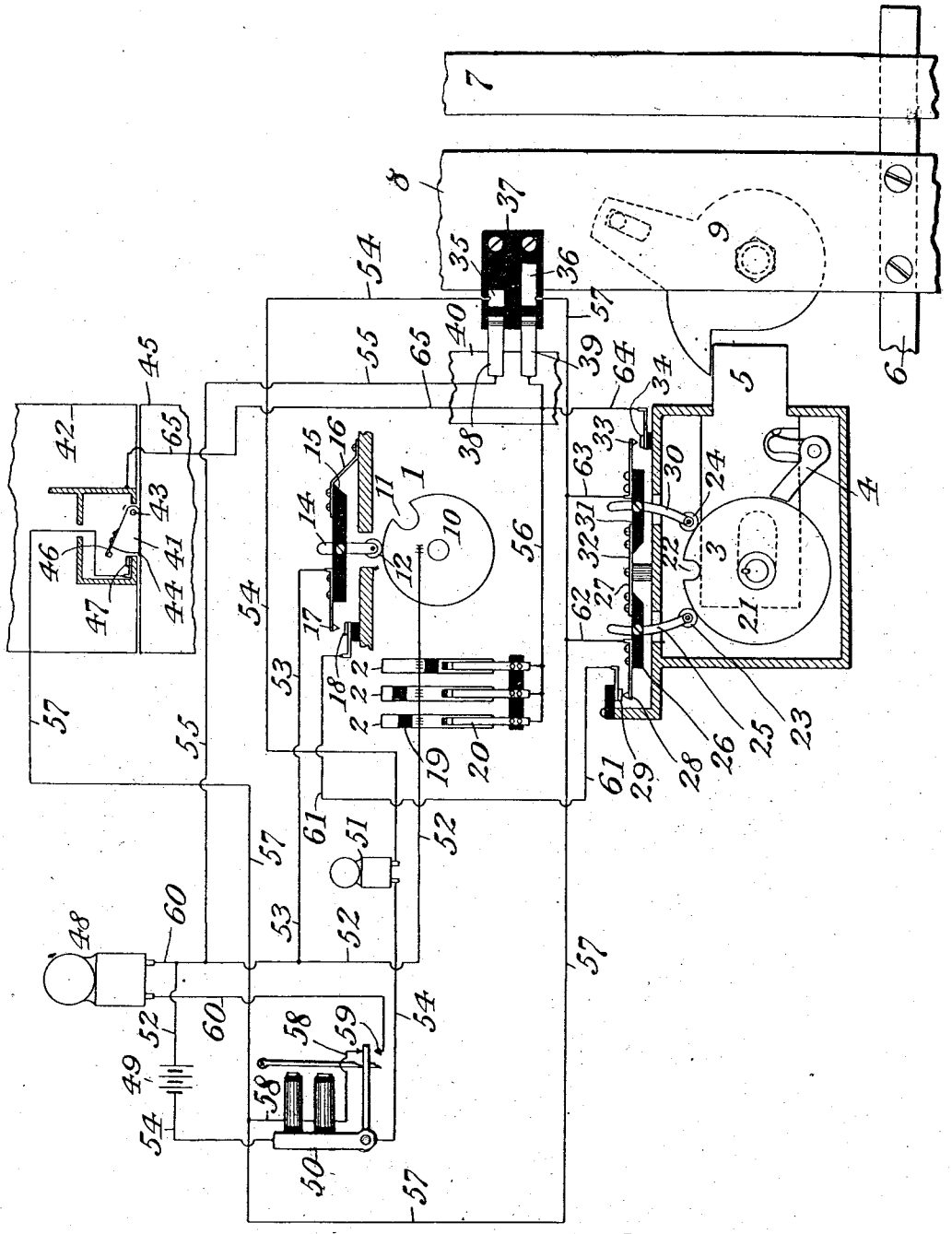
J. P. WILLIAMS.

ELECTRIC BURGLAR ALARM SYSTEM.

APPLICATION FILED JUNE 1, 1910.

1,114,565. Patented Oct. 20, 1914.



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ELECTRIC BURGLAR-ALARM SYSTEM.

1,114,565. Specification of Letters Patent. Patented Oct. 20, 1914.

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To all whom it may concern:

Be it known that I, JOHN P. WILLIAMS, a citizen of the United States, and resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Burglar-Alarm Systems, of which the following is a specification.

