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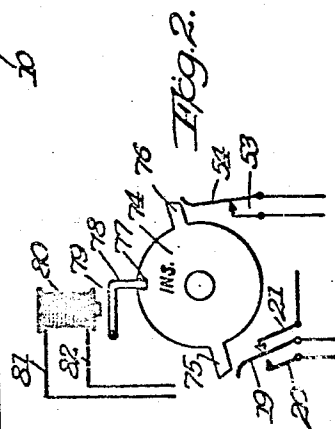
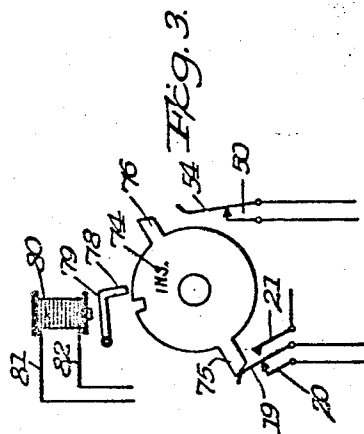
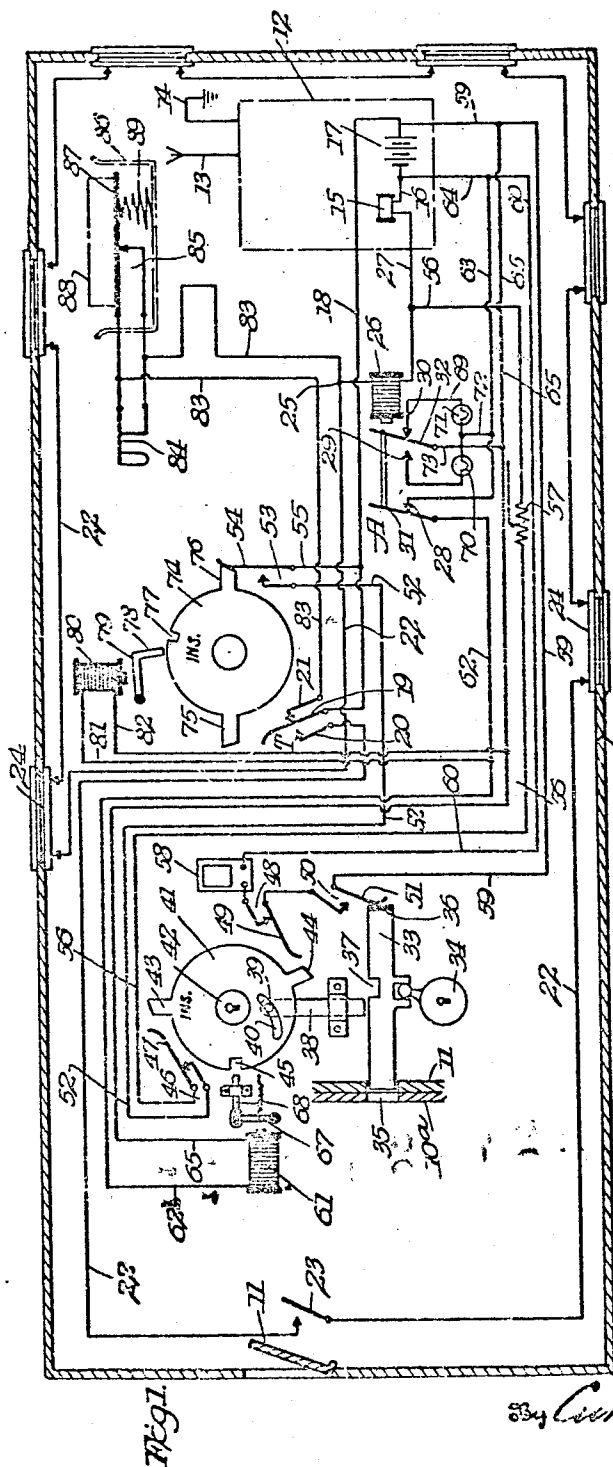
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RADIO ALARM SYSTEM

