Aug. 14, 1934. W. L. GILCHRIST ET AL 1,970,005

MULTIPLE COIN SEPARATOR

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Fig. 3

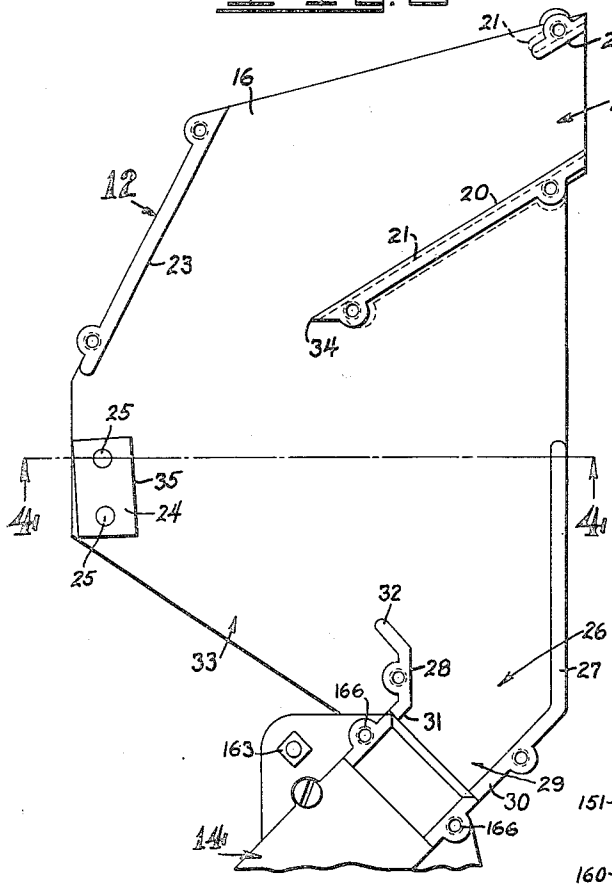


Fig. 1

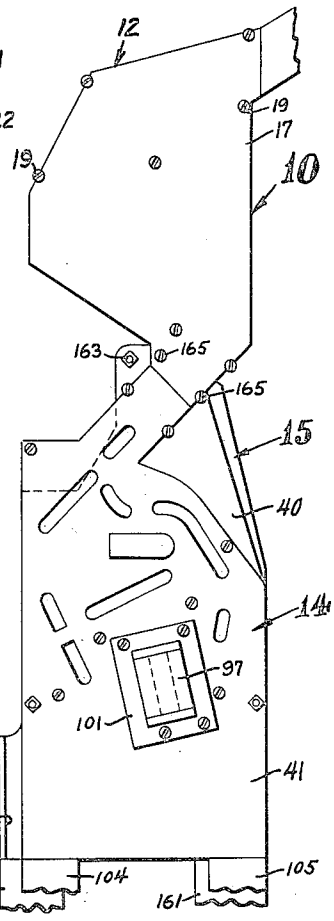


Fig. 4

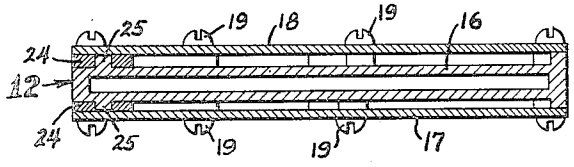
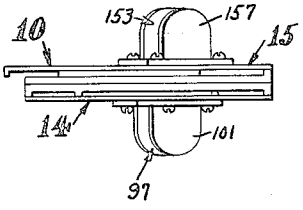


