Aug. 24, 1937. F. H. VOGEL ET AL 2,091,232

COIN DETECTOR

Filed March 23, 1936 2 Sheets-Sheet 1

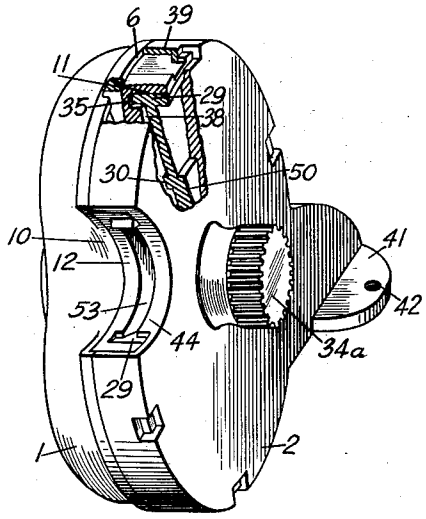


Fig. 1

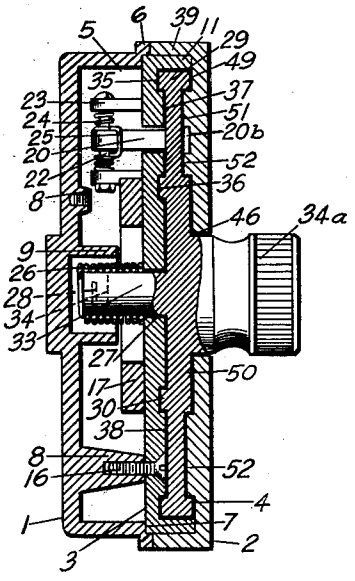


Fig. 2

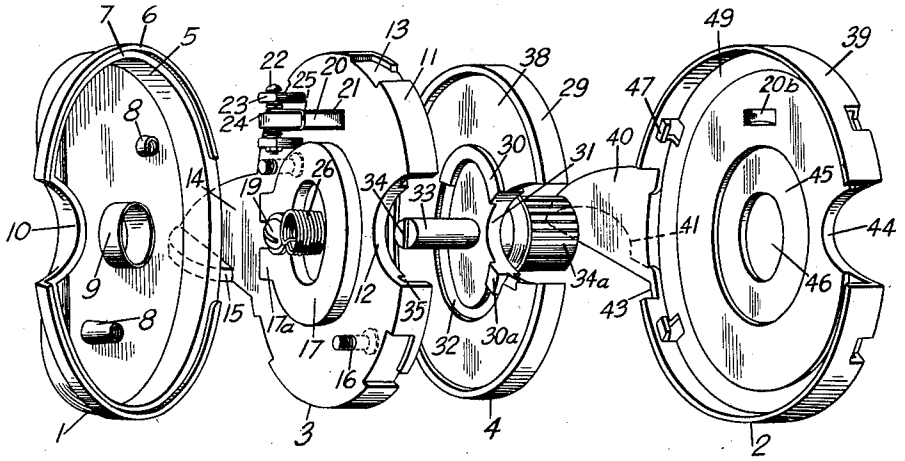


Fig. 3

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Filed March 23, 1936 2 Sheets-Sheet 2

