March 28, 1950 R. M. FOUSHEE 2,502,212

COIN SEPARATOR

Filed July 26, 1946

Fig. 1.

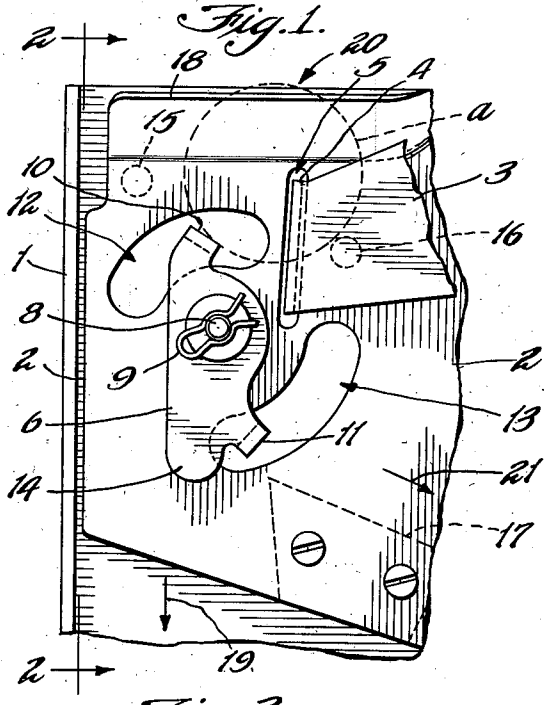


Fig. 2.

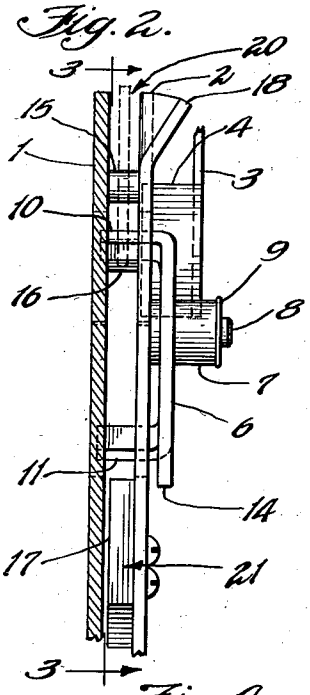


Fig. 3.

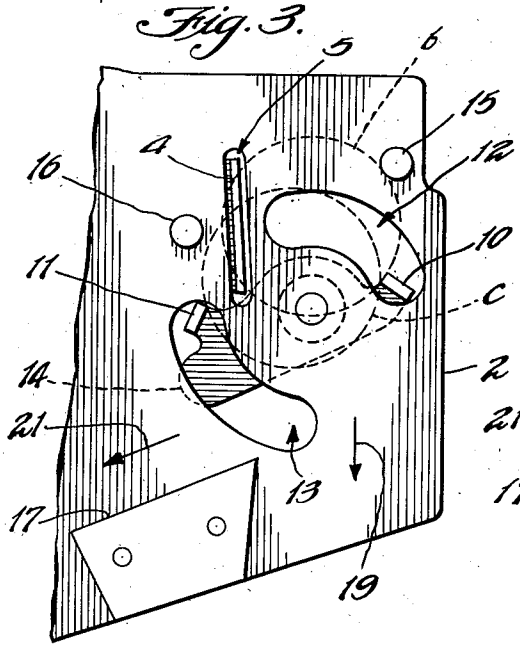
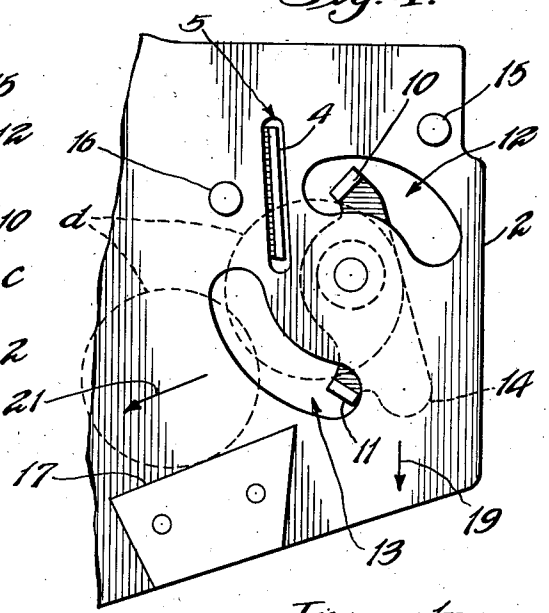


Fig. 4.



