Oct. 2, 1934. G. J. McLAREN 1,975,401

COIN DETECTOR

Filed July 23, 1931 2 Sheets-Sheet 1

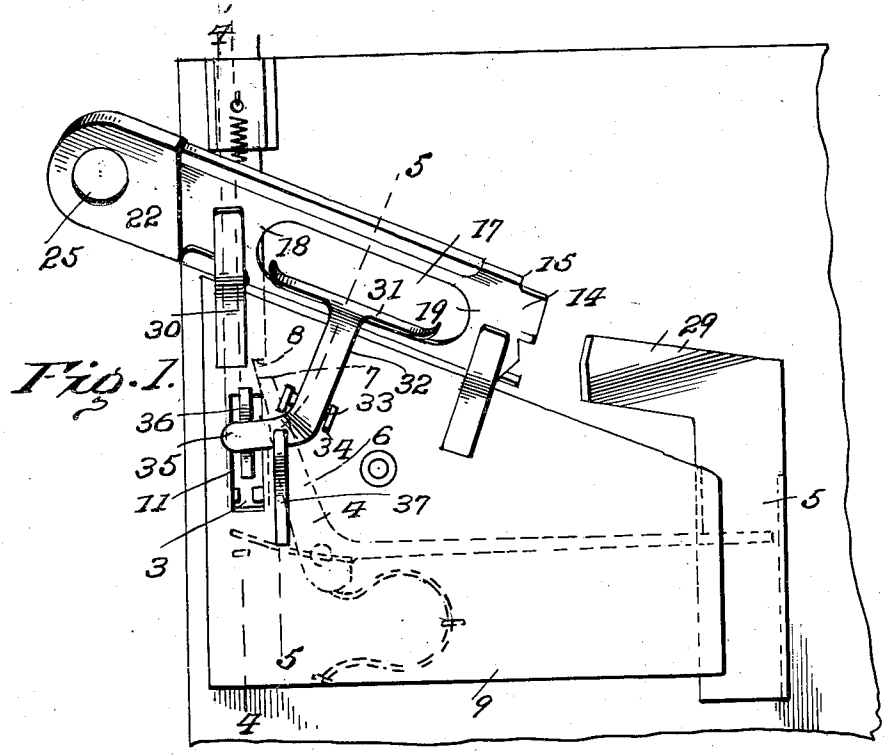


Fig. 1.

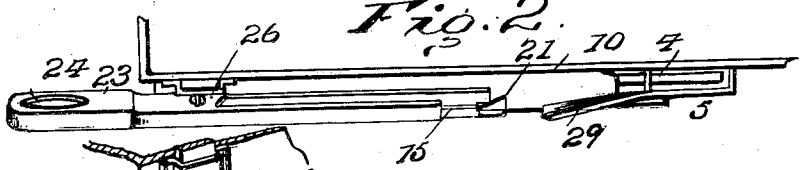


Fig. 2.

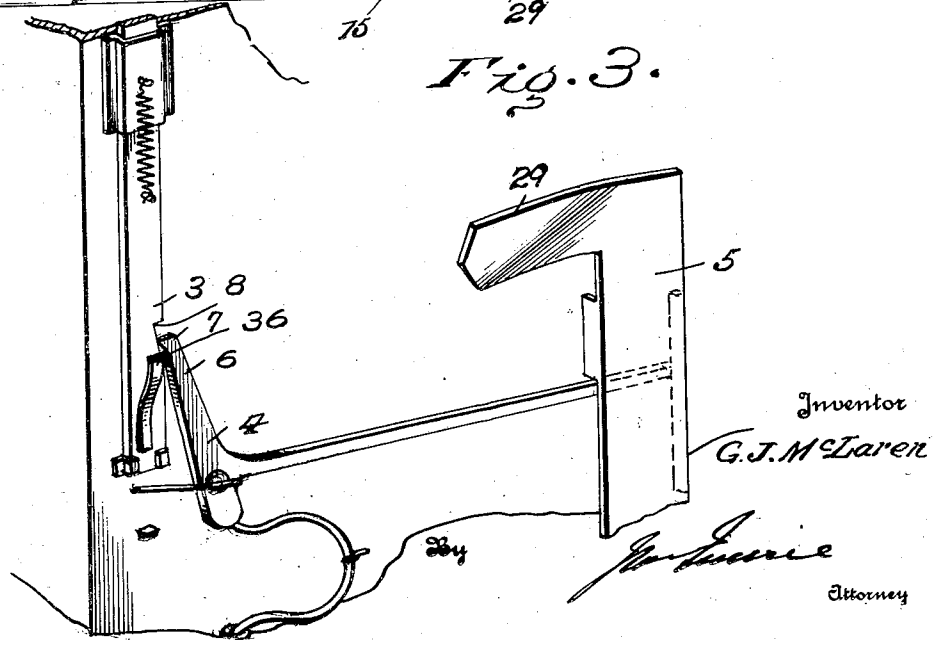


Fig. 3.

