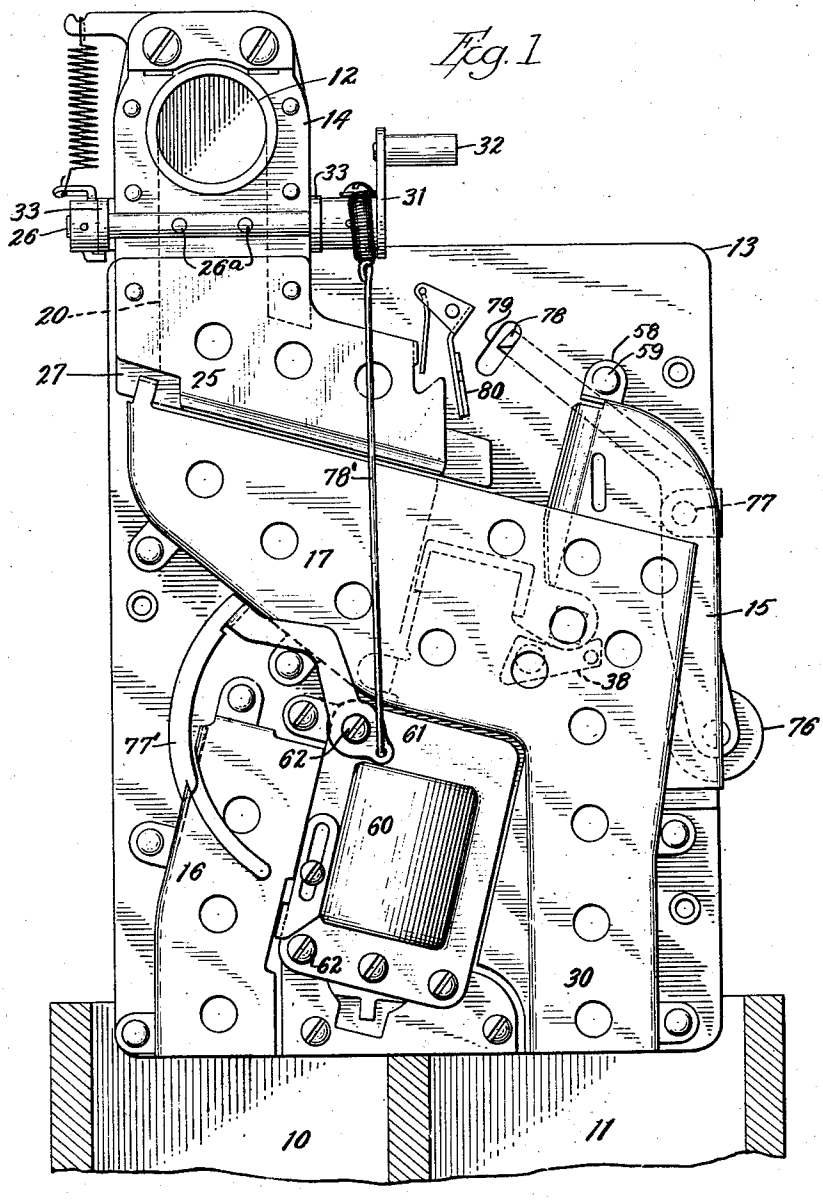
July 22, 1941. B. E. MILLS 2,250,047

COIN SELECTOR

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Fig. 1



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Fig. 2

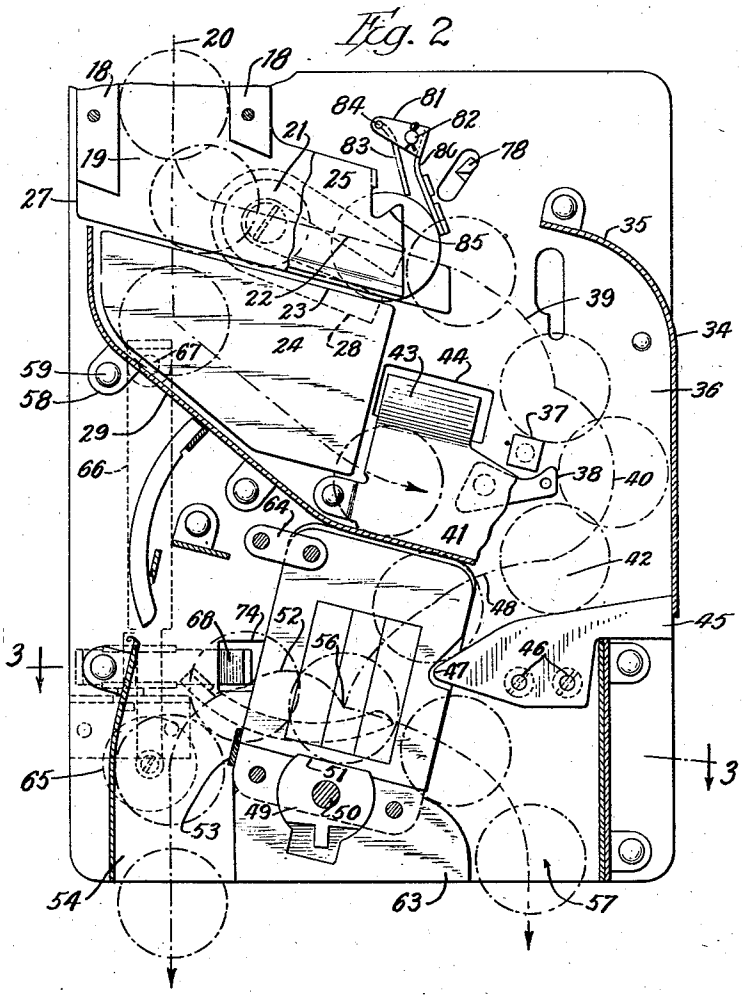
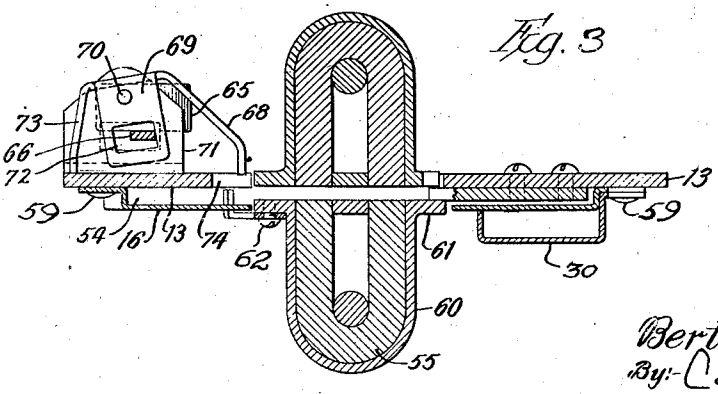


Fig. 3



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Patented July 22, 1941 2,250,047

UNITED STATES PATENT OFFICE

2,250,047

COIN SELECTOR

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Application October 1, 1937, Serial No. 166,763

3 Claims. (Cl. 194—100)

This invention relates to coin selectors for use in connection with coin-controlled mechanisms, and has as its general object to provide a device of improved efficiency for testing the material in a coin so as to reject all coins counterfeit of material.

The present invention, although adaptable to coins of other materials also, is directed primarily to a device for selecting United States nickels and rejecting counterfeit nickels and all other types of slugs, checks, and counterfeit coins.

The invention employs the principle of droping the coin upon a member from which it will rebound, acceptable coins being adapted to rebound over a barrier, and rejected coins being stopped by the barrier or otherwise prevented from passing into the acceptable coin outlet.

An object of the invention is to provide, in a selector of this type, a concentrated field of magnetic flux in immediate association with the rebound member, for arresting the rebound of coins of high conductivity, such as copper, silver, or brass. In contrast to prior devices in which the coin is subjected to the influence of the magnetic field, either prior or subsequent to rebound, to control the position of ultimate delivery of the coin, the present invention aims to check the rebound of a coin of such material, in the immediate vicinity of the rebound. I find that there are advantages in doing so. For instance, the speed of the coin is at a maximum at the point of rebound in view of the fact that the coin will constantly accelerate as it falls toward the rebound member. The amount of arresting force set up by the passage of the coin through the magnetic field, will be proportional to the speed. By employing the arresting influence of the magnetic field at the point of greatest vertical declination, it is therefore possible to secure greater effect and consequently greater selectivity than is the case where the arresting influence of the magnetic field is applied at some more nearly horizontal portion of the trajectory.

