Fig. 7.

Fig. 8.

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This invention relates to coin stacking and dispensing machines of the type used for delivering a predetermined number of coins, and is an improvement over the machine disclosed in my prior application, Serial No. 205,110, filed January 15, 1951, for Coin Dispensing Machine, now Patent No. 2,644,470, issued July 7, 1953.

In coin dispensing machines of the type which utilize a rotatable pocketed disc, difficulty is encountered by reason of (a) the cocking of coins in the pockets of the rotating disc, whereby they are prevented from dropping into coin discharge chutes when the pockets containing the cocked coins are brought into register with the mouths of the chutes; (b) the lack of self-adjusting deflector and guide means for the conjoint deflection of cocked coins and the introduction of properly pocketed coins to the mouths of discharge chutes; (c) improper design of coin chutes delivering coins into stacking tubes whereby coins may be cocked in the chutes, thus preventing further delivery of coins to the stacking tubes; and (d) complicated switch mechanisms used to control the delivery of coins into the stacking tubes.

The improvements of the present invention comprehend a coin dispensing machine of improved design, and characterized by means preventing the cocking of coins in the pockets of the rotary disc, as well as by novel wobbler deflector and guide means assuring the proper seating of coins in the rotary disc pockets and their discharge to a specially designed delivery chute for the stacking tube, the tube incorporating a switch member of novel design at the top thereof and in the line of discharge from the chute, whereby when the tube is filled with coins, a succeeding coin delivered from the chute is directed against the switch member, thereby opening the motor control circuit and stopping the further delivery of coins to the tube.

It is, therefore, an object of my invention to provide an improved coin dispensing machine which is wholly automatic in operation, of rugged construction, and so constructed and arranged as to be substantially fool-proof, and capable of practically unlimited use without requiring servicing or overhauling.

Another object of the invention is to provide an improved machine for automatically stacking coins of like denomination, and including means for dispensing predetermined numbers of coins.

It is also an object of my invention to provide a coin dispensing machine in which coins are automatically stacked, and from which they can be manually dispensed in predetermined unit quantities.

Other objects of the invention include anti-cocking means and improved chute delivery means for handling coins, as well as stacked coin-operated switch control means for stopping and starting the driving motor of the assembly.

With these and other objects in view, which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements, comprising my invention, may be varied in construction, proportions and arrangement, without departing from the spirit and scope of the appended claims.

In order to make my improved invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect, without limiting the improvements in their useful applications to the particular constructions, which, for the purpose of explanation, have been made the subject of illustration. In the drawings, like numerals refer to similar parts throughout the several views, of which

Figure 1 is a perspective view of an encased machine; Fig. 2 is a longitudinal section taken on line 2--2 of Fig. 1, and showing the orientation of the coin stacking tube and subjacent dispenser with respect to the hopper, coin distributor, and driving motor with switch controls; Fig. 3 is a longitudinal section, taken on line 3--3 of Fig. 2, showing the upper half of the coin distributing disc, the anti-cocking means, the coin delivery chute, coin stacking tube, and coin dispenser; Fig. 4 is a diagonal cross-section, taken on line 4--4 of Fig. 2, showing the coin distributing disc and rocker-mounted wobbler plate and guide means; Fig. 5 is a vertical section, taken on line 5--5 of Fig. 3, showing the anti-cocking means in association with the wobbler plate; Fig. 6 is a vertical detail section through the junction of the coin chute and stacking tube, and showing the novel control switch and mounting; Fig. 7 is a plan view of a modified coin discharge mechanism; Fig. 8 is a vertical section taken on line 8--8 of Fig. 7, and showing the elements of the coin discharge mechanism of Fig. 7; Fig. 9 is an exploded view of the elements of the modified coin discharge mechanism of Fig. 7; Fig. 10 is a plan view of the modified coin depressor of Figs. 7--9, and Fig. 11 is a vertical section, partly in elevation, taken on line 11--11 of Fig. 10.

