

July 28, 1936.

P. E. MILLS

2,049,170

COIN COLLECTOR APPARATUS

Filed April 10, 1935

2 Sheets-Sheet 1

FIG. 1

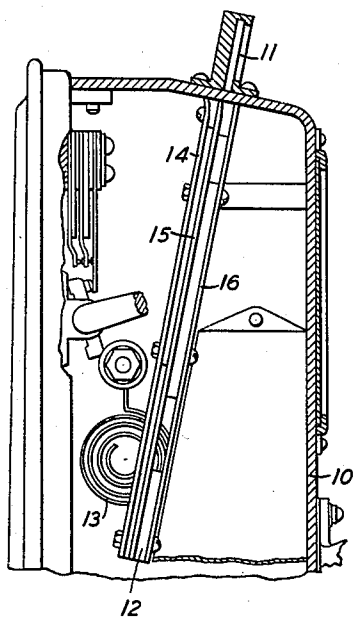


FIG. 2

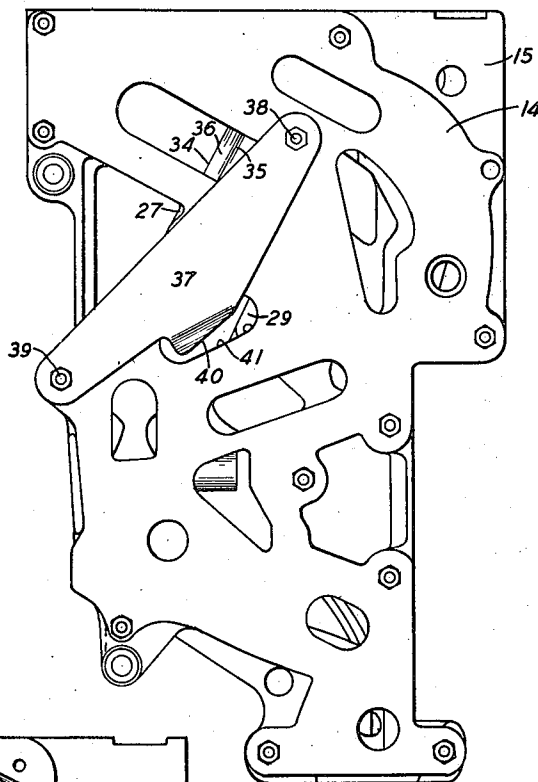
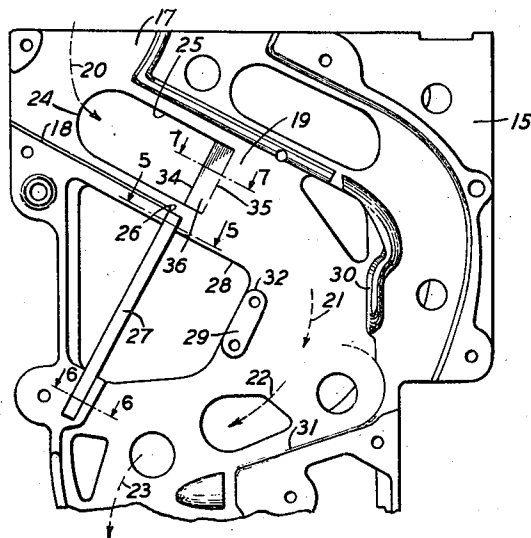


