

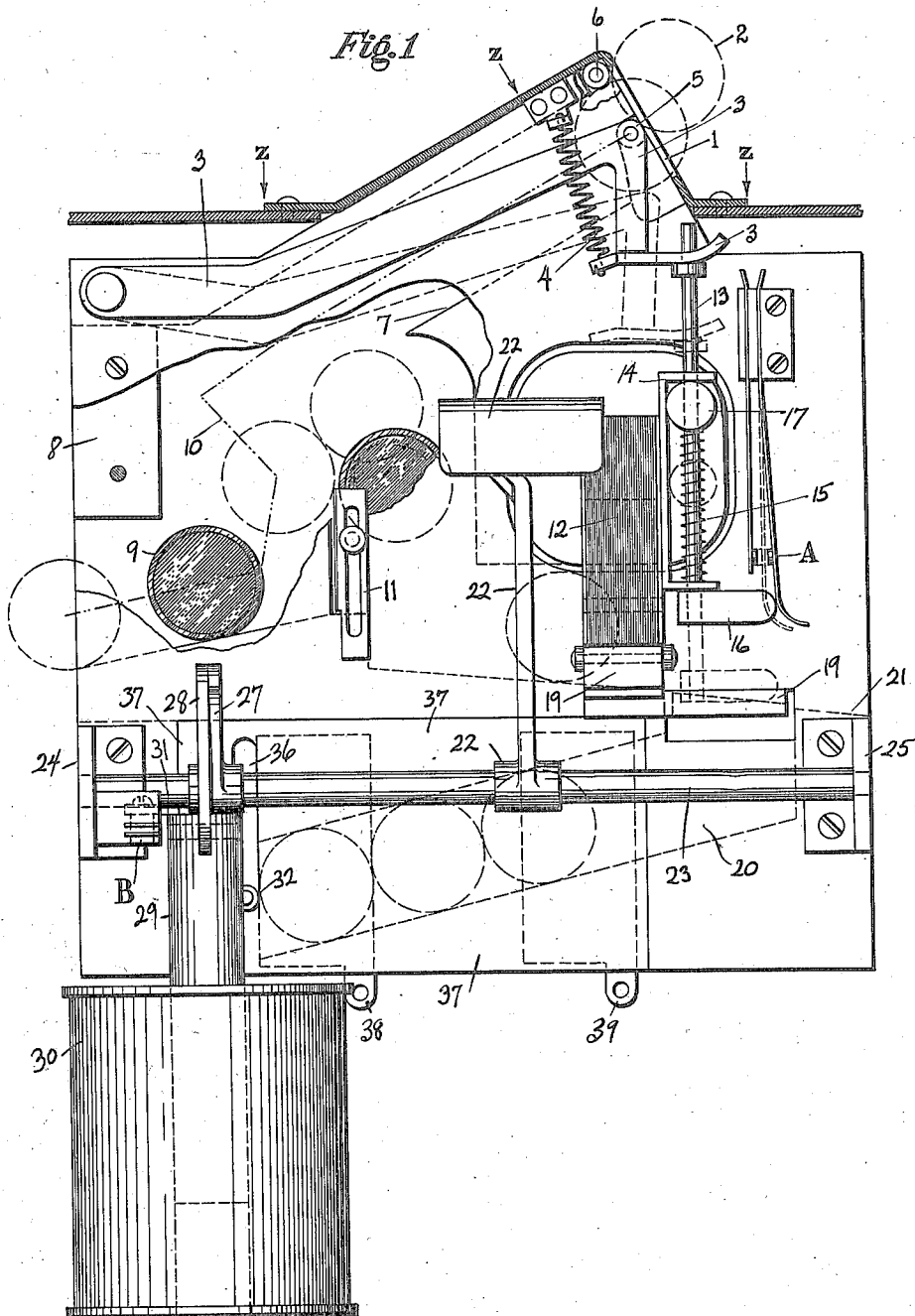
May 26, 1936.