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UNITED STATES PATENT OFFICE

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RADIO ALARM SYSTEM

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7 Claims. (CL 177—314)

This invention relates particularly to alarm systems comprising a plurality of alarm circuits intended to be alternatively active and the circuits may be, for example, a night alarm circuit and a day alarm circuit. In premises such as a bank building, for instance, I provide, according to the present invention, a door and window circuit for night protection and it is, of course, important that during the day this circuit, in the normal use of the windows and doors, be rendered inoperative to effect an alarm. I provide also a day circuit which may include various control switches, such as money switches and the like, and it is hereinafter assumed, for purposes of illustration of the invention, that the day system is desirably rendered inoperative at night. A main purpose of the invention is to provide means whereby the alarm signal control may be conveniently transferred from one circuit to the other and no false alarm be given in case either circuit, through inadvertence, is not intact when sought to be placed in control.

In order that the invention may be readily understood, I have shown diagrammatically a practical embodiment thereof in the accompanying drawing with reference to which the description will proceed.

In the drawing:

Figure 1 shows an embodiment of the invention in proper day condition.

Figure 2 shows an association of elements which appear in Figure 1, in a different relation, and

Figure 3 shows the same elements in a still different relation.

For the purpose of illustration the basic alarm system is assumed to be a radio alarm system, such as disclosed, for example, in my copending applications Serial No. 184,713, filed January 12, 1938 and Serial No. 191,783, filed February 21, 1938.

Referring to the drawing, reference numeral 10 designates the enclosing walls of the protected premises and reference numeral 11 designates a door, here assumed to be the one designated for use by an authorized person closing or opening the premises.

Reference numeral 12 designates generally a radio transmitter such as is disclosed, for example, in my above mentioned applications, the transmitter including an aerial 13 and a ground 14. The aerial is ordinarily disposed outside of the protected premises, but if desired may be arranged inside. Operation of the transmitter is initiated by means of a relay having a coil 15

and it is here assumed, as in the above mentioned applications, that the coil is normally energized and that upon its deenergization an alarm signal will be broadcast.

One end of coil 15 is connected by a wire 15 with one side of a battery 17, the other side of the battery being connected by a wire 18 with the movable switch arm 19 of a transfer switch T, the arm 19 being cooperable with one or the other of fixed contacts 20 and 21 and being spring biased toward the latter for contact therewith.

Contact 20 is connected directly into the night protective circuit designated by reference numeral 22, this circuit being a burglar circuit and including a switch 23 which may be operated by the door 11 to be opened when the door is opened, and various window switches as at 24 and back to a terminal 25. Switch 23 may be manually closed to render circuit 22 intact. Terminal 25 is in connection with one end of the coil 26 of a relay A, the other end of coil 26 being connected by a wire 27 with the other end of coil 15. It will thus be seen that with switch arm 19 in engagement with contact 20 and switches 23 and 24 closed, relay coil 15 will be energized. There may, of course, be any desired number of door and window switches or other appropriate switches in the night circuit 22.

Relay A comprises fixed contacts 28, 29 and 30, and contactor arms 31 and 32 movable in unison and normally spring biased to the left, Figure 1, so that contact is made between arm 32 and contact 29 and broken between arm 31 and contact 28 and arm 32 and contact 30.

Slidably guided in door 11 is a bolt 33 which is reciprocable by means of a key controlled operator 34 between the unlocking position shown and the locking position wherein it is engaged in a recess 35 in the adjacent jamb 10a. At its inner end bolt 33 carries an insulating pad 36 and on its top surface is provided with a square notch 37. Vertically reciprocable above bolt 33 and in the plane of the latter is a detent 38 to whose upper end is fixed a pin 39 engaged in the cam slot 40 of a disc 41 of insulating material mounted on a rotary key controlled operator 42. With detent 38 in the position shown, bolt 33 is freely reciprocable by means of operator 34, but when recess 37 is directly beneath the detent, as in the locking position of the bolt, the detent may be projected downwardly through the pin and slot connection upon rotation of the disc 41 through operator 42 in counter-clockwise direction. Disc 41 carries a pair of radially projecting fingers 43

and 44, and between these fingers has a square notch 45 formed in its periphery.

