Aug. 29, 1939. F. W. HOBAN 2,170,897

COIN CLASSIFIER AND SLUG DETECTOR

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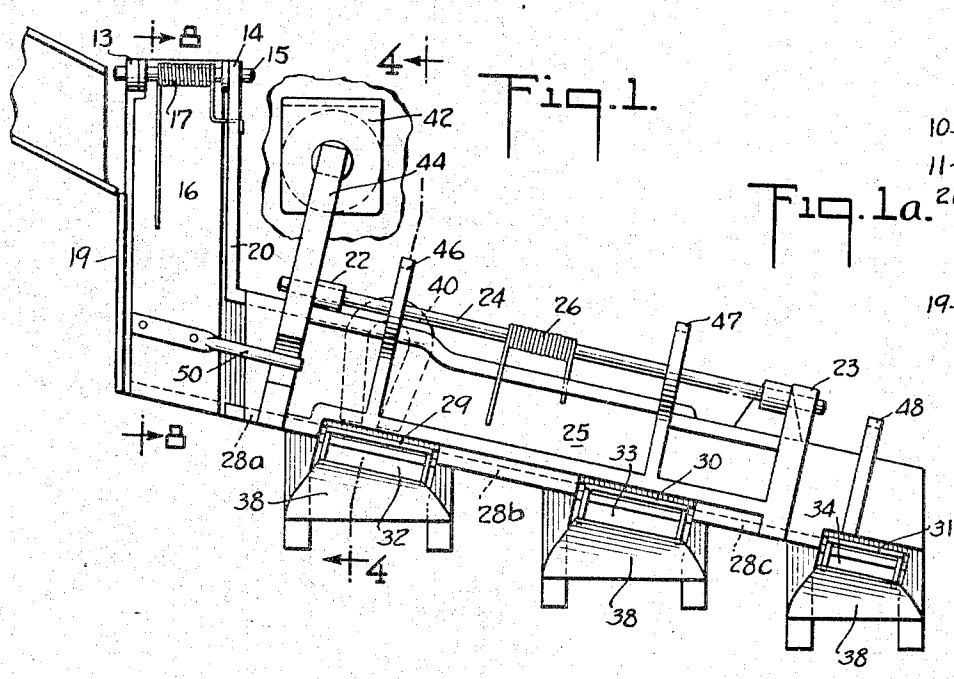

Fig. 1.

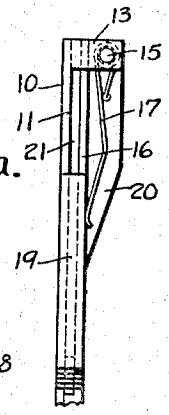

Fig. 1a.

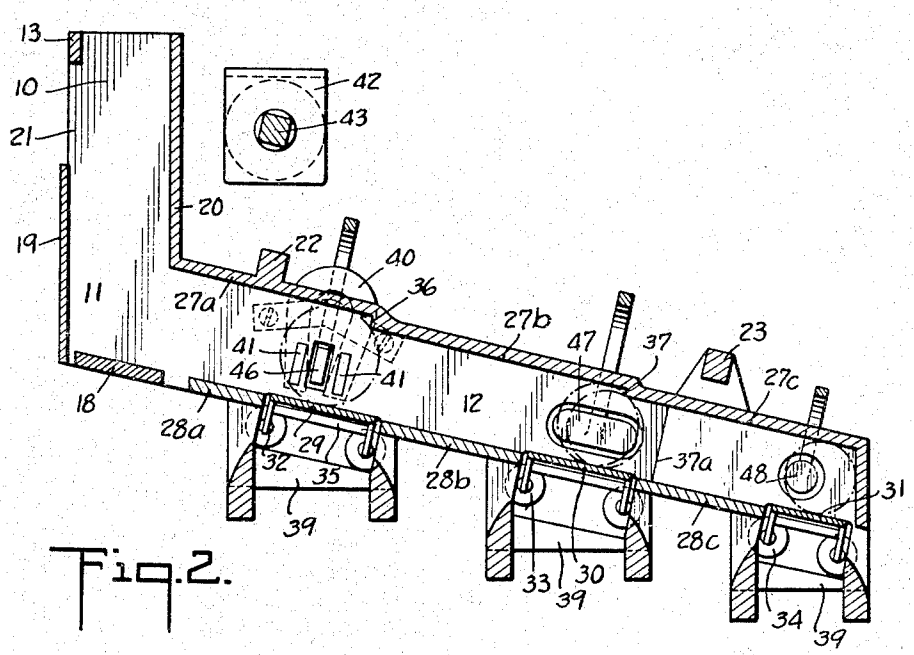

Fig. 2.