D. TROY

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COIN CONTROLLED APPARATUS

Original Filed Nov. 29, 1933 2 Sheets-Sheet 1



WITNESSES:

Frank Jackson
Rickett C. Smith

INVENTOR:

Daniel Troy

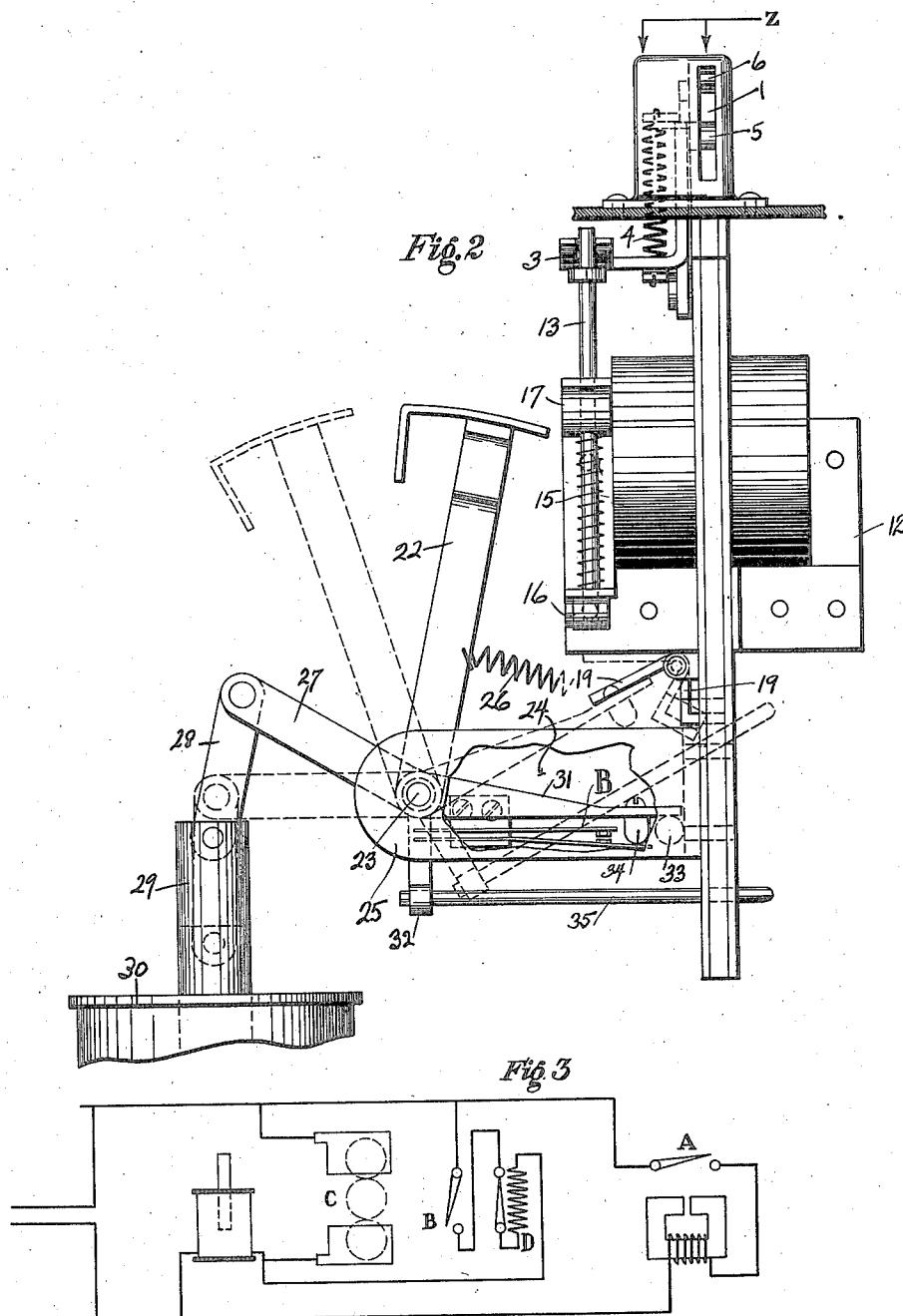
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UNITED STATES PATENT OFFICE

