June 30, 1942. H. W. LORMOR 2,287,892

CHANGE MAKING MACHINE

Original Filed June 30, 1938 4 Sheets-Sheet 1

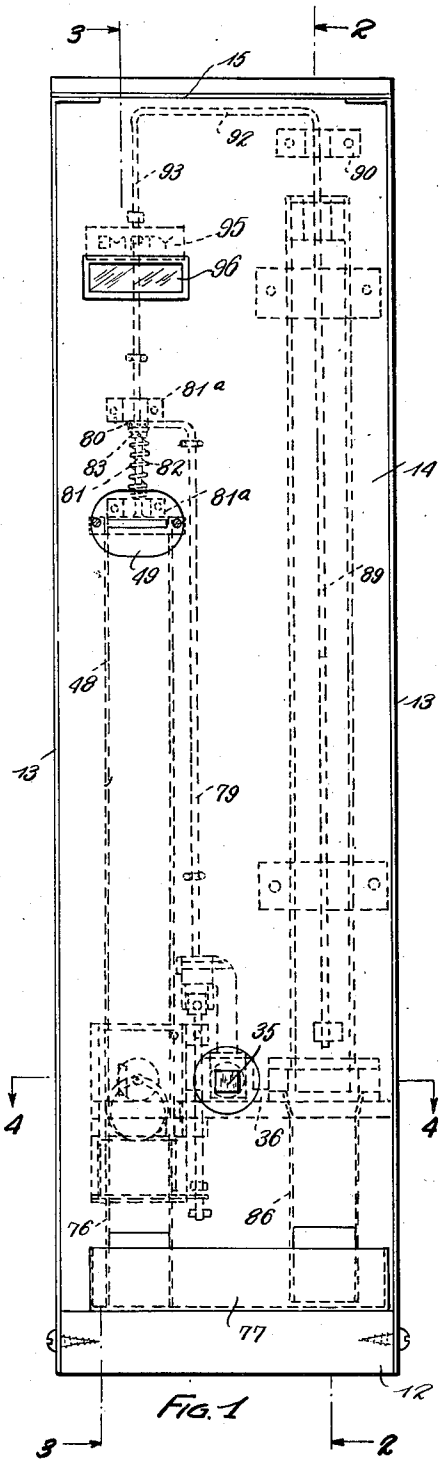


FIG. 1

