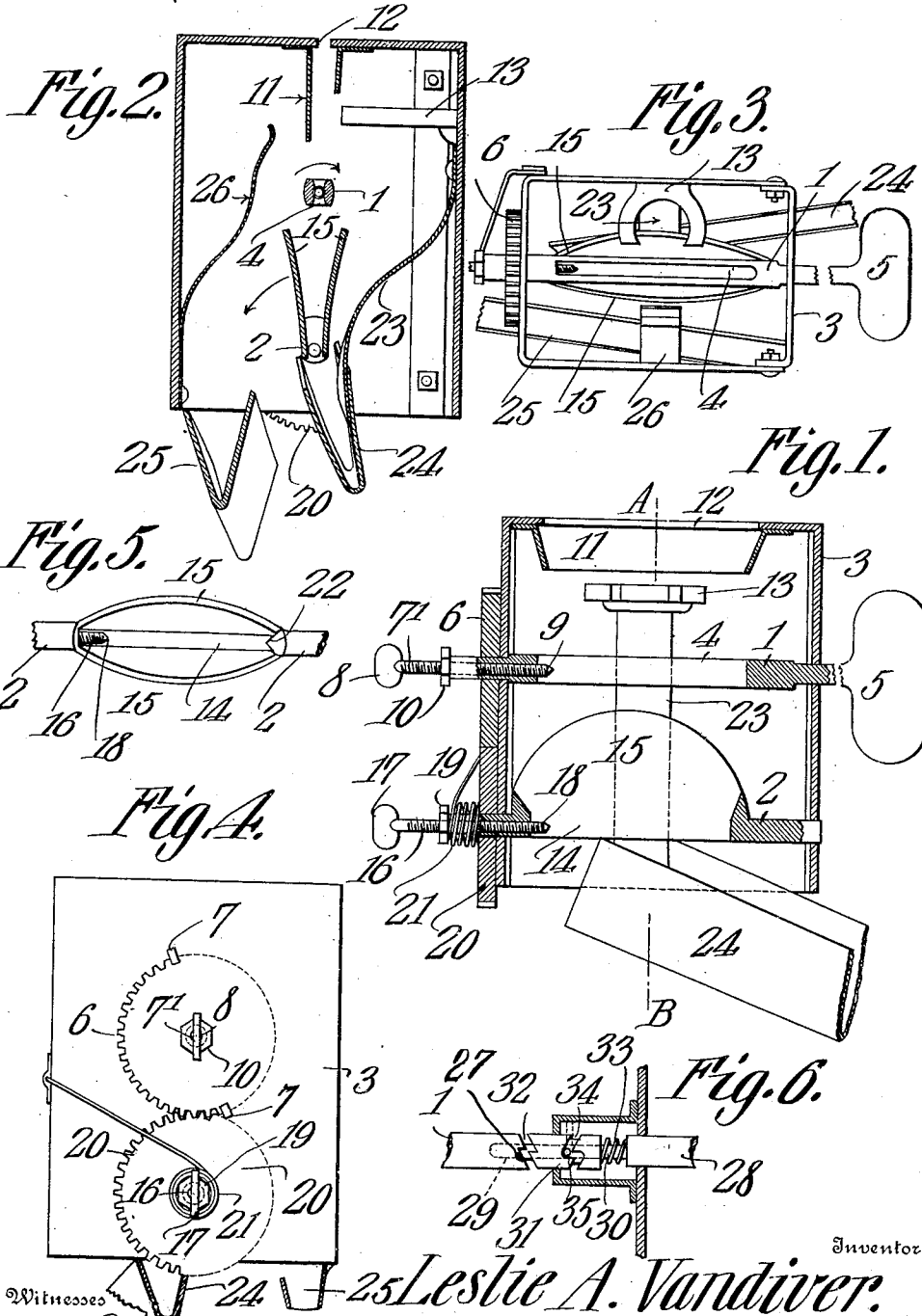


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 SPURIOUS COIN DETECTOR FOR VENDING MACHINES.
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SPURIOUS-COIN DETECTOR FOR VENDING-MACHINES.

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To all whom it may concern:

Be it known that I, LESLIE A. VANDIVER, a citizen of the United States, residing at 239 East Lake street, Chicago, in the county of Cook and State of Illinois, have invented a new and useful Spurious-Coin Detector for Vending-Machines, of which the following is a specification.

