Sept. 26, 1933. C. B. GILMORE ET AL 1,928,419

COIN DETECTOR

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Fig. 1.

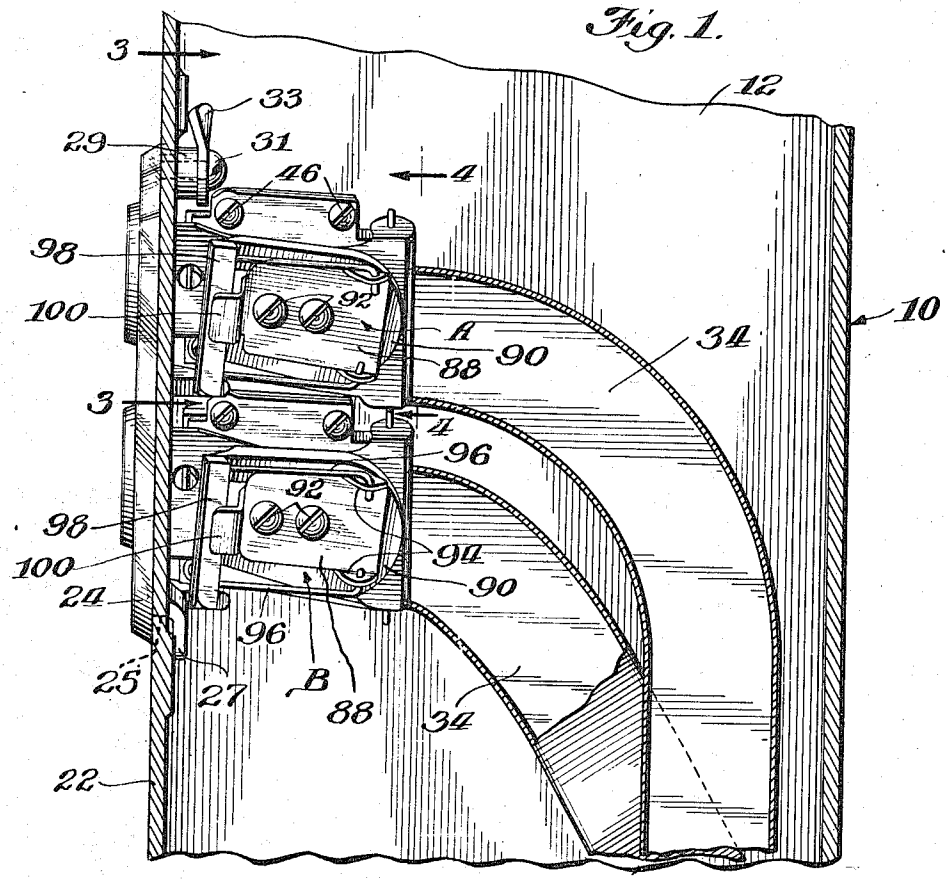
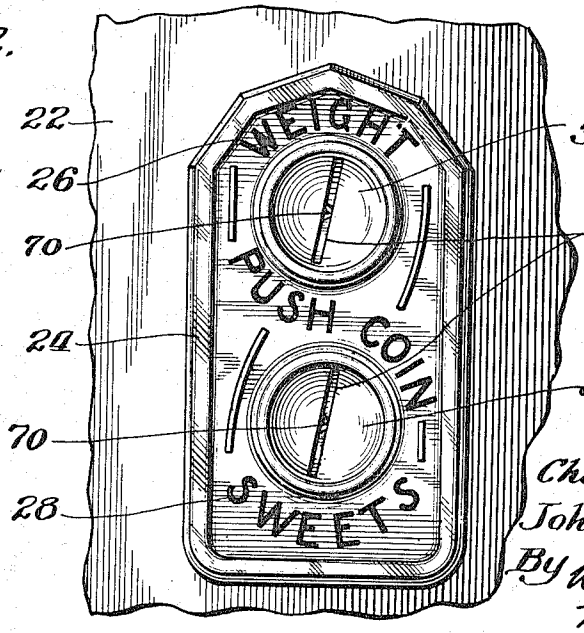


Fig. 2.



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Fig. 3.

