

May 15, 1928.

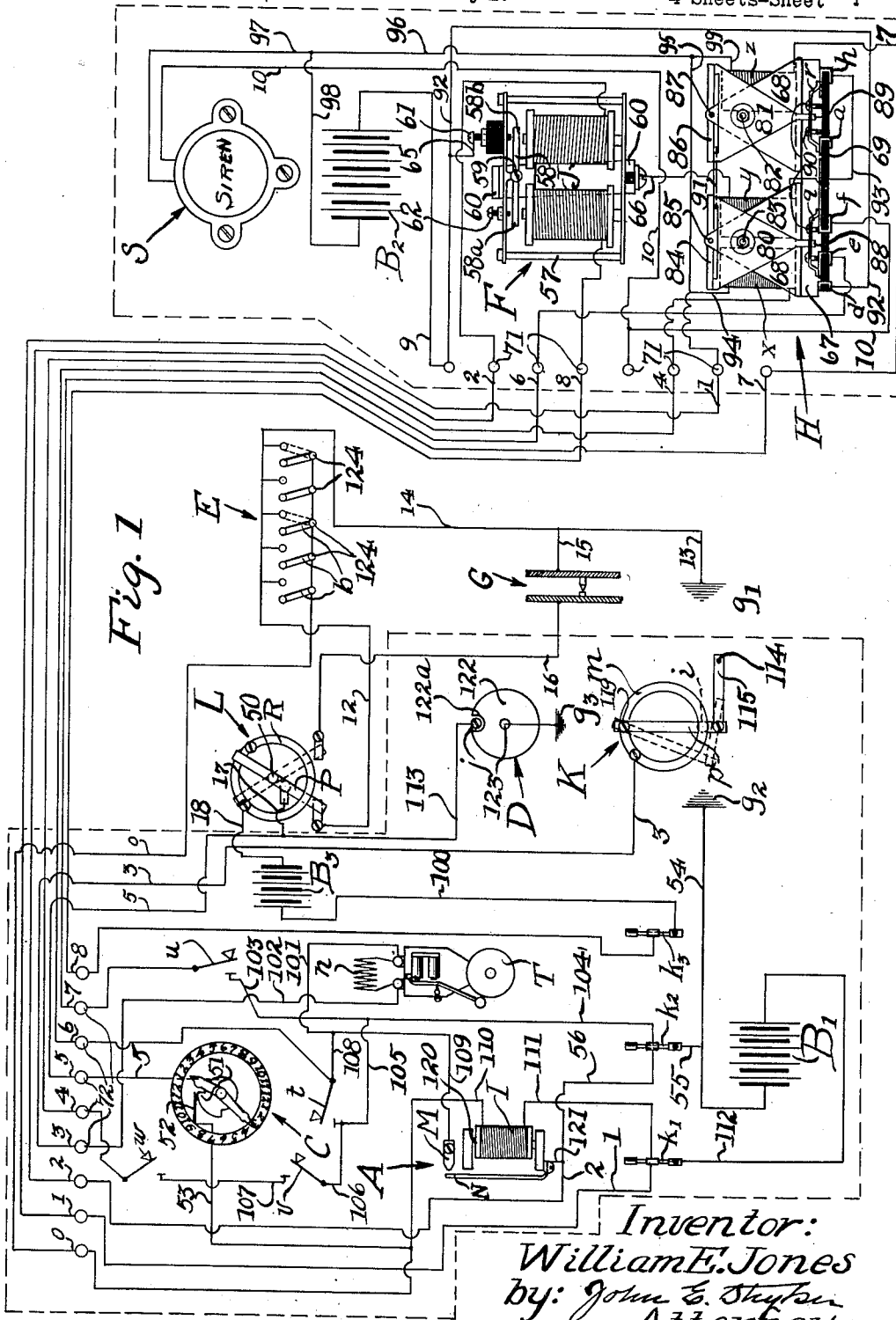
W. E. JONES

1,669,564

BURGLAR ALARM SYSTEM

Filed May 15, 1920

4 Sheets-Sheet 1



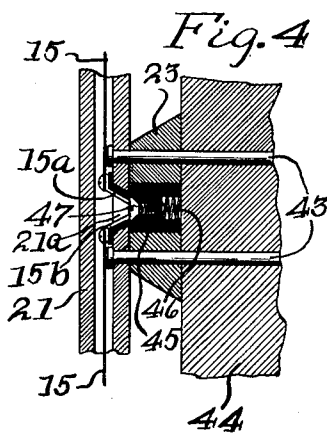
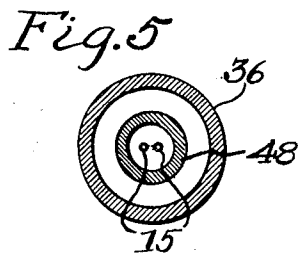
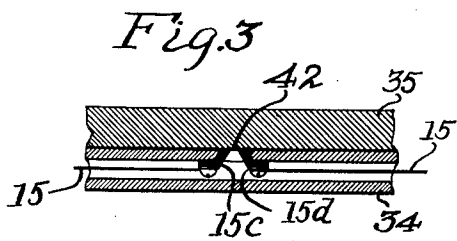
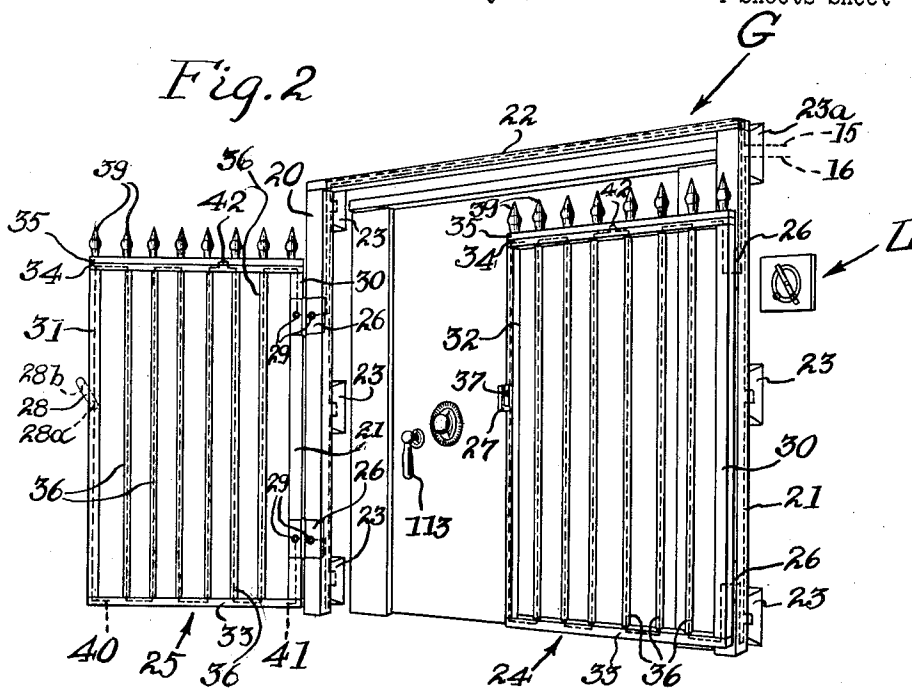