The chief advantage, however, lies in the fact that the coin is subjected to the action of the magnetic field twice, once just prior to the rebound and once just after the rebound. The magnetic field is so arranged with respect to the rebound member that the coin passes through the center of the field before it contacts the rebound member, and then, in rebounding, again passes through the center of the field in the opposite direction.

In contrast to prior devices, in which both acceptable and unacceptable coins rebound in the same direction of horizontal travel, but at varying distances from the point of rebound, the present invention provides for the acceptable coins continuing after rebound in the initial direction of horizontal travel while the unacceptable coins, checks, etc. reverse their direction of horizontal travel after rebound, and pass out of the device on the opposite side of the bouncing anvil or rebound member from that on which the acceptable coins leave the device.

To this end, the rebound face of the anvil or rebound member is inclined upwardly in the direction of horizontal travel of the coin prior to rebound, and the trajectory of the delivery of the coin to the anvil and the inclination of the rebound face are so related to each other and to the horizontal and to the rate of travel of the coin that acceptable coins will rebound toward the high side of the rebound face and clear the same, whereas unacceptable coins, failing to do so, will roll back down the incline of said face to the rejection outlet.

The barrier used in connection with the present invention is located adjacent the high side of the anvil and serves to turn back certain of the unacceptable coins so as to cause them to reverse their direction of travel and roll back across the anvil.

Another object of the invention is to provide a novel anti-tilt mechanism adapted to obstruct the coin passage in the event that the device is tilted out of its proper position.

A further object of the invention is to provide a novel means for eliminating under-sized coins prior to subjecting the coins to the action of the material-testing mechanism.

Other objects of the invention will become apparent from the following detailed description of the invention when considered in connection with the accompanying drawings, in which:

Figure 1 is a front elevation of the selector embodying the invention;

Figure 2 is a similar view, parts being removed and shown in section to show the interior of the device; and

Figure 3 is a horizontal, sectional view taken on the line 3—3 of Figure 2.

In Figure 1 I have shown the selector in connection with a pair of chutes 10 and 11 for receiving the acceptable and unacceptable coins, respectively. The inlet where the customer introduces the coin to the selector is shown at 12.

The various passages in the selector are formed between a base plate 13 and a series of chute members 14, 15, and 16, secured to the plate 13

and spaced therefrom in the same plane, and a scavenger chute member 17 secured to the plate 13 in a plane beyond that of the members 14, 15, and 16.

The coins, after passing through the inlet 12 in the chute 14, will drop through the inlet passage 19 (Figure 2) in the chute member 14, in a path indicated by the broken line 20, into the first lateral passage 21, in which ferrous slugs and undersized coins are eliminated, as will hereinafter be more fully described. Passing through the passage 21 along the path 22, the non-ferrous slugs, coins, etc. will fall in a trajectory 39 upon a separating barrier 37, over which most of them, including the acceptable coins, will bounce as indicated at 40, dropping through the second vertical passage 36, upon the block 45, forming the bottom of the second lateral passage 42.

The coins, as they strike the block 45, will be rotating in a clockwise direction as a result of rolling through the passage 21, and will therefore stop dead before rolling down the inclined edge of the block 45.

The block 45 is secured by screws 46 to the plate 13. The upper edge of the block 45 terminates at 47 so as to deliver coins in a freely falling, downwardly and laterally inclined trajectory 48 upon the anvil or rebound member 49.

The anvil is mounted upon a shaft 50 and the angle of inclination of its upper face 51 may be adjusted by rotating it around said shaft.

The face 51 intersects the trajectory 48 so as to form the rebound surface, and is inclined upwardly in the direction of horizontal travel of the coin in the trajectory 48. The inclination from the horizontal is slight enough so that acceptable coins will rebound in a trajectory 52 continuing in the same direction of horizontal travel as the trajectory 48. Other coins will tend to bounce in the same direction, but due to insufficient resiliency or being retarded, as will hereinafter be more fully described, will fail to clear the barrier 53 located beyond the higher end of the face 51 in a position to be cleared by the acceptable coins.