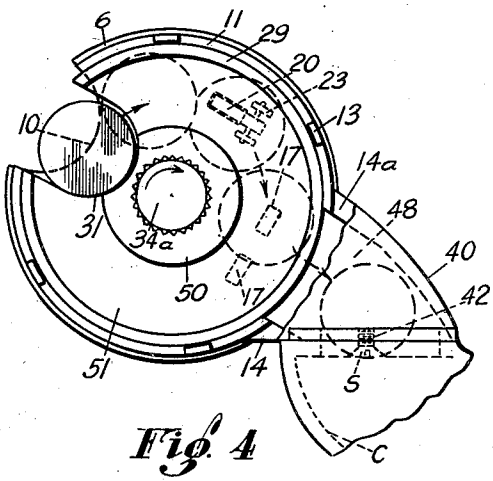


Fig. 4

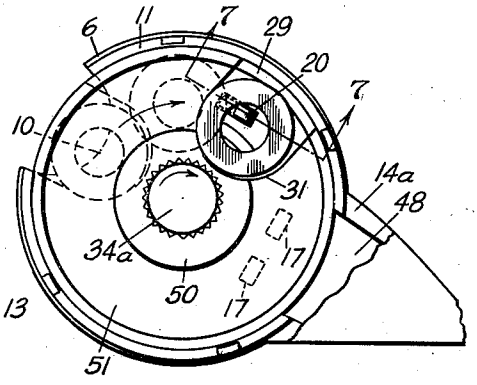


Fig. 5

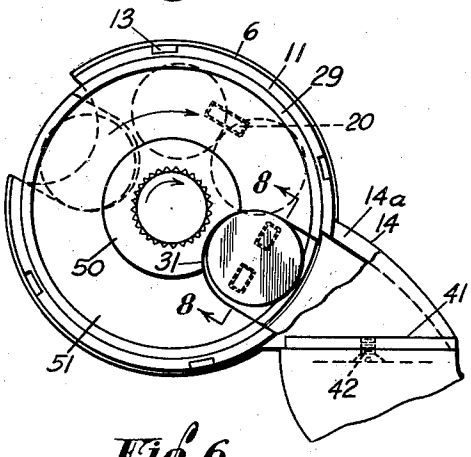


Fig. 6

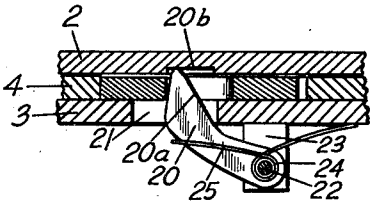


Fig. 7

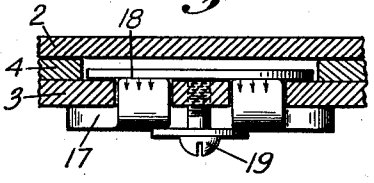


Fig. 8

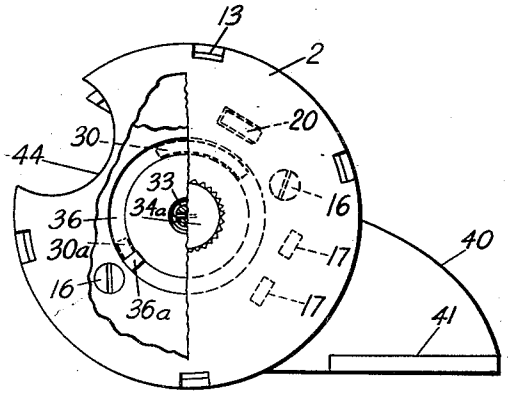


Fig. 9

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Patented Aug. 24, 1937 2,091,232

UNITED STATES PATENT OFFICE

2,091,232

COIN DETECTOR

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Application March 23, 1936, Serial No. 70,315

5 Claims. (Cl. 194—97)

Our invention relates to a coin detector. It has to do, more particularly, with a coin detector adapted to be applied to a coin operated vending machine in order that it will detect spurious magnetic coins or slugs, coins or washers having a hole in them and even very thin coins or slugs, and prevent such spurious coins from reaching the operating mechanism of the vending machine.

In the prior art, there are a number of different types of coin detectors. In most cases, these prior art coin detectors are made as a part of the vending machine itself. Most of these prior art coin detectors are very complicated both in structure and operation. However, one of the greatest disadvantages of prior art coin detectors resides in the fact that they are very easily jammed so as to be rendered inoperative by thin coins or slugs, cardboard, paper or other material which when inserted in the coin detectors will wedge between the moving parts thereof.

One of the objects of our invention is to provide a coin detector which will detect and prevent from reaching the operating mechanism of a vending machine to which it is applied, spurious magnetic coins or slugs, coins or washers having a hole in them and even very thin coins or slugs.

Another object of our invention is to provide a coin detector which is made in the form of a very compact unit separate from the vending machine and which may be readily applied to various types of vending machines now commonly in use.

Another object of our invention is to provide a coin detector of the type indicated which is very effective for the purposes for which it is intended and which is very simple both in structure and operation.

Another object of our invention is to provide a coin detector of the type indicated which is provided with means for insuring that thin coins, paper, cardboard or other thin material will not wedge between the moving parts thereof and thereby render the device inoperative.

Another object of our invention is to provide a device of the type indicated which may be readily disassembled for cleaning purposes.