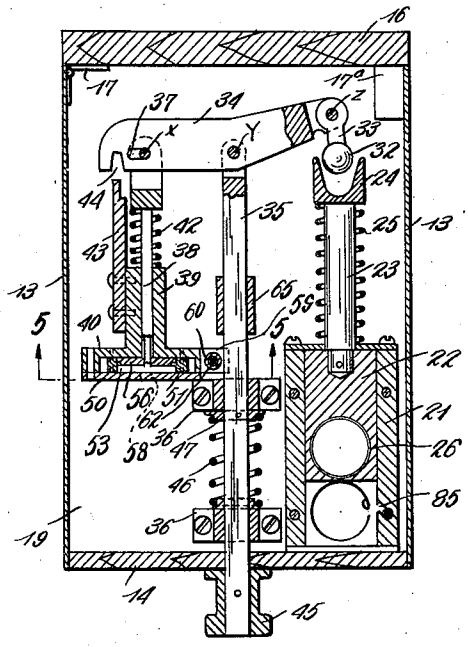


FIG. 4

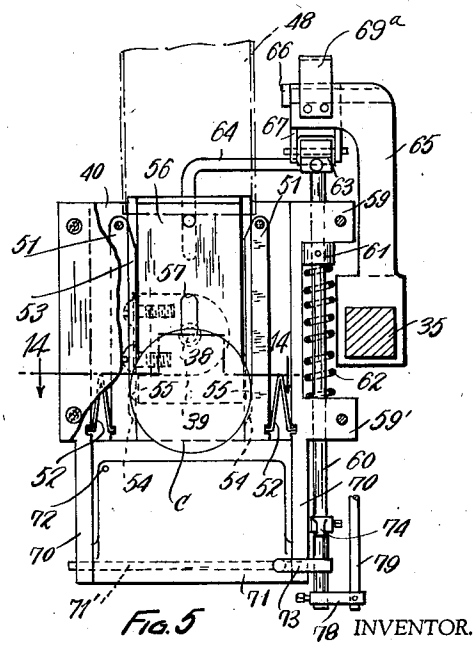


FIG. 5

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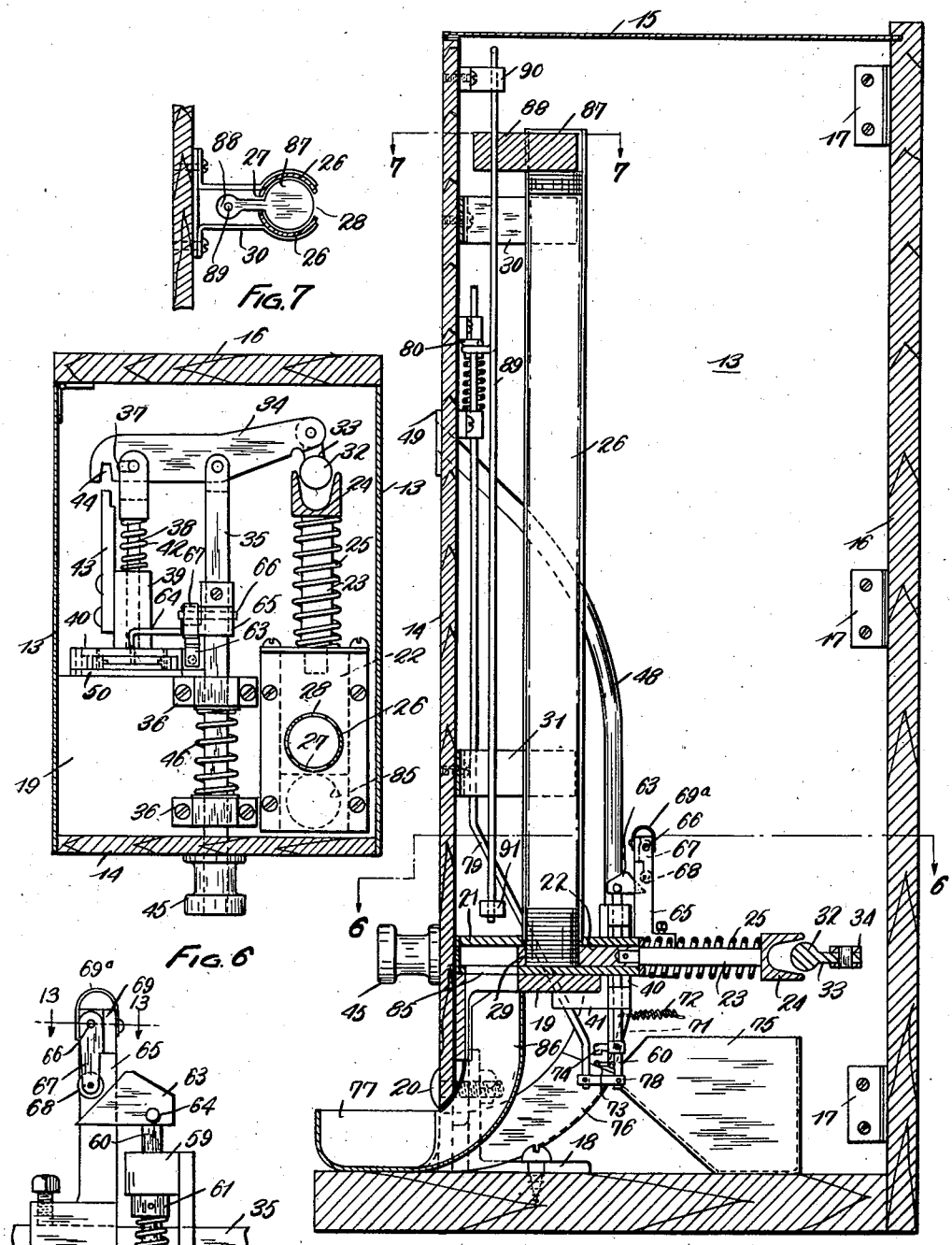