This invention has reference to improvements in spurious-coin detectors for vending machines and its object is to provide means for returning to a customer all coins, tokens or other similar articles except those properly designed to operate the coin controlled mechanism of the machine.

The invention comprises means whereby proper tokens or coins or similar articles pass into the machine to the coin operated lock, but if larger than the proper coin or token are diverted into a chute by which means they are returned to the customer. In this connection the usual magnetic means is employed for diverting washers or iron slugs away from the coin controlled mechanism of the machine. If the coin or token be of the proper size it will pass by the diverting mechanism and will thereupon gravitate to another part of the structure which may be properly manipulated to deliver the coin to the coin controlled mechanism. Should however the coin be worn so as to be of less value than indicated on its face, then such worn coin will pass the secondary means and fall into a conduit by which it is finally delivered to the customer. The machine, therefore automatically refuses to receive any coin not of the proper size and value.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawing forming a part of this specification in which drawing,

Figure 1 is a longitudinal vertical section of the spurious coin detecting mechanism forming the subject of the present invention. Fig. 2 is a cross section in a vertical plane on the line A—B of Fig. 1. Fig. 3 is a top plan view of the structure of Fig. 1. Fig. 4 is an end view of the structure of Fig. 1. Fig. 5 is a detail view of a portion of the structure and Fig. 6 is a detail view of an additional structure which may be used in conjunction with the mechanism shown in the other figures.

The showing of the drawing is not to be taken as illustrating with any great exacti-

tude the structure which is employed in the practical embodiment of the invention, since to adapt the invention to different types of vending machines will necessitate certain modifications in the structure which however do not in any manner change the principles upon which the invention is based. For this reason it is within the scope of the invention to modify the forms and proportions and even the locations of parts so long as the operations hereinafter set forth are performed.

Referring to the figures there are shown two shafts 1 and 2 each journaled in a suitable support or casing 3 which latter may be rectangular as shown or any other suitable shape, depending upon the particular machine to which the invention is applied. The shaft 1 is arranged above the shaft 2 and is provided with a longitudinal through-slot 4, the length of the slot 4 being a little more than is necessary to permit the passage of the coin of the greatest diameter designed to be used with the machine or any machine to which the invention is applied. In the simpler form of the invention the shaft 1 projects beyond its journal bearings at one end for a sufficient distance to extend beyond the exterior casing of the machine and is there provided with a handle 5. The handle 5 may be an ordinary flat thumbpiece such as indicated or it may be a crank or a milled head, or any other suitable means of manipulation may be employed.

The shaft 1 outside of but adjacent to the supports 3 at the end remote from the handle 5 has secured thereto or formed thereon a gear-wheel 6, having upon its periphery in addition to the gear-teeth appropriately spaced stops or projections 7 to which reference will hereinafter be made. The end of the shaft 1 carrying the gear-wheel 6 extends a short distance beyond the outer face of the gear-wheel and is provided with a longitudinal, axial, threaded passage for the reception of the screw 7', the outer end of which latter may be provided with a manipulating handle 8 of any appropriate type either the flat thumb type shown or any other type. The screw 7' has its end remote from the handle 8 formed into a point 9 entering the slot 4, and a lock-nut 10 is applied to the screw 7' exterior to the shaft 1. The point 9 of the screw 7' is hardened so as to resist wear and the distance between this

point 9 and the other end of the slot 4 will determine the effective diameter of a coin or token which may pass through the slot 4 in the shaft 1. When the screw 7' is once set
 5 then the lock-nut will hold it permanently in place. Except for the initial adjustment of the effective length of the slot 4 it is seldom necessary to further adjust the screw 7' except when it is desired to set the machine for
 10 coins of other value than for which it was initially adjusted.

Under working conditions the slot 4 is normally vertical, the shaft 1 being horizontal, and directly above the slot is the opened end
 15 of a coin-chute 11, the other end of which latter is entered through the usual slot 12 of such size as to admit a coin of the proper value. In the drawings the coin-chute 11 is shown as very short but it will be understood
 20 that in practice this coin-chute may be of any desired length.

Within the path of the inserted coin before it reaches the shaft 1 there may be located a permanent magnet 13 which is designed to divert any iron structures such as
 25 iron washers or other such structures sometimes used by persons who desire to dishonestly operate the machine.

