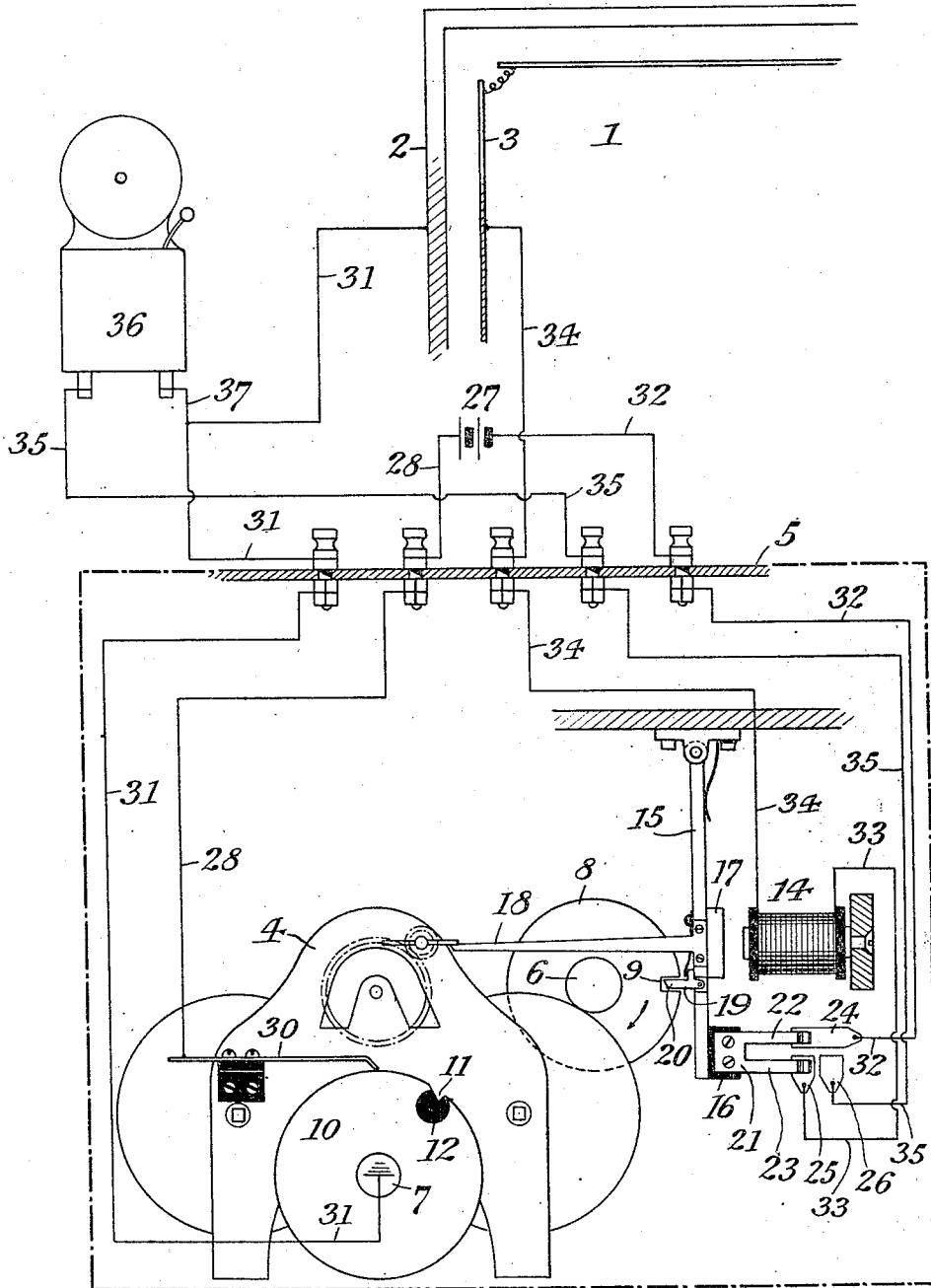


J. P. WILLIAMS & H. HUHNS.
 AUTOMATIC RESETTING ALARM OUT-OUT FOR ELECTRIC BURGLAR ALARM SYSTEMS.
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Witnesses:
A. R. Appleman
Bessie Costigan

Inventors
John P. Williams & *Hermann F. Huhns*
 By *Wm. H. ...*
R. Reed Little

UNITED STATES PATENT OFFICE

JOHN P. WILLIAMS AND HERMANN HUHN, OF NEW YORK, N. Y., ASSIGNORS TO
ELECTRIC BANK PROTECTION COMPANY, A CORPORATION OF DELAWARE.

