

Jan. 19, 1943.

L. VIETH

2,308,634

COIN CHUTE

Filed Oct. 29, 1940

2 Sheets-Sheet 1

FIG. 1

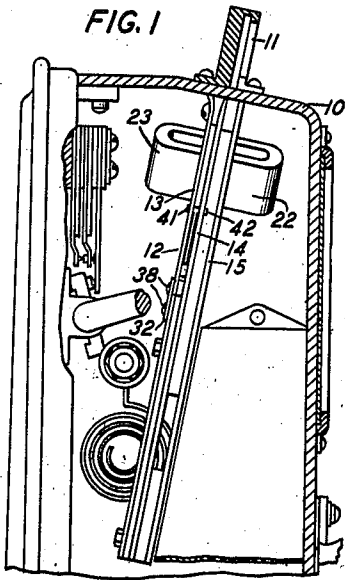


FIG. 2

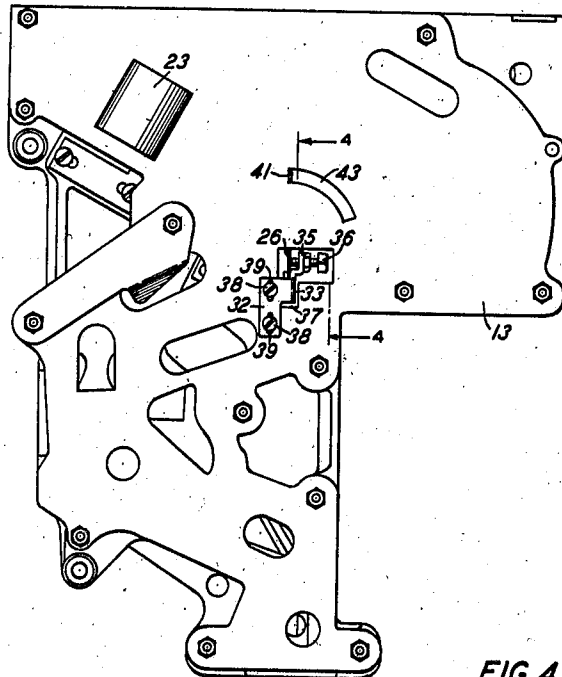


FIG. 3

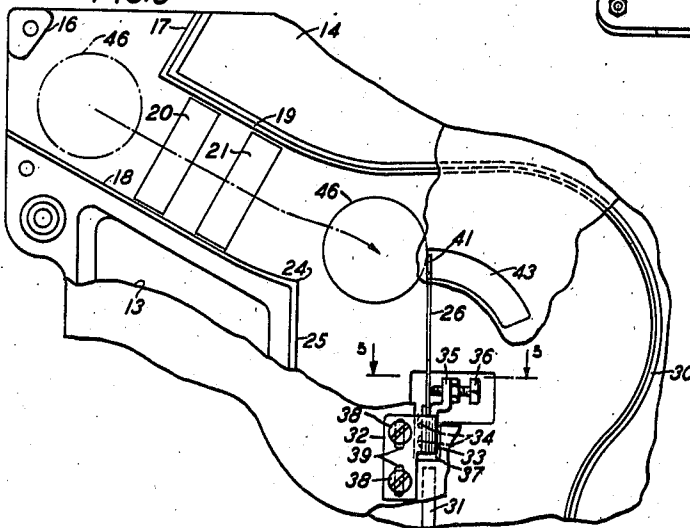


FIG. 4

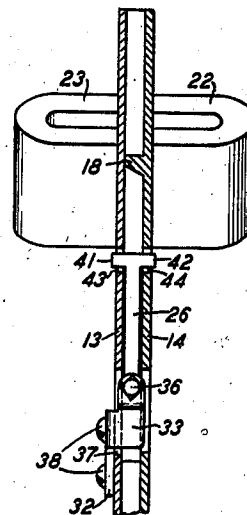
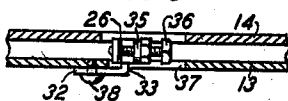