The shaft 2 has a through-slot 14 extending longitudinally of said shaft and similar
 30 in general structure to the slot 4 of the shaft 1. On the two sides of the slot 14 are wings 15 which may be formed integral with the shaft 2 or secured thereto and these wings
 35 normally extend upwardly toward the other shaft and are divergent toward their upper ends, as best shown in Fig. 2. The shaft 2 is provided with a screw 16 having a manipulating handle 17 and a hardened point 18 entering
 40 the slot 14, all similar to the screw 7' and its parts. The screw 16 is held in adjusted position by a lock-nut 19 similar to the lock-nut 10 on the screw 7'.

The shaft 2 carries a gear-wheel 20 fastened thereon or if desired formed thereon
 45 and the teeth of this gear-wheel 20 engage the teeth of the gear-wheel 6 on the shaft 1. Since as will hereinafter appear, the gear-wheels 6 and 20 make but a partial revolution
 50 they may be of the mutilated gear type, or if desired the gear-teeth may continue all the way around these gear-wheels.

Surrounding the shaft 2 between the nut 19 and the gear-wheel 20 is a helical spring
 55 21 having one end made fast to the gear-wheel or shaft and the other end made fast to the support 3. When the shaft 2 is turned in the proper direction then the spring 21 is put under stress tending to turn
 60 the shaft 2 in the reverse direction. The structure is such that the spring 21 will hold the shaft 2 in a certain predetermined position, which position is determined by the engagement of one of the stops or tongues 7
 65 on the gear-wheel 6 with the periphery of the

other gear-wheel 20. If now the handle 5 be turned in proper direction then the gear-wheel 6 will through its intermeshing with the gear-wheel 20 turn the shaft 2 in the reverse direction, and at the same time wind
 70 up the spring 21 and this movement will continue until the other stop 7 engages the periphery of the gear-wheel 20. The slot 14, remote from the screw 16, is made V-shaped or toothed as indicated at 22 for a purpose
 75 which will presently appear.

Fast on the inner face of the support 3 is a pendent curved bracket or support 23 carrying at its lower end a chute 24, having one
 80 end below the slot 14 and inclined downward away therefrom and ultimately terminating at a point outside of the vending machine.

Fast to the support 3 at one side of the chute 24 is another coin-chute 25 which it will be understood leads to the coin-controlled
 85 mechanism of the vending machine.

Fast to the support 3 on one of the inner faces thereof is a spring member 26 having its free end in operative relation to the slot
 90 4 in the shaft 1 for a purpose which will presently appear.

Let it be assumed that a coin or token of the proper size is inserted through the slot 12. Since the coin is unaffected by the magnet 13 it will gravitate to the slot 4, and the effective
 95 length of the slot 4 being slightly in excess of the diameter of a coin of proper size, such said coin will gravitate into the slot 14 in the shaft 2. The effective length of the slot 14 however, is such as to retain a coin of
 100 the proper size. On rotating the shaft 1 by means of the handle 5 the shaft 2 is rotated in the direction indicated by the arrow of Fig. 2 that is counter-clockwise as viewed in Fig. 2. The coin when in the slot 14 projects slightly
 105 through the same and consequently as the shaft 2 is rotated the corresponding end of the coin is brought into engagement with the bracket 23 as the ends of the wings are moved toward the conduit or chute 25, and should
 110 the coin tend to stick slightly within the shaft 2 the engagement of the said coin with the bracket 23 will force the coin out toward the chute or conduit 25 and the weight of the coin will cause it to gravitate off the corresponding
 115 wing into the conduit 25 and down the latter to the coin controlled mechanism of the vending machine, where the coin may be utilized to cause the operation of the vending machine in the usual or in any approved
 120 manner. Suppose however, that an iron washer or some other iron article be inserted through the slot 12 then it will not reach the slot 4 but will be diverted because of the attraction of the magnet 13 and the iron
 125 washer or other structure will be caused to move toward the bracket 23 out of the path of the slot 4 and so ultimately be directed into the chute 24 and thereby returned to the customer. Suppose now that a slug or even
 130

