

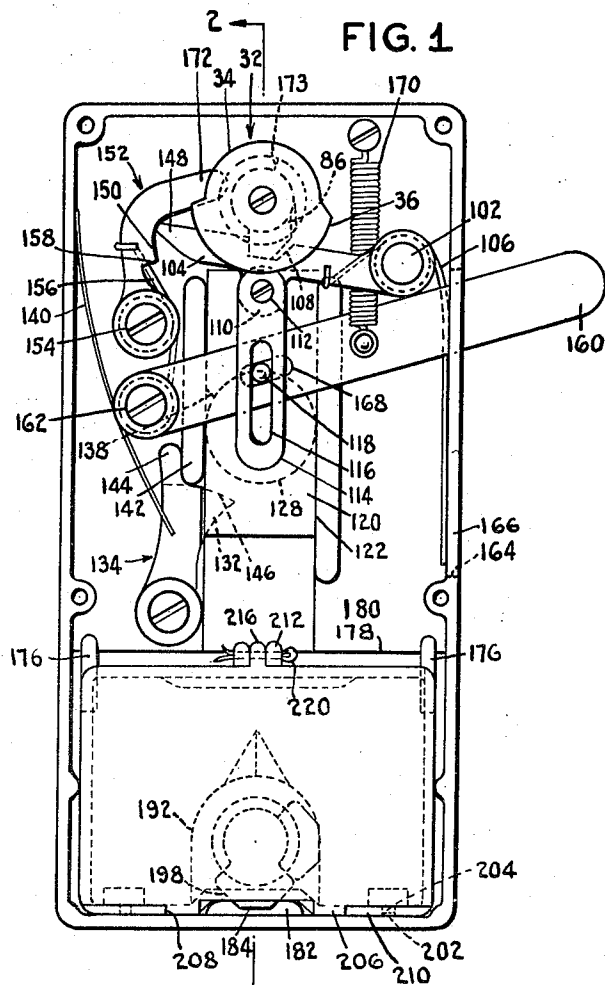
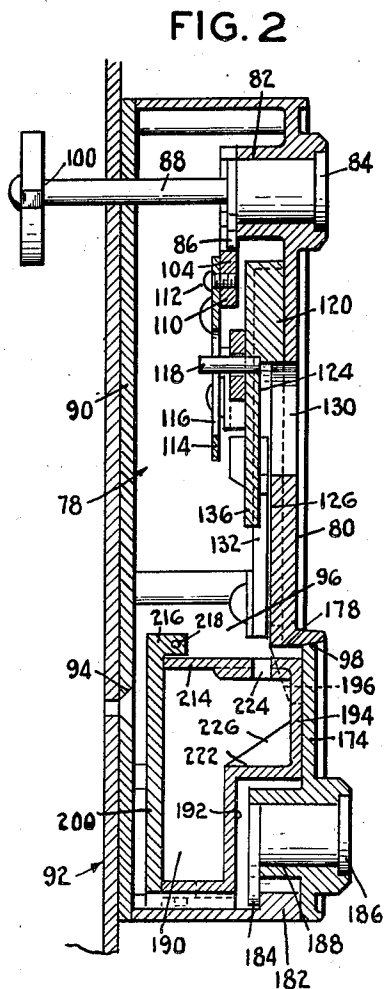
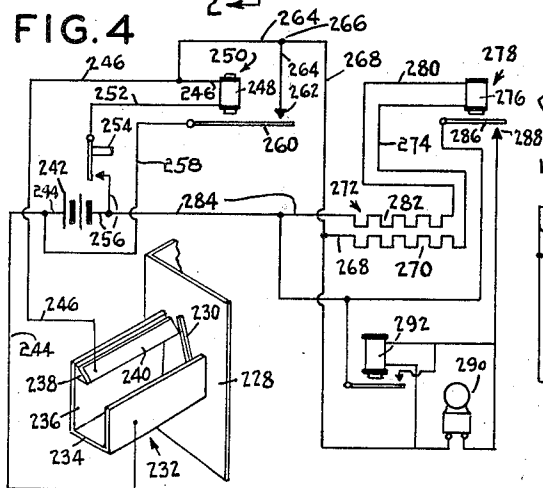
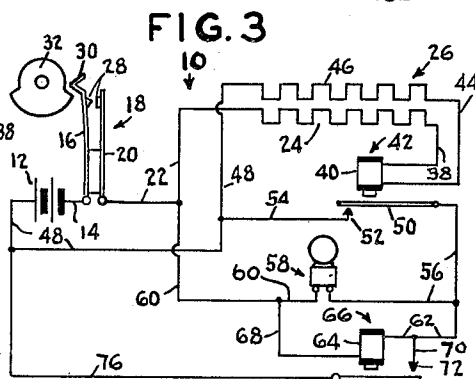
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ALARM APPARATUS

