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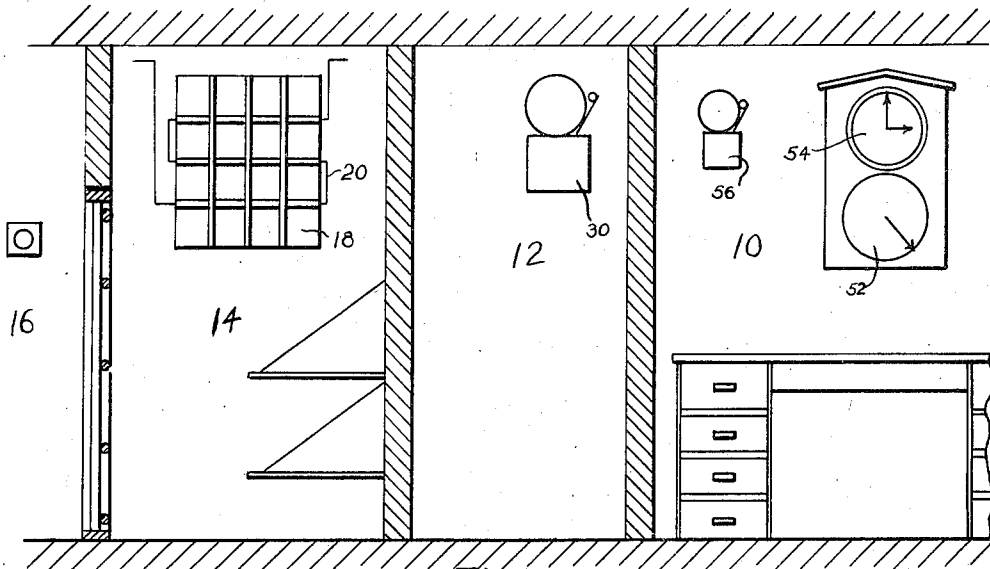
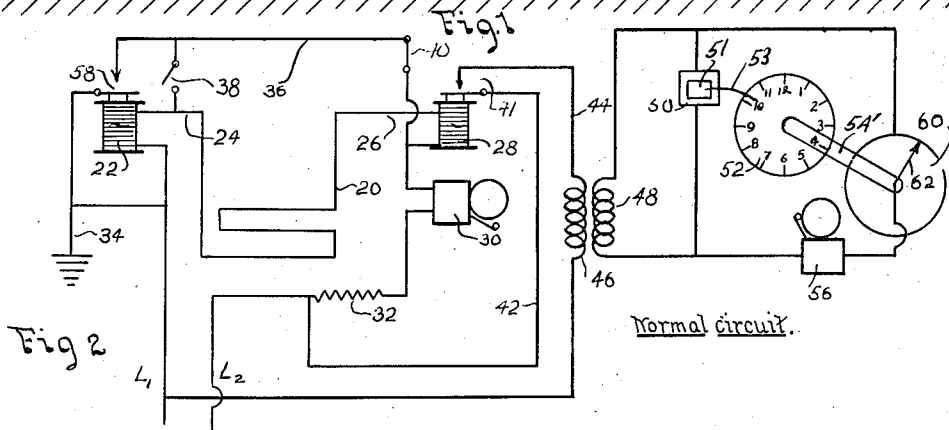
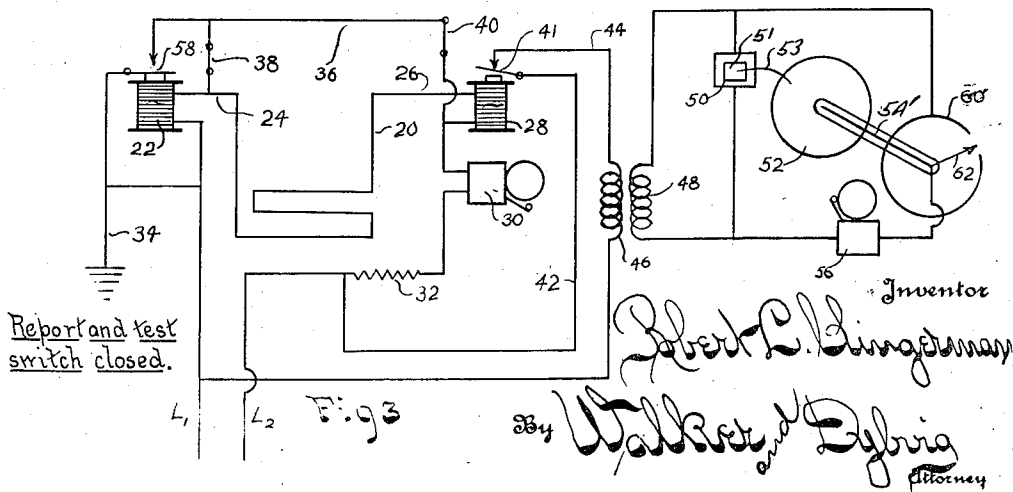
R. L. CLINGERMAN