AUTOMATIC RESETTING ALARM CUT-OUT FOR ELECTRIC BURGLAR-ALARM SYSTEMS.

1,082,667.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOHN P. WILLIAMS and HERMANN HUHN, both citizens of the United States, and residents of New York, in the county and State of New York, have invented certain new and useful Improvements in Automatic Resetting Alarm Cut-Outs for Electric Burglar-Alarm Systems, of which the following is a specification.

This invention relates to automatic alarm cut-outs for electric burglar-alarm systems, and it has for its object to provide electric protective means of the above class in which an electric protective circuit is automatically controlled to sound and cut out an alarm and the cut-out will be automatically reset after its period of operation.

Our invention is designed to provide simple and improved means of certain and positive automatically-operative characteristics by which the operative status of the alarm circuits can be definitely governed to sound an alarm for a predetermined period of time and automatically reset to successively repeat the periods of alarm operation.

Our present improvements are particularly adapted for installation within electrically-protected structures, such as a vault or safe, the door of which is provided with a mechanical time lock, so that in case an attack is made upon such a structure, and an alarm sounded, the system is automatically reset after the alarm has been operated for a predetermined period of time, thus insuring perfect protection at all times.

Under the circumstances just indicated, where a mechanical time lock is employed, the door of the protected structure could not be opened by any mechanical means until the lapse of a predetermined period of time as controlled by the time lock, and therefore, in case of an alarm being sounded, if the cut-out within the vault does not automatically reset itself or must be manually set, entrance to the vault is required for resetting the cut-out after each completed alarm period, and the vault would thus be without operative electrical protection until the time lock operated. Our automatic resetting cut-out obviates this disadvantage and insures the protective status of the system at all times.

Automatic cut-outs have been employed in electric protective systems, to control the

operative periods of an alarm sounded when an attack is made, but unless such automatic cut-out is reset its operation disconnects the alarm circuit and the protective status is vitiated. The manual resetting of such automatic cut-outs requires entrance to the vault or protected structure within which the cut-out is usually installed in the class of burglar-alarm systems to which our improvements especially relate, and the obvious disadvantages and weakness inherent in automatic cut-outs and alarm-circuit controlling devices which require manual resetting is entirely overcome by the improved means of our present invention by which the alarm is not only controlled in an operative status during predetermined periods and cut out after the period of operation, but is automatically reset for operation during the next ensuing period.

A further object of our invention is to provide cut-out means of the class described which will possess advantages in point of simplicity, effectiveness, positive operation, convenience and general efficiency.

In the drawings we have shown a diagrammatic illustration of our automatic resetting cut-out mechanism in connection with the linings of an electrically-protected structure, such as a vault or safe, and the alarm circuits of a burglar-alarm system.

The type of burglar-alarm systems to which our improvements particularly relate involve primarily a guarded structure protected by the burglar-alarm system, which structure may be a vault, safe, or other apartment which it is desired to protect in a bank or other building, and all the parts of the system that may be attacked or manipulated to cripple the system are within the protected structure or structures. The guarded structure is electrically protected by the system in such a manner that an unauthorized attempt to gain entrance thereto by an attack upon the structure will operate an electrical circuit and sound an alarm, and our improvements provide means to automatically cut out the alarm and then automatically reset the cut-out to permit a successive operation of the alarm.