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ALARM APPARATUS

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6 Claims. (Cl. 194—55)

This invention relates to alarm apparatus, and particularly to that type made a part of so-called "local alarm systems".

Systems of this type generally are installed by organizations which, for a nominal fee, supply accessories such as batteries, and make such other repairs as become necessary, from time to time, to maintain the system in operation. In many cases, these installations are for small shopkeepers to whom the charges for such maintenance, if paid in a lump sum, appear inordinately large. As a matter of fact, such service charges generally are easily reduced in terms to payment by a very small coin for service for one day. To provide the force necessary to make collections on so frequent a schedule would eliminate the possibility of operation at any such low figure. On the other hand, it is a well-known psychological fact that persons cannot be taught themselves to collect and retain the coins at such intervals to pay them over at the next round of the collector.

It is an object of the invention, in order to enlarge the number of possible users for such systems, to provide, as an integral part of a system, means to perform automatically the functions of a collector by making operation of the apparatus for alarm purposes impossible unless that collection function has first been satisfied. The storekeeper may make the system operative for a single continuous time period merely, and only, by depositing a coin of small value in a predetermined relationship to the apparatus.

Apparatus for such purposes requires, first, that, either after the coin has been inserted, or by the deposit of the coin, switching on and off of one or more of the circuits involved in such apparatus may be, or is, effected; that, once the circuit has thus been made effective, the return of the circuit to a condition of alarm-making inoperativeness or similar condition will make impossible again to energize the circuit unless the initial operation of inserting a coin has been repeated. Once the circuit has been energized, after the deposit of a coin, it can remain so only continuously; deenergization of the circuit requires the repetition of all the steps including the deposit of the coin to energize the system again.

Secondly, it is requisite that tampering with the mechanism will not effect defeat either of the coin-controlled locking arrangement which limits the apparatus to but a single complete cycle of operation from a deenergized state to energized, and then again to the deenergized state, for the deposit of each coin, or of the alarm apparatus

itself. Thirdly, it is necessary to eliminate from the operation of such apparatus all technical details so that the user will require no high degree of mechanical intelligence to operate it.

In one of its applications, apparatus embodying the invention may include a switch to be actuated by an element of a lock. The lock requires a definite key to free the element. But further than this, even though the proper key be had, the key-actuated member, for purposes of this invention, normally is restrained from movement unless and until a coin has been deposited in a slot provided for that purpose and certain other operations dependent upon the coin then effected. Not until these preliminary steps have been completed may the key-actuated member be free to energize the apparatus.

In one type of cylinder lock control, a coin-receiving slot, a slide and a guide therefor are provided. The slide engages the coin deposited in the slot and impels it down along the guide. Normally, if no coin were in the guide, the slide would be stopped by a dog extending into the guide. With a coin inserted into the guide and positioned between the dog and the slide moving toward the dog, the dog will be cammed out of the path of the slide which then continues its movement past the dog. This additional movement of the slide makes it operative to engage a link and through it, to make ineffective the means which locks the key-actuated member against effectiveness. During the additional downward movement of the released slide, a portion of the locking means is latched to prevent its return to locking position even if the slide be released and permitted to return to normal position.

With the locking means inoperative, the key-actuated member may be made effective to close a switch in one or more of the circuits of the alarm apparatus. Simultaneously that the circuit is closed, release of the latched locking means occurs. The locking means now moves into a position relative to the member where it remains until the member is actuated to bring the switch to "off" position. On arriving at the latter position, the means will reengage the member and again retain it against actuation to make the switch effective. Therefore, for the deposit of a single coin, the detailed steps would complete the cycle of apparatus operation, closing the circuit, and then reopening it.

