

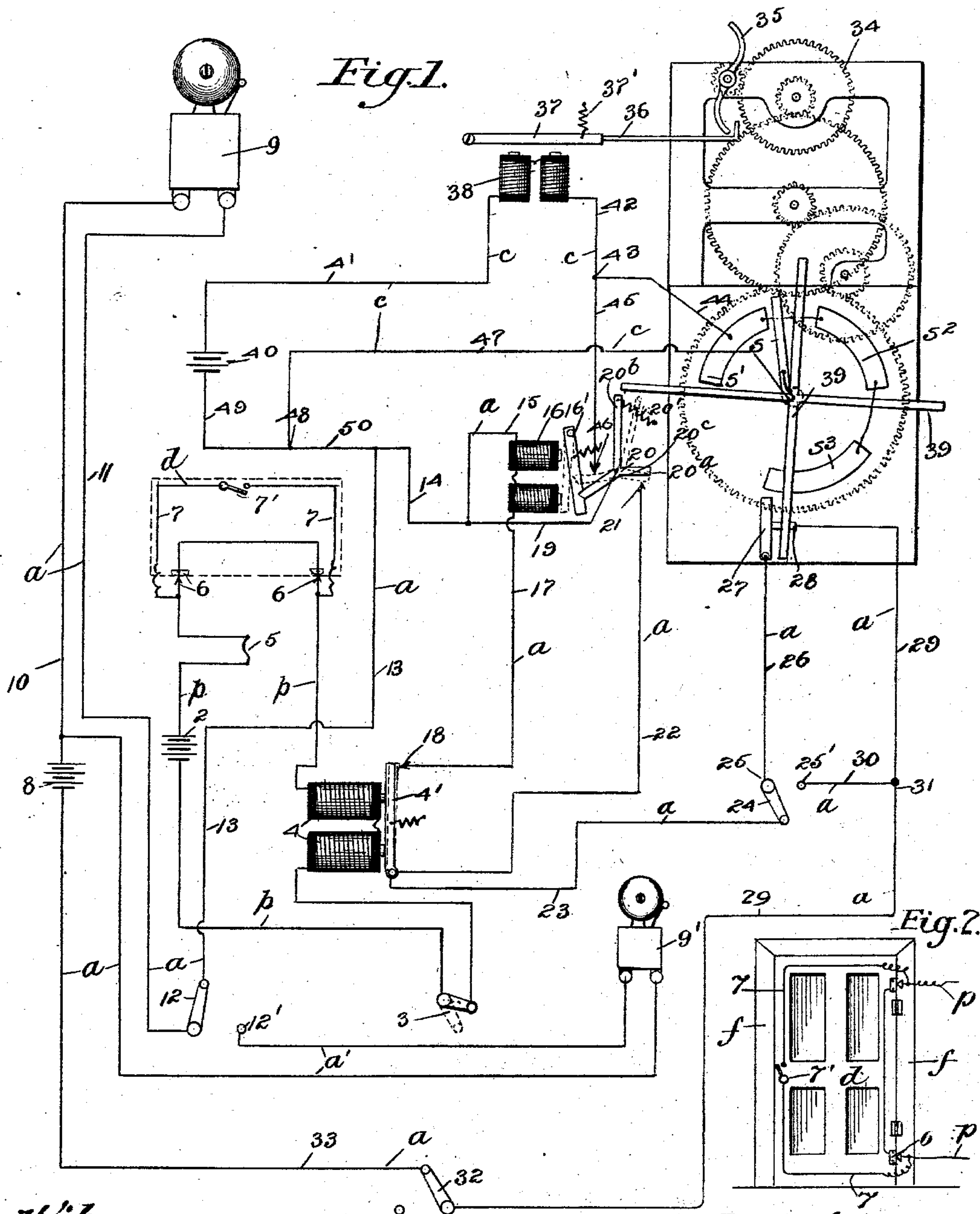
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J. W. HASBURG.
ALARM SYSTEM.

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NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ALARM SYSTEM.