This invention relates to electric burglar-alarm systems, and it has particular relation to improved means whereby access to the guarded structure will be permitted to authorized persons without sounding the alarm, and to other protective features comprised in the operative status of such systems, substantially as hereinafter described.

A time mechanism of the character above set forth is shown in the patent to M. F. Juruick, Serial No. 944,733, granted December 28, 1909.

Considerable disadvantage and risk attend the employment of controlling time mechanisms inclosed within the guarded structure and in connection with the electrical protective alarm system thereof, for governing the operative and inoperative status of the system, as under such conditions the protective operative status and convenient employment of the system has a dependency upon the perfect and regular operation of a clock-work mechanism or automatically-operating time device which in its nature is liable to disarrangement or operative disorder.

A leading object of my present invention and improvements is to overcome the conditions above mentioned and obviate the employment of controlling time mechanism for throwing off the alarm to permit access to the guarded structure or for governing the operative and inoperative status of the alarm system, and to provide simple and improved means of certain and positive operative characteristics by which the operative status of the alarm circuits can be definitely and conveniently governed to permit authorized access at any time to the guarded structure.

A further object of my present invention and improvements is to provide a general burglar-alarm system which will possess advantages in point of simplicity, effectiveness, positive operation, convenience, and general efficiency, substantially as hereinafter set forth and particularly pointed out in the claims.

Reference is had to the accompanying drawings, which show in diagrammatic representation the main parts of a burglar-alarm system embodying my improvements.

The type of burglar-alarm systems to which my improvements particularly relate involve primarily a guarded structure or main structure protected by the burglar-alarm system. The guarded structure, as herein referred to, may be the vault, safe, or other structure which it is desired to protect in a bank or other building or apartment, or the building or apartment itself or a part thereof. The guarded structure is provided with a door or other means of access thereto, and is electrically protected by the system in such manner that an attempt to gain entrance thereto will cause the actuation of an alarm. In connection with such burglar-alarm systems, the subject-matter of my present invention has particular relation to the means for permitting authorized access to the main guarded structure at any desired time and without actuating the alarm or disturbing the general operative protective status of the alarm system.

To this end, the main subject-matter of my present invention comprises electro-mechanical interlocking combination devices, which in their relative arrangement and construction and circuit connections enable the governing of the system so as to permit authorized access to the guarded structure without actuating the alarm or disarranging the operative conditions of the system.

Referring to the drawings, 1 designates a combination lock device, which in its general features of construction and operation of parts may be of the usual well-known types which are employed upon the doors of vaults, safes and other structures. Such combination lock devices employ a plurality of tumblers, which are herein indicated at 2, the diagrammatic illustration of said tumblers 2 being an end or edge view thereof. These tumblers 2 are the loose tumblers of the combination construction, as will be readily understood. In my present invention, the combination device 1 is not employed as a lock, in the usual sense of having bolts and fences and other locking parts, but is employed as a controlling means in association with a combination lock device which is operative for locking purposes. The combination de-

vice 1 is preferably arranged at a convenient point upon the door or means of access to the vault, safe, or main guarded structure which is protected by the electric burglar-alarm system, but it may be otherwise suitably arranged as desired.

3 designates an ordinary combination lock, such as is usually employed upon the doors of vaults, safes, and other structures, and is employed for locking purposes. This combination lock 3 may be, in its main features of construction and operation of parts, of any usual or adapted type, and the diagrammatic illustration shows the usual fence, 4, and bolt, 5, for locking the door, and the drawbolt, 6, these being of the usual constructions well known in the art, and operating in the usual manner. Such combination locks, as generally employed in the art, sometimes have their bolts thrown by a mechanical arrangement, such as a mechanical time-lock, in lieu of the arrangement for manually throwing the bolts by means of a drawbolt, and in such case the mechanical arrangement is employed to serve the purpose of the drawbolt. While I have herein illustrated the combination lock 3 in its relation to a drawbolt, it will be understood that the means for throwing the bolts of such lock, in its employment in association with my present invention and improvements, are not necessarily restricted to the use of a manually-operatable drawbolt, but that the bolts of the combination lock 3 may be thrown by a mechanical arrangement such as a mechanical time-lock, or in any other suitable manner, when employed in association with my invention. The combination lock 3 is suitably and conveniently mounted upon the door of the vault, safe, or other structure to be protected by the electric burglar-alarm system, and I have herein shown it, in the diagrammatic illustration, in association with the usual fixed drawbolt frame, 7, the movable draw-bolt bar, 8, and the dogging-block, 9, the operation of which parts is as usual and will be readily understood.