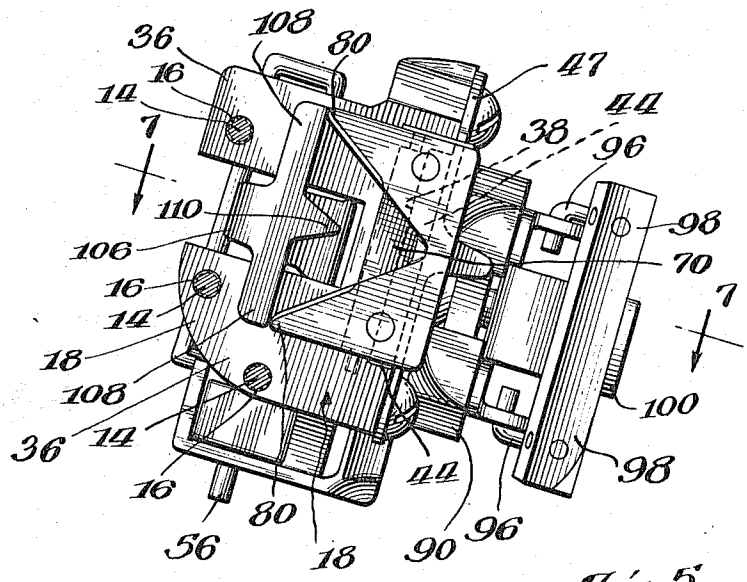


Fig. 5.

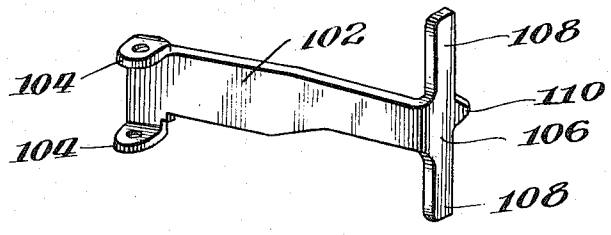
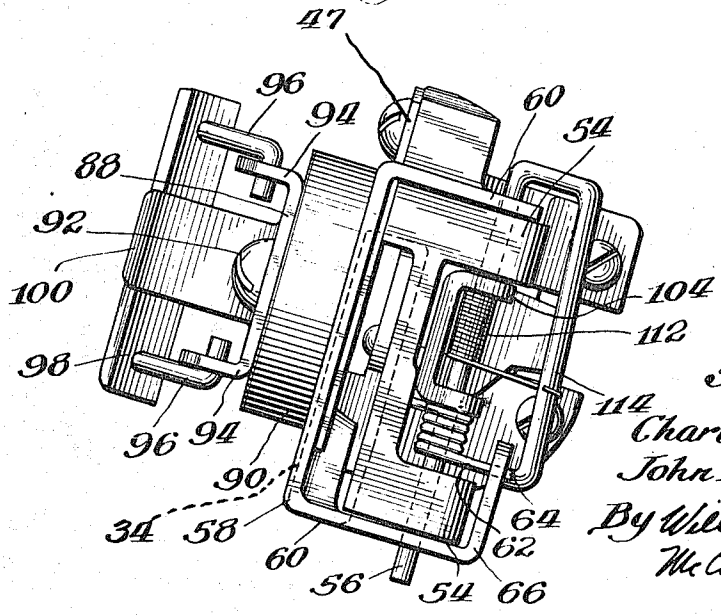


Fig. 4.



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Fig. 6.

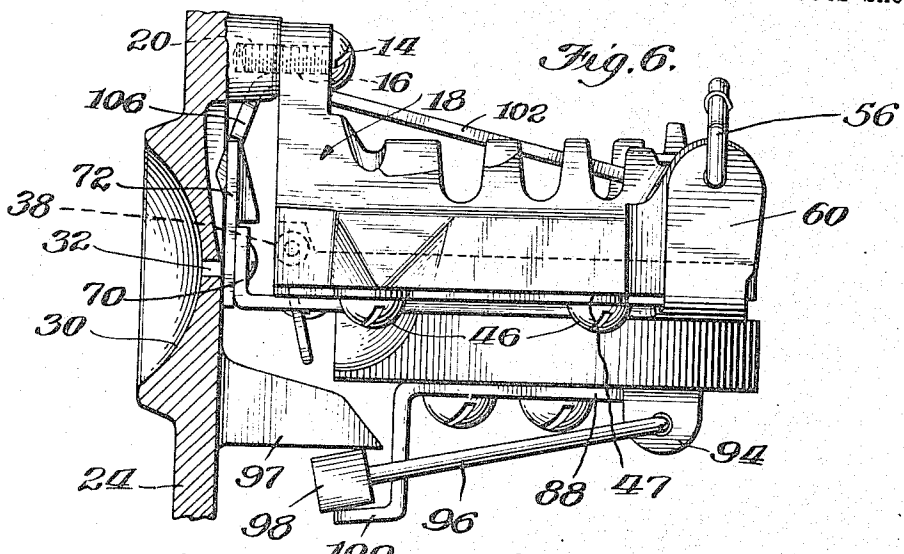


Fig. 7.

