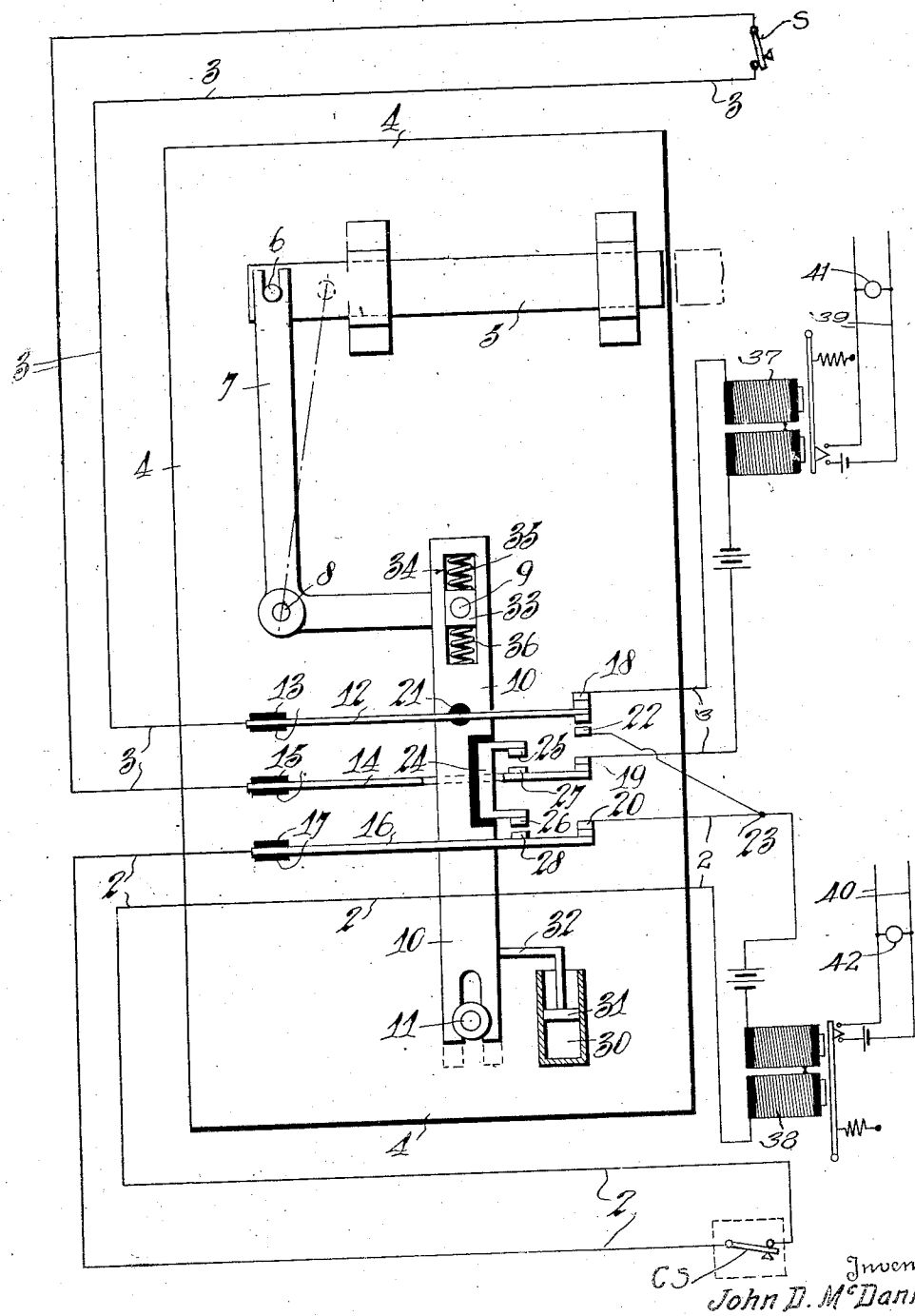
Nov. 22, 1927. 1,650,288

J. D. McDANIEL

PROTECTIVE ALARM SYSTEM

Filed April 10, 1925



Inventor
John D. McDaniel.

By Albert E. Dietrich

Attorney

Patented Nov. 22, 1927. 1,650,288

UNITED STATES PATENT OFFICE.

JOHN D. McDANIEL, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

PROTECTIVE ALARM SYSTEM.

Application filed April 10, 1925. Serial No. 22,178.

This invention relates to protective alarm systems and it particularly has for its object to provide a system employing two distinct signaling circuits, one of which may be used to protect the openings to buildings such as windows, doors, etc. and the other used with concealed switches, hold-up switches and the like to protect the interior of a building, each circuit including, at a central protective agency, a suitable signal giving device operable to give an indication should the respective circuit be opened; the invention also has for its object to provide means associated and operable with the locking and unlocking of the door of a building for giving a signal to a central station attendant, through the medium of which he can tell whether the door has been locked or unlocked and at what time, and for connecting those portions of the two circuits which are within the protected building, in series with one another to operate in connection with the signal giving device of one of those circuits at the central office and give an indication.