The combination controlling device 1 is in an operative sense an electrical lock, and in its particular structural features as adapted to my present invention and improvements it comprises a driver tumbler (shown in the diagrammatic illustration at 10) having a peripheral recess, 11, adapted to receive a roller, 12, normally bearing upon the periphery of said tumbler and carried by an arm, 14, connected to a bar, 15, suitably spring-mounted, as at 16, and carrying a contact point, 17, operating with relation to a contact point or plate, 18. The construction further comprises insulated sections or blocks, 19, upon the periphery of the loose tumblers 2, and spring contacts, 20, bearing with relation to the periphery of said tumblers.

The combination lock 3 is in an operative sense a mechanical lock for locking purposes and is in electrical connection with the electrical combination lock 1. The lock 3, in its particular construction as related to my present invention and improvements, comprises a tumbler (shown in the diagrammatic illustration at 21) having a peripheral recess, 22, adapted to receive either one of two rollers, 23 and 24, respectively, bearing with relation to the periphery of said tumbler. The roller 23 is carried upon a rod, 25, connected to a bar, 26, suitably spring-mounted, as at 27, and carrying a contact point, 28, operating with relation to a contact plate or point, 29. The roller 24 is correspondingly carried by a rod, 30, connected to a bar, 31, spring-mounted, as at 32, and carrying a contact point, 33, operating with relation to a contact plate or point, 34. The mounting of the respective rollers 23 and 24 and their main carrying bars 26 and 31 is preferably reversely-arranged, as shown.

At 35 and 36, respectively, are shown contact plates or blocks, which are carried upon the movable drawbolt bar 8, the mounting of said plates upon the drawbolt bar being preferably by means of an insulated plate, 37, secured to said bar. The contact 35 is of shorter extent than the contact 36, and by the movement of the bar 8 these contacts are operative with relation to spring contacts, 38 and 39, respectively, which are suitably mounted, preferably upon a portion of the door frame, 40. In the general burglar-alarm system to which my improvements especially relate, the contacts just described constitute drawbolt contact means, the operation of which will be hereinafter set forth.

In the improved electrical burglar-alarm system there is also comprised a trip (shown in the diagrammatic illustration at 41) which is suitably mounted at any desired point upon the frame, 42, of the door of the vault, safe, or other structure to be protected. This trip is preferably constituted by a plate, pivotally mounted, as at 43, to operate within the door frame and through a slot or opening, 44, therein, in such manner that said plate will be raised to the position shown in the drawings by action of the door, 45, when the latter is in normal closed position, and will drop when the door is opened or withdrawn from within the door frame. Said plate 41 carries a contact point 46, adapted to contact with a contact plate or contact point, 47, when the trip plate 41 is released and drops from the position in which it is normally held by the closed door.

The alarm of the burglar-alarm system is indicated at 48, and may consist of a gong device which is usually located in the protected alarm housing or structure hereinbe-

fore referred to. The battery of the electrical alarm system is shown at 49, and the system further comprises an automatic drop, shown at 50, and a test bell, shown at 51, these supplementary parts and other parts which may be comprised in the general features of the alarm circuits being preferably arranged within the main guarded structure, which is the vault, safe, or other structure to be protected, as hereinbefore referred to.