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Fig. 3.

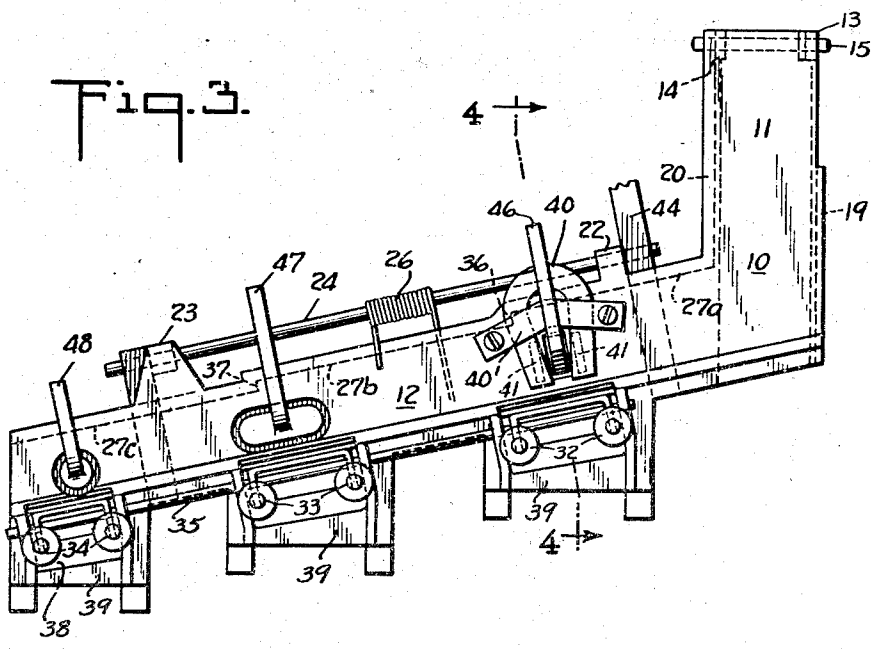


Fig. 4.

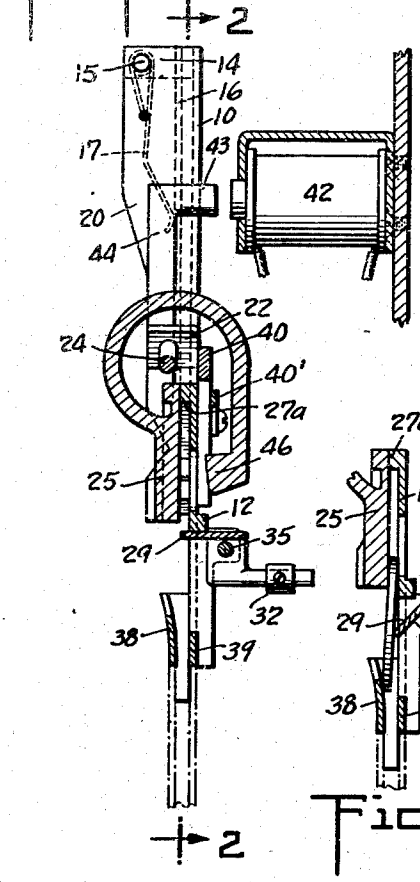


Fig. 5.

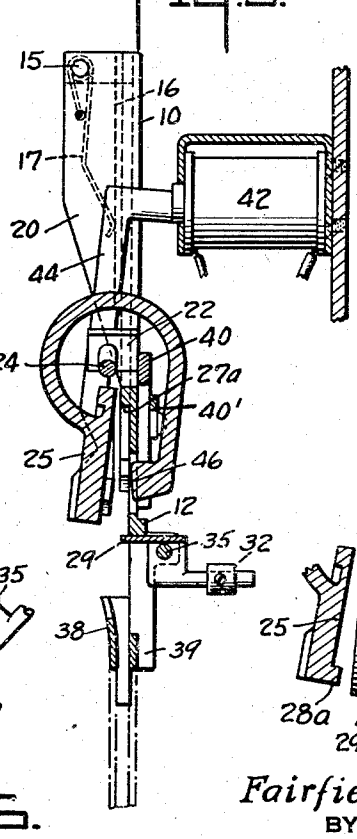


Fig. 8.