A switch 46 includes an arm 47 in the path of finger 43 and a similar switch 48 includes an arm 49 in the path of finger 44. Both of arms 47 and 49 are spring biased to the closed position shown, but upon counter-clockwise rotation of disc 44 are engageable by fingers 43 and 44, respectively, so that the switches are opened. Switch 48 is in series with a switch 53 which includes an arm 51 spring biased toward closed position, but held in open position by the insulating pad 35 on bolt 33 when the latter is in the unlocking position shown.

The fixed contact of switch 46 is connected by a wire 52 with the fixed contact of a switch 53 which includes an arm 54 spring biased toward closed position, arm 54 being connected by a wire 55 with wire 18. Arm 47 of switch 46 is connected by a wire 56 through an adjustable resistance 57 with wire 27 and when switches 46 and 53 are closed it will be evident that a shorting circuit for the burglar circuit is established and the condition of the night circuit 22 is immaterial so far as effect upon coil 15 is concerned.

A buzzer or other desired signalling means 58 is in connection with battery 17 on the one side through switches 48 and 59 and a wire 59 and on the other side through a wire 60 so that when the two switches are closed the buzzer is operative.

A magnet 61 has one end of its winding connected through a wire 62 with the arm 31 of relay A and when the arm 31 is engaged with contact 23 as shown, a line is completed through wires 63 and 64 to one side of battery 17. The other end of coil 61 is connected by wires 65 and 69 with the other side of battery 17. A pivotally mounted armature 67 is cooperative with magnet 61 and is in pivotal connection with a reciprocable latch 68 which is adapted to engage in recess 45 of disc 41 when the parts are in the relation shown.

A circuit 69 extending between contacts 29 and 30 of relay A contains a red light 70 and a green light 71 and a wire 72 connects wire 63 with circuit 69 between the two lamps. Relay arm 32 is connected with wire 65 through a wire 73.

Reference numeral 74 designates a rotary operator disc of insulating material having fingers 75 and 76 cooperable with switch arms 19 and 54 respectively. Disc 74 may be key controlled like disc 41, although this is not essential. Between arms 75 and 76 the disc has a square peripheral recess 77 which is engageable by a latch 78 formed as part of a pivoted armature 79 which is associated with a magnet 80 whose winding is connected by means of wires 81 and 82 to wires 62 and 65 respectively. Operator 74 and associated switches are mounted at a convenient point inside the premises.

The day alarm or protective circuit 83, also a burglar circuit as here contemplated, is connected between contact 21 of the transfer switch T and terminal 25. Interposed in this circuit are a normally closed push switch 84 and normally closed money switch 85. The latter is mounted in a drawer 86 and includes a metallic pivotally mounted money support 87 which will ordinarily be held in switch closing position by the weight of the bills 88 supported thereby. If the bills, or most of them, are removed, plate 87 will be lifted by a relatively weak spring 89 so that switch 85 is opened. However, the circuit 83

will still be complete through switch 84 and this switch, as well as switch 85, must be opened in order that an alarm signal may be produced. Other appropriate switches may be included in the day circuit.

With the system in the condition shown, the day circuit is complete through transfer switch T and consequently coil 26 of relay A is energized so that relay arms 31 and 32 are held in engagement with contacts 28 and 36, respectively, as shown. Consequently, the green light 71 shows and magnets 51 and 80 are energized so that latches 62 and 78 are retracted and discs 41 and 74 are freely rotatable. Arm 76 is holding switch 53 open so that the shorting circuit is open. The day circuit 83 is intact and relay coil 15 is accordingly energized. The switches 84 and 85 may be assumed to be at a teller's window with switch 84 in such position as to be operable by the teller without likelihood of detection. With switch 84 held open, if bills 88 are removed from the support 87 so as to break switch 85, coil 15 will be deenergized and an appropriate alarm signal will be given. The extra switch 84 is provided so that if bills 88 are removed in ordinary transactions, a false alarm will not be given. As soon as switch 84 is released, the day circuit is again intact so that coil 15 is again energized as is also coil 26 of relay A. The deenergization of coil 25 has had no effect other than to cause temporary deenergization magnets 61 and 80 and a temporary showing of red light 70 instead of green light 71.