The general circuits connecting the various parts of the electrical burglar-alarm system comprised in the subject-matter of my present invention, may be arranged in any suitable or desired manner, and I have herein shown one preferred arrangement of circuits which I will now proceed to describe. From one side of the battery 49, a wire, 52, extends to electrical connection with the tumblers of the combination electrical lock device 1, this electrical connection being in practice preferably through the metallic parts of said device 1, with which the tumblers are of course in metallic electrical circuit association. A wire, 53, extends from the wire 52 to the contact point 17 of the roller device 12. From the other side of the battery 49, a wire, 54, extends, through the frame of the automatic drop 50 and through the test bell 51, to the short drawbolt bar contact 35. A wire, 55, extends from the wire 52 to the spring contact 38 which operates with relation to the short drawbolt bar contact 35. A wire, 56, extends, from the spring contact 39 which operates with relation to the long drawbolt bar contact 36, to the spring contacts 20 which operate with relation to the tumblers 2 and their insulated sections 19 of the electrical lock device 1. A wire, 57, extends from the long drawbolt bar contact 36 to the contact 47 which operates with relation to the contact point 46 on the door trip plate 41. A wire, 58, extends from the wire 57 to the coil of the automatic drop 50, and from the contact point, 59, of the automatic drop 50, a wire, 60, extends, through the main alarm 48, to the wire 52. From the contact point 18 which operates with relation to the contact point 17 of the roller device 12 of the electrical lock device 1, a wire, 61, extends to the contact 29 which operates with relation to the contact point 28 of the roller device 23 of the combination lock device 3, and from said contact point 28 a wire, 62, extends to the wire 57. From the contact point 33 of the roller device 24 of the combination lock device 3, which operates with relation to the contact 34, a wire, 63, extends to the wire 57, and from said contact 34 a wire, 64, extends to the wire 56. A wire, 65, extends from the wire 56 to the contact point 46 of the door trip plate 41, by electrical connection with said plate in any suitable manner.

The operation and advantages of my invention and improvements, in relation to general electrical burglar-alarm systems for the protection of vaults, safes, or other structures, will be readily understood by those skilled in the art. The diagrammatic illustration of the drawings shows the position of the contacts and the relatively-operating parts and the circuit conditions when the door of the vault or protected structure is closed or in normal position and locked, and in the positions shown the alarm system 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. Under the circumstances just indicated, if an unauthorized person tampers with the combination electrical lock controlling device 1, before trying to effect access through action upon the combination lock device 3 by removing the electrical protective status of the device 3, the turning of the driver tumbler of the electrical controlling device 1 will cause the roller device 12 to drop into the recess 11 of the tumbler and thus close the contact 17 and 18 which is normally open.

With relation to the various contacts, it will be understood that the contact 28 and 29 is normally closed, the contact 33 and 34 is normally open, the contacts 35 and 38 and 36 and 39 are normally open, the contact 46 and 47 is normally open, the contact 17 and 18 is normally open, and the contact of the automatic drop 50 is normally open.

The closing of the contact 17 and 18 as above indicated will complete a circuit and cause an alarm to be sounded, as follows: from one side of the battery 49 through the wires 52 and 53, through the contact 17 and 18, through the wire 61, through the closed contact 28 and 29, through the wires 62 and 57, through the wire 58, through the automatic drop 50, and through the wire 54, to the opposite side of the battery 49. The circuit thus completed through the automatic drop will cause the continuous actuation of the alarm 48 through its circuit connections by the wire 60. The continuous alarm circuit thus established is as follows: from one side of the battery 49 through the wire 54, through the frame and closed contact 59 of the automatic drop, through the wire 60 and across the magneto bell-device 48, and through the wire 52 to the other side of the battery 49.

If, instead of first tampering with the combination electrical lock controlling device 1, the burglar or other unauthorized person tampers with the combination lock device 3, the actuation of the tumbler 21 will cause the roller 24 to drop into the recess 22 of said tumbler and close the normally-open contact 33 and 34, thus completing a circuit and causing the alarm to be sounded, as follows: from one side of the battery 49 through

the wire 52, through the tumblers 2 of the electrical lock device 1, through the spring contacts 20, through the wire 56, through the wire 64, through the contact 33 and 34, through the wires 63 and 57, through the wire 58, through the automatic drop 50, and through the wire 54, to the opposite side of the battery 49.

Should an attack be made upon the door of the vault or protected structure, by blowing down the door or otherwise impairing its relation to the door frame at points having the door trip 41, said trip would be released and thus close the normally open contact 46 and 47, which would complete a circuit and cause the actuation of the alarm, as follows: from one side of the battery 49 through the wire 52, through the tumblers 2 and spring contacts 20, through the wire 56, through the wire 65, through the trip plate 41 and contact 46 and 47, through the wire 57, through the wire 58, through the automatic drop 50, and through the wire 54 to the opposite side of the battery 49.

Should an attempt in any manner be made to spring the drawbolts, which would bring the spring contact 39 in connection with the contact 36 on the drawbolt bar, a circuit would be completed and an alarm sounded thereby, as follows: from one side of the battery 49 through the wire 52, through the tumblers 2 and spring contacts 20, through the wire 56, through the contacts 39 and 36, through the wire 57, through the wire 58, through the automatic drop 50, and through the wire 54, to the opposite side of the battery 49.