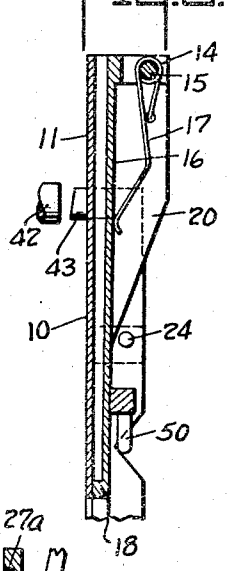
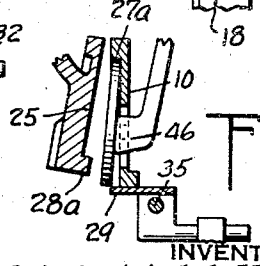


Fig. 6.

Fig. 7.



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Patented Aug. 29, 1939 2,170,897

UNITED STATES PATENT OFFICE

2,170,897

COIN CLASSIFIER AND SLUG DETECTOR

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Application September 5, 1936, Serial No. 99,554

7 Claims. (Cl. 194—103)

The present invention relates to coin classifiers and slug detectors for use with coin-controlled vending machines and the like.

It has heretofore been customary in coin-controlled machines adapted to be operated by coins of different denominations, to provide as many coin openings as there are sizes of coins receivable by the machine, and to provide a coin chute from each of the openings to separate coin weighing and scavenging devices to test the coins before they are allowed to pass on into the vending machine.

The present invention contemplates a coin classifier and slug detector having a single coin opening adapted to receive the largest size coin with which the device is to operate, as well as any smaller coins.

These coins are all allowed to roll along a coin chute or coin guide provided with independent coin scales, each adapted to be tripped only by a coin of sufficient weight.

The coin guide is also provided with a stepped passageway which arrests or stops coins or slugs in accordance with the diameter of the same, so that larger coins, such as quarters, are stopped at one place, preferably over the quarter scale; intermediate size coins, such as nickels and cents stopped above the coin scale for the nickel, and dimes are allowed to roll to the last coin scale in the series.

As each of the coin scales is adapted to be tripped only by a coin of sufficient weight, and as the dimensions of the passageway may be made so that they will not receive other sized slugs, it is apparent that the device, when provided with a magnetic device to stop magnetizable slugs, will ensure that good coins only are discharged by the coin scales.

The present invention also contemplates that the coin classifier and slug detector will be provided with means for opening up the coin guide or chute so as to clear it of slugs, under-weight coins or improper coins which will be discharged in such a manner as not to enter into the chute provided for the good coins discharged by the coin scales. The discharge of these slugs and under-weight coins is preferably accomplished by providing the coin chute with fixed and movable wall forming members, spaced to accommodate the coins and wherein the movable wall forming member is provided with elements adapted to engage the slugs or coins on the coin scale and shift them laterally off the coin scale so that they drop free.

Other and further objects of the invention will appear as the description proceeds.

The accompanying drawings show, for purposes of illustrating the present invention, one of the many embodiments in which the invention may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings,

Fig. 1 is a front elevational view of the coin classifier and slug detector;

Fig. 1a is a fragmentary end view;

Fig. 2 is a vertical sectional view taken from the front and on the line 2—2 of Fig. 4;

Fig. 3 is a rear elevational view;

Figs. 4 and 5 are sections on the line 4—4 of Figs. 1 and 3, Fig. 4 showing the coin guide closed, and Fig. 5 showing it open;

Fig. 6 is a fragmentary section view similar to Fig. 4 showing the tripping of the scale by a coin;

Fig. 7 is a fragmentary sectional view similar to Fig. 5 illustrating the discharge of a slug or under-weight coin; and

Fig. 8 is a section on the line 8—8 of Fig. 1.

