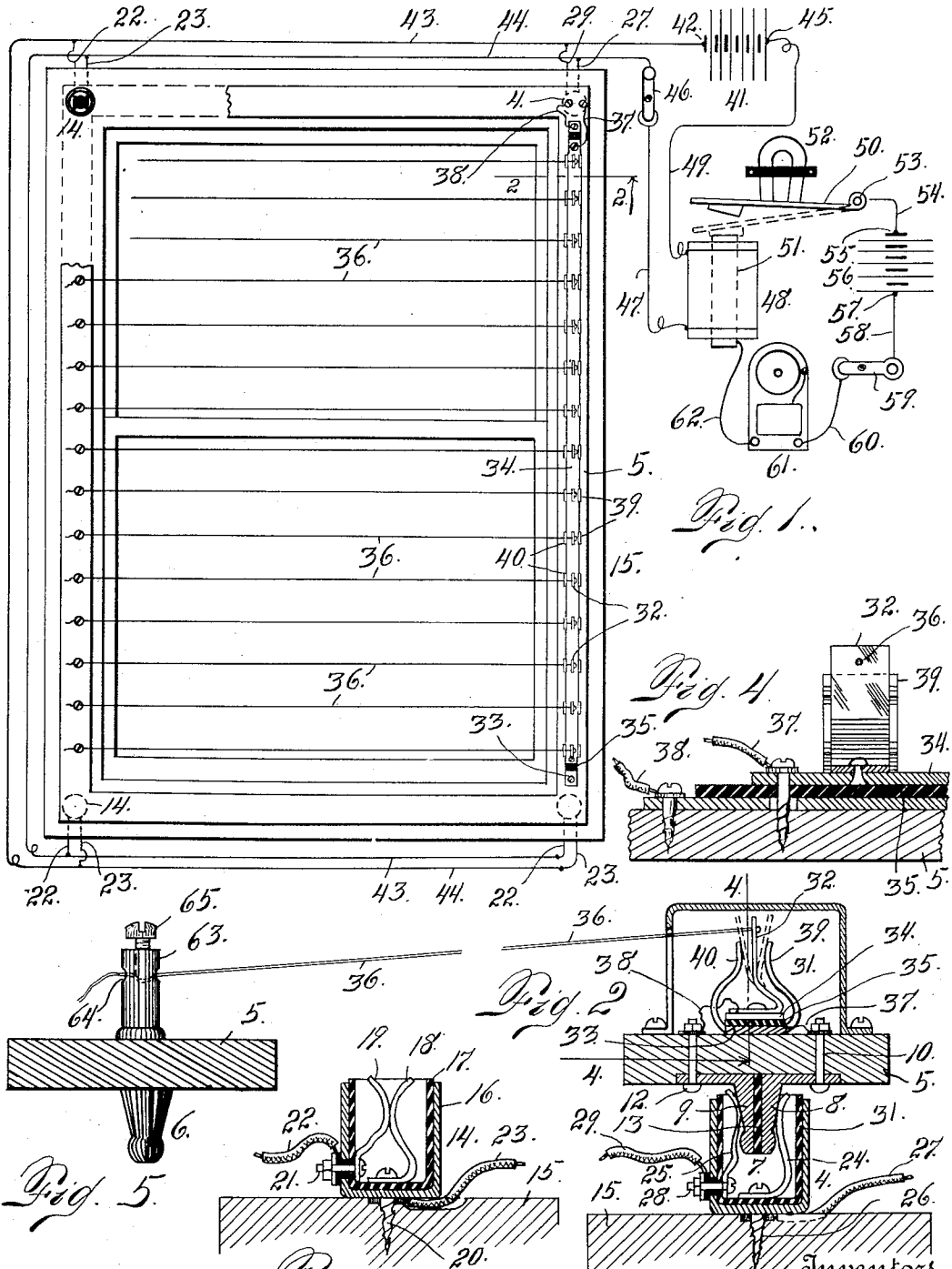


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BURGLAR ALARM.  
APPLICATION FILED AUG. 22, 1912.

1,081,884.

Patented Dec. 16, 1913.



Witnesses  
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*Fig. 3.*

*Fig. 2.*

*Fig. 4.*

*Fig. 5.*

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# UNITED STATES PATENT OFFICE.

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## BURGLAR-ALARM.

