July 27, 1937. O. A. SHANN 2,088,309

COIN COLLECTOR APPARATUS

Filed July 2, 1935

FIG. 1

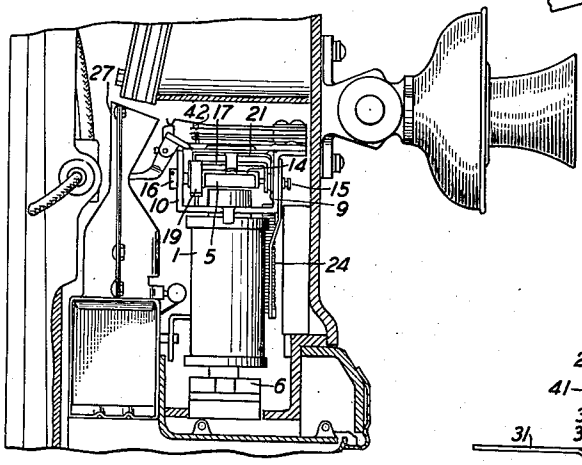


FIG. 3

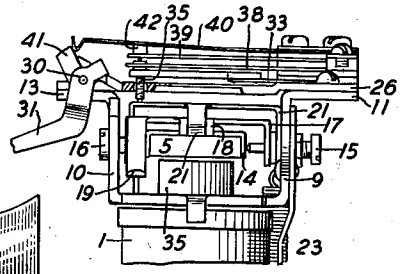


FIG. 4

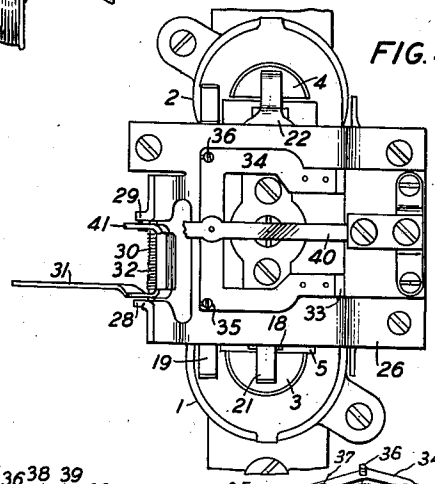
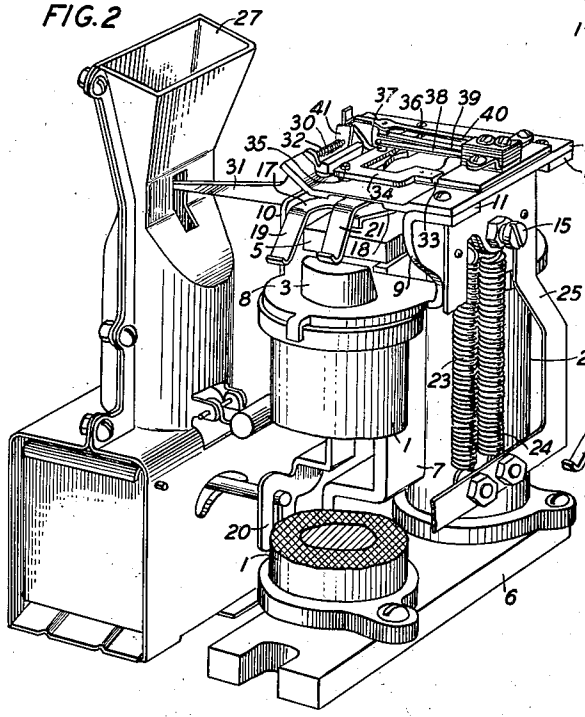


FIG. 2



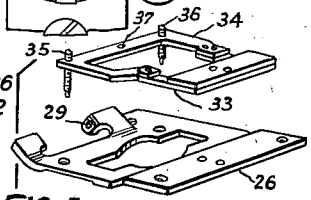
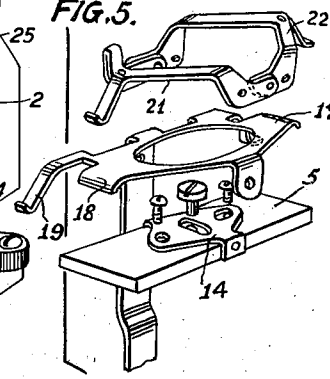


FIG. 5.