FIG. 3



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FIG. 4

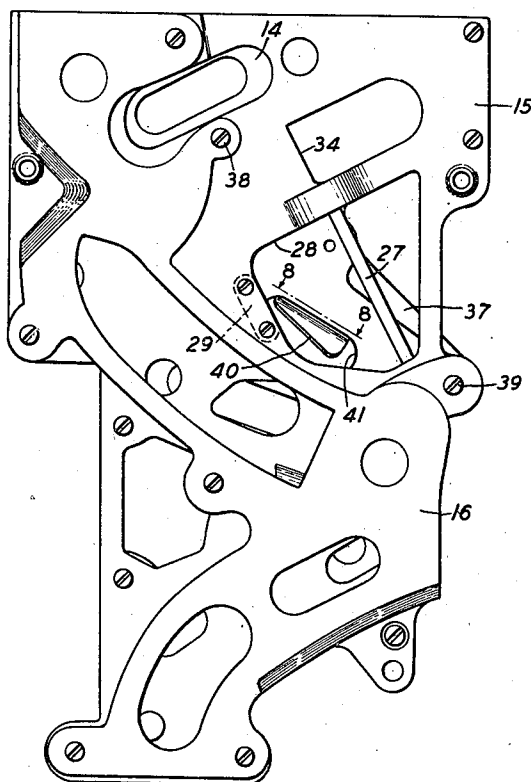


FIG. 5

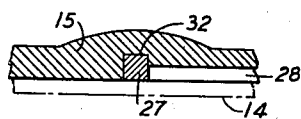


FIG. 6

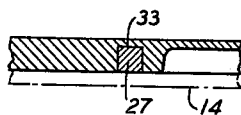


FIG. 7

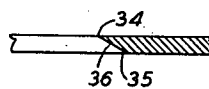
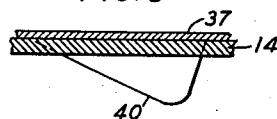


FIG. 8



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## UNITED STATES PATENT OFFICE

2,049,170

## COIN COLLECTOR APPARATUS

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Application April 10, 1935, Serial No. 15,561

2 Claims. (Cl. 194—101)

This invention relates to coin chutes particularly for telephone coin collectors and has for an object the provision of means for ejecting from the chute coins or slugs made of magnetic material.

In telephone coin collectors as exemplified by the disclosure in the O. F. Forsberg Patent 1,043,219, issued November 5, 1912, it is customary for the subscriber to tentatively deposit a coin when services are desired, which coin is subsequently collected or refunded depending upon whether the desired telephone connection is obtained. Occasionally attempts are made to secure the acceptance of a slug of magnetic material such as an iron disc or washer which is otherwise standard.

Coin chutes as heretofore constructed for telephone collectors usually comprise a laterally and longitudinally inclined coin channel formed between front and rear sections of a chute to guide a standard coin, for example, to a signaling device that is sounded by the impact of the coin. The lower side wall in the longitudinally inclined section usually has an elongated opening for rejecting under-diameter coins which are tilted outwardly through the opening due to the lateral inclination of the chute. Such a reject area, however, is of no value in preventing the acceptance of a magnetic coin of substantially the same diameter and thickness as the standard coin for the chute.

In accordance with this invention it is proposed to use one pole of a bar magnet as part of the bottom wall of the coin channel, whereby the resulting retarding effect upon the speed of travel of magnetic slugs may be utilized in conjunction with a gap in the bottom wall immediately following the magnet to cause the magnetic slugs to fall through the gap and be rejected while standard non-magnetic coins traveling with undiminished velocity will jump the gap and continue on down the coin channel to sound a signaling device or to perform other functions. The magnet and the following gap should be located in a portion where the coin or slug normally travels with a definite velocity independent of the manner in which it is deposited. In a coin chute of the type disclosed in the Forsberg patent the preferred position for the magnet is in the first inclined portion of the runway, the portion which contains the under-diameter reject opening in the lower side wall. For conserving space and for obtaining satisfactory operating characteristics the magnet should be inserted in the bottom wall of the chute at a point immediately

adjacent the end wall for the under-diameter reject opening. Since it is preferable to have the gap follow the under-diameter reject opening it is advisable to have the under-diameter reject opening designed to minimize the danger that a legitimate coin will be retarded sufficiently by the reject opening, such as by the end wall thereof, to prevent such a coin from clearing the gap.

It has been found that a bar magnet having only one pole in the above-mentioned coin channel gives quite satisfactory performance providing its length is many times the equivalent diameter of its cross-sectional area to give it a magnetic field of a substantially constant value, and providing the strength of the magnet is not sufficient to hold attracted to itself thin discs of metal such as tobacco tags which if present would tend to block the chute for the passage of genuine coins.

Referring to the drawings,

Fig. 1 is a fragmentary side view partly in section of a portion of a telephone coin collector in which this invention may be employed;

Fig. 2 illustrates one view of a coin collector chute embodying this invention;

Fig. 3 is a view of the upper part of the central section of the coin chute with the rear cover plate removed;

Fig. 4 is a view of the opposite side of the coin collector chute from that shown in Fig. 2;

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

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 3;

Fig. 7 is a sectional view taken along the line 7—7 of Fig. 3; and

Fig. 8 is a sectional view taken along the line 8—8 of Fig. 4.