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COIN SEPARATOR

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3 Claims. (Cl. 194—102)

1

This invention relates in general to coin devices and more particularly to improvements in slug detection apparatus whereby certain spurious coins may be automatically tested and separated from genuine coins.

The effective automatic separation of underweight coins of proper diameter and coins of proper weight but under-diameter, as a preliminary test prior to other well known means of testing, has long been a problem. Likewise, the necessity for establishing a constant accelerating velocity to like coins propelled by gravity when deposited in a testing device at various velocities, has long been a problem in the coin detection art.

The present invention embraces a combination of elements simple to manufacture, highly effective in operation, which satisfactorily solves the problems above set forth by separating coins having different physical properties, and establishing a constant accelerating velocity to acceptable coins whereby they may be accurately further tested by well known means dependent upon the predetermined velocity of the coins.

A principal object of the invention is the provision of gravity-operated means for testing coins of various weight and diameter, and transferring coins of acceptable diameter and weight at a constant accelerating velocity to an acceptance passageway, and rejecting through a rejection passageway, under-weight coins and coins of non-acceptable diameters.

A further object of the invention is the provision of a cradle means, wherein coins are tested for weight and diameter, and by the reverse movement imparted to the cradle means by coins propelled by gravity, acceptable coins are transferred to an acceptance passageway at a constant accelerating velocity.

These and other objects will appear in one embodiment of the invention in the following description and drawings, in which:

Fig. 1 is a fragmentary side elevation of the device.

Fig. 2 is a fragmentary end view of the device taken through section line 2—2 Fig. 1.

Fig. 3 is a fragmentary side elevation opposite to that shown in Fig. 1 taken through section line 3—3 Fig. 2.

Fig. 4 same as Fig. 3 with elements in changed position.

Referring to Fig. 1, a main frame 1 forms a housing for the entire apparatus. A plate 2 shown Figs. 1 and 2, is positioned in parallel spaced relation to frame 1 by a well known means not shown. An abutting member 3, having a projection 4, extending through an aperture 5 in plate 2, is secured in position shown Figs. 1 and 2 to the main frame by well known means not shown. A cradle 6 and its integral hub 7, is pivotally journaled on stud 8, which stud is perpendicular to and integral with plate 2. Spring key 9 fitted in a groove in stud 8, retains the cradle member in its proper operative position.

2

Spaced projections 10 and 11, integral with cradle 6, project through clearance apertures 12 and 13 respectively, in plate 2 and frame 1. The distance between the inner edges of the projections 10 and 11 is sufficiently less than the diameter of an acceptable coin to permit the free passage of undersized coins therethru and to temporarily retain in straddle position thereon an acceptable coil while being transferred by said cradle to said testing passageway. Elongation 14 of the cradle 6 is provided as a counterweight to normally urge the cradle into the position shown Fig. 1.

Abutment guide pins 15 and 16 are secured to plate 2 in properly spaced relation to the axis to stud 8. These pins serve the dual purpose of establishing proper clearance between frame 1 and plate 2, and provide in combination with lip 18 of plate 2, proper entry of coins deposited in the upper open space between the frame 1 and the plate 2, which constitute the coin entry passageway 20.

In operation, and assuming that an acceptable coin is deposited in the entrance passageway under the influence of gravity as is illustrated by dotted line *a* Fig. 1, the coin will first impinge upon the projection 10 of cradle 6 and the fixed pin 16, whereby the kinetic energy present in the coin will overcome the restraining action of the counterweight elongation 14 of the cradle, and rock the cradle to its extreme counter-clockwise position, better illustrated by the dotted line coin *b* in Fig. 3, whereupon the leading edge of the coin will strike the pin 16 and then cause the coin to move in opposite direction and come to rest between the projections 10 and 11 all of the cradle as illustrated by dotted line *c* Fig. 3. At this point, substantially all the kinetic energy stored in the coin upon deposit, is absorbed in the structure and the coin will proceed from this point in its travel to rotate the cradle in opposite direction, aided by the counterweight elongation 14 to transfer the coin to the runway 17 as illustrated by two consecutive dotted positions *d* Fig. 4. It is now obvious that the coin will travel down the incline runway 17 at a prede-

termined constantly accelerating velocity regardless of the velocity initially imparted to the coin in the entrance passageway. It is also apparent that upon discharge of the coin, the cradle will then return from the position shown Fig. 4 to that shown in Fig. 1, which is the proper position for the deposit of a subsequent coin.