Referring to the drawings, the novel coin stacking and dispensing machine herein is provided with a removable, box-like casing or cover, designated generally by the numeral 10, formed from sheet metal, or of any other suitable material. The cover includes a front panel 11, having a fenestrated opening 12 mounting a viewing glass; side walls 13, 14, severally provided with bottom extensions, 13', 14'; a rear wall 15; and an apertured top 16, having a hopper opening 17, and a toggle switch opening 18. The rear wall and side wall extensions extend downwardly over the back and adjacent side sections of a base 21 of a machine supporting structure 20, and are secured in place thereon by means of screws 19. Desirably, a protective metal strip 22 is fastened to the front and sides of base 21 by screws 21b. The supporting framework of the device is designated generally by the numeral 20, and is comprised of a relatively thick base member 21, desirably of wood; side wall members 22, 23, having their lower portions conform to and masked by the lower portions of side walls 13' and 14' of the cover; a back wall 24 joined to the rear edges of the side walls; a bottom platform 25 secured to and between the side walls, immediately above the lower extensions thereof, and having its rear edge resting on and secured to the top of back wall 24; a coin hopper-supporting platform 26, disposed at an angle of substantially 30° to the horizontal, and secured on and between the tops of side walls 22, 23, the upper edge of member 22 being in a lower horizontal plane than the top of member 23, and the tops of both said wall members being beveled at an angle of about 30°, to prop-
erly orient the platform 26. The side walls and back walls are secured to the base in any suitable manner, as by screws 27. If the structural framework is made of metal, the parts thereof may be secured by welding, machine screws, or rivets, as desired. It will be seen (Figs. 2, 3 and 5) that the top of casing 10 extends well above the top of the supporting framework 20, to accommodate the height of the coin distributing mechanism. The front edge of platform 26 is recessed, as indicated at 28, to receive the coin chute and switch control mechanism, to be described more in detail hereinafter. A circular platform or raised hopper support 29 is fixedly secured to the top surface of platform 26, and is provided with a front recess in register with recess 28 of the platform, as shown. For purposes of convenience the conjoined recesses will be designated generally by the numeral 28.

The hopper assembly 30 is comprised of a bottom collar 31, conforming to and detachably secured on and over the periphery of circular hopper support 29 in any suitable manner. A perpendicular hopper casing or wall member 32 has a bottom edge 33 conforming to the upper edge of collar 31 and permanently secured thereto, as by welding. The horizontally disposed upper edge 34 of member 32 is received beneath, and masked by the depending skirt 16a of hopper opening 16 of cover 10. The entire wall of collar 31 is provided with a semicircular or skirt 35 welded thereto subjacent the deepest portion of hopper wall 32. A canted coin-deflector strip 36 extends into the hopper chamber and is secured to the hopper wall immediately above the center of member 35.

The coin distributing mechanism is comprised of a metal plate 40, conforming to and secured on the surface of hopper support 29, by any suitable means, such as screws 41, and a rotatable, conformed disc 50, mounted thereon and therebelow. The member 40, which may be formed from steel, or other suitable wrought and abrasion resistant material, is circular, as shown, and is centrally apertured at 42 to receive the hub 51 of superjacent conformed circular disc 50. The hub 51 is secured to the disc by rivets 52, or other suitable securing means, and receives shaft 53 of motor 54, which is coupled to the shaft through reducing gear assembly 55 secured to the underside of platform 26 by screws 56, or the like. A fan 57 is mounted on the bottom end of shaft 53, and serves to cool the interior of the machine. A series of equispaced peripheral pockets 58 is formed in the disc 50. These pockets are circular and their centers lie on the base circle which is concentric with the disc. The pockets 58 are essentially circular apertures, slightly larger than the coins which are to be handled, which apertures coast with the subjacent plate 40 to form the desired coin holding pockets. The disc 50 is in frictional contact with the surface of the base plate 40, but owing to the relatively slow speed of the disc, there is no need of lubricating the contacting surfaces. It is to be noted that the bottom, skirted portion 31, of the hopper fits over both the plate 40 and the conformed superjacent disc 50, and that there is a minimum of clearance between the hopper and these members.

It will be seen that the plate 40 and coating disc 50 are mounted at an angle of 30° to the horizontal, which angle has been found to be the critical angle of repose of the coins to be handled, in this instance, nickels. Assuming the section line 5—5 of Fig. 3 to be a North-South axis, and the section line 3—3 of Fig. 2 to define the East-West axis of the platform 26, the plate 40 is provided with a coin-receiving peripheral recess 43 lying halfway between the North-West axes, that is at about an angle of 135° from the East axis. A particular feature of this improved coin stacking and dispensing machine, is the provision of anti-coin cocking means. To effect this desirable result, the upper (North) surface of plate 40 is provided with a series of convergent grooves 44, converging to a point in advance of recess 43, which is provided with a beveled entering edge 45 (Fig. 6). The grooves 44 radiate inwardly from the periphery of plate 40 (between 60° to 90° in quadrant 1) to the point of convergence, about 105°, as seen in the showing of Fig. 4. The North-South and East-West axes have been indicated on Fig. 4 to assist in the orientation of the anti-cocking grooves 44, as well as the coin-discharge chute 46. A series of coin-discharge chutes 46 is subjoined to the plate 40, beneath the recess 43, and extends in a line at right angles to the East-West axis, up to that axis, as shown in Fig. 6, to discharge into the coin-stacking tube, to be described more in detail hereinafter.