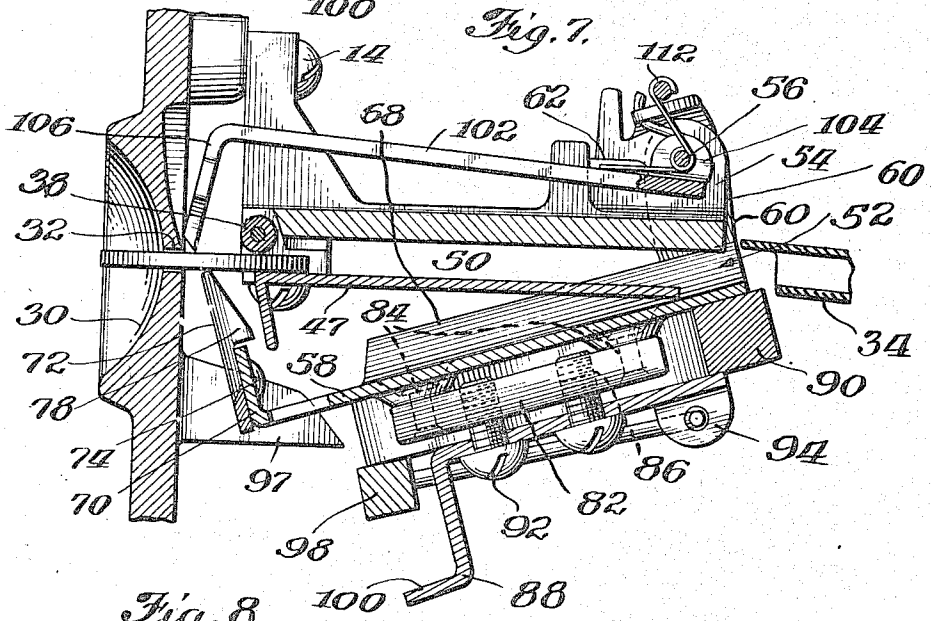
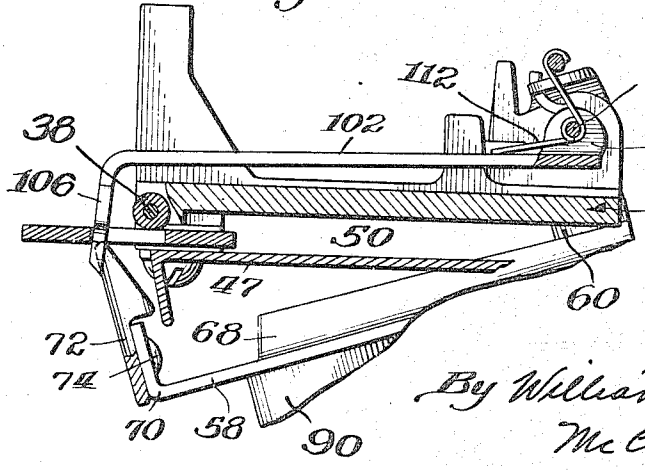


Fig. 8.



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Fig. 9.

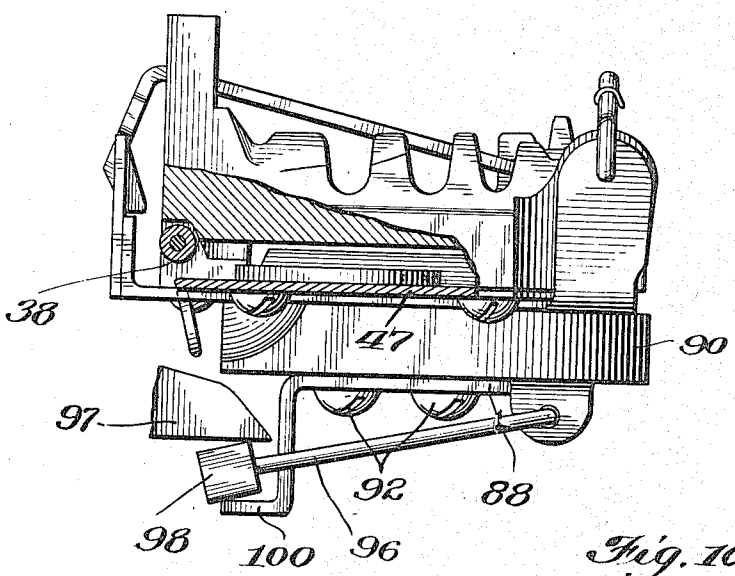


Fig. 10.