FIG. 2

FIG. 7

FIG. 6

FIG. 12

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CHANGE MAKING MACHINE

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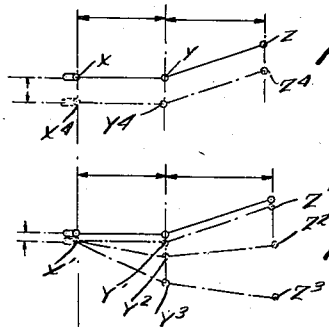


FIG. 10

FIG. 11

FIG. 3

FIG. 8

FIG. 9

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CHANGE MAKING MACHINE

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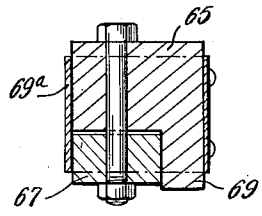


FIG. 13

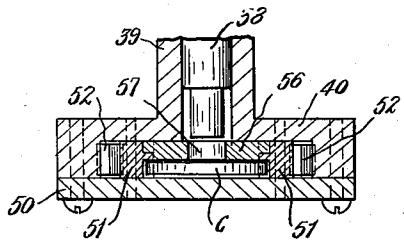


FIG. 14

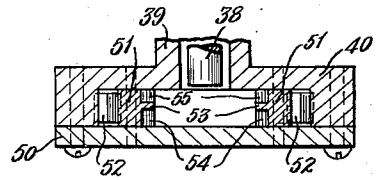


FIG. 15

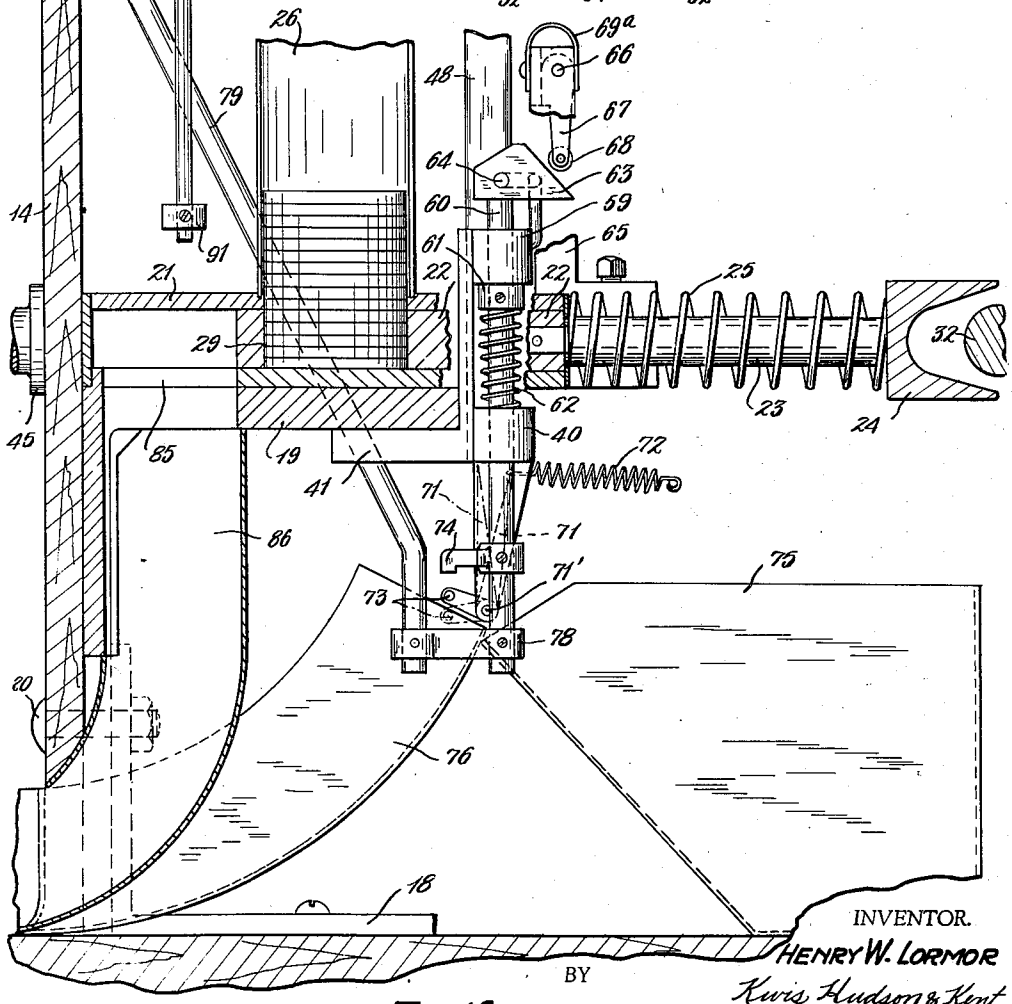


FIG. 16

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UNITED STATES PATENT OFFICE

2,287,892

CHANGE MAKING MACHINE

Henry W. Lormor, Cleveland Heights, Ohio

Substituted for abandoned application Serial No. 216,712, June 30, 1938. This application October 5, 1939, Serial No. 298,090

6 Claims. (Cl. 194—91)

This invention relates to improvements in change making machines, that is to say a machine for delivering a plurality of coins of a given denomination when a coil of higher denomination is inserted into the machine. In the particular embodiment herein disclosed the machine delivers five nickels when a quarter is inserted, but it may be adapted to changing two nickels for a dime, five pennies for a nickel, ten pennies for a dime, etc. The present application is a substitute for my prior application Serial No. 216,712, filed June 30, 1938.

One of the objects of the invention is the provision of a machine of the character stated which shall be relatively simple and yet capable of functioning accurately at every operation.