Fig. 2



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Fig. 5

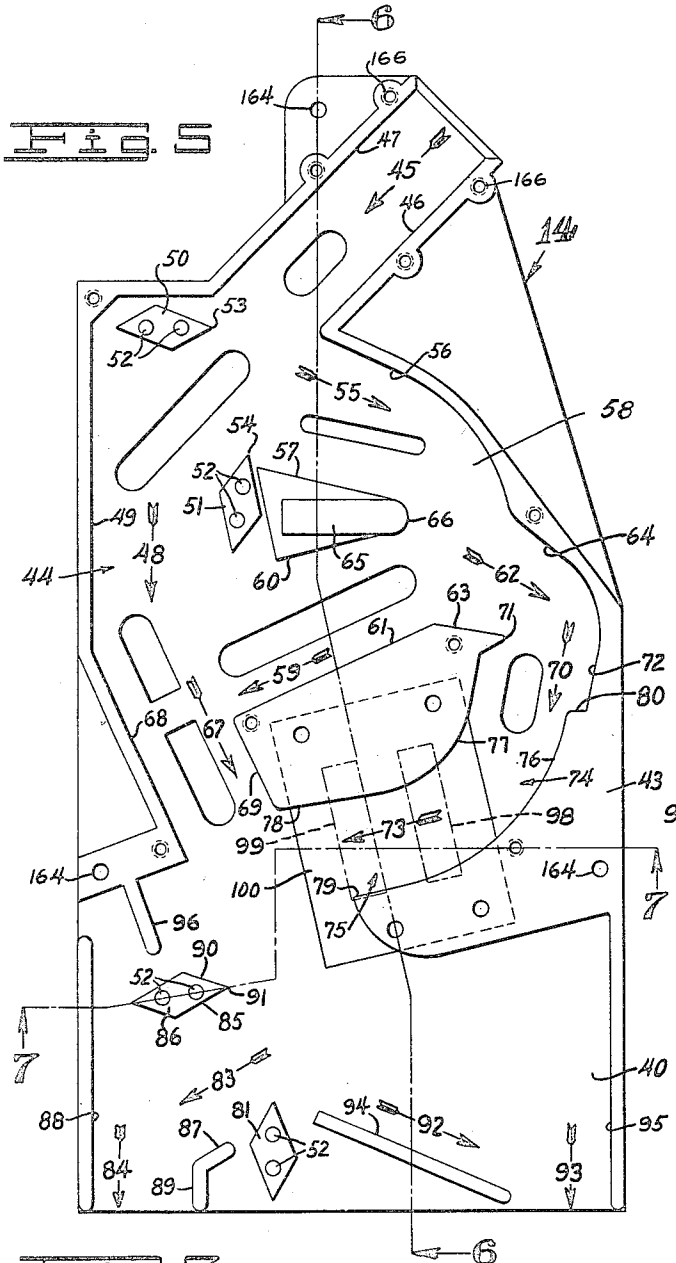


Fig. 6

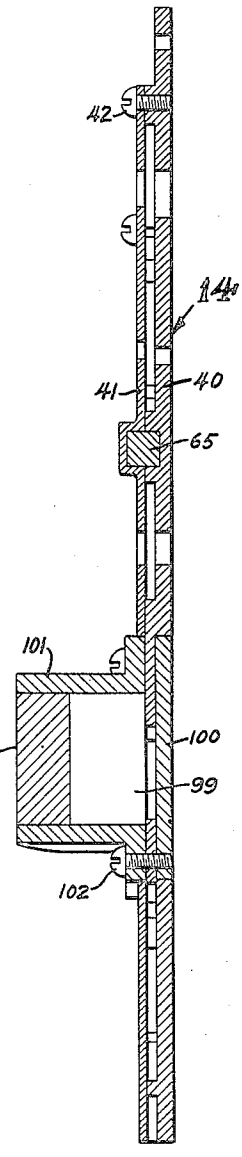
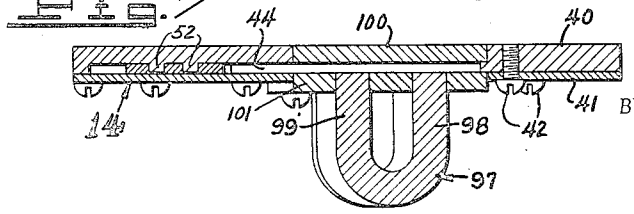