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Fig. 4.

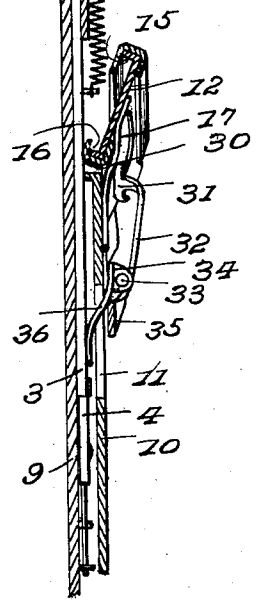


Fig. 5.

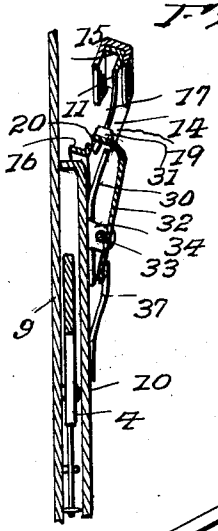


Fig. 7.

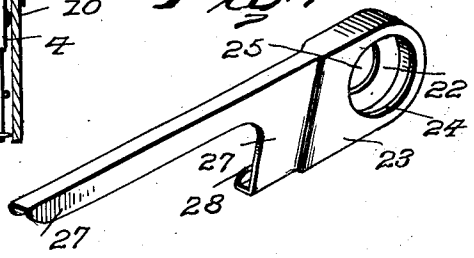
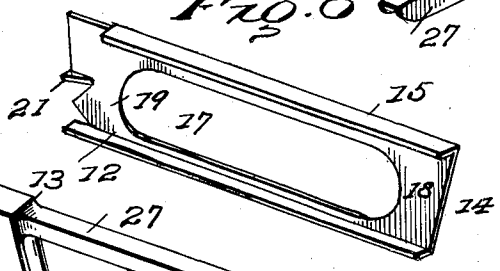


Fig. 6



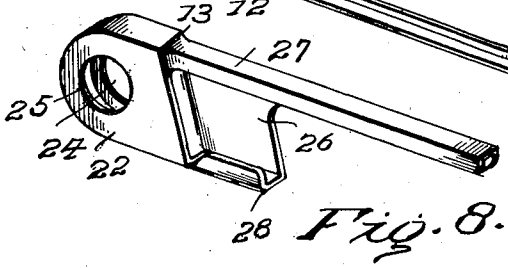


Fig. 8.

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UNITED STATES PATENT OFFICE

1,975,401

COIN DETECTOR

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Application July 23, 1931, Serial No. 552,744

5 Claims. (Cl. 194—97)

This invention is directed to a detector for coin controlled mechanisms, in the use of which slugs of less than the normal diameter of the proper coin, and particularly washers or other like slugs containing a hole, are deflected from the normal coin path and prevented from operating the coin controlled mechanism.

In many coin controlled mechanisms such, for example, as coin controlled telephone boxes, the use of a slug in place of the proper coin is effective for operating the coin controlled mechanism, and a usual type of such slug generally employed is an ordinary washer which approximates the diameter of the proper coin, such washers being used owing to their being conveniently obtained. Of course, it is impossible for the authorized parties to prevent the use of such slugs, and the continued use of the consequent free service to the user and loss of return to the authorized parties has proven to be so constant as to prove a source of annoyance and serious loss of returns in connection with the service rendered, as in coin controlled telephone boxes or the commodity delivered, as in ordinary vending machines.

The primary object of the present invention, therefore, is to provide in connection with a coin chute for delivering a proper coin for service, a coin detector which will serve to eliminate slugs having a diameter less than that of the proper coin, and particularly eliminate washers in which the diameter and weight substantially approximates that of the proper coin, with the coin detector deflecting such slugs from the normal coin path and returning the slug to the user, thus preventing the operation of the mechanism by such slug and materially reducing loss incident to such slug use.