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COIN CONTROLLED APPARATUS

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1 Claim. (Cl. 194—101)

The invention relates to coin controlled apparatus such as vending machinery and the like; and the object of the invention is to provide new, useful, reliable, and inexpensive methods and apparatus for accepting good coins and rejecting imitations thereof, and for operating coin controlled mechanism in conjunction therewith.

The invention is not confined to the specific employment shown in the drawings and adopted herein as a typical application of the method and apparatus, but is capable of much flexibility of design and use. I have taken herein as generally illustrative of the invention an apparatus designed for use with a package vending machine, such as a cigarette vendor, the merchandise to be sold at a uniform price of fifteen cents, and the apparatus arranged to operate upon the introduction of three five cent pieces or nickels. It will be obvious that the method employed is not materially limited by the number of coins desired to be taken into the machine at one operation.

In the drawings, Fig. 1 is a partly sectional elevation of the apparatus, the sectional portion being only the housing which is part of the vending machine itself; this elevation is such as would be had from within the machine housing. For clarity, magazines to hold the merchandise, and other related parts, are omitted. Fig. 2 is a view at right angles to that in Fig. 1, with certain parts omitted; while Fig. 3 is a circuit diagram.

The invention will be best understood by a description of the progress of coins through the apparatus.

The coins are introduced, one after the other, and preferably with short intervals between each insertion, into a slot 1. The initial position of a coin to be introduced is indicated in a dotted circle 2 in Fig. 1. As the coin is forced into the slot, a lever 3, controlled by a spring 4, is depressed, its extremest operating position being indicated on Fig. 1 by dotted outlines, the coin engaging a stud 5 at the end of said lever, and passing between said stud and a fixed stud 6. When more than half the coin is within the slot, the retractile spring 4 operates to force the coin into the apparatus with considerable velocity.

The coin travels down a runway 7, being defined in this model by two sheets or laminations separated by suitable spacers or guides, as indicated in the drawings. The coin strikes an anvil 8, which may, but need not be, so disposed with a vertical face as here shown (Fig. 1). If the disc inserted into the slot does not

happen to be a genuine coin of the required denomination and issue, but is a slug made of lead, babbitt, solder, and in some cases other soft metals, it bounces but slightly from the face of the anvil, and generally follows through the apparatus a path of which the dot-and-dash center-line path 10 is typical. 9 is a soft slug being rejected, seen through a cutting in one of the plates defining the coin runways. Other positions of soft slugs are shown in dotted circles. If the coin or imitation coin is of sufficient resilience it rebounds from the anvil much farther; and an adjustable partition, here shown (Fig. 1) slidable up and down in a slotway in the plate or wall of the runways at 11, is so disposed as to route the coins and slugs after such coins and slugs have struck the anvil; and the adjustment of such partition is that found by experimentation which will serve best to separate lead, babbitt, etc. from harder coins and slugs, such as the genuine coin itself, brass, iron, steel, copper, duralumin, etc. 11 is shown only in Fig. 1. Coins and slugs which clear the top of the partition 11 are routed to an airgap in an electromagnet, the runway being so designed as to break the speed of the coin or slug and to nearly bring it to a halt just before the air gap is reached. It has been found desirable to have the speed of the approaching coin as nearly devoid of velocity as possible without rendering the declivity of the runway incapable of permitting the coin to roll further subsequently, when no electrical disturbances are acting against the ordinary attraction of gravitation.