Fig. 7



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Fig. 8

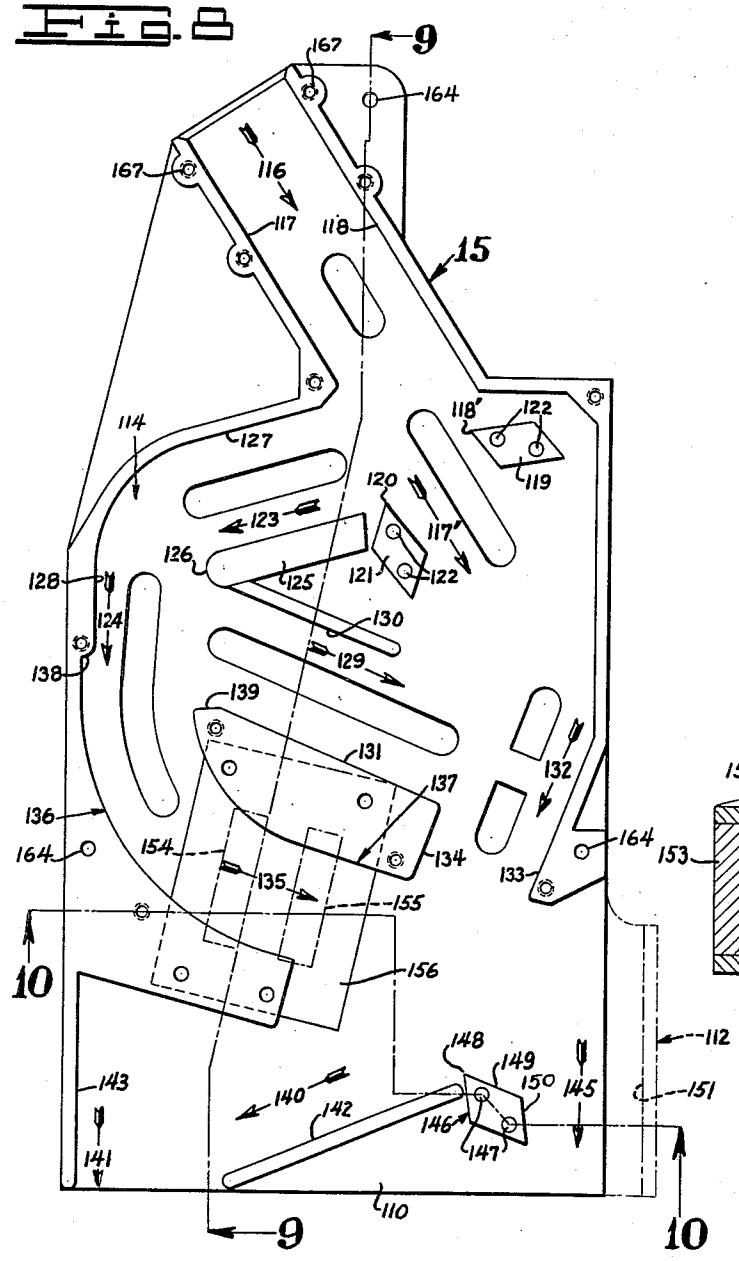


Fig. 9

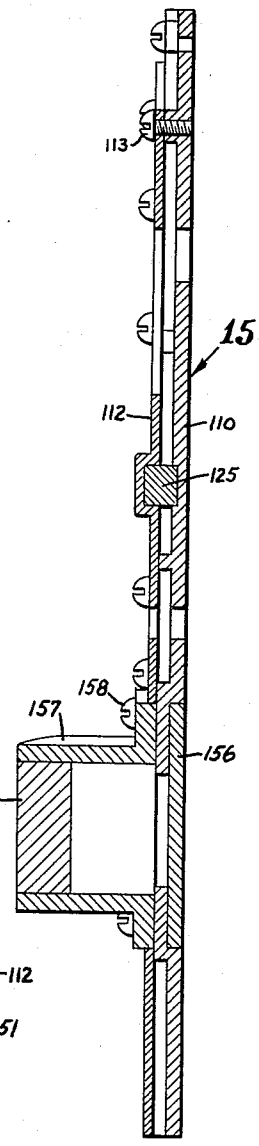
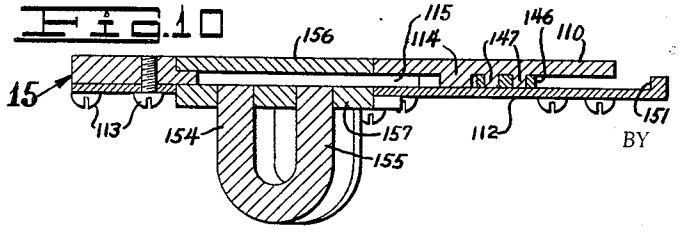


Fig. 10



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Patented Aug. 14, 1934 1,970,005

UNITED STATES PATENT OFFICE

1,970,005

MULTIPLE COIN SEPARATOR

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Application June 15, 1932, Serial No. 617,356

4 Claims. (Cl. 194—99)

This invention relates to improvements in multiple coin separator devices for use in combination with coin actuated mechanisms of various types.