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To all whom it may concern:

Be it known that I, JOHN W. HASBURG, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful
5 Improvements in Alarm Systems; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

10 My invention relates to improvements in alarm systems, and more particularly to alarm systems designed to transmit a signal to a proper alarm-signaling instrumentality upon the disturbance of the prearranged conditions
15 of an electric circuit by the occurrence of fire, the entrance of burglars, or the like.

The primary object of my invention is to provide devices designed for coöperation with suitable electric circuits so arranged that upon
20 the temporary disturbance of conditions in a protective circuit an alarm may be actuated, continued in operation for a definite predetermined period, and then stopped.

A further object of my invention is to provide mechanism whereby after a temporary
25 disturbance of the local or protective circuit, resulting in the timed operation of the alarm, as above described, the device will be automatically set in condition for operation afresh,
30 so that subsequent temporary disturbances of the normal conditions of the protective circuit will result in the transmission of further signals to the alarm-station.

A further object of my invention is to so
35 construct and arrange the devices that a permanent disturbance of the local or protective circuit will result in the continuous operation of the alarm for a longer period than when the interference in said local circuit is merely
40 temporary or, if desired, for an indeterminate period limited only by the exhaustion of the batteries.

With a view to attaining these and other objects which will become apparent to those
45 skilled in the art from the following description my invention consists in the combination and arrangement of parts hereinafter more fully described, and specified in the claims.

In the drawings, Figure 1 represents diagrammatically certain electric circuits with
50 which are associated suitable mechanical devices arranged in accordance with my invention to carry the same into effect. Fig. 2 indicates a detail of the door-wiring.

In the embodiment of my invention herein
55 illustrated the protective devices—such as safety thermal fuses, door and window contact devices, and the like—are arranged in a normally closed local circuit, (indicated in the drawings generally at *p*.) 2 indicates a bat-
60 tery, 3 a circuit-closing switch, and 4 a relay, all included in series in said protective circuit.

5 indicates a thermal-fuse device, and 6
65 indicate door-hinge contact members, so arranged upon the frame *f* and hinge-stile of a door *d* that when the door is swung open the continuity of the circuit *p* is destroyed, while when the door is closed its integrity is reëstablished.
70

To permit the entrance of authorized persons into the area protected by the local circuit, an open shunt 7 may be formed around the contact devices 6, suitable normally open contact-pieces 7' being provided in said shunt
75 in such relation to the lock or other door-fastening device that the proper manipulation of the key or other means employed in opening the lock will serve to complete the shunt-circuit 7. As the operation of the alarm devices
80 is dependent upon the breaking of the local circuit *p*, it is apparent that when the door is opened in the authorized way, as by the use of a proper key, while the key is allowed to remain in the lock the door may be opened
85 without giving an alarm, so that the party entering may take proper steps to disconnect the alarm apparatus and subsequently remove his key without causing the alarm to be sprung.

a indicates generally the alarm-circuit,
90 which includes in series therein a battery 8 and a suitable electric alarm, such as a bell 9, disposed at a central station or other point where it is desired that the alarm shall be given. From the battery 8 the circuit extends
95 by wire 10 to the bell 9, thence by wire 11 to

one of the contact-points of a switch 12, thence from the pivot-point of said switch 12 by wire 13 to the wire 14, at the end of which the circuit splits, one path being by wire 15 through the coils of an electromagnet 16, and thence by wires 17 to the point 18 of the relay 4, with which its armature 4' contacts when the coils of said relay are deenergized. The other path of the circuit extends from the aforesaid wire 14 by the conductor 19 to the pivot-point of drop 20, continuing from the contact-point 21 of said drop by wire 22 to the pivot end of the armature 4' of relay 4. Thence the rejoined paths continue by wire 23 to the pivot end of switch 24, one of whose contact-points 25 is connected by wire 26 with the pivot end of the switch-arm 27, whose relatively stationary contact-plate 28 is connected to wire 29, while the second contact-point 25' of the switch 24 is connected by a tap-wire 30 to the said wire 29 at the point 31. From said point 31 the wire 29 extends to the pivot-point of a circuit-breaking switch 32, from one of the points whereof a wire 33 extends back to the battery 8.