In a coin stacking and dispensing mechanism of the character herein described, it is of prime importance to insure automatic and positive delivery of the coins from the coin distributing mechanism into the coin stacking tube, in such a manner as to prevent any misalignment of the coins during their travel, or any jamming of the feeding mechanism due to cocking of the coins in any part of the apparatus. The coins delivered by the peripheral pockets in the disc 50 to the discharge chute 46, are positively fed into the latter in the following manner: A guide member 60, of metal, has a relatively thick body portion 61, with top and bottom surfaces, 62, 63, respectively, an inside edge 64, and a trailing edge 65 formed to each other; and an outside, curvilinear edge 66 conformed to the inner surface of member 31 of the hopper, secured thereto by suitable screws 60a, as shown in Figs. 2 and 4. The forward edges of the sides 64 and 66 are joined by a forward edge or face 67. A central longitudinal slot 68 is formed in the body of member 60, as shown, and the upper face 62 is grooved forwardly of the slot, as indicated at 69, Fig. 4. The member 60 mounts a biasing spring 70, of spring wire, having a main, depending loop on body section 71, received in slot 68, and depending below lower face 63, of the guide, and resiliently front and rear sections, 72, 73, respectively. The section 73 of the spring is received in the groove 69 of support 60, and locked therein by leaf springs 74, having a depressed forward end 75, whose function will be advertised more in detail hereinafter. The spring 74 is secured in place on member 60 by machine screws 76, or the like, tapped into suitable apertures, not shown. The trailing end 73 of spring 70 is biased downwardly against a transverse stop member 77, secured in and across the spaced segments of rear face 65 of support 60. A limit stop member 78 is secured transversely across the middle section of slot 68, and serves to prevent the unscrewing of the body section 71 from the disc 50, in the following manner. The trailing end 73 of spring 70 is biased downwardly against a transverse stop member 77, so that the forward edge of any coin approximating the recess 43 will be positively pushed down into the chute, and delivered to the coin stacking tube subjacent the discharge end of the chute.

A special feature of the invention herein is the anti-coin cocking and rejection mechanism which kicks out improperly seated or cocked coins from the advancing pockets of the distributor disc and returns them to the hopper, wherein they fall to the bottom and are returned to the periphery of the disc 50 to be seated in the pockets 58, and again, and properly, opposed to the discharge chute. This mechanism is comprised of two cooperating elements: the first of these elements is comprised of the specially oriented, convergent grooves 44, described in detail hereinafter, and the second of these elements bears the specially mounted wobble 80 hingedly secured to the hopper wall section 31, in advance of the coin guide mechanism 60—70. The member 80 comprises a flat-topped body 81 having a depending inboard skirt 82, provided with a looped forward extension 83. The outboard edge 84 of the top 81 is curvilinear, and generally parallel to the axis of hopper section 31. The wobble plate 80 is adapted to swing outboard of the wall 31 in the following manner: the trailing edge 31b, of an aperture 31c, formed in
hopper wall 31, serves as a vertical, knife edge pivot. This aperture is continued, counterclockwise, in the said wall to form a curvilinear slot 31d, terminating at the junction of forward face 67 of member 60 with the inner surface of hopper wall member 31. The slot 31d is adapted to receive the curvilinear edge 34 of member 80. The upper surface 81 of stop member 85 is secured to, of formed integrally with the outer, curvilinear edge 34, which stop member is adapted to engage the outer surface of wall 31, immediately below the slot 31d. The member 80 is conjointly biased into its pivoted position and seated in place inside the hopper 30, in the following manner: the forward extension 83 of skirt 82 is bent back on itself to form a loop 83a, and its terminal edge 83b is disposed outside of the wall 31 and at a slight distance therefrom. A lug 86 is secured to the outer surface of wall 31, beneath the trailing edge of slot 31d, and a tension spring 87 is secured by and between lug 86 and terminal edge 83b of member 80, whereby the latter is positively pivoted and simultaneously spring biased into position in the hopper 30, immediately in advance of the guide member 60. The trailing portion of wobbler plate surface 81 is biased downwardly by the forward edge 25 of leaf spring 74, described hereinabove. This positive downward biasing of member 80 causes the bottom edge of skirt 82 to be seated against and engage the aposeed upper surface of counterclockwise rotating disc 50. The member 80 not only has a limited horizontal radial movement about the pivot 31b, but it also has a limited vertical radial movement about the same pivot, by virtue of the fact that the latter is essentially a knife edge pivot, and that loop 83a is merely aposed thereto by a spring-biasing member, and is not hingedly connected thereto. This mounting permits the plate 80 to rock about its pivot, or "wobble," as such action is known in the art.

