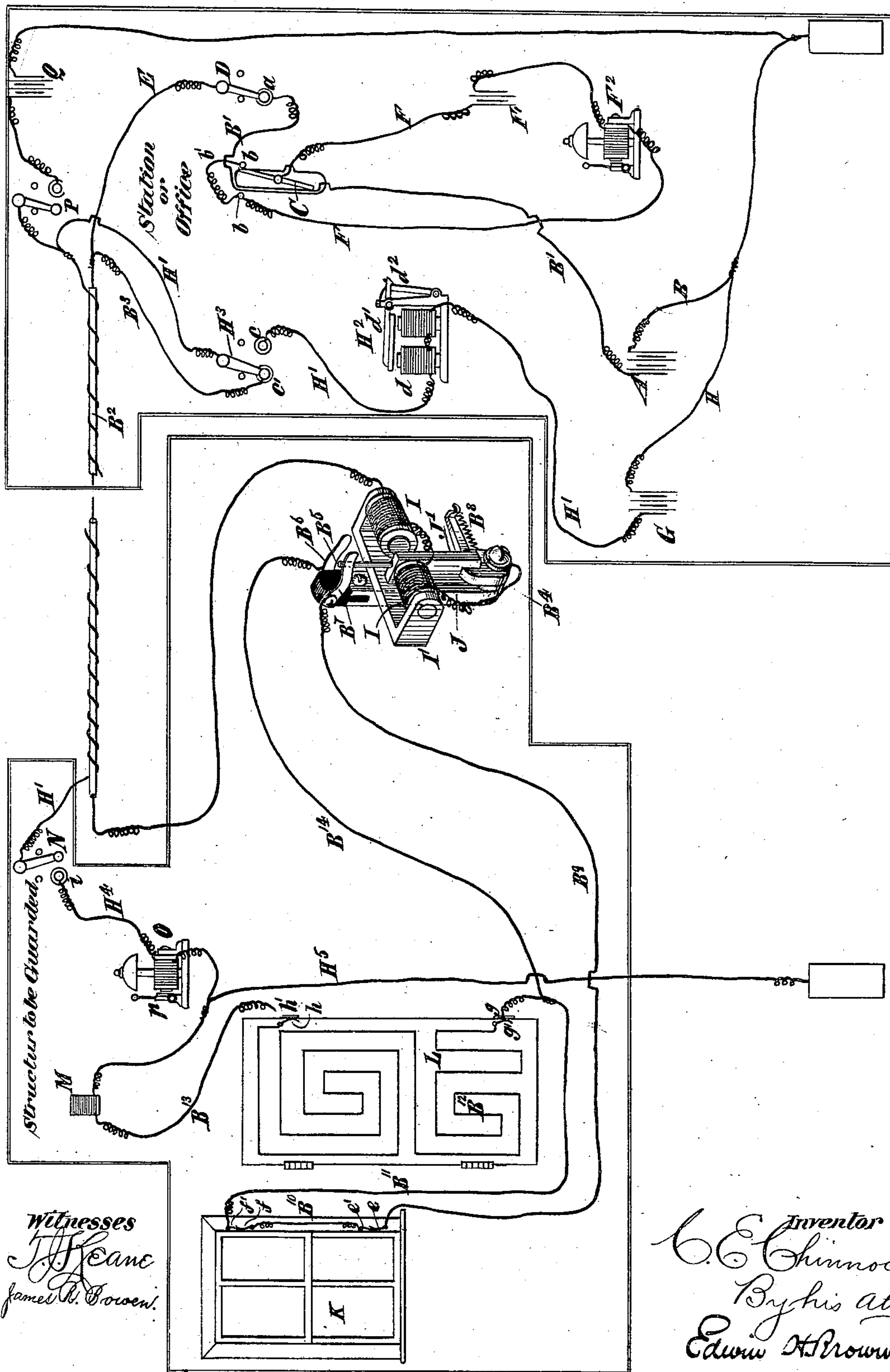


(No Model.)

