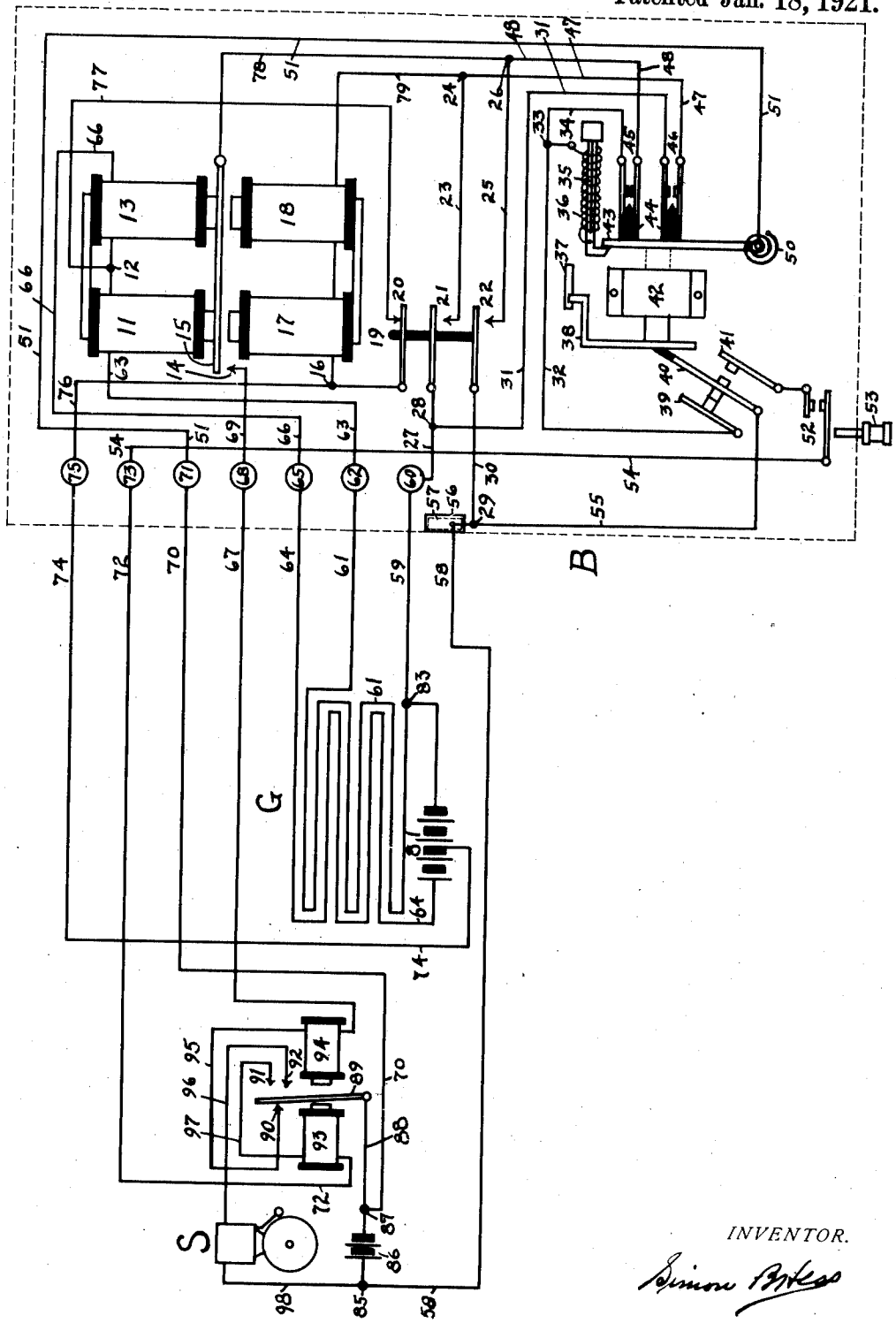
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THERMOSTATIC BURGLAR ALARM SYSTEM.