a coin of greater diameter than the coin designed to operate the machine be introduced through the slot 12. The larger coin or slug will be caught between the pointed end 9 of the screw 7 and the farther end wall of the slot 4. If now the shaft 1 be rotated as before, that portion of the coin or slug which projects through and to one side of the slot 4 will be engaged by the spring 26 and expelled from the slot in a direction toward the bracket 23 to be diverted by the latter into the chute 24 and returned finally to the customer. Suppose now that a coin of the proper denomination be used but that the coin be so worn as to be of less value than indicated on its face. Such a coin is worn on its edges as well as on its face and consequently is of slightly less diameter than a coin of full value or new coin. Such a coin will gravitate through the slot 4 onto the shaft 2 and into the slot 14. The edge of such a coin because of thinness of the coin will engage at its edge on the tooth 22, and for such a coin the effective length of the slot 14 is greater than it is for a coin of full thickness. The result is that the coin will gravitate through the slot 14 and fall into the conduit 24 to be returned, as is the case with other spurious coins or slugs, to the customer. If a small coin, that is a coin of a smaller diameter than a coin necessary to operate the mechanism, be dropped into the slot 12 it will gravitate directly into the conduit 24 and be returned to the customer. It is to be observed that the shafts 1 and 2 make a little less than a half revolution in the structure shown in the drawings. It is desirable, however, that the handle 5 be always rotated in the same direction. For this purpose there may be introduced in the line of the shaft 1 between the same and the handle 5, the structure shown in Fig. 6. For this purpose the shaft 1 may be formed at an appropriate point in its length with a tooth end 27 so shaped as to form two annular reversed cams. A continuation 28 of the shaft 1 is inserted in a socket in the end of the shaft 1 as indicated by the dotted lines 29 so that the shaft 1 and continuation 28 may rotate independently, the said continuation 28 being formed with a stem 30 for this purpose. Upon the stem 30 there is mounted for longitudinal movement a block 31 under the control of a spring 33 between the said block 31 and the corresponding end of the continuation 28. The end of the block 31 remote from the spring 33 is formed with two annular reversed cams 32 similar to and arranged to engage the cams on the end 27 of the shaft 1. The block 31 is formed with a cam groove 34 in which engages a pin 35 attached to a fixed portion of the framework of the machine. Now when the continuation 28 is turned in one direction, the pin 35 engaging the groove 34

forces the block 31 with its cam end into engagement with the cam end 27 of the shaft 1, the spring 33 aiding in this movement. The shaft 1 then participates in the rotative movement of the continuation 28 until the cam groove 34 acted upon by the pin 35 withdraws the block 31 against the action of the spring 33 with its cam end out of engagement with the cam end of the shaft 1. The rotative movement of the shaft 1 has caused the spring 21 to be wound up or put under tension so that when the block 31 is withdrawn from engagement with the corresponding end of the shaft 1, the latter is returned to its initial position by the unwinding of the spring 21, and this position is such that a continued rotation of the continuation 21 will cause the block 31 to again engage the shaft 1 and to cause this to again rotate through the requisite distance to operate the mechanism under its control. Thus the shaft continuation 28 which is operated from the outside of the machine may have rotative movement always in the same direction while the shaft 1 is rotated in like direction for a suitable distance and then it is released and allowed to return to its initial position.

In the following claims the term coin is used as indicative of an actual coin or a token or a slug or any instrument used for the purpose of operating a coin controlled mechanism.

What is claimed is:—

1. A spurious coin detector for vending machines, comprising a receptacle constructed to permit the passage therethrough of coins of proper size, and to retain coins of larger size, another receptacle constructed to retain coins of proper size and to permit the passage of coins of smaller size, the two receptacles being in operative relation one to the other so that coins passing through the first named receptacle will enter the second receptacle, means exterior to the machine for the manual operation of the receptacles to discharge coins therefrom, and means for causing the coins discharged from each receptacle to take a path individual to the respective receptacles.

2. A spurious coin detector for vending machines, comprising a receptacle constructed to permit the passage therethrough of coins of proper size and to retain those of larger size, another receptacle constructed to retain coins of proper size and to permit the passage of coins of smaller size, and means exterior to the machine for the manual operation of the receptacles simultaneously.

3. A spurious coin detector for vending machines, comprising coin chutes, one leading to the coin operated mechanism of the vending machine and the other returning to the operator exterior to the machine, a re-

ceptacle constructed to permit the passage therethrough of coins of proper size to operate the machine and to retain those of larger size, said receptacle being movable into operative relation to the return chute, another receptacle constructed to retain coins of proper size to operate the machine and to permit the passage therethrough of coins of smaller size, said receptacle being movable into operative relation to the chute leading to the coin operated mechanism, and means exterior to the machine for the manual operation of the receptacles.