Another object is the provision of simple and effective means for returning to the customer coins of a wrong denomination which may be inserted into the machine and for preventing the introduction of any coin into the machine while the path to the coin box is open, or when the magazine in which are stored the coins to be delivered contains less than a predetermined minimum number of coins.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawings, in which

Fig. 1 is a front elevational view of a machine embodying the invention.

Fig. 2 is a vertical sectional view taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view looking in the opposite direction and taken substantially on the line 3—3 of Fig. 1.

Fig. 4 is a horizontal sectional view taken substantially on the line 4—4 of Fig. 1.

Fig. 5 is a fragmental detail elevational view on a larger scale, looking in the direction of the arrows 5—5 of Fig. 4.

Fig. 6 is a horizontal cross sectional view taken substantially on the line 6—6 of Fig. 2.

Fig. 7 is a detail sectional view taken substantially on the line 7—7 of Fig. 2.

Fig. 8 is a fragmental view corresponding to Fig. 4 but showing the operating plunger pulled forward when there is no coin in the chute.

Fig. 9 is a similar view showing the first stage of forward movement when there is a coin in the chute.

Figs. 10 and 11 are diagrammatic views indicating respectively different positions of the operating lever with no coin in the chute and with a coin deposited in the chute.

Fig. 12 is a detail elevational view of a slide bar operating means embodied in the machine.

Fig. 13 is a horizontal sectional view taken substantially on the line 13—13 of Fig. 12.

Fig. 14 is a detail sectional view taken substantially on the line 14—14 of Fig. 5.

Fig. 15 is a view similar to Fig. 14 but with certain parts removed in order to better disclose the construction.

