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COIN CHUTE

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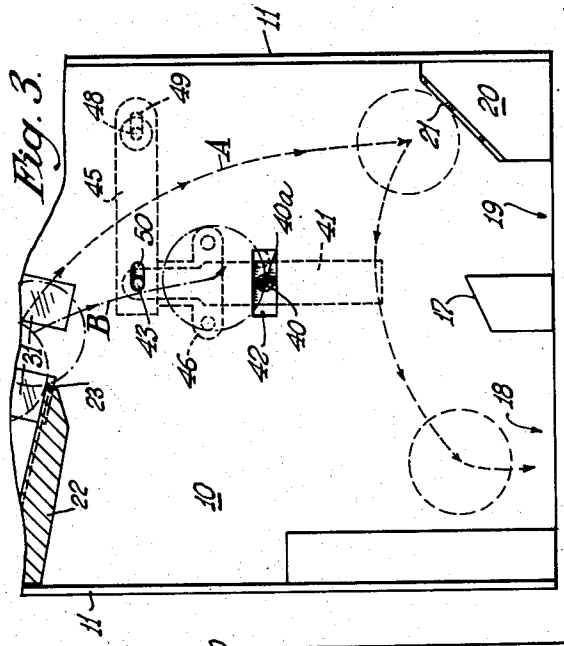


Fig. 3.

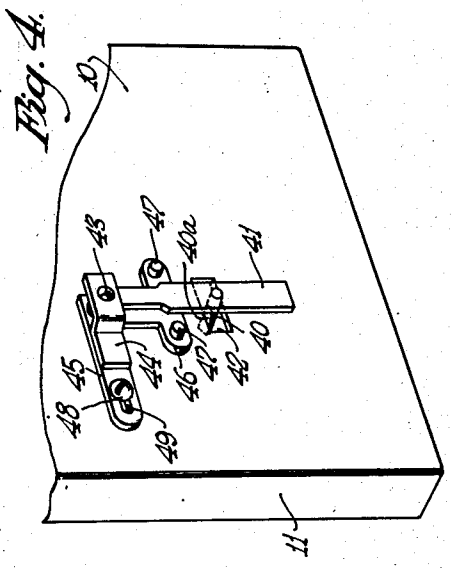


Fig. 4.

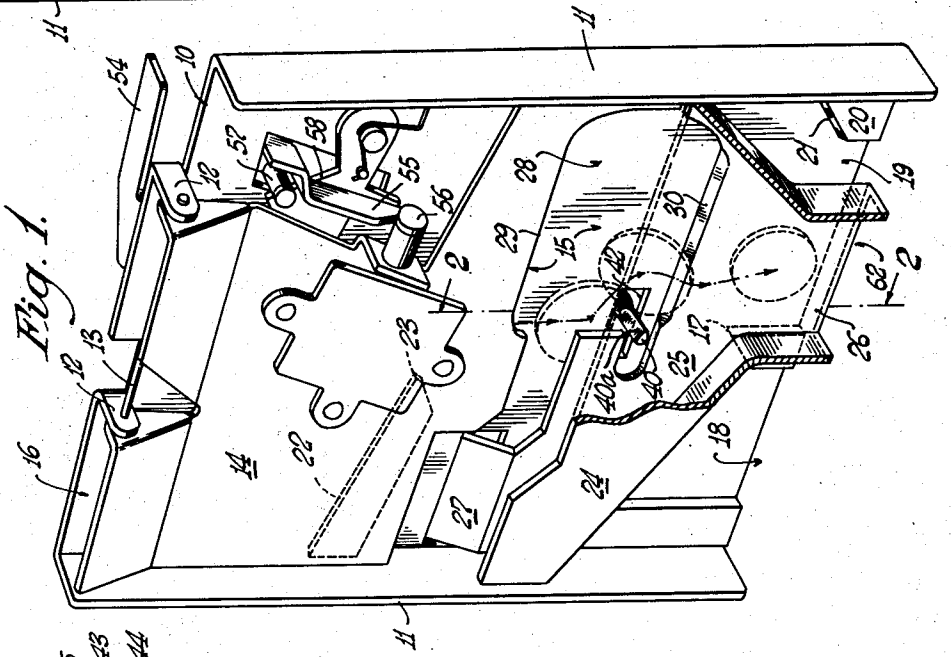


Fig. 1.