The guide is designed to discharge its coins into a chamber, access to which is provided through an opening, normally kept closed, in the front portion of the casing. To retain the wall in posi-

tion, there may be used locking means of some character such as includes a cylinder extending within the chamber. To facilitate handling the coins for collection and to insure against petty thefts, the chamber may have associated therewith a coin container fitting snugly in the chamber so that a coin-receiving slot in the container is located properly with relation to the chute of the guide. This container has a recess formed in a wall thereof, within which, in the assembled relation, the lock cylinder will be housed. Advantage is taken, in this construction, to locate the coin-receiving slot of the container immediately over the wall of the recess. The dimensions of the container at this point are then so adjusted that coins within the container may not, merely by tipping the container, be positioned to slide, or be slid, out of the slot. The space between the wall having the slot and the inner wall of the recess is adjusted to be smaller than the diameter of such coins as are intended for use in this particular apparatus.

It is an object of the invention to provide apparatus, subjected to coin-control in its operation, which does not require the interposition of mechanical means to make possible the actuation of the alarm circuit, this actuation taking place automatically upon the deposit in the apparatus of a coin.

Other objects of this invention will hereinafter be set forth, or will be apparent from the description and the drawing, in which are illustrated embodiments of apparatus for carrying out the invention.

The invention, however, is not intended to be restricted to any particular construction or arrangement of parts, or to any particular application of such construction, or to any specific manner of use, or to any of various details thereof herein shown and described, as the same may be modified in various particulars or be applied in many varied relations without departing from the spirit and scope of the claimed invention, the practical embodiments herein illustrated and described showing some of various forms and modifications in which the invention might be embodied.

On the drawing, in which the same reference characters refer to the same parts throughout, and in which are disclosed preferred embodiments:

Fig. 1 is an elevational view of a coin-actuated switch control device, intended as an element of apparatus embodying the invention, as seen from the rear face of the unit with the cover plates removed;

Fig. 2 is a vertical sectional view, on the line 2-2 of Fig. 1, illustrating the manner of association of the device with the front wall of an alarm element;

Fig. 3 is a diagrammatic view of an alarm circuit of which a device of this character, utilizing the invention, has been made a part; and

Fig. 4 is a diagrammatic view of a modified arrangement of an alarm circuit by which it is automatically controlled by a coin.

In Fig. 3, an alarm circuit 10 is very simply illustrated; merely sufficient of a conventional circuit is illustrated to make clear one possible application of the invention. In this circuit, a battery 12 is shown as a power supply source. A lead 14 from the power supply source is connected to one pole of a switch device, and here to prong 16 of a jack-switch 18. The other pole of the switch, here being prong 20, is connected by a

conductor 22 to one section 24 of a protective circuit 26. Contact points 28 may be provided on the prongs while one of them, as prong 16, is formed or provided with a cam surface 30. Surface 30 is located to bear against a cam 32, the resilience of prong 16 assuring this continued contact. Cam 32, has, in the peripheral surface with which cam surface 30 contacts, a cut-away edge portion 34. When edge portion 34 and cam surface 30 register, the surface will bear against the peripheral edge of portion 34 and contact points 28 will be moved out of the engaged relation. Upon rotating cam 32 until the edge portion 36 at the greater radial distance comes into contact with surface 30, points 28 will be forced together against the resilience of the prongs.

The other terminal of section 24, by a conductor 38, may be connected with solenoid 40 of a relay or drop 42. The other terminal of the solenoid, by a conductor 44, is connected, through the other section 46 of the protective circuit and a lead 48, to the opposite terminal of battery 12.

Drop 42 includes an armature 50 which tends normally to rest, by gravity, upon a post 52. Through leads 54 and 48, this post is connected to the battery. The armature, by a conductor 56, is connected to an alarm device 58, the other terminal of which, by conductors 60 and 22, makes connection with prong 20. Another conductor 62, connected through conductor 56 with armature 50, is connected to solenoid 64 of relay 66, and then through conductor 68 to conductor 60. A conductor 70 connects conductor 62 with a post 72 against which, when solenoid 64 is energized, an armature 74 attracted thereby will bear. The armature, by leads 76 and 48, is energized from the battery.

The operation of this apparatus is simple. After cam 32 has been rotated to press points 28 together, current flows from the battery through section 24, solenoid 40, section 46 and back to the battery, energizing drop 42 sufficiently to lift armature 50 away from post 52 and to break that circuit. If interference with protective circuit 26 now occurs with consequent deenergization of solenoid 40, armature 50 will fall upon post 52.