2,101,049

PROTECTIVE SIGNALING DEVICE

Filed Jan. 9, 1935

2 Sheets-Sheet 1



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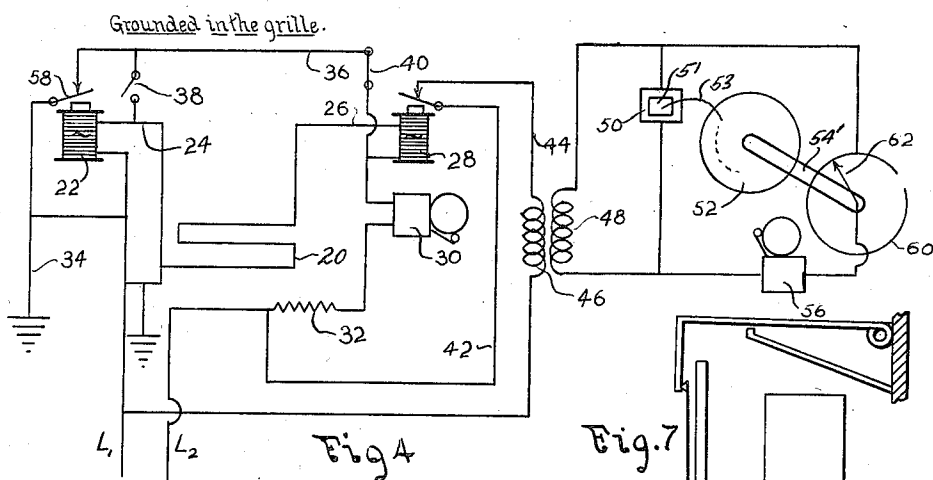
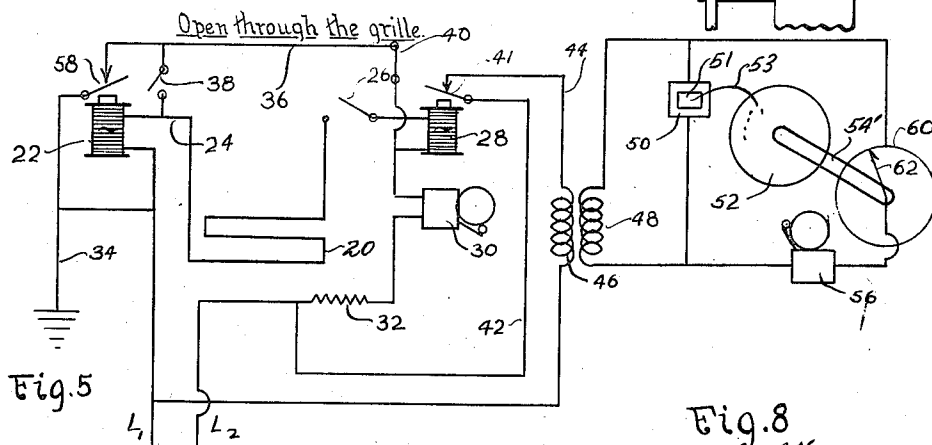
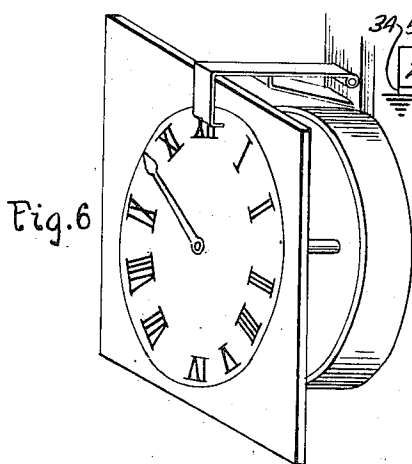
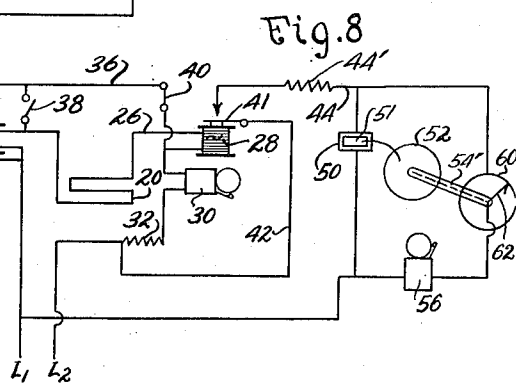
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PROTECTIVE SIGNALING DEVICE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,101,049