In its preferred form, our invention contemplates the provision of a coin detector which is made as a separate unit from the vending machine but which may be readily applied thereto. This coin detector comprises mainly a housing in which a rotatable coin transporting member is disposed. This transporting member is adapted to receive a good coin at one point where it may be inserted into the casing and when rotated to transport the coin to a coin receiving channel formed as part of the coin detector and which is in communication with the coin channel of the vending machine. However, if a coin or washer with a hole in it or a very thin coin or slug is inserted in the detector, rotation of the transporting means will be stopped before the spurious coin is deposited in the coin channel of the vending machine and it will be returned to the point where it was inserted in the detector. If a magnetic coin is inserted in the detector, the coin transporting means will rotate until the magnetic coin reaches the point where the good coins drop into the coin channel. However, a magnet is provided which will prevent the magnetic coin from dropping into the coin channel and when the coin transporting member returns to its original position, the magnetic coin will be returned to the point where it was inserted in the detector.

The preferred embodiment of our invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view, partly broken away, of a coin detector made in accordance with the principles of our invention.

Figure 2 is a section taken substantially through the center of the device illustrated in Figure 1.

Figure 3 is a perspective view showing the various parts of the coin detector in disassembled spaced relation.

Figure 4 is a diagrammatic view illustrating operation of the coin detector when a good coin is placed therein.

Figure 5 is a similar view illustrating operation of the coin detector when a coin or washer with a hole in it is placed therein.

Figure 6 is a similar view illustrating operation of the detector when a magnetic coin is placed therein.

Figure 7 is a detail in section, taken substantially along line 7—7 of Figure 5, showing the means for projecting through a hole in a washer or coin to interrupt movement of the coin transporting member.

Figure 8 is a similar view, taken substantially along line 8—8 of Figure 6, showing a magnetic coin in position over the magnet of the device.

Figure 9 is a side elevation of the device, partly broken away, showing a stop member for limiting rotation of the coin transporting member.

With reference to the drawings, our invention

is shown as comprising an outer casing which is of substantially drum-like form. The device comprises mainly members 1 and 2 which cooperate with each other to form the outer casing, a member 3 which carries certain parts of the mechanism and a member 4 which is the coin transporting member.

The member 1 is mainly of disk-like form but has a peripheral flange 5 projecting inwardly therefrom. This flange 5 has a rib 6 on its edge which extends the greater portion of the circumference of the flange 5 and forms a shoulder 7 on the edge of the flange within said rib. The disk-like portion of the member 1 has a pair of hollow bosses 8 projecting inwardly therefrom and having their inner surface threaded. A larger centrally disposed inwardly projecting hollow boss 9 is also formed on the disk-like portion of member 1. The member 1 has notched portion 10 formed in its periphery as indicated.

The member 3 is of substantially disk-like form as indicated and has a peripheral flange 11 that projects in the same direction as flange 5 of member 1. This member 3 is notched in its periphery as at 12. At circumferentially spaced points, bayonet slots 13 are formed in the outer surface of the flange 11, which are provided for the purpose to be explained later. Substantially diametrically opposite to the notched portion 12, a projecting portion 14 is integrally formed on member 3. This portion 14 has a laterally projecting lug 15 on its lower edge. A pair of screws 16 pass through openings formed in the member 3 and these screws are so disposed that when the members 1 and 3 are placed in cooperative relation, they will cooperate with the bosses 8. One of the bosses 8 projects inwardly farther than the other and when the device is assembled, it contacts with member 3 and serves to prevent caving inwardly of the disk-like portion of member 1.

The member 3 carries a magnet 17 on the flat surface thereof adjacent member 1. This magnet is of special form being mainly of circular form but having its spaced ends 17*a* projecting outwardly from the circumference thereof and then laterally at right angles through openings formed in member 3 so that the poles thereof will be disposed substantially flush with the opposite side of member 3 as indicated at 18 in Figure 8. The magnet 17 is held flat against the member 3 by means of a screw 19 which is threaded into member 3 and passes between the legs 17*a* of the magnet and has a washer that contacts with said legs. The member 3 also carries a pawl member 20 that projects through an opening 21 formed in member 3, as indicated best in Figure 7. This pawl member has its opposite end pivoted to member 3 by means of a bolt 22 passing through openings formed in the projecting lugs 23 on member 3. A spring 24 surrounds the bolt 22 and has its free end bearing against one side of the lug 23. A portion 25 of the spring is extended and looped around the pawl 20. Thus, the spring is so arranged that the pawl is forced about its pivot in such a manner that it normally projects through the opening 21 as far as possible. A depression 20*b* is formed in member 2, and the pawl 20 will project into said projection when a washer with a hole in it is inserted in the device and member 4 is rotated or when there is no coin at all in the device, and will thus positively stop rotation of member 4 at all proper times. The member 3 also carries a coil spring 26 which is disposed within the circular portion of the magnet 17. This spring is disposed in line with a circular opening 27 formed centrally in the member 3. The lower free end of the spring 26 is anchored to the screw 19 while its upper free end is bent in such a manner that a straight portion 28 is formed which projects substantially across the space within the spring.

