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F. A. HOYT

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COIN CHUTE

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FIG. 1

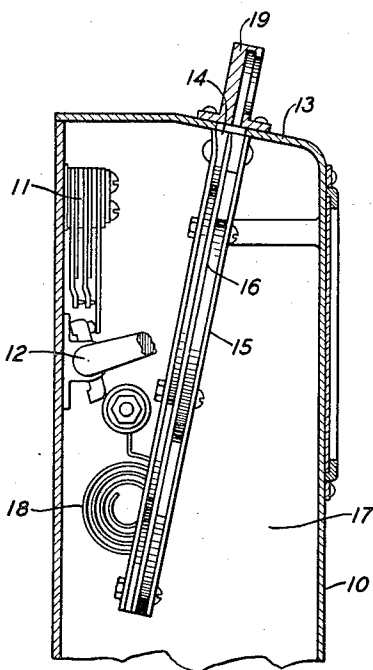


FIG. 2

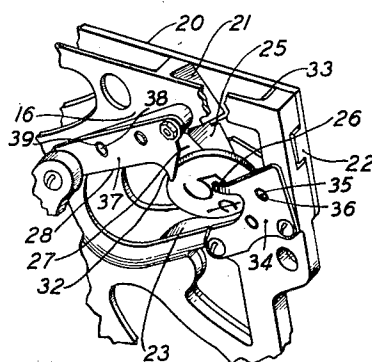


FIG. 3

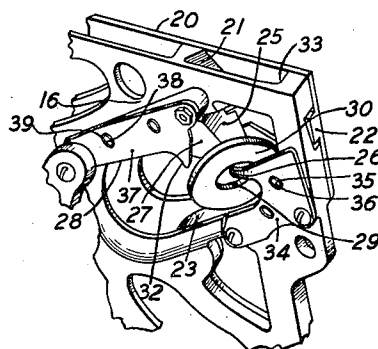


FIG. 5

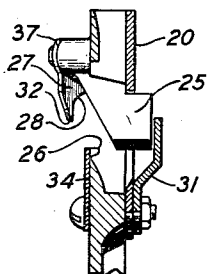
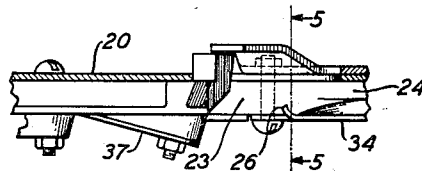


FIG. 4



INVENTOR
F. A. HOYT

BY

J. M. Campbell

ATTORNEY

UNITED STATES PATENT OFFICE

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COIN CHUTE

Frederick A. Hoyt, East Orange, N. J., assignor to
Bell Telephone Laboratories, Incorporated, New
York, N. Y., a corporation of New York

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9 Claims. (Cl. 194—97)

This invention relates to coin chutes and particularly to those intended for use in coin operated apparatus.

An object of the invention is to prevent the use of slugs and washers for fraudulently obtaining goods or services from coin controlled apparatus.

The invention provides improved means for rejecting washers, thin coins or discs the same diameter as legitimate coins, and undersized coins or slugs, and for preventing the successful operation of coin controlled devices by the manipulation of undersized coins or slugs as they are inserted or after insertion in the chute.

Specifically, the invention provides a barrier which cooperates with a washer ejector disposed in the side of the chute immediately before it and a reject opening for undersized coins disposed in the side of the chute immediately following it. All coins or slugs placed in the chute are momentarily arrested by the barrier and their plane of movement abruptly changed by rotation of the coins and slugs about an axis tangent to the lower edge. In other words, the coins and slugs after being arrested by the barrier tip over toward the side of the chute against the washer ejector, which, in the case of legitimate coins or solid discs, supports and directs them into an inclined chute, and in the case of washers or perforated slugs enters the opening therein and turns them out of the chute through an opening in the side thereof.

The invention and various features thereof are illustrated in the accompanying drawing as applied to a coin controlled telephone station in which

Fig. 1 is a partial side elevation in section of a wall telephone set showing a coin chute mounted therein;

Fig. 2 is a partial front elevation in perspective of a coin chute showing a legitimate coin passing the washer ejector;

Fig. 3 is a similar view of the coin chute showing a washer about to be ejected;

Fig. 4 is a partial plan view of the novel barrier and washer ejector; and

Fig. 5 is the corresponding elevation of the barrier and ejector of Fig. 4.

Referring now to Fig. 1, 10 is a coin box in which is mounted a circuit controlling switch 11 adapted to be operated by a pivoted receiver support 12. A portion 13 of the top of the box 10 is inclined and is perforated at 14 to permit the passage therethrough of coins of various denominations. Mounted immediately below the per-

foration 14 is a multiple chute 15, made preferably by the die-casting method, with a separate passageway for each of three types of coins, nickels, dimes and quarters. The chute 15, as shown in Fig. 1, is inclined towards the right, which is normally toward the front of the coin box. Any coin passing through the chute will, therefore, be supported in part by the front wall of the chute, and if this wall is cut away or altered in such a manner as to be unable to support a coin, the coin will fall into the forward position 17 of box 10 and will not continue in the chute.