Because of its wobbling action, the plate 80 can be displaced, to a limited extent, both vertically as well as horizontally, by coins riding on top of the distributor disc 50, or locked in the pockets 58 thereof. Coins which merely ride along the surface of disc 50 and engage skirt 82 of the deflector, are deflected back on the downwardly sloping surface of the disc and slide to the bottom of the hopper. Coins which are locked in the pockets are carried along into engagement with convergent grooves 44 in plate 40, subjacent the pockets, and are moved therealong into edgewise engagement with skirt 82 of deflector 80, causing the latter to swing outwardly against the bias of tension spring 86. The bias of spring 86 is sufficient to overcome the outward push of any coin riding in one of the grooves 44, so that the coin is automatically unseated from the groove by the inwardly biased skirt 82. This action has been observed to be relatively rapid, so that the coins are kicked out of the grooves 44, rather than merely pushed out or shunted aside. As noted, this section action has been observed in many hours of continuous testing, and there has been no jamming of the device due to failure of this mechanism. Coins normally seated in the pockets will be carried under member 80, clearing skirt 82, and will be discharged into chute 46.

The coins received in downwardly sloping chute 46, are discharged therefrom into a coin stacker 90. This device comprises a tubular body 91 having its lower end 92 seated in and flush with the bottom of a suitable aperture in platform 25 of the framework. The upper end 93 is received in recess 28 of the hopper platform support, and has its top edge beveled to engage the under surface of plate 40. The side walls and bottom of chute 46 are conformal to the upper end of the tube, and the latter is secured to the chute by an angular bracket 94, clamped to the tube by ring clamp 95. The tube is provided with a cut-out 96 at the lowest portion of the top beveled edge, which cut-out lies in the longitudinal central axis of the chute 46, and is adapted to receive the actuator of an automatic switch control, to be described more in detail hereinafter.

The bottom of the coin-stacking tube is formed by the flat, elongated base of a U-shaped bracket 100, having laterally flanged side arms, securedly secured to a supporting plate 101, which is attached to the bottom platform 25 by screws 102. Adjacent its forward edge, the bottom of the U-bracket is provided with an aperture 103 (Fig. 3) whose rearmost edge lies in front of the transverse longitudinal axis of tube 90. The bracket 100 and plate 101 conjointly form a slot adapted to receive coin-dispensing slide 103a having a rearwardly disposed, L-shaped hand pull 104, secured to the slide by screws 105, and a coin-receiving member 131 secured to adapt with dispensing aperture 103. A tension spring 106 is connected to the rear of the slide, and to a hook or screw 107, at the rear of platform 25, as shown, and serves to bias the slide backwardly against the forward edge of a stop member 108.

The member 108 is secured to the bottom of platform 25 by screws 109. The slide, as noted, is provided with an aperture 103b of the same internal diameter, and in register with the bottom 92 of tube 90. Section 92 of tube 90, desirably, may be fixedly secured to or made integral with plate 101, which is apertured to conform with the tube and with slide aperture 103a. The slide 103a is of a predetermined thickness, and is designed to hold a selected unit quantity of coins. In the instant case, where the device is designed to dispense nickels, the recess 103b in slide 103a will hold five coins, that is the change for a quarter.

The coin stacking mechanism of the improved device herein is designed to operate automatically. To this end, it is desired to automatically stop and start the motor controlling the distributing disc 50 when the coin stacking tube is filled, and when it is depleted below the filled level. In other words, the coin stacking tube herein is intended to be kept filled at all times, and to be automatically replenished from the hopper. The control mechanism is designed generally by the numeral 110 and comprises a main switch 111, desirably of the toggle type, mounted on bracket 112 which is suitably secured to the upper portion of side wall 23 of the framing and supporting structure 20. The switch 111 extends through the top of the cover, as shown. Current leads 113, 114, are respectively connected to the switch 111, and to one terminal 115 of motor 54. The other terminal 116 of the motor is connected to the other terminal of main switch 111 through leads 117, 118, which are interconnected through a tell-tale lamp 119 mounted on the platform 25, in back of the window 12, and its terminals are shunted across lines 114, 117, as shown in Fig. 2. It will be seen that when the motor circuit is closed, the lamp 119 will be lit, thereby warning the attendant.