In the drawings, reference character 10 illustrates a back plate substantially L-shaped, having an upright part 11 and a downwardly sloping part 12. The upper end of the fixed plate has bearing members 13 and 14 for a shaft 15 which supports a movable side plate 16 held toward the back plate by a coil spring 17. This movable plate 16 is held spaced from the fixed plate by a flange 18 at its lower edge and it is normally disposed between two forwardly extending side elements 19 and 20. The side element 19 does not extend all the way to the top of the fixed plate, so that an opening 21 is provided for the receipt of coins. The coins fall down between the parts 11 and 16 and are stopped by the bottom flange 18 so that they can continue down and to the right as viewed in Figs. 1 and 2.

The fixed plate is provided with upwardly extending lugs 22 and 23 which carry a shaft 24 on which is pivotally carried a movable front plate 25. A coil spring 26 holds the plates together and permits swinging the movable plate about the shaft as an axis.

The plates are provided with top and bottom flanges which hold the plates spaced to provide a channel and also determine the maximum diameter of the coin which can pass thrqugh that portion of the channel. As here shown, the flanges, along the top of the channel, are carried by the fixed plate and are indicated at 27a, 27b and

27c, and the bottom flanges are carried by the movable plate and indicated at 28a, 28b and 28c.

The lower flanges are discontinuous and between these flanges are placed the platforms 29, 30 and 31 of coin scales 32, 33 and 34 pivoted on a shaft 35 carried by the fixed plate 10. The upper flanges 27a, 27b and 27c are stepped, as indicated in the drawings, the steps 36 and 37 being opposite the scale platforms 29 and 30.

In the preferred construction, the parts are dimensioned so that a 25¢ piece is stopped by the shoulder 36 and weighed by the scale 32. Nickels and pennies are stopped by the shoulder 37 and the nickel is weighed by the scale 33, the pennies being held against further movement down the chute and the dimes pass into a narrow portion of the chute provided by the shoulder 37a, and go to the bottom of the chute, to be weighed by the scale 34. The positions of these coins are indicated by the heavy dotted circles in Fig. 2. The discharge of a good coin by the scale is illustrated in Fig. 6. This coin presses down on the scale platform 29 and must travel in a substantially vertical direction for a considerable distance. It is pushed only a slight amount out of vertical as it leaves the upper chute and the amount of this movement is limited by a front liplike member 38 carried by the coin receiving chute 39. The coin passes down this chute to the proper mechanism of the vending machine.

Should a magnetic slug be passed into the opening 21, it will pass down the chute, but will be stopped by the magnet indicated at 40. This magnet is held in place by a strap 40', and has pole pieces which project through openings in the rear wall platform member 10 so as to cause the magnetic slug to adhere to them. Any underweight coin or improper coin will be held in the chute or passage-way and will not be discharged by the coin scales.

The coin chute is opened to release the slugs or improper coins, and this opening is accomplished with some mechanism which swings the front plate 25 about its axis. This mechanism is here shown in the form of a magnet coil 42, acting on an armature 43 carried by an extension 44 on the front movable member. The extent of movement is indicated by comparing Figs. 4 and 5.

In order to make sure that coins or slugs will be ejected from the coin chute, the movable member or plate carries three ejectors, 46, 47 and 48, normally behind the path of travel of the coin, but movable forwardly when the coin chute is opened to engage any coin or slug on the scale and push it forwardly. This operation is illustrated in Fig. 7. The ejector 46 is placed between the pole pieces of the magnet so as to push a magnetic slug away from these pole pieces, and the ejector 47 is made long enough to engage cents as well as nickle size slugs.

In order that the vertical portion of the coin passage may be opened to allow foreign matter stuffed into the coin chute to drop out, the plate 16 is provided with a member 50 which extends down in front of the front plate 25 to be engaged by that plate so that the plate 16 is swung forwardly at the same time that the lower portion of the coin chute is opened.

The construction herein shown and described is one which is susceptible of mass production at low cost. The various parts may be accurately and cheaply made by die-casting processes and the parts readily assembled with a minimum amount of labor.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims and I wish it to be understood that the particular form shown is but one of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. A coin classifier and slug detector comprising a fixed plate, a movable plate hinged to the fixed plate and pressed toward it, the plates being spaced and disposed to form a coin chute along which coins may roll and having stops which determine the maximum diameter of coins or slugs to be accepted by the portion of the chute therebeyond, discontinuous bottom flanges carried by one of the plates, coin scales carried by the fixed plate and having platforms between the flanges to provide a bottom wall for the chute, each scale being adapted to be tripped only by a coin of sufficient weight, the movable plate having slug ejectors above each platform and normally behind the path of the coin, the ejectors moving forwardly to engage slugs or underweight coins on the platforms and shift them off, and a coin chute disposed below each scale to receive coins discharged thereby and out of the path of coins or slugs discharged by the corresponding ejector.

