

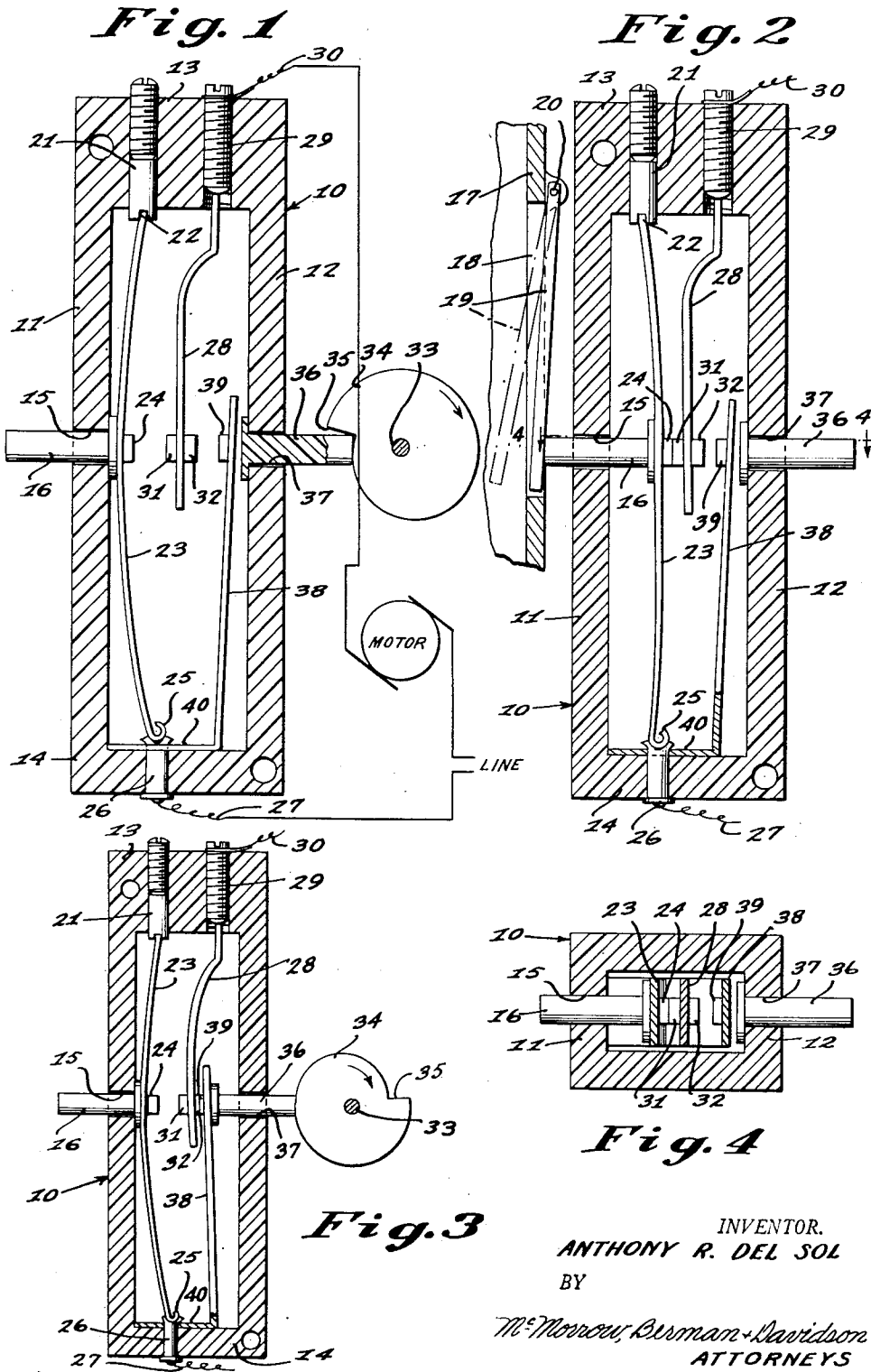
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CHECK CONTROLLED TIME SWITCH

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CHECK CONTROLLED TIME SWITCH

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My invention relates to time switches of the type wherein a switch is closed for a predetermined length of time and then automatically opened, whereby to retain a circuit closed for a predetermined length of time. The switch according to the invention is susceptible of many uses, but is particularly adapted for use with coin-controlled devices, such as coin-controlled radios or television apparatus, which are intended to be operated for a predetermined length of time after a suitable coin has been inserted into the device.