The automatic switch mechanism, designated generally by the numeral 120, will now be described: An insulating clamp 121 is secured on and about coin stacking tube 90, and mounts an insulated switch block 122 in which are spacedly secured the upstanding spring arms, or armatures 123, 124. These armatures have depending portions which are severally solenoided or otherwise electrically coupled to current leads 117, 118, as indicated at 125, 126, respectively. At their upper ends, the armatures 123, 124, are severally provided with contacts 127, 128, which are normally apportion in circuit closing relation due to the mutually opposing spring bias of the armatures 123, 124. In the closed position of this switch, the main switch 111 controls the operation of the motor. To provide for automatic control of switch mechanism 120 by the coins in the coin stacking tube, a switch actuator 130 is used. This member comprises an inverted, generally L-shaped insulating member having its vertical arm 131 secured to the upper portion of armature 124, in any desired manner. The
shorter, transverse leg 132 of the actuating member 130, has its upper surface subjacent the plate 40, and generally thereto. The leg 132 extends into the upper end of tube 90, through a conformed slot or cut-out 96, described hereinafter. The end of member 132 is specially formed to insure the maximum quickness of response and smoothness of operation of switching mechanism 120, as controlled by the height of coins stacked 90, as previously described. To this end, the end face of member 132 is provided with a relatively short vertical section 133, and a subjoined beveled section 134, whose bottom edge is flush with the horizontal bottom edge 135 of the actuator. The beveled section 134 of the end of the actuating member 132, as shown in Figs. 2 and 6, is so constituted and arranged as to have its median section substantially overlie the bottom edge of slot 96, when the switch mechanism 120 is in normally closed condition. By virtue of the slope of face section 134, the leading edges of coins discharging from chute 46 into tube 91 of the coin stacker 90 will clear the actuator, and the coins will drop properly into the tube. When the topmost coin of the stack is on a level with the bottom of slot 96, it will be seen that the next succeeding coin will have its leading edge slidingly engage the top surface of said topmost coin, and will slide forward into engagement with the actuator 130, forcing the leg 132 out of slot 96, and thereby breaking the contact between armatures 123, 124 of the switch mechanism 120. With the opening of this switch, both the motor and tell-tale lamp circuits are broken, and the operator is on notice that his coin stack is full. When the next quota of coins is delivered from the stack, usually five coin units, the level of the topmost coin in the stack will drop, thereby releasing the switch-opening bias on the switch actuator 130. The switch armatures will then reposition and close the motor circuit, and the distributor disc will feed coins from the hopper to the coin chute 46 until tube 91 is again filled to its predetermined level, when the cycle will be repeated.

The modified coin distributing mechanism illustrated in Figs. 7–11 will now be described: In this form of the invention, the modifications are concerned with variations in the anti-coinc mechanism, and in the coin guides and chute elements, all as incorporated in a coin dispensing device of the general character hereinafter described.

In this modified form a specially conformed hopper support 150 is secured to the hopper supporting platform 56 previously described, as shown in Fig. 7. The support 150 is generally circular and is centrally apertured to receive the shaft 53 of the driving motor. The member 150 is formed with a peripheral cut-out having a chordate side 151 and a non-radial short side 152 at right angles thereto. The opposite or free end of side 151 terminates in a radially outward extension 153. A second chord 154, extends at an obtuse angle between chordate edge 151 and the periphery of the member 150. The chord 154 defines the inner edge of stepped depressions or marginal cut-outs 155, 156. The upper two of the sections, 155, has a generally radial edge 157 which form the inner edge of lower step or platform 156 whose free edge is formed by one end of side 151 of the cut-out and the radial extension 153. The cut-out section and steps platforms 155, 156 cooperate to receive and support the coin chute and its support, designated generally by the numeral 160. A metal member of dog-leg shape having a generally flat entrant or platform 161, which is inserted, angularly disposed, depressed discharge or chute section 162 integral therewith. The terminal edge of the bottom section 162 is cut out or scalloped, as indicated at 163, to conform to the mouth of coin dispensing tube 164, and depending sides 165, are welded to member 161, as shown, and forms the coin chute 162 therewith, all as noted above. The entrance to the chute and the discharge section thereof are generally conformed and are severally opposed to peripheral edges 154 and 151, respectively, of the hopper support 150. The member 160 is secured in place in the following manner:

A guide plate 170, of generally trapezoidal configuration, is provided with a rectilinear base or inboard edge, 171; a leading edge or side edge 172; a trailing edge 173, also at right angles to edge 171; and an outboard edge 174, parallel to edge 171, and joining sides 172, 173. The inboard side of the trailing edge section of the top of plate 170 is chamfered, as shown at 175, so that the portion of edge 173 which overlies platform 161 of the chute member is feathered to coincide therewith. A lateral spacer member 176, spacedly apertured, as shown at 179, is mounted on member 170, and is disposed at an angle to the chamfered section 175. The member 170 is provided further with apertures 177 adapted to receive flat head screws 178, which screws are received in registering apertures 158 in depressed platform section 155 of hopper support 150. Section 170 may be fixedly secured to coin chute section 160 by spot welds, indicated generally at 166. The chute assembly will be fitted in place at the periphery of the hopper support 150, and fixedly secured thereto by the screws 178.