The electromagnet 16, heretofore referred to, is provided with an armature 16', which when in normal position unattracted by the magnet 16 forms a latch to hold in set or raised position the drop 20. To this end the drop 20 is provided with an arm 20^c, arranged when the drop is in elevated position to engage a notch in the armature 16' and when the armature is attracted to its magnet to escape the said notch. The drop is further provided with an arm 20^a, arranged when the drop is down to make contact with the point 21, closing the circuit α through the path around the electromagnet 16. The drop 20 is also provided with a lever-arm 20^b, adapted when the arm 20^c is released by the magnet-armature to drop under the influence of gravity or a positive spring 20' to the position shown in dotted lines.

c indicates generally a controlling-circuit including instrumentalities by which the time of operation of the alarm 9 is under certain conditions controlled through the intermediary of suitable timing mechanism. Such timing mechanism comprises generally a motor of any suitable type, herein indicated as a clock-work-motor, having a determinate speed or revolution and an instrumentality for resetting the drop 20 at predetermined intervals actuated by said motor, the motor being arranged for control by devices including an electromagnet comprised in the controlling-circuit. In the specific construction herein illustrated 34 indicates a clock or spring motor, and 35 a fan-governor for the same. 36 indicates a hook for holding said fan against movement, carried by the armature 37 of an electromagnet 38, included in the controlling-circuit c , said armature being normally held out of contact with its magnet by a suitable

spring 37'. The time-switch comprises a series of segmental contact members s' , s^2 , and s^3 , electrically connected and suitably mounted with reference to the motor.

s indicates a switch-arm carried by a rotating part of the motor and adapted to sweep successively over the segments s' , s^2 , and s^3 when the motor is in operation. The arm s is further so arranged that after completing its excursion past the segment s^3 it strikes the movable switch-arm 27, included in the circuit α , and removes said arm from contact with its coacting contact-plate 28.

The drop-resetting device illustrated comprises simply a spider 39, mounted on the same shaft as the switch-arm s and having a series of arms spaced apart to correspond with the separations of the segmental contact-plates s' , s^2 , and s^3 . These arms are of equal length and are arranged relative to the drop, so that during the rotation of the spider the path of each spider-arm is intercepted by the drop when in fallen position, so that said drop is raised by the passage of any one of the arms 39.

40 indicates a battery included in the controller-circuit.

The specific circuit connections herein illustrated are as follows: battery 40 by wire 41 to the coils of electromagnet 38, thence by wire 42 to the point 43, where the circuit splits, one branch extending by conductor 44 to the first segmental switch-plate s' and the other branch by wire 45 to a contact-point 46, arranged when the drop is in depressed condition to make contact with the drop-arm 20^c. From the switch-arm s , coacting with the segmental members s' , s^2 , and s^3 , a wire 47 extends to point 48 and thence by wire 49 back to the battery, while completing the alternative path from the contact-arm 20^c through wires 19 and 14, respectively, the circuit is completed by tap 50, connecting said wire 14 with point 48.

When in use the connections of my system will be those heretofore described, and the protective circuit p being normally closed the armature 4' of the relay 4 is attracted from its point 18, so that the alarm-circuit is opened. If now the protective circuit be momentarily opened and then closed—as, for example, by the lifting of a window and its subsequent closure—the following results will ensue: Upon the breaking of the protective circuit p the relay 4 is deenergized and its armature 4' flies back into contact with the point 18. Now an alarm-circuit is completed as follows: from the battery 8 by wire 10 through the bell 9, by wire 11 to switch 12, thence by wires 13, 14, and 15 through the coils of the magnet 16, returning by wire 17, contact-point 18, armature 4' of the relay 4, wire 23, switch 24, and contact-point 25, through the wire 26 to switch member 27, thence by contact 28 and wire 29 to the switch 32 and by the wire 33