Fig. 1 is a showing of the upper portion of a coin collector housing of the type disclosed, for example, in the O. F. Forsberg U. S. Patent 1,043,219 above mentioned. Mounted upon the upper part of housing 10 is a coin gauge 11 containing side openings for receiving coins of various denominations and directing them into individual coin passageways in a coin chute 12 for sounding suitable signaling devices such as gong 13 after which the coins are diverted into a cash compartment for collection or into a refund chute for return to the user depending upon whether the desired connection has been obtained.

The present invention is concerned with the construction of the coin chute 12 to provide means therein particularly in the five-cent runway to reject slugs of magnetic material even

when the slugs are of standard dimensions. Such chutes when arranged for the passage of United States nickels, dimes and quarters may be made of several sections slotted to provide 5 runways for legitimate coins such as a cover plate 14, a central plate 15 and a front section 16. Fig. 2 is a view from the rear showing cover 14 on top the other sections while Fig. 4 is a view from the front with the front section 16 on top.

10 The passageways for nickels and dimes are provided between cover 14 and central plate 15 while the passageway for quarters lies between front section 16 and center section 15 in a manner quite similar to the disclosure of the above-men-

15 tioned Forsberg patent. As shown in Fig. 1 such a coin chute is preferably mounted in a laterally inclined position to facilitate the rejection through side wall openings of coins or slugs having a diameter less than standard.

20 In Fig. 3 the cover plate 14 has been removed to disclose more fully the arrangement in the five-cent runway for rejecting slugs of magnetic material. A five-cent piece or a slug of substantially the same dimensions after insertion in an

25 opening in gauge 11 drops into a substantially vertical chute section 17 until it strikes the bottom wall 18 of a longitudinally inclined section 19 and proceeds on down the runway, the path of a legitimate five-cent coin being indicated by

30 arrows 20, 21, 22 and 23. The longitudinally inclined section 19 has an elongated opening 24 in its lower side wall, the distance between its upper edge 25 and bottom wall 18 being such that an under-diameter coin rolling along bottom wall 18

35 will not be supported by edge 25 but will fall out of the chute through opening 24 due to the lateral inclination of the chute as shown in Fig. 1.

The bottom wall 18 of the longitudinally inclined section terminates at the point 26 immediately adjacent the upper end of a permanent

40 magnet in the form of a straight bar 27 so that beyond the magnet there is a gap 28 in the bottom of the passageway extending between wall section 29 and magnet 27. This gap is of such length

45 that a legitimate coin after deposit in the coin gauge 11 will acquire sufficient velocity to strike retaining wall 30, drop downwardly between retaining walls 29 and 30, strike the longitudinally inclined bottom wall 31 and continue on down

50 the chute as indicated by arrows 22, 23. A slug of magnetic material of substantially the same dimensions as the five-cent piece will safely pass the under-diameter reject opening 24 but will be attracted by magnet 27 to reduce substantially its

55 linear velocity to the extent that it will fail to jump gap 28 but will fall out of the chute through this gap before it has sounded the signaling device or performed other functions which should be limited to legitimate coins. It will be apparent

60 that a magnetic slug of a diameter greater than standard cannot be deposited since gauge 11 limits the maximum diameter of an acceptable coin; reject opening 24 will reject magnetic slugs of a diameter less than standard; and bar magnet 27

65 will cause the rejection of magnetic slugs even though of standard dimensions.

It will be noted that the upper end 32 of dividing wall 29 is substantially below the plane representing an extension of bottom wall 18 towards

70 vertical wall 30, so as to minimize the danger that legitimate coins will fail to pass to the right of block 29. In actual practice in order to provide a sharp line of division between a speed of coin travel sufficient for acceptance and a speed causing rejection it will generally be found desirable

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to have the length of gap 28 such that a legitimate coin traveling at its normal speed will strike the upper end 32 of the dividing wall 29 but in such a manner that it will continue on down the regular runway. Other coins with a slightly less speed such as one retarded by the magnet may strike wall 29 but will be thrown back into gap 28 for rejection.

Due to the arrangement of coin gauge 11 and vertical section 17 of the chute all legitimate coins 10 deposited in the coin gauge have substantially the same linear velocity when they reach the lower end 26 of the inclined bottom wall 18 so as to enable an accurate discrimination between a legitimate coin and a magnetic slug retarded by 15 magnet 27. Magnet 27 is preferably of insufficient strength to permanently attract any deposited magnetic disc as any slug held by magnet 27 particularly near its upper end would tend to block the chute and put the coin collector out of 20 service. Magnet 27 should merely cause a substantial reduction in the linear speed of a magnetic slug in order that its rejection may be assured.