The coin distributing mechanism of the modified form of the invention includes the usual, peripherally apertured disk 50, described hereinafter, with its coin-receiving pockets 58, and mounted for rotation on and with shaft 53 of the driving motor. A centrally apertured metal plate 180 is conformed and fixedly secured to hopper base 150 by flat head screws 181 passing through apertures 182, and engaging registering apertures 158 in the base. Plate 180 has an angular peripheral cut-out with a short side 183 conformed to and in register with edge 151 of member 150, and a long side 184 extending inwardly in register with edge 154 of the said base member. A pair of generally converging chordate grooves 185, 186, are formed on the surface of member 180 and extend from the approximate middle section of long side 184 of the cut-out to the periphery of the plate, as shown. It will be seen that with rotating coin-distributing disk 50 opposed to plate 180 and in sliding frictional engagement therewith, the disk will slidingly engage the upper face of member 170 and the co-planar top surface of the cover 164 of the coin chute, whereby coins moved counterclockwise in the pockets 58 of rotating disk 59 are directed upwards towards the plate 180, which ride with the downwardly sloping, trailing surface 175 of member 170, and will be directed into the chute 160, to be discharged thence into the coin-distributing chute 90. The positive delivery of the coins into the coin chute is accomplished in the following manner:

As will be seen from the showings of Figs. 7 and 9, the short side 174 of the member 170, and the spacer 176 mounted thereon lie outside of the coincident peripheries of coaxial members 150, 150, and 50. A depressor support, designated generally by the numeral 190, is mounted on and secured to member 176, and extends inwardly of the coincident periphery of the coin-distributing means described immediately above. The depressor support includes a specially shaped base plate 191, having a long edge or side 192, a parallel, short edge 193, an end edge, with an angular jog or cut-out 195, and joining sides 192, 193, a short, angularly disposed end portion 196 at the other end of side 192, and a long end portion, or edge 197, joining short side 193 and end section 196. The member 190 is provided with a pair of spaced apertures, 198, adjacent the side 193, and with an elongated slot 199, extending from the edge 194 inwardly toward, and offset from the center of the member, at a slight angle towards the edge 193. The apertures 198 are adapted to register with apertures 179 in member 176, and with registering, tapped apertures in subjacent member 170,
not shown, whereby members 176 and 190 are fixedly secured in place on member 170 by means of machine screws 198a. The coin-depressor mechanism is designated generally by the numeral 200, and is comprised of a pair of coacting levers 215, severally mounted on pivots, and lying in slot 199 of the depressor support. The first toggle member 201 is pivotally mounted at one end of its upper, generally rectangular top section 202. The member has a subjoined, integral polygonal section 203 with a flat top edge 204 and an obtusely angled bottom with a leading edge 206. The member is dimensionally 207 comprises a generally U-shaped member threaded through an aperture adjacent the leading edge of the top section 202, the legs of the U being adjustably clamped between plate 190 and washer 208 by machine screw 209 in threaded engagement with a suitably threaded hole in plate 190, as shown in Figs. 10 and 11. It will be seen that the member 201 can be advanced and/or retracted in slot 199 of member 190 by a distance corresponding to the length of the parallel legs of the U-member 207. The bottom or transversely angular edge thereof is adapted to engage plate 190 and to be lifted out of engagement therewith when its leading edge is engaged in the trailing edge of a pocket 50 of the counter-clockwise rotating coin-distributor disk 50.

The second toggle member 210 is pivotally mounted on pivot 211, the ends of the pivot being adjustably clamped against plate 190 by clamping members 212, 213, severally unilaterally slotted, as shown at 214, 215, and cured in place by screws 216, 217, tapped into plate 190. The clamping members are movable with respect to the clamping screws, whereby the toggle member 210 can be shifted in and along the slot 199 of base plate 190, as will be described more in detail hereinafter. The member 210 is made of metal and is so constructed as to provide an edgewise mounted toggle member having a flat top 218, an inwardly sloping trailing edge 219, a bottom edge 220, parallel to the flat top edge 218, and a pair of ascending steps 221, 222, parallel to the top and mutually separated by obliquely sloping risers 223, 224, the section 222 forming a trailing finger or bearing member 225 with the top edge 228. The pivot 211 is mounted in the oblique angle formed by and between step 221 and riser 224, so that the member 210 is pivoted off-center, as shown in Fig. 11.

The construction of the toggle mechanism of the coin-depressor is relatively simple. Referring more particularly to Figs. 7 and 11, it is to be noted that the leading edge 205 of the bottom toggle member 201 overlies the chamfered trailing end section of the top of plate 170, so that a coin carried beneath member 201 by a pocket 50 of distributor disk 50 will be automatically pushed down onto the chamfered end section of plate 170, which section acts as a sloping entrant to the coin chute 160. When the disk 50 continues with its counter-clockwise rotation, the beveled edge 205 of the depressor toggle member 201 is engaged by the trailing arcuate edge of the coin pocket which has just discharged its contained coin into chute 160. The edge of the coin pocket raises member 201 up and the bottom edge 220 of member 210 is forced into the previous pocket. By this action, the second toggle member has its bottom surface 220 positively forced into bearing engagement with the subjacent inter-pocket web 225. The now empty pocket, is moved beneath member 210, the support of the plate 50 is withdrawn from the bottom edge 220 of the second toggle member, and the bottom thereof drops into the empty pocket, whereby the toggle member 210 tilts downwardly about its pivot, thereby releasing the biasing pressure of the toggle member 201 is again tilted upwardly by the advancing inter-pocket web of the next pocket, to be forced downwardly against the coin in the next succeeding pocket, when the now trailing inter-pocket web is slidingly engaged and cleared by the trailing bottom edge 206 of member 201. The downward movement of member 201 positively projects a subjacent coin from its pocket onto the chamfered chute entrant, whence it falls by gravity through the chute 160 and into the coin-dispensing tube 90.