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4 Sheets-Sheet 2



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Fig. 6

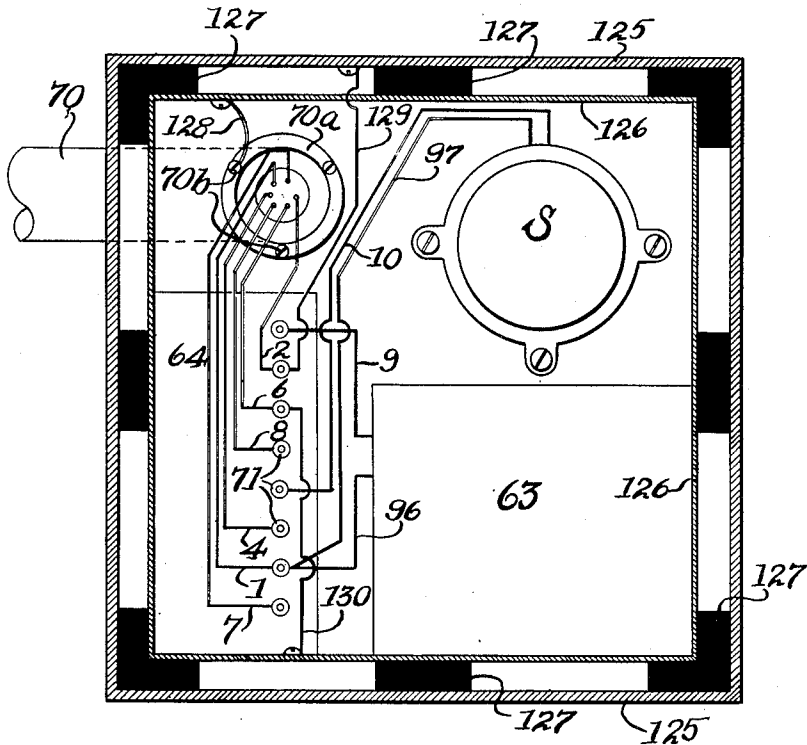


Fig. 7.

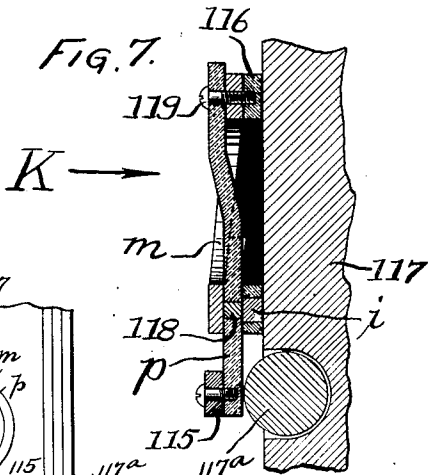


Fig. 11.

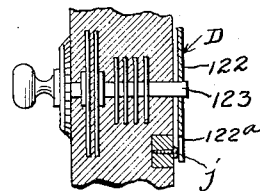
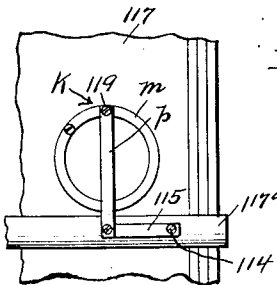


Fig. 10.