FIG. 5



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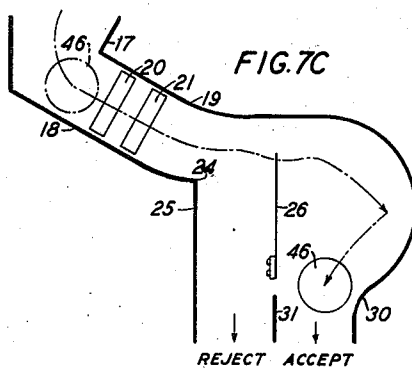
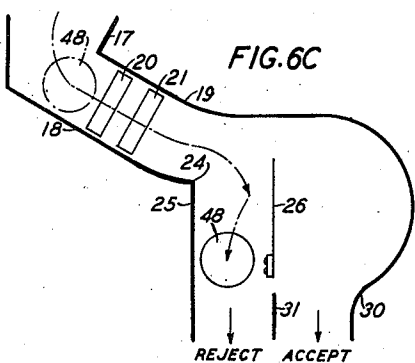
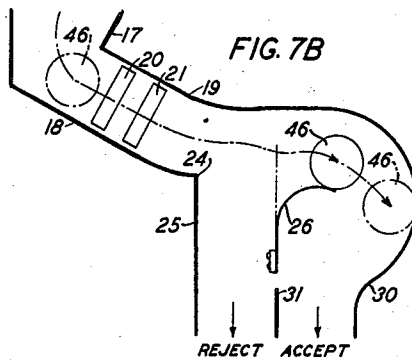
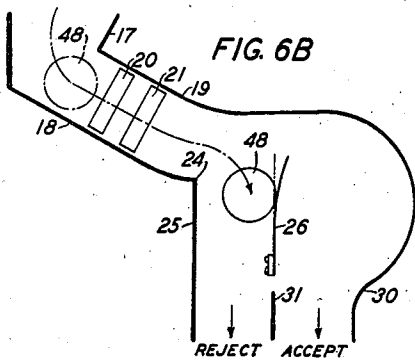
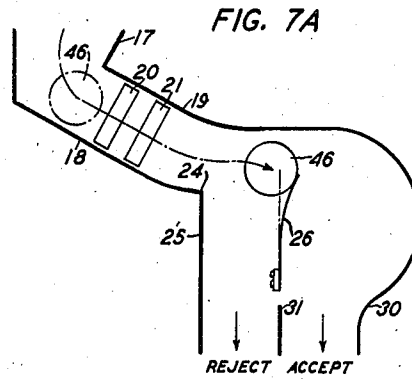
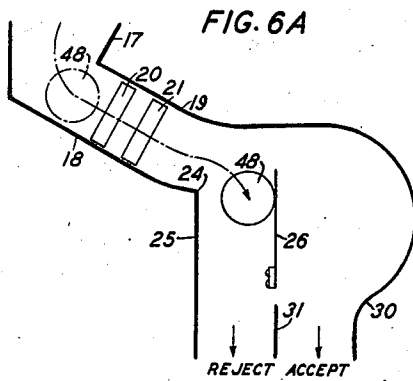
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2,308,634

COIN CHUTE

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Application October 29, 1940, Serial No. 363,294

5 Claims. (Cl. 194—100)

This invention relates to coin chutes, particularly to those intended for use in coin-operated devices such as telephone coin collectors.

An object of the invention is to prevent the use of non-standard coins or slugs for fraudulently obtaining goods or services from a coin-controlled device.

It has hitherto been proposed to direct genuine coins and non-magnetic slugs down a longitudinally inclined runway terminating in a gap over which they must leap for acceptance, where the projected speed or trajectory of a coin or slug is made dependent upon its electrical resistance by having them traverse the field of an eddy-current magnet. In such an arrangement the strength of the eddy-current magnet may be adjusted to permit a genuine coin to leap the gap for acceptance while a slug of substantially lower electrical resistance than a standard coin will be slowed up enough to fail to leap the gap and hence can be rejected.