The modified coin-distributing and chute feeding mechanism, described immediately above, is mounted at the desirable slope of 30° to the horizontal, as is the case with the form shown in Figs. 1-6. The coins are discharged through the coin chute 206 in the same manner. A further modification of the invention herein concerns the special coin knock-out mechanism for returning cocked coins to the coin hopper from the coin distributor plate, which kick-out mechanism will now be described:

A metal band 230, shown in fragmentary view in Fig. 9, encircles the periphery of the hopper base 150 and the concentric, superjacent bearing plate 180 and coin distributor disk 50. The band 230 is secured to the hopper base by screws 231 received in suitable apertures 232 in the band. The band is cut away on its bottom edge, as indicated at 233, to permit jog 193 of member 190 to extend therewithin, so that member 190 may be vertically manipulated from the outside of the band. A second notch 234 serves as a restraining guide for a lug 243, formed on the top surface of the coin kick-out member 240, to be described more in detail hereinafter. A third notch edge 235 serves as a knife edge pivot for the kick-out member. The kick-out member is of generally jack-boot shape having a bellied upper leg portion 241; a curvilinear top edge 242, conforming to the edge 196 of member 190; an ankle portion having a superposed guide lug 243; a foot 244; a notched heel 245; a stub toe 246, apertured at 247 to receive a pivot pin 248; and an aperture 249 adjacent the heel notch 245. The heel notch is engaged with its pivot 235 and is spring-biased therewith against tension spring 236 having one end secured in aperture 249 and the other end secured to a pin 237, desirably mounted in the hopper bottom. A stop member 246a is secured to the hopper base and serves to limit the movement of the kick-out board of the hopper wall in response to the biasing action of tension spring 238 which is secured at one end by pivot pin 248 and at the other end in aperture 239 of the hopper wall. The inboard edge of member 240 generally overlies the inner contour of the deflecting member 244 so that any cocked coin riding in either of grooves 185, 186, will shoulder member 240 outboard against the bias of spring 238, until the coin rides up out of the groove, when the biasing spring will snap member 240 back into its inboard position, whereby the coin will be kicked out into the coin hopper.

The kick-out plate 240 is prevented from vertical displacement by a spring-biased hold-down 250 in the following manner: The hold-down is a flat sheet metal member having a rectangular portion 251 transversely curved, as shown at 252. The member is continued inwardly, at an obtuse angle, so that its inner leg 253 normally overlies and coincides with inboard edge 192 of member 190. The outboard edge 254 normally lies adjacent and is generally conformed to hopper wall member 230. The edge 253 forms part of an inner, elongated arm 255, while the edge 254 is inwardly offset to form finger 256 which normally abuts against subjacent member 190 on member 190. The body portion of member 250 is provided with an oversize aperture 258 adapted to overlie and register with tapped hole 259 in member 190, and to receive round head screw 260 which is threadedly engaged in the hole 259. A compression spring 261 fitted over the shank of screw 260 serves to keep curved bearing section 251 of hold-down 250 in spring-biased bearing engagement with the trailing end of kick-out plate 240, thereby preventing the latter from being vertically displaced during the operation of the machine. Because of the loose
mounting of member 250, the latter can be horizontally displaced to a slight degree, but is effectually restrained in its operative, hold-down position in bearing engagement on and with kick-out plate 240.

It will be seen that with the improved devices of the present invention, the stacking of coins for delivery in predetermined numbers, is made wholly automatic, and merely requires an attendant to displace the plurality of coins into the hopper, snap on the main switch, and let the novel machines herein take care of keeping the dispensing mechanisms charged with coins to be dispensed, which coins are delivered in selected quantities, and do not require counting, or any other treatment involving the handling of individual coins.

There have been described and illustrated devices capable of performing all of the specifically mentioned objects of this invention, as well as others which are apparent to those skilled in the art. Various uses of the present invention may be made employing the described structure. Accordingly, it is apparent that variations as to operation, size and shape, and rearrangement of the elements may be made without departing from the spirit of the invention. Therefore, limitation is sought only in accordance with the scope of the following claims.

