This invention relates to coin-controlled electric time switches.

The principal object of the invention is to close the switch for a predetermined period of time upon the deposit of a coin of the requisite value. Another object is to maintain the switch in continuously operative position when a plurality of coins are deposited in the apparatus.

Another object is to receive a series of coins successively into the coin-controlled means so that each coin effects a complete cycle of operation of the time switch, as prepayment for a succession of the predetermined time intervals. Another object is to eject the operating coin instantaneously from the coin-controlled means when the predetermined period of operation expires.

Another object is to cause the succeeding coin to drop forcibly into the coin-controlled means, insuring the proper operation of the switch contacts.

Another object is to assure the apparatus measuring accurately the exact period of time paid for.

A further object is to minimize fine precision in manufacture of the parts of the apparatus. Other objects and advantages will appear as the description progresses.

In this specification and the accompanying drawings the invention is disclosed in its preferred form. It is to be understood, however, that it is not limited to this form because it may be embodied in other forms within the purview of the claims following the description.

In the accompanying two sheets of drawings:

Fig. 1 is a front elevation of a time switch constructed in accordance with this invention, with a plurality of coins deposited therein.

Fig. 2 is a vertical section of the same showing the time switch about to complete its cycle of operation.

Fig. 3 is a longitudinal vertical section taken along the line III—III in Fig. 1.

Fig. 4 is a rear elevation, partially in vertical section, of the resilient mounting of the trigger for ejecting the coins from the coin controlled means.

Fig. 5 is a schematic diagram of the wiring circuits of the apparatus.

In detail, the construction illustrated in the drawings, comprises the casing 1 having the lid 2 hinged thereto at 3—4 and adapted to close the open front of the casing. The latch 4 is mounted at the side of the casing to engage the lid and is suitably padlocked to prevent access, of unauthorized persons, to the interior of the casing.

The base 5 is mounted within the casing on the brackets 6—8 (see also Fig. 5). The coin chute 7 consists of the plate 9 fixed to the base 5 by the interposed brackets 6—8. The transparent pane 10 forms the front of the chute and is spaced from the plate 9 by the guide blocks 11, 12 on opposite sides of the chute. The upper end of the chute projects through the top of the casing and may extend into the usual "coin detector" or other precautionary means to prevent the use of spurious coins and other fraudulent practices.

The lever 13 is pivoted at 14 beneath the lower end of the guide 12 and has the rounded shoulder 15 extending into the path of the coins in the chute 7. The pin 16 is fixed in the chute opposite the shoulder 15 and serves as a stop and directs the coins against the cam shoulder 15. The lower end of the lever 13 extends downward beyond the pivot 14 and serves as an extension of the guide 12. The spring 17 has its lower end fixed at 18 and is coiled around the pivot 14 at 19. The operative end of the spring engages the side of the coin chute at 20 in juxtaposition to the upper end of the lever 13 and is adapted to impinge on the lever when the lever is sufficiently displaced, as shown in Fig. 2.

The dielectric roller 21 is mounted at the upper end of the lever 13 and is adapted to impinge on the spring contactor 22 having the non-burning contact point 23 in juxtaposition to the similar point 24 on the contactor 25. These contactors are mounted on the blocks 26, 27, respectively, which are set in the dielectric base 28.

The disk 29 is loosely mounted on the shaft 30 and has the trigger 31 extending laterally therefrom and adapted to engage the lowest coin in the chute 1. The plate 8 has the arcuate slot 32 cut therein to permit the passage of the trigger 31 through the coin chute.

The arm 33 (see Fig. 3) is fixed on the power driven shaft 30 and has the pin 34 thereon projecting through the segmental slot 35 in the disk 29. The torsion spring 36 (see also Fig. 4) is interposed between the disk 29 and the arm 33 and has one end fixed in the disk 29 and the other end expanding against the pin 34. The tension of the torsion spring urges the pin 34 into engagement with the end of the slot 35 as illustrated in Fig. 1.

The shaft 30 is driven by the squirrel cage type induction motor 37 (see Fig. 3) which is energized by the inductive coil 38 wound on the usual laminated field magnet 39. The conventional electric
clock reduction gearing 40 is interposed between the motor 37 and the shaft 30 to time the rotation of the shaft. The precise ratio of reduction can be varied to time any predetermined period of operation as desired for different applications of the apparatus.

The wires 41, 42 are connected to the terminals 43, 44 and lead from the usual incoming service line (see Fig. 5). The contactor 25 is connected to the terminal 44 by the wire 45. The opposed contactor 22 is connected through the wire 48 to the terminal 47 having the consuming line wire 48 leading therefrom. The opposite wire 49 of the consuming line is permanently connected to the service line 41 through the terminal 50 and the wire 51.