INVENTOR
O. A. SHANN
BY
P. H. Jacobson
ATTORNEY

Patented July 27, 1937 2,088,309

UNITED STATES PATENT OFFICE

2,088,309

COIN COLLECTOR APPARATUS

Oscar A. Shann, Bayside, N. Y., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

Application July 2, 1935, Serial No. 29,435

7 Claims. (Cl. 194—16)

This invention relates to coin collector apparatus for use at telephone pay stations and more particularly to that part of the mechanism by means of which a signal is given at the central office when a call is desired to be made and the disposition of the deposited coin is controlled from the central office.

Specifically, the invention relates to the operation of the switch contacts at a pay station of the type disclosed in O. F. Forsberg Patent 1,043,219.

In the operation of such an apparatus a coin or token is deposited by the subscriber which in its passage operates a mechanism which causes the closure of a switch, whereby a circuit is closed to cause the operation of a signal at the central office which indicates that communication is desired. As a part of this mechanism, as described in the Forsberg patent, there is an electromagnet which may be operated in one direction to collect the deposited coin and in the other direction to return the coin to the depositor. The operating circuit of this electromagnet includes the switch contacts which are closed when the coin is deposited.

Heretofore, there has been a series of levers between the coin-actuated part, called the coin trigger, and the switch contacts. With such an arrangement there is a possibility of a signal being given if the apparatus as a whole is jarred and if the levers are not in proper adjustment, no signal may be given upon the deposit of a coin.

The present invention has as an object the simplification of the switch contact actuating mechanism.

Another object of this invention is to insure the actuation of the switch contacts upon the deposit of a coin.

Another object is to prevent false actuation of the switch contacts.

A further object is to facilitate adjustment of the contact springs.

Referring to the drawing, Fig. 1 shows a part of a telephone coin collector with a portion of the enclosing case removed so that the apparatus of the invention may be seen;

Fig. 2 is a perspective drawing of the switch mechanism, electromagnet, coin chute, etc.;

Fig. 3 is an enlarged side view showing the switch contacts and armature; and

Fig. 4 is a top view of the apparatus of Fig. 3.

Fig. 5 is an exploded view of the armature and the levers, etc., mounted above the armature.

For a full description of a telephone coin collector capable of utilizing this invention, reference may be had to Forsberg Patent 1,043,219 of November 5, 1912. Also, Forsberg Patent 1,117,485 of November 17, 1914 describes an electromagnet and switch arrangement of which this present invention is an improvement. The electromagnet consists of two coils 1 and 2 having magnetic material cores which terminate in pole-pieces 3 and 4, so shaped as to leave but a small air-gap when the armature 5 is operated to take a position adjacent either of the pole-pieces.

The coils are mounted on a base-plate 6 of magnetic material which in turn is supported in the enclosing case indicated as a whole in Fig. 1. A piece of magnetized material 7 extends from the base-plate upwards to a point just under the middle of the armature to form part of the magnetic circuit.

A bridge-plate 8 extends between the upper ends of the coils. The middle portion of this bridge-plate has upturned portions 9 and 10 which are provided with flanges 11, 12, and 13.

The armature structure comprises the armature proper 5, upon which is mounted preferably by screws a non-magnetic metal supporting plate 14 having downwardly projecting ears. The ears are perforated or indented to receive the points of trunnion screws 15, 16, thus forming a bearing about which the support and attached armature may rotate.

Trunnion screws 15, 16 pivotally support a plate 17 by means of perforations in its downwardly projecting ears. Plate 17 is provided on each end with downwardly extending projections 18 adapted to be engaged by the armature 5. The lengths of the projections and the manner of supporting plate 17 permit a slight movement of the armature 5 before engaging the projections. Plate 17 is also provided at each end with a downwardly projecting arm 19 adapted when the armature is rotated to engage the bridge-plate 8 to limit the movement of the armature.