In other words the invention is a means to notify a central office whether the door of a building is locked or unlocked; also a means to protect the building against entrance from the outside when the building is locked and to protect the inside area of the building at all times.

Generically the invention resides in providing a switching mechanism connected in two separate signaling circuits, such signalling circuits each including a circuit within a building and circuit connections with an external set of signals (located at the protective agency), said switch mechanism being connected with the locking mechanism of a door of a building and arraged so that when the locking mechanism is in one position the signalling circuits will be maintained separately and when the locking mechanism is in another position the portions of the signalling circuits within the building will be connected in series and cooperate with the circuit connections of but one circuit leading from the building to the exterior signals.

The drawing illustrates diagrammatically the two circuits and the manner of connecting and disconnecting the same cooperatively with the locking and unlocking of the door.

In the drawing 2 represents one circuit which, for convenience of reference we will call the interior protection circuit, and 3 indicates the other circuit, which for convenience of reference we will call the exterior protection circuit. The interior protection circuit may be provided with the usual concealed circuit controllers and hold-up switches, while the exterior protection circuit includes the usual circuit controllers located at windows, doors and other places through which access is obtained or may be obtained to the building.

Both circuits 2 and 3 are energized by batteries or otherwise and are normally closed so that they require to be broken to give an alarm. The circuit 2 extends throughout the interior of the building and passes out to a police station or to a private protective agency in the locality.

The circuit 3 extends around the windows and doors of the building so that if the same are interfered with the circuit will be broken and an alarm given to the same protective agency to which the circuit 2 is conducted.

After the working hours of the bank, or other business having this system installed, it is desirable to connect the circuit 2 in series with the circuit 3 and this connection should be automatically established cooperatively with the locking of the main door affording ingress and egress.

In the drawing the main door is represented as bounded by the lines 4 and the slidable bolt by which the door is secured by 5.

On the lock bolt 5 is a pin 6 which engages a bifurcation 7 on the end of one arm of a bell crank lever pivoted on the door at 8. The other end of this lever is pin-connected at 9 to a bar 10 which is vertically movable on a guide pin 11 secured to the door at the lower end of the bar.

Two parallel switch bars 12 and 14 are connected to the door 4 on suitable insulation at 13 and 15, which bars are connected to parallel wires of the circuit 3. These switch bars have a spring tendency to maintain this circuit 3 closed on the contacts 18 and 19 respectively located on the opposite side of the vertically movable bar 10 from the springy bar's connections.

A similar switch bar 16 is connected at 17 to the door and to one of the wires of the

circuit 2 and has a spring tendency to maintain that circuit closed on a contact 20 on the other side of the bar.

The switch bar 12 is connected at 21 on suitable insulation to the vertically movable bar 10 to move with it. Downward movement on the bar 10 will then open the circuit 3 at the contact 18 and will thereafter make contact at 22 with a wire connected at 23 to the circuit 2.

The other switch levers 14 and 16 of the circuits 3 and 2 respectively have contacts 27 and 28 on them adjacent the bar 10, which contacts are normally clear of corresponding contacts 25 and 26 on a conducting member 24 secured on suitable insulation to the bar 10.

Downward movement of the bar 10 will first close these contacts 25 and 26 on the contacts 27 and 28 of the switch bars 14 and 16 and will thereafter move these switch bars to break connection at 19 and 20 from their respective lines 3 and 2.

The throwing of the bolt 5 to lock the door 4 will thus move the bar 10 downward and in doing so will open the circuit 3 at 18 and 19 and the circuit 2 at 20, and will simultaneously connect the open end of the circuit 2 with the circuit 3 at 22 and will connect the other open end of the circuit 2 with the other wire of the circuit 3 at 28, 27 through the conducting member 24 on the bar 10.

As it is desirable that the opening and closing of these contacts should occur a sensible period after movement of the locking bolt 5, the downward movement of the bar 10 is delayed by an air dash pot 30 secured to the door 4, in which dash pot is movable a piston 31 connected at 32 to the bar 10, and the pin 9 of the bell crank lever is mounted in a die block 33 movable in an elongated slot 34 in the bar 10. The die block 33 is supported in the medial position between upper and lower springs 35, 36, so that as the bolt 5 is thrown to secure the door, the lower spring 36 is compressed and the pressure of that spring is gradually exerted on the bar 10 to overcome the air resistance in the dash pot 30: Conversely, when the bolt 5 is moved backward to release the door, the upper spring 35 is compressed and its pressure slowly acts to overcome the air resistance in the dash pot 30 to move the bar 10 to the position in which the switch levers 12, 14 and 16 close the circuits 2 and 3 as separate circuits.