In connection particularly with coin controlled apparatus, it not infrequently happens that a coin deposited for the release of the locking means of the machine, particularly where a coin detector is employed, will for some reason stick in the coin detector part and thus fail to unlock the mechanism to permit the purchaser to obtain the desired commodity. Ordinarily, following the deposit of a coin which is designed to unlock the mechanism, the operator is called upon to push a button, move a handle or shift a lever or the like to initiate the actuation of the mechanism which results in the delivery of the selected commodity to him. Ordinarily the element operated by the purchaser actuates mechanism which has been unlocked by the proper coin and if the coin, incident to its sticking in the coin detector part of the coin chute, fails to reach the unlocking mechanism, the purchaser cannot obtain the selected commodity and his coin remains lost to him, as well as serving to prevent the proper introduction of other coins.

The present invention, therefore, contemplates a means immediately responsive to the initial operation of the element actuated by the purchaser to obtain the selected commodity to jar or exert a pressure or displacement action of any coin which may be stuck or held within the coin detector part of the mechanism to thereby insure that such coin will be caused to move through the coin detector mechanism and be appropriately handled therein, either for the release of the lock, if the coin is a proper one, or for discharge to a position beyond influencing the lock if the coin or element is an improper one. Thus entirely without particular operation on the part of the purchaser, the element or coin deposited by him is compelled to travel through the coin detector mechanism, insuring a proper operation of the lock release if the coin is proper and thus avoiding any possibility of the coin being held in the coin detector mechanism.

A further object of the invention is the provision of the coin detector chute of the coin detector mechanism in two parts arranged for convenient assembly in order to facilitate manufacture and the mounting of the coin detector mechanism in any particular apparatus.

The invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in elevation showing the coin detector in relation to the locking bar and the means for actuating the dislodging bar.

Figure 2 is a top plan view of the coin detector per se.

Figure 3 is a perspective view indicating the normal play between the locking bar and the coin control locking lever to insure operation of the dislodging bar.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a section on the line 5—5 of Figure 1.

Figure 6 is a perspective view of the main section of the coin detector chute.

Figure 7 is a perspective view of the cooperating section of the coin detector chute.

Figure 8 is a perspective view of that part of the chute shown in Figure 7, the view being taken from the opposite side.

In order that the coin detector detail of the present invention may be properly understood

in association with the coin control locking means for the vending machine, it is necessary to briefly refer to such locking means. The coin control locking means to be described forms the subject matter of an application filed by me on the 23rd day of July, 1931, Serial #552,745, which includes as a locking means a sectional locking bar selectively operated by push buttons, with each push button longitudinally moving all sections below it. The sectional locking bar of this application includes a lower section which is longitudinally moved, when released by a coin, in the operation of any push button.

The present invention is concerned only with the lower section of the locking bar, here indicated at 3, moved in the operation of any push button and is normally held against full operative movement by a locking lever 4, one arm of which is seated in the path of a coin passing through the coin chute 5 and a second arm 6 of which is provided with a lateral nose 7 normally seating, when in operative locking relation, in a notch 8 in the lower section 3 of the locking bar. The operation of the parts needs no further description, it being appreciated that if the locking lever 4 has been tripped by a coin, the locking bar is free to be moved vertically under the action of an appropriate push button.

The salient feature in connection with this arrangement for the purposes of the present invention is the fact that the notch 8 in which the nose 7 of the lever 4 is seated is of such form and in such relation to the nose 7 as to permit a limited vertical play of the locking bar even when said locking bar is held by the lever against full operative movement. That is to say, if the locking lever 4 is not tripped by a coin and a manually operable device such as a push button is operated, the locking bar, and particularly the lower section 3 thereof, is permitted a limited vertical movement, notwithstanding the fact that it is still locked against full operative movement by the locking lever. This limited free movement of the locking bar is the particular essential of this construction with which the present invention is concerned.

The coin detector includes a plate 9 to be removably secured to the wall 10 of the vending machine, this plate having edge flanges to space the plate from the wall and being formed with an opening 11 which overlies the lower section 3 of the locking bar. The upper edge of the plate inclines rearwardly and downwardly with respect to the front end of the machine, and secured to this upper inclined edge is a coin detector mechanism made up in two sections 12 and 13. The section 12 is in the form of an elongated plate 14 having inwardly extending top and bottom flanges 15 and 16, the plate being further formed with an elongated opening 17 of such length as to provide end sections 18 and 19 and of such width as to leave a narrow ledge 20 throughout the length of the opening at the bottom to define with the bottom flange 16 a guide for the coin.