When a coin having a diameter less than that of an acceptable coin, but having the proper weight, is deposited, it is apparent that the coin will displace the cradle to a position shown at *b* Fig. 3, but will then pass through spaced projections 10 and 11 and fall directly into the rejection passageway 19.

When a coin of acceptable diameter but under weight is deposited, the coin will not possess sufficient kinetic energy to rotate cradle 6 sufficiently far to permit the coin to pass between the projection 10 and the pin 16. Hence, it will rest suspended on the pin 16 and the projection 10, and will require the movement of the plate 2, by a well known means not shown, away from the frame 1 whereby projection 4 of the abutting member 3 will dislodge the suspended coin from projection 10 and pin 16 and cause it to fall by gravity into the rejection passageway 19.

Having described my invention, I claim:

1. A coin separator comprising frame means forming an entrance and an acceptance passageway and a junction open to each said passageway, each said passageway adapted to conduct gravity propelled coins edgewise therethrough in a substantially vertical plane, a cradle pivotally secured to said frame means adjacent to said junction and adapted for rotation in two directions from a normal position, abutment means integral with said frame means for arresting the rotation of said cradle when said cradle is rotated a predetermined angle in one direction from its normal position and for arresting said cradle when moved a second predetermined angle in opposite direction from said normal position, said cradle having two integral spaced projections extending into said junction in the path of coins descending in said entrance passageway, said projections spaced to intercept and temporarily retain thereon a coin of acceptable weight and diameter, urging means for normally urging said cradle into said normal position with one of said projections uppermost, guide means on said frame means in said entrance passageway for directing a said coin descending therein in a direction toward and against the uppermost of said projections for rotating said cradle against the restraining action of said urging means through the first said angle in one direction and whereby said coin under the influence of gravity will further descend and straddle said projections and rotate said cradle in opposite direction through an angle equal to the sum of both said first and second angles to transfer said coin from said cradle to said acceptance passageway at a predetermined velocity.

2. In a coin separator frame means forming an entrance passageway and an acceptance passageway open to each other at a junction, a cradle pivotally positioned on said frame means adjacent to said junction for transferring a coin

of acceptable weight and diameter descending in said entrance passageway to said acceptance passageway, a pair of spaced projections integral with said cradle extending into said junction for intercepting said coin, a first and a second abutment integral with said frame means positioned in said entrance passageway in predetermined spaced relation with respect to the axis of rotation of said cradle for guiding said coin against a predetermined one of said projections, urging means for urging said cradle in a normal position, stop means integral with said frame means for arresting rotation of said cradle when moved in one direction from said normal position, a second stop means integral with said frame means for arresting the rotation of said cradle when rotated in opposite direction from said normal position whereby a coin descending in said entrance passageway will first impinge upon said first abutment and be guided against one of said projections and rotate said cradle against the restraining action of said urging means in said one direction and whereby said coin will further descend and impinge upon said second abutment and be guided to momentarily straddle both said cradle projections whereupon the action of gravity on said coin will rotate said cradle in said opposite direction to transfer said coin from said entrance passageway to said acceptance passageway at a predetermined velocity.

3. A coin separator for separating coins of acceptable weight and diameter from underweight coins comprising in combination frame means forming an entrance a rejection and an acceptance passageway, each said passageway terminating at a junction, cradle means pendantly suspended to said frame means and retained by gravity in a normal position, a first and a second projection integral with said cradle means and extending into said junction for intercepting and temporarily retaining a coin of proper weight and diameter thereon, said first projection normally positioned uppermost in said junction, stop means integral with said frame means positioned for arresting the rotation of said cradle means when it is moved a predetermined angle in either direction from its said normal position whereby a said coin descending in said entrance passageway will be guided thereby to impinge upon said first projection and rotate said cradle in one direction and will further descend to straddle both said projections whereupon the action of gravity on said coin will rotate said cradle in opposite direction to transfer said coin from said entrance passageway to said acceptance passageway and whereby an underweight coin descending in said entrance passageway will impinge upon said first projection and be retained thereby in the entrance passageway.

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The following references are of record in the file of this patent:

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