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1,365,693.

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THERMOSTATIC BURGLAR-ALARM SYSTEM.

1,365,693. Specification of Letters Patent. Patented Jan. 18, 1921.

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To all whom it may concern:

Be it known that I, SIMON B. HESS, a citizen of the United States, residing at Jamaica, in the county of Queens and State of New York, have invented certain new and useful Improvements in Thermostatic Burglar-Alarm Systems, of which the following is a specification.

This invention relates to electric burglar alarm systems of the class employed for the protection of banks, stores, and the like, and it is an object of this invention to provide novel means whereby the person manipulating the system is enabled to leave the guarded structure by any exit within a certain time after setting the alarm without actuating the signal.

This invention consists in the general combination of parts and details described hereinafter, all of which contribute to produce an effective burglar alarm system.

A preferred embodiment of my invention is described in the accompanying specification, while the scope of the protection contemplated is pointed out in the claims.

In the drawing, the dotted rectangle B incloses a diagrammatic representation of the instrument board as seen from the rear, G indicates the wiring in the guarded structure, and S represents the alarm signal.

Referring particularly to the instrument board B, the armature 15 is mounted between the magnet coils 11, 13 and the magnet coils 17, 18. The magnet coils 11 and 13, and 17 and 18 are so constructed and arranged that either coil 11 or 13 is able to move said armature 15 away from contact 14 to its attracted position when coils 17 and 18 are not energized and is able to retain said armature in its attracted position against the attraction of coils 17 and 18 when said coils are energized. Test button 19 is adapted to open switch 20 and close switches 21 and 22. Lock 42 is provided with an indicator 38 adapted to project through a slot 37 in the front of the instrument board and in one position (shown in the drawing) is adapted to hold switch contact 40 in engagement with contact 39. When moved to its opposite position, indicated by the dotted lines, switch contact 40 is moved out of engagement with contact 39 and into engagement with contact 41 and lever 43 is moved into position to be engaged by the hooked end of a thermostatic metal arm 35, bearing a heating winding 36. Lever 43 bears two insulating wedges 44 which are adapted to hold open the switches 45 and 46 when the lever is retained by the hooked end of arm 35 against the tension of spring 50. Reset button 53 is mounted in the bottom of the instrument board and is arranged to close switch 52. When the instrument board is attached to its mounting on a wall or other surface the contact plate 56 secured to the instrument board is adapted to engage contact plate 57 which is secured to the mounting.

Referring to the apparatus shown associated with the alarm signal S, armature 89 is mounted between the coils 93 and 94 and is adapted to be attracted by either coil and, as it is not biased, it will remain in the position to which it was last moved.

In the position shown in the drawing, the protective circuit (1) is complete and (the bolt of the lock 42 having just been moved from its dotted line position to its solid line position) the heating circuit (2) is also complete. These circuits are as follows:—(1) from right hand terminal of battery 81, to junction 83, conductor 61 in the guarded structure, terminal 62, on the instrument board, conductor 63, coil 11, junction 12, coil 13, conductor 66, terminal 65, conductor 64 in the guarded structure, to left hand terminal of battery 81; a current path also exists from junction 12, along conductor 77, switch 20, junction 16, conductor 76, terminal 75, conductor 74, to center of battery 81, but as this path is merely the "neutral" of the typical "three-wire" circuit the current through coils 11 and 13 is not affected by this path except when there is a break in one or the other of the conductors 61, 64:—(2) from right hand terminal of battery 86, to junction 87, conductor 70, terminal 71, conductor 51, lever 43, arm 35, winding 36, junction 33, conductor 32, contact 39, contact 40, conductor 55, junction 29, plate 56, plate 57, conductor 58, junction 85, to left hand terminal of battery 86.

The manipulator of the system may now leave the protected premises by any exit, providing only that the exit is closed and circuit (1) above traced is recompleted before the heating of thermostatic arm 35 by the winding 36 in the circuit (2) above traced becomes sufficient to cause said arm

to bend far enough away from lever 43 to release said lever.

