are dispensed and accessible to the customer and any suitable means provided for supporting the plate 22. Means for supporting the tubes 27 at the upper ends is provided in the form of a rod 49 (see Fig. 7) which is threaded at the lower end for engagement within a threaded opening 50 provided in the tube support plate 31. The upper end of the rod is provided with a plate 51 provided with four properly spaced openings 52 of diameters for accommodating the tubes similarly to the tube openings 16a in the false top 16 for receiving and stabilizing the tubes.

It will thus be seen that the improved change making mechanism can be mounted either in a vending machine cabinet or it can be located

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within a casing 10 and the latter secured to or located contiguous to the cabinet.

At the beginning of a dispensing operation the coin slide 25 is in the position shown in Figs. 3 and 4 and each aperture 25a will contain a coin if the four tubes are in use. As the motor begins to operate the slide moves from right to left, the coins sliding on the plate 22 until they drop through openings 22a into the receptacle 20. On the return stroke of the slide, each aperture 25a will pass into registration with the respective coin stack and receive another coin and the slide will come to rest in the position shown in Fig. 4. The position of the apertures 25a in Fig. 4 is slightly to the right of precise axial registration with the respective tubes and the movement of the apertures to and from the indicated positions affords the coins a better opportunity to become seated within the apertures.

In Fig. 3 of the drawing the conductor 45 is shown as fused at 53 while conductors 44 and 48 lead to binding posts 54 suitably supported upon the plate 22.

It will be seen that the momentary closure of the contacts 39 starts the motor through a starting circuit which comprises conductors 42, 43, 44, the remainder of which, comprising arm 38c, and conductors 45 and 46 being part of the main motor circuit. Initial operation of the motor moves the cam 36 from the position shown in Fig. 6 whereupon the arm 38c closes the main motor circuit and holds it closed until the button 38d of the switch 38 is again pressed inwardly by the cam whereupon the main motor circuit is opened and the motor stops; the contacts 39 having opened in the meantime. A reciprocal cycle of the slide 25 is effected by each rotation of the cam 36 which not only controls the actuation of the switch 38 but acts as a crank for operating the slide.

While the illustrated mechanism has been described as handling coins of a single denomination such as one cent pieces, it will be apparent that parts may be modified to enable the apparatus to dispense coins of two or more denominations in special instances if desired.

While I have shown and described a structure which is illustrative of my invention, it will be apparent that changes in details may be made within the scope and spirit of the invention defined by the appended claims.

What is claimed is:

1. In a change maker, a horizontal supporting plate, a supporting base spaced above the plate for a plurality of tubular holders for coins in stack relation, said base being provided with a plurality of openings each receiving the lower end of and supporting one of said holders and through which openings coins are adapted to pass, said plate being provided with passages for coins off-set in a longitudinal direction from said openings, a reciprocable coin slide on the plate operable within the space between the plate and base and provided with coin receiving openings each adapted to receive a coin from one of the holders during movement of the slide in one direction and to move the coins into registration with the passages in said plate for discharge therethrough upon movement of the slide to a given position in the other direction, a motor means, means operable by the shaft of the motor means for reciprocating the slide first in a direction to discharge coins in the openings thereof and then in the opposite direction for receiving coins from said holders, and a plurality of as-

semblies adjacent opposite side edges of the slide for maintaining the plate and the base in spaced relation to provide room for the slide, each assembly comprising a first washer means located at the side of the plate toward the base and being thicker than the slide and clear of the adjacent side edge thereof, a second washer means located at the side of the base toward the plate and overlapping the adjacent side edge of the slide, and fastening means going through the first and second washer means to retain the same between the plate and the base, said washer means cooperating with the side edges of the slide for guiding the slide in its reciprocating movement.

2. In a change maker, a horizontal supporting plate provided with a plurality of coin discharge passages therein, a tube supporting base parallel with and spaced above said plate a distance slightly greater than the thickness of the coins to be handled, tubes supported at the lower ends in said openings and each constituting a holder for a plurality of coins in stack relation, a cyclically movable element on said supporting plate extending beneath said base and provided with a plurality of coin receiving recesses adapted to register with the openings in said base for receiving coins from the respective coin holders and

also to register with the passage in the plate for depositing the coins through said passage, a motor means, mechanism operable by the motor means for actuating said element, and a plurality of assemblies adjacent the edges of the element for maintaining the plate in the base in spaced relation to provide room for the element, each assembly comprising a first washer means located at the side of the plate toward the base and being thicker than the element and clear of the adjacent edge thereof, a second washer means located at the side of the base toward the plate and overlapping the adjacent edges of the element, and fastening means for retaining the first and second washer means between the plate and the base, said washer means cooperating with the sides of the element to guide said element in its cyclical movement.

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