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BURGLAR ALARM SYSTEM

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Fig. 8

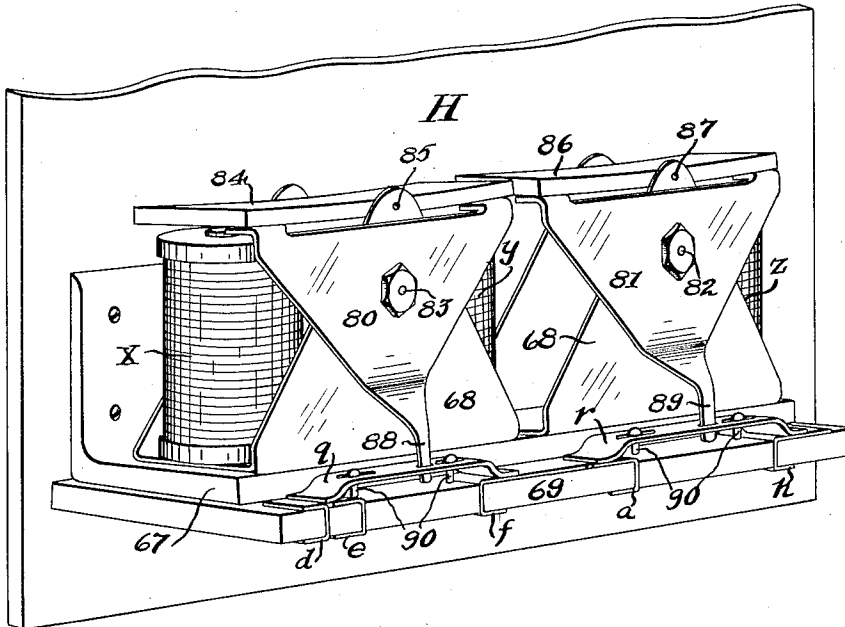
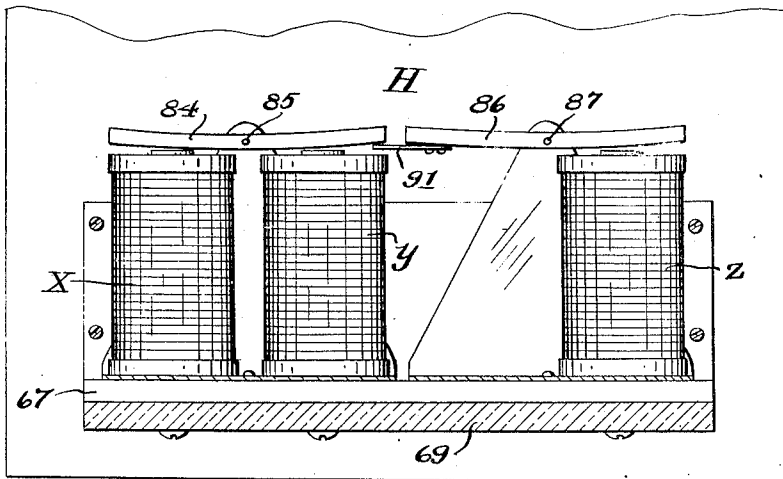


Fig. 8



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UNITED STATES PATENT OFFICE.

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BURGLAR-ALARM SYSTEM.

Application filed May 15, 1920. Serial No. 381,536.

My invention relates to improvements in burglar alarm systems. It consists generally, in providing means for protecting a bank vault, comprising a complete closed circuit system and a complete open circuit system in combination with a single alarm instrument.

The object of my invention is to give complete electrical protection to a bank vault against unauthorized entrance.

A further object of my invention is to provide means for stopping the sounding of alarms that have been caused accidentally or because of a break in the closed circuit wiring. To this end I provide a relay instrument which is controlled by push buttons located within the guarded structure, to cut out the closed circuit system, and switches at various points about the bank and on the vault combination lock which may be manipulated to stop an alarm started by the open circuit system.

Another object is to provide novel means for testing an alarm system.

By my use of a grille, of novel construction, placed over the vault door and connected with a manually operated switch in the closed circuit system and another switch in an independently acting open circuit, attached to the dial of the vault, I provide double protection for the vault door. Another advantage of my system over existing systems is in the fact that the open circuit wiring is at all times protected by the closed circuit wiring. This is accomplished by making a single wire of the circuit common to both the open and closed systems.

The shunt of the open circuit system is similar to the one set forth in my application for patent filed March 29th, 1920, Serial No. 369,721.

Referring to the accompanying drawings, Fig. 1 is a diagram of my complete system; Fig. 2 is a perspective view of the grille and vault wall switch as they are placed on a vault; Fig. 3 is a central vertical section thru a portion of the upper horizontal grille door members; Fig. 4 is a central vertical section thru one of the grille offset blocks, Fig. 5 is a horizontal section thru one of the vertical rods of the grille door; Fig. 6 is a section thru the alarm housing, and Fig. 7 is a central vertical section thru the bolt

switch, Fig. 8 is a perspective view of my relay instrument, Fig. 9 is a vertical section through said instrument, the triangular plates and supports being removed to show the three coils in elevation. Fig. 10 is a central vertical section through the combination lock and dial switch D and Fig. 11 is a fragmentary elevation of the interior of the vault door showing the mounting of the switch k thereon.