When the premises are to be closed, operator disc 74 is turned in a counter-clockwise direction, causing switch 53 to close before finger 75 strikes switch arm 19 to move it out of engagement with contact 21 and into engagement with contact 23, as shown in Figure 3. The system is now on the night circuit and even though this circuit is not intact a false alarm will not be given, since the shorting circuit has been closed at switch 53.

The person closing the premises now leaves through door 11, closes the same, and through operator 34 moves bolt 33 to the locking position wherein recess 37 is directly below detent 38. Switch 59 closes so that buzzer 58 begins to operate as a reminder that something remains to be done. Disc 41 is then turned in a counter-clockwise direction, and can be freely turned provided the night circuit is intact. If the night circuit is not intact, magnet 61 will be in deenergized condition so that latch 68 will be in notch 45, thus locking operator 41 against rotation. Under these circumstances the person closing the premises must re-enter the premises and place the night circuit in proper condition.

Assuming that the night circuit is intact, rotation of disc 41 will project detent 33 into notch 37, thus locking bolt 23 against movement. Switches 46 and 48 will be opened by fingers 43 and 44, respectively, so that the shorting and buzzer circuits will be interrupted.

When entering the premises, operator 41 is turned in a clockwise direction thus releasing bolt 33 and permitting switches 46 and 48 to close, establishing the shorting and buzzer circuits. As soon as bolt 33 is moved to unlocking position the buzzer circuit is broken at switch 50. Upon entering the premises the operator 74 is turned in a clockwise direction. The arrangement is such that the transfer switch operates to close the day circuit through contact 21 prior to the time notch 77 passes latch 78 and before finger

75 has opened switch 53. If the day circuit is not intact, coil 80 will be de-energized and latch 78 will engage in notch 77, Figure 2, to lock operator 74 against further movement. Switch 53 is still closed so that the shorting circuit is complete and a false alarm cannot be given. When the day circuit is properly conditioned, latch 78 will be retracted by magnet 80 so that operator 74 may be moved to the position of Figure 1, opening switch 53 and placing the system under the control of the day circuit.

It will be understood that the present disclosure is merely illustrative of the invention and not restrictive of the scope thereof, determined in the claims which follow. The door system, that is the bolt 33, operator 41 and circuits controlled thereby are not claimed per se herein, being covered in my copending application Serial No. 212,330, filed June 7, 1938.

In referring, in the claims, to "disturbance of" a burglar circuit, is meant the affecting of the circuit, in a manner appropriate to the particular circuit, to disturb its normal current condition so that it is conditioned to cause operation of the alarm signal means.

I claim:

1. An alarm system comprising a day protective circuit, a night protective circuit, and alarm signal producing means, a transfer switch for placing said circuits alternatively in operative association with said signal producing means so that disturbance of the circuit so operatively associated and of that circuit only, will cause an alarm signal to be produced, a circuit across said night circuit for shorting the same so that disturbance thereof will not affect said signal producing means, a switch in the shorting circuit, and a common operator for controlling movements of said switches, the arrangement being such that upon appropriate manipulation of said operator the transfer switch is moved from night to day position and then the shorting circuit switch is opened.

2. An alarm system comprising a day protective circuit, a night protective circuit, and alarm producing means, a transfer switch for placing said circuits alternatively in operative association with said signal producing means so that disturbance of the circuit so operatively associated and of that circuit only, will cause an alarm signal to be produced, a circuit across said night circuit for shorting the same so that disturbance thereof will not affect said signal producing means, a switch in the shorting circuit, a common operator for controlling movements of said switches, the arrangement being such that upon appropriate manipulation of said operator the transfer switch is moved from night to day position and then the shorting circuit switch is opened, locking means for said operator, and means for rendering said locking means operative to lock the operator prior to the opening of said shorting circuit switch if the day circuit is not intact.