The general object of the invention is to provide an improved multiple coin separator device which will separate spurious coins, slugs or other objects from good coins of the denomination intended to actuate the machine with which it is associated.

Another object of the invention is to provide a coin selecting device including a scavenger unit which separates objects of a shape different from the shape of the coins intended to actuate the machine from objects of the same shape as the good coins.

Other objects and the advantages of this invention will be apparent from the following description taken in connection with the accompanying drawings wherein:

Fig. 1 is a side elevation of our improved coin selecting device.

Fig. 2 is a bottom plan view of the device shown in Fig. 1.

Fig. 3 is an enlarged side elevation of the scavenger unit showing the adjacent cover plate removed.

Fig. 4 is a section taken on line 4—4 of Fig. 3.

Fig. 5 is an enlarged side elevation of one of the coin selecting units of the device showing the cover plate removed.

Fig. 6 is a section taken on line 6—6 of Fig. 5.

Fig. 7 is a section taken on line 7—7 of Fig. 5.

Fig. 8 is a view similar to Fig. 5 of the other coin selecting unit of the device.

Fig. 9 is a section taken on line 9—9 of Fig. 8 and

Fig. 10 is a section taken on line 10—10 of Fig. 8.

Referring to the drawings by reference characters we have indicated our improved coin selecting device generally at 10. The device 10 is especially adapted for use in combination with a coin actuated mechanism, wherein two coins of different denominations are required to actuate the mechanism which in this instance are a dime and a nickel.

As shown the device 10 comprises a scavenger unit 12, a dime coin selecting unit 14 and a nickel coin selecting unit 15. The scavenger unit 12 includes a center member 16 having cover plates 17 and 18 secured thereto by screws 19. The center member 16 and the cover plates 17 and 18 are made of a non-ferrous metal which is preferably die cast. On each face of the center member 16, we provide a pair of vertically spaced downwardly inclined guide members 20 and 21 which form an entrance raceway 22 which directs objects placed therein rearwardly towards an abutment member 23.

Below the abutment 23, we provide a selector member 24 which is preferably made of steel and is shown as mounted on studs 25 integral with the center member 16. Spaced forwardly of the selector 24, we provide a vertical raceway 26 which is formed by guide members 27 and 28 and which communicates with a rearwardly and downwardly inclined exit raceway 29 formed by guide members 30 and 31. Extending rearwardly and upwardly at an angle from the guide member 28, we provide a short guide member 32. The space between the selector 24 and the guide member 32 is left open to form a large scavenger exit indicated at 33.

The selector 24 is located and set at the correct angle so that coins or disk shaped metal slugs upon leaving the point 34 of the guide member 20 will strike the working face 35 of the selector and are directed across the scavenger exit 33 into the vertical raceway 26 which will direct them into the exit raceway 29. Pieces of paper, cardboard, strips of metal, toothpicks, hair pins and other odd objects which might be inserted into the entrance raceway 22 upon leaving the point 34 will fall downwardly and pass out of the device 12 through the scavenger exit 33.

The dime coin selecting unit 14 includes a back member 40 having a cover plate 41 secured thereto by screws 42 and which is retained in spaced relation from the back member by raised portions on the back member such as indicated at 43 to form a chamber 44. The back member 40 and the cover plate 41 are made of a non-ferrous metal which is preferably die cast. Adjacent the top of the device 14, we provide an entrance raceway 45 which is formed by a pair of spaced rearwardly and downwardly inclined guide portions 46 and 47.