At an appropriate location with respect to the chute 15 may be placed a gong 18 or other audible signaling device operable by the coin as it progresses through the chute. A gauge 19 is mounted above opening 14 in multiple chute 15 to enable the user to drop the various coins into their respective chutes.

In Fig. 2 is shown a portion of the chute which is used for the passage of nickels. The portion comprises a substantially vertical section located at the entrance to the chute through which the coin is dropped, and an adjacent inclined section through which the coin rolls. The chute is inclined forward, as illustrated in Fig. 1, so that front wall 16 forms part of the support for the coin, and rear wall 20 acts merely as a guide therefor. To impart an initial ejecting force to the coin as it is dropped, a guide 21 is provided which cooperates with padded portion 33 of front wall 16 to rotate the coin about a vertical axis and to cause the forward edge of the coin to tend to turn out of the chute. The guide is also designed to throw the coin to the right so that when a coin is dropped into the chute, it strikes a retaining bar 22 and the bottom 23 of the chute. The bottom of the inclined section of the chute, however, is made several times wider than the coin for ejecting purposes, and unless the coin is very carefully and uniformly guided as it is dropped, it will not strike the bottom 23 in exactly the same place and manner each time and hence its subsequent motion may be indeterminate. For this reason, a small portion 24 (Figs. 4 and 5) of the bottom 23 at the beginning of the inclined section of the chute is narrowed to cause the coin always to fall in the same place, and its subsequent motion, therefore, to be always the same. The chute, however, even at this point, is still a trifle wider than the coin to prevent the coin from binding between the walls.

When a coin is dropped into the chute it strikes bottom 24 and retaining bar 22 and then

changes its direction and begins to pass through the inclined section of the chute. Before progressing very far, however, it encounters an oblique barrier 25, and, due to the loss of energy at the previous impact with bottom 24 and retaining bar 22, the additional impact with barrier 25 momentarily arrests the coin. Thus the original energy imparted to the coin by the person dropping the coin into the chute is, to a large extent, dissipated and all coins, legitimate or otherwise, begin to roll down the inclined section of the chute under the action of gravity alone.

As shown in Figs. 4 and 5, the barrier comprises a plane surface disposed normally to the bottom 23 of the inclined section and at an angle to the walls thereof. This angularity with the walls, combined with the forward inclination of the chute, tends to tip the upper left-hand portion of the coin out of the chute. The lower edge of the coin, however, remains in contact with rear wall 20. The tipping continues (Fig. 2) until the central portion of the coin strikes washer ejector 26, which is simply a substantially horizontal prong bent to protrude into the chute a predetermined amount. The prong is a portion of detail 34 which is accurately located on the chute with respect to barrier 25 by means of apertures 35 through which dowels 36, die-cast with the chute, are threaded. Ejector 26 then supports the coin while the upper edge of the coin slides along barrier 25 until the edge encounters slot 27, whereupon barrier 25 no longer restrains the coin and it begins to roll down the chute. While it is rolling, its upper edge is in contact with the upper edge 28 of an ejecting opening in front wall 16. As in the case of ejector 26, upper edge 28 may also comprise a portion of a separate detail 37 which is accurately located on the chute with respect to barrier 25 and bottom 23 of the chute by means of die-cast dowels 38 cooperating with apertures 39 in the detail. The upper edge 28 is designed to restore the tipped coin to parallelism with the walls of the chute and to guide the coin into the remainder of the chute. The distance between edge 28 and the intersection of the front face of the coin with the bottom of groove 23 varies with the length of the opening and is made only a few thousandths of an inch smaller than the diameter of the coin near the lower end of the opening so that all coins or slugs of a lesser diameter or thickness than the legitimate coin will not be supported by edge 28 thereat, and will consequently fall out of the chute. At slot 27, however, portion 32 of edge 28 is located considerably closer to the bottom 23 of the chute to insure the entrance of a legitimate coin into the chute, but it is still far enough away from prong 26 to permit washers and other centrally perforated discs to be ejected by the prong.

In the case of a washer, as illustrated in Fig. 3, the tipping following the encounter with barrier 25 continues beyond the angle at which the coin of Fig. 2 was supported by prong 26, because there is nothing for the prong to contact except the inner periphery 29 of the washer. The upper edge of washer 30 is, therefore, tipped beyond slot 27, being held there by prong 26, and washer 30 can not thereafter enter the inclined section of the chute. Prong 26 is not designed to hold the washer permanently, but merely sufficiently long to allow it to assume a slight additional twist toward the reject opening and hence, on passing slot 27, washer 30 continues

twisting until it is free of prong 26 and drops into the forward space 17 of box 10.

While washer 30 is twisting about prong 26, the lower edge of the washer swings backward toward rear wall 20 and hence rear wall 20 is displaced at this point, as shown at 31 in Figs. 4 and 5, to permit the washer to swing unrestricted.