PROTECTIVE SIGNALING DEVICE

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Application January 9, 1935, Serial No. 975

5 Claims. (Cl. 177—314)

This invention relates to a protective signaling device and more particularly to a protective signaling device for penal institutions.

An object of this invention is to provide an electrical signaling system responding to mutilation of grilles, detention bars, muntin bars or protective devices extending across the more vulnerable areas of penal institutions.

Another object of this invention is to provide an electrical network for protection that may also be used in a reporting system.

Another object of this invention is to provide an alarm system emitting one type of alarm in case an attempt is made to escape through the more vulnerable area of an enclosure or confinement and a different signal to report riots.

Another object of this invention is to provide a device that may be used for periodically recording tests of the electrical network.

Another object of this invention is to provide a new and novel testing device for electrical networks.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims.

In the drawings, Fig. 1 discloses a schematic view of portions of a penal institution equipped with electrical signaling devices. Fig. 2 discloses the signaling device normally energized. Fig. 3 discloses a circuit energized and transmitting a report. Fig. 4 discloses the electric circuit that is energized but grounded at the more vulnerable area. Fig. 5 shows the same electric circuit as shown in Fig. 4 excepting the conductor through the more vulnerable area has been broken. Figs. 6 and 7 disclose fragmentary detail views of the clock control switch and recording mechanism. Fig. 8 discloses a signaling circuit adapted to use with direct current.

Various circuits have been used or attempted to be used to signal attempts of the inmates to cut the detention bars. The instant disclosure shows conductors embedded in the duo-functional detention muntin bars that are normally energized. An alarm relay has been placed on one side of the window which normally holds open a circuit shunting a primary alarm across the input terminals or lines. If the current through this relay is interrupted the circuit across the primary alarm is closed and causes this alarm to signal by ringing a bell or other suitable signaling device thereby giving a warning. As one terminal of this relay is grounded, the terminal remote from the window, it can readily be seen that if the conductor through the window is grounded no current will flow through the relay thereby causing the

circuit through the primary signal to be closed. Another relay has been placed on the opposite side of the window which normally holds open a circuit connected to a reporting mechanism and a circuit to a secondary signaling device. If a guard on duty closes a shunt around this last mentioned relay, which will hereinafter be referred to as the riot reporting and testing relay, the circuit through the reporting device will be closed causing the reporting device to record the time upon a movable dial so as to have a record as to when the shunt switch was closed. The secondary signaling device is provided with a clock mechanism which periodically open-circuits the circuit through the secondary signaling device so that if the guard turns in a report on schedule no gong will be sounded but if the guard turns in a report at any other than schedule time a gong will be heard. When the guard closes the shunt around the second mentioned relay, or the riot and test relay, the current through the conductor in the window is utilized so that if the entire system has been deenergized this may be detected by the absence of a report turned in on schedule time.