The raceway 45 is adapted to direct undersized coins towards a vertical passageway 48, the rear of which is formed by a guide portion 49. The entrance to the vertical passageway 48 is formed by a selector 50 and a selector 51 both of which are made of steel and are mounted on studs 52 integral with the back member 40. The selector 50 includes a deflecting point 53 and the selector 51 includes a similar point 54. Coins or metal disks of the correct size on striking the selector points 53 and 54 in the

proper manner will be directed into a forwardly and downwardly extending raceway 55, the top of which is formed by a guide portion 56 and the bottom by a guide portion 57. The raceway 55 curves downwardly as at 58 and communicates with rearwardly inclined raceway 59 the top of which is formed by a guide portion 60 and the bottom by a guide portion 61.

At the juncture of communication with the raceway 59 the raceway 55 also communicates with a forwardly inclined raceway 62 the bottom of which is formed by a guide portion 63 and the top by a guide portion 64. At the juncture of the raceways 55, 59 and 62 we provide a magnet or magnetized iron block 65 which includes a rounded end portion 66 which forms a small portion of the bottom of the raceway 55 and a small portion of the top of the raceway 59.

The vertical passageway 48 communicates with a forwardly inclined raceway 67 and the raceway 59 also communicates with the raceway 67, opening thereinto at the forward side. The rear of the receway 67 is formed by a guide portion 68 and the front is formed by a guide portion 69.

The raceway 62 communicates with a downwardly and slightly rearwardly inclined raceway 70 the rear of which is formed by a guide point 71 and the front by a guide portion 72. The raceway 70 communicates with a raceway 73 which includes a rearwardly curved section 74 and a straight rearwardly and downwardly inclined section 75. One side of the curved section 74 of the raceway 73 is formed by a guide portion 76 and the other side by a guide portion 77 and the top of the straight section 75 is formed by a guide portion 78 and the bottom by a guide portion 79. The upper end of the curved section 74 of the raceway 75 is offset from the raceway 70 to the rear thereof thus forming a shoulder 80 at the juncture of the raceways 70 and 73.

Good dimes upon leaving the raceway 73 fall downwardly and are guided by a selector 81 into a rearwardly and downwardly inclined raceway 83 which communicates with a vertical exit raceway 84. The top of the raceway 83 is formed by a surface 85 of a selector 86 and the bottom by a guide portion 87. The rear of the exit raceway 84 is formed by a guide portion 88 and the front is formed by a guide portion 89.

Some spurious coins upon leaving the raceway 73 strike either the surface 90 or the point 91 of the selector 86 and are directed into a forwardly and downwardly inclined raceway 92 which directs them into a reject raceway 93. The bottom of the raceway 92 is formed by a guide portion 94, and the front of the reject raceway 93 is formed by a guide portion 95. Other spurious coins upon leaving the raceway 73 strike an abutment portion 96 and the face 90 of the selector 85 and are directed into the raceway 92.

The selectors 81 and 85 like the selectors 50 and 51 are mounted on studs 52 which are integral with the back member 40. Adjacent the straight section 79 of the raceway 73, we provide a horse shoe magnet 97, the poles 98 and 99 of which are positioned across the raceway 73 at approximately right angles thereto with the faces of the poles flush with the inner face of the cover plate 41. Opposite the magnet 97 we provide an armature plate 100, the inner face of which is flush with the face of the raceway formed by the back 40. The magnet 97 is shown as mounted in a bracket 101 which is secured in position by screws 102 which engage the armature plate 100. The bracket 101 like the back 40 and the cover 41 is made of non-ferrous metal and is preferably die cast.

The armature plate 100 causes the magnetic field to travel from one of the magnet poles straight across the raceway 73 into the armature plate and thence from the armature plate straight across the raceway 73 to the other pole of the magnet.

Good dimes entering the entrance raceway 45 of the device 14 from the exit raceway 29 of the scavenger device 12 pass downwardly through the raceway 45 and strike the working point 53 of the selector 50 from whence they are directed into the raceway 55. As they leave the raceway 55 they strike the guide portion 63 and pass through the raceway 62 into the raceway 70 wherein they strike the shoulder 80 which momentarily stops them causing them to joggle so that each coin enters the curved section 74 of the raceway 73 at approximately the same speed. As a dime passes between the poles of the magnet 97 and the armature plate 100 the current produced in the dime by the dime passing through the magnetic field between the magnet poles 98 and 99 and the armature plate 100 retards the dime sufficiently so that it does not strike the selector 85 but strikes the face of the selector 81 which directs it into the raceway 83 from which it passes into the exit raceway 84.