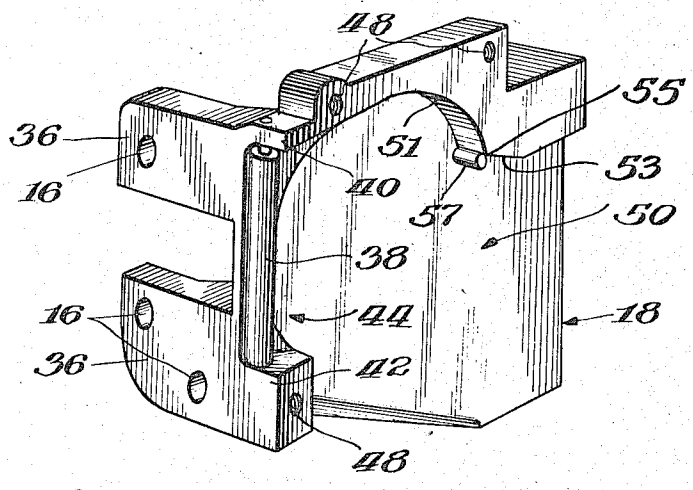
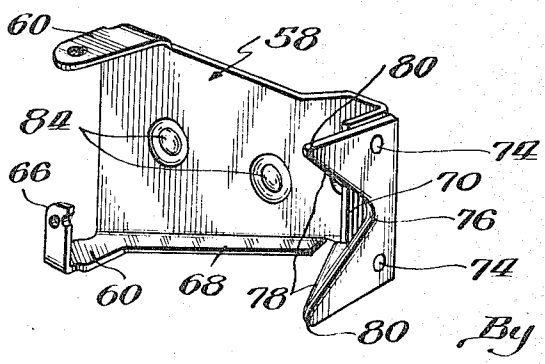


Fig. 11



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UNITED STATES PATENT OFFICE

1,928,419

COIN DETECTOR

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Application September 2, 1930. Serial No. 479,157

19 Claims. (Cl. 194—97)

This invention relates to coin control apparatus and is more particularly concerned with the provision of new and improved coin passageways, coin entranceways, and mechanisms for detecting and intercepting the passage of spurious coins or slugs.

An object of the present invention is to provide an improved spurious coin detector for use in connection with the ordinary coin controlled devices such as weighing machines, vending machines, turnstiles, toll gates, and the like.

One of the objects of this invention is to provide a normally closed coin slot or passageway operable to be opened by the insertion of a coin therein.

It is a further object to provide a normally closed coin passageway entrance into which toothpicks, matches, paper, cardboard, lead or other soft slugs cannot be inserted to operate the coin controlled device.

A further object of the present invention is to provide means adjacent the entranceway of the coin slot which prevent the insertion of an annular check or washer.

A further object of the present invention is to provide means which automatically detect and intercept magnetizable coins or slugs and deflect them into a by-pass or course other than that traversed by a coin of the proper type.

A further object of the present invention is to deflect away from the normal coin course any non-magnetizable slug which is of a predetermined amount less in thickness than that of a proper coin.

A further object of the present invention is to provide a spurious coin detector of the type described wherein the magnetizable slug arrester is adapted to perform its function positively upon said slugs regardless of their bulk or their specific gravity.

Another object of the invention is to provide in the receiving chamber of the coin passageway means for automatically and positively expelling any received magnetized slug, non-magnetized slug or a proper coin, before a subsequently inserted coin arrives in said chamber, thus eliminating the possibilities of clogging the coin passageways either to the coin controlled apparatus or to the depository of the rejected coins.