Current now flows from the battery through conductor 60, alarm device 58, conductor 56, armature 50, post 52, and leads 54 and 48 to the battery. At the same time, solenoid 64, connected in parallel with alarm device 58, will be energized to lift armature 74.

Even if the interference with the protective circuit should now be removed, or solenoid 40 be otherwise energized, still alarm device 58 would continue to operate. Current would flow continuously through solenoid 64, keeping post 72 and armature 74 continuously in contact, and supplying current for solenoid 64 and alarm device 58. Current flows from battery 12 through leads 48 and 76, armature 74, post 72, conductors 70, 62 and 56, alarm device 58, conductors 60 and 22, prong 20, contact points 28, prong 16 and lead 14 to the battery. To deenergize the alarm device and its holding circuit, it is necessary to break the circuit at points 28.

Cam 32 is controlled in its rotation by apparatus constructed so that, once the cam has been rotated to bring points 28 into contact, the cam can thereafter be operated only to release the contacted parts. Thereupon the cam, by suitable means, will be latched in that released position, and only upon the completion of certain other operations of the apparatus may the cam be again released for a repetition of a similar cycle

of steps. The apparatus for this purpose may be housed in a casing 78 the front wall 80 of which has a bearing section 82 bored in the customary manner for the reception of a lock cylinder 84.

5 Secured or otherwise carried by the cylinder at its inner end is a cam finger 86. Cylinder and cam finger are intended to rotate as a single unit.

10 Secured with the cylinder and the cam finger, and extending rearwardly substantially axially of the cylinder, is a shaft 88. It is shown extended beyond a back wall 90 of the casing which is secured to the casing by screws or the like. The shaft preferably extends into another casing of which wall 92 may be the front wall.

15 Casing 78 may be secured to wall 92 by fastening means engaged with both walls through openings 94 through wall 90, which are made accessible only through chamber 96 and the opening 98 into that chamber through front wall 80. In such a construction, within the latter casing may be arranged the relays and so forth, such as previously described in connection with, and any other mechanism of, the alarm apparatus.

20 At the free end of shaft 88 a shouldered portion 100 may be provided to receive cam 32, the shoulder being squared or otherwise arranged to prevent relative rotation of cam and shaft. The cam, in this case, not intended to be a portion of a circuit, may be of non-conducting material, such as fibre. It is mounted on the shaft to dispose its peripheral surfaces with relation to switch 18 in the manner previously indicated. In the construction shown, switch 18 is located in the casing of which wall 92 forms a part.

25 Pivoted on a suitable bearing pintle 102 extending from wall 80 is a finger 104, dimensioned and arranged to extend directly beneath cam finger 86. A spring 106, coiled around pintle 102, tends to force the finger against cam finger 86, limiting its upward movement. In the "off" or non-circuit-closing position of cam 32, cam finger 86 will extend substantially directly downwardly. When so extended, and if finger 104 be in its normal position, the cam finger will be seated within a notch 108, cut in the top edge of finger 104.

30 Finger 104 has a bearing portion 110 for the reception of a pin 112 with which a slotted link 114 is pivotally engaged. This link depends from portion 110 so that its slot 116 may be engaged over a pin 118, extending from a slide 120. The slide is retained in a guide 122 which may, if desired, be formed as an integral part of the casing. Furthermore, the slide is cut away at 124, adjacent bottom wall 126 of the guide, to provide a space of sufficient depth to receive between slide and guide a coin 128 of a proper denomination. This coin, when so deposited and inserted through an opening 130 in front wall 80, will abut against the face of cut-out portion 124 and then descend through the chute between guide and slide to be brought to a halt by an inwardly projecting finger 132 of a dog 134.

35 The slide includes an extending wall 136 the inner face of which forms a continuation of the face of cut-out portion 124. This face rides over the top face of finger 132 as the slide moves, the movement of the slide along the guide normally being limited by the engagement against finger 132 of an edge 138 at the junction of wall 136 with the body of the slide containing cut-out portion 124. This finger is maintained extending into the guide by a leaf spring 140, the dog being limited in its inward movement by engagement

with a wall 142 defining the guide, of a lug 144 formed as a part of the dog.