Iron and steel disks entering the enrtance raceway 45 pass downwardly therein and strike the point 53 of the selector 50 and are directed into the raceway 55. As these ferrous disks are directed downwardly toward the raceways 59 and 62 they are attracted to the magnetic bar 65 and engage the rounded end 66 thereof which directs them into the raceway 59 as the momentum and weight of the disks disengage them from the magnetic bar 65. These ferrous disks then pass through the raceway 59 and enter the raceway 67 and are directed downwardly thereby towards the raceway 92.

Some other non-ferrous spurious disks after passing through the entrance raceway 45 strike the selector 51 to the rear of the point 54 and are directed into the passageway 48 and thence into the raceway 67.

Other non-ferrous spurious disks which may have the same resilience as a dime strike the point 53 of the selector 50 and are directed into the raceway 55 and thence are directed through the raceways 62 and 70 into the raceway 73. As these spurious disks pass through the magnetic field between the poles of the magnet 97 and the armature plate 100 their momentum is either increased whereupon they strike the abutment 96 and are thereafter directed into the raceway 92 or they are retarded sufficiently to cause them to fall straight downwardly onto the guide portion 94 whereupon they enter the raceway 92.

All spurious disks upon leaving the raceway 67 either strike the selector 86 and are directed into the raceway 92 or strike forwardly of the upper point of the selector 81 and are directed into the raceway 92.

The raceway 84 into which good dimes are directed may communicate with a coin chute 104 which directs the coins to the coin actuated mechanism of the machine with which the device is associated and the raceway 93 into which spurious disks are directed may communicate with a chute 105 which may either direct the spurious

disks out of the machine or into a suitable receiver. (See Fig. 1.)

The nickel coin selecting unit 15 includes a back member 110 having a cover plate 112 secured thereto by screws 113 and which is retained in spaced relation from the back member by raised portions on the back member such as indicated at 114 to form a chamber 115 between the back and the cover. The back member 110 and the cover plate 112 are made of a non-ferrous metal which is preferably die cast.

Adjacent the top of the device 15, we provide an entrance raceway 116 which is formed by a pair of spaced rearwardly and downwardly inclined guide portions 117 and 118. The entrance raceway 116 directs coins and spurious disks towards a passageway 117' the entrance of which is formed by a point 118' of a selector 119 and a point 120 of a selector 121. The selectors 119 and 121 are shown as mounted on studs 122 which are integral with the back member 110. The entrance raceway communicates with a forwardly and downwardly inclined raceway 123 which curves into a vertical raceway 124. The bottom of the raceway 123 is formed by a magnetic bar 125, the end of which adjacent the raceway 124 is rounded as at 126. The top of the raceway 123 is formed by a guide portion 127 and the front of the raceway 124 is formed by a guide portion 128.

Communicating with the raceway 124 and inclined forwardly and downwardly from the rounded end 126 of a magnetic bar 125, we provide a raceway 129. The top of the raceway 129 is formed by a guide portion 130 and the bottom by a guide portion 131. Both the passageway 117' and the raceway 129 direct articles into a forwardly and downwardly reject raceway 132, the rear of which is formed by a guide portion 133 and the front by a guide portion 134.

The raceway 124 communicates with a raceway 135 which includes a curved section 136 and a straight rearwardly and downwardly inclined section 137. At the juncture of the raceway 135 and the raceway 124 the raceway 135 is offset to the front as indicated at 138. At the juncture of the raceway 135 and the raceway 129 we provide a shoulder 139, the forward point of which extends forwardly of the rounded end 126 of the magnetic bar 125.

The raceway 132 directs articles passing therethrough across the path of the raceway 135 into a forwardly and downwardly inclined raceway 140 which communicates with a vertical exit raceway 141. The bottom of the raceway 140 is formed by a guide portion 142 and the front of the vertical raceway 141 is formed by a guide portion 143.