In the drawings A represents a shunt instrument used in the open circuit system, B_1 the open circuit battery, B_2 the cabinet battery, B_3 the closed circuit battery, C the clock, D the dial switch, E a plurality of banking room switches, F the closed circuit electromagnet, G the grille, H the relay instrument, K the bolt switch, L the vault wall switch, S an alarm siren and T a test bell. Three knife edge switches k_1 , k_2 and k_3 are provided to facilitate installation and for opening the circuits to make repairs. In operation these switches are normally left in the closed position.

The shunt instrument A, batteries B_1 and B_3 , clock C, test bell T, knife edge switches k_1 , k_2 and k_3 , push buttons w , v , t and u , dial switch D and bolt switch k , are located within the guarded structure. Battery B_2 may, however, be located at any desired point outside of the guarded structure. The vault wall switch L is placed on the vault wall as shown in Fig. 2; the grille G (Fig. 2) is placed over the vault door; the series of switches E are located within the various banking rooms and the siren S, battery B_2 , electro-magnet instrument F and relay instrument H are placed in the alarm housing shown in Fig. 6. A box 63 contains the battery B_2 and the instruments F and H are contained in a box 64.

A cable 70 (Fig. 6) containing wires 1, 2, 4, 6, 7 and 8 extends from the guarded structure to the alarm housing. A series of terminals 71 are provided for the cable wires and the wire 10 in the alarm housing and another series of terminals 72, located within the guarded structure is provided for wires 0 to 8 inclusive.

The construction of the grille G, represented diagrammatically in Fig. 1, is shown in Figures 2, 3, 4 and 5. A hollow frame consisting of vertical members 20 and 21 and

a horizontal member 22 is placed in front of the vault to be protected and offset from the wall by blocks 23. Grille doors 24 and 25 are mounted on this frame by means of hinges 26. The grille doors when closed are secured by a latch 27 on the door 24 and a latch bar 28 on the door 25. The grille doors 24 and 25 consist of vertical members 30, 31 and 32, horizontal members 33, 34 and 35 and vertical tubes 36 having pointed upper ends 39. All of the members and tubes of the doors are hollow and contain wires with the exception of the members 35.

The latch bar 28 pivots about a pin 28^a on the door 25 and has a knob 28^b which is adapted to be manipulated to latch the gates in closed position. The latch 27 is in the nature of a hook pointing upwards to receive the latch bar 28 when the grille doors are closed.

The members 20, 21 and 22 of the frame and all of the members of the doors 24 and 25 are protected by wiring, in the closed circuit system, as indicated in dotted lines in Fig. 2. Wires 15 and 16 of the closed circuit system enter the grille door thru the wall of the vault and upper right hand offset block 23^a. The wire 15 passes thru the hollow interior of the horizontal member 22 and down thru the member 20 to the upper hinge 26 of the door 25. All of hinges of the grille doors are provided with insulated contact buttons 29 which break the circuit at the hinges when the doors are opened and complete the circuit when the doors are closed. Thus the wire 15 continues, after passing the button 29 of the upper hinge 26 of the door 25, within the member 30 of said door, crosses in the horizontal member 34 to the first vertical tube 36, down thru this tube to the member 33, within this member to the next tube 36, up within this tube and continues weaving thru all the tubes and members to the point 40 when it weaves back thru the same tubes and members in the opposite direction to the point 41. From here the wire 15 extends thru the lower contact button 29, down within the member 20 to the lowest offset block 23 and up within said member 20, to the intermediate and upper offset blocks 23. The wire 15 makes contact with each of these blocks 23 as shown in Fig. 4 in a manner hereinafter described. From the upper block 23 the wire passes back within the member 22 and down within the member 21 to the upper hinge contact button 29 of the door 24. From here it weaves thru the door 24 identically as described for the door 25 with the exception that a button 37, located within the latch 27, is provided to break the circuit when the latch bar 28 is raised out of contact with the said button.

This button 37 is so constructed that it is depressed and the circuit containing the

wire 15 is completed when the grille doors 24 and 25 are closed and the latch bar 28 is in engagement with the latch 27.

After weaving through the members and tubes of the door 24, the wire 15 emerges thru the lower hinge contact 29 of this door and continues upwards thru the member 21 of the grille frame, making contact with the lower and intermediate offset blocks 23, on this side of said frame and passes out thru the upper offset block 23^a and into the vault thru the wall, as the wire 16.

Details of the construction of the offset blocks 23 are shown in Fig. 4. The hollow vertical members 21 are secured to the wall 44 by bolts 43 which are anchored in a suitable manner in said wall. The wire 15 has terminals 15^a and 15^b which extend through a slot 21^a in the side of the member 21 and are insulated from said member. A block of insulating material 45 fits loosely in a suitable perforation in the offset block 23 and a metallic screw 47 projects slightly from said block 45 to make contact with the terminals 15^a and 15^b. A coiled spring 46 in a recess in the block 45 abuts against the wall 44 to press the block 45 with the screw 47 towards the member 21 of the grille frame. As the insulating block 45 is loose in the perforation in the offset block 23, when the frame of the grille is secured to the wall said screw 47 will be held against the member 21 thus facilitating installation, but if said grille is torn from the wall when the closed circuit system is in operation the terminals 15^a and 15^b will be withdrawn from contact with the screw 47 and the circuit will be broken.