1,081,884.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that we, EDWARD C. BERTAGNOLLI and FRANCIS W. BERTAGNOLLI, citizens of the United States, residing at Central City, county of Gilpin, and State of Colorado, have invented certain new and useful Improvements in Burglar-Alarms; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in burglar alarms of the class in which it becomes practicable to protect windows, doors, safes, and practically receptacles of all descriptions in which valuables are contained. As illustrated in the drawing, it is shown applied to a window in such a manner that the wires, cords, or other flexible devices forming a part of the apparatus are stretched across the opening whereby it becomes impossible for the burglar to enter the house or interfere with anything through the window without disturbing the said flexible devices, and a disturbance of any one of these devices will close an electrical circuit and produce an alarm in the desired location.

An important feature of our improved structure consists in the fact that it is readily attachable or detachable, whereby it may be removed during the day and put in place at night, when it is most needed.

The window frame, or other structure where the device is to be located, is equipped with sockets in which are located spring contact members which are normally separated by projections applied to the frame of the device and which, when in place, separate the said contacts and maintain the alarm circuit normally broken. As many of these sockets as desired may be employed. As the contacts of each socket are respectively connected through the medium of suitable conductors to the opposite poles of a battery, or other electrical source, if the frame-work of the device is disturbed sufficiently to remove one of the projections from its engaging socket, the two spring contacts will immediately engage each other and close the alarm circuit. This is

important, since the burglar might endeavor to detach the frame of the device from the window in order to avoid disturbing the flexible devices which extend across the area of the window opening. These flexible devices may be placed so closely together that it is impossible to pass the hand or an instrument between them without a sufficient disturbance to close the alarm circuit. Each flexible device is connected at one extremity with a post, the said device being passed through an opening in the post and secured in place by a set-screw, whereby the spring contact is held in a position midway between two members of another contact located in the other branch of the circuit. If the flexible device is broken, the spring contact, by virtue of its normal tendency, will engage one member of the companion contact, while, if the flexible device is disturbed in such a manner as to pull the contact member with which it is connected, in a direction opposite its normal tendency, it will engage the other member of the companion contact; in either event the alarm circuit will be closed. There is one of the spring contacts and a pair of companion contact members for each flexible device with which the article is equipped.

Having briefly outlined our improved construction, we will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a front view of our improved device, showing the same applied to a window. Fig. 2 is a section taken approximately on the line 2—2, Fig. 1, the parts being shown on a larger scale. In this view, one of the corner sockets, together with the projection carried by the frame of the article and engaging the socket, is also shown in section, though the line 2—2 is not located to produce this result. Fig. 3 is a section taken through one of the sockets with which the structure to be protected is equipped. Fig. 4 is a section taken on the line 4—4, Fig. 2. Fig. 5 is a section taken through one side of the frame-work and showing one of the projections mounted on the frame and adapted to enter one of the sockets.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a rectangular

frame-work, which is provided at each of three corners with an insulating projection 6, and at the fourth corner with a projection 7, the last-named projection being composed of two metal parts 8 and 9 secured to the bottom of the frame by bolts 10 and 12 passing therethrough, the parts 8 and 9 being separated from each other by an insulating member 13. Each of the projections 6 enters a socket 14 secured to the frame 15 of the window or other structure to which the article is applied. This socket consists of an outer shell 16 provided with an insulating lining 17. Within the socket are located two spring contact members 18 and 19, the contact 18 being secured to the bottom of the socket by a screw 20, while the contact 19 is secured to the wall of the socket by a bolt 21 which serves to connect the contact member 19 with a branch conductor 22, while the screw 20 serves to connect the other contact member 18 with a branch conductor 23, the said contact members 18 and 19 being insulated from each other where they are connected with the socket, their upper portions, however, being adapted to engage except when separated by a projection 6. The single projection 7 enters a socket 4 and passes between the two contact members 8 and 9, whereby they are separated to break the circuit at this point.

Within the socket 4 are located two contact members 24 and 25. The member 24 is secured to the bottom of the socket by a screw 26, which also fastens the socket to the frame 15 of the window, or other structure. The screw 26 also serves to electrically connect the contact 24 with a branch conductor 27. The contact member 25 is secured to the socket by a bolt 28, which also serves to electrically connect the contact 25 with a branch electrical conductor 29. The shell of the socket 4 is lined with insulating material 30, and the two contacts 24 and 25 are insulated from each other.