The raceway 135 directs articles across the path of the raceway 132 towards a vertical raceway 145, the front of which is formed by a selector 146 which is mounted on studs 147 integral with back 110. The selector 146 includes an upper point 148 and a face 149 inclined downwardly and rearwardly therefrom and an approximately vertically extending race 150 which forms the front guide portion of the raceway 145. The rear of the raceway 145 is formed by a guide portion 151 which is integral with the cover plate 112.

Adjacent the straight section 137 of the raceway 135, we provide a horse shoe magnet 153, the poles 154 and 155 of which are positioned across the raceway 135 at approximately right angles thereto with faces of the poles flush with the inner face of the cover plate 112. Opposite the magnet 153, we provide an armature plate 156, the inner face of which is flush with the side of the raceway 135. The magnet 153 is shown as mounted in a bracket 157 which is secured in position by screws 158 which engage the armature plate 156. The bracket 157 like the back 110 and the cover 112 is made of non-ferrous metal and is preferably die cast.

Good nickels entering the coin selecting unit 15 from the scavenger unit 12 enter the raceway 116 and pass therethrough. As a good nickel emerges from the raceway 116 it strikes the point 118' and is directed through the passageway 117' into the raceway 123 which directs it into the vertical raceway 124. As it reaches the juncture of the raceway 124 and the raceway 135 it strikes the shoulder 139 thereby momentarily stopping the coin as it joggles before entering the raceway 135. Thus each coin entering the raceway 135 does so at approximately the same speed. As the nickel passes between the poles of the magnet 153 and the armature plate 156 the current produced in the nickel by the nickel passing through the magnetic field between the magnet poles 154 and 155 and the armature plate 156 acts on the nickel to decrease its momentum just sufficiently to carry it over the point 148 of the selector 146 and into the exit raceway 145.

Iron and steel disks entering the raceway 116 pass downwardly therein and strike the point 118' of the selector 119 and are directed across the passageway 117' into the raceway 123. As these ferrous disks pass from the raceway 123 into the vertical raceway 124 the attraction of the magnetic bar 125 causes the momentum of the disks to swing them into the rearwardly inclined raceway 129. After passing through the raceway 129 they enter the raceway 132 which directs them downwardly into the raceway 140 from whence they enter the vertical reject raceway 141.

Other non-ferrous spurious disks which may have the same resilience as a nickel strike the point 118' of the selector 119 and are directed through the raceways 123 and 124 into the raceway 135 in the same manner as a good nickel. As these spurious disks pass through the magnetic field between the poles of the magnet 153 and the armature plate 156 their momentum is retarded more than a nickel coin whereupon as they leave the raceway 135 they fall downward into the raceway 140 which directs them into the reject raceway 141.

The raceway 145 into which good nickels are directed may communicate with a coin chute 160 which directs the coins to the coin actuated mechanism of the machine with which the device is associated and the raceway 141 into which spurious disks are directed may communicate with a chute 161 which may either direct the disks out of the machine or into a suitable receiver.

Undersized nickels pass the points 118' and 120 and go to the raceway 132 whence they pass to the raceway 140 to the reject raceway 141.

When assembling the units 12, 14 and 15 to make the complete coin selector 10, the units 14 and 15 are secured together by bolts and nuts 163 (see Fig. 1) at the points indicated at 164 in Figs. 5 and 8. After the units 14 and 15 have been secured together the cover plate 17 of the scavenger 12 is secured by bolts 165 to the back member 40 of the unit 14 at the points indicated

at 166 in Figs. 3 and 5 and the cover plate 18 of the scavenger unit is secured to the back member 110 of the unit 15 by bolts similar to the bolts 165 at the points indicated at 167 in Fig. 8.

From the foregoing description it will be apparent that we have provided a novel coin selecting device which is simple in construction and highly efficient in use.

Having thus described our invention, we claim:

1. In a coin selector, a housing comprising a front member and a back member spaced apart, said housing including an entrance chute, a top guide portion and a bottom guide portion forming a raceway in communication with said chute, a second raceway sharply inclined and communicating with the first raceway and having its lower face defined by a forwardly sloping wall terminating in a projecting guide portion, a third raceway substantially vertically arranged and extending from the second raceway, said third raceway including an abrupt shoulder in advance of and below said guide point, a fourth raceway in advance of the third raceway and having concentrically curved upper and lower walls with the radius of curvature above the walls and with the lower wall terminating short of the end of the upper wall, a magnet member disposed in the fourth raceway, said fourth raceway being disposed with its discharge portion downwardly directed whereby the path of a coin passing from the fourth raceway is entirely downward, an abutment member in advance of the fourth raceway, a selecting point having a forwardly sloping upper surface in advance of said fourth raceway, a second selecting point in advance of and below said first selecting point and a fifth downwardly directed raceway in advance of the second selecting point.