The horizontal members 34 and 35 of the grille doors are protected against separation by a contact point 42 for the wire 15, as shown in Fig. 3. The wire 15 is provided with insulated terminals 15^c and 15^d, similar to terminals 15^a and 15^b described above for the offset blocks 23, which make contact with the solid members 35. If the members 35 are separated from members 34 the circuit which is normally closed between the terminals 15^c and 15^d is broken at 42.

The wire 15 as it passes thru the tubes 36 is protected as shown in Fig. 5. Each of the tubes 36 contains a second hollow tube 48, thru which the wire 15 passes. The tubes 48 extend the length of the tubes 36 and are loosely held therein. If an attempt is made to gain access to the vault by sawing the tubes of the grille door, the saw after passing part way thru the tube 36 will strike the revoluble tube 48 and merely rotate the latter, it being obviously impossible for the teeth of a saw to penetrate a tube that is freely revoluble. If an attempt is made to sever the tubes in any other manner than by sawing, the wire 15 will be broken and the closed circuit opened.

My closed circuit system is used when the grille is closed, to protect the vault and in addition affords protection to the open circuit system at all times, as hereinafter described.

The switch L is placed, as shown in Fig. 2, at a point where it can be manipulated from outside of the vault. It consists of a metallic ring R (Fig. 1) insulated from the wall, and a metallic bar P which may be turned to either of the positions shown in full and dotted lines in Fig. 1. The bar P pivots about a pin 50, is always in contact with the ring R and may be placed to make contact with either the terminals of wires 12 and 17 or wire 16. Thus in the full line position the switch completes the circuit between the wire 18 and the wires 17 and 12 and in the dotted line position complete the circuit between wires 18 and 16. At night the bar P is placed in the dotted line position and in the daytime in the full line position.

The clock C is of a type ordinarily used in alarm systems, having a metallic cam 51 secured to the hour hand and a brush terminal 52 with which said cam makes contact during the night hours. A wire 5 is connected to the cam 51 and a wire 53 connected to the brush 52.

The electro-magnet instrument F comprises a frame 57 upon which is mounted two coils J, connected in series, a permanent steel magnet 60 and an armature 58. The armature 58 is pivotally mounted near its middle point on a screw 59 in the normally upper end of the frame 57 and the coils J are mounted upon the lower end of frame 57 being fastened by screws which pass through said frame into the soft iron cores of said coils. The permanent magnet 60 is rigidly connected at its lower end to the frame 57 and is offset from the vertical center line of said frame. Thus the magnet 60, through the frame 57, magnetizes the cores of the coils J giving their upper ends opposite polarity from the adjacent end of the magnet 60, and, because of the off-set arrangement of said magnet, gives a stronger pull on the end 58^a of the armature 58 than on the end 58^b. Therefore, the end 58^a is drawn downward toward the core of one of the coils J and the end 58^b is brought in contact with the lower end of the screw 61. The effect of passing current through the coils J is to counteract the effect of the permanent magnet 60 and bring the end 58^a of the armature 58 in contact with the end of a stop screw 62. The screw 61 is insulated from the frame 57 and forms a terminal for a wire 65. The frame 57 is connected by a wire 66 in series with the coil Y of the relay instrument H.

The relay instrument H has a base 67 (Figs. 1, 8 and 9) upon which is rigidly

mounted two triangular uprights 68 and a board of insulating material 69 is secured to its under side. Two triangular shaped plates 80 and 81 are pivotally mounted on the uprights 68 by means of bolts 83 and 82 respectively, and the armatures 84 and 86 are also pivotally mounted on the upper ends of said uprights 68 by means of pins 65 and 67 respectively. The upper corners of the plates 80 and 81 severally project under the ends of the armatures 84 and 86 in a manner to cause said plates to be tilted when the armatures are tilted. Three coils x , y and z are mounted in positions to severally attract the adjacent ends of the armatures 84 and 86 when current is passed thru said coils. The lower ends of the plates 80 and 81 are formed with projections 88 and 89 respectively. The ends of the projections 88 and 89 severally engage the small slidable conductors q and r thru slots in said conductors. Four small screws 90 hold the slidable conductors q and r in contact with clip terminals f , e , d , a and h and as they pass through slots in said slidable conductors, permit them to be moved from one of said terminals to another. Thus the conductor q may be made to electrically connect the terminal e with f or d with f and the conductor r may connect either a with h or f with h . The screws 90 are insulated from all of the clip terminals.

A small bar 91 is rigidly attached to the left side (Figs. 1 and 9) of the armature 86 and projects under the right side of the armature 84 in a manner to cause the right side of the armature 84 to be raised when the left side of the armature 86 is raised and to cause the left side of the armature 86 to be lowered when the right side of the armature 84 is lowered.

The operation of the relay instrument H is as follows. If the coil x is energized by an electric current the left side of the armature 84 will be drawn downwards and the terminals e and f will be electrically connected. If the coil y is energized the right side of the armature 84 will be drawn downwards connecting the terminals d and f , and if the coil z is energized the right side of the armature 86 will be drawn downward, causing the bar 91 to raise the right side of the armature 84 and bringing the conductor q from contact with the terminal d to contact with the terminal e . Energizing the coil z also breaks the connection between terminals a and h and connects f with h .

A wire 92 connects the terminal d with the wire 65 leading to the screw 61 and a wire 91 leading to the battery B₂. The wire 6 is connected to the terminal e and a wire 10 connects the terminal f with the siren S. The terminal h is in series with the coil y by a wire 93.