The insulated sections or blocks 19 of the tumblers 2 of the combination electrical lock controlling device 1 are for the purpose of permitting the insulation of the spring contacts 20 from said tumblers 2, after the combination lock device 3 has been properly set to break the normally-closed contact 28 and 29, the relative positional arrangement of said insulated sections 19 being adapted to this purpose and with respect to the secret combination and the conditions of operation hereinafter described. In the operative arrangement as herein shown, the contact 28 and 29 is normally in closed position, by reason of the fact that the roller 23 is operating upon the periphery of the tumbler 21 in a direction away from the recess 22 of said tumbler, and it will be understood that the roller 24 would drop into said recess and thus close the normally-open contact 33 and 34 before the roller 23 could enter said recess, in the operative actuation of the combination lock device 3. These conditions are related to the features of my invention and improvements by which the locking means may be at any time operated to enable the opening of the door of the protected structure without causing an alarm to be sounded, but this provision of operation can only be accomplished by an authorized person having cognizance of the secret combination whereby authorized access to the protected structure can be gained. For instance, the adjustment of the combination lock device 3 is such that a secret combination will enable the operation of the lock to permit the roller 23 to drop into the recess 22 when the tumbler 21 is turned to the left from the position shown in the diagrammatic illustration of the drawings, and the conditions are such that it would be necessary to turn said tumbler to the left and to stop at a definite secret combination whereby the recess 22 will be directly under the roller 23. It will be understood that if the tumbler was first turned to the right, in tampering with the combination lock, a circuit would be completed and the alarm actuated by reason of the closing of the normally-open contact 33 and 34. But the operation under the secret combination, by an authorized person having cognizance thereof, to bring the recess 22 directly under the roller 23, would cause the opening of the normally-closed contact 28 and 29 and thus disconnect the combination lock device 3 from the alarm circuits. Then, under these conditions, the authorized person, in the further operation of the locking means, can manipulate the combination electrical lock controlling device 1 to arrive at a definite secret combination, of which he has cognizance, which will set the spring contacts 20 on the insulated sections or blocks 19 of the tumblers of said device 1. This latter action of course takes the electrical current connections completely from the combination lock device 3 and the drawbolt bar contacts 39 and 36 and the door trip device 41, and the authorized person can thereafter manipulate the combination lock device 3 upon its regular locking combination and unlock and open the door in the usual manner without sounding the alarm and without disturbing the general conditions of the burglar-alarm system which are not related to the locking means and the opening and closing of the access door. The secret combination herein set forth, for disconnecting the locking means and door protective contacts from the electrical current connections, is of course entirely different from the regular combination by which the locking means is operated to enable the unlocking and opening of the door. In practical usage, it is of course not necessary that the same person have cognizance of the secret combination whereby the locking means is disconnected from the electrical current connections and the regular combination for enabling the unlocking and opening of the door, but these different combinations can be respectively known to two persons the

presence of both of which would be required to enable the unlocking and opening of the door and access to the protected structure without actuating the alarm.

A further condition of the operative status of the electrical burglar-alarm protective system comprised in my present invention and improvements is that, when the bolt of the combination lock 3 is thrown, by the usual operation of said lock, and the bolts which fasten the door to the walls of the door opening and which are held by the drawbolt bar 8 are released by means of the usual drawbolt handle, the movement of said drawbolt bar 8 either forward or backward causes the passage of the short drawbolt bar contact 35 under the spring contact 38 on the door frame. This completes a circuit during the period of time the contact 35 is passing beneath the contact 38 in the movement of the drawbolt bar 8, and during this period of time the test bell 51 will be sounded. This sounding of the bell will serve as an indication that the batteries are in good condition, and will also serve as an automatic test of the strength of the batteries. It will be understood that the movement of the drawbolt bar 8 only maintains this completed circuit condition for a determined period of time, regulated by the length of the short drawbolt bar contact 35, as the spring contact 38 will pass off the contact 35 and onto the insulated plate 37 in either direction, during the movement of the drawbolt bar 8. The completed circuit under the conditions just mentioned, is as follows: from one side of the battery 49 through the wire 52, through the wire 55, through the spring-contact 38, through the contact 35, and through the wire 54 and test bell 51 and automatic drop 50, to the opposite side of the battery 49. The operative status of the contacts 35 and 38 is also such that in closing and locking the door the test bell will continue to ring until the door and drawbolt bar have been brought to proper position, as only the proper throwing of the drawbolts will bring the contacts 35 and 38 in the relative position in which they are out of contact, and thus the operative status of the mechanism just described will serve as a test for assuring the proper closing and locking of the door.