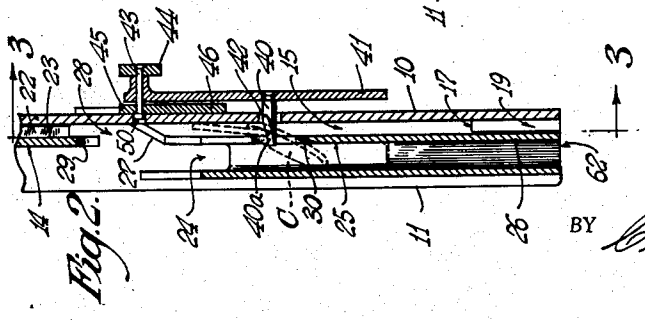


Fig. 2.

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COIN CHUTE

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7 Claims. (Cl. 194—97)

This invention relates to coin testing devices, particularly that type known as a coin chute, in which coins gravitate past a testing means, such as a magnetic field, and follow a certain trajectory toward another testing means in the nature of a rebound anvil from which proper coins rebound past a reject opening into which other and improper coin elements fall by reason of the fact that they do not follow said trajectory because of physical characteristics differing from the proper or acceptable coin. In this type of chute, certain unacceptable coin elements fall short of the rebound anvil with a consequent rejection. Under certain conditions in this type of chute, it is found that some types of slugs or tokens drop short of the anvil or rebound means and strike other parts of the chute so that they fall into the acceptance opening or are deflected back onto the anvil from which they in turn rebound into the acceptance opening.

A principal object of the present invention is the provision of coin deflecting means for positively ejecting coin elements through a special exit opening when they follow a trajectory short of the normal trajectory toward the anvil.

A further object is the provision of a deflector for the purpose set forth and further characterized by the fact that it is movable in the general direction of movement of the coin in the chute passage and arranged to assume effective deflecting positions on opposite sides of a normal position whenever the chute is tilted in either direction from a normal position.

Yet another object is the provision of a discharge apron arranged to form a lower side portion of the main passage and provided with an edge portion defining one side or margin of the special rejecting exit adjacent the novel deflector and having a beveled or knife edge beneath the deflector in a position further to assure ejection of coins by the latter.

Still another object is the provision of an adjustable mounting for the deflector by means of which the same may be properly aligned in various installations or re-aligned when certain of the testing parts, such as the magnets, for example, change due to wear or aging.

Other objects, advantages and novel aspects of the invention reside in certain details of construction as well as the cooperative relationship of the component parts of the illustrative embodiment described hereinafter in view of the annexed drawing, in which:

Fig. 1 is a perspective of the gate side of the coin chute showing the coin engaging portion of the novel deflector and the improved discharge apron;

Fig. 2 is a fragmentary vertical section along line 2—2 of Fig. 1; showing the deflector particularly;

Fig. 3 is a fragmentary inside elevation of the chute with the apron and gate removed to show the positions of the deflector with respect to the runway and exits, as seen in the direction of line 3—3 of Fig. 2;

Fig. 4 is a fragmentary perspective of the outside of the chute showing the complete mounting of the deflector.

One type of chute with which the present invention may be successfully used includes a main plate member 10 having opposite vertical edge portions offset laterally to provide side walls 11 and having laterally offset ears 12 along its upper edge to provide a mounting for a pintle rod 13 from which is suspended a swinging discharge gate 14.

The gate 14 hangs normally in parallelism with the inside of the plate 10 and is spaced from the latter to define, in part, a coin passage 15 (Fig. 2) which descends from a coin entrance 16 to the region of the bottom edge of the main plate, where there is arranged a beveled or pointed separator 17 (Fig. 3) defining on opposite sides thereof an acceptance passage or exit 18 and a reject passage 19. A rebound anvil 20 is spaced from the separator 17 on the opposite side of the passage 19 and is provided with a sloping rebound edge 21 arranged so that certain coins will be deflected over the reject exit 19 and the separator 17 into the passage 18.

Mounted on the inside of the gate 14 is an inclined coin runway 22 having its upper levels disposed substantially beneath the entrance 16 and terminating at its lower end 23 in the region generally above the separator 17 and the acceptance opening 18. In other respects, the lower edge portion of the gate is unobstructed, and the remaining lower portions of the main passage are guarded by a discharge apron 24 having an inner vertical surface portion 25 disposed in parallelism with the main plate 10 with a portion 26 forming a substantial side portion for the exit 19 adjacent the anvil. The apron has a tongue 27 which is offset into the plane of the main passage in the region beneath the entrance 16 and the runway 22 for the purpose of guiding discharged coin elements into the apron when the gate is opened and delivering such coins for discharge through the open bottom edge part 62 of the apron opposite the reject opening 19.