The coil x is connected in series with the

wire 4 and a wire 94 which branches into the wire 1 and the wire 95. The wire 95 connects with a wire 96 and with a wire 99 leading to the coil *z*. The other end of the coil *z* is connected to the wire 7. The wire 96 branches into the wire 97 leading to a terminal of the siren *S* and a wire 98 leading to a terminal of the battery *B₂*.

The push buttons *w*, *v*, *t* and *u* are of ordinary type which when depressed make electrical connection between the wires at their terminals. The button *w* is adapted to connect the wire 4 with the wire 107; the button *v* the wire 107 with 106; the button *t* the wires 105 and 106 with the wires 108 and 6, and the button *u* to connect the wire 103 with the wire 7. The wire 105 branches into the wires 103 and 104 and the wire 108 into the wire 109 leading to the shunt instrument terminal *M* and the wire 101 leading to one terminal of the test bell *T*.

The test bell *T* is in series with the wire 3 and the wire 101 and has a shunt *n* across its terminals.

The bolt switch *K*, shown in detail in Figs. 7 and 11, is mounted on the inside of the vault door and suitably connected at 114 (Figs. 1 and 11) to one of the vault locking bolts 117^a in a manner to cause the switch to be actuated when the vault door handle 113 (Fig. 2) is turned. The switch comprises a metallic ring *m* insulated from the vault door 117 by a ring of insulating material 116 and having an arm *p*, of fibrous or other nonconducting material, pivoted at one side of the ring *m* on a screw 119. The insulating ring 116 contains a metallic button *i* which makes contact with the vault door and extends to the surface of said ring 116. A second metallic button 118 is mounted in the arm *p* in a position to make contact with the ring *m* and button *i* when in the position shown in full lines in Fig. 1. The wire 3 is connected to the ring *m*. Thus when the bolts of the vault are moved to the locked position or withdrawn, the button 118 is drawn across between the ring *m* and button *i* in a manner to ground the wire 3 on the vault door for a moment.

The dial switch *D* (Figs. 1 and 10) consists of a thin metallic disc 122 rigidly mounted on the inner end 123 of the lock spindle and the screw terminal *j* which is insulated from the vault door. The disc 122 is adapted to make contact with the screw *j* in all positions of the combination dial, except when the notch 122^a in said plate registers with said screw so that the metal of the disc does not touch the screw. The disc 122 is grounded on the vault door at *g₂*.

The switches *E* are located at various points (usually in different compartments) for which it may be desirable to sound an alarm manually in case of an attempted

burglary in office hours. They indicate diagrammatically either floor or wall push buttons which may be manually placed in either the position shown in full lines or the one shown in dotted lines, thus breaking or completing the electric circuit. The switches *E* consist of a series of metallic bars *b*, arranged in parallel between the wire 12 and the wire 0, are pivoted on pins 124 and adapted to individually close the circuit between wires 12 and 0 when moved to the dotted line position.

Fig. 6 shows the arrangement of, and connections for, the siren *S*, the box 63 (containing the battery *B₂*), the box 64 (containing the relay and electromagnet instruments), the cable 70 and the terminals 71 in the alarm housing.

The alarm housing is provided with electric protection for the instruments therein. The outer casing 125 is insulated by blocks of fibrous material 127 from the inner casing 126, and wires 129 and 130 connect the outer casing with the wire 2 and the inner casing with the wire 6 respectively.

The cable 70, consisting of wires 1, 2, 4, 6, 7 and 8 enters the alarm housing and is attached thereto by a ring 70^a. The ring 70^a is secured in a suitable manner to the cable covering and fastened by screws 70^b to the inner casing 126 of the housing. A wire 128 connects the ring 70^a electrically with the inner casing 126 and the covering of the cable 70 is insulated from the outer casing 125 of the housing. The wires 1, 2, 4, 6, 7 and 8 are brought into the housing and fastened to the terminals 71 as shown in Fig. 6. Wires 9 and 96 lead to the battery *B₂* and wires 10 and 97 lead to the siren *S* as hereinbefore stated. The wires leading to the relay instrument *H* and magnet *F* are connected, within the box 64, to the several terminals 71 as shown in Fig. 1. Any attempt to gain access to the instruments in the alarm housing would result in bringing the outer and inner casings 125 and 126 in electrical connection, and would as hereinafter described, sound an alarm. If an attempt is made to jerk the cable 70 from the alarm housing, the ring 70^a coming in contact with the outer casing 125 will connect (through the wire 128) the outer and inner casings with the result that an alarm will be sounded.

The shunt *A* consists of a coil of wire *I*, having a large number of turns, an armature *N* and a contact point *M*. The coil *I* has terminal wires 110 and 111 connecting it in circuit with the knife edge switch *k₁* and wires 53 and 0. When current passes through the coil *I* the core 120 will be magnetized and attract the armature *N*. The armature *N* is flexible and adapted to bear against the contact point *M* when drawn toward the coil *I*. A wire 121 connects the

armature M in circuit with the wires 2 and 56 and a wire 109 connects the contact point M with the junction of wires 108 and 101.

Operation of the closed circuit system.