One of the downwardly projecting ears of plate 17 is extended, having at its lower end a fork 20 adapted to engage a mechanism for the distribution of the deposited coins.

To normally hold the armature in a neutral position relative to the pole-pieces and to return it to normal position after being rotated therefrom by the magnetic action of coils 1 and 2, two independently movable levers 21 and 22 are provided also pivotally mounted on trunnion screws 15 and 16. These levers are adapted to be engaged by plate 17 which imparts the motion of armature 5 to either lever 21 or 22, depending upon the direction of movement of the armature.

Springs 23 and 24 attached at their lower ends to framework 25, which, in turn, is fastened preferably by rivets to upturned portion 9 of bridge-plate 8, are attached at their upper ends to levers 21 and 22. Upon the cessation of the magnetic action on armature 5 these springs through the intermediary of levers 21 and 22 return the armature to its normal position. This armature structure is described in more detail in Forsberg Patent 1,117,485 which was previously noted.

Mounted upon flanges 11, 12 and 13 of bridge-plate 8 is a framework 26. On the edge of this frame 26 adjacent the coin hopper 27 are bent-up portions provided with downwardly projecting tabs 28 and 29 having holes therein to act as bearings for a rod 30 upon which trigger 31 is rotatably mounted. A spring 32 coiled about rod 30 and fastened to trigger 31 tends to move the trigger in a clockwise direction, as viewed in Figs. 1 and 3.

On the side of framework 26 away from the trigger 31 there is mounted, by means of flat spring hinges 33, a frame 34. Frame 34 at the corners near the trigger 31 is provided with adjusting screws 35 and 36. Juxtaposed holes in framework 26 permit these screws to be acted upon by the independently movable levers 21 and 22. Lever 21 acts upon screw 35 and lever 22 acts upon screw 36.

Near the middle of that edge of the framework 34 near the trigger is a stud 37 of insulating material adapted to contact the lower spring 38 of a contact spring pile-up comprising in addition to spring 38, springs 39 and 40. This spring pile-up is mounted with insulating spacers in the well-known manner on the side of frame 34 away from the trigger 31.

Spring 40 is formed on its free end with a hook-shaped projection adapted to contact with and also to ride upon cam portion 41 of trigger 31. In Figs. 1 and 2 spring 40 is shown riding on cam 41 while in Fig. 3 spring 40 is shown acting as a pawl against the cam to hold trigger 31 in a lowered position. This spring 40 is provided with an insulating stud 42 and the spring is so tensioned that when released from riding on cam 41 it will force the contact members of springs 38 and 39 together.

As explained in Forsberg Patent 1,043,219, when a coin is deposited in one of the coin openings of the set and traverses the coin passageways, it is projected into coin hopper 27 and remains temporarily on a trap near the bottom of the chute. In passing through the hopper the coin strikes that portion of trigger 31 which extends into the hopper, as shown in Fig. 2.

The trigger is moved in a counter-clockwise direction, as viewed in the drawing, by the moving coin and cam portion 41 of the trigger moves away from the hook-shaped portion of spring 40. Upon being freed, spring 40 forces springs 38 and 39 together, thereby closing a circuit which actuates a signal at the central office, indicating that it is desired to make a call. Also spring 40 moves down from cam portion 41 and acts as a pawl against this cam portion in its operated position. These springs also close a circuit over which the coils may be energized.

If the call is completed the electromagnet is energized to operate forked arm 20 to collect the coin by current in one direction and if the call is not completed the electromagnet is operated in the opposite direction by current of opposite polarity to return the coin. In either case armature 5 is moved and either lever 21 or 22 is moved, and in turn either adjusting screw 35 or 36 causes spring-hinged framework 34 to rise. By means of insulating stud 37 frame 34 raises all the springs 38, 39 and 40 of the spring pile-up, thereby releasing the trigger 31 from spring 40. The springs are held in contact maintaining the circuits closed until the armature returns to normal position. Trigger 31 under the action of spring 32 returns to its normal position and spring 40 is held on the cam portion of the trigger and is restrained from forcing springs 38 and 39 together.