Other objects and advantages will be readily apparent from the following description, reference being had to the accompanying drawings, in which

Fig. 1 is a vertical sectional view through a portion of the housing of a vending and weighing machine, with parts broken away to clearly show the spurious coin detectors and the coin passageways;

Fig. 2 is a fragmentary elevational view from the front of the vending and weighing machine, showing the coin entranceways;

Fig. 3 is a front view of one of the spurious coin detectors, the view being taken on the line 3—3 of Fig. 1;

Fig. 4 is a rear elevational view of the same coin detector, being taken generally on the line 4—4 of Fig. 1;

Fig. 5 is a perspective view of the annular check arrester means;

Fig. 6 is a plan view of the spurious coin detector with a portion of the front entrance plate to which it is attached shown in cross-section;

Fig. 7 is a somewhat similar view in section taken generally on the line 7—7 of Fig. 3, showing the parts in an operative position and a coin entering the spurious coin detector;

Fig. 8 is another view similar to Fig. 7, showing an annular check or washer being inserted into the coin detector;

Fig. 9 is a plan view similar to Fig. 6, with parts broken away in section, showing a magnetizable slug trapped in the spurious coin detector;

Fig. 10 is a perspective view of the coin detector body; and

Fig. 11 is a perspective view of the coin thrust plate.

In the drawings, 10 may indicate an enclosed portion of a housing of a vending and weighing machine having an interior chamber 12 in which the coin detectors A and B are mounted by means of screw members 14 which pass through openings 16 in the body 18 of the coin detectors and engage in screw threaded openings 20 in the rear wall of an entrance plate 24. The entrance plate 24 is suitably positioned on the exterior of wall 22 of housing 10 with regard to the coin detectors A and B and is provided with indicia 26 and 28 which inform prospective purchasers as to which entranceway to use in inserting a coin, either to buy sweets or to indicate their weight. The entrance plate 24 is further provided with a pair of similar coin entranceways 30, each provided with a slot 32 through which a coin is initially passed.

Each of the coin detectors A and B is provided with a coin chute or passageway 34 extending from its rear end downwardly to the coin controlled mechanism to be operated by the coin. This mechanism is not shown and it will not be further described since it forms no part of the invention. The entrance plate 24 is held in posi-

tion over an opening 25 in the front wall 22 by means of a pair of rearwardly and downwardly extending lugs 27 which extend through the opening 25 and bear against the rear side of wall 22. At its upper end plate 24 carries a lug 29 tapped to receive a screw 31 and adapted to carry a removable plate member 33 which is adapted to bear against a flattened portion upon the rear face of front wall 22 directly above the opening 25. In this manner the plate 24, to which the coin detectors A and B are rigidly attached, may be secured to a coin operated mechanism.

As the coin detectors A and B are identical, only one will be described herein in detail. The coin detector generally comprises a body member 18 illustrated in perspective in Fig. 10 and is provided with a pair of lateral lugs 36 through which the screws 14 pass to attach the coin detector to the front plate 24. Adjacent the lugs 36, which are at the front of the body, a roller 38 is rotatably secured upon a suitable pivot pin which passes through a shoulder 40 and a shoulder 42, which shoulders define the outlines of a coin passageway 44.

A slug stripper plate 47 is attached to the side of body 18, being secured thereto by screw members 46 which pass into suitably tapped holes 48 in the body 18, the slug stripper plate forming a wall of a chamber 50 formed between the stripper plate and the wall of body member 18. It will be apparent from the drawings (see Figs. 7, 9 and 10) that access to chamber 50 is provided through opening 44, past roller 38, through the opposite end 52 of the chamber 50 and through the lower end.

The chamber 50 is formed with an arcuately shaped upper wall 51 which terminates in a straight wall portion 53 at a point 55. At 55 a hardened steel pin 57 is provided extending across the chamber to form a stop element to prevent coins from being projected through the chamber 50 too rapidly. As will presently be described, a coin entering chamber 50 through entrance 44 will be "shot" against pin 57 and will then drop down upon the floor of the chamber and roll out and into chute 34.

The body 18 is further provided with a pair of laterally extending lugs 54 through which a pin 56 is journaled. A combined magnet and coin thrust plate carrier 58 is reciprocably mounted upon pin 56, the plate being provided with ears 60 lying adjacent the upstanding lugs 54 of the body 18. A coiled spring 62 positioned around pin 56 and bearing against body 18 has one end 64 extending through an opening in an extension 66 of one of the ears 60, thus normally tending to hold the member 58 yieldingly against the body 18. An inturned ledge 68 is formed along the lower portion of member 58 and this ledge is adapted to provide a floor portion for the chamber 50 when the member 58 is in a normally closed position. The forward end of member 58 is forwardly bent to form a ledge portion 70 upon which a coin thrust plate 72 is securely attached by means of rivets 74.