2. In a coin selector, a housing comprising a front member and a back member spaced apart, said housing including an entrance chute, a passageway comprising a reject chute for undersized coins, a passageway for full sized coins including a top guide portion and a bottom guide portion forming a raceway, a magnetized block at the lower end of the raceway, a second raceway leading from said block back to said reject chute, a third raceway communicating with the first raceway and having its lower face defined by a forwardly sloping wall terminating in a guide point, a fourth raceway and extending from the third raceway, a fifth raceway in advance of the fourth raceway and having concentrically and upwardly curved upper and lower walls with the lower wall terminating short of the end of the upper wall, a magnet member disposed with its poles in the fifth raceway, said fifth raceway being disposed with its discharge portion downwardly directed whereby the path of a coin passing from the fifth raceway is entirely downward, said fifth raceway intersecting said reject chute, an abutment member in advance of the fifth raceway, a selecting point below the abutment and having a forwardly sloping upper surface arranged in advance of said fifth raceway, a second selecting point in advance of and below said first selecting point and a sixth downwardly directed raceway in advance of the second selecting point.

3. In a coin selector, a housing comprising a front member and a back member spaced apart, said housing including an entrance chute, a passageway comprising a reject chute for undersized coins, a passageway for full sized coins, a size tester including a selecting point to selectively direct coins from said entrance chute into one of said passageways, a top guide portion and a bottom guide portion in advance of the full sized coin passageway and forming a raceway, a second raceway for ferrous coins, a third raceway sharply inclined and communicating with the first raceway and having its lower face defined by a forwardly sloping wall terminatnig in a guide point, a fourth raceway substantially vertically arranged and extending from the third raceway, said fourth raceway including an abrupt shoulder in advance of and below said guide point, a fifth raceway in advance of and below said guide point, and having concentric upper and lower walls with the lower wall terminating short of the end of the upper wall, a magnet member disposed with its poles in the fifth raceway, said fifth raceway being disposed with its discharge portion downwardly directed whereby the path of a coin passing from the fifth raceway is entirely downward, said fifth raceway intersecting said reject chute, an abutment member in advance of the fifth raceway, a second selecting point below the abutment and having a forwardly sloping upper surface arranged in advance of said fifth raceway, a third selecting point in advance of and below said second selecting point and a sixth downwardly directed raceway in advance of the third selecting point.

4. In a coin selector, a housing comprising a front member and a back member spaced apart, said housing including an entrance chute, a passageway comprising a reject chute for undersized coins, a passageway for full sized coins, a size tester to selectively direct coins from said entrance chute into one of said passageways, said size tester comprising a pair of selecting points spaced apart vertically, a top guide portion and a bottom guide portion in advance of the lower selecting point and forming a raceway, a magnetized block at the lower end of the raceway, a second raceway leading from said block back to said reject chute, a third raceway sharply inclined and communicating with the first raceway and having its lower face defined by a forwardly sloping wall terminating in a guide point, a fourth raceway substantially vertically arranged and extending from the third raceway, said fourth raceway including an abrupt shoulder in advance of and below said guide point, a fifth raceway in advance of and below said guide point, said fifth raceway having concentric upper and lower walls with the lower wall terminating short of the end of the upper wall, a magnet member disposed with its poles in the fifth raceway, said fifth raceway being disposed with its discharge portion downwardly directed whereby the path of a coin passing from the fifth raceway is entirely downward, said fifth raceway intersecting said reject chute, an abutment member in advance of the fifth raceway, a third selecting point below the abutment and having a forwardly sloping upper surface arranged in advance of said fifth raceway, a fourth selecting point in advance of and below said third selecting point and a sixth downwardly directed raceway in advance of the fourth selecting point.

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