In accordance with this invention the above-specified gap and the acceptance channel following the gap are effectively separated by a flexible spring rigidly fastened at its lower end and with its upper free end extending into the path taken by a genuine coin in leaping said gap. The strength of the eddy-current magnet and the flexibility and position of this spring are preferably such that a genuine coin in striking the upper portion of the spring will have sufficient momentum to bend the spring sharply in the direction of coin travel and permit the coin to roll over the top edge of the spring into the acceptance channel. In particular, the arrangement is preferably such that genuine coins strike the spring at the same distance from its fixed support whereby the various factors involved may be adjusted to give each coin at impact no more momentum than is required to bend the spring sufficiently to enable a genuine coin to reach the acceptance channel. Under these conditions it follows that any slug whose momentum does not exceed that of a standard coin but whose trajectory is such as to strike the spring at a lower point than a standard coin will be unable to bend the spring sufficiently to pass into the acceptance channel but will be diverted back into the gap for rejection; such would be the case, for example, for a slug whose projected speed across the gap was retarded by the eddy-current magnet more than a standard coin because of the slug having a lower electrical resistance. Light-weight slugs will also be rejected by such a spring even though they strike the spring at the same point

as a standard coin since such slugs will possess insufficient momentum to be accepted.

It follows from the above description that the path taken by a coin or slug after impact with the spring will depend primarily upon three factors, the mass and velocity of the coin or slug and the distance between the point of impact and the fixed end of the spring; and with the device so arranged that the net result of these three factors is just sufficient to secure the acceptance of a standard coin it follows that a variety of types of slugs will be rejected where one or more of these factors differs materially in value from those for a standard coin.

Referring to the drawings,

Fig. 1 is a side view partly in section of the upper housing of a coin collector employing a coin chute in accordance with this invention;

Fig. 2 is a rear view of the coin chute of Fig. 1;

Fig. 3 is a view of the upper portion of the nickel coin channel disclosing one form of this invention;

Fig. 4 is a sectional view of the coin channel taken along the line 4—4 of Fig. 2;

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 3;

Figs. 6A, 6B and 6C illustrate the manner in which a non-standard coin is rejected by means of this invention; and

Figs. 7A, 7B and 7C illustrate the path taken by a standard coin in reaching the acceptance channel.

Fig. 1 represents a side view partly in section of the upper housing of a telephone coin collector of the general type disclosed in the O. F. Forsberg United States Patent 1,043,219, issued November 5, 1912. The lower part of the collector is not shown since the present invention is concerned with the coin chute usually located in the upper housing. Referring to Fig. 1, the upper housing 10 has the usual multiple coin gauge 11 into which nickels, dimes and quarters may be inserted after which the coins traverse individual channels in the laterally inclined coin chute 12 for selectively actuating a signaling device such as a gong or bell before reaching a coin hopper where the coins are held in suspense for subsequent collection or refund depending upon conditions occurring after coin deposit. The chute assembly 12 comprises a cover plate 13, a nickel and dime channel plate 14 and a quarter channel plate 15 with the cover plate 13 on the upper side of the chute as mounted in the collector. A rear view of the chute assembly is shown in Fig. 2 while the upper portion of the nickel channel is shown in Fig. 3.

In these drawings, the slug rejector of this invention is disclosed as forming a part of the nickel runway but it will be obvious that the invention is equally applicable to coin channels for coins of other denominations.