When the device is in place upon the window frame 15, for instance, each of the three sockets 14 is entered by an insulating projection 6 which passes between the two contacts 18 and 19 and holds the same separated from each other, whereby the circuit is broken at these sockets, and as the projection 7 is in separating engagement with the contacts 24 and 25 at the same time that the insulating projections 6 are in similar engagement with the contacts 18 and 19, the circuit is normally broken at all four corners of the frame 5 of the device, but since the members of each pair of contacts of all of the sockets are respectively connected with the opposite poles of an electrical source, if any projection 6 or 7 be removed from its socket, the contacts 18 and 19, or 24 and 25, as the case may be, immediately engage each other by virtue of their spring tension, and

close the circuit. It is necessary, however, that at one corner of the frame, or where the socket 4 is located, provision be made for electrically connecting the contacts 24 and 25 with a series of contacts 31 and 32 carried by our improved device. This is accomplished through the agency of the metal parts 8 and 9, the bolts 10 and 12 and the narrow metal plates, or strips, 33 and 34, which are separated from each other by an insulating member 35. The plates 33 and 34 extend along one side of the frame 5 of our improved device, and the pairs of contacts 31 and 32 are arranged as closely together as may be desired for the purpose of employing the necessary number of flexible devices 36, each of which is connected with a contact member 32 of each pair of contacts 31 and 32. From the bolt 10 a branch conductor 37 leads to the metal strip 33, while from the bolt 12 a branch conductor 38 leads to the metal strip 34.

As illustrated in the drawing, the two metal strips 33 and 34 are arranged one above the other along the right-hand side of the device, (see Fig. 1.) The contact 32, if unrestrained, would engage the twin part 39 of the contact 31, which is composed of two parts 39 and 40. Normally, however, the flexible device 36 which is connected with the contact 32, as aforesaid, is placed under sufficient tension to maintain the contact 32 in a position midway between the two twin parts 39 and 40 of the contact 31, thus normally maintaining the circuit broken where these contacts are located.

The general arrangement of the circuit employed in connection with our improvement will now be described. The numeral 41 designates a source of electricity, from one pole 42 of which a main wire 43 passes around three sides of the window where our improvement is located, while another main wire designated 44 passes around the same three sides of the window, the conductor 44 being connected with the opposite pole of the source through a switch arm 46, a conductor 47, a relay magnet 48 and a conductor 49. From the main conductors 43 and 44 the branch conductors 27 and 29 lead to the contacts 24 and 25 respectively of the socket 4, which is located at the upper right-hand corner of the device; while from the main conductors 43 and 44 the branch conductors 22 and 23 lead to the contacts 19 and 18 respectively of the three different sockets 14 of our improved structure. Normally, or when the circuit is broken through the electrical source 41, the armature 50 of the relay magnet 48 is held away from the core 51 of the magnet by a permanent magnet 52, the armature 50 being hinged as shown at 53. This armature is connected by a conductor 54 with one pole 55 of an electrical source 56, from whose opposite pole

57 a conductor 58 leads to a switch arm 59 from which a conductor 60 leads to an alarm bell 61, while from this bell a conductor 62 leads to one extremity of the core 51 of the magnet. From this it will be understood that as soon as the circuit is closed through the electrical source 41, whereby the magnet 48 is energized, the said magnet will act to draw the armature 50 into engagement with the core 51 of the said magnet, whereby it is caused to occupy the dotted line position in Fig. 1. As soon as this occurs, the circuit will be closed through the alarm bell 61. Each flexible device 36 which is connected with one extremity of the contact 32, as heretofore explained, is also connected with a post 63 attached to the opposite side of the frame 5 of our improvement, the said flexible device being passed through an opening 64 in the said post and held in the desired position by means of a screw 65 threaded into a perforation in the post which intersects the opening 64. In this manner the desired number of flexible devices 36 are stretched between the two side members of the frame 5.

Now, in the event that a burglar should attempt to enter a window protected by our improved device, as illustrated in Fig. 1 of the drawing, if he should disturb one of the flexible devices 36 without breaking it, the contact 32 would be pulled toward the left,—see Fig. 2,—whereby it would be caused to engage the part 40 of the contact 31. On the other hand, if he should break one of the flexible devices 36, the contact 32 would move to the right-hand dotted line position in Fig. 2 and engage the part 39 of the contact 31. In either event the circuit would be closed through the electrical source 41, whereby the magnet 48 would be energized and its armature drawn into engagement with the core 51 whereby the circuit would be closed through the source 56 and the alarm device 61.