C. E. CHINNOCK.  
ELECTRIC BURGLAR ALARM.

No. 260,536.

Patented July 4, 1882.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## ELECTRIC BURGLAR-ALARM.

SPECIFICATION forming part of Letters Patent No. 260,536, dated July 4, 1882.

Application filed April 8, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. CHINNOCK, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Electric Burglar-Alarms, of which the following is a specification.

My improvement relates to those electric burglar-alarms which are employed to connect banks and other structures to be guarded with a station or office where watch is kept.

The object of my improvement is to enable the watchmen at the station or office to ascertain whether an alarm which is given at the station or office is caused by an effort to effect an entrance through a window in the structure to be guarded, through a door in said structure, or from any accident to the wires which connect the said structure with the station or office.

My improvement consists in a novel means whereby an alarm proceeding from a source located between the station or office and a structure to be guarded may be distinguished from others.

It also consists in novel means whereby an inmate of a structure to be guarded can signal a watchman at the station or office, and vice versa.

It also consists in means whereby an alarm occasioned by the opening of a window at a structure to be guarded can at the station or office be distinguished from an alarm occasioned by an effort to gain entrance through a door, a wired partition, or other like article.

The accompanying drawing is a diagrammatic view of an electric burglar-alarm embodying my improvement.

All the devices which are located in the station or office I have inclosed with lines marked "station" or "office," and all the devices which are located in the structure to be guarded I have likewise inclosed with lines and marked the latter "structure to be guarded." I have only represented the burglar-alarm applied to one structure to be guarded, but it is adapted and intended for application to a large number.

A designates a battery located in the station or office.

B designates a wire connecting it to the ground, and B' designates a wire extending

therefrom to the coil of a galvanometer, C. From the galvanometer C the wire B' leads to the contact-point *a* of a switch, D, which is always closed upon the said contact-point when the burglar-alarm is in use. To this switch is fastened a wire, E, which proceeds from the station or office to the structure to be guarded. This wire has a covering of gutta-percha or other suitable insulating material, B<sup>2</sup>. The needle of the galvanometer C, when vibrated sufficiently in either direction, makes contact with one of two contact-points, *b*, which are connected together by a wire, *b'*. One of them has also connected to it one end of the wire F of a local circuit, which at the other end is fastened to the needle of the galvanometer or its pivot. This local-circuit wire is connected with a battery, F', and with an electro-magnetic call or alarm-bell, F<sup>2</sup>. This electro-magnet bell consists of a bell, an electro-magnet whose coils are connected to the wire F, and an armature carrying the hammer of the bell. When the needle makes contact with either of the contact-points *b* the electric call or alarm bell is rung.

G designates another battery in the station or office.

H designates a wire leading therefrom to the ground, and H' designates a wire leading therefrom to an electro-magnetic annunciator, H<sup>2</sup>, thence to the contact-point *c* of a switch, H<sup>3</sup>, and from this switch it proceeds out of the station or office. Passing outside the station or office, it is wound spirally around the exterior of the insulating material B<sup>2</sup> of the wire E.

The electric annunciator consists of an electro-magnet, *d*, whose coils of wire are connected with the wire H' and an armature, *d'*, provided with a hook engaging with a plate, *d*<sup>2</sup>, which is hinged in place at the lower end and has a tendency to drop forward. When the armature is attracted its hook releases the said plate and the latter drops forward and exhibits a number indicating the structure to be guarded, with which it is combined. As the plate *d*<sup>2</sup> in falling forward will make a considerable noise, it constitutes an audible, as well as a visual signal. Any other audible signal of suitable kind may be used with it, if desirable. The switch H<sup>3</sup> is adjusted to its contact-point *c* during the day only. At night it is shifted against a contact-point, *c'*, which