The battery B₃ normally furnishes current for the closed circuit system. The vault and grille doors being closed and latched and the switch L being in the dotted line position, (Fig. 1) current flows from the battery B₃ and is conducted by the wire 18 to the ring R thru said ring and the bar P, to the wire 16, thru this wire to the grille G out on wires 15 and 13 to the ground G₁ is picked up at G₂, passes by wires 54 and 55 to the knife switch k₂, from said switch over wires 56 and 2 to the coils J of the electro-magnet F, thru the coils, said coils being in series, back over the wire 8 to the knife switch k₃ and to the battery B₃ over the wire 100. The conductor r is normally in the position to connect terminals h and f of the relay instrument H. Any attempt to open the grille doors, separate any of the members of the grille G or a break in any of the closed circuit wires will break this closed circuit as hereinbefore described and stop the flow of the current thru the coils J. This will allow the permanent magnet 60 to bring the armature 58 in contact with the screw 61 and sound an alarm through the following circuit; from the zinc side of the battery B₂ current will flow over wires 9 and 65 to the screw 61, from said screw to the armature 58 and frame 57, over the wire 66 to the coil y, thru said coil, out on wire 93 to the terminal h, from said terminal thru the conductor r to the terminal f from the terminal f, over the wire 10 to the siren S, sounding said siren and back to the carbon side of the battery B₂ over the wires 97 and 98. Energizing the coil y in the manner just described, draws the right side of the armature 84 downward and connects the terminal f and d by the conductor q. This causes the alarm to continue to sound through the following circuit. From the zinc side of the battery B₂ current flows over wires 9 and 92 to the terminal d, by the conductor q to the terminal f, from said terminal over the wire 10 to the siren S, sounding said siren and passes back over the wires 97 and 98 to the carbon side of the battery B₂.

To stop an alarm started by breaking the closed circuit it is necessary to enter the guarded structure and depress the push buttons v and w simultaneously. Pressing these buttons causes a current from the carbon side of the battery B₁ to flow by the wire 55, switch k₂, wires 104, 105 and 106, button v, wire 107, button w, wire 4 to the coil x. The current energizes said coil and returns to the zinc side of the battery B₁ via the wires 94 and 1, the switch k₁ and

wire 112 to the zinc side of the battery B₁. Energizing the coil x draws the left side of the armature 84 downwards which breaks the connection between the terminals d and f and again connects the terminals e and f. Breaking the connection between d and f breaks the circuit thru the siren S and stops the sounding of the alarm. Current does not now flow thru the coil y because in energizing said coil just previously the bar 91 under the action of the armature 84 has drawn the left side of the armature 86 downward and severed the connection between the terminals f and h, thus breaking the circuit containing the battery B₂.

To make the system again operative the button u must be depressed. Pressing the button u energizes the coil z and causes the conductor r to be moved from contact with the terminal a to contact with the terminal f by current thru the following circuit; from the carbon side of the battery B₁ via the wire 55, switch k₂ wires 104 and 103, the button u and the wire 7 to the coil z, energizes said coil and returns via wires 99, 95 and 1, the switch k₁ and the wire 112 to the zinc side of the battery B₁.

To test the system the push button t is depressed. This sounds the siren S. When the button t is pressed current flows from the carbon side of the battery B₁ over the wire 55, the switch k₂ wires 104 and 105 to the button t, from the button t, via the wire 6, the terminal e, the conductor q, the terminal f, and the wire 10, to the siren S and back via wires 97, 96, 95 and 1, the switch k₁ and wire 112 to the zinc side of the battery B₁.

My closed circuit system affords protection to the open circuit system at all times in the following manner. During banking hours the switch L being in the full line position, current flowing from the battery B₃ over the circuit 18, R, P, 12, 14, 13, g₁, g₂, 54, k₂, 56, 2, J, 8, k₃ and 100 includes the wires 2, 12 and 14 which are common to both the open and closed circuit systems. This makes it impossible to tamper with or sever either the cable or the wiring leading to the plurality of switches E without causing an alarm to be sounded through the closed circuit system as hereinbefore described. At night the switches E are not in use but the current in the wires 2 and 8 of the cable affords protection against any such breakage of said cable as would make the open circuit switch D inoperative.

Operation of the open circuit system.

In the daytime the circuit through the clock C is broken and the circuits are normally open at the switches E and between the armature N and contact point M of the shunt A. The switch L is now in the full line position. An alarm is sounded by closing one of the switches E. Current will flow

from the battery B_1 through the wire 54 to where said wire is grounded at G_2 on the vault door, is picked up at G_1 , passes by the wires 13 and 14 to the closed switch bar b , through said bar, over the wires 0 and 110 to the coil I , energizes said coil and returns to the battery B_1 by the wire 111, switch k_1 and wire 112. Energizing the coil I , attracts the armature N to the contact M and sounds the siren S through the following circuit. Current flows from the battery B_1 over the wire 112, the switch k_1 , wires 1, 95, 96, and 97 to the siren S , operates said siren and returns to the battery B_1 by the wire 10, the terminal f , conductor q , terminal e , wires 6, 108 and 109, the contact M armature N wires 121 and 56, switch k_2 and wire 54.

To stop the alarm it is only necessary to move the switch bar b (which has been moved to the dotted line position) back to the full line position shown in Fig. 1.