When the hook on the end of arm 35 releases the lever 43, the force of spring 50 causes circuit (2) to be broken between arm 35 and lever 43 and by withdrawing the wedges 44 permits the closing of switches 45 and 46. The closure of switch 46 completes the following circuit:—(3) from right hand terminal of battery 81, to junction 83, conductor 59, terminal 60, conductor 27, junction 28, conductor 31, switch 46, conductor 47, junction 24, conductor 79, coil 18, coil 17, junction 16, conductor 76, terminal 75, conductor 74, to center of battery 81. Upon the closure of circuit (3) the coils 17 and 18 become energized, but as armature 15 has already been moved toward coils 11 and 13, the attraction of coils 17 and 18 has no operative effect upon said armature. The apparatus is now in the "night" or "set" condition, while the opening of circuit (2) permits the cooling of the thermostatic arm 35 and allows the hooked end thereof to bend back into position to engage lever 43 when the bolt of the lock 42 is again actuated.

When the premises are entered in the morning (which is represented by a break in both the conductors 61, 64) or in the event of an intrusion upon the guarded structure (which would result either in a breaking of both the conductors 61, 64, or in a shunting of said conductors) both of the coils 11 and 13 would become deënergized, permitting the movement of armature 15 away from coils 11 and 13 and toward coils 17 and 18 and into engagement with contact 14, thus closing the following circuit:—(4) from right hand terminal of battery 86, to junction 87, conductor 88, armature 89, contact 90, conductor 95; signal coil 94, conductor 67, terminal 68, conductor 69, contact 14, armature 15, conductor 78, junction 26, conductor 48, switch 45, conductor 34, junction 33, conductor 32, contact 39, contact 40, conductor 55, junction 29, plate 56, plate 57 conductor 58, junction 85, to left hand terminal of battery 86. Upon the closure of circuit (4) the signal coil 94 becomes energized and moves armature 89 out of engagement with contact 90 and into engagement with contacts 91 and 92.

The movement of armature 89 out of engagement with contact 90 causes the breaking of circuit (4) and the movement of said armature into engagement with contact 92 closes the alarm signal circuit as follows:—(5) from right hand terminal of battery 86, to junction 87, conductor 88, armature 89, contact 92, conductor 96, alarm signal S, conductor 98, junction 85, to left hand terminal of battery 86.

After the alarm signal has thus been set in operation it may be stopped in the following manner:—The bolt of the lock is moved from the position shown in the drawing (its extreme left hand position) to its extreme right hand position (indicated by the dotted lines). The withdrawal of the bolt from switch contact 40 permits said contact to move out of engagement with contact 39 (thus making another break in circuit (4)) and into engagement with contact 41. The movement of the other end of the bolt against lever 43 causes said lever to be moved into position to be engaged by the hooked end of arm 35 (thus closing one break in circuit (2)) and causes wedges 44 to open the switches 45 and 46 (thus making another break in circuit (4) and breaking circuit (3)). The reset button 53 is then pressed upward, closing switch 52 and completing the following circuit:—(6) from right hand terminal of battery 86, to junction 87, conductor 88, armature 89, contact 91, conductor 97, reverse coil 93, conductor 72, terminal 73, conductor 54, switch 52, contact 41, contact 40, conductor 55, junction 29, plate 56, plate 57, conductor 58, junction 85, to left hand terminal of battery 86. Upon the closure of circuit (6) the reverse coil 93 becomes energized and moves armature 89 out of engagement with contacts 91 and 92 and into engagement with contact 90, opening circuits (6) and (5) and closing one break in circuit (4). The opening of circuit (5) stops the operation of the alarm signal. The apparatus is now in the "day" or "unset" position.