The member 3 is adapted to be mounted on the member 1. When it is mounted thereon, the outer edge of member 3 will rest on the shoulder 7 of member 1 and the flange 11 of member 3 will be disposed within the rib 6 formed on flange 5 of member 1. The spring 26 will fit in the boss 9. The screw 16 will cooperate with bosses 8 to firmly hold these two members together. The notched portion 12 of member 3 will exactly coincide with the notched portion 10 of member 1. The rib 6 is not present at the point where portion 14 of member 3 contacts with flange 5.

The member 4 is of substantially disk-like form and has a peripheral flange 29 which projects laterally from both sides thereof. On the side of the member 4 adjacent the member 3 and towards the center thereof it has a curved rib 30 formed thereon. The member 4 is notched in its periphery as at 31 and on the opposite side of the notch is a short rib 30*a* which is a continuation of rib 30. A curved groove 32 is formed in the surface of member 4 and this groove with ribs 30 and 30*a* form a complete circle. The member 4 at this side has a centrally disposed cylindrical projection 33 formed thereon. This portion 33 has a slot 34 in its outer end. The opposite side of member 4 has a knob member 34*a* formed thereon which projects therefrom and has a knurled outer end.

The member 4 is adapted to be mounted on the member 3. When it is mounted on such member, the portion 33 thereof is passed through opening 27 in member 3 and through spring 26 and the slot 34 in the outer end of member 33 will engage the straight portion 28 of the spring. This spring will normally tend to maintain the member 4 on member 3 in such a manner that the notched portions 12 and 31 coincide. The outer edge of member 4 will lie within the peripheral flange 11 on member 3. When the member 4 is mounted on member 3, one portion of the peripheral flange 29 will project into an annular groove 35 formed in member 3. The ribs 30 and 30*a* will project into an annular groove 36 (Figure 9) formed in member 3. It will be seen that a wide rib 37 is formed on member 3 between grooves 35 and 36 and this rib projects into a corresponding wide groove 38 formed between the flange 29 and the rib 30 on member 4. These interfitting portions of the two members 3 and 4 are provided to eliminate any possibility of thin slugs, cardboard, paper or other similar material wedging between members 3 and 4 during relative rotation thereof. These various interfitting portions also serve to keep the two members in proper relation to each other during rotation. As shown best in Figure 9, the groove 36 has a stop member 36*a* disposed therein and formed on member 3 in such a position that it will project into the groove 32 in member 4. This stop member will contact with one end of rib 30 and of rib 30*a* to limit rotation of the coin transporting member 4.

The member 2 is of substantially disk-like form but has an inwardly projecting peripheral flange

39 formed thereon which extends the greater portion of the distance around member 2. A portion 40 projects from the member 2 and is similar to the portion 14 of member 3. It has a lug 41 formed on its lower edge projecting laterally therefrom which is shown best in Figure 1. This lug and the corresponding lug 15 on member 14 each has a threaded opening 42 therein. The flange 39 is cut away as at 43 adjacent the projecting portion 40. Substantially diametrically opposite the projecting portion 40 the member 2 is notched as at 44. The member 2 is provided with a depressed centrally disposed portion 45 and a centrally disposed opening 46. It is further provided with a plurality of lugs 47 projecting inwardly from flange 39 and formed at circumferentially spaced intervals.