In Fig. 3 most of the cover plate 13 has been removed to expose the path taken by a deposited nickel in the upper portion of the channel plate 14. A nickel deposited in coin gauge 11 will drop downwardly between the retaining ledges 16 and 17 to strike a longitudinally inclined rail 18 down which the coin will roll on its edge. The plate 14 between rails 18 and 19 contains two parallel slots 20, 21 for receiving the two poles of an eddy-current creating magnet 22 while the opposed cover plate 13 has similarly aligned slots for receiving the poles of another eddy-current creating magnet 23. Beyond the terminating point 24 of supporting rail 18 is a reject channel lying between ledge 25 and spring 26 while to the right of spring 26 (Fig. 3) is an acceptance channel lying between the curved outer wall 30 and a wall comprising spring 26 and partition 31.

Member 26 is a thin flexible leaf spring rigidly mounted at its lower end while its upper end is free to bend under the impact of a coin or slug. Mounted on cover plate 13 (Fig. 3) is a bracket 32 having an arm 33 which projects through a slot 37 into the space between cover plate 13 and channel plate 14. The lower end of spring 26 is rigidly fastened to arm 33 in any suitable manner as by rivets 34 while the upper end 35 of arm 33 is spaced away from spring 26 and carries a screw 36 bearing against spring 26 so that the latter has adjustable tension. Bracket 32 is held in position by screws 38 which pass through slots 39 in bracket 32 to enable spring 26 to be elevated or lowered to set spring 26 in its optimum position for the desired discrimination between slugs and genuine coins. The upper end of spring 26 has lateral projections 41, 42 which enter the arcuate slots 43, 44 in plates 13 and 14. Spring 26 is preferably biased to a normally vertical position with tabs 41, 42 lying against the end walls of slots 43, 44 as shown in Fig. 3.

As disclosed particularly in Fig. 3 the upper end of spring 26 lies in the path taken by a genuine coin after leaving guide rail 13. The channel configuration and the strength of the eddy-current magnets 22, 23 are preferably such that a standard coin 46 after passing beyond point 24 will strike spring 26 adjacent its upper end near the lateral tabs 41, 42 with sufficient momentum to bend spring 26 from its normal position of Fig. 3 to a position which will permit the coin to roll over the upper edge of the spring into the acceptance channel defined by wall 30. For example, the path followed by a standard coin after impact with spring 26 may be as shown in Figs. 7A, 7B and 7C where in Fig. 7B the spring has been bent over far enough to permit the coin to enter channel defined by wall 30 after which spring 26 resumes its normal position of Fig. 7C with coin 46 proceeding on down the acceptance channel defined by wall 30.

The flexibility of spring 26 is preferably such that a standard coin has no more than sufficient momentum to insure the passage of the coin into the acceptance channel defined by wall 30. In view of this relation it follows that many types of slugs will fail to be accepted because of the resistance offered by spring 26. For example, we may assume a deposited slug 48 having the

same mass as the standard coin but of lower electrical resistance. Such a slug will be retarded more than a standard coin in passing through the field of the eddy-current magnets and hence will strike spring 26 at some lower point as indicated in Fig. 6A. Due to the greater resistance of spring 26 against bending when struck at the point indicated in Fig. 6A as compared with the point of impact indicated in Fig. 7A and due to the relatively smaller kinetic energy in the slower moving slug 48, the spring when struck by such a slug will be flexed only to some maximum position such as indicated in Fig. 6B after which the slug will rebound back into reject channel 25 as shown in Fig. 6C.

In order to dispose of slugs of such light weight that they produce no appreciable bending of spring 26 it is preferable that the distance between point 24 and spring 26 should be somewhat greater than the diameter of a standard coin to permit such a light-weight slug to drop freely into the reject channel defined by ledge 25.

In the section of the nickel runway shown in Fig. 3 no provision has been shown for rejecting magnetic slugs from the chute in order to avoid their entering the field of the eddy-current magnets 22, 23. Such magnetic slugs may be rejected in any suitable manner as, for example, in accordance with the disclosure of the P. E. Mills United States Patent 2,049,170, issued July 28, 1936.