When a coin is inserted in the guide, the wall of cut-out portion 124, engaging against the coin, will, when the slide is moved downwardly, force the coin against finger 132. A cam surface 146 at the upper edge of the finger will co-operate with the rounded contouring of coin 128 to cam finger 132 out of the guide and out of the path of the slide. Continued downward movement of the slide will bring pin 118 into engagement with the bottom extremity of slot 116, to drive link 114 and its related finger 104 downwardly.

15 Finger 104 at its free end 148 may have a pointed formation against which the edge 150 of an L-shaped arm 152 normally may bear. This arm, pivoted upon a post 154, may be driven by a spring 156, coiled around post 154, to force the arm against free end 148. When the slide has been permitted the downward movement just described, free end 148 will be moved to such position that a notch 158 will be snapped into engagement with it. Such engagement will retain the free end locked against upward movement.

In order to effect the necessary downward movement of the slide, a lever 160, pivoted on a post 162 extending from the casing wall, extends through a slot 164 in side wall 166 of the casing. By means of a slot 168, the lever has loose engagement with pin 118. A spring 170 normally forces the lever to raise the slide to a position where it would be inoperative to retain the finger depressed.

35 Once a coin has been moved downwardly past the dog, and the free end of the finger has been engaged with notch 158, lever 160 may be released and permitted to return to its normal position. Now, a key inserted into the lock cylinder may be used to rotate shaft 88, and with it, the cam finger at its end. The prongs of the jack-switch are thus brought together and the circuit completed. But, as this function of the apparatus is effected, there also results liberation from engagement within notch 158 of free end 148 so that the finger may rise, under the action of its spring, up against cam finger 86. Cam finger 86, on its rotation, engages with the free end 172 of arm 152. Movement of the shaft to the "on" position will, therefore, release finger 104 from engagement within notch 158, and thus permit the finger to rise and be in a position where the return of the shaft to the "off" position will cause interlocking of cam finger 86 within notch 108. Shaft 88 may be limited in its rotation by engagement of cam finger 86 with a shoulder 173 on bearing section 82 so that continuous rotation of the shaft will not be possible.

40 Guide 122, below finger 132, forms a coin chute which, together with the slide, guides the coin so that it will fall in a definite plane. Below the chute is chamber 96 into which the coins normally would fall. This chamber is accessible through opening 98 through wall 90. The opening may be closed by a removable wall portion 174, the wall portion having a pair of inwardly directed lugs 176 for engagement beneath and against the bottom edge 178 and rear face 180, respectively, of front wall 80. A projection 182 from the bottom wall of the casing is intended to be engaged by a lug 184 secured to a lock cylinder 186 carried in a lock cylinder bearing portion 188, similar in construction to that for cylinder 84. The key to operate cylinder 186, is, 75

likewise, a means for removing wall 174 whenever access to the chamber is desired.

In order to facilitate the collection of coins discharged into the chamber and also to protect the company supervising the operation of such apparatus against frauds on the part of its employees, the chamber is adapted to receive a container 190. This container is retained in position by its engagement with certain portions of the chamber walls and of a recessed wall portion 192, thereof over and around bearing portion 188. Wall 194 of the container is cut away to provide recesses 196 for accommodating lugs 178. In this manner, the container and the chamber snugly are related to assure a definite relation of certain elements of each when the apparatus is completely assembled.

In removing wall portion 174 when container 190 is in position, lug 184 may not be capable of complete rotation; since, with the snug relationship of the parts, the free end of lug 184 may engage with the wall of the recess and practically prevent complete removal of the wall from the chamber. For this reason, the edges of the lug are squared off, as shown at 198, so that, by partially moving the lug to the position shown in dot-and-dash lines in Fig. 1, the lug end will be free of the top surface of projection 182, and the wall may be moved outwardly without interference between lug 184 and the walls of recessed portion 192.

The container includes also a removable wall 200. This wall may be constructed to be retained assembled by inserting into openings 202 in the bottom of the container a pair of nubs 204 carried upon projections from the wall. A pair of lugs 206 on the wall, cooperating with a cut-out 208 in bottom 210, retain the wall against inward movement as does also the engagement of lugs 206 against the faces of the edges of bottom, and the wall against the top and side walls.

A pair of lugs 212, extending upwardly from top wall 214 of the container and a projection 216 from the front wall are intended to cooperate so that openings 218 in each of them may be aligned to provide a passage through which a sealing wire 220 may be inserted. A seal, applied to such wire at the main office, would prevent tampering and would be intended to be severed only when the container was returned to the main office for the removal of its contents.