It has been found that if metal discs are routed through a region of intense magnetic flux, the well-known Foucault currents set up in the disc in its effort to cut the lines of force tend to retard the progress of the disc as it enters the field. It has further been found that magnetic fields of certain strengths in combination with certain speeds of travel of such discs will operate to arrest certain electrical conductors, but permit to pass others of lower conductivity. In the apparatus herein described, the field is preferably set up by a laminated nearly-complete iron core within a coil energized by alternating current of the common 110-120 voltage range. This field is of course particularly intense. I have found that in the design herein shown and in a number of similar designs the flux operates to arrest brass, copper, aluminum, duralumin, zinc, iron, steel, German silver, and a number of other metal discs, but will pass the common five cent piece or nickel, which is of an unusually high re-

sistivity. The schematic design of this magnet 12 is shown in the circuit diagram (Fig. 3).

As it is desirable to energize the magnet 12 only as and when needed in the coin testing function, an automatic switch mechanism is provided for this purpose. The downward movement of the lever 3 depresses axially a rod 13, suitably guided in a bracket 14 which is attached or mounted as shown to the iron of the magnet pile-up, and said rod 13 is controlled by a retractile compression spring 15. At the lower end of the rod 13 is a cam 16, of some insulating material such as bakelite, which, in moving downward, permits a switch A, of the common jack type, and controlling the circuit embracing magnet 12, to close. An armature (here a cylinder, preferably of iron), 17, fixed to rod 13, and which, in operation, is moved along the pole piece of the magnet, and is attracted thereby as soon as the switch A is closed, acts as a brake and materially retards the recovery to normal position of the rod 13. The rod 13 is independent of the upward motion of the lever 3 (see Fig. 2 particularly); lever 3 may recover its normal position almost instantaneously; but rod 13, forced upward after the introduction of each coin by the retractile spring 15, due to the artificial friction caused by the attraction of magnet 12 and the armature 17, retains its normal position only after an interval of a second or thereabouts; and the magnet 12 is energized throughout most of this period. Of course it is desirable to predetermine this interval so that the coin to be tested electrically will have had time to reach the air gap, and so be tested for its resistivity, etc., before the field is deadened. The weight of the armature, the strength of the springs, and incidental friction, and other factors provide ample latitude, should, in various designs, it be desired to change the interval of energization.

As the magnet is energized it attracts and lifts an armature 19, which is a peculiarly shaped iron bell-crank, hinged beneath the pole face as shown, and passing through a slot in the plate of the apparatus, thus forming, in its normal position, part of the floor of the coin runway through the air gap and beyond. When 19 is withdrawn, or attracted, a genuine coin, not arrested by the flux, is permitted to fall into runway 20. If the disc introduced is brass, zinc, or something of relatively low resistivity, it is arrested by the flux until the magnet is deenergized; and then rolls down the slightly inclined runway, over the lip of armature 19, which will have immediately regained its normal position, and so to rejection at 21.

Thus coins of low resilience fail to rebound from the anvil sufficiently to clear the partition 11, while coins and slugs of harder material, but of lower resistivity than the desired coin, do clear the partition, but are arrested by the flux until the deenergization of magnet 12, and are then rejected as shown above.

22 is a lever especially constructed to be employed in delivering small packages, such as packs of cigarettes, from the bottom of a stack within a magazine of the type well known in the art. 22 is fixed as shown on a shaft 23, which is journaled in brackets 24 and 25, fixed to the plates of the apparatus. The lever 22 is normally held as shown (Fig. 2) in full lines; its extreme operating position is indicated on Fig. 2 in dotted outlines.

Also fixed on shaft 23 is a peculiarly shaped three-armed member (the design being quite ar-

bitrary), consisting in a shaft collar, radiating from which and integral with are an arm 27, connected, as shown, by a link 28, with the core 29 of a solenoid 30; and an arm 31, and a stud 32. The two arms and the stud are disposed angularly substantially as shown, and being made as one unit, are so fixed with relation to each other (see Fig. 2). The throw of the solenoid core 29 is shown by dotted position lines in Figs. 1 and 2, and the extreme operating positions of the other members are likewise shown in Fig. 2 in dotted outlines. The movement of lever 22 is that found adequate to dislodge the package to be vended, and this movement, of course, is the chief factor in determining the construction of the solenoidal equipment.