In the preferred arrangement of the combination electrical lock controlling device 1 and the combination lock device 3, both of these devices may be suitably arranged to be carried by the same door of the protected structure, but within the compass and intent of my invention and improvements the combination lock device 3 could be mounted upon the door of the protected structure and the combination electrical lock controlling device 1 could be mounted at any other suitable desired point or station or in an electrically-protected housing or structure, under which circumstances the electrical circuit connections between the devices 1 and 3 would be contained in a protected cable such as is usually employed in burglar-alarm systems of this character where an exposed connection is made between two separated parts of the system. If the device 1 is located at a station away from the protected structure, its operative conditions would be controlled at that station, and thus the control of the combination lock device 3, to enable the opening of the door of the protected structure and access thereto without actuating the alarm, would be governed from the station at which the device 1 was located. It will be understood that, when the controlling device 1 is located at an alarm station away from the protected structure, a single device 1 could be adapted to protect a plurality of distant structures either located adjacent each other or at various individual points and each guarded by the combination lock device 3, by having the electrical connections from the single controlling device 1 extend to all the separate combination lock devices 3. Thus, the control of all of the electrically protected combination lock devices 3 could be governed by an operator at a distant central station, who would have to set the controlling device 1 so that the spring contacts 20 contacted with the insulated blocks or sections 19 thereof before the combination locks 3 of the distant protected structures could be operated to enable access without actuating the alarm. Under the circumstances and conditions just stated, authorized persons desiring access to the protected structures would first notify the central station to properly set the controlling device 1, to enable their access to the protected structure without actuating the alarm, or the central station could operate the controlling device 1 at a predetermined and mutually understood time when access was to be permitted to the protected structure or structures.

Various other modifications in the relative arrangement and operative status of the mechanisms comprised in my present invention and improvements may also be employed. If desired, a mechanical time lock could be employed with relation to either or both the combination electrical lock controlling device 1 and the combination lock device 3, to dog the same, as will be readily understood.

I do not desire to be understood as limiting myself 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 my invention to varying conditions of use without departing from the spirit and scope of my

invention and improvements. I therefore reserve the right to all such variations and modifications as properly fall within the scope of my invention and the terms of the following claims.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, locking means governing said access means and in electrical connection with said circuit, said connection comprising means whereby unauthorized tampering with the locking means will cause the actuation of the alarm, and manually-operatable means in electrical connection with said circuit, said last named connection comprising means whereby unauthorized tampering with said manually-operatable means will cause actuation of the alarm and means whereby authorized operation of said manually-operatable means will disconnect said locking means from its circuit connections to enable operation of the locking means without actuating the alarm.

2. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, locking means governing said access means and in electrical connection with said circuit, said connection comprising means whereby unauthorized tampering with the locking means will cause the actuation of the alarm, and supplementary means manually-operatable to cause actuation of the alarm and to control the circuit connections of said locking means so that authorized operation of the latter can be effected without actuating the alarm.

3. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, locking means governing said access means and in electrical connection with said circuit, said connection comprising means whereby unauthorized tampering with the locking means will cause the actuation of the alarm, and supplementary means in connection with said alarm circuit and in connection with the circuit connections of said locking means with said alarm circuit said supplementary means being manually-operatable to cause actuation of the alarm and control the electrical connections of said locking means so that authorized operation of the latter can be effected without actuating the alarm.

4. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, locking means governing said access means and in electrical connection with said circuit, said connection comprising means whereby unauthorized tampering with the locking means will cause the actuation of the alarm, supplementary manually-operatable means in connection with said alarm circuit, said last named connection comprising means whereby unauthorized tampering with said manually-operable means will cause the actuation of the alarm, electrical circuit connections between said supplementary means and said locking means, and means for disconnecting said supplementary means from its circuit connections and to permit operation of the locking means without actuating the alarm.

5. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, a combination-lock mechanism governing said access means and in connection with said circuit, said connection comprising means whereby unauthorized tampering with said combination-lock mechanism will cause the actuation of the alarm, a supplementary combination mechanism in connection with said alarm circuit, said last named connection comprising means whereby unauthorized tampering with said supplementary combination mechanism will cause the actuation of the alarm, and electrical connections between said supplementary combination mechanism and said combination-lock mechanism, said last named connections comprising means whereby authorized actuation thereof will enable operation of the combination-lock mechanism without actuating the alarm.

6. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, a combination-lock mechanism governing said access means and comprising tumblers, an automatic switch mechanism governed by the tumblers of said combination-lock mechanism and in connection with said alarm circuit, whereby unauthorized tampering with the combination-lock mechanism will cause the actuation of the alarm, a supplementary combination mechanism comprising tumblers, an automatic switch mechanism governed by the tumblers of said supplementary combination mechanism and in connection with said alarm circuit whereby unauthorized tampering with said supplementary combination mechanism will cause the actuation of the alarm, and circuit connections between said supplementary combination mechanism and said combination-lock mechanism, said last named connections comprising means whereby authorized actuation thereof will enable operation of the combination-lock mechanism without actuating the alarm.

7. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, a combination-lock mechanism governing said access means, an automatic switch mechanism controlled by the moving parts of said

combination-lock mechanism and in connection with said alarm circuit, whereby unauthorized tampering with said combination-lock mechanism will cause the actuation of the alarm, and means for so controlling the circuit connections of said combination-lock mechanism that authorized operation thereof can be effected without actuating the alarm, said last named means being in connection with said alarm circuit and operatable to cause actuation of the alarm.

8. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, a combination-lock mechanism governing said access means, circuit connections between said combination-lock mechanism and said protective alarm circuit, and means operatable by said combination-lock mechanism for controlling its circuit connections, said means comprising devices for maintaining the circuit connections open when the combination-lock mechanism is operated on the true combination and for closing the circuit connections when the combination-lock mechanism is tampered with.

9. In a burglar-alarm system, a structure to be guarded, access means to said structure, an electric alarm circuit protecting said structure, a lock mechanism controlling the means of access to said guarded structure, circuit connections between said lock mechanism and said protective alarm circuit, said connections comprising means whereby unauthorized tampering with said lock mechanism will cause the actuation of the alarm, and means exterior of said protected structure, and governing said lock mechanism to cause actuation of the alarm in one order of movement and in another order of movement to disconnect said lock mechanism from said electrical connection to permit authorized operation thereof without actuating the alarm.

10. In a burglar-alarm system, a structure to be guarded, access means to said structure, an electric alarm circuit protecting said structure, a lock mechanism controlling the means of access to said guarded structure, circuit connections between said lock mechanism and said protective alarm circuit, said connections comprising means whereby unauthorized tampering with said lock mechanism will cause the actuation of the alarm, and manually-operatable means exposed exteriorly upon said protected structure and operatable in one order of movement to cause actuation of the alarm and in another predetermined order of movement to so control the electrical connection of the locking mechanism that authorized operation thereof can be effected without actuating the alarm.

11. In an alarm system, an electric protective alarm circuit, a combination switch mechanism in connection with said alarm circuit and operatable to cause the actuation of the alarm, a combination switch and locking mechanism in connection with said alarm circuit and with said first combination switch mechanism and operatable to cause the actuation of the alarm, and manually-operatable means governing said combination mechanisms to cause actuation of the alarm in one order of movement and in another predetermined order of movement to disconnect said combination mechanisms from the alarm circuit to permit authorized opening of the combination locking mechanism without actuating the alarm.

12. In a burglar-alarm system, a structure to be guarded, an electric alarm circuit protecting said structure, a combination switch mechanism in connection with said alarm circuit and operatable to cause the actuation of the alarm, a combination switch and locking mechanism inclosed within the guarded structure and in connection with said alarm circuit and with said first combination switch mechanism and operatable to cause the actuation of the alarm, and manually-operatable means exposed exteriorly of said protected structure and governing said combination mechanisms to cause actuation of the alarm in one order of movement and in another predetermined order of movement to disconnect said combination mechanisms from the alarm circuit to permit authorized opening of the combination locking mechanism without actuating the alarm.

13. In an alarm system, an electric protective alarm circuit, a combination switch mechanism in connection with said alarm circuit and operatable to cause the actuation of the alarm, a combination switch and locking mechanism in connection with said alarm circuit and with said first combination switch mechanism and operatable to cause the actuation of the alarm, means governing said combination mechanisms to cause actuation of the alarm in one order of movement and in another predetermined order of movement to disconnect said combination mechanisms from the alarm circuit to permit authorized opening of the combination locking mechanism without actuating the alarm, and means for indicating whether the locking mechanism has been returned to normal locking action and is thus set for its operative action to cause actuation of the alarm, said means operating when the locking mechanism is operated to return it to locking position.