The preferred arrangement for mounting the 25 magnet in the coin chute is to provide slots in the center section 15 to receive both the upper and lower ends of the magnet. Referring to Figs. 3 and 5 it will be apparent that the upper end of magnet 27 fits snugly into a slot 32 with the inner 30 face of the magnet lying substantially in the plane of the upper face of bottom wall 18 so that coins and slugs actually contact with the end of the magnet as they pass down the chute. As shown in Figs. 3 and 6 the opposite end of the 35 magnet is embedded in an elongated slot 33 in a portion of center section 15 remote from the path of coin travel so as to prevent the lower end of the magnet from exerting any attracting force on magnetic slugs. In order to conserve space and 40 obtain satisfactory operating characteristics the magnet is preferably in substantial alignment with the lower end wall 34 of reject opening 24. This end wall of the reject opening is preferably beveled back for a substantial distance from edge 45 34, say to point 35, as shown in Fig. 7, the terminating edge 34 being the edge remote from the path of coin travel. This minimizes the danger that a legitimate coin in traveling down the longitudinally inclined section 19 might have its forward 50 edge turned slightly towards the reject opening 24 to strike the lower end wall 34 of the reject opening, and be slowed up enough thereby to cause the coin to fail to jump the gap 28 as would occasionally be the case if the beveled surface 36 were absent and forward edge 34 presented a face at right angles to the path of coin 55 travel equal to the full thickness of center section 15. However, even if a legitimate coin strikes the beveled surface 36 it should not slow up its speed 60 enough to cause rejection. It is also preferable to have the end edge 34 of the reject opening form a line substantially at right angles to the upper edge 25 and the lower edge of the reject opening as shown in Fig. 3, since such an arrangement 65 also minimizes the danger that a legitimate coin will be accidentally retarded enough for rejection.

In order to obtain constant results the attractive force exerted by the permanent magnet 27 should be fairly constant even over a long 70 period of time. This may be attained by making the length of the magnet many times its equivalent diameter, such as a ratio of 10 to 1 or 15 to 1. The coin chute sections 14, 15 and 16 are preferably of non-magnetic material so that 75

the return path for the magnetic flux is substantially a path through air. That is, there is normally no other magnetic material adjacent the magnet 27.

Although the coin chute when mounted in a coin collector is tilted downwardly with reject opening 24 on the lower side there is still danger that magnetic slugs rejected through gap 28 may not clear the lower part of the coin chute but may lodge, for example, against section 16 of the chute which, as shown in Fig. 4, is fastened to the forward side of the center section 15. In order to avoid this possibility a metallic strip 37 is mounted outside cover 14 between two of the assembly screws 38, 39 and this strip 37 has an angular tab 40 projecting through an opening 41 in the cover plate to form a deflector for magnetic slugs rejected through gap 28 to insure that the slugs are thrown clear of the quarter runway section 16. Fig. 8 is a detail view of this deflector.

While the particular embodiment of this invention chosen for illustration is concerned with rejection of magnetic slugs in the five-cent runway of a coin collector it will be obvious that the invention may be readily applied to runways for other sizes of standard coins.

What is claimed is:

1. In a coin chute, a coin channel comprising a laterally and longitudinally inclined section preceded by a substantially vertical section arranged so that genuine coins deposited in said

chute will have substantially the same linear velocity at the upper end of said inclined section, said inclined section having opposed side walls and a bottom wall, a deposited coin riding on said bottom wall with the coin tilted towards one of said side walls, an elongated opening in said one side wall for rejecting under-diameter coins, and a permanent bar magnet having one end terminating substantially flush with the coin supporting surface of said bottom wall, the remainder of said magnet being remote from said inclined section of said channel and subsequent sections of said channel, the passage of a genuine coin down said inclined section being substantially free and unimpeded until after the coin has rolled over the end of said magnet whereby each genuine coin deposited has substantially the same linear velocity when passing over the end of said magnet, said bottom wall having a gap beyond said magnet into which magnetic coins will fall for rejection but which will be passed over by a genuine coin, said side wall opening extending down the channel in a direction parallel to the path of coin travel for a substantial distance and terminating at a point substantially opposite the end of said magnet in said channel.

2. A coin chute in accordance with claim 1 in which the length of said magnet is at least ten times its equivalent diameter.

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