back to the battery. It will be seen that this foregoing circuit just traced includes the battery 8 and the alarm 9 in closed circuit, so that the alarm is at once sounded. It will be noted, moreover, that the said circuit also includes the coils of the relay 16, whose armature 16' is accordingly attracted, permitting the drop 20 to fall and closing the various contacts controlled thereby. It will thus be seen that the actuation of the drop is dependent on the condition of the protective circuit. Assuming now that the break in the local protective circuit has been again promptly closed, the armature 4' is attracted to relay-magnet 4, breaking the circuit above traced at point 18. The integrity of the alarm-circuit *a* is not, however, destroyed by the said break, as a parallel path from the wire 13 to the pivot-point of the armature 4' is provided by the conductor 19, drop-arm 20^a, contact-point 21, and wire 22. Consequently the alarm will continue to sound as long as the drop remains in fallen or active position. The falling of the drop 20 to active position closes the time-controlling circuit *c*, the circuit being traced from the battery as follows: through the wire 41 to the electromagnet 38, thence by wire 42 to point 43, through the path 45 to the point 46, by the drop-arm 20^c to the wire 19, thence through wires 14, 50, and 49, back to the battery. The armature 37 of the relay 39 is accordingly attracted, withdrawing its hook 36 from the path of the fan 35 of the motor 34. Accordingly the motor is started under tension of its spring, imparting rotation to the switch-arm *s* and the spider 39. When the foremost advancing arm of the spider 39 now strikes the lever-arm 20^b of the drop 20, the said arm is lifted, breaking the contact made with points 21 and 46 and restoring the arm 20^c into engagement with the armature 16' of the electromagnet 16 in the alarm-circuit. Both of the paths through wires 17 and 22, constituting parts of the alarm-circuit *a*, being now broken, respectively, at points 18 and 21, the alarm ceases to sound. The controller-circuit path through wire 45 and the drop-arm 20^c is also broken as soon as the arm 39 commences to raise the drop, but the switch-arm *s* being yet in contact with the contact-segments *s'* the continuity of the controlling-circuit *c* remains for the present unbroken. The parts are preferably so arranged, however, that just as the arm 39 completes its operation of resetting the drop 20 the switch-arm *s* leaves its contact-plate *s'*, completely breaking the controller-circuit. Now the hook 36 is restored to its initial position under tension of the spring 37', stopping the motor 34 by engaging the fan-governor 35 thereof. The parts are all now restored to operative condition, so that in the event of a subsequent break and closure of the protective circuit *p* the foregoing operation may be repeated, the switch-arm in its second

operation, however, moving over the switch-segment *s*². A third operation may then follow in like manner; but at the end of the third operation the switch-arm *s* strikes the switch member 27, forming part of the alarm-circuit, and opens said alarm-circuit, so that the alarm devices remain inoperative until the timing mechanism and switch has been manually reset and restored to the initial position.

From the foregoing description it will be seen that however short may be the duration of the break in the protective local circuit the alarm will be sounded for a definite time, the operation of the alarm devices being, after the initial closure of the alarm-circuit by the breaking of the local circuit, independent of said local circuit. If, however, the break in the local circuit be permanent, as by the blowing of a fuse occasioned by fire or the like, the armature 4' remaining permanently in contact with the point 18, the alarm-circuit is permanently closed, so that the bell continues to ring until the circuit is broken at some other point. It will be noted in this connection that the closed path includes the relay 16, whose armature is held in attracted position out of position to engage the drop 20. Consequently when the drop is raised by the approach of the forwardmost spider-arm 39 it received no support from the armature 16' and falls again, closing the controller-circuit a second time and maintaining the magnet 38 in an energized condition. Accordingly, the hook 36 remaining out of the path of the fan 35, the motor continues in operation, and the switch-arm *s* continues in its excursion until it strikes the switch-arm 27, moving the same to break the alarm-circuit, as heretofore described.

It will be seen by setting the switch 24 in contact with the point 25', associated therewith, the switch members 27 and 28 may be cut out of the alarm-circuit, so that in the event of a permanent break in the local circuit the alarm will ring continuously until the battery 8 becomes exhausted.