At the protective station any suitable signalling device may be employed. For convenience of illustration I have indicated such device as follows: For the circuit 3 there is provided a relay 37 which is adapted, when de-energized, to close a local circuit 39 which includes a signal 41. For the circuit 2 there is provided a relay 38 which, when de-energized, is adapted to close a local circuit 40 containing a signal 42.

Operation.

Assume that the door is unlocked as indicated in full lines in the drawing. At that time circuit 3 will be connected with the relay 37, which, being energized, keeps local circuit 39 open and signal 41 extinguished. In a like manner relay 48 is energized through circuit 2 and signal 42 is extinguished. Should entrance to the building be attempted through an unauthorized opening S (such unauthorized opening being protected by the circuit 3) circuit 3 will be broken, relay 37 will be de-energized and signal 41 will be energized, thus indicating to the attendant at the central station that the "exterior protection" circuit 3 of the building has been broken and some one has attempted to enter the building at an unauthorized place.

Likewise should a hold-up occur the party held up, by operating a concealed switch CS in circuit 2, breaks that circuit which de-energizes relay 38 and sets signal 42, thus indicating to the attendant at the protection station that a hold-up has occurred.

Assume that both circuits 2 and 3 are intact and relays 38 and 37 energized and signals 42 and 41 extinguished the building is now to be locked as in the evening when the building has been vacated. Throwing the bolt 5 causes compression of the spring 36 which, applying a force downwardly the bar 10, will momentarily break both circuits 2 and 3 causing the signals 41 and 42 to flash at the central office. The movement downwardly of the bar 10 also causes the circuit 3 within the protected area to be thrown into series with the circuit 2 in the protected area, thereby again energizing relay 38 and extinguishing signal 42. Thus when the attendant at the protection station sees both signals flash for an instant, and then signal 42 comes on and stays on he knows that the door has been locked and the circuits 3 and 2 within the protected building have been brought into series. Then should either the circuit 2 or circuit 3 within the protected area be broken, either by some one attempting to enter or leave the building or by some one concealed within the building coming into contact with a concealed switch the circuit will be broken causing de-energizing of relay 38 and an operation of signal 42, thereby indicating to the attendant that something is wrong at the protected building.

Assume, however the combined circuit remains intact and next morning the door is unlocked. When the bolt 5 is thrown back to the unlocked position spring 35 will be compressed, moving the bar 10 upwardly. This causes a momentary break of the circuit

2 while the circuits 2 and 3 are being switched over to parallel again, causing a momentary flash of signal 42. Signal 41 will still be exposed since relay 37 has not yet been energized, but the instant the bar 10 has come to its uppermost position and brought the circuits 2 and 3 into parallel once more, both relays 38 and 37 will become energized again and both signals 42 and 41 will be extinguished. The flashing of signal 42 while signal 41 has been burning and the subsequent extinguishing of both signals indicates to the central station operator that the door has been unlocked.

From the foregoing description, taken in connection with the accompanying drawing, it is thought that the objects and utility of the invention and the mode of operation will be clear to those skilled in the art.

What I claim is:

1. In a protective alarm system for the protection of buildings, two separate normally closed and energized circuits each including a portion within the building to be protected, and a portion in an exterior protective agency and there including suitable signal giving devices, said signal giving devices being operated when the energizing circuits containing said signal giving devices are opened, a switch device operatively connected with a lock of a door of the building being protected and including means for electrically connecting said circuits for maintaining said circuits in parallel when the door lock is in one position, and for switching the portions of the circuits within the building being protected into series one with the other when the lock is in another position, said switch device also including means to momentarily open each circuit effective to cause a signal to be momentarily given when the switching operation takes place.

2. In a protective alarm system for the protection of buildings, two separate normally closed and energized circuits each including a portion within the building to be protected, and a portion in an exterior protective agency and there including suitable signal giving devices, said signal giving devices being operated when the energizing circuits containing said signal giving devices are opened, a switch device cooperatively connected with a lock of a door of the building to be protected and including means for electrically connecting said circuits for maintaining said circuits in parallel when the door lock is in one position and for switching the portions of the circuit within the building being protected into series one with the other when the lock is in another position, said switch device also including means to momentarily open each circuit effective to cause a signal to be momentarily given when the switching operation takes place, said switch device including means for disconnecting one of the circuits within the building protected from its signal giving device at the protective agency when the circuit portions within the protected building are in series.