Referring to the drawings, 1 designates a portion of a vault, safe or other structure to be guarded, the wall or frame thereof, shown at 2, and the lining, shown at 3, be-

ing of conducting material. In the general preferred arrangement of our improved automatic resetting alarm cut-out as herein illustrated, we have shown a suitable clockwork, 4, mounted in a suitable case or cabinet, 5, which parts are protected in practical arrangement by inclosure within the guarded structure 1. Shafts, as at 6 and 7, are revolubly mounted within said cabinet 5, in operative engagement with the gear train of the clockwork, 4, and carried on the shaft 6 is a trip disk, 8, provided at its periphery with a recess, 9.

Under certain conditions, in the operation of our present invention and improvements, the protective circuit may sometimes be sustained in operative condition and the actuation of the alarm maintained, and in order to break the protective circuit after a predetermined period of time we employ a circuit-controller disk, 10, carried on the shaft 7 and provided with a peripheral recess, 11, having an insulating block, 12, at the base thereof.

Suitably arranged, preferably within the casing 5, is a relay, 14, and pivotally mounted for co-active relation thereto is a spring-pressed trip lever, 15, provided at its free end with an insulating block, 16, and carrying an armature, 17, operating in connection with the core of the relay 14. Fixed to the free-end portion of the trip lever 15, and ranging toward the clockwork 4, is a trip arm, 18, which is normally in engagement with the escapement mechanism of the clockwork and operates to release the clockwork when the relay 14 is energized to draw the armature 17 and trip lever 15 toward its core. Pivotally mounted on the free end of the trip lever 15 is a spring-pressed trip dog, 19, provided with an extension, 20, adapted to normally enter the recess 9 of the trip disk 8. Secured to the insulating block 16 which is carried on the trip lever 15 is a conducting plate, 21, having spring contact fingers, 22 and 23, which respectively contact normally with a long contact plate, 24, and a short contact plate, 25, both suitably mounted, and said fingers are adapted, when the lever 15 moves under action of the armature 17, to respectively contact with the long plate 24 and another short contact plate, 26, suitably mounted adjacent the short contact 25, as will be readily understood.

The general circuits connecting the various parts of the electrical burglar-alarm system as employed in connection with the subject matter of our present invention may be arranged in any suitable or desired manner, and we have herein shown one preferred arrangement of circuits, which we will now proceed to describe.

From the positive side of a battery, 27, a conductor, 28, extends to a spring contact

brush, 30, engaging the periphery of the circuit-controller disk 10. A conductor, 31, extends from the shaft 7 of the controller disk 10 to the wall or frame 2 of the protected structure. A conductor, 32, extends from the negative pole of the battery 27 to the long contact plate 24, and is in electrical connection with the short contact plate 25 through the fingers 22 and 23 of the conducting plate 21, and a conductor, 33, extends from the short contact plate 25 to the coil of the relay 14, from which a conductor, 34, extends to the lining 3 of the protected structure. A conductor, 35, extends from the short contact plate 26 to the magnet of a bell or gong alarm device, 36, which is in electrical connection with the conductor 31 through a branch conductor, 37.

The operation and advantages of our invention and improvements will be readily understood by those skilled in the art.

The drawing shows the position of the contacts and the relatively operating parts and the circuits when conditions are normal, and in the positions shown the alarm circuit controlled by the operation of the contacts is set in operative condition and ready for actuation in case of an attack upon the protected structure. With relation to the contacts it will be understood that the contacts 24 and 25 are normally closed and the contacts 24 and 26 are normally open. When an attack is made upon the protected structure, for instance by a drill or other tool contacting with the wall 2 and lining 3, a circuit is established through the wall 2, the conductor 31, shaft 7 and controller disk 10, brush 30, conductor 28, battery 27, conductor 32, contact plate 24, conducting plate 21, contact plate 25, conductor 33, relay 14, and conductor 34, to the lining 3 of the protected structure. The relay 14 is then energized and attracts the armature 17, causing movement of the lever 15 to withdraw the dog 19 from engagement with the recess 9 of the disk 8, and this action also withdraws the trip arm 18 of the lever 15 from engagement with the escapement mechanism of the clockwork to release the same. This movement of the trip lever 15 also causes the spring finger 23 to pass from the short contact plate 25 and engage with the other short contact plate 26, while the spring finger 22 remains in contact with the long contact plate 24. Under the conditions just stated, an alarm circuit is then established through the conductor 32, battery 27, conductor 28, brush 30, controller disk 10, shaft 7, conductor 31, branch conductor 37, gong 36, conductor 35, short contact plate 26, conducting plate 21, and long contact plate 24. Upon the breaking of the short circuit between the wall 2 and lining 3, current is withdrawn from the relay 14 and the armature 17 released, but said alarm circuit