In chutes without the novel barrier and washer rejector, but designed merely to reject undersized coins through a reject opening, it is sometimes possible to give an undersized coin additional momentum by spinning it as it is dropped into the chute, and with the aid of the additional momentum, to cause the coin to pass by the reject opening too rapidly to be effected thereby. With the barrier inserted in the chute, however, any coin which is spun to give it additional momentum will simply strike the barrier and rebound until it is substantially deenergized, whereupon it will roll down the chute under the action of gravity alone and will be subject to ejection as though it had not been spun.

Another scheme sometimes employed to make an undersized coin pass the ejecting opening, consists in filling in the bottom of the groove with a granular substance until the coin is raised sufficiently to engage the upper edge of the opening. When a coin is arrested, however, as by barrier 25, it sinks into the granular substance and rolls more nearly along the bottom of the groove, thereby being subject again to the action of the rejecting opening.

It is understood that this invention is not limited to coin chutes either as used in telephone stations or elsewhere, but that it is applicable generally to all devices intended to pass discs of a certain character and to reject discs which are smaller or thinner than the desired discs, or discs which are perforated at or near their centers.

What is claimed is:

1. A coin chute having opposite side walls between which a coin travels substantially parallel thereto, said walls defining a substantially vertical section and an inclined section, a barrier between said sections for momentarily arresting coins and slugs deposited in the chute, one of said side walls having an opening in the inclined portion immediately following said barrier for ejecting undersized coins and slugs, and an opening immediately preceding said barrier, and means projecting into said last opening to eject washers from said chute.

2. A coin chute having a track along which the coins roll, said track lying in a transversely inclined plane, a guide for the upper edge of the coin lying in the plane oblique to the plane of said track, said guide and said track defining an opening progressively increasing in width for rejecting undersized coins and slugs, and a barrier at the beginning of said opening for momentarily arresting the movements of coins and slugs.

3. A coin chute having a track along which the coins roll, said track lying in a transversely inclined plane, a guide for the upper edge of the coin lying in the plane oblique to the plane of said track, said guide and said track defining an opening progressively increasing in width for rejecting undersized coins and slugs, and a barrier at the beginning of said opening for momentarily arresting the movements of coins and slugs, said barrier lying in a transverse plane substantially perpendicular to the plane of said track, one edge of said barrier being tapered and forming with said guide a slot for coins and slugs.

4. A coin chute having a longitudinally vertical section, and a longitudinally inclined section, said sections having side walls defining a channel, and means for rejecting spurious coins and slugs comprising a barrier between said sections extending from one of said side walls partially across the channel, the walls of said sections being sloped transversely so that coins and slugs will turn abruptly sidewise past said barrier one of said side walls having an opening therein the width of which is slightly less than the diameter of a legitimate coin immediately following said barrier whereby coins and slugs of under-diameter are rejected.

5. A coin chute having a longitudinally vertical section, a longitudinally inclined section having side walls defining a channel, and means for rejecting washers comprising a barrier extending partially across said channel from one of said side walls and between said sections, the opposite side wall having an opening therein immediately in advance of said barrier, the vertical dimension of said opening being greater than the diameter of a legitimate coin, a prong extending from the edge of said opening to prevent legitimate coins from falling out of the chute and for engaging the inner periphery of a washer to turn it out of the channel through said opening.

6. A coin chute having side walls defining a channel, a barrier extending from one of said side walls partially across said channel for momentarily arresting coins and slugs, means comprising in one of said side walls an opening immediately in advance of said barrier for ejecting washers, and means immediately following said barrier for ejecting coins and slugs of under-diameter.

7. A coin chute having side walls and a bottom defining a channel, said bottom having an upwardly and outwardly sloping surface forming one side, the opposite side having an opening

therein to reject washers of the same diameter as legitimate coins, a barrier extending partially across said channel for momentarily arresting all washers deposited in said chute and for causing said washers to fall toward said opening, and a prong projecting from the edge of said opening for engaging the inner periphery of the washers to turn them out of the chute.

8. A die-cast coin chute having a longitudinally vertical section, a longitudinally inclined section having side walls defining a channel, and means for rejecting washers comprising a barrier extending partially across said channel from one of said side walls and between said sections, the opposite side wall having an opening therein immediately in advance of said barrier, the vertical dimension of said opening being greater than the diameter of a legitimate coin, a prong extending from the edge of said opening to prevent legitimate coins from falling out of the chute and for engaging the inner periphery of a washer to turn it out of the channel through said opening, said prong comprising an extension of a separate detail, and means for accurately locating said detail with respect to the chute, said means comprising apertures in the detail and dowels die-cast in the chute and extending through said apertures.

9. A coin chute having opposed side walls forming a channel between which a coin travels substantially parallel thereto due to gravity, said chute being laterally inclined, a barrier extending from one of said walls partially across the channel for momentarily arresting coins and slugs deposited in said chute, the lower of said side walls having an opening immediately following said barrier for ejecting under-diameter coins and slugs and an opening immediately preceding said barrier, and means projecting into said last opening to eject washers from said chute.

FREDERICK A. HOYT.