The switch member 32 affords a means for breaking the alarm-circuit completely when the system is out of use, the switch 3 affording a similar means for breaking the normally closed local circuit.

9' indicates a local alarm-bell included in a circuit *a'*, one side of which is tapped by wire 10 and the other side whereof is connected to contact-point 12' of switch 12. By throwing the switch 12 to the contact-point 12' the said bell 9' may be cut into the alarm-circuit in place of the primary alarm 9. Thus tests of the apparatus may be made by the use of the local bell or it may be employed to sound the alarm locally, if desired.

While I have herein described in detail one embodiment of my invention which I have found well adapted for the practical performance thereof, I do not desire to be understood

as limiting myself to the arrangement or apparatus herein specified in all its details, as many changes therein may obviously be made without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an alarm system, an alarm-circuit, a controlling-circuit, a drop arranged to control both of said circuits, a timing device controlled by the controlling-circuit and adapted when in operation to move the drop to inactive position at predetermined intervals, said timing device being arranged to be started when the drop is moved to active position, a local protective circuit, and means for actuating the drop controlled by the condition of the protective circuit.
2. In an alarm system, an alarm-circuit, a controlling-circuit, a drop arranged to control both of said circuits, a motor, means for controlling the operation of said motor arranged in the controlling-circuit, a time-switch arranged in said controlling-circuit, and actuated by the motor, means operated by the motor for moving the drop to inactive positions at predetermined intervals, a local protective circuit, and means for actuating the drop controlled by the condition of the protective circuit.
3. In an alarm system, an alarm-circuit, a controlling-circuit having two branches, a drop arranged to control the alarm-circuit and one branch of the controlling-circuit, a time-switch in the other branch of the controlling-circuit, a motor arranged to drive the time-switch, a means for controlling the motor arranged in the controlling-circuit and common to both branches thereof, means operated by the motor for moving the drop to inactive position at predetermined intervals, a local protective circuit, and means for actuating the drop controlled by the condition of the protective circuit.
4. In an alarm system, an alarm-circuit, a controlling-circuit having two branches, a drop arranged to control one of the branches of the controlling-circuit and the alarm-circuit, and a time-switch arranged in the other branch of the controlling-circuit, a switch in the alarm-circuit arranged relative to the time-switch of the controlling-circuit to be operated by a switch member thereof as the time-switch completes its operation, devices for controlling the operation of the motor including an

electromagnet arranged in the controlling-circuit common to both branches thereof, means operated by the motor for moving the drop to inactive position at predetermined times, latch devices for maintaining said drop in elevated or inactive position, and electromagnetic means for actuating the latch devices controlled by the condition of the protective circuit.

5. In an alarm system, a protective circuit including a relay, a normally open alarm-circuit adapted to be closed by the operation of said relay, a current-responsive device in said alarm-circuit, a drop controlled by said current-responsive device, a controlling-circuit controlled by said drop, a motor, electromagnetic means arranged in the controlling-circuit for controlling the operation of said motor, means actuated by the motor for moving the drop to inactive position at predetermined intervals.

6. In an alarm system, a local protective circuit, a relay having its coils arranged in said circuit, an alarm-circuit having two branches, one of said branches including the armature of the said relay, and a current-responsive device controlling a drop, and the other branch being controlled by said drop, a controlling-circuit having two branches, one of which is controlled by said drop, a time-switch arranged in the other branch, an electromagnet arranged in the protective circuit common to both branches, a motor adapted to actuate the time-switch, means for controlling the motor actuated by the electromagnet in the controlling-circuit, and means actuated by the motor for moving the drop to inactive position.

7. In an alarm system, an alarm-circuit, and a controlling-circuit, a circuit-closer arranged to control both of said circuits, an instrumentality for automatically moving the circuit-closer to inactive position at intervals, motor devices for actuating said instrumentality, means for controlling the operation of said motor including an electromagnet arranged in the controlling-circuit, a local protective circuit, and means controlled by the condition of the protective circuit for retaining the circuit-closer in inactive position.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN W. HASBURG.

In presence of—

GEO. T. MAY, Jr.,
MARY F. ALLEN.