cut is retained in the operative condition just indicated, causing the actuation of the alarm, while the trip disk 8 makes a full revolution with the extension 20 of the dog 19 bearing on the periphery thereof. When the full revolution of the disk 8 has been completed and the recess 9 comes beneath the extension 20, the latter enters the recess 9, and the movement of the lever 15 then causes the finger 23 to move back into contact with the short contact plate 25, while the finger 22 remains in contact with the long contact plate 24, and at the same time the trip arm 18 engages the escapement mechanism and stops the clockwork. Thus, the alarm will be in operation during one complete revolution of the trip disk 8, and the alarm circuit is then broken and the cut-out automatically reset for again establishing the alarm circuit. The above described conditions follow where the short circuit between the wall 2 and lining 3, or between other parts of the electrical protection of the guarded structure 1, is only temporary. When such short circuit is prolonged or permanent, the actuation of the alarm would be continued because the coil of the relay 14 would still be energized by the completion of the alarm circuit through such short circuit, thus retaining the extension 20 of the dog 19 from engagement with the recess 9 in the trip disk 8, and the alarm circuit would then remain in operation and cause the actuation of the alarm during several revolutions of the trip disk 8 and until the revolution of the circuit-controller disk 10 brought the brush 30 into contact with the insulating block 12 and thus broke the circuit. For instance, should the penetrating tool used in attack upon the protected structure be left in contact with the wall 2 and lining 3 the alarm circuit would be closed and in operation until the circuit-controller disk 10 made, say, one complete revolution, when the brush 30 would contact with the insulating block 12 and break the alarm circuit, as will be readily understood. The trip disk 8 may be adapted to any desired time for one complete revolution and the circuit-controller disk 10 adapted to any desired longer period of time for revolution. For instance, the disk 8 may be regulated to a five minute period of revolution and the disk 10 to a one-hour period.

It will be understood that the relative adjustment of parts is such that the disk 8 will make such a number of revolutions with respect to the disk 10 that the recess 9 is in front of the extension 20 of the dog 19 when the insulation 12 reaches the contact member 30.

It will be understood that our improved automatic resetting cut-out means may be operatively adapted to either open or closed circuits, or to a combination of open and

closed circuit conditions, in electric burglar-alarm protective systems, as will be readily understood.

We do not desire to be understood as limiting ourselves to the detail construction and arrangement of parts or circuits as herein shown and described, as it is manifest that variations and modifications therein may be resorted to, in the adaptation of our invention to varying conditions of use, without departing from the spirit or scope of our invention and improvements. We therefore reserve the right to all such modifications and variations as properly fall within the scope of our invention and the terms of the following claims.

Having thus described our invention, we claim and desire to secure by Letters Patent:

1. In an alarm system, an electric protective system including an alarm circuit operable to actuate an alarm, a motor mechanism, cut-out means operated by said motor mechanism and in said alarm circuit to control the operation thereof for a predetermined period of time, an electro-responsive device in shunt to the alarm, and means operated by the action of said electro-responsive device to automatically govern the operation of said cut-out means and thus permit successive and repetitive actuation of the alarm during the period said cut-out means is operative to control the alarm circuit and before its cut-out action thereon, said governing means comprising a movable member governing the operation of said motor mechanism and supplementary mechanism governing the position of said movable member when said electro-responsive device is not energized.