At night the circuit between the wires 5 and 53 is closed by the cam 51 of the clock C , the dial switch D is normally set so that the circuit between the ground G_3 and the wire 113 is broken and the switch L is set in the dotted line position. Now if the combination dial is manipulated the disc 122 will be brought in contact with the terminal j and current will flow from the battery B_1 , by the wire 54 ground g_2 , ground g_3 , disc 122, the screw j , wires 113 and 5, thru the clock C , and wires 53 and 110, will energize the coil I and return to the battery B_1 by the wire 111, the switch k_1 and the wire 112. This closes the circuit containing the siren S , between the armature N and the contact M and sounds the alarm as described above. To stop the alarm it is only necessary to turn the combination dial back to the position where the notch 122^a is over the screw j .

The switch K (Figs. 1 and 7) operates to sound the test bell T and siren S for a moment whenever the bolts of the vault are actuated, thus serving as an effective means for testing the system when the vault is unlocked or locked. When the bolts are operated the bar p is drawn across the button i and completes the circuit between the wires 54 and 3 as hereinbefore described. Current momentarily flows from the battery B_1 by the wire 54 to the ground g_2 through the switch K out on the wire 3, sounds the bell T , passes by the wires 101, 108 and 6 to the terminal e , from said terminal through the conductor q and terminal f , by the wire 10 to the siren S , sounds the siren, returns by the wires 97, 96 95 and 1, the switch k_1 and the wire 112 to the opposite side of the battery B_1 .

At night when the clock C is "on" if the bar P of the switch L is moved from its night position i. e. the dotted line position, an alarm will be sounded through the wires 17 and 5, the clock C and shunt instrument A .

As will now be readily understood, an authorized person, desiring to enter the guarded structure, during the period when the clock switch is open, may do so after moving the member P of the switch L to contact with the terminal of the wire 12. Thus, the branch of the closed circuit, including the grille G , is shunted by the branch circuit including the wires 12, 14 and 13 of the circuit to the switches E . Opening the clock switch renders the dial switch D inoperative. The relay instruments F and H are sufficiently slow acting to permit the normal movement of the bar P between the spaced terminals of the wires 16 and 12 without sounding an alarm.

Having described my invention, what I claim is new and desire to protect by Letters Patent is—

1. In a burglar alarm the combination with a guarded structure and an alarm instrument of a main open circuit extending between said guarded structure and alarm instrument, a relay instrument having a plurality of coils adapted to actuate switches, one of said switches being in said main circuit, a local open circuit including said alarm and relay instruments and another of said switches, means for passing current through one of said coils to sound an alarm through said local circuit and to simultaneously disconnect said main circuit, means for passing current through another of said coils to stop an alarm and to simultaneously connect said main circuit and means for passing current through a third of said coils to reset said relay instrument in position to sound a new alarm in either of said main or local circuits.

2. In a burglar alarm, a guarded structure, means protecting said structure, a normally closed protective circuit including said alarm and having two branches, one of which includes said protective means and the other of which includes a shunt around said means, a clock actuated switch, a normally open circuit including said clock actuated switch and said alarm, a manually operable switch movable to two positions, the first position including contacts in series with said branch of said normally closed circuit including said protective means, the second position including contacts in series with said branch of said normally closed circuit including said shunt and also including contacts in series with said normally open circuit and said clock actuated switch, whereby movement of said manually operable switch from the first to the second positions while said clock actuated switch is operative will close said open circuit to sound the alarm.

3. In a burglar alarm, a guarded structure, a grille protecting said structure, a normally closed protective circuit including said alarm and having two branches, one of

which includes said grille and the other of which includes a shunt around said grille, a clock actuated switch, a normally open circuit including said clock actuated switch and said alarm, a manually operable switch movable to two positions, the first position including contacts in series with said branch of said normally closed circuit including said grille, the second position including contacts in series with said branch of said normally closed circuit including said shunt and also including contacts in series with said normally open circuit and said clock actuated switch, whereby movement of said manually operable switch from the first to the second positions while said clock actuated switch is operative will close said open circuit to sound the alarm.

4. In a burglar alarm, a guarded structure, a closure for said structure, a protective circuit including said alarm and having two branches, one of which includes said closure and the other of which includes a shunt around said closure, a clock actuated switch, a second circuit including said clock actuated switch and said alarm, a manually operable switch movable to two positions, the first position including contacts in series with said branch of said first mentioned circuit including said closure, the second position including contacts in series with said branch of said first mentioned circuit including said shunt and also including contacts in said second circuit under control of said clock actuated switch, whereby movement of said manually operable switch from the first to the second positions while said clock actuated switch is operative will cause said second circuit to sound the alarm.

5. In a burglar alarm, a guarded structure, means protecting said structure, a normally closed protective circuit including said alarm and having two branches, one of which includes said protective means and the other of which includes a shunt around said protective means, a series of push buttons in said shunt, a clock actuated switch, a normally open circuit including said clock actuated switch, push buttons and said alarm, a manually operable switch movable to two positions, the first position including contacts in series with said branch of said normally closed circuit including said protective means, the second position including contacts in series with said branch of said normally closed circuit including said shunt and also including contacts in series with said normally open circuit and said clock actuated switch, whereby movement of said manually operable switch from the first to the second positions while said clock actuated switch is operative will close said open circuit to sound the alarm.

In testimony whereof, I have hereunto signed my name to this specification.

WILLIAM E. JONES.