With the foregoing in view, it is an object of my invention to provide an improved time switch.

A further object is to provide an improved time switch which includes check-controlled means for automatically actuating the switch to close a circuit to time-controlled means, and means actuated by said time-controlled means for opening the switch at the expiration of a predetermined time cycle.

A further object is to provide in a switch such as that last described means for re-setting the switch for repeated actuations at the expiration of each time cycle.

A further object is to provide an improved time switch which is extremely simple in structure and which may be readily and economically manufactured from readily available material, yet which will be strong and sturdy and long-lived in use.

Other objects and advantages reside in the particular structure of the invention, combination and arrangement of the several parts thereof, and will be readily understood by those skilled in the art upon reference to the attached drawing in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawing:

Figure 1 is a longitudinal vertical sectional view through a preferred form of the invention showing the parts in a set position;

Figure 2 is a view like Figure 1, but showing the parts in one circuit-closing position;

Figure 3 is a view like Figures 1 and 2, on a slightly reduced scale, and showing the same in a circuit-closing position with a portion of the switch re-set;

Figure 4 is a horizontal sectional view taken substantially on the plane of the line 4—4 of Figure 2, parts being omitted.

Referring specifically to the drawings, wherein like reference characters have been used throughout the several views to designate like parts, 10 designates generally any suitable casing for the

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switch according to the invention, and which casing is preferably formed of insulating material. The casing 10 is preferably rectangular in shape and comprises front and rear walls 11 and 12, a top wall 13 and a bottom wall 14. The front wall 11 has a hole 15 formed therein in which is slidable a plunger 16 which likewise is preferably formed of insulating material. One end of the plunger 16 is disposed inwardly of the casing 10 and may be provided with a head, as shown, to prevent withdrawal of the plunger outwardly of the casing. The other end of the plunger 16 extends laterally outwardly of the casing 10 and bears against the rear side of an actuating arm 19 which is pivotally supported, as at 20, to a wall of a check passage 17. The check passage 17 is formed with a slot 18 therethrough through which the arm 19 is swingable. As indicated in broken lines, Figure 2, when the plunger is in the position shown in Figure 1, the arm 19 projects well into the check passage 17. However, when a check, not shown, passes through the passage 17, it will engage the arm 19 and move the same to the full line position of Figure 2, thereby moving the plunger 16 laterally inwardly of the casing 10 and the front wall 11 thereof.

The top wall 13 of the casing 10 may have secured therein in any suitable manner a plug 21 having an inner end extending inwardly of the casing and formed with a slot 22 which is generally parallel to the front wall 11 of the casing. The slot 22 is adapted to have rockably secured therein the upper end of a leaf spring contact 23. The contact 23 includes a rounded lower end 25 rockably journaled on the inner end of a current-conducting member 26 extending through the bottom wall 14 of the casing 10. A lead 27 to one side of a circuit extends from the current-conducting member 26. The contact 23 is of arcuate concavo-convex configuration and is adapted to be rocked from the position of Figure 1 to the oppositely-concavo-convex position shown in Figure 2 upon movement of the plunger 16 from left to right. A central portion of the contact 23 includes a laterally-inwardly-directed contact point 24. The nature of the contact 23 is such that as it is bowed inwardly by the plunger 16, it will resist such movement until it passes a dead center, at which time it will snap to the oppositely-bowed position comprising a sprung position. In this connection, the Figure 1 position may be considered a set position.