What is claimed is:

1. In a coin collector coin chute, a chamber, a partition dividing the lower portion of said chamber into a first coin channel and a second coin channel, a downwardly inclined coin runway for receiving coins and for projecting them with a horizontal component of motion in a general direction across the entrance to said first channel and over said partition, magnetic means associated with said runway for causing a deposited genuine coin and a deposited spurious coin of the same mass as the genuine coin but of substantially different electrical resistivity to be projected across said chamber in different trajectories dependent upon their resistivity, a flexible spring rigidly mounted at its lower end and having its free end extending substantially vertically into the paths taken by said genuine coin and said spurious coin whereby one of said coins strikes said spring at a certain distance from its fixed end and the other deposited coin strikes said spring at a greater distance from its fixed end, said spring being of such flexibility relative to its length between its fixed end and the points engaged by said coins that the spring deflection when engaged by said other coin is sufficient to permit said other coin to reach said second channel while the spring deflection when engaged by said one coin is insufficient to permit said one coin to reach said second channel but instead is deflected into said first channel.

2. In a coin collector coin chute, a chamber, a partition dividing the lower portion of said chamber into a first coin channel and a second coin channel, a downwardly inclined coin runway for receiving coins and for projecting them with a horizontal component of motion in a general direction across the entrance to said first channel and over said partition, magnetic means associated with said runway for causing coins and slugs to be projected across said chamber in different trajectories dependent upon their relative electrical resistivities, a thin flexible leaf spring

substantially vertically arranged, said spring being rigidly mounted at its lower end and with its upper free end extending into the upper portion of said chamber for engagement by all coins leaving said runway with a speed and a trajectory sufficient in the absence of said spring to direct the coins into said second channel whereby a deposited genuine coin of a given mass will strike said spring at a point a certain distance from its fixed end and a deposited spurious coin of equal mass but of lower electrical resistivity will due to its lower trajectory strike said spring nearer the fixed end of said spring, said spring being of such flexibility relative to its length between its fixed end and the points engaged by said coins that the spring deflection when engaged by said genuine coin is sufficient to permit said genuine coin to reach said second channel while its deflection when engaged by said spurious coin is insufficient to permit said spurious coin to reach said second channel whereby said spurious coin is directed into said first channel.

3. In a coin collector, a coin channel along which a deposited coin rolls on its edge, said channel terminating in a gap over which a coin must leap for acceptance, a second coin channel having a coin entrance for receiving a coin successfully leaping said gap and a thin flexible leaf spring interposed between the termination of said first channel and the entrance to said second channel, said spring being rigidly mounted at a point located a substantial distance below the path of travel taken by a genuine coin in traversing said gap, the free end of said spring projecting upwardly into the path of a genuine coin,

said upper end being of sufficient flexibility to bend under impact of a standard coin to an extent sufficient to permit said coin to pass over the upper edge of said spring into said second channel.

4. In a coin collector, a coin channel along which a deposited coin rolls on its edge, said channel terminating in a gap over which a coin must leap for acceptance, an eddy-current creating magnet associated with said channel for retarding the speed of coins or slugs in accordance with their electrical resistance whereby a slug of lower electrical resistance than a standard coin will in traversing said gap follow a lower trajectory than a standard coin, a flexible spring, and means for holding stationary one end of said spring with the free end of said spring extending upwardly into a position to be struck by said slug at a point nearer its stationary end than the point at which it is struck by a standard coin, said spring being of such length and flexibility that said spring under the impact of a standard coin is flexed to a degree sufficient to permit said standard coin to pass over said spring.

5. In a coin collector, a downwardly descending coin channel terminating in a gap over which a genuine coin must leap for acceptance, a second coin channel having a coin entrance for accepting a coin leaping said gap, a thin strip of resilient material, a stationary support, one end of said strip being fastened to said support, the free end of said strip guarding said coin entrance and yielding on coin impact to permit a deposited coin to enter said second channel.

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