

B. MENKIN.
 ELECTRIC CIRCUIT CONTROLLING RELAY.
 APPLICATION FILED FEB. 3, 1909.

942,508.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

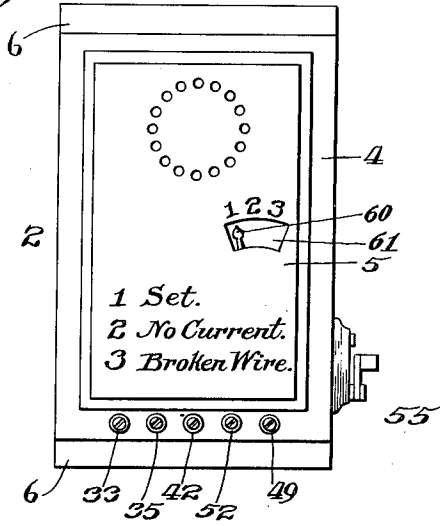


Fig. 2.

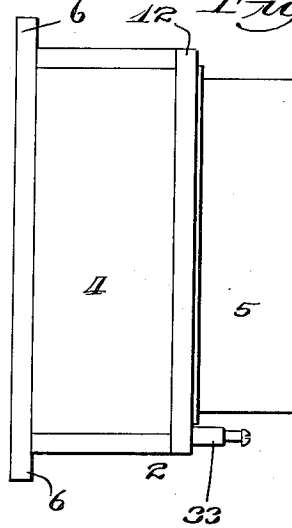


Fig. 3.

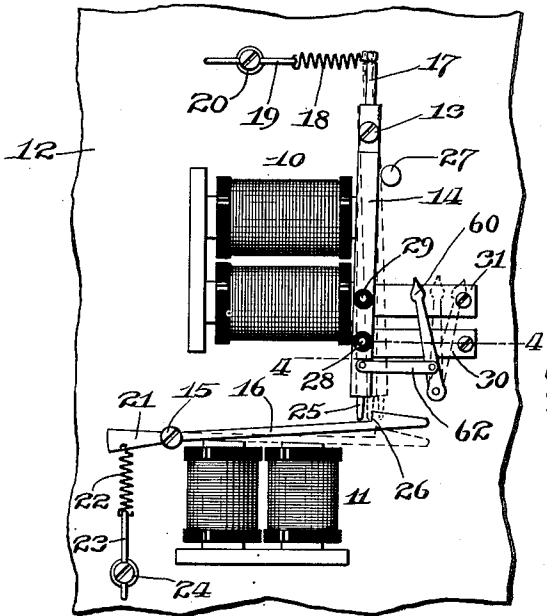
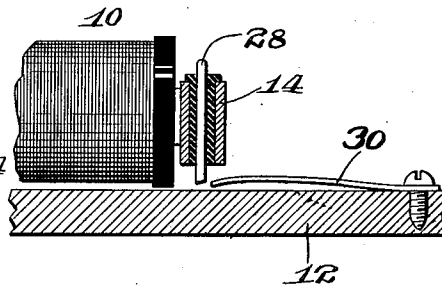


Fig. 4.