The member 2 is mounted on the remainder of the device as illustrated in Figure 2 by passing the knob 34a through the opening 46 formed therein. The member 2 is positioned so that the flange 39 thereof surrounds the flange 11 of member 3 and lies in close contact therewith. The edge of the flange 39 contacts with the inner edge of rib 6 of member 1. In positioning member 2 on member 3, the lugs 47 are passed laterally through the mouths of the bayonet slots and then member 2 is rotated relative to member 3 so that the lugs and slots will be in proper relationship with each other to retain member 2 on member 3. When properly positioned in this manner, the extension 40 will coincide with the extension 14 and closely abut each other since the extension 14 will fit within the cutaway portion 43 of flange 39. The cutaway portion 43 is sufficiently wide to permit relative rotation of members 2 and 3 sufficient for the lugs 47 to be engaged with and disengaged from the bayonet slots 13. As shown in Figures 4 and 6, the inner surface of the extension 14 of member 3 has shoulders 14a along its edges which space the inner surface of the extension 14 from the inner surface of the extension 40 so as to form a coin channel 48 therebetween. When the member 2 is properly positioned on member 3, the notched portion 44 will coincide with the notched portions 10, 12 and 31.

The member 2 on its inner surface is provided with an annular groove 49 into which a portion of the flange 29 on member 4 projects. A raised portion 50 is formed at the center of member 4 and fits in the depression 45 formed in member 2. Thus, a wide groove 51 is formed in the member 4 which receives the wide raised annular rib 52 formed on member 2. These interfitting portions of the members 4 and 2 serve to eliminate any danger of thin coins, or paper, cardboard or other material cut to resemble a coin, wedging between the rotatable member 4 and the member 2.

When the device is assembled as indicated, it may be readily attached to any vending machine having a coin channel C (Figure 4) projecting therefrom and having a flat upper surface. It may be held thereon by means of screws S which may be passed upwardly through a flange usually formed on the upper end of such a coin channel and threaded through the openings 42 in the lugs 41. When the coin detector is applied to the machine in this manner it will be impossible to rotate member 2 relative to member 3 and, consequently, take the device apart. Furthermore, when cap member 2 is in position on the device, it will be impossible to reach the screws 16 which hold member 1 in position. Thus, when the device is attached to a vending machine as indicated, it will be impossible to disassemble it and reach the operating mechanism thereof. When the detector is attached to the vending machine as described, the coin channel 48 thereof will be in alignment with the coin channel of the vending machine.

It will be noted from Figure 1 that the notched portions of all the members are in coincidence when the member 4 is in its original position to which it is always returned by means of the spring 26. The notched portion 31 is of such size that it will receive a coin of the proper size to operate the machine. If the coin is too large, it cannot be inserted in this notch. A coin slot 53 is formed at the notched portions by the members 1 and 2. This coin slot will be of such a width as to prevent coins which are too thick being inserted in the detector.

In operation of this device, if a good coin is inserted in the slot 53 and it is of the proper size, it will fit in the pocket formed by the notched portion 31 of member 4. The member 4 may then be rotated by means of the knob 34a in the direction indicated by the arrows in Figure 4. During rotation, the coin will be between the surface of portion 51 of member 2 and the surface 37 of member 3. The pawl member 20 is usually held in depressed position, as indicated in Figure 2, since it will contact with the surface of member 4. When the transporting member is rotated until the coil is positioned above the pawl member, the pawl member will contact therewith but will not interrupt rotation of the transporting member if the coin is of proper thickness and does not have an opening therein. Continued rotation of the transporting member 4 causes the coin to pass to a position where it will drop into the coin channel 48 and will then pass to the operating mechanism of the machine. The stop 36a on member 3 will contact with the end of rib 30 to limit rotation of member 4 so that at the end of its rotation, the coin pocket will be in alignment with coin channel 48.

If a washer or coin with a hole in it of proper size is inserted in the coin slot 53 and the member 4 is rotated, the washer will be carried to the position indicated in Figure 5 when the pawl member will project up through the opening therein and prevent further rotation of the transporting member 4 so as to prevent the washer from reaching the coin channel 48. However, if the knob is released so as to permit the member 4 to be returned to its original position by means of the spring 26, since the pawl member has a bevelled surface 20a on the one edge thereof, the coin or washer will contact with said surface and force the pawl member downwardly so as to permit the washer to be returned to the coin slot 53 so that it may be removed. Reverse rotation of member 4 is limited by contact of stop 36a with rib 30a. Thus, each time the member 4 is returned to its original position, the coin pocket will coincide with the notched portions 12 and 44.

