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S. MAY

2,442,174

COIN SWITCH

Filed July 19, 1945

FIG. 1.

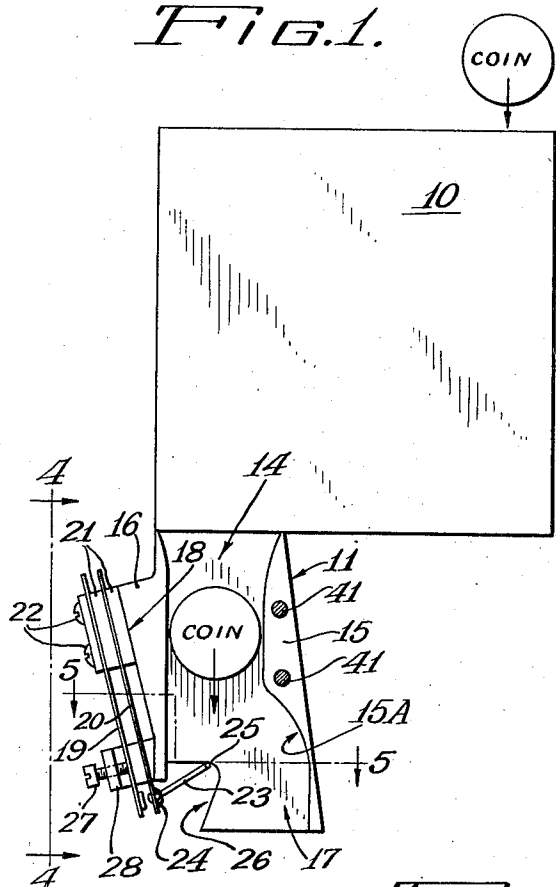


FIG. 2.

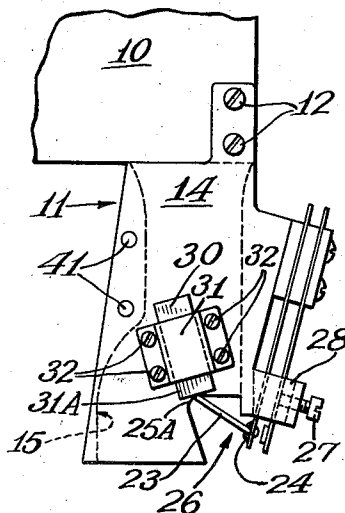


FIG. 3.

FIG. 4.

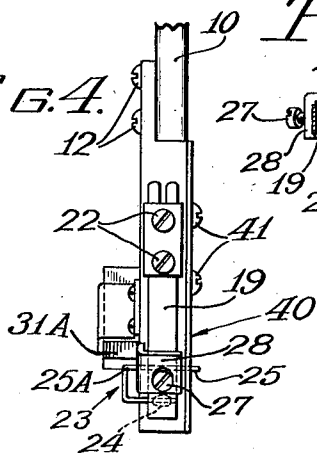
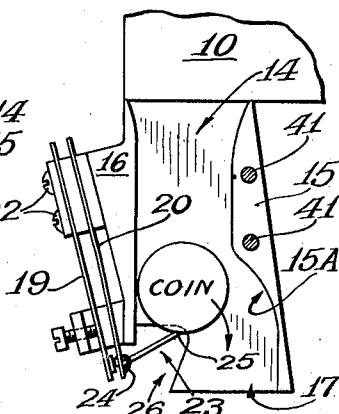
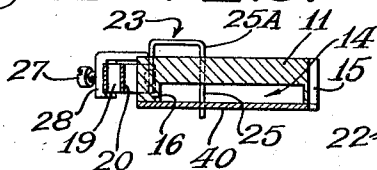


FIG. 5.



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UNITED STATES PATENT OFFICE

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COIN SWITCH

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2 Claims. (Cl. 194-97)

1

This invention has as its principal object the provision of improvements in shock proof switches and more particularly to switches adapted for coin operation.

Viewed from another aspect it is an object of the invention to provide a coin-operated switch and means for preventing fraudulent operation thereof as by jarring, shaking and pounding.

Further objects are: the provision in a coin chute of a switch having a magnetically attractable operating arm and magnetic means holding the arm normally in non-operated condition, the arrangement and construction being such that the attractive force of the magnetic means effectively holds the operating arm against movement from shock and the like, while at the same time affording a form of yieldability in the operating arm which does not interfere with movement of said arm by impact therewith of a coin, the magnetic restraining force being elastic in a sense different from that of the holding force of springs and the like, which are themselves subject to inertia reaction responsive to jarring and like impacts.

Additional objects and aspects of novelty and invention relate to details of construction and operation of the preferred embodiment described hereinafter in view of the annexed drawing in which:

Fig. 1 is a side elevation of a coin chute and the novel switch means with the cover plate removed;

Fig. 2 is a side elevation of the switch means viewed from the opposite side shown in Fig. 1;

Fig. 3 is a view of the switch means shown in Fig. 1 but in operated condition;

Fig. 4 is a view of the switch means looking in the direction of lines 4-4 of Fig. 1;

Fig. 5 is a horizontal section through the switch means looking in the direction of lines 5-5 of Fig. 1.