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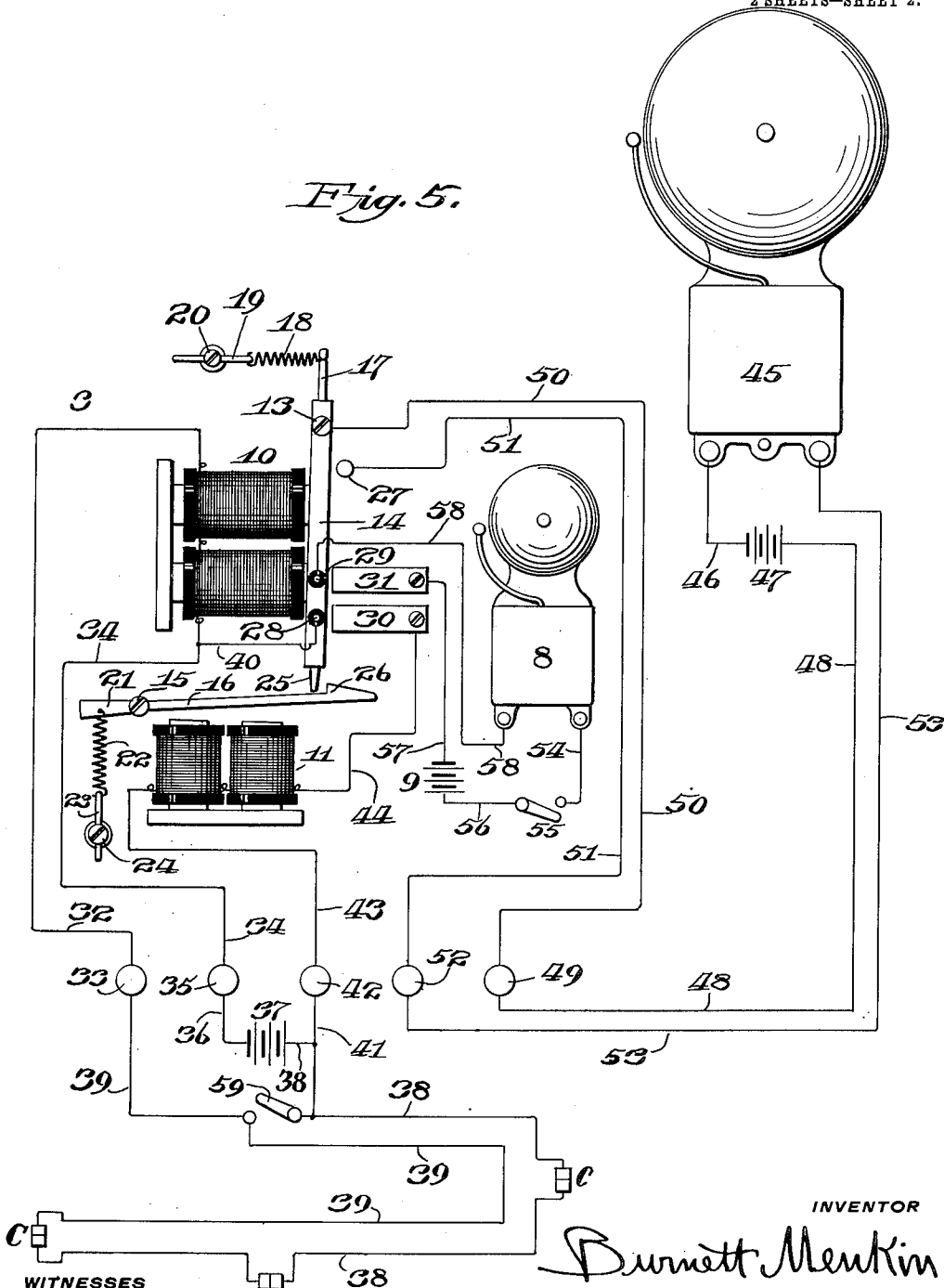
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2 SHEETS—SHEET 2.

Fig. 5.



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BURNETT MENKIN, OF NEW YORK, N. Y.

ELECTRIC-CIRCUIT-CONTROLLING RELAY.

942,508.

Specification of Letters Patent.

Patented Dec. 7, 1909.

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To all whom it may concern:

Be it known that I, BURNETT MENKIN, citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric-Circuit-Controlling Relays, of which the following is a specification.

This invention relates to automatic relay devices for controlling electric circuits, especially adapted for use in connection with burglar alarm systems, wherein one electric circuit is employed leading to many points in the building to be protected, and wherein another electric circuit including an alarm device is employed, the parts being so constructed and arranged that the opening and closing of one electric circuit will control the opening and closing of another electric circuit and the actuation of the alarm device.