14. In an alarm system, an electric protective alarm circuit, a combination switch mechanism in connection with said alarm circuit and operatable to cause the actuation of the alarm, a combination switch and locking mechanism in connection with said alarm circuit and with said first combination

switch mechanism and operatable to cause the actuation of the alarm, means governing said combination mechanisms to cause actuation of the alarm in one order of movement and in another predetermined order of movement to disconnect said combination mechanisms from the alarm circuit to permit authorized opening of the combination locking mechanism without actuating the alarm, an auxiliary test alarm circuit and a supplementary automatic switch mechanism in connection with said test alarm circuit and operating to actuate the same to indicate whether the locking mechanism has been returned to normal locking action and is thus set for its operative action to cause actuation of the alarm, said supplementary switch mechanism being operative when the locking mechanism is operated to return it to locking position.

15. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, a combination switch and locking mechanism governing said access means and in connection with said alarm circuit and operatable to cause the actuation of the alarm, means controlling said combination switch and locking mechanism to enable authorized operation thereof without actuating the alarm, a movable part comprised in the locking mechanism and controlling the operative locking action thereof, an auxiliary test alarm circuit, a circuit contact carried by said movable part and in connection with said test alarm circuit, and a fixed contact operatable with relation to said movable circuit-contact and in connection with the test alarm circuit, whereby said contacts will operate to cause the actuation of the test alarm circuit to indicate whether the locking mechanism has been returned to normal locking action and is thus set for its operative action to cause the actuation of the alarm, said contacts operating when said movable part of said locking mechanism is operated to return the locking mechanism to locking position.

16. In an alarm system, an electric protective alarm circuit, a structure protected thereby, access means to said structure, a combination switch mechanism in connection with said alarm circuit and operatable to cause the actuation of the alarm, a combination switch and locking mechanism governing said access means and in connection with said alarm circuit and with said first combination switch mechanism and operatable to cause the actuation of the alarm, means for disconnecting said combination mechanisms from the alarm circuit to permit authorized opening of the combination locking mechanism without actuating the alarm, a movable part—as at 8—comprised in the locking mechanism and controlling the operative locking action thereof, circuit contacts—as at 35 and 36—carried by said movable part, and stationary circuit contacts—as at 38 and 39—adapted for contact with said movable circuit-contacts, said circuit contacts 36 and 39 being relatively arranged in electrical connection with said protective alarm circuit and with said combination mechanisms, an auxiliary test alarm circuit, said circuit contacts 35 and 38 being relatively arranged in electrical connection with said test alarm circuit, substantially as set forth, whereby said movable part and the contacts 35 and 38 and circuit connections thereof constitute means to cause the actuation of the test alarm circuit to indicate whether the locking mechanism has been returned to normal locking action and is thus set for its operative action to cause the actuation of the alarm, and said movable part and the contacts 36 and 39 and circuit connections thereof constitute means to cause the actuation of the main protective alarm circuit when said first combination switch mechanism has not been set in its operative position to establish the normal electrical connection of the combination locking mechanism with the main protective alarm circuit, said contacts operating when said movable part of the locking mechanism is operated to return the locking mechanism to locking position.

17. In a burglar-alarm system, a structure to be guarded, access means to said structure, an electric alarm circuit protecting said structure, a locking mechanism governing said access means and in connection with said alarm circuit, said connections comprising means whereby unauthorized tampering with the locking mechanism will cause the actuation of the alarm, a movable part in association with said locking mechanism and controlling the operative locking action thereof, means controlling the circuit connections of said locking mechanism to enable authorized operation thereof and of said movable part without actuating the alarm, and a supplementary automatic switch mechanism in connection with said alarm circuit and controlled by said movable part, said supplementary switch mechanism and circuit connection constituting means to cause the actuation of the alarm by movement of said part independent of any movement of said main locking mechanism.

In testimony whereof I have signed my name in the presence of the subscribing witnesses.

JOHN PRITCHARD WILLIAMS.

Witnesses:

HERMANN CARL GUSTUS HUHN,

FREDERICK ARNOLD SMITH.