4. A spurious coin detector for vending machines, including a shaft having a through slot of such effective size as to permit the passage of coins of proper size to operate the vending side of the machine, and to retain coins of larger size, means co-acting with the slotted shaft to direct the coins arrested thereby away from the vending side of the machine, another shaft in operative relation to the first named shaft and having a through slot in the path of coins passing through the slot in the first named shaft and of such effective size as to retain coins of the proper size to operate the machine and to permit the passage of coins of smaller size, means for directing coins arrested by the second slotted shaft to the vending side of the machine, and means exterior to the machine for the manual operation of the shafts to rotate the latter upon their longitudinal axes, to discharge coins arrested thereby.

5. A spurious coin detector for vending machines, comprising a shaft having a through slot of such effective size as to permit the passage of coins of proper size to operate the machine and to retain coins of larger size, another shaft having a through slot of such effective size as to retain coins of proper size to operate the machine, and to permit the passage of coins of smaller size, means connected to and connecting the shafts for simultaneous rotation of the latter in opposite directions, and means exterior to the machine for the manual operation of said shafts to discharge from said shafts coins arrested by the slotted portions thereof.

6. A spurious coin detector for vending machines, comprising a shaft rotatable on its longitudinal axis and having a through slot of such effective size as to permit the passage of coins of proper size to operate the machine and to retain coins of larger size, another shaft rotatable upon its longitudinal axis and having a through slot of such effective size as to retain coins of proper size to operate the machine and to permit the passage of coins of smaller size and also provided with wings on each side of the slot, a coin chute or conduit in operative relation to the second shaft for direct-

ing coins therefrom to the vending apparatus of the machine, another chute or conduit in operative relation to the first named shaft for directing coins to the exterior of the machine, and means exterior to the machine for the manual operation of the shafts.

7. A spurious coin detector for vending machines, comprising a shaft with a longitudinal through slot, means carried by the shaft for determining the effective length of the slot, another shaft provided with a through slot and in the path of coins passing through the slot in the first shaft, the slot in the second shaft having a narrowing continuation at one end, means at the other end of the slot in the second shaft for determining the effective length of said slot, and means for rotating said shafts upon their longitudinal axes.

8. A spurious coin detector for vending machines, comprising a shaft with a longitudinal through slot, a pointed screw carried by said shaft and entering one end of the slot to determine the effective length of said slot, another shaft provided with a longitudinal through slot, in the path of coins passing through the slot in the first named shaft, a pointed screw carried by said second named shaft and entering one end of the slot to determine its effective length, and means for operating said shafts.

9. A spurious coin detector for vending machines, comprising a shaft with a longitudinal through slot, a pointed screw carried by said shaft and entering one end of the slot to determine its effective length, another shaft having a through slot in the path of coins passing through the slot in the first named shaft, a pointed screw carried by the second shaft and entering one end of the slot therein to determine its effective length, means for limiting the movement of the shafts about their longitudinal axes, a spring for holding the shafts in one position, and means for rotating the shafts in opposition to the action of the spring.

10. A spurious coin detector for vending machines, comprising a shaft with a longitudinal through slot, a pointed screw carried by said shaft and entering one end of the slot to determine its effective length, another shaft with a longitudinal through slot in the path of coins passing through the slot in the first named shaft, a pointed screw carried by the second shaft and entering one end of the slot therein to determine its effective length, and the second shaft having wings projecting therefrom on each side of the slots therein, means for rotating the shafts on their longitudinal axes, connections between the shafts for imparting opposite rotations thereto, and coin chutes, one in operative relation to one of the shafts and the other in operative relation to the other of the shafts.

11. A spurious coin detector for vending machines, comprising a shaft with a longitudinal through slot, a pointed screw carried by said shaft and entering one end of the slot
5 to determine its effective length, another shaft having a longitudinal through slot, a pointed screw carried by the second shaft and entering one end of the slot, to determine the effective length thereof, means for
10 rotating said shafts upon their longitudinal axes, means coupling the shafts to cause

their rotation to be in opposite directions, and means in operative relation to each shaft for ejecting the coins lodged therein.

In testimony that I claim the foregoing 15 as my own, I have hereto affixed my signature in the presence of two witnesses.

LESLIE A. VANDIVER.

Witnesses:

CLARENCE C. CALDWELL,
SAMUEL W. VANDIVER.