If a very thin coin is inserted in the device, it will function substantially the same way as it does when a washer with a hole is inserted therein. That is, the pawl member 20 will project through the opening 21 so that the thin coin will be forced against the inner surface of the member 2. However, the pawl member will project into the coin receiving pocket formed by the notched portion 31, a sufficient distance so that it will engage the edge of said pocket and prevent further rotation of member 4.

If a magnetic coin or slug is inserted in the device, it will be carried by the transporting member 4 to a point directly opposite the coin channel 48. However, at this point, the poles of the magnet 17 are disposed and will prevent the magnetic coin from dropping into the coin channel 48. When the knob is released and the member 4 is returned to its original position the magnetic coin or slug will be carried back to the point where it was inserted so that it may be removed. In case the spring 26 breaks, the member 4 may be rotated manually to return the spurious coin to the point of insertion.

Thus, this device detects spurious coins of magnetic material, washers with holes in them, or very thin coins and prevents them from reaching the operating mechanism of the vending machine.

It will be apparent from the above description that this device has many advantageous features. It is simple in structure and operation and is made in the form of a very compact unit which may be readily applied to various types of vending machines now commonly in use. Although we have illustrated it applied to a vending machine having a coin channel with a horizontally disposed plate at its upper end, it will be understood that it might be modified slightly so that it could be applied to a machine where the plate at the outer end of the coin channel is vertically disposed or is obliquely disposed.

It will be apparent that if, after the device has been used for a long time, dirt or grit accumulates between member 4 and either of members 2 and 3, to clean it out it will merely be necessary to remove the device from its support and rotate member 2 relative to member 3 which permits the necessary disassembling for cleaning purposes. The device may then be easily and quickly assembled in a similar manner.

Having thus described our invention, what we claim is:

1. A coin detector comprising a casing of disk-like form having an inwardly projecting peripheral flange, a disk member adapted to rest against the edge of said flange, said disk member carrying on one side thereof a magnet having its poles projecting through openings formed therein to the opposite side thereof and carrying a pawl member which projects through an opening formed therein to the opposite side thereof, said magnet and said pawl member being disposed within the said casing when said disk is mounted thereon, a rotatable coin transporting member of substantially disk-like form mounted on said disk member for rotation, said coin transporting member having a coin receiving pocket formed therein, the portion of said pawl and the poles of the magnet which project through said disk being in the path of movement of said coin pocket, and a cap member for covering said coin transporting member, and means for securing said cap member in position.

2. A coin detector comprising a casing of disk-like form having an inwardly projecting peripheral flange, a disk member adapted to rest against the edge of said flange, a rib for keeping the disk in position on said flange, said disk member having a radially projecting portion which cooperates with a notch in said rib to keep the disk and the casing from rotating relative to each other, said disk member carrying a magnet on the side thereof disposed adjacent said casing which has its poles projecting through openings formed in the disk to the opposite side thereof and carrying a pivoted pawl member which projects through an opening formed therein to the opposite side thereof, resilient means tending to project the pawl member through said opening, said disk member also carrying a coil spring disposed in alignment with a central opening formed therein and having one end secured thereto, said magnet, spring and pawl being disposed within said casing when the disk is mounted thereon, a rotatable coin transporting member of substantially disk-like form having a centrally disposed projection extending through the opening in the disk and through said spring and being connected to the other end of the spring, said disk and coin transporting member having interfitting portions which prevent entrance of thin members therebetween and which limit rotation of said coin transporting member on the disk, said coin transporting member having a notch in its periphery which forms a pocket for receiving a coin, the portion of said pawl and poles of the magnet which project through said disk being in the path of movement of said coin pocket, a cap member for covering said coin transporting member, said coin transporting member having a centrally disposed knob which projects through an opening in said cap member, said disk member having a peripheral flange provided with bayonet slots in its outer surface, said cap member having lugs which cooperate with said slots to hold the cap thereon, said coin transporting member and said cap member having interfitting portions to prevent entrance of thin material therebetween, said cap member having a depression in its inner surface opposite the end of the pawl, said cap member having a radially projecting portion which is in alignment with the radially projecting portion on the disk member and cooperates therewith to form a coin discharge channel, said cap member, disk and casing having notches in their peripheries which are disposed in alignment for permitting insertion of a coin into the coin pocket in the transporting member when it is in alignment therewith.