Fig. 16 is a detail view taken at right angles to Fig. 5 showing the means for operating a coin deflecting gate which may be employed in connection with the invention.

In the drawings, wherein a single unit machine is illustrated, 12 is the base of a casing or cabinet in which the mechanism is housed. This casing comprises sides 13, a front wall 14, and a top 15 secured together by suitable means. The back 16 of the casing is preferably hinged at one side as by hinges 17, the other side being fastened by a lock indicated at 17*a*. In this manner the interior of the casing is made conveniently accessible.

On the base behind the front wall there is mounted a transversely extending angle iron 18 which assists in supporting another angle iron 19 that extends across the casing directly behind the front wall thereof, the horizontal leg of this upper angle iron forming a shelf upon which are carried certain parts of the mechanism. The vertical legs of the angles 18 and 19 are cut away at certain points to provide clearance for coin discharge chutes, as will appear hereinafter, and these vertical legs are fastened together and to the front wall of the casing by means of bolts 20.

On the shelf formed by the horizontal part of angle 19 I mount a shallow box 21 which forms a guide for a flat slide 22 which is slightly less in thickness than the height of the group of coins which it is the function of the machine to deliver at one operation, in this case five nickels. To the rear end of this slide there is attached a rod 23 with a ball socket 24 on its rearmost extremity. A coil spring 25 surrounding the rod and bearing at one end against the box 21 and at the other against the ball socket 24, tends to hold slide 22 in its rearmost position.

In the top of the box 21 there is a countersunk opening in which is received the lower end of a coin tube 26 which constitutes the magazine of the machine wherein are stored the nickels or other coins to be delivered to the customer. This tube is conveniently made in two pieces, as indi-

cated in Fig. 7, so that slots 27 and 28 are provided front and rear running the entire length of the magazine. In the slide 22 there is a round hole 29 which in the rearmost position of the slide registers with the interior of the magazine, and is normally filled with coins that descend into it by gravity from the magazine. The two parts of the magazine are supported intermediate their ends by brackets 30 and 31 secured to the front wall of the casing. These brackets have curved surfaces fitting the curved surfaces of the magazine, to which they may be welded or soldered if desired.

The ball socket 24 is adapted to be engaged by a ball 32 at the free end of a link 33 that is pivoted at one end of a lever 34. This lever is arranged to be operated by a plunger 35 which is rectangular in section, and which is pivotally connected with lever 34 near the middle of the latter, and is mounted to slide in bearing blocks 36 that are secured to the top of angle 19. The other end of lever 34 is provided with a slot 37 which receives a pivot carried by the bifurcated rear end of a pin 38 that is mounted to slide in the bore of a barrel 39 which forms an integral part of a bracket 40. This bracket has a front cover plate 50 that is provided with an ear 41 which extends beneath and is suitably secured to the horizontal leg of angle 19. A coil spring 42 urges pin 38 rearwardly, its rearward movement being restrained by its connection with lever 34. One side of barrel 39 is flattened in order to have fastened thereto a flat bar 43, the end of which is formed to fit within a notch 44 formed in the forward edge of lever 34.

A knob 45 is pinned to the forward end of plunger 35 outside the casing. A person operating the machine grasps this knob and pulls the plunger forward against the action of a coil spring 46 which bears at one end against the forward guide block 36 and at the other end against a collar 47 pinned to the plunger. In some cases the spring 46 may be omitted, springs 25 and 42 being sufficient to insure proper functioning of the mechanism.