3. An alarm system comprising a day protective circuit, a night protective circuit, and alarm signal producing means, a transfer switch for placing said circuits alternatively in operative association with said signal producing means so that disturbance of the circuit so operatively associated and of that circuit only, will cause an alarm signal to be produced, a circuit across said night circuit for shorting the same so that disturbance thereof will not affect said signal producing means, a switch in the shorting circuit,

a common operator for controlling movements of said switches, the arrangement being such that upon appropriate manipulation of said operator the transfer switch is moved from night to day position and then the shorting circuit switch is opened, locking means for said operator, and means for rendering said locking means operative to lock the operator prior to the opening of said shorting circuit switch if the day circuit is not intact, said last-named means including electromagnetic means controlled in dependence upon the condition of the day circuit.

4. An alarm system comprising a day protective circuit, a night protective circuit, and alarm signal producing means, a transfer switch for placing said circuits alternatively in operative association with said signal producing means so that disturbance of the circuit so operatively associated and of that circuit only, will cause an alarm signal to be produced, a circuit across said night circuit for shorting the same so that disturbance thereof will not affect said signal producing means, a switch in the shorting circuit, a common operator for controlling movements of said switches, the arrangement being such that upon appropriate manipulation of said operator the transfer switch is moved from night to day position and then the shorting circuit switch is opened, locking means for said operator, and means for rendering said locking means operative to lock the operator prior to the opening of said shorting circuit switch if the day circuit is not intact, said operator being constituted by a pivoted member having operating arms for said switches.

5. An alarm system comprising a day protective circuit, a night protective circuit, and alarm signal producing means, a transfer switch for placing said circuits alternatively in operative association with said signal producing means so that disturbance of the circuit so operatively associated and of that circuit only, will cause an alarm signal to be produced, a circuit across said night circuit for shorting the same so that disturbance thereof will not affect said signal producing means, a switch in the shorting circuit, a common operator for controlling movements of said switches, the arrangement being such that upon appropriate manipulation of said operator the transfer switch is moved from night to day position and then the shorting circuit switch is opened, locking means for said operator, and means for rendering said locking means operative to lock the operator prior to the opening of said shorting circuit switch if the day circuit is not intact, said operator being constituted by a pivoted member having operating arms for said switches, and said locking means comprising a latch and a notch in said operator in which the latch is engageable.

6. An alarm system for premises including an entrance door provided with a lock, said system comprising a day protective circuit, a night protective circuit, and alarm signal producing means, the combination of a transfer switch for placing said circuits alternatively in operative association with said signal producing means so that disturbance of the circuit so operatively associated, and of that circuit only, will cause an alarm signal to be produced, a circuit across said night circuit for shorting the same so that disturbance thereof will not affect the signal producing means, a switch in said shorting circuit inside the premises, a common operator for controlling movements of said switches, the arrangement being

such that upon appropriate manipulation of said operator the transfer switch is moved from night to day position and then the shorting switch is opened, and a second switch in said shorting circuit operable from the exterior of the door by an authorized person, said second switch being normally open when said door is locked and being normally closed when the door is unlocked.

7. In an alarm system for premises including an entrance door provided with a lock, said system comprising a day protective circuit, a night protective circuit, and alarm signal producing means, the combination of a transfer switch for placing said circuits alternatively in operative association with said signal producing means so that disturbance of the circuit so operatively associated, and of that circuit only, will cause an alarm signal to be produced, a circuit across said night circuit for shorting the same so that disturbance thereof will not affect the signal producing means, a switch in

said shorting circuit inside the premises, a common operator for controlling movements of said switches, the arrangement being such that upon appropriate manipulation of said operator the transfer switch is moved from night to day position and then the shorting switch is opened, and a second switch in said shorting circuit operable from the exterior of the door by an authorized person, said second switch being normally open when said door is locked and being normally closed when the door is unlocked, an operator for said second switch, means operative to prevent movement of the operator for said second switch to open the latter when the system is on night circuit and the latter is not intact, and means to prevent manipulation of said common operator to an extent to move the first shorting circuit switch to open position after transfer to day circuit when said day circuit is not intact.

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