The coin thrust plate comprises a metallic member having a large V slot 76 therein, which slot extends beyond the edge of the ledge 70. The inclined walls of the V portion 76 are inturned at 78 from the pointed portions 80 to a point adjacent the ledge 70 for a purpose to be hereinafter described. A magnet carrier plate 82 is securely attached to the member 58 and is provided with a pair of tapped openings 86.

A magnet clamp plate 88 is adapted to bear against an edge of a horseshoe magnet 90 and securely hold the magnet 90 against the member 58 by means of a pair of screws 92 which pass through suitable openings in the magnet clamp plate 88 and are screw threaded into the openings 86. It will be understood that all the parts of the coin detector, unless otherwise specified, including the body 18, slug stripper plate 47, the member 58, the magnet carrier plate 82, and the magnet clamp plate 88, are of a non-magnetic metal such as brass, in order not to interfere with the satisfactory operation of the magnet 90.

The magnet clamp plate is provided at opposite edges with a pair of upturned ears 94 which provide bearings for a pair of bent wire members 96 which carry at their end a steel shunt bar 98. The magnet clamp plate 88 is also provided at its end adjacent the shunt bar with an upturned and offset flange 100 which provides a limit stop for the shunt bar 98. To separate the shunt bar 98 from the magnet 90, a finger 97 is provided, extending rearwardly from front plate 24, keeping the shunt bar normally positioned against limit stop 100.

Means for preventing the introduction of annular checks or coins is provided and comprises the annular check arrester 102 (most clearly shown in Fig. 5) provided with a pair of upturned portions 104 provided with openings through which the pin 56 passes. The member 102, thus pivotally mounted on pin 56, comprises a flat metallic element having its forward end 106 bent generally at right-angles and having a pair of elongated portions 108 formed therein and a V-shaped pointed tooth 110 extending forwardly. A coiled spring 112 mounted upon the pin 56 has one end extending around a portion 114 of the pin 56 and its other end bearing against the check arrester 102 to normally hold the elongated ends 108 of the check arrester against the points 80 of the coin thrust plate 72.

As will be noted from the drawings, the coin detectors A and B are mounted at a slightly tilted angle.

The operation of the coin detector will now be described.

When it is desired to insert a coin into either of the slots 32, a coin of the proper size is forced through the slot 32 against the coin thrust plate 72. The coin is inserted against the thrust plate 72 at a point adjacent the lateral portion of the member 58. If the coin is of a sufficient hardness so as not to be compressed against the wall 70 the coin will bear against the sloping sides 78 of the V portion 76 and the member 58 will be forced away from the body 18 against the action of the coiled spring 62, allowing the coin to enter the chamber 50 between the coin stripper plate 47 and the roller 38. As the outer edge of the coin passes the points 80 of the V portion 76 the action of spring 62 will cause the coin to be quickly expelled into the chamber 50, striking against pin 57, causing the coin to drop to the floor of chamber 50, and then roll into the coin chute 34, and so on, to the coin controlled mechanism. It will be noted that in the movement of the member 58 outwardly as a coin is being inserted, the floor portion 68 will be removed from the chamber 50. However, as the member 58 returns to its normal position very rapidly a proper coin that is inserted has not sufficient time to drop through the opening before the floor portion 68 resumes its normal position.

If a magnetizable coin or slug is inserted through the slot 32 it will progress in exactly

the same manner as a proper coin until it arrives in chamber 50, at which time, due to the fact that member 58 has returned to normal position while the coin was striking pin 57 and dropping to the floor 68, the magnet 90 will attract the coin through the slug stripper plate 47, and the coin will be entrapped in the chamber 50 and it will not pass through the coin chute 34 to the operating mechanism. When the next coin is inserted the member 58 will be swung away from the chamber 50, carrying the magnet 90 and shunt bar 98 which will be carried away from finger 97, and as the member 58 is swung away from the chamber 50 the magnet will attract and contact the shunt bar 98, thus weakening its power sufficient to release the magnetic attraction for the magnetizable coin trapped in chamber 50, and because the floor 68 has been removed from the chamber the released coin will be dropped through the bottom of the chamber into a suitable receptacle.

From the foregoing description, it will be apparent that any magnetizable coin that may be inserted into the coin detector will pass into the chamber 50 and be held there by the magnetic attraction of the magnet 90 until another coin is inserted, at which time the magnet is moved away from the chamber and contacted with a steel shunt bar which allows the coin to be dropped through the bottom of the coin detector.