The object of my invention, as generally stated, is to provide a simple and efficient device of the character to which the invention relates, having provision whereby the opening and closing of two electric circuits supplied with current from a common source will control the opening and closing of one or more additional electric circuits in which the translating devices are included; and when the invention is used in connection with burglar alarm systems the translating device or devices may be any suitable indicator or alarm device.

Having this general object in view, the precise nature of the invention will be hereinafter fully described and particularly claimed.

In the drawings:—Figure 1 is a front elevation of a suitable casing containing parts of my improved railway device. Fig. 2 is a side elevation thereof. Fig. 3 is an elevation of a base board upon which are mounted the main parts of the device. Fig. 4 is a section, enlarged, on the line 4—4 of Fig. 3. Fig. 5 is a diagrammatic view illustrating the electrical connections.

2 designates a suitable casing which is divided into two parts, 4 and 5. The part 4 of the casing 2 is provided with extensions 6 by means of which it may be secured to the wall of a building, and the part 5 of the casing 2 is provided with a suitable flange by means of which it may be secured to the part 4.

Suitably mounted within the part 5 of the casing are the parts of the device shown in

Fig. 3, and also the small alarm bell 8 shown in Fig. 5. The electric battery or batteries 9 for the bell 8, shown in Fig. 5, are contained within the part 4 of the casing.

Referring now to Figs. 3, 4 and 5:—10 and 11 designate electromagnets which are mounted upon a base board 12 which forms the outer wall of the part 4 of the casing 2. Pivotally mounted on the base board 12 as at 13 is the armature 14 of the electromagnet 10, and pivotally mounted on the base board 12 as at 15 is the armature 16 of the electromagnet 11. Attached to an arm 17 extending from the armature 14 is one end of a spring 18 the other end of which is attached to a pin 19 which is adjustably secured to a post 20 on the base board 12; and attached to an arm 21 extending from the armature 16 is one end of a spring 22 the other end of which is attached to a pin 23 which is adjustably secured to a post 24 on the base board 12. The tendency of the spring 18 is to draw the armature 14 away from the electromagnet 10 and the tendency of the spring 22 is to draw the armature 16 away from the electromagnet 11.

Normally, the armature 14 is held against the poles of the electromagnet 10 against the action of the spring 18, and the armature 16 is held away from the poles of the electromagnet 11 and against a projection 25 on the armature 14 by the action of the spring 22.

The armature 16 is provided with a tooth or latch 26, against which the armature 14 is moved by the action of the spring 18 when the armature 14 is released by the electromagnet 10, as shown by dotted lines in Fig. 3. Thus the armature 14 is moved by its spring 18 from a first or normal position against the poles of the electromagnet 10 to a second position in engagement with the tooth 26 of the armature 16; and when the armature 16 is attracted by the electromagnet 11 to lower the tooth 26 out of the path of the projection 25 of the armature 14, the spring 18 will be permitted to move the armature 14 to a third position against a contact post 27 on the base board 12, as shown by dotted lines in Fig. 3.

Extending through the armature 14 are two contact pins 28 and 29, which are insulated from the armature 14 by suitable collars surrounding the pins and engaging the armature 14. Mounted upon the base board 12 directly beneath the pin 28 is a contact spring 30, and mounted on the base board

12 directly beneath the pin 29 is a contact pin 31. The contact pins 28 and 29 are adapted to make and break contact between the springs 30 and 31 respectively; and when the armature 14 is in the first position against the poles of the electromagnet 10, the pins 28 and 29 are out of contact with the springs 30 and 31 respectively. When, however, the armature 14 is moved to its second position against the tooth 26, the pins 28 and 29 are brought into contact with the springs 30 and 31 respectively; and during the movement of the armature 14 from its second position against the tooth 26 to its third position against the contact post 27, and while the armature remains in engagement with the contact post 27, the pins 28 and 29 remain in contact with the springs 30 and 31.