Within the container, it is to be noted, walls 222 of the recessed wall portion are related to slot 224 through which coins from the chute pass through the top wall into the container so that coins may not be positioned flat upon the inner face of wall 194. In such position, they might be removed from the container through the slot. To eliminate this possibility, the inner face of wall 194, immediately above walls 222, may be provided with a ridged formation 226 extending upwardly sufficiently toward the slot so that no coin, while extending into the slot, could possibly arrange itself flat against wall 194. In this manner, the possibility of removal of coins by employee is lowered.

As shown in Fig. 4, coin control of apparatus of this type may be embodied in apparatus wherein the deposit of the coin initiates operation of the alarm apparatus automatically, and without the interference or intervention of mechanical elements. For this purpose, only the wall 228 of a coin-receiving casing is illustrated. Through a slot 230 in this wall, the coin is inserted and is received in a guide 232. This guide

preferably is downwardly tilted so that the coin would tend to travel downwardly to a proper depository. Also, the arrangement of the slot and the construction of the guide is such that the coin continuously will remain in contact with two portions of that guide.

The guide, as seen from the drawing, is made up of an angular frame 234 having a longer arm 236. At the upper end of this arm, there is applied a bevelled piece 238 of insulating material and at the outer face of this insulating material is a metal strip 240. Electrical connections are made to the frame and to the strip. As shown diagrammatically, the power source, such as battery 242, may have one of its terminals connected by a conductor 244 to the frame. The strip, by a conductor 246, is connected to the solenoid 248 of a relay 250, the other terminal of the solenoid being connected, by a conductor 252, to a break switch 254, that is, a switch which normally remains closed, but, by suitable means, may be operated to open the circuit. A conductor 256 returns from this switch to the battery.

When a coin is deposited in slot 230 and metal-lically connects strip and frame, relay 250 will be energized, causing lifting of armature 260. Current will now flow from the battery through conductor 258 to armature 260, post 262 against which the armature is lifted by the action of the solenoid, conductors 264 and 246, solenoid 248, conductor 252, switch 254, and conductor 256 to the battery. Solenoid 248 thereby remains constantly energized as long as switch 254 remains closed.

With this constant energization of the solenoid, current will flow from point 266 through conductor 268, section 270 of a protective circuit 272, conductor 274, solenoid 276 of drop 278, then by a conductor 280 back through the other section 282 of the protective circuit and through conductors 284 and 256 to the battery. Armature 286 is thus lifted away from its post 288 to eliminate possibility of energizing the circuit of alarm device 290. The circuit of this device and its holding relay 292 is substantially that of device 58 and relay 66 shown in Fig. 3, except that power is derived through contact of armature 260 and post 262.

In order to release this apparatus, it is necessary to open switch 254 which may be made up as a jack-switch with a key-operated shaft similar to shaft 88. The path of the coin, in moving down through the chute provided by frame 234, may be made long enough to assure energization of solenoid 248 for a sufficient period to assure setting of drop 278 for continued functioning. Also, the chute may be designed to discard coins other than those necessary for operation of the apparatus. For instance, since the common penny and dime are similar in diameter to the nickel, the chute could discard them through proper openings in advance of the point where contact is made with the metal strip.

Many other changes could be effected in the particular apparatus designed, and in the methods of operation set forth, and in the specific details thereof, without substantially departing from the invention intended to be defined in the claims, the specific description herein merely illustrating operative embodiments carrying out the spirit of the invention.

What is claimed as new and useful is:

1. In combination with a rotary circuit-controlling device, an auxiliary governing device for the circuit-controlling device, and means to insure that the circuit-controlling device effect but

a single completed cycle of operation for each actuation of the governing device, the insuring means including a pivoted arm normally held in contact with the circuit-controlling device, co-operating means including a notch on the arm and a lug on the circuit-controlling device for engaging the notch to prevent rotation of the circuit-controlling device, a pivoted finger functioning with the arm to make the co-operating means ineffective on actuation of the auxiliary governing device to pivot the arm out of contact with the circuit-controlling device, the finger having a lug extending into the path of the lug, the lug, on rotation of the circuit-controlling device, destroying the conjoint functioning of the arm and the finger to release the arm for movement into contact with the circuit-controlling device again.