Referring to the drawings, like parts are indicated by similar characters of reference throughout the several views.

Referring to Fig. 1, the reference character 10 indicates the warden's office or the report receiving station, 12 the corridor, 14 a cell, and 16 a remote corridor. The window 18 is provided with a plurality of conductors 20 embedded in the muntin bars so that if an attempt is made to saw the muntin bars, the conductors 20 are grounded when the saw, usually of metal, contacts both the bars and the conductors. These conductors 20 are energized from a suitable source of either alternating or direct current supplied to the lines L—1—L—2, Figs. 2 or 3, the line L—1 being connected in series with the relay 22, to a conductor 24 connecting the relay 22 to the conductor 20, and conductor 26 connecting the other terminal of the conductor 20 to the riot or test relay 28 having the other terminal connected to an alarm signal 30 connected in series with the line L—2. In order to secure the proper voltage upon the terminals of the relays and the alarm signal, a resistance 32 may be connected in series with the alarm signal. The impedance of the series circuit including relay windings 22 and 28 and the resistance 32 is sufficiently high to prevent ringing of the primary alarm 30 when it is energized through this circuit. This alarm 30 operates only on a relatively high potential which necessitates the elimination of at least some of the voltage drops across other impedances in the circuit before the alarm will operate. The line L—1 is grounded at 34. A shunt circuit including the lead 36, a switch 38, and switch 40 is connected between the conductor 24 and the alarm signal 30.

If and when the guard closes the switch 38 no current will flow through the relay 28, which permits the contact 41 to move away from the relay 28 into the full line position disclosed in Fig. 3 to close the circuit through the conductors 42 and 44, the latter including a primary winding 46 of a step down transformer. If direct current is used the transformer must obviously be eliminated, as is well known to those skilled in the art. Members 50, 52, 56, 60 and 62 may then be connected into a suitable direct current circuit including the normally open contacts 41 controlled by the relay 28. A suitable resistance 44' is provided, when a direct current is used, and lines L—1 and L—2 lead from a suitable source of direct current such, for example, as a battery (not shown). In the embodiment disclosed, the secondary winding 48 of the transformer is connected across the terminals of the recording device 50 that records the time the switch 38 is closed upon the rotary dial 52 driven by a clock 54 as by a driving connection 54' leading from the driving mechanism of the clock 54. The clock 54 permits the circuit through the riot signal 56 to remain closed except for short durations of time when the guard may report from predetermined stations at prearranged times. If the guard closes the switch 38 at any other time the circuit through the riot signal 56 is closed thereby producing a riot alarm in the warden's office. The closing of the switch 38 does not, however, supply sufficient current to operate the alarm signal 30 as the impedance of the emergency alarm relay 22 reduces the current flow through the alarm signal 30 below the value required to operate this alarm.

The grounded terminal 34 of the relay 22 is connected to the relay operated switch 58 that also closes the shunt circuit 36 but in addition to closing the shunt circuit it also grounds one terminal of the primary alarm signal 30 which permits sufficient current to flow through the primary alarm signal 30 to give a signal. In the event that conductors 20, 24 or 26 are open circuited the relay 22 is deenergized and the switch 58 is closed, which causes sufficient current to flow through the primary alarm signal, to signal, but as the shunt 36 is closed no current will flow through the relay 28 which causes the switch 41 to close the circuit through the conductors 42 and 44 thereby energizing the primary winding 46 and the secondary winding 48, recording upon the dial 52 and if not on the schedule reporting time the riot signal 56. These circuits will remain closed so that as the clock closes the circuit through the riot signal 56 it will also signal.