A coin chute 48 for the reception of the coins of higher denomination for which change is desired, that is quarters in the present case, is suitably supported at its upper end by the front wall 14 of the casing and projects into a slot in that wall and into communication with a slotted plate 49 screwed or otherwise attached to the wall. The lower end of this chute terminates at and is attached to bracket 40 which, with the cover plate 50, constitutes a continuation of the coin chute. In bracket 40 two fingers 51 are hung upon pivots at their upper ends, their lower ends being urged inwardly or toward each other by V-shaped springs 52. The sides of these fingers which face each other are formed with ribs 53 that define front and rear grooves in the fingers. The front grooves are aligned with the interior of the coin chute 48, and at their lower ends are provided with bevels 54 which serve to support a coin, illustrated at C, see particularly Fig. 5. The rear grooves also terminate at their lower ends in bevels 55 which form wedge surfaces that are adapted to be engaged by similar surfaces on the lower end of a wedge plate 56 that slides in the grooves behind ribs 53. When this wedge plate is caused to descend below its normal position it swings the arms 51 outwardly against the action of springs 52, thereby spreading the bevels 54 apart and releasing the coin then being supported, permitting it to fall from the supported position indicated in Fig. 5. A vertical slot 57 is formed in the plate 56, into which a reduced end of pin 38 extends. If this pin is drawn forward at a time when there is a coin C supported by the fingers 51, the coin forms a stop preventing further travel of the pin 38 in a forward direction. When there is no coin thus supported by the fingers 51 the pin is free to travel further in a forward direction, a perforation 58 being formed in the cover plate 50 to clear the pin.

In laterally projecting ears 59 and 59' on bracket 40 there is mounted a slide bar 60. A collar 61 pinned to this bar forms an upper abutment for a coil spring 62 which bears at its lower end against ear 59'. Collar 61 also limits the upward travel of the slide bar resulting from the pressure of spring 62. The bar 60 terminates at its upper end in a head 63, the upper surface of which is beveled downwardly toward the front. In this head there is mounted one end of a bent rod 64, the opposite end of which is welded or otherwise attached to wedge plate 56. Hence when the rod 60 is depressed the wedge plate 56 moves downwardly to the same extent.

On the plunger 35 there is secured an upwardly extending arm 65 which supports a pivot pin 66 from which hangs a bifurcated pawl 67. Between the bifurcations of this pawl there is mounted a roller 68. Pawl 67 is free to swing rearwardly, but forward motion is prevented by an extension 69 on the arm 65. Hence when the plunger 35 is pulled forwardly from its normal position illustrated in Figs. 2, 3, 4 and 6 of the drawings, roller 68 engages the rear surface of head 63, swinging the pawl 67 rearwardly far enough to enable it to ride over the top of the head. Its motion in this direction is limited however by a resilient stop 69a of watch-spring metal as illustrated particularly in Fig. 12. On the return stroke however the roller engages the bevel surface on the forward side of the head and pushes it downwardly momentarily. It will be observed that the beveled upper surface on head 63 is held against turning by the attachment of the slide bar 60 to the wedge plate 56.

Bracket 40 includes downwardly projecting extensions 70 at the lower ends of which there is mounted upon a pivot 71' a gate 71 that is normally drawn toward a rear position, illustrated in Figs. 2 and 3, by a coil spring 72. A bent arm 73 welded or otherwise secured to gate 71 extends around to a position near and in front of slide bar 60, and on the latter bar there is secured a finger 74 which engages arm 73 when the slide bar is depressed, and thereby swings gate 71 forwardly against the action of spring 72. When the gate is in the position illustrated in the drawings any coin which descends through chute 48 and is not caught by fingers 51, as for instance coins smaller than a quarter, is deflected by gate 71 away from a coin box 75 and into a discharge chute 76 leading to an elongated cup 77 in front of the casing, from which it may be removed by the customer. On the other hand, when the gate 71 is swung forwardly by the pressure of finger 74 on bent arm 73, as it is when the fingers 51 are in the coin releasing position, the coin which then drops from those fingers is deflected into the box 75.