Referring to Fig. 1 a known type of coin testing chute is indicated schematically at 10, such chute being commonly used in connection with coin-operated vending machines and the like, and being further adapted to receive coin in an unshown deposit opening along the upper edge thereof, and to discharge said coin, if acceptable, from a lower edge portion thereof into an auxiliary chute member 11 attached to chute 10, as by screw means 12 (Fig. 2). The auxiliary or switch chute 11 is preferably in the form of a casting providing a vertical coin passage 14 flanked by opposite vertical margins or side walls

2

15 and 16, this chute being open at the bottom edge to provide a coin exit 17.

The side wall portion 16 is pitched inwardly of the chute as at 18 to provide an angular mounting face for switch means, including a pair of normally open spring switch blades 19 and 20 secured between the insulating wafers 21 held in assembled relation and attached to the face 18 by screws 22.

A switch-operating arm 23 in the form of a U-shaped wire (see also Fig. 4) has one of its free end portions anchored, as by soldering 24 to the innermost end portion of switch blade 20, the other end portion 25 of said arm being turned back beneath a cutaway portion 26 of the chute casting 11 so as to lie in the path of a coin descending in the latter from test chute 10 (Fig. 5 also).

Switch operating arm 23, being rigidly attached to switch blade 20, is held in raised normal position by the spring bias of blade 20, but when engaged by a coin as in Fig. 3 said arm and blade yield until blade 20 is in circuit-closing engagement with the companion blade 19, the latter being adjustably spaceable relative to blade 20 by means of an adjusting screw 27 threaded into an offset extension 28 (Figs. 2 and 4 also) of the chute casting 11.

As illustrated in Fig. 3, the coin after striking and depressing the switch-operating arm 23 is deflected sidewise toward a relieved portion 15-A in marginal wall 15 of the casting and thence downwardly through the exit opening 17, whereupon spring blade 20 is restored, with said arm, to the normal position of Fig. 1.

Means for yieldably holding the switch-operating arm 23 in normal position as aforesaid includes a small permanent magnet 30 (Fig. 2) clamped by a bracket 31 secured by screw means 32 to an outer face of casting 11 with one of its polar ends 31-A disposed in close proximity to a portion 25-A of arm 25 of the switch-operating member (Fig. 4 also) so as to attract said arm to the fully raised normal position of Figs. 1 and 2, cooperatively with the bias of spring 20.

Jarring or pounding of the coin chute assembly in fraudulent attempts to cause an operation of switch means 19-20 are defeated by the holding attraction of magnet 30, such attraction, however, being in a sense yieldable so as not to interfere with the displacing action of a coin in striking the operating arm, such magnetic attraction moreover decreasing with the square of the increasing distance between operating arm portions 25-A and the attracting end 31-A of

3

the magnet as the operating arm moves away from the latter under impact from the coin; and in this latter connection a difference is to be noted between such magnetic action and the action of a holding spring, for example, attached to the switch operating arm as in some prior arrangements, wherein such spring means would tend to effect a retarding action on the descent of the coin in proportion as the spring would be tensed.

The switch chute structure is completed by the application of a cover plate 40 (Figs. 4 and 5) secured against the side wall margins 15 and 16 as by screws 41 (Fig. 4) threaded into chute portion 15.

The foregoing construction permits of the use of an inexpensive, light-weight switch of the leaf-spring variety shown, which requires very little operating effort from the coin, and which may be angularly mounted, as shown, for securing optimum angular disposition of the operating means or arm 23 relative to the angle of impact of the coin; and the magnetic holding means is contrived to exert a positive maximum fraud-preventive holding effort on said switch arm with a minimum of interference to displacement of said arm by a coin.

The foregoing specific construction is subject to modification, and the invention is not intended to be limited to the precise form shown and described excepting as may be expressly provided in the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent of the United States is:

1. A device of the class described including a chute having a substantially vertical coin passage with an angularly directed side portion thereon, a leaf spring switch mounted on said side portion with at least one leaf spring contact pitched downwardly toward the lower end of said passage, a magnetically attractable switch-operating arm projecting from the said lower end region of said leaf spring contact and at an angle to the latter, upwardly into the path of a coin moving into said lower end of the passage, said chute having a widened portion in a vertical side-wall thereof substantially opposite the portion of said switch-operating arm in the coin path aforesaid, such that said coin moving into the lower end of said passage will engage and move said

4

switch operating arm to actuate said switch and continue downward movement in said passage, said one leaf spring contact being biased to normally maintain said switch-operating arm in the coin path as aforesaid, and magnetic means mounted on said chute and yieldingly holding said switch-operating arm against jarring displacement from said normal position but permitting movement of the arm from said position responsive to engagement of a coin therewith.

2. A fraud-preventive attachment for coin chutes and comprising: a chute member adapted to be mounted relative to a coin-testing chute to receive a coin therefrom, a switch on said chute member, a magnetically attractable operating arm for said switch and yieldingly and normally disposed thereby in the path of a coin descending in said chute member for transient engagement and displacement by a coin received as aforesaid to actuate said switch, a magnet on said chute member and normally and yieldingly holding said operating arm in said normally disposed condition, said chute member having a widened portion substantially opposite the coin-engaged portion of said operating arm and the latter being angularly disposed relative to the movement of a coin engaging said arm to yield in switch-operating action in a direction substantially away from said widened portion and the attracting magnet.

SAM MAY.

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