A second contact 28 depends from the top wall 13 of the casing 10 rearwardly of the contact 23 and normally spaced therefrom, as shown. The

contact 28 is secured in place by any suitable terminal-providing current-conducting member 29 to which is operatively connected a second lead 30 to the opposite side of the circuit aforesaid. The contact 28 is provided with a front contact point 31 adapted to engage the point 24 of the contact 23 and a rearwardly-directed contact point 32. As is apparent from Figures 1 and 2, when the contact 23 moves from the Figure 1 to the Figure 2 position, the points 24 and 31 engage and a circuit is closed through the leads 27 and 30. The circuit thereby closed is intended to activate any suitable time-controlled mechanism, such as a time clock, not shown. However, such time-controlled mechanism includes a shaft 33 driven thereby. A cam 34 is fixed to said shaft and rotates therewith. Thus, as soon as the circuit is closed, as aforesaid, the time-controlled mechanism is actuated and the shaft 33 commences rotation in a clockwise direction. The cam surface of the cam 34 is in constant engagement with the outer free end of a plunger 36 slidable through a hole 37 formed in the rear wall 12 of the casing 10. The inner end of the plunger 36 may be formed with a head to prevent withdrawal of the same outwardly of the casing and is adapted to engage a third contact 38 upon partial rotation of the cam 34. The contact 38 includes a contact point 39 which is normally spaced from the point 32 of the second contact 23. The third contact 38 is a spring contact and is normally biased to the position shown in Figures 1 and 2, wherein it is out of engagement with the contact 28. Likewise, the contact 38 includes a forwardly-directed foot portion 40 which operatively engages the terminal-providing member 26 aforesaid which is also engaged with the first contact 23. Thus, the first contact 23 and third contact 38 comprise means for separately closing the same circuit, and each contact is capable of closing said circuit independently of the other. As clearly shown in Figure 3, as the cam 34 rotates with the shaft 33, the plunger 36 is driven forwardly relative to the casing 10 so that the third contact 38 is moved from the Figures 1 and 2 positions forwardly in the casing 10 until the point 39 engages the point 32 of the second contact 23. This action is effective to move the second contact 23 forwardly, carrying with it the first contact 23 until the same passes a dead center, at which point it will snap back to the Figures 1 and 3 positions, whereby it becomes re-set. The cam 34 may be provided with a shoulder 35 and when the cam has completed substantially a full revolution, the spring action of the third contact 38 causes the plunger 36 to drop down off of the shoulder 35 and permits the contact 38 to disengage the contact 23, whereby to break the circuit to the time-controlled apparatus, thus stopping the same. This action leaves the parts in the re-set position of Figure 1 ready for another cycle of operation upon the passage of a new coin or check through the check passage 17.

It follows from the foregoing that an extremely simple time-controlled switch has been provided which is not only relatively small, but which is readily manufactured and maintained by unskilled personnel from readily accessible material.

It should be understood that the particular means 19 for springing the switch initially and the particular re-set means 34 are not essential per se, as other check-controlled and time-controlled means may be utilized to initially

actuate the plunger 16 and subsequently actuate the plunger 36.

While I have shown and described what is now thought to be a preferred embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinabove except as hereinafter claimed.

I claim:

1. A time switch, comprising a first movable contact, said contact including means biasing the same in opposite directions from a dead center to set and sprung positions, a second movable contact engageable with said first contact with the latter in said sprung position to close a circuit, time-controlled means actuated by said closed circuit, a third movable contact in said circuit and providing with said second contact an alternate closure for said circuit, said third contact comprising a spring contact normally biased out of engagement with said second contact, actuating means movable by said time-controlled means and engageable with said third contact to move the latter into circuit-closing contact with said second contact and thereafter forcing said first contact past said dead center whereby to re-set said first contact, and said actuating means being disengageable from said third contact after the expiration of a time cycle, whereby to permit movement of said third contact to a circuit-opening position.