The depression of the slide bar 60 performs a third operation, namely it closes the upper end of coin chute 48, thereby preventing the introduction of a coin into the chute while the gate 71 is in its forward position, so that it is im-

possible for a user to put a wrong coin into the machine and have it go into the box 75 instead of being deflected and discharged into the cup 77. For this purpose I provide a clamp 78 pinned to the lower extremity of a rod 79 and attached to the lower end of slide bar 60. Rod 79 is suitably guided for vertical movement along the front wall 14 of the casing. At its upper end this rod has a short horizontal portion bent to provide a horizontal eye 80 which surrounds a short vertically arranged rod 81, guided by brackets 81*a* for vertical movement and normally supported by a coil spring 82 which engages beneath a collar 83 pinned to the rod. The lower end of rod 81 normally stands just above chute 48, but the upper wall of that chute has an opening 84 therethrough which is adapted to receive the rod when it is depressed. When so depressed the rod obviously forms a barrier preventing the introduction of a coin into the chute.

When a coin is inserted into the machine and the plunger 35 is pulled forwardly as far as it will go, slide 22 is moved forwardly and the coins in the hole 29 of the slide are moved forwardly until they fall through an opening 85 into a chute 86 that also extends through the forward wall of the casing and communicates with the cup 77.

87 is a weight which is placed on the top of the stack of coins in the magazine 26. It is provided with an extension 88 which projects through slot 27 in the magazine and is perforated to slide upon a rod 89 that is guided near its upper end in a guide bracket 90 attached to the front wall of the casing. On its lower end it carries a collar 91. Rod 89 has a horizontal upper portion 92 and a downwardly extending vertical portion 93 which at its lower end is turned at right angles and formed with an eye 94 that surrounds rod 81 just below eye 80. When the stack of coins in magazine 26 is so depleted that the weight 87 engages and depresses collar 91, rod 89, 92, 93 pushes down rod 81 and closes off chute 48. At the same time an "Empty" sign 95 carried by rod 93 descends into position behind a small window 96 in order to indicate to the prospective customer the reason why his quarter is rejected.

Operation.—Assuming that a customer wishes to change a quarter for five nickels, he inserts his quarter through the slot in plate 49. The quarter descends through chute 48 and is caught by fingers 51. The customer then grasps knob 45 and pulls it forward. The first result of this movement is to bring pin 38 up against the quarter, as indicated in Fig. 9, when further movement of that pin is prevented and its free extremity thereafter acts as a fulcrum for lever 34. Continued movement of the plunger forward brings ball 32 into engagement with socket 34 and then causes rod 23 to move forward, pushing slide 22 forward with its charge of five nickels which are dumped through opening 85 into chute 86 and delivered to the customer. During the forward movement of the plunger roller 68 swings pawl 67 rearwardly and rides over the top of slide bar 60. The customer then releases his hold upon the knob 45 and springs 46, 25 and 42 act to return the parts to normal position. During this return movement roller 68 engages the beveled face on the head 53 of slide bar 60 and depresses that bar by cam action. Its first effect is to close the coin chute 48. It then swings gate 71 forwardly and thereafter spreads fingers 51, releasing coin C, when the latter drops, striking the gate 71 and being deflected into box 75.

The normal positions of the pivotal connections of the lever 34 with the parts 38, 35 and 33 are marked X, Y and Z in the drawings. In Fig. 11 X', Y' and Z' indicate the positions of these pivots at the time when the coin has stopped the movement of pin 38. X', Y^2 and Z^2 indicate their positions when the ball 32 is in full engagement with the socket 24, and X', Y^3 and Z^3 indicate the positions of the pivots at the end of the forward stroke of the plunger.

Now, in the event that some one should pull knob 45 without first having inserted a quarter in the coin chute 48, plunger 35 will move forwardly a certain distance, moving all of the pivots to positions indicated at X^4, Y^4 and Z^4 in Fig. 10, pin 38 moving through slot 57 and perforation 58, but when the notch 44 in the lever 34 has fully engaged the rear end of bar 43, as indicated in Fig. 8, the lever 34 is locked against further movement and the travel of slide 22 forwardly is prevented, so that in this case no nickels are delivered.