A sidewise reject opening 28 is defined by an edge portion 29 along the bottom of the gate and an opposite beveled edge portion 30 on the discharge apron.

In the usual operation of this type of chute, there is provided a testing means in the nature of a permanent magnet (Fig. 3) having poles 31 arranged adjacent the lower end 23 of the runway to maintain a strong magnetic flux across the passage for the purpose of selectively influencing the trajectories to be followed by various coin elements in leaving the end of the runway, acceptable coins following a trajectory which carries them down onto the edge 21 of the anvil from which they rebound appropriately over the exit 19 and separator 17 and into the acceptance exit 18. Unacceptable coin elements, both metallic and non-metallic tend, in general, to follow a shorter trajectory, that is, to drop off the end of the runway at a sharper angle and hence fall more directly toward the exit 19 or the separator 17. It frequently happens that some otherwise unacceptable coin elements, in following the shorter trajectory, strike the separator 17 in such manner that they bounce back onto the edge 21 of the anvil and rebound over the separator 17 into the acceptance opening.

In order to prevent false operation of the chute in the manner aforesaid and, in general, to provide for the positive ejection of all forms of coin elements which follow the shorter trajectories, there is provided a novel deflector in the form of a pin 40 (Fig. 4) projecting laterally from a pendent arm 41 through an opening 42 in the main plate 10 of the chute so as to lie in the coin passage (Fig. 3) in the region generally between the end 23 of the runway and the separator 17 and anvil 20, the pin, in fact, lying almost directly above the separator 17. The arm 41 is pivoted as at 43 between an offset bracket 44 and an attaching strap 45 from which there is a depending T-shaped portion 46 provided with spaced pins 47, constituting stops for the arm 41, to limit the swinging movement of the latter.

The strap 45 is mounted for adjusting movement on the outside of the main plate by means of a set screw 48 passing through an elongated slot 49 in one end of the strap, the latter having additional support at its opposite end in the nature of the pintle pin 43 (Fig. 3), which mounts the arms 41, and which passes through the horizontally elongated slot 50.

As a result of this arrangement, the strap 45 may be shifted horizontally when the screw 48 is loosened, in consequence of which the deflecting pin 40 may be shifted in opposite directions generally toward or away from the end 23 of the runway, and hence into various positions with respect to the several possible trajectories of the coin elements leaving the runway.

It is important to observe in Figs. 1 and 2 that the pin 40 is slanted or beveled as at 40*a* so as to incline toward the reject opening 28. Any coins striking the deflecting pin will thus be deflected into the reject opening and over the knife edge 30 of the apron out of the chute in the manner illustrated by the coin C in Fig. 2. It should also be observed that in addition to its outward slope toward the reject opening and apron, the surface 40*a* of the deflecting pin also slopes slightly toward the knife edge 30 and the reject opening 19.

When properly installed, the coin chute is fixed in position in a vending machine or other coin-controlled instrumentality, which is usually mounted on a level so that no particular adjustment need be made of the deflecting unit which has previously been adjusted at the factory. However, if adjustment is needed for any reason, the screw 48 is loosened and the strap 45 shifted to the right or left, as required, until the chute operates properly, whereupon the screw is turned up tightly. An important feature of the invention resides in the fact that the beveled or inclined part 40*a* of the deflector is calculated to effect the proper deflection of a coin even though the chute or apparatus with which it is associated may be slightly off level, the arm 41 being free to swing in opposite directions so as to maintain a predetermined operative relationship with respect to the end 23 of the runway, the separator 17, and anvil 20. In Fig. 3, the trajectory of a good coin in leaving the end of the runway is indicated by the tracer arrow A, and it will be observed that the latter coins follow a path which is far removed from the deflector. Certain slugs and unacceptable coins tend to follow a shorter trajectory, such as is generally indicated by the tracer arrow B, with a tendency to move down toward the pointed end of the separator 17. However, in following the shorter trajectory, coins strike the deflector 40 and are shunted out through the opening 28 in the manner aforesaid, which precludes any possibility of their rebounding either from the separator 17 or the anvil 20 into the acceptance opening.

It may be explained that the gate 14 is intended to be opened by operation of a lever 54, which causes an offset cam arm 55 to bear against a roller 56 on the gate and swing the latter outwardly, and at the same time a roller 57 bears against a cam edge of a sweep 58 and pivots the latter from its normal position so as to sweep across the poles of the permanent magnet and dislodge any coin elements or the like which may have been arrested thereby for movement through the open gate into the discharge apron 24.