The rear edge of the end section 19 of the plate is provided with a triangular projection 21 arranged practically in line with the center longitudinal line of the opening 17 and projecting inwardly relative to the end section 19 of the plate, the inner edge of the projection being sharply inclined rearwardly and inwardly toward the wall 10. This projection defines a deflector element, the function of which will be more clearly explained hereinafter.

The section 13 of the detector mechanism includes a metallic section formed at one end of spaced walls 22 and 23, in one of which is formed an opening 24 of a size to receive the appropriate coin and in the other of which is formed a smaller opening 25 to facilitate placing of the coin. The spaces between the edges of the walls 22 and 23 are bridged by a wall 26 except at the inner edge, which is preferably inclined downwardly and rearwardly, and to one of these walls is secured an extension in the form of an upper channel member 27 and a lower channel member 28. These channel members are so arranged as to slidably engage with the upper and lower edges of the section 12, thus completing the coin chute element of the detector mechanism. In this connection, it is to be noted that the upper channel member has one wall extended below the upper edge of the section 12 so as to form a guide for the passage of the coin longitudinally of such section 12.

A deflector plate 29 is secured to the upper edge of the coin chute 5 and extends toward the detector coin chute, this deflector plate having its free end inclined outwardly with respect to the wall 10 and having a definite spaced relation to the end of the detector chute. It is, of course, to be understood that the coin guides of the detector chute are so spaced apart vertically as to permit the passage therethrough of a coin of the appropriate size. Coins of greater diameter are thus excluded, though coins of smaller diameter can be introduced, as well as slugs of smaller diameter, and it has been found particularly that the usual slug employed is the conventional washer which has a central opening and which is otherwise of substantially the same diameter and thickness as the proper coin.

On the passage of such a slug through the coin chute, the triangular projection 21 rides into the central opening in the slug and deflects the rear portion of the slug by reason of the inclined face of this detector lug. This deflection of the slug moves the forward end outwardly relative to the deflector plate 29 so that the slug passes on the outer side of that plate instead of between such plate and the wall 10 of the machine. Coins of proper size and weight are guided by the deflector chute between the deflector plate and the wall 10 of the machine and so delivered into the coin chute 5 for the operation of the locking lever 4.

If a slug is introduced into the coin opening 24, the diameter of which is less than that of the proper coin, such slug when in line with the elongated opening 17 of the detector chute does not bridge the opening, and incident to the inclination of the chute from the vertical will fall of its own weight through the opening 17 and so through appropriate channels be returned to the person introducing the slug. Slugs with central openings are deflected into the same channels by the deflector. Thus the coin detector chute will take care of the slugs with central openings and slugs which are of less diameter than the proper coin.

The detector chute is secured to the plate 9 by straps 30 engaging the end sections 18 and 19 of the detector chute, these straps being so disposed that the detector chute is not only inclined downwardly and rearwardly, but also inclined vertically, that is, the upper edge of the detector chute is spaced farther from the wall 10 of the machine than is the lower edge. This latter inclination serves to insure gravital discharge of slugs which

are less than the proper diameter, as previously described.

In operating a coin vending machine, it not infrequently happens that a coin otherwise proper for the operation of the machine will become stuck in the coin chute and unless it can be dislodged by the jarring of the machine as a whole serves to obstruct the further use of the machine until access is gained to the coin chute to remove the obstructing coin. The present invention contemplates the provision of means by which any such coin which may be stuck in the coin detector chute is dislodged automatically in the attempted normal operation of the machine.

To provide for this result, a dislodging bar 31 is mounted adjacent the lower edge of the elongated opening 17 of the detector chute, this bar being arranged on edge with respect to the opening and extending substantially throughout the full length of the opening. The bar is provided with a depending section 32 pivotally supported on a pin 33 mounted in a bracket 34 secured to the plate 9. The lower end of the projection, that is, the portion below the pivot, being laterally deflected to provide a tongue 35 which overlies the opening 11 in the plate 9, which opening, it will be remembered, is in line with the lower section 3 of the locking bar. The tongue 35 is inclined with respect to the vertical, the upper edge being spaced farther from the plate 9 than the lower edge, and secured to the lower section 3 is a cam strip 36 which extends through the opening 11 and contacts with the tongue 35. A spring 37 secured to the plate 9 and overlying the tongue serves to return the dislodging bar to normal or inoperative position.