The acceptable coins (nickels) will, after clearing the barrier 53, drop through the acceptable coin outlet passage 54 formed by the chute member 16, and into the acceptable coin chute 10.

Nickels have a fairly high coefficient of resiliency and will rebound so as to clear the barrier 53. In doing so, they pass through a concentrated field of magnetic flux created between the poles of opposed horseshoe magnets 55 at the point of rebound, indicated by the numeral 56, being relatively unaffected by said magnetic field. Slugs of lead or copper material also are relatively unaffected by the magnetic field, but their coefficient of resiliency is so low that they will have very little rebound, and will either stop substantially dead on the anvil and thence roll back into the rejection outlet 57, or if they should travel far enough to contact the barrier 53, will be turned back by the barrier and will roll back down the inclined face 51 and into the rejection outlet 57.

Coins of silver, brass, or copper, although having sufficient resiliency to otherwise clear the barrier 53, will be sufficiently retarded by the opposing force set up by the creation within said coins of eddy currents formed by the cutting of the lines of force of the magnetic field, so that the rebound will be insufficient to carry such coins across the barrier. These coins likewise will therefore be turned back by the barrier and will roll down the inclined face 51 into the rejection outlet 57.

It will be noted that the magnets 55 are set at such an angle and so positioned that the lower extremity of the trajectory 48 is substantially parallel to the pole pieces of the magnets 55. Thus the coin traverses the magnetic field for an appreciable distance substantially along the center of said field, where concentration of magnetic flux is at a maximum.

The various chute members 15, 16, and 17 are secured to the plate 13 by means of ears 58 and rivets 59.

The chute member 14 comprises a flat plate spaced from the plate 13 by spacers 18 which define the side edges of the vertical inlet passage 19 leading downwardly from the inlet 12 to the first lateral passageway 21. The passage 21 is defined between the upper edge 23 of the block 24, secured to the plate 13, a scavenger door 25, and a sweeper panel 27 of thin, flexible metal, rigid with the door 25 and adapted to swing laterally therewith when the scavenger shaft 26 is oscillated for a scavenging operation.

A horseshoe magnet 28, mounted on the rear side of the plate 13 behind the passage 21, arrests and holds slugs of iron or other paramagnetic material, and the scavenger gate 25 and sweeper panel 27 serve to transfer such slugs laterally from the plane of the chute 22 to the plane of the scavenger chute 17. Being thus swept from the upper edge 23 of the block 24, these slugs will drop into the scavenger chute 17, travel down the inclined bottom 29 thereof, and thence drop through the vertical leg 30 thereof into the rejection chute 11.

The scavenger shaft 26 is oscillated by means of a lever 31 attached to one end thereof, said arm carrying at its outer end a pin 32 adapted to be connected to a suitable scavenger operating link, not shown. The shaft 26 is journaled in brackets 33 formed integrally on the plate 13. The gate 25 and sweeper plate 27 tend to spring outwardly, are normally restrained by cams 26a mounted in the shaft 26, and are released when such cams are swung to inoperative position by oscillation of the shaft 26.

The chute member 15 has an integral flange 34 curving upwardly and forwardly at 35 to form the upper and side edge boundaries of vertical coin passage 36, the upper end of which forms a continuation of the first lateral passage 21. The inner side of the passage 36 is open except for a dividing member 37 and a spacer block 38 just below the member 37. A coin of proper diameter will, after leaving the end of the block 24, travel in the trajectory 39, dropping upon the dividing member 37 at a sufficiently advanced point to continue into the vertical leg of the chute 36. A coin of insufficient diameter will be arrested by the small coin-eliminating device 80, which will hereinafter be described in detail, and will thence be swept off the corner of the block 24 by the scavenger door 25 and sweeper panel 27 into the scavenger chute 17. The inner side of the scavenger chute 17 below the block 24 is formed by a partition wall 41 which separates the scavenger chute laterally from the passage 36, and the delivery passage 42 forming a lateral continuation of the lower end of the latter. The upper region of the partition wall 41 is inclined at 43 through an opening 44 in the

plate 13 so as to divert coins swept laterally off the corner of the block 24 into the scavenger chute.