2. In an alarm system, an electric protective system including an alarm circuit operable to actuate an alarm, motor mechanism, cut-out means operated by said motor mechanism and in the alarm circuit for controlling the operation thereof for a predetermined period of time, an electro-responsive device in shunt to the alarm, motor controlling means operated by the action of said electro-responsive device and governing the operation of said motor mechanism, supplementary means operative to control said motor controlling means to govern the operation of said alarm circuit for the actuation of the alarm during a lesser period than the period of control by said cut-out means, circuit contacts carried by said motor controlling means, and circuit contacts for closing the circuit through the electro responsive device or alarm and adapted to contact with the circuit contacts carried by said motor controlling means under different positions of said latter means.

3. In an alarm system, an electric protective system including an alarm circuit oper-

5 atable to actuate an alarm, motor mechanism, cut-out means for controlling the operation of said alarm circuit for a predetermined period of time, said cut-out means
 10 being constituted by a revoluble disk in said alarm circuit and operated by said motor mechanism and having an insulated point and by a contact in said alarm circuit and
 15 adapted to contact with said insulated point, an electro-magnet in shunt to the alarm, a long contact, 24, in said alarm circuit, short
 20 contacts, 25 and 26, in said shunt and alarm circuit respectively, a movable member operated by the armature of said electro-magnet and governing the operation of said motor
 25 mechanism, circuit contacts, 22 and 23, carried by said movable member and adapted to respectively contact with said long circuit contact and said short circuit
 30 contacts, a supplementary revoluble disk operated by said motor mechanism and having a recess, and an automatic catch carried by said movable member and adapted to engage
 35 said recess.

4. In an alarm system, an electric protective system including an alarm circuit operable to actuate an alarm, a motor mechanism, automatic cut-out means operated by
 40 said motor mechanism and in said alarm circuit for controlling the operation thereof for a predetermined period of time, an electro-responsive device in shunt to the alarm,
 45 contacts for closing the circuit through the electro-responsive device or alarm, a movable member operated by the action of said electro-responsive device and governing the
 50 operation of said motor mechanism, circuit contacts carried by said movable member and adapted to contact with said first named
 55 contacts, and supplementary means operated by said motor mechanism and governing the position of said movable member when said electro-responsive device is not energized
 to control the alarm circuit for the actuation of the alarm for a lesser period than the period of control by said cut-out means.

5. In an alarm system, an electric protective system including an alarm circuit operable to actuate an alarm, an electro-responsive device in shunt to the alarm, circuit
 54 contacts comprised in said alarm circuit for closing the circuit through the electro-responsive device or alarm, a movable member operated by the action of said electro-responsive
 55 device, circuit contacts carried

60 ried by said movable member and adapted to contact with said first named circuit contacts, means for governing the position of said movable member when said electro-responsive
 device is not energized and for a predetermined period of time, and means carried by said movable member for engaging said governing means at the termination
 of such period.

6. In an alarm system, an electric protective system including an alarm circuit operable to actuate an alarm, a motor mechanism, cut-out means operated by said
 65 motor mechanism and in said alarm circuit for controlling the operation thereof for a predetermined period of time, an electro-magnet in shunt to the alarm, means for
 70 closing the circuit through the magnet or alarm, means operated by the action of said electro-magnet and governing the operation of said motor mechanism, means carried by
 75 said last-mentioned governing means and operating to control said means for closing the alarm circuit, and supplementary means governing the position of said means which
 80 is controlled by said electro-magnet and operable when said electro-magnet is not energized to control the alarm circuit for the actuation of the alarm for a lesser period
 85 than the period of control by said cut-out means.

7. In an alarm system, an electric protective system including an alarm circuit operable to actuate an alarm, an electro-magnet in shunt to the alarm, means for closing the
 90 circuit through the magnet or alarm, motor controlling means operated by the action of said electro-magnet, means carried by said motor controlling means and operating to
 95 control said means for closing said alarm circuit, means for governing the position of said motor controlling means when said electro-magnet is not energized and for a
 predetermined period of time, and means for retaining said governing means against further operation at the termination of such
 100 period.

In testimony whereof we have signed our names in the presence of the subscribing witnesses.

JOHN P. WILLIAMS.
 HERMANN HUH.

Witnesses:

M. GREENWOOD,
 E. SIDNEY BOOTH.