In Fig. 8 we have illustrated the action of an annular coin check and the manner in which it is prevented from passing through the coin detector. As the coin is pressed forward against the thrust plate the tooth 110 of the check arrester is adapted to ride across the surface of the coin and as the opening in a check of this type passes tooth 110 the tooth, due to the action of spring 112, passes into the opening and prevents further forward movement of the annular coin. Due to the fact that the annular check arrester is resiliently held in this position the annular check may be withdrawn, the check arrester swinging in an opposite direction to allow the tooth 110 to be removed from the hole in the annular check.

From the drawings it will further be apparent that the floor 68 is adapted to only partially close the lower entrance to the chamber 50. This is for the purpose of allowing very thin non-magnetizable coins to fall through the bottom of the chamber as soon as they are inserted into the coin detector and strike pin 57 and drop to the floor of the chamber. It will be noted that the coin detectors are positioned at a slight angle to allow the very thin coins to fall toward the edge of the floor where the slot is located.

By the use of the roller 38 at the entrance of the chamber 50 the frictional engagement with the coin is brought to a minimum and as the thrust plate returns to its normal position, forcing the coin forward, it rolls very easily upon the roller 38 and is forced through the coin detector, in effect being "shot" against pin 57, from where it drops perpendicularly to the sloping floor of the chamber.

The portion 70 of member 58 that extends forward from the vortex of the V-shaped coin thrust plate may be smooth or serrated or roughened, as desired. Its purpose is to engage soft elements such as toothpicks, matches, paper, or wood or lead slugs that are inserted through slot 32 and are not of sufficient hardness to contact only the edges of the sides 78 of the V-shaped portion 76 of the coin thrust plate. Pressure against the sides of the coin thrust plate will tend to swing member 58 outwardly whereas pressure against the portion 70, being a direct forward pressure, will not tend to swing the member 58. Consequently the coin chute will not be opened and a soft member cannot be inserted into the chamber 50.

While we have illustrated and described a preferred embodiment of our invention, it is to be strictly understood that various changes in construction may be made without departing from the spirit of the invention and we do not wish to be limited in any particular but rather, what we desire to protect by United States Letters Patent is:

1. A spurious coin detector mechanism for coin controlled devices comprising a coin passageway and a movable closure element having a V-shaped slot and a plate adjacent and behind said slot substantially totally closing the opening in said coin passageway, said movable closure element adapted to be removed from the opening to allow a coin to enter the passageway by the thrust pressure of a hard coin being inserted in said coin passageway against the edges of said V-shaped slot.

2. A slug detector for coin controlled devices comprising a coin passageway, a coin or slug detention chamber therein having stationary side walls, and a movable floor for said chamber adapted to be withdrawn from said chamber by the insertion of a coin or slug into said coin passageway and means for forcibly projecting the coin into said chamber.

3. A slug detector for coin controlled devices comprising a body member, a chamber therein having stationary side walls, a coin thrust plate closing one end of said chamber, a magnet carrying plate rotatably secured adjacent the other end of said chamber, a magnet carried by said plate, and a removable floor for said chamber, said floor and said magnet arranged to be simultaneously moved to allow a magnetizable coin in said chamber to become free from the attraction of said magnet and also from lateral support by said floor whereby said coin may be dropped through the bottom of said chamber.

4. A slug detector for coin controlled devices comprising a coin passageway having a detention chamber with stationary side walls therein, a coin thrust plate closing one end of said chamber, a slug stripper plate forming a side wall, a magnet positioned adjacent said stripper plate, and a removable floor for said chamber, said floor and said magnet arranged to be simultaneously moved by the insertion of a coin into said passageway to allow a magnetizable coin in said chamber to become free from the attraction of said magnet and drop through the bottom of said chamber.

5. A slug detector for coin controlled devices comprising a coin passageway having a detention chamber therein, a coin thrust plate normally closing one end of said chamber, a slug stripper plate forming a side wall of said chamber, a magnet positioned adjacent said stripper plate, a magnet shunt bar positioned away from said chamber, and a removable floor for said chamber, said floor and said magnet arranged to be removed toward said shunt bar to allow a magnetizable coin in said chamber to be dropped through the bottom thereof.

6. A slug detector for coin controlled devices comprising a coin passageway having a detention chamber therein, a coin thrust plate normally

closing one end of said chamber, an annular check engaging element abutting said thrust plate to prevent access of annular checks into said chamber, a slug stripper plate forming a side wall of said chamber, a magnet positioned adjacent said stripper plate, a magnet shunt bar positioned away from said chamber, and a removable floor for said chamber, said floor and said magnet arranged to be removed toward said shunt bar to allow a magnetizable coin in said chamber to be dropped through the bottom thereof.