What is claimed is:

1. In combination, an electromagnet comprising a pair of electromagnetic elements, a bridge therebetween, an armature pivoted to said bridge, a contact spring pile-up supported by said bridge above said armature, and means comprising a hinged frame to transmit motion from said armature to one or more of the contact springs of said pile-up.

2. In combination, an electromagnet comprising a pair of electromagnetic elements, a bridge therebetween, an armature, pivots in said bridge upon which said armature is rotatably mounted, a pair of independently movable levers supported on said armature pivots, and means to transmit motion singly and selectively to said levers from said armature, a contact spring pile-up supported by said bridge above said levers, and means to transmit motion from either of said levers to one or more of the contact springs of said pile-up.

3. In a coin controlled apparatus, a coin hopper, a trigger pivoted externally of said hopper but projecting therein, a cam forming a part of said trigger, a contact spring pile-up, one of the springs of said pile-up being held out of contact with another of the springs of said pile-up by the cam portion of the trigger when the trigger is in the unoperated position, means tending to maintain said trigger in its unoperated position, said one spring adapted to restrain the return of said trigger to its unoperated position after it has been moved to its operated position, an electromagnet comprising a pair of electromagnetic elements, a bridge therebetween, an armature pivoted to said bridge, an extension on said bridge upon which said spring pile-up is supported above said armature, and means to transmit motion in a straight line from said armature to said trigger restraining spring.

4. Coin controlled apparatus comprising a coin hopper, a trigger pivoted externally of said hopper but projecting therein for operation by a deposited coin, said trigger being biased to its unoperated position, a cam forming a part of said trigger, a spring pile-up, one of said springs contacting directly with said cam portion to restrain the return of said trigger to its unoperated position after said trigger has been moved by a deposited coin, and electromagnetic means for actuating said one spring to permit the restoration of said trigger to its unoperated position.

5. Coin controlled apparatus comprising a coin hopper, a trigger pivoted externally of said hopper but projecting therein for operation by a deposited coin, said trigger being biased to its normal position, a cam forming a part of said trigger, a contact spring pile-up, one of said springs pressing against said cam portion when said trigger is in its normal position and restraining the return of said trigger to its normal position after said trigger has been moved by a deposited coin, a pair of electromagnetic elements, a bridge there-

between, an armature pivoted to said bridge, means responsive to a clockwise movement of said armature for actuating said springs to permit said trigger to be restored from its operated position to its normal position, and a second means responsive to a counter-clockwise movement of said armature for actuating said springs to permit said trigger to be restored from its operated position to its normal position.

6. In combination, an electromagnet comprising a pair of electromagnetic elements, a bridge therebetween, an armature, pivots in said bridge upon which said armature is rotatably mounted, a pair of independently movable levers supported on said armature pivots and adapted to be singly and selectively actuated by said armature, one of said levers being actuated upwardly by a clockwise movement of said armature and the second of said levers being actuated upwardly by a counter-clockwise movement of said armature, a contact spring pile-up mounted on said bridge above said levers, and a pivoted member actuated by the movement of said first lever for operating the contact springs of said pile-up when said armature is moved clockwise, said member being actuated by movement of said second lever for operating the contact springs of said pile-up when said armature is moved counter-clockwise.

7. Coin controlled apparatus comprising a coin hopper, a trigger pivoted externally of said hopper but projecting therein for operation by a deposited coin, said trigger being biased to its unoperated position, a cam forming a part of said trigger, a spring pile-up, said cam in its normal position contacting directly with one of the springs of said pile-up to hold open the electrical contacts of said pile-up while permitting said one spring to close said electrical contacts when said trigger is moved to its operated position, said one spring restraining the return of said trigger to its unoperated position after the trigger has been moved to its operated position, and electromagnetic means for actuating said one spring to permit the restoration of said trigger to its unoperated position.

OSCAR A. SHANN.