Arm 31, not visible in Fig. 1, and shown nearly complete in Fig. 2, engages, at its far end, a stud 33, fixed on bracket 24, such engagement normally determining the angular positions of shaft 23 and its members.

Bracket 25 is cut away partially to show arm 31 and a switch of the ordinary jack type B, the end of said switch being also seen in Fig. 1. Near the extreme end of arm 31 is a vertically fixed stud 34, of bakelite or some other suitable insulating material, which normally serves to hold the switch B open, as shown.

The vertically disposed stud 32 holds a rod 35, of bakelite or some other insulating material, which passes through a vertical slot 36 in the apparatus (see Fig. 1), and said insulator rod is able to move in a vertical plane to the position shown on Fig. 2 in dotted outlines.

The runway 20 is continued into an inset block 37 of some suitable insulating material such as bakelite, and beyond (not shown) to a cash box, or other suitable receptacle. Inset in the block 37 and so insulated from the apparatus generally are two rectangular brass or other suitable conductor blocks, 38 and 39, which are separated from each other as shown by a considerable area of insulating material. In constructions found workable by the inventor, the block 37 was previously milled to receive the conductor rectangles 38 and 39, which were fixed in place, by being riveted or screwed; then the coin runway was milled diagonally, to provide the required declivity of runway, through the entire assembly. The assembly was covered by an insulator sheet, and screwed into a rectangular frame formed by the apparatus structure. The plan is clearly shown in Fig. 1. The conductor blocks provide metal on three sides of the coin runway in their respective regions, and such areas are separated by insulated runway. The conductor blocks 38 and 39 are, in Fig. 1, shown provided with connecting lugs, for attaching wires. When three coins have been received into the runway 20, the bottommost having been held in place by the rod 35 intersecting the runway 20 through the slot 36, blocks 38 and 39 are in electrical connection through the coins.

Fig. 3, a circuit diagram, shows clearly the function of all switches heretofore mentioned. D is a thermo-relay, designed to operate fairly quickly. When three coins are received in switch C (C being the switch which consists in the block 37, the contacts 38, 39, and associated parts), which controls a shunt line through the solenoid, said solenoid is energized, and begins to draw in its core 29. But when a small fraction of the total operation of the solenoid has been effected, arm 31 will have moved upward sufficiently so that its stud 34 will have disengaged switch B, 75

5 permitting said switch to close. Switch B is in another shunt line to the solenoid (Fig. 3), which line also embraces a thermo-relay D. D is nowhere shown pictorially, its position being immaterial. When B is closed, the solenoid is no longer dependent upon C for the supply of current. As the operation continues, rod 35 rises and permits the nickels to roll out of runway 20 into a cash box, or elsewhere. The solenoid completes its 10 throw uninterruptedly, effecting delivery of the article to be vended; the movable parts associated with the solenoid are of course held in extreme operating displacement until the thermo-relay D automatically opens—which may be a half 15 second or so—and cuts the circuit. A spring 26, attached to the lever 22, and to some adequate lug or other suitable member (not shown) of the apparatus operates to bring the parts associated with shaft 23 back to their normal positions. 20 Spring 26 is shown only on Fig. 2, and only partially on that drawing.

Having described my invention, what I claim is:

In apparatus of the class described, an anvil, means arranged to guide coins against the anvil, a fence arranged to be cleared by coins of certain 5 resiliency rebounding from said anvil and to stop coins of less resiliency, a runway arranged to be traversed by coins which have cleared said fence, means arranged to produce an alternating mag- 10 netic field across said runway strong enough to arrest coins of certain specific conductivity in said runway and to pass coins of less specific conductivity, means for maintaining the magnetic field for a predetermined time, and means con- 15 trolled by said first named means and operative only while said field is in existence to allow coins which have cleared said fence and traversed said runway to be selectively received.

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