7. A spurious coin detector for coin controlled devices comprising a coin passageway, a shutter normally closing one end of said passageway and having a V-shaped slot whereby it is adapted to be moved laterally from the entrance of said passageway by a coin of a predetermined size, and an annular check engaging element abutting said shutter on either side of said slot and having a finger projecting into said slot adapted to engage an annular check inserted into the entrance of said passageway to prevent its passage therethrough.

8. In combination, a vending machine having a housing, a coin entrance plate secured to said housing, a spurious coin detector attached to said entrance plate in said housing, a passageway extending from said coin detector to coin controlled apparatus in said vending machine, a magnet in said coin detector for magnetically retaining ferrous slugs in said detector, and a magnetic shunt bar actuated by a subsequent coin inserted into said detector for rendering said magnet inoperative and releasing the retained slug.

9. A spurious coin detector for coin controlled devices comprising a coin passageway, means at the entrance of said passageway for normally closing said entrance against the admission of all coins except imperforate coins of a predetermined degree of hardness and size, and means associated with said passageway for ejecting from said passageway magnetizable coins.

10. A spurious coin detector for coin controlled devices comprising a coin passageway, means stationed at the entrance of said passageway for preventing the admission of annular checks, additional means stationed at the entrance of said passageway for preventing the entrance of coins other than metallic coins of the required size, means in said passageway for entrapping magnetizable coins, and means actuated by the insertion of a subsequent coin for dropping said magnetizable coins from said passageway.

11. A slug detector for coin controlled devices comprising a coin passageway, a shutter element normally closing the entrance to said passageway, a coin or slug detention chamber therein having stationary side walls, means for detaining a magnetizable coin therein, a movable floor for said chamber adapted to be withdrawn from said chamber by the insertion of a subsequent coin or slug into said coin passageway, and means for releasing said magnetizable coin to allow said coin to drop from said chamber.

12. A slug detector for coin controlled devices comprising a body member, a chamber therein having stationary side walls, a coin thrust plate closing one end of said chamber movable by a coin of predetermined size to permit access of said coin to said chamber, a magnet carrying plate rotatably secured adjacent the other end of said chamber, a magnet carried by said plate, and a removable floor for said chamber, said floor and said magnet arranged to be simultaneously moved to allow a magnetizable coin in said chamber to become free from the attraction of said magnet and also from lateral support by said floor whereby said coin may be dropped through the bottom of said chamber.

13. A slug detector for coin controlled devices comprising a coin passageway, a magnet for detaining magnetizable slugs in said passageway, a magnet shunting element, means adapted whereby when a subsequent coin or slug is placed in said passageway said magnet shunting element becomes effective to shunt said magnet and render it ineffective to detain said magnetizable slugs.

14. A slug detector for coin controlled devices comprising a coin passageway, a movable slug detention magnet, a magnet shunting element spaced away from said magnet, and means whereby upon the insertion of a coin or slug into said passageway said magnet is moved toward said magnet shunting element thereby reducing its energy to detain said slug.

15. A slug detector for coin controlled devices comprising a coin passageway, a slug detention magnet and a magnet shunting element normally spaced away from each other, and means adapted to cause said spacing to be reduced upon the insertion of a coin or slug into said passageway thereby reducing the energy of said magnet to detain said slug.

16. A slug detector for coin controlled devices having a coin passageway, a shutter for the entrance to said passageway comprising a V-shaped member, and a coin thrust plate cooperating with said V-shaped member, an annular check arrester contacting with said V-shaped member, said shutter adapted to maintain said passageway closed normally and to yield to coin ingress upon insertion of a coin.

17. A slug detector for coin controlled devices having a coin passageway, a shutter for the entrance to said passageway normally closing same and adapted to be moved upon insertion of a coin, said shutter comprising a thrust plate and a member having a V-shaped slot therein, the axis of said slot being substantially perpendicular to the plane of said coin.

18. In a spurious coin detector having a coin chamber, a shutter and a member adapted to prevent insertion of washers into said chamber, said shutter and said member being arranged to cooperate with each other to forcibly inject a coin into said chamber.

19. In a spurious coin detector, a coin chamber, means for forcibly injecting a coin into said chamber, a roller disposed at the entrance to said chamber, said coin passing over said roller in its passage to said chamber with the long axis of the coin parallel to the long axis of the roller.

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