The various advantages and objects of the invention may be accomplished by modifications of the particular embodiment specifically described herein, and it is intended that the appended claims shall include all equivalent arrangements fairly coming within their call.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:

1. A coin chute including a descending passage having a sidewise discharge opening between the ends thereof and testing means above said opening and of a type to cause certain coin elements to follow a predetermined trajectory toward the lower portions of the passage, and a second testing means arranged in said lower portions of the passage to be engaged by coin elements following said trajectory for selective guidance with respect to a plurality of exits, certain unacceptable coin elements following a shorter trajectory under the influence of said first-mentioned testing means, and deflecting means positioned adjacent said sidewise opening in the path of coin elements following said shorter trajectory and having an inclined coin-engaging portion disposed to deflect coin elements into said sidewise opening, said deflecting means being mounted for movement in opposite directions from a normal position in the general plane of movement of coins in said passage whereby said deflecting means may be maintained in a predetermined relationship with respect to said testing means notwithstanding that

the coin chute may be tilted certain amounts in either of said directions to displace said deflecting means from said normal position.

2. In a coin chute, a runway terminating in space above a reject opening, and an anvil at a far side of said opening in a general direction down the chute, said chute having an acceptance opening adjoining the reject opening on a side of the latter toward said runway, means for selectively influencing the movement of coins leaving said runway so that certain coins will follow a path causing them to engage said anvil and rebound therefrom over said reject opening into the acceptance opening while other coins will tend to drop short of the anvil and thereby move into said reject opening, and a deflector arranged in the region below the lower end of said runway but above the level of said reject opening in the path followed by coins tending to fall short of the anvil as aforesaid, said deflector having inclined coin-engaging portions disposed to deflect coins for movement laterally of the passage, and means providing a sidewise discharge opening adjacent said deflector and into which coins deflected laterally as aforesaid may move for passage from the chute.

3. The combination of claim 2 further characterized by the provision of a discharge apron arranged to provide a wall portion of said passage, said wall portion having a substantially horizontal edge defining a lower side of said sidewise discharge opening in the region adjacent and below said deflector, said edge being inclined outwardly of the passage into said apron to facilitate the ejection of coins from the chute cooperably with the deflector.

4. A coin chute including, in combination, means providing a descending coin passage having a sidewise discharge exit between its ends, a runway in said passage and terminating above said exit so that coins may fall in space therefrom toward the lower portions of the passage, a permanent magnet arranged adjacent the terminus of said runway and adapted to cause certain coin elements to follow a certain trajectory in leaving the runway, means defining an acceptance and reject opening at the bottom of said passage below said discharge exit, a rebound anvil in said passage below said exit and positioned in the path of coins following said certain trajectory so as to be struck by said coins and effect rebound of certain coins over the reject opening into the acceptance opening, certain unacceptable coins being influenced by said magnet to follow a shorter trajectory tending to carry such coins in the general direction of said acceptance opening, and means for preventing coins following the shorter trajectory from arriving at the acceptance opening, said means including a deflecting member projecting into said passage in the region adjoining said discharge exit and having a surface inclined to deflect coins striking the same into said discharge exit.

5. A coin chute in accordance with claim 4 further distinguished by the fact that said deflecting member is mounted on a pivoted arm arranged to permit movement of the deflecting member back and forth in opposite directions from a normal operative position in a direction generally toward or away from said anvil whereby said deflecting member may be automatically maintained in a certain operative relationship with respect to said runway and anvil when said chute is tilted in a manner to move the deflecting member out of said normal position.

6. In a coin chute, means providing a descending coin passage having an entrance in its upper region and a plurality of exits in its lower region, together with a sidewise discharge exit between said entrance and first-mentioned exits, a runway in said passage inclined from said entrance toward said discharge exit and terminating above the latter, coin testing means arranged to influence the trajectory followed by certain coin elements in leaving the terminus of said runway, testing means in the region below said sidewise discharge exit for selectively guiding movement of coins with respect to said first-mentioned exits in the lower region of the chute in accordance with the trajectory followed thereby, a deflector projecting laterally into said passage substantially opposite said discharge exit and having a coin-engaging portion inclined to deflect coin elements into said discharge exit for ejection from the passage, and means mounting said deflector for gravitating movement back and forth from a normal position between said testing means so as to lie along the trajectory followed by certain coin elements notwithstanding the tilting of said chute in directions tending to displace said deflector from said normal position.

7. In a coin chute of the type having a descending coin passage with an open side portion constituting an exit for certain coin elements, the combination of a deflector in the form of a pivoted member on the chute having a coin engaging part projecting into said passage in the region adjoining said exit and pitched in the direction of the exit.

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