2. In combination with a rotary circuit-controlling device, an auxiliary governing device for the circuit-controlling device, and means to insure that the circuit-controlling device effect but a single completed cycle of operation for each actuation of the governing device, the insuring means including a pivoted arm normally held in contact with the circuit-controlling device, co-operating means including a notch on the arm and a lug on the circuit-controlling device for engaging the notch to prevent rotation of the circuit-controlling device, a pivoted finger functioning with the arm to make the co-operating means ineffective on actuation of the auxiliary governing device to pivot the arm out of contact with the circuit-controlling device, the finger having a lug extending into the path of the lug, the lug, on rotation of the circuit-controlling device, destroying the conjoint functioning of the arm and the finger to release the arm for movement into contact with the circuit-controlling device again, the co-operating means being constructed so that rotation of the circuit-controlling device to return to the initial position of the cycle will again bring such co-operating means into operation again to prevent operation of the circuit-controlling means.

3. For an alarm apparatus including a protective circuit, an alarm-indicating device, and means for energizing the device including a circuit, means for controlling operation of the apparatus by closing or opening one of the circuits, the controlling means including an electric switch, means for moving the switch to make the apparatus operative, means for locking the switch-moving means against movement including an arm and means on the switch-moving means and the arm cooperating when the arm and switch-moving means are in a predetermined relation to each other to prevent actuation of the switch-moving means, a lug for engaging the arm to make the cooperating means on the switch-moving means and the arm inoperative for actuation-preventing purposes and to latch the arm in position to continue the cooperating means in inoperative condition, the switch-moving means, immediately that it is actuated after being unlatched, releasing the actuation-preventing means to make the means again effective for actuation-preventing purposes, a link carried by the arm, and means for engaging the link to move the arm out of cooperating relation to the switch-moving means.

4. For an alarm apparatus including a protective circuit, an alarm-indicating device, and means for energizing the device including a cir-

cuit, means for controlling operation of the apparatus by closing or opening one of the circuits, the controlling means including an electric switch, means for moving the switch to make the apparatus operative, means for locking the switch-moving means against movement including an arm and means on the switch-moving means and the arm cooperating when the arm and switch-moving means are in a predetermined relation to each other to prevent actuation of the switch-moving means to circuit-closing position, a lug for engaging the arm to make the cooperating means on the switch-moving means and the arm inoperative for actuation-preventing purposes and to latch the arm in position to continue the cooperating means in inoperative condition, the switch-moving means, immediately that it is actuated after being unlatched, releasing the actuation-preventing means for actuation preventing purposes, a link carried by the arm, and means permitted limited reciprocating movement relative to, but beyond one limit of such movement engaging with, the link to move the arm out of cooperating relation to the switch-moving means and into engagement with the lug.

5. For an alarm apparatus including a protective circuit, an alarm-indicating device, and means for energizing the device including a circuit, means for controlling operation of the apparatus by closing or opening one of the circuits, the controlling means including an electric switch, means for moving the switch to make the apparatus operative, means for locking the switch-moving means against movement including an arm and means on the switch-moving means and the arm cooperating when the arm and switch-moving means are in a predetermined relation to each other to prevent actuation of the switch-moving means to circuit-closing position, a lug for engaging the arm to make the cooperating means on the switch-moving means and the arm inoperative for actuation-preventing purposes and to latch the arm in position to continue the cooperating means in inoperative condition, the switch-moving means, immediately that it is actuated after being unlatched, releasing the actuation-preventing means, a link carried by the arm, means permitted limited reciprocating movement relative to, but beyond one limit of such movement engaging with, the link to move the arm out of cooperating relation to the switch-moving means and into engagement with the lug, and releasable means for limiting movement of the link-engaging means to prevent its engagement with the link.

6. For alarm apparatus including a protective circuit, an alarm circuit, and means to make the alarm circuit effective when interference with the protective circuit occurs, a switch control for one of the circuits, a rotatable member for governing operation of the switch, an arm, means on the arm and the member normally brought into cooperation to prevent rotation of the member, a guide, a slide in the guide, a link extending between the arm and the slide so that, on predetermined movement of the slide, the link will move the arm out of cooperative relation to the member, and a releasable stop extending into the guide and into the path of the slide to limit movement of the slide so that it will not affect the position of the arm.