The terminals 47, 50 are connected through the wires 52—53 to the field coil 38 of the induction motor 37. Thus, the induction motor is driven whenever current is supplied to the consuming line.

The apparatus operates substantially as follows: Any desired number of coins x of the requisite value are deposited in the coin chute 7, depending on the length of time it is desired to operate the switch. The load of the series drops into the position shown in Fig. 1, and wedges between the pin 16 and the shoulder 15 of the lever 13. This displaces the lever 13 and swings the roller 17 laterally against the contactor 22 to bring the contact points 23, 24 together, closing the switch circuit. The tension of the spring contactor 18 prevents the weight of the coin x' from displacing the lever 13 sufficiently to permit the coin to drop.

The closing of the contacts 23, 24 permits current to flow from the service line through the wires 42, 45 across the contacts, and through the wires 46, 48 to the point of consumption. The current returns to the source through the wires 49, 51, and the service line 41.

The field 38 of the induction motor 37 is energized from the consuming line through the wires 52, 53. The motor 37, through the interposed gearing 48, slowly rotates the shaft 30 and the arm 33 fixed thereto.

The interposed spring connection 36 causes the disk 29 to rotate with the arm 33 until the trigger 31 is brought into contact with the coin x', arresting the movement of the disk 29. The continued rotation of the arm 33 by the prime mover 37 advances the pin 24 in the segmental slot 35, as illustrated in Fig. 2, against the tension of the torsion spring 36. Thus the tension of this spring is exerted with progressively increasing pressure against the coin x' in the chute 7 gradually displacing the lever 13 until the lever impinges on the operative end of the spring 17. This prevents further displacement of the lever 13 as the pressure of the spring 36 is insufficient to overcome the superior strength of the spring 17.

Further rotation of the arm 33 brings the pin 30 into contact against the end 54 of the slot 35 forcing the disk 29 to resume its rotation. The trigger 31 then slowly presses the coin x' downward moving the lever 13 outward against the tension of the relatively heavy spring 17. When the coin x' is sufficiently depressed so that its center passes below the line of maximum pressure between the pin 16 and the spring pressure shoulder 15, the tension of the spring 17 against the coin is relieved. This permits the stored-up pressure of the torsion spring 36 to rapidly rotate the disk 29 until the end of the slot 35 backs up against the pin 24. This snaps the coin x' from its operative position between the pin 16 and the shoulder 15 and shoots the coin through the bottom of the chute 7.

The instantaneous ejection of the coin x' allows the succeeding coin x to fall forcibly of its own weight into operative position wedged between the pin 16 and the shoulder 15 to close the contact points 23, 24. This initiates another cycle of operation similar to that above described. It is essential that the succeeding coin x be permitted to drop suddenly to permit it to gain momentum so that its impact may displace the lever 13 sufficiently to properly operate the switch contacts.

When the last coin of the series deposited in the chute is ejected from operative position against the shoulder 15, the tension of the spring contactor 22 swings the lever 13 into inoperative position. This permits the contacts 23, 24 to separate as shown in dotted lines in Fig. 1 to open the consuming circuit. This also discontinues the flow of current to the motor field 38 and renders the device non-operational.

Having thus described this invention what is claimed and desired to be secured by Letters Patent is:

1. A time switch including resiliently mounted switch contacts, a coin chute; means for supporting a coin in said chute; a lever in said chute and adapted to be displaced by the supported coin to close said resilient contacts; a spring adapted to impinge on said lever when the lever is sufficiently displaced; a disk having a slot therein, a pin engaging in said slot; timed motive means for revolving said pin; resilient means interposed between said disk and pin; a trigger on said disk adapted to move into contact with, and displace, said coin from its supported position.

2. A time switch including switch contacts, a coin chute; means for supporting a coin in said chute; means operated by the supported coin for closing said switch contacts; a rotatable disk having a segmental slot therein; a trigger on said disk adapted to eject the supported coin; an operating member mounted coaxially with said disk and having a pin engaging in said slot; horometric motive means for driving said operating member; and a spring having its opposite ends fixed on said disk and said operating member respectively with its central portion coiled around the axis thereof.

3. A time switch including switch contacts; a coin chute; means for supporting a coin in said chute; means operated by the supported coin for closing said switch contacts; a rotatable disk having a segmental slot therein and mounted in a plane parallel to that of said chute; a trigger extending laterally from said disk into said chute and adapted to eject the supported coin therein; an arm mounted coaxially with said disk and having a pin extending into said slot; horometric motive means for driving said arm; and a spring having its opposite ends fixed in said disk and said arm respectively and having its central portion coiled around the axis thereof.

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