The recording device 50 includes driving means 51 actuating an arm 53, the end of which is provided with a writing implement, normally out of contact with the rotating dial 52. Whenever a signal is to be registered upon the dial 52 the driving means 51, which includes a magnet, is energized to actuate the arm 53 causing the writing implement to record the time upon the dial 52.

Instead of the circular segment 60 closing the circuit through the rotary brush 62, a stationary switch may be used as shown in Figs. 6 and 7. In these figures, the switch 64 is provided with a movable member 66 that normally rests in closed position but is moved to open position by the rotary hand 68 driven by the clock. Instead of the dial 52 being disk-shaped as dis-

closed in Figs. 2, 3 and 4 this may be cylindrical and driven by the clock as shown at 70 in Figs. 6 and 7.

Starting and resetting

The primary circuit is deenergized. The coils of the relays 22 and 28 are therefore deenergized and since their contacts are spring actuated, said contacts are held in a closed position under such circumstances. Switch 40 is opened. With this switch open at the time potential is impressed upon L₁ and L₂, the contacts of relays 22 and 28 become opened because of current flow through their coils, thus establishing the original primary circuit, after which switch 40 must be closed, and can be, without in any way altering the already established current flow.

Switch 40 is not only an important part of the invention but without it the apparatus will not function as described, so that it is essential. Should the primary circuit, after being deenergized, be energized by a potential impressed upon L₁ and L₂ when switch 40 is closed, or if there be no such switch, the current flow would be L₁, 34, 58, 40, 30, 32 and L₂ thus sounding the primary alarm 30 indefinitely until lead 36 is open-circuited by opening switch 40 or some equivalent means. It thus becomes evident that the circuit will not function without switch 40.

Circuit analysis

If a signal is reported by the system it may be determined whether an open circuit or a ground is the cause. This may be determined by opening switch 40. If the circuit is grounded, the opening of switch 40 will cause alarm 30 to cease, and it will also cause the secondary alarm 56 and registration to cease for the reason that relay 28 becomes again energized through ground. When the circuit is grounded both terminals of relay 28 are at ground potential, one of such grounds taking place through switch 40, which if opened removes this ground thereby energizing this relay and reestablishing the flow of current therethrough.

If an open circuit is developed, the opening of switch 40 causes the alarm 30 to cease but fails to so affect the secondary alarm 56 and registration for the reason that the relay 28 remains deenergized irrespective of the position of switch 40.

Thus it will be seen that by means of switch 40 it may be determined whether the circuit is grounded or open. Upon the opening of the switch 40 and removal of the ground or the open circuit, as the case may be, the lines L₁ and L₂ being energized, the closing of the switch 40 will again restore the system to normal operating condition.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of

putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

5 Having thus described my invention, I claim:

1. A protective signaling system, comprising, a grounded source of E. M. F.; a normally closed protective circuit, including in series the winding of an emergency alarm relay, a protective conductor, the winding of a secondary alarm relay, and a primary alarm means; a secondary alarm means under the control of the contacts of the secondary alarm relay, to give a secondary signal upon deenergization of the secondary alarm relay; means, including a normally open circuit, having a manually operable test switch and the contacts of the emergency alarm relay therein, connected in series with the primary alarm means, and in parallel with the winding of the secondary alarm relay; a normally open circuit energizable by the source of E. M. F., and having the contacts of the secondary alarm relay therein, and including means for energizing the secondary alarm means; whereby, opening of the protective circuit causes actuation of both alarm means, and opening of the manual switch silences both alarm means, if their actuation was caused by a ground imposed on the protective circuit, but only the primary alarm means, if their actuation was caused by an opening of the protective circuit.