The test button 19 is provided to enable the person in charge of the premises, or any other person, to test the apparatus without using the lock and also without using the thermostatic arm and then being required to wait for it to cool. The test is made as follows:—Assuming all exits closed, circuit (2) is open between contact 39 and contact 40; circuit (3) is open at switch 46; circuit (4) is open at switch 45, also between contact 39 and contact 40; circuit (5) is open between armature 89 and contact 92; and circuit (6) is open between armature 89 and contact 91, also at switch 52. If now, test button 19 is pressed, the "neutral" of the circuit for coils 11 and 13 is opened at switch 20; the break in circuit (3) at switch 46 is short-circuited via junction 28, switch 21, conductor 23, to junction 24; the breaks in circuit (4) at switch 45 and between contact 39 and contact 40 are short-circuited via junction 26, conductor 25, switch 22, conductor 30, to junction 29. If either conductor 61 or 64 is broken or if these two conductors are "crossed," or if battery 81 is of insufficient strength, armature 15 is not moved out of engagement with contact 14, and circuit (4) is completed, causing the energization of signal coil 94, the closing of alarm signal circuit (5), and the operation of the alarm

signal S. After releasing button 19, the alarm signal may be stopped by the manipulation of button 53 to close switch 52. If the alarm does not operate it can be assumed that the protective conductors 61 and 64 are complete and that battery 81 is of sufficient strength. However, the non-operation of alarm signal S might be due to a failure of battery 86, signal coil circuit (4), or alarm signal circuit (5). This may be tested by opening any exit and thereafter depressing test button 19. If the alarm signal now operates, it is evident that battery 86, signal coil circuit (4) and alarm signal circuit (5) are in operative condition and hence the non-operation of alarm signal S on the first test showed that the protective conductors 61 and 64 were complete and that battery 81 was of sufficient strength.

In case there is a break in one of the conductors 61 or 64, the alarm signal S will be operated when the system is tested in the manner just described, but even while in this condition the system may be "set" and protection obtained, because the armature 15 will be moved to its attracted position when the lock is moved to the "set" position and will remain in attracted position as long as the other protective conductor is intact. When the building is entered this other conductor will be disturbed and the alarm will be sounded.

In case there is a break in both of the conductors 61 and 64, or the two conductors are "crossed," or the battery 81 is not of sufficient strength, the alarm signal S will be operated when the system is tested, and when the system is "set" the manipulator thereof will barely have stepped away from the last closed exit when the alarm signal will be operated, thus giving an immediate indication of the fact that the alarm system is out of order.

As shown, test button 19 is arranged to operate three independent switches 20, 21, and 22. It will be evident to one skilled in the art, that, by reversing that part of circuit (3) between junction 28 and junction 16, switches 20 and 21 may be combined into one switch having both an upper and a lower contact, the arm of the switch being common to circuit (3) and to the neutral of circuit (1).

The time interval of the thermostatic arm 35 may be varied by changing the construction of the arm itself or by changing the resistance of the heating coil 36, and it is evident that the device should be so arranged that the manipulator of the system will have sufficient time to leave the guarded structure and close the exit behind him before the arm operates to release the lever 43.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a burglar alarm system, electromagnetic means included in a protective circuit, an alarm circuit, a switch therein controlled by said electromagnetic means, a second switch therein, and thermostatically retarded means for closing said second switch connected in parallel with said second switch.

2. In a burglar alarm system, electromagnetic means included in a protective circuit, a second electromagnetic means included in a bypass in parallel with said first electromagnetic means, and retarded closing means for said bypass.

3. In a burglar alarm system, electromagnetic means included in a protective circuit, a second electromagnetic means included in a bypass in parallel with said first electromagnetic means, and thermostatically retarded means for closing said bypass.

4. In a burglar alarm system, circuit closing means, a circuit therefor including an alarm, an electromagnet to actuate said circuit closing means, and thermostatically retarded means for closing the circuit of said actuating electromagnet connected in parallel with said actuating electromagnet.

SIMON B. HESS.