The electromagnet 10 is included in a normally closed electric circuit, which I shall term the first electric circuit, comprising a wire 32 leading from a binding post 33 to the electromagnet 10, a wire 34 leading from the electromagnet 10 to a binding post 35, a wire 36 leading from the binding post 35 to a constant electric battery 37 or source of electric current for the circuit, a wire 38 leading from the battery 37 to and through the alarm system, and a wire 39 extending through the alarm system with the wire 38 and returning to the binding post 33.

The electromagnet 11 is included in a second normally open electric circuit, comprising the contact pin 28, a wire 40 leading therefrom to the wire 34, the wire 34, binding post 35 and wire 36 leading to the battery 37, the wire 38, a wire 41 leading from the wire 38 adjacent the battery 37, a binding post 42, a wire 43 leading to the electromagnet 11, a wire 44 leading from the electromagnet 11 and the contact spring 30; this second circuit being normally broken between the contact spring 30 and contact pin 28.

It will here be noted that the battery 37 forms a common source of electric current for the first and second circuits hereinbefore described.

45 designates the main alarm device which may be of any desired construction. In the present instance, I have shown a small, ordinary electric bell. This alarm device is included in a normally open third electric circuit, which comprises a wire 46 leading from the device 45 to an electric battery 47, a wire 48 leading from the battery 47, a binding post 49, a wire 50 leading from the binding post 49, a contact post 27, the armature 14, a wire 51 leading from the contact post 27, a binding post 52, and a wire 53 leading from the post 52 to the alarm device 45. This third circuit is normally open between the contact post 27 and armature 14.

The small alarm bell 8 is included in a

normally open fourth electric circuit which comprises a wire 54 leading from the bell 8, a suitable switch 55, a wire 56 leading from the switch 55, the battery 9, a wire 57 leading from the battery 9, the contact spring 31, the contact pin 29, and a wire 58 leading from the contact pin 29 to the bell 8. This fourth electric circuit is normally open between the contact spring 31 and contact pin 29.

The binding posts 33, 35, 42, 52, and 49, are arranged upon the casing 2 as shown, for convenience of wiring.

When my invention is used in connection with a burglar alarm system, the wires 38 and 39 are adapted to extend throughout the building to be protected, and the wires are connected to suitable contact devices C which are opened and closed by the opening and closing of doors and windows in various parts of the building, and these wires are also stretched across suitable spaces and are otherwise arranged in manner and position to render them liable to be broken by the intrusion of burglars.

The battery 37 and electromagnet 10 are arranged comparatively close together, and the wires 38 and 39 are connected together by a suitable switch 59 which may be opened and closed as desired, thus leaving the main body of the wires 38 and 39 which are to protect the building against intrusion, extending beyond the switch 59. It will thus be seen that when the switch 59 is closed, the wires 38 and 39 extending throughout the building may be connected and disconnected at will without disturbing the first circuit including the electromagnet 10, or the second circuit including the electromagnet 11.

During the day time when the windows and doors of the building throughout which the wires 38 and 39 extend are being opened and closed, the switch 59 is in the closed position, thus permitting the opening and closing of the doors and windows of the building without affecting the first and second electric circuits in which the electromagnets 10 and 11 respectively are included. When, however, the building is left for the night, the switch 59 is opened so that any breaking of the normally closed first electric circuit throughout the building, by breaking or disconnecting the wires 38 and 39, will deenergize the electromagnet 10, thus freeing the armature 14 and permitting the spring 18 to move the armature 14 against the tooth 26. This movement of the armature 14 causes the pin 28 to contact with the spring 30 and complete the second electric circuit in which is included the electromagnet 11, thereby energizing the electromagnet 11 and causing it to draw down its armature 16 and free the armature 14 from engagement with the tooth 26; whereupon the spring 18 will move the arma-

ture 14 against the contact post 27, thus completing the third circuit in which is included the main alarm device 45, and thereby sounding the alarm.