is connected by a wire,  $B^3$ , to the wire  $E$ . The wire  $E$  enters the structure to be guarded, and is connected to the coils of electro-magnets  $I$ , wound and connected together, so that they will be of different polarity. These electro-magnets, as here shown, are supported by a strap or frame,  $I'$ , which is fastened to and extends from one pole of a permanent magnet,  $J$ . To the other pole of this permanent magnet is pivoted a bar,  $J'$ , so that it can vibrate between the opposite poles of the electro-magnets  $I$ . This bar  $J'$  is polarized with the permanent magnet  $J$ , and constitutes a polarized armature for the electro-magnets  $I$ . Hence it will always be repelled by one of the electro-magnets and attracted by the other, no matter in which direction an electric current is passed through their coils. The bar or armature  $J'$  is connected with the coil of the left-hand electro-magnet by a wire,  $B^4$ , and at its upper end it carries a contact-piece,  $B^5$ . This contact-piece  $B^5$  always bears against one or the other of two contact-pieces,  $B^6$   $B^7$ , which are connected to the permanent magnet, but insulated therefrom and from each other. When no current passes through the wire  $B'$  a light spring,  $B^8$ , shifts the said bar or armature to the right, so as to bring its contact-piece  $B^5$  against the contact-piece  $B^6$ . When, however, the switch  $D$  is closed and a current from the battery  $A$  passes through the coils of the electro-magnets  $I$  the right-hand electro-magnet is caused to repel and the left-hand electro-magnet to attract the bar or armature to the left. Its contact-piece  $B^5$  is thereby shifted into contact with the contact-piece  $B^7$ . A wire,  $B^9$ , extends from the contact-piece  $B^7$  to one of a pair of contact-pieces,  $e e'$ , on the frame or casing of a window,  $K$ . A wire,  $B^{10}$ , extends from the other of these contact-pieces to one of a pair of contact-pieces,  $f f'$ , also arranged on the frame or casing of the window. From the other of the last-mentioned contact-pieces a wire,  $B^{11}$ , extends. When the sashes of the window are closed the pairs of contact-pieces  $e e'$  and  $f f'$  are pressed together, and the circuit extends through them; but when either sash is opened the inner contact-piece of the pair controlled by that sash separates from its fellow, owing to its resilience, and the circuit is broken. The wire  $B^{11}$  extends to one of a pair of contact-pieces,  $g g'$ , through which the circuit is continued to a door,  $L$ . A wire,  $B^{12}$ , traverses the door, and is connected by a pair of contact-pieces,  $h h'$ , with a wire,  $B^{13}$ , leading to a resistance-coil,  $M$ , and thence to a wire,  $H^5$ , which extends to the ground. When the door  $L$  is opened the pairs of contact-pieces  $g g'$  and  $h h'$  are separated, and the circuit is broken. If the door is cut through, the wire  $B^{12}$ , which traverses it, is severed, and the circuit is of course broken. A wire,  $B^{14}$ , extends from the contact-piece  $B^6$  to the wire  $B^{11}$ . The wire  $H'$  is connected to a switch,  $N$ , located in the structure to be guarded. This switch may be shifted against a contact-piece,  $i$ , but it is never

to be in contact therewith except when the inmates of the structure to be guarded may, during the day, desire to signal the watchmen at the station or office. At other times the wire  $H'$  is not in circuit, or, in other words, does not form part of a continuous circuit except under circumstances which will be hereinafter explained. A wire,  $H^4$ , connects this contact-piece  $i$  with the coils of the electro-magnet of an electro-magnetic bell,  $O$ , and the wire  $H^5$  connects the coils of this electro-magnet with the ground. When an inmate of the structure to be guarded desires to signal a watchman at the station or office he shifts the switch  $N$  against the contact-piece  $i$ . As the switch  $H^3$  in the station or office is then bearing against the contact-piece  $c$  the plate  $d^2$  of the annunciator  $H^2$  is dropped, and the watchman thereby signaled.