What I claim is:

1. In a change-making machine of the character described, having a coin-storage tube with a subjoined slide dispenser, a coin-feeding chute discharging into the storage tube at an angle greater than the angle of rest of the coins being handled, a coin hopper having an angularly disposed bottom member, driving a motor-driven, peripherally pocketed coin distributor disk, wherein the pockets are sequentially brought into register with the coin-feeding chute and coins carried by said pockets drop into the coin chute, and normally closed switch means in and controlling the motor circuit, the switch means being mounted at the top of the coin-storage tube in line with the coin chute and movable to open circuit position when the said tube is filled with coins, the improvements comprising coin-depressor means, mounted in the hopper superjacent the entrance to the coin feeding chute, constructed and arranged whereby coins apportioned to said chute entrance are forced downwardly into sliding engagement with the chute, said coin-depressor means comprising a toggle mechanism support member secured to the bottom of the hopper, said support member having a slot therein overlying the entrance to the coin chute, a pair of coacting toggle members pivotally mounted on the support, one of the toggle members being pivoted at one end thereof and having a subjoined polygonal shaped portion extending into the slot of the support member in line with the entrance to the coin chute, the other of said toggle members being pivotally intermediate of its leading and trailing edges, the leading edge thereof overlying the top of the subjoined portion of the first toggle member, whereby said subjoined portion is forcibly moved downwardly of the slot into a distributor pocket by the overlying leading edge of the second toggle member by the advancing inter-pocket webs of the rotating coin distributing disk.

2. Change-making machine according to claim 1, characterized by the fact that radially convergent grooves are formed in the angularly disposed hopper bottom and generally convergent on the coin chute entrance, whereby cooked coins carried by the pockets of the coin-distributor disk on and over the subjacent hopper bottom are engaged by and advance in said convergent grooves, and are kicked out of said grooves into the coin hopper by the trailing inter-pocket web of the said disk.

3. Change-making machine according to claim 1, characterized by the fact that radially converging grooves are formed in the angularly disposed hopper bottom and generally convergent on the coin chute entrance, and pivoted, spring-biased coin kick-out means is mounted in the hopper wall and over both the coin-distributor disk and the said converging grooves subjacent thereto, whereby cooked coins carried by the pockets of the coin-distributor disk are engaged by and advanced in said convergent grooves, against the spring bias of the kick-out means, initiated partially by displacing said means about its pivot, and are kicked out of said grooves into the coin hopper by the spring-biased coin kick-out means.

4. Change-making machine according to claim 3, characterized by the fact that the spring-biased coin kick-out means is generally flat plate member and swings outboard of the hopper wall, against the bias of its biasing spring, and spring-biased hold-down means is opposed to the top of said kick-out plate at the trailing end thereof.

5. Change-making machine according to claim 3, characterized by the fact that the coin kick-out means is pivoted in the coin hopper wall with its pivot point adjacent the coin chute entrance.

6. Change-making machine according to claim 4, characterized by the fact that the spring-biased hold-down means is mounted on the coin-depressor mounting.

7. Change-making machine according to claim 4, characterized by the fact that the hold-down means is fixedly secured to the coin-depressor mounting.

8. Change-making machine according to claim 6, characterized by the fact that the spring-biased hold-down means is laterally displaceable on the coin-depressor mounting and of the juxtaposed coin kick-out member.

9. Change-making machine according to claim 5, characterized by the fact that the coin kick-out means comprises a skirted plate member having an inboard rectilinear skirt with a leading finger portion bent on itself and opposed to a vertical pivot edge in the hopper wall to form a pivot for the kick-out, the outboard portion of said finger being normally biased inboard by a tension spring connected to the free end thereof, the other end of the spring being connected to the hopper wall adjacent the trailing edge of the said skirted plate.

10. Change-making machine according to claim 3, characterized by the fact that the coin kick-out means is pivoted in the coin hopper wall with its pivot point adjacent the divergent ends of the convergent grooves in the coin-distributor disk.

11. Change-making machine according to claim 10, characterized by the fact that the coin kick-out means comprises a flat plate member of generally jack-boot shape having a pivot edge in the hopped wall to form a pivot for the kick-out, the trailing edge or top of the boot being generally curvilinear and movable in juxtaposition to a conformed edge of the fixed plate mounting for the coin-depressor means; and spring-biasing means connecting the hopper wall and its base with the foot of said boot and operable to maintain the leg of said kick-out normally spring-biased inboard of the hopper wall.

12. Change-making machine according to claim 3, characterized by the fact that the spring-biasing means comprises opposed tension springs generally attached to the kick-out member immediately adjacent and outboard of the notch in the heel, and at the tip of the toe of said member, whereby the member is maintained positively opposed to its pivot by the first said spring, and is rotatable about the said pivot against the bias of the second said spring.

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