The magnets 55 are contained within shells 60 of diamagnetic material having flanges 61 secured by screws 62 to filler block 63 and strap 64.

The anti-tilt device comprises a pendulum 65 having an arm 66 pivoted at 67 to the plate 13, and a finger 68 provided with ears 69 pivoted at 70 upon a bracket 71 secured to the plate 13. An opening 72 in an extension of one of the ears 69 receives the arm 66 of the pendulum. Normally the arm 66 engages the ear on one side of the opening 72 so as to hold the stop 73 of the finger 68 against the plate 13. In this position, the end of the finger 68 will lie in a plane outside of that of the coin passage 54. In the event the selector is tilted in an attempt to fraudulently change the operation thereof, the arm 66 will swing laterally, engage the ear 69 on the other side of the opening 72, and swing the finger 68 around the pivot 70 so as to cause the end of the finger 68 to enter the passage 54 through the opening 74 in the plate 13 above the barrier 53 in the path of rebound of a coin, and turn back the same into the rejection outlet 57.

The small coin-eliminating device comprises a gate member 80, having a bell crank arm 81 pivoted at 82 on the plate 13, and a pawl 83 pivoted at 84 on the end of the arm 81 and normally hanging over a notch 85 in the scavenger gate 25 so that as the gate 80 is swung forwardly by an undersized coin, which clears the pawl 83, said pawl will engage and lock in the notch 85 before the coin has cleared the gate 80, whereupon the coin will be restrained from further movement. A proper-sized coin, however, will engage the pawl 83 and swing it laterally sufficiently to clear the notch 85 and the end of the scavenger gate 25 so that the gate 80 may swing clear of the coin.

Another anti-tilt device comprises a pendulum 76 pivoted at 77 to the plate 13 and having an end 78 bent laterally through an opening 79 in the plate 13 and arranged to swing downwardly to lock the gate 80, in the event of tilting.

In the event a slug or coin should become lodged in the region immediately above the anvil 49, it will be dislodged by a kicker 77' pivoted to one of the screws 62 and connected by a link 78' to the scavenger arm 31 so as to be operated in unison therewith.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

I claim as my invention:

1. In a coin selector, means to deliver a coin in a trajectory having a component of horizontal travel, a member having a face against which said coin may rebound, said face intersecting said trajectory and being inclined upwardly in the direction of coin travel at an angle of small degree relative to the horizontal so that the general direction of horizontal travel of the coin will continue the same after as before rebound, a barrier positioned beyond said rebound face in the direction of coin travel, so as to be hurdled by a coin of proper resiliency and conductivity and to arrest a coin of less resiliency or greater conductivity and cause the latter to roll back along said rebound face and be thereby rejected, and means creating a concentrated field of magnetic flux in the immediate vicinity of rebound to impede the rebound of a coin of excessive conductivity.

2. In a coin selector, means for delivering a coin in a trajectory having a component of horizontal travel, a member having a face intersecting said trajectory and inclined upwardly in the direction of coin travel, the inclination of said face and the relation thereto of said trajectory being such that an acceptable coin will rebound beyond said member in the direction of travel while a non-acceptable coin will roll back along said face and be thereby rejected, and a barrier positioned adjacent the higher end of said face, in a position to be cleared by acceptable coins and to arrest a coin of insufficient rebound and cause the same to roll back across said face.

3. In a coin selector, means for delivering a coin in a trajectory having a component of horizontal travel, a member having a face intersecting said trajectory and inclined upwardly in the direction of coin travel, the inclination of said face and the relation thereto of said trajectory being such that an acceptable coin will rebound beyond said member in the direction of travel while a non-acceptable coin will roll back along said face and be thereby rejected, and a barrier positioned adjacent the higher end of said face, above the plane thereof and spaced from said member a distance less than the diameter of any unacceptable coin, in a position to be cleared by acceptable coins and to arrest a coin of insufficient rebound and cause the same to roll back across said face.

BERT E. MILLS.