5 By the employment of my invention, I prevent the actuation of the main alarm device 45, or, in other words, the sounding of a false alarm if perchance the battery 37 should run down or become polarized, either during the daytime when the switch 59 is closed, or at other times when the switch 59 is open, thereby deenergizing the electromagnet 10. Should the battery 37 which supplies electric current to both the first and second circuits, run down or become polarized, the absence of electric current in the first circuit in which the electromagnet 10 is included will release the armature 14 which will be moved by its spring 18 into engagement with the tooth 26 of the armature 16; and at the same time move the contact pin 28 against the contact spring 30, to complete the second circuit. But the absence of current in the second circuit will permit the spring 22 to hold the armature 16 away from the poles of the electromagnet 11, and the tooth 26 in engagement with the armature 25, thereby preventing the movement of the armature 14 by the spring 18 into contact with the post 27, and thus preventing the completion of the third electric circuit and the sounding of the main alarm device 45.

When the armature 45 is moved to its second position against the tooth 26, due to the absence of electric current in the first and second electric circuits, the contact pin 29 is brought into contact with the contact plate 31, thus completing the electric circuit for and actuating the small alarm bell 8, and thereby giving notice that the battery 37 has run down or become polarized. The switch 55 is provided to break the circuit for the bell 8 and stop the sounding thereof after notice has been given as to the condition of the battery 37.

By the construction hereinbefore described, it may be readily ascertained whether or not a door or window of the building protected by the wires 38 and 39 has been left open when the building is closed for the night, or whether the wires 38 have been cut or otherwise broken. This is readily ascertained upon opening the switch 59, which is opened before leaving the building to set the entire alarm system in operative position. If, when the switch 59 is opened, and the wires 38 and 39 are disconnected at any point, the normally closed circuit for the electromagnet 10 will be therefore broken, thus releasing the armature 14 and causing the contact pin 28 to engage the contact spring 30 and complete the second circuit for the electromagnet 11, which in turn will draw down the armature 16 and

permit the armature 14 to move under the influence of the spring 18 into contact with the contact post 27, thereby completing the third circuit for the main alarm bell 45. Thus the sounding of the main alarm bell 45 when the switch 59 is open will indicate that the wires 38 and 39 are disconnected at some point in the building, indicating that the wires have been broken or tampered with, or that a window or door of the building has been left open.

In order to ascertain readily the position of the operating parts within the casing 2, I provide indicator arm 60, one end of which is pivotally mounted on the board 12, and the other or free end of which extends to a position directly beneath an opening 61 in the outer wall of the casing 2. This indicator arm 60 is connected by a link 62 with the lower portion of the armature 14, whereby the indicator arm will be moved to the three positions indicated by dotted lines in Fig. 3 by the movement of the armature 14 to its three positions indicated by dotted lines in the same figure. On the outside of the casing 2 I place the numbers "1," "2," and "3," adjacent the first, second, and third positions occupied by the free end of the arm 60, and I also place upon the outer face of the casing 2, language explanatory of what each of the three positions of the arm 60 indicates:—"1 set," "2 no current," and "3 broken wire." If, in looking at the free end of the arm 60, it is seen to be adjacent the numeral "1," it will be understood that the entire system is set and that all the parts thereof are in normal condition; if the free end of the arm 60 is adjacent the numeral "2," it will be understood that there is no current in the first and second electric circuits, or that the battery 37 has run down or become polarized; and if the free end of the arm 60 is adjacent the numeral "3," it will be understood that somewhere in the building a wire 38 or 39 is broken, or that a door or window has been left open.

While I have herein shown and described my invention in a desirable and practicable form, I desire it to be understood that I do not limit myself to this particular construction, as the same may be greatly modified without departing from my invention; and further, I desire it to be understood that the invention is not limited to use in connection with burglar alarm systems, as it may be employed in an electrical system for any purpose requiring notice to be given when the battery for the system has run down or become polarized, and when notice is to be given if a break in the circuit should occur.

I claim:—

1. The combination of a first electric circuit including an electromagnet, a second electric circuit including an electromagnet, said first and second circuits receiving elec-

tric current from a common source, a third electric circuit including a translating device, means under the control of the electromagnet of the first circuit for opening and closing the second circuit, and means under the control of the electromagnet of the second circuit for changing the character of the third circuit.