The electro-magnetic bell  $O$  has a polarized armature,  $p$ , of such polarity that the current from the battery  $G$  will magnetize the electro-magnets of the said bell, so that they will repel the armature. When the watchman is signaled this bell  $O$  will not therefore be rung. The watchman, when signaled, switches off the battery  $F'$ , and by means of a switch,  $P$ , switches on a battery,  $Q$ , whereby an electric current will be sent in the reverse direction through the coils of the said electro-magnets. Then the electro-magnets will attract the armature and ring the bell. The inmates of the structure to be guarded will then know that their signal was received. Conversation can then be carried on through the telephone, if necessary. This feature of my improvement is important, as an inmate of a structure to be guarded frequently desires to communicate with a watchman at the station or office, and needs to do so when he is about to lock up and leave the structure to be guarded, so that the watchman shall shift the switch  $H^3$  against its contact-piece  $c'$ .

It is not necessary to employ the switch  $P$ , the battery  $Q$ , and the wire leading from this battery to the ground, or to polarize the armature  $p$  of the electro-magnetic bell  $O$ , for the watchman at the station or office can signal to the inmates of the structure to be guarded by making and breaking the circuit with the switch  $H^3$ .

If while the burglar-alarm is set for the night with the switch  $H^3$  against the contact-piece  $c'$  a wire or other article not comprised in the burglar-alarm should fall upon the wire  $H'$ , and establish electric communication between it and the ground, the galvanometer  $C$  will be affected, so as to indicate the fact to the watchmen at the station or office.

The opening of the window  $K$  will, as before explained, break the electric circuit, and when this happens the bar or armature  $J'$  of the electro-magnets  $I$  will be drawn to the right by the spring  $B^8$ . The circuit will then extend through the wire  $B^{14}$  to the wire  $B^{11}$ , thence to the wire  $B^{12}$  of the door  $L$ , and thence along



the wire B<sup>13</sup> to the ground. As soon as the circuit is completed again in this manner the electro-magnets I will move the said bar or armature to the left; but, as the circuit cannot be continued through the contact-piece B<sup>7</sup>, the electro-magnets will be demagnetized, and the bar or armature will move to the right again, and its contact-piece B<sup>5</sup> will make contact with the contact-piece B<sup>6</sup>. The circuit being thus again completed through the wires B<sup>14</sup>, B<sup>11</sup>, B<sup>12</sup>, and B<sup>13</sup>, the electro-magnets will again shift the bar or armature to the left and break the circuit. This operation will continue and the bar or armature will be kept constantly vibrating. The making and breaking of the circuit through the vibrations of the bar or armature will be indicated by constant vibrations of the galvanometer-needle at the station or office. If desirable, another battery may be then switched on, so as to send a reverse electric current through the electro-magnets I, whereupon the bar or armature will be held with its contact-piece against the contact-piece B<sup>6</sup> and the circuit kept complete through the wires B<sup>14</sup>, B<sup>11</sup>, B<sup>12</sup>, and B<sup>13</sup>. The vibrations of the galvanometer-needle will then be stopped. The same result can be accomplished by the use of a reversing-key.

Should the door be cut through or opened instead of the window, the circuit will be broken and will remain broken. The galvanometer-needle will then be shifted to one position and remain there. The constant vibrations of the galvanometer-needle caused by the opening of the window will be easily distinguished from the single vibration which it will make when the door is cut through or opened. Hence the watchman will know where an attempt to effect an entrance into the structure to be guarded is being made.

The switch H<sup>3</sup> will enable the watchmen to easily determine whether an alarm proceeds from the cutting or opening of the door or the contact of a wire or other article with the wire H'. Should any doubt arise on that point, for if it occurs from the latter cause then the shifting of the said switch away from the contact-piece c' will cause the alarm to cease, but if it arises from the former cause the shifting of the switch will have no effect on the alarm.