3. A coin detector comprising a casing of disk-like form having an inwardly projecting peripheral flange, a disk member adapted to rest on said flange, said disk member having a radially projecting portion, said disk member carrying a magnet on the side thereof disposed adjacent said casing which has its poles projecting through openings formed in the disk to the opposite side thereof and carrying a movable pawl member which is normally forced by resilient means through an opening formed therein to the opposite side thereof, said disk member also carrying a coil spring disposed in alignment with a central opening formed therein and having one end secured thereto, said magnet, spring and pawl being disposed within said casing when the disk is mounted thereon, a rotatable coin transporting member of substantially disk-like form having a projection extending through the opening in the disk and through said spring and being connected to the other end of the spring, said disk and coin-transporting member having interfitting portions which prevent entrance of thin members therebetween, means for limiting rotation of said coin-transporting member on the disk, said coin-transporting member having a notch in its periphery which forms a pocket for receiving a coin, the portion of said pawl and poles of the magnet which project through said disk being in the path of movement of said coin pocket, a cap member for covering said coin transporting member, said coin transporting member having a handle which

projects through an opening in said cap member, a bayonet slot connection for holding said cap member in position, said coin transporting member and said cap member having interfitting portions to prevent entrance of thin material therebetween, said cap member having a radially projecting portion which is in alignment with the radially projecting portion on the disk member and cooperates therewith to form a coin discharge channel, said cap member, disk and casing having notches in their peripheries which are disposed in alignment for permitting insertion of a coin into the coin pocket in the transporting member when it is in alignment therewith.

4. A coin detector comprising a casing of disk-like form having an inwardly projecting peripheral flange, a disk member adapted to rest on said flange, said disk member having a radially projecting portion, said disk member carrying a magnet on the side thereof disposed adjacent said casing which has its poles projecting through openings formed in the disk to the opposite side thereof and carrying a movable pawl member which is normally forced by resilient means through an opening formed therein to the opposite side thereof, said disk member also carrying a coil spring disposed in alignment with a central opening formed therein and having one end secured thereto, said magnet, spring and pawl being disposed within said casing when the disk is mounted thereon, a rotatable coin transporting member of substantially disk-like form having a projection extending through the opening in the disk and through said spring and being connected to the other end of the spring, said disk and coin-transporting member having interfitting portions which prevent entrance of thin members therebetween, means for limiting rotation of said coin-transporting member on the disk, said coin-transporting member having a notch in its periphery which forms a pocket for receiving a coin, the portion of said pawl and poles of the magnet which project through said disk being in the path of movement of said coin pocket, a cap member for covering said coin transporting member, said coin transporting member having a handle which projects through an opening in said cap member, said coin transporting member and said cap member having interfitting portions to prevent entrance of thin material therebetween, said cap member having a radially projecting portion which is in alignment with the radially projecting portion on the disk member and cooperates therewith to form a coin discharge channel, said cap member, disk and casing having notches in their peripheries which are disposed in alignment for permitting insertion of a coin into the coin pocket in the transporting member when it is in alignment therewith.

5. A coin detector comprising a casing of disk-like form having an inwardly projecting peripheral flange, a disk member adapted to rest on said flange, said disk member having a radially projecting portion, said disk member carrying a magnet on the side thereof disposed adjacent said casing which has its poles projecting through openings formed in the disk to the opposite side thereof and carrying a movable pawl member which is normally forced by resilient means through an opening formed therein to the opposite side thereof, said disk member also carrying a coil spring disposed in alignment with a central opening formed therein and having one end secured thereto, said magnet, spring and pawl being disposed within said casing when the disk is mounted thereon, a rotatable coin transporting member of substantially disk-like form having a projection extending through the opening in the disk and through said spring and being connected to the other end of the spring, means for limiting rotation of said coin-transporting member on the disk, said coin-transporting member having a notch in its periphery which forms a pocket for receiving a coin, the portion of said pawl and poles of the magnet which project through said disk being in the path of movement of said coin pocket, a cap member for covering said coin transporting member, said coin transporting member having a handle which projects through an opening in said cap member, said cap member having a radially projecting portion which is in alignment with the radially projecting portion on the disk member and cooperates therewith to form a coin discharge channel, said cap member, disk and casing having notches in their peripheries which are disposed in alignment for permitting insertion of a coin into the coin pocket in the transporting member when it is in alignment therewith.

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