2. The combination of a first electric circuit including an electromagnet, a normally open second electric circuit including an electromagnet, said first and second circuits receiving electric current from a common source, a normally open third electric circuit including a translating device, means under the control of the electromagnet of the first circuit for closing the second circuit, and means under the control of the electromagnet of the second circuit for closing the third circuit.

3. The combination of a first electric circuit including an electromagnet, a second electric circuit including an electromagnet, said first and second circuits receiving electric current from a common source, a third electric circuit including a translating device, a fourth electric circuit including a translating device, means under the control of the electromagnet of the first circuit for opening and closing the second and fourth circuits, and means under the control of the electromagnet of the second circuit for changing the character of the third circuit.

4. The combination of a first electric circuit including an electromagnet, a normally open second electric circuit including an electromagnet, said first and second circuits receiving electric current from a common source, a normally open third electric circuit including a translating device, a normally open fourth electric circuit including a translating device, means under the control of the electromagnet of the first circuit for closing the second and fourth circuits, and means under the control of the electromagnet of the second circuit for closing the third circuit.

5. The combination of a normally closed first electric circuit including an electromagnet provided with an armature held normally in a first position against the magnet and movable to a second position and a third position away from the magnet, a spring tending to move the armature away from the magnet, a normally open second electric circuit including an electromagnet, said first and second circuits receiving electric current from a common source, said second circuit being closed by the movement of said armature from its first to its second position, means under the control of the electromagnet of the second circuit to control the movement of said armature from its second to its third position, and a normally open

third electric circuit including a translating device, said third circuit being closed by the movement of said armature from its second to its third position.

6. The combination of a normally closed first electric circuit including an electromagnet provided with an armature held normally in a first position against the magnet and movable to a second position and a third position away from the magnet, a spring tending to move the armature away from the magnet, a normally open second electric circuit including an electromagnet, said first and second circuits receiving electric current from a common source, said second circuit being closed by the movement of said armature from its first to its second position, means under the control of the electromagnet of the second circuit to control the movement of said armature from its second to its third position, a normally open third electric circuit including a translating device, and a normally open fourth electric circuit including a translating device, said second and said fourth circuits being closed by the movement of said armature from its first to its second position, and said third circuit being closed by the movement of said armature from its second to its third position.

7. The combination of a normally closed first electric circuit including an electromagnet provided with an armature held normally in a first position against the magnet and movable to a second position and a third position away from the magnet, a spring tending to move the armature away from the magnet, a normally open second electric circuit including an electromagnet provided with an armature movable to a first position against its magnet and to a second position away from its magnet, said first and second circuits receiving electric current from a common source, a spring tending to move the last named armature to its second position, the second position of the second named armature being such as to engage the first named armature and prevent its movement from its second to its third position, and a normally open third electric circuit including a translating device, said second circuit being closed by the movement of the first named armature from its first to its second position, and said third circuit being closed by the movement of the first named armature from its second to its third position.

8. The combination of a normally closed first electric circuit including an electromagnet provided with an armature held normally in a first position against the magnet and movable to a second position and a third position away from the magnet, a spring tending to move the armature away from the magnet, a normally open second

electric circuit including an electromagnet provided with an armature movable to a first position against its magnet and to a second position away from its magnet, said
5 first and second circuits receiving electric current from a common source, a spring tending to move the last named armature to its second position, the second position of the second named armature being such as to
10 engage the first named armature and prevent its movement from its second to its third position, a normally open third electric circuit including a translating device, and a normally open fourth electric circuit

including a translating device, said second 15 and said fourth circuits being closed by the movement of the first named armature from its first to its second position, and said third circuit being closed by the movement of the first named armature from its second to its 20 third position.

In testimony whereof I affix my signature in presence of two witnesses.

BURNETT MENKIN.

Witnesses:

SIGMUND HELFGOTT,
CHARLES TANESTI.