3. In a protective alarm system for buildings, two separate circuits normally closed and energized and each including a portion within the building to be protected and a portion located in a central protective agency and there including suitable signal giving devices, said signal giving devices being operable upon the opening of said circuits, means cooperative with the locking of a door of the building being protected for momentarily opening both circuits and then switching that portion of one circuit which is located within the protected building into series with that portion of the other circuit which is located within the protected building for the purposes specified.

4. In a protective alarm system for buildings, two normally closed electric circuits each including a portion within the building to be protected and a portion located in a central protective agency and there including signal giving instrumentalities, said signal giving instrumentalities each being arranged to indicate whether the circuit including it is open or closed; means cooperating with a bolt by which a door of the building is secured for simultaneously opening both circuits and for connecting those portions of the circuits which are located within the building to be protected in series with one another and with that portion of one of the circuits which extends from the building being protected to the protective agency.

5. In a protective alarm system, the combination with two normally closed separate signaling circuits, each including a circuit portion within a building to be protected and a circuit portion complementary thereto and connecting the same with a protective agency, the circuit portions at the protective agency including suitable signal giving instrumentalities, operable upon disturbance of either circuit portion within the building to give a signal on its corresponding signal giving instrumentality at the protective agency, a switching device connected in said circuits and including means operatively connected to a lock of one of the doors of the building to be protected, said switching device including means for normally maintaining said circuits separated and in parallelism and for opening the said circuits and then connecting that portion of one of the circuits within the protected area in series with the other circuit when the lock is operated for the purpose specified.

6. In a protective alarm system, the combination with two normally closed separate signalling circuits, each including a circuit

portion within a building to be protected and a circuit portion complementary thereto and connecting the same with a protective agency, the circuit portions at the protective agency including suitable signal giving instrumentalities, operable upon disturbance of either circuit portion within the building to give a signal to the corresponding signal giving instrumentality at the protective agency, a switching device connected in said circuits and including means operatively connected to a lock of one of the doors of the building to be protected, said switching device including means for normally maintaining said circuits separated and in parallelism and for opening the said circuits and then connecting that portion of one of the circuits within the protected area in series with the other circuit when the lock is operated, and means interposed in the connection between the door lock and the switch device for delaying the switching operation after the door is locked or unlocked for the purposes specified.

7. In a protective alarm system for buildings having a door with a lock, the combination with two distinct signalling circuits each including a portion within the building to be protected and a portion outside of the building, the latter portions containing signal giving instrumentalities operable upon opening the circuits; a switching device including switching elements for each circuit whereby one of said circuits may be broken and a portion of the same connected in series with the other circuit at times, and a connection between said switching device and the lock of a door whereby the action of locking and unlocking the door will effect the operation of the switching device for the purposes specified.

8. In a protective alarm system, the combination with two normally closed parallel signalling circuits including portions in the building to be protected and portions with signalling devices at a distant station operable upon opening the circuits, and a locking bolt on a door of the building being protected; a circuit changing switch device associated with said circuits and adapted when in one position to maintain the circuits parallel and when in another position to connect the portions of the circuits within the building being protected in series with the portion of one of the circuits at the distant station, and operative connections between said locking bolt and said device for effecting the movements of the same.

9. In a protective alarm system, the combination with two normally closed parallel signalling circuits including portions in the building to be protected and portions with signalling devices at a distant station operable upon opening the circuits, and a locking bolt on a door of the building being protected; a circuit changing switch device associated with said circuits and adapted when in one position to maintain the circuits parallel and when in another position to connect the portions of the circuits within the building being protected in series with the portion of one of the circuits at the distant station, operative connections between said locking bolt and said device for effecting the movements of the same, and means associated with said switch device for delaying its action with relation to the movement of the locking bolt.

10. In protective alarm systems wherein is provided two distinct normally closed signal circuits connected with a central agency at which the circuits include suitable signal giving instrumentalities operable upon disturbance of the normal condition of the circuits; a switching device comprising elements for each circuit whereby one of said circuits may be broken and a portion of the same connected in series with the other circuit at times, a door lock and a connection between said switching device and the door lock whereby the action of locking and unlocking the door will effect the operation of the switching device.

11. In a protective alarm system wherein two distinct normally closed signal circuits are provided; a switch device for switching said circuits from parallel circuits to a condition where one circuit is broken and a portion of the same is connected in series with the other circuit, said switching device comprising a support, a door locking bolt mounted on the support, a bell crank lever connected with the bolt and pivoted on the support, a slide bar slidably mounted on the support, a dash pot cooperating with the slide bar for delaying its movements, a connection between said bell crank lever and said slide bar including spring elements, a plurality of spring contact members mounted on said support, fixed contact members on said support associated with said spring contact members, and means carried by said slide bar for effecting the position of said spring contact members with relation to said fixed contact members according to the movements of said slide bar.

In testimony whereof I affix my signature.

JOHN D. McDANIEL.