2. A time switch, comprising a first movable contact, said contact including means biasing the same in opposite directions from a dead center to set and sprung positions, a second movable contact engageable with said first contact with the latter in said sprung position to close a circuit, time-controlled means actuated by said closed circuit, a third movable contact in said circuit and providing with said second contact an alternate closure for said circuit, said third contact comprising a spring contact normally biased out of engagement with said second contact, actuating means movable by said time-controlled means and engageable with said third contact to move the latter into circuit-closing contact with said second contact and thereafter forcing said first contact past said dead center whereby to re-set said first contact, said actuating means being disengageable from said third contact after the expiration of a time cycle, whereby to permit movement of said third contact to a circuit-opening position, and check-controlled means engaging said first contact and being formed and arranged to move said first contact from said set position to said sprung position.

3. A time switch, comprising a first movable contact, said contact including means biasing the same in opposite directions from a dead center to set and sprung positions, a second movable contact engageable with said first contact with the latter in said sprung position to close a circuit, a third movable contact in said circuit, said third contact being movable into engagement with said second contact to provide a second means for closing said circuit, means operative upon initial closing of said circuit for moving said third contact into circuit-closing engagement with said second contact and simultaneously biasing said first contact past said dead center to re-set said first contact, said last named means being formed and arranged to disengage said second and third contacts and

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open said circuit at the expiration of a time cycle.

4. A time switch, comprising a first movable contact, said contact including means biasing the same in opposite directions from a dead center to set and sprung positions, a second movable contact engageable with said first contact with the latter in said sprung position to close a circuit, a third movable contact in said circuit, said third contact being movable into engagement with said second contact to provide a second means for closing said circuit, means operative upon initial closing of said circuit for moving said third contact into circuit-closing engagement with said second contact and simultaneously biasing said first contact past said dead center to re-set said first contact, said last named means being formed and arranged to disengage said second and third contacts and open said circuit at the expiration of a time cycle, and check-actuated means operatively associated with said first contact and being formed and arranged for actuating the same from said set position to said sprung position.

5. A time switch, comprising a first movable contact, said contact including means biasing the same in opposite directions from a dead center to set and sprung positions, a second movable contact engageable with said first contact with the latter in said sprung position to close a circuit, a third movable contact in said circuit, said third contact being movable into engagement with said second contact to provide a second means for closing said circuit, means operative upon initial closing of said circuit for moving said third contact into circuit-closing engagement with said second contact and simultaneously biasing said first contact past said dead center to re-set said first contact, said last named means being formed and arranged to disengage said second and third contacts and open said circuit at the expiration of a time cycle, a check passage adjacent said first contact, an element carried by said first contact extending into said passage, said element being engageable by a check passing through said passage and being movable thereby to bias said first contact from said set position to said sprung position.

6. A time switch, comprising first, second and third movable contacts, said second contact be-

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ing intermediate said first and third contacts, both of said first and third contacts being individually engageable with said second contact, means for moving said first contact from a set position into engagement with said second contact, means operated in response to the engagement of said first and second contacts for moving said third contact into engagement with said second contact and simultaneously return said first contact to said set position, said last named means being formed and arranged to move said third contact out of engagement with said second contact at the end of a time cycle, said first contact comprising a leaf spring, and means mounting said spring to bow the same in opposite directions from a dead center to said set position and to a sprung position engaging said second contact.

7. A switch, comprising first, second and third contacts, said first contact comprising a concavo-convex leaf spring adapted to be bowed from an open set position past a dead center to a sprung closed position of reversed concavo-convexity engaging said second contact to close a circuit initially, said second contact being movable in one direction by said first contact, said third contact comprising a normally open spring contact engageable with said second contact to provide a second closure for said circuit, means operative by the initial closing of said circuit for moving said third contact into engagement with said second contact and for moving said first contact reversely from its sprung closed position past dead center to its open set position.

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