It is obvious that the electro-magnets I, the armature J', with its contact-piece B<sup>5</sup>, and the contact-pieces B<sup>6</sup> and B<sup>7</sup> form an electro-magnetic switch and an electro-magnetic circuit-breaker.

The insulating material B<sup>2</sup> of the wire B' would of course prevent any contact of another wire or any article with the wire B'; but as the material is liable to become broken or worn through, it could not be relied on. For this reason I use the wire H', so that an alarm will be given as soon as any wire or article makes contact with it. Then the difficulty can be remedied before injury is done to the insulating material, and all uncertainty as to the source of an alarm is avoided.

Any number of windows may be placed in circuit similarly to the window K, and any number of doors or wired coverings, partitions, sky-lights, or like articles may be included in the circuit in a manner similar to the door L. It will be understood that the window K is really in a tap in the electric circuit.

Of course the window might be in the main circuit and the door and like devices in the tap.

Obviously any suitable electric conductor surrounding the insulating material B<sup>2</sup> may be used in lieu of that portion of the wire H' which surrounds said insulating material.

What I claim as my invention, and desire to secure by Letters Patent is—

1. In an electric burglar-alarm, the combination, with a wire covered with insulating material leading from the station or office where watch is kept to a structure to be guarded, of a wire or conductor surrounding the insulating material of the same and connected at one end with a battery, but unconnected at the other end with an electrical conductor, and a device at the station or office connected with it for giving an alarm, substantially as specified.

2. In an electric burglar-alarm, the combination, with a wire covered with insulating material leading from the station or office where watch is kept to a structure to be guarded, of a wire or conductor surrounding the insulating material of the same and connected at one end with a battery but unconnected at the other end with an electrical conductor, a device at the station or office connected with it for giving an alarm, and a switch at the station or office, whereby the surrounding wire or conductor may be disconnected from the battery and alarm device, substantially as specified.

3. In an electric burglar-alarm, the combination, with a wire covered with insulating material leading from the station or office where watch is kept to a structure to be guarded, of a wire or conductor surrounding the insulating material of the same, and connected at one end with a battery but normally unconnected at the other end with an electrical conductor, an alarm device connected at the station or office with the surrounding wire or conductor, a switch connected to said surrounding wire or conductor at the structure to be guarded, and a wire leading to the ground, with which said switch may be put in contact, substantially as specified.

4. In an electric burglar-alarm, the combination, with the wire B', covered with insulating material B<sup>2</sup>, of the surrounding wire H', the switch H<sup>3</sup>, the battery G, a device for giving an alarm at the station or office, the switch N, and the electro-magnetic bell O, substantially as specified.

5. In an electric burglar-alarm, the combination, with a wire leading from the station or office where watch is kept, a portion of the electric circuit, including a door, a wired partition, or other like article, and a tap from said



portion of the electric circuit, including a window, or vice versa, of an electro-magnetic switch located at the structure to be guarded and operating in conjunction with the portion of the electric circuit and the tap therefrom, before referred to, substantially as specified.

6. In an electric burglar-alarm, the combination, with a wire leading from the station or office where watch is kept, a portion of the electric circuit, including a door, a wired partition, or other like article, and a tap from said portion of the electric circuit, including a window, or vice versa, of an electro-magnetic switch and circuit-breaker located at the structure to be guarded and operating in conjunction with the portion of the electric circuit and the tap

therefrom, before referred to, substantially as specified.

7. In an electric burglar-alarm, the combination, with a wire leading from the station or office where watch is kept, a portion of the electric circuit, including a door, a wired partition, or other like article, and a tap from said portion of the electric circuit including a window, or vice versa, of the electro-magnets I, polarized armature J', spring B<sup>8</sup>, and contact-pieces B<sup>5</sup> B<sup>6</sup> B<sup>7</sup>, substantially as specified.

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Witnesses:

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