2. A protective signaling system, comprising a grounded source of E. M. F.; a normally closed protective circuit including in series the winding of an emergency alarm relay, a protective conductor, the winding of a secondary alarm relay and a relatively high potential primary alarm means; a shunt circuit connected across the terminals of said source of E. M. F., said shunt circuit including means for energizing a secondary alarm means under the control of the contacts of the secondary alarm relay to give a secondary signal upon the deenergization of the secondary alarm relay; means including a normally open circuit having a manually operable test switch and the contacts of the emergency alarm relay therein connected in series with the primary alarm means and in parallel with the winding of the secondary alarm relay; whereby opening of the protective circuit causes actuation of both alarm means, and opening of the manual switch silences both alarm means, if the actuation was caused by a ground imposed on the protective circuit, but only the primary alarm means, if the actuation was caused by the opening of the protective circuit.

3. A protective signaling system, comprising a grounded source of E. M. F.; a normally closed protective circuit including in series the winding of an emergency alarm relay, a protective conductor, the winding of a secondary alarm relay and a relatively high potential primary alarm means; a second circuit energized from a suitable source of E. M. F., said second circuit including means for energizing a secondary alarm means under the control of the contacts of the secondary alarm relay to give a secondary signal upon the deenergization of the secondary alarm relay; means including a normally open circuit having a manually operable test switch and the contacts of the emergency alarm relay therein connected in series with the emergency alarm

relay and the primary alarm means and in parallel with the secondary alarm relay; whereby opening of the protective circuit causes actuation of both alarm means, and opening of the manual switch silences both alarm means, if the actuation was caused by a ground imposed on the protective circuit, but only the primary alarm means, if the actuation was caused by the opening of the protective circuit.

4. A protective signaling system, comprising, 10 a grounded source of E. M. F.; a normally closed protective circuit, including in series the winding of an emergency alarm relay, a protective conductor, the winding of a secondary alarm relay, and a primary alarm means; a secondary alarm means under the control of the contacts of the secondary alarm relay, to give a secondary signal upon deenergization of the secondary alarm relay, means for energizing the secondary alarm means; means, including a normally open circuit, 20 having a manually operable test switch and the contacts of the emergency alarm relay therein, connected in series with the primary alarm means, and in parallel with the winding of the secondary alarm relay; a normally open circuit energizable from a source of E. M. F. and having the contacts of the secondary alarm relay therein, means for causing the deenergization of the secondary alarm relay to cause the closing of the normally open circuit to energize the secondary alarm means; whereby, opening of the protective circuit causes actuation of both alarm means, and opening of the manual switch silences both alarm means, if their actuation was caused by a ground imposed on the protective circuit, but 35 only the primary alarm means, if their actuation was caused by an opening of the protective circuit.

5. A protective signaling system for a detention means preventing the passage of human bodies, said system comprising a source of E. M. F. having one terminal at the same potential as the detention means; a normally closed protective circuit, including in series the winding of an emergency alarm relay, a protective conductor 45 embedded in the detention means, the winding of a secondary alarm relay, and a primary alarm means; a secondary alarm means under the control of the contacts of the secondary alarm relay, to give a secondary signal upon deenergization of the secondary alarm relay, means for energizing the secondary alarm means; means, including a normally open circuit, having a manually operable test switch and the contacts of the emergency alarm relay therein, connected in series 55 with the winding of the primary alarm means, and in parallel with the secondary alarm relay; a normally open circuit energizable from a source of E. M. F. and having the contacts of the secondary alarm relay therein, means for causing the deenergization of the secondary alarm relay to cause the closing of the normally open circuit to energize the secondary alarm means; whereby, opening of the protective circuit causes actuation of both alarm means, and opening of the manual switch silences both alarm means, if their actuation was caused by a ground imposed on the protective circuit, but only the primary alarm means, if their actuation was caused by an opening of the protective circuit. 70

ROBERT L. CLINGERMAN.

CERTIFICATE OF CORRECTION.

Patent No. 2,101,049.

December 7, 1937.

ROBERT L. CLINGERMAN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 56, claim 5, strike out the words "winding of the" and insert the same before "secondary" line 57, same claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of February, A. D. 1938.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.