Following the deposit of a coin, the purchaser, naturally assuming that the coin has released the necessary mechanism, operates one of the push buttons to secure the desired commodity. If the particular coin, however, is stuck in the coin detector chute, no unlocking operation has been carried out by the coin and it is impossible for the purchaser to obtain the desired article, under these conditions. However, the attempt to operate the push button has moved the locking bar to the extent of the lost motion permitted by the relation of the lateral nose 7 of the locking lever 4 and the notch 8 of the lower section 3 of the locking bar.

Incident to the movement of this section permitted in this lost motion connection, the cam strip 36 engages and rides beneath the tongue 35 of the dislodging bar, swinging the bar with respect to its pivot and moving the dislodging bar proper 31 into the elongated opening 17 of the coin detector chute and contacting with any coin which may be stuck therein and starting it on its way to the coin chute 5. This dislodging operation is automatically carried out regardless as to whether or not a coin may be stuck in the coin detector chute, so that if a coin is so stuck and the initial attempt to operate the push button is not successful, such initial attempt dislodges the coin and by the time the push button is again operated, the mechanism is unlocked ready for the delivery of the selected article.

The coins are naturally fed by gravity and the coin detector portion of the chute will instantly reject coins of less than proper diameter or slugs of less than proper diameter and particularly those containing a central hole similar to a washer even if such slugs of proper diameter. Thus a very large proportion of the slugs usually employed in apparatus of this character will be rejected by the coin detector and prevented from actuating the coin controlled mechanism.

It is, of course, to be understood that the parts are to be constructed both in proportions and material as will best adapt the coin detector portion of the chute for the service demanded and that, if desired, such coin detector portions of the chute may be connected in advance of the normal portion of the chute leading to the control mechanism so that a proper coin deflected over the deflector plate 12 will be thereafter permitted to travel through an appropriate chute for actuation of the control mechanism.

It will, of course, be understood that the means for automatically dislodging a jammed coin may be arranged to cooperate with any locking mechanism in which there is permitted sufficient lost play for the operation of the dislodging bar, and that no particular restriction is intended by the specific description of the particular locking mechanism as hereinabove set forth.

I claim:—

1. In combination, a coin releasing article delivery locking means capable of independent lost motion, a detector chute into which the coins are initially delivered, said chute being inclined with respect to the horizontal and the vertical and formed with an elongated opening having a width approximating that of the proper coin, a coin chute arranged beyond the detector chute for the reception of coins to release the locking means, a deflector plate carried by the coin chute, an element carried by the detector chute to control the path of movement of proper coins and slugs with respect to the coin chute, a coin dislodging bar operating through said opening in the detector chute, and an element carried by the locking means and responsive to the lost motion movement of said means to operate the dislodging bar.

2. In combination, a coin releasing article delivery locking means capable of independent lost motion, a detector chute into which the coins are initially delivered, said chute being inclined with respect to the horizontal and the vertical and formed with an elongated opening having a width approximating that of the proper coin, a coin chute arranged beyond the detector chute for the reception of coins to release the locking means, a deflector plate carried by the coin chute, an element carried by the detector chute to control the path of movement of proper coins and slugs with respect to the coin chute, a coin dislodging bar operating through said opening in the detector chute, and an element carried by the locking means and responsive to the lost motion movement of said means to operate the dislodging bar, said dislodging bar operating substantially throughout the length of said opening.

3. In a coin controlled apparatus, a detector chute mounted at a vertical and horizontal inclination with respect to the apparatus, and means carried by the detector chute for directing proper coins in one path and slugs having a central aperture in a different path, said detector chute being formed in sections arranged for sliding cooperation, one of the sections being formed with an opening to initially receive a coin.

4. A coin detector for use in connection with coin controlled apparatus comprising a two-part detector chute, one of said parts being fixed with respect to the apparatus and arranged at an inclination to the vertical and horizontal, said part including edge flanges and a coin escape opening, a second part having sliding cooperation with

the first mentioned part and having edge flanges to cooperate with the edge flanges of the first mentioned part and provide with said part U-shaped guides for the coin, the second mentioned part being supported solely through its sliding cooperation with the first mentioned part.

5. A coin detector for use in connection with coin controlled apparatus including a detector chute made up of two parts, one of said parts being fixed with respect to the apparatus and arranged at a vertical and horizontal inclination, said first mentioned part being formed with a coin escape opening and with upper and lower laterally deflected edges, a deflecting element arranged at the exit end of said first mentioned part, the second part of the coin chute including a channel to initially receive the coin, and longitudinally extending arms slidably cooperating with the edges of the first mentioned part to support said parts in alignment, said arms being formed to cooperate with the first mentioned part to form coin guides.

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