Attention is called to the fact that the flexible devices 36 may be made of combustible material, whereby our improved device will not only serve as a burglar alarm, but also as a fire alarm device. Attention is, also, called to the fact that the rectangular frame constituting the body of our improved device is readily detachable from the structure equipped therewith, since the electrical conductors through which the current passes to the contact members of the frame, are connected directly with the spring contacts mounted on the equipped structure. The removal of the frame allows the spring contacts of these sockets to engage each other, and, therefore, would operate the alarm. When, however, the frame is removed from the equipped structure during the time when it is not desired to have burglar alarm protection, the switch arm 46 is moved to break

the circuit and prevent the operation of the alarm.

It will be understood that the alarm bell and its connections may be placed in any desired location remote from the extremity to which the frame is applied.

Having thus described our invention, what we claim is:

1. A burglar alarm, comprising a frame, metal strips arranged along one side of the frame, and insulated from each other, a series of spring contacts mounted upon one of the metal strips, a series of cooperating contacts mounted on the other strip, each cooperating contact being composed of two members, and each spring contact being located between the two members of a cooperating contact and having a normal tendency to engage one member of its corresponding cooperating contact, flexible devices connected with the respective spring contacts and extending across the space surrounded by the frame, means for securing the flexible devices in such a manner that the several spring contacts are normally held out of engagement with both members of their respective cooperating contacts, a structure to which the said frame is applied, said structure being equipped with a number of pairs of spring contacts having a normal tendency to engage each other, insulating projections carried by the frame and adapted to engage certain of said spring contacts, and separate the same, a normally open electrical circuit, an alarm arranged to be operated by the closing of said circuit, the members of each pair of spring contacts being insulated from each other and respectively connected with the opposite branches of the circuit, a plug consisting of two separated electrical conductors mounted upon the frame and adapted to engage one pair of said spring contacts, the two conductors of said plug being electrically connected with the aforesaid respective metal strips.

2. In a burglar alarm, the combination with a structure to be equipped, of a frame provided with insulating projections, the said structure having sockets exceeding by one the number of said projections, each socket being equipped with a pair of spring contacts having a normal tendency to engage each other, the projections on the frame being adapted to space said contacts, an electrical circuit, the spring contacts of each socket being respectively connected with the opposite branches of the circuit, a plug consisting of two separated electrical conductors mounted upon the frame and adapted to engage respectively the spring contacts of one of said sockets, metal strips mounted on one part of the frame insulated from each other and electrically connected to the members of said plug, a series of spring con-

5 tacts mounted upon one metal strip, a series  
 of cooperating spring contacts mounted on  
 the other metal strip, the cooperating con-  
 10 tacts being each composed of two spaced  
 members, and each of the spring contacts be-  
 ing interposed between the two members of  
 a cooperating contact, the spring contacts  
 having a normal tendency to engage one  
 15 member of their respective cooperating con-  
 tacts, flexible devices connected with the  
 respective spring contacts and extending  
 across the space between opposite parts of  
 the frame of the device and connected with  
 the frame to hold the spring contacts out  
 20 of engagement with both members of the  
 cooperating contacts, the said circuit being  
 normally open and an alarm arranged to be  
 operated by the closing of the circuit.

25 3. In a burglar alarm the combination  
 with a structure to be equipped of a frame,  
 a plurality of insulating projections carried  
 by the frame a plug similar in shape to said  
 projections and consisting of two separated  
 electrical conductors, said plug being also

25 carried by the frame, the said structure hav-  
 ing sockets each provided with a pair of  
 spring contacts having a normal tendency  
 to engage each other but which are spaced  
 by the projections and plug when the frame  
 is in operative position, an electric circuit,  
 30 the spring contacts of the sockets being  
 respectively connected with the opposite  
 branches of the circuit, spring contacts  
 mounted upon the frame and electrically  
 35 connected with the conductors of said plug,  
 means mounted upon the frame which, when  
 disturbed are adapted to cause said last  
 named spring contacts to engage, and an  
 alarm adapted to be operated by the closing  
 40 of said circuit.

In testimony whereof we affix our signa-  
 tures in presence of two witnesses.

EDWARD C. BERTAGNOLLI.  
 FRANCIS W. BERTAGNOLLI.

Witnesses:

BERNARD E. NAUGHTON,  
 NEEL MCKAY.