In the event that some one should insert into the chute 48 a coin of smaller denomination than a quarter, such coin, being of small diameter, will not be caught by the fingers 51, and as the gate 71 will then be in the rearward position illustrated in the drawings, the coin will be deflected forwardly and out of the machine through chute 76 into cup 77.

Having thus described my invention, I claim:

1. In a coin operated machine, a coin chute, means for temporarily supporting a coin after its insertion into the chute, a lever, a fulcrum for said lever, a pin upon which said fulcrum is carried, said chute having an opening therein through which said pin is adapted to move, said pin being movable through said opening into engagement with said supported coin, means for moving the lever bodily to carry said pin into engagement with the coin whereby movement of the fulcrum is stopped and then to swing the lever upon said fulcrum, and means adapted to be actuated by the swinging movement of the lever for delivering articles from said machine.

2. In a coin operated machine, a coin chute, means for temporarily supporting a coin after its insertion into the chute, a pin mounted to slide endwise towards said coin, said chute having an opening therein through which said pin is adapted to move, a fulcrum carried at the opposite end of said pin, a lever mounted on said fulcrum, means for moving the lever first bodily to cause said pin to engage said supported coin and then to swing the lever upon said fulcrum, and means adapted to be actuated by the swinging movement of the lever for delivering articles from said machine.

3. In a coin operated machine, a coin chute, means for temporarily supporting a coin after its insertion into the chute, a pin mounted to slide endwise towards said coin, said chute having an opening therein through which said pin is adapted to move, a fulcrum carried at the opposite end of said pin, a lever mounted on said fulcrum, means for moving the lever first bodily to cause said pin to engage said supported coin and then to swing the lever upon said fulcrum, means adapted to be actuated by the swinging movement of the lever for delivering articles from said machine, and means adapted to lock the lever against swinging movement in the event that the absence of a coin permits further sliding movement of said pin.

4. In a coin operated machine, a coin chute, means for temporarily supporting a coin after

its insertion into the chute, a pin mounted to slide endwise towards said coin, said chute having an opening therein through which said pin is adapted to move, a fulcrum carried at the opposite end of said pin, a lever mounted on said fulcrum, means for moving the lever first bodily to cause said pin to engage said supported coin and then to swing the lever upon said fulcrum, means adapted to be actuated by the swinging movement of the lever for delivering articles from said machine, means for returning said lever to normal position after actuation, and means actuated by said return movement for releasing said coin.

5. In a coin operated machine, a coin chute, means for temporarily supporting a coin after its insertion into the chute, said means comprising a member adapted to enter the chute from one edge wall thereof, said member having an extension to one side of the plane of the chute, a pin mounted to slide endwise towards said coin, said chute having an opening therein through which said pin is adapted to move, a fulcrum carried at the opposite end of said pin, a lever mounted on said fulcrum, means for moving the lever first to cause said pin to engage said supported coin and then to swing the lever upon said fulcrum, means adapted to be actuated by the swinging movement of the lever for delivering articles from said machine, means for returning said lever to normal position after actuation, and wedge means for engaging said extension to spread said coin supporting means and release the coin, said wedge means being adapted to be actuated by the return movement of said lever.

6. In a coin operated machine, a coin chute, means for temporarily supporting a coin after its insertion into the chute, said means comprising a member adapted to enter the chute from one edge wall thereof, said member having an extension to one side of the plane of the chute, a pin mounted to slide endwise towards said coin, said chute having an opening therein through which said pin is adapted to move, a fulcrum carried at the opposite end of said pin, a lever mounted on said fulcrum, means for moving the lever first to cause said pin to engage said coin and then to swing the lever upon said fulcrum, means adapted to be actuated by the swinging movement of the lever for delivering articles from said machine, means for returning said lever to normal position after actuation, wedge means for engaging said extension to spread said coin supporting means and release the coin, said wedge means being adapted to be actuated by the return movement of said lever, and said wedge means having an opening therethrough in line with said chute opening to accommodate said pin.

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