2. In a coin classifier and slug detector, an inclined coin chute down which coins are adapted to roll, the depth of the chute being graduated to provide stops which determine the maximum diameter of coins or slugs allowed to pass by, the chute comprising a rear, fixed, wall-forming element whose front face is free of obstructions along its lower edge, and a front wall-forming element normally spaced from the rear wall-forming element to accommodate coins and having discontinuous rearwardly extending shelf-like parts to receive the lower edge of the coins, and a plurality of coin scales corresponding with the coins to be classified and successively disposed along the chute opposite the stops, the coin scales having coin receiving platforms disposed between the shelf-like parts and on to which the coins may roll so that a coin may roll down the chute as far as its diameter permits, each scale being adapted to be tripped only by a coin of sufficient weight, the front wall-forming element being movable away from the rear wall-forming element so that slugs, or improper coins, may fall out of the chute.

3. In a coin classifier and slug detector, an inclined coin chute down which coins are adapted to roll, the depth of the chute being graduated to provide stops which determine the maximum diameter of coins or slugs allowed to pass by, the chute comprising a rear, fixed, wall-forming element whose front face is free of obstructions along its lower edge, and a front wall-forming element normally spaced from the rear wall-forming element to accommodate coins and having discontinuous rearwardly extending shelf-like parts to receive the lower edge of the coins, and a plurality of coin scales corresponding with the coins to be classified and successively disposed along the chute opposite the stops, the coin scales having coin receiving platforms disposed between the shelf-like parts and on to which the coins may roll so that a coin may roll down the chute as far as its diameter permits, each scale being adapted to be tripped only by a coin of sufficient weight, the front wall-forming element being movable away from the rear wall-forming element so that slugs, or improper coins, may fall out of the

chute and carrying slug ejectors which move said slugs or improper coins forwardly to free them of the scale platforms.

4. In a coin classifier and slug detector, an inclined coin chute down which coins are adapted to roll, the depth of the chute being graduated to provide stops which determine the maximum diameter of coins or slugs allowed to pass by, the chute comprising a rear, fixed, wall-forming element whose front face is free of obstructions along its lower edge, said element being apertured in advance of each stop, and a movably mounted front wall-forming element to accommodate coins and having discontinuous rearwardly extending shelf-like parts to receive the lower edge of the coins and ejectors extending through the apertures, and a plurality of coin scales corresponding with the coins to be classified and successively disposed along the chute opposite the stops, the coin scales having coin receiving platforms disposed between the shelf-like parts and on to which the coins may roll so that a coin may roll down the chute as far as its diameter permits, each scale being adapted to be tripped only by a coin of sufficient weight.

5. A coin classifier and slug detector having three coin scales adapted respectively to be tripped by a quarter, nickel, or a dime, a downwardly sloping coin chute disposed in a vertical plane and of such dimensions as to conduct dimes and cents while rolling on edge past the quarter and the nickel scale, to conduct dimes only to the dime scale, nickels and cents only to the nickel scale, and quarters only to the quarter scale, the chute having a movable side wall adapted to be opened to allow coins or slugs to drop out of the chute, the movable side wall carrying an ejector above said scale to shift underweight coins or slugs off the corresponding scales.

6. A coin classifier such as claimed in claim 5, having coin chutes corresponding with the scales, each disposed to receive only coins discharged by the scale above the same.

7. A coin mechanism comprising a chute having vertical side walls spaced to receive a coin of predetermined size, a scale having a rearwardly offset pivot and a forwardly extending flat platform extending across the bottom of the chute, the scale platform being depressed by a coin of proper weight and the coin passing downwardly by the edge of the platform, a second coin chute disposed below the scale to receive the coin discharged thereby, the upper end of the second chute having a front wall disposed a substantial distance beyond the edge of the platform to intercept the advancing edge of the coin as it passes down by the platform and is tilted out of the vertical plane by the platform, and means for laterally discharging coins or slugs which do not depress the scale to project them beyond the upper edge of the chute.

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