A. CLINE.

BURGLAR ALARM.

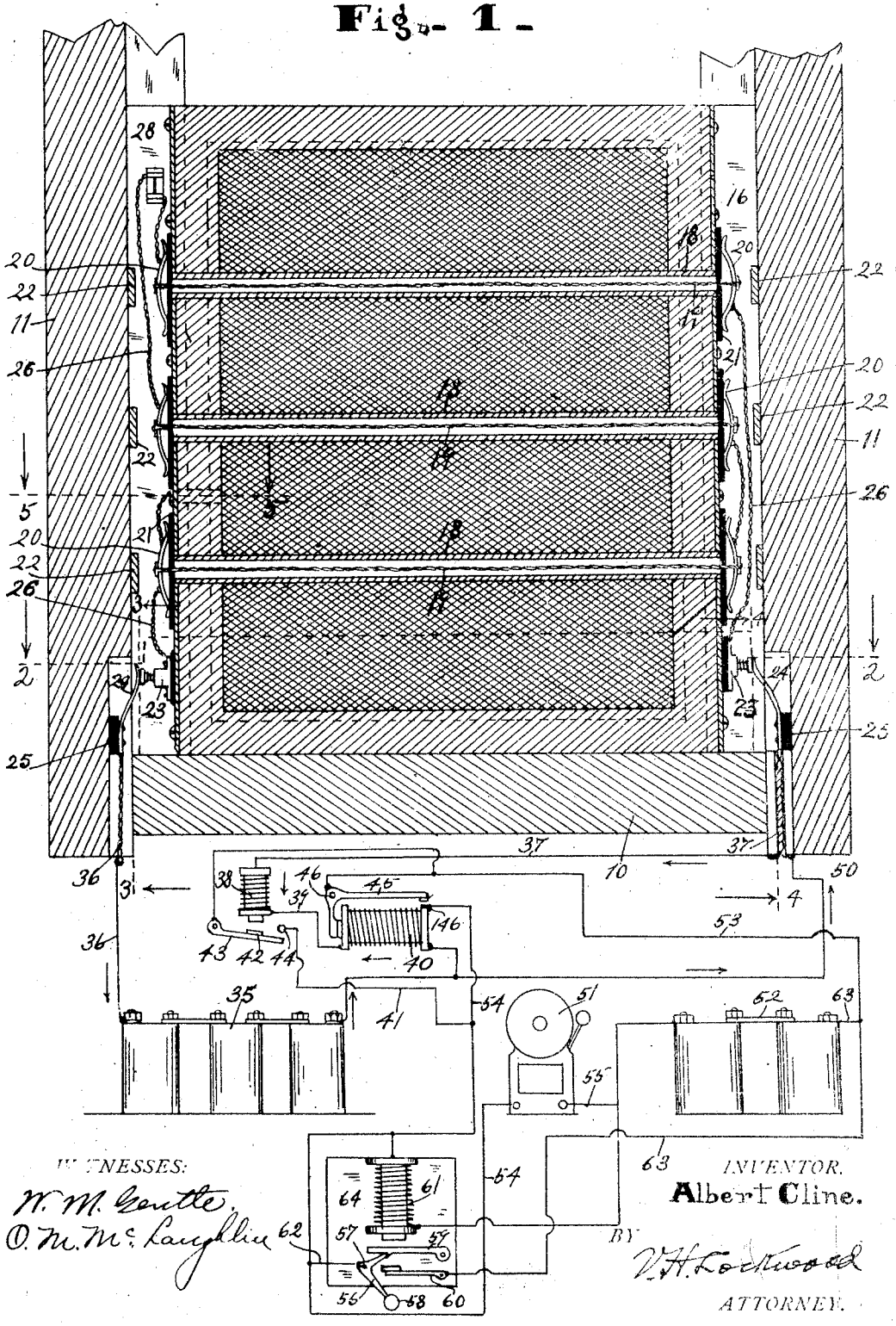
APPLICATION FILED NOV. 5, 1909.

1,003,234.

Patented Sept. 12, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

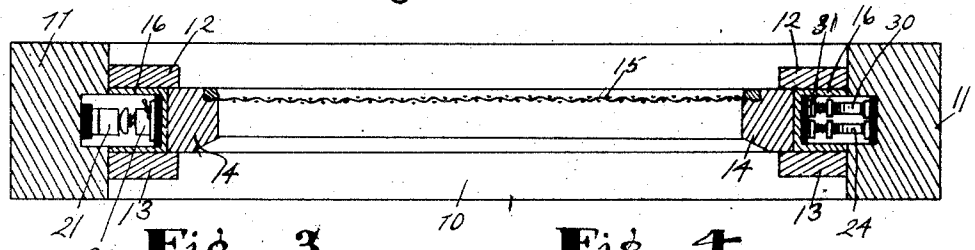


Fig. 3.

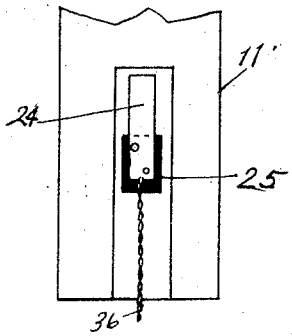


Fig. 4.

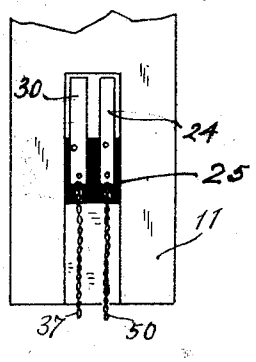


Fig. 5.

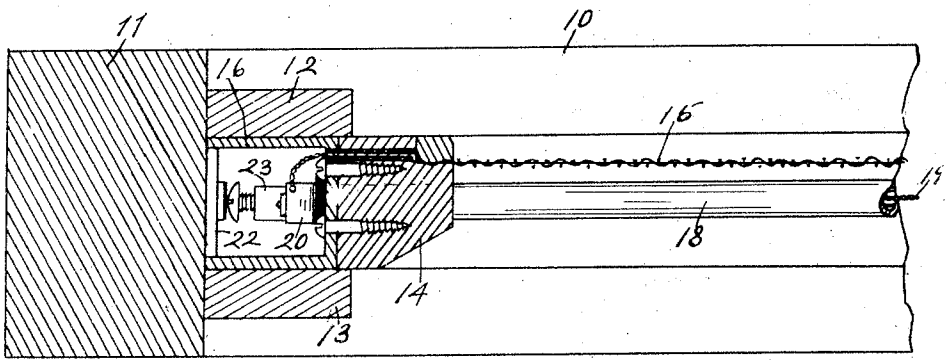
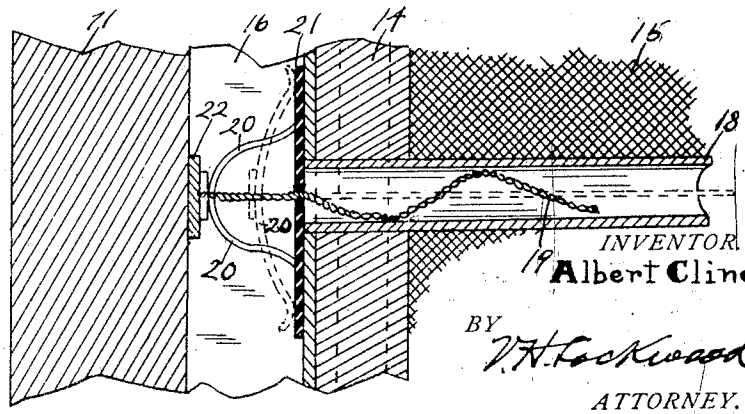


Fig. 6.



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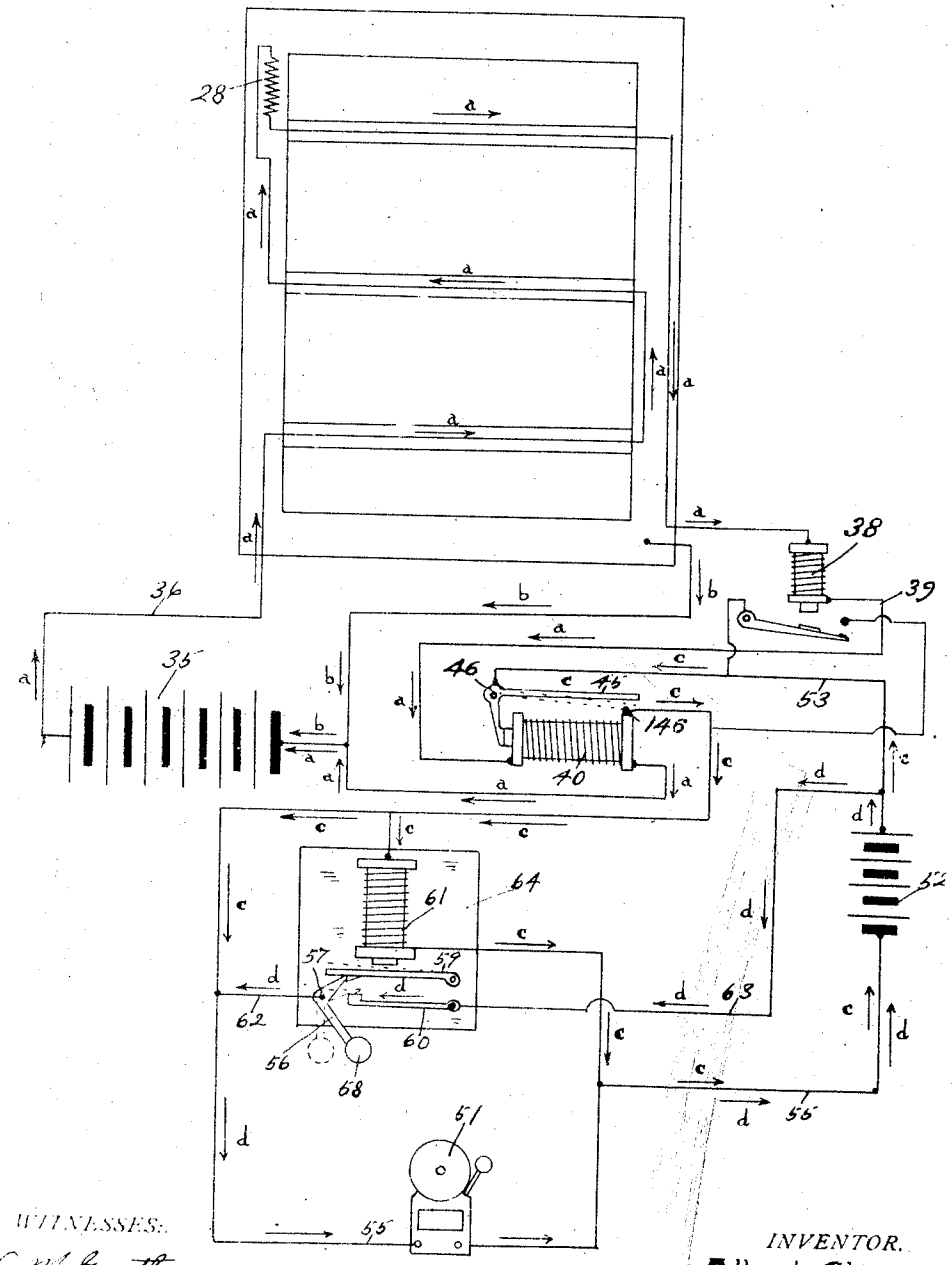
4 SHEETS--SHEET 3.

Fig. 7.



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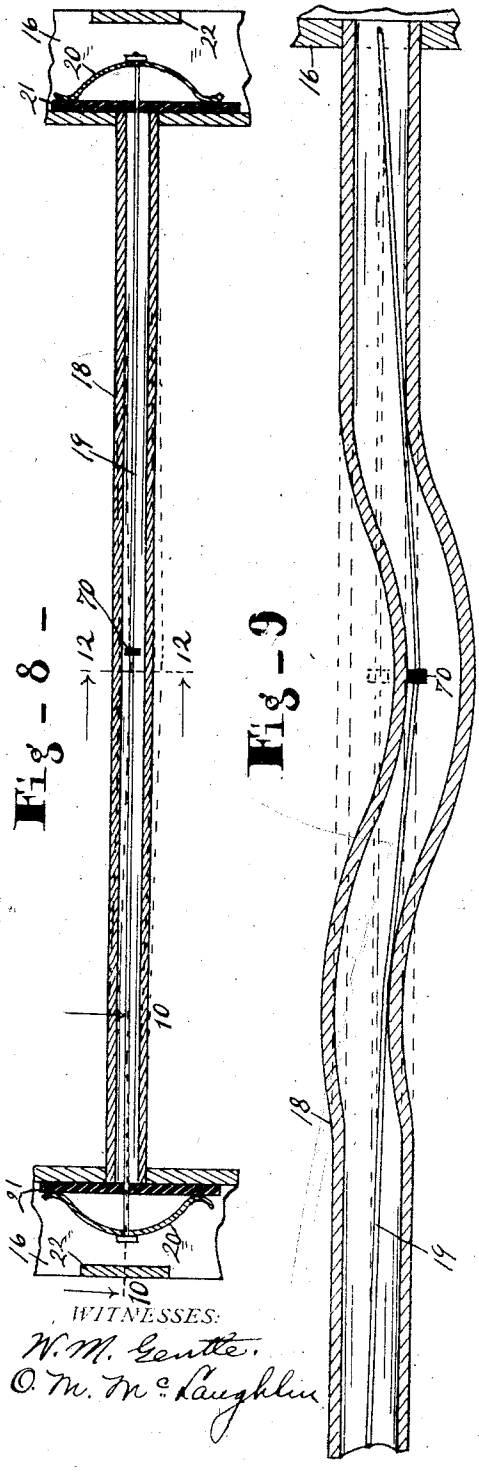

Fig. 8.

Fig. 9.

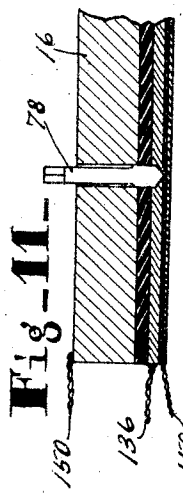

Fig. 11.

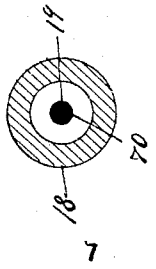

Fig. 12.

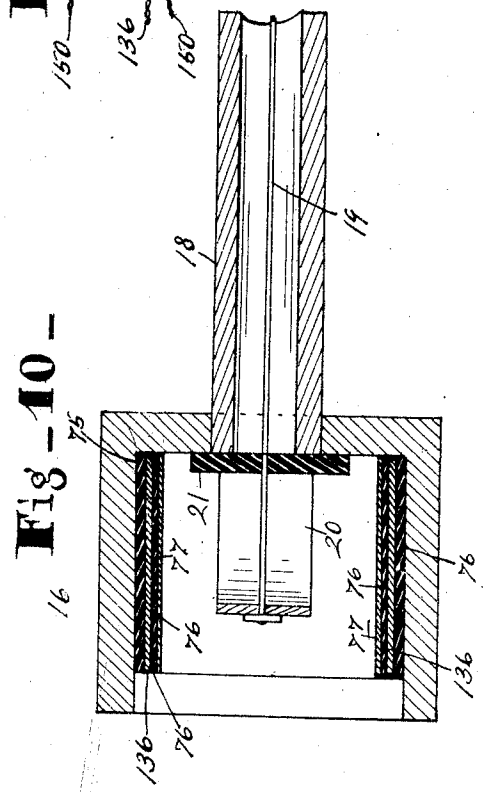

Fig. 10.

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UNITED STATES PATENT OFFICE.

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BURGLAR-ALARM.

1,003,234. Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed November 5, 1909. Serial No. 526,416.

To all whom it may concern:

Be it known that I, ALBERT CLINE, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Burglar-Alarm; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

The object of this invention is to provide an improved electric signaling apparatus particularly adapted for the prevention of robbers and burglars breaking through windows, doors, bars and the like.

The chief feature of this invention consists in maintaining an electric circuit in relation to a window frame or the like so that when the latter is manipulated said main circuit will be affected thereby, by being broken or short-circuited. A signal and signal circuit are provided with means in said main circuit for closing the signal circuit, which circuit closing means is held normally open by the current passing through said main circuit. When the main circuit is broken or short-circuited, said signal circuit will be closed and the signal operated. In working out said feature of the invention, I have provided transverse tubes in a window frame at intervals, through which wires are stretched normally out of contact with the tubes, which wires form a part of the main circuit, and said tubes are in electrical connection with the window frame and said window frame is short-circuited, so that when a tube is bent enough to touch the wire passing through it, the signal will be operated, and the same will be true if the wire be broken. Likewise, the main circuit is broken when the window is raised. The wire extending through each tube is stretched on a pair of springs and when the wire is broken, said springs will expand against means in electrical communication with the frame so that again there will be short-circuiting and the signal operated. In order that the signal may continue to operate until stopped by a person inside the house, I provide a primary signal circuit, which is brought into operation as above described and will operate the signal as long as the current is permitted to pass through it, and also a secondary signal circuit with a switch for closing said secondary circuit, which is normally held open, and means actuated by the current passing through the primary circuit for releasing said switch and permitting it to close. Then the secondary circuit will operate the signal until stopped, regardless of the primary circuit. Thus a burglar might stop the primary circuit by immediately lowering the window, but he could not stop the secondary circuit from further operation of the signal.

The nature of my invention will be understood from the accompanying drawings and the following description and claims.

In the drawings Figure 1 is a central vertical section through the lower part of a window casing and screen frame with a diagrammatic view below the same of the signal and electric wiring. Fig. 2 is a horizontal section on the line 2—2 of Fig. 1. Fig. 3 is a side elevation of the lower part of the window casing at the left hand of Fig. 1, viewed from the line 3—3. Fig. 4 is the same view of the lower part of the right hand side of the window casing, viewed from the line 4—4 of Fig. 1. Fig. 5 is a horizontal section on the line 5—5 of Fig. 1. Fig. 6 is a vertical section through a portion of the window casing and window showing the position of parts when the wire is broken, the same appearing on an enlarged scale. Fig. 7 is a diagram of electric circuits. Fig. 8 is a vertical section centrally through one of the tubes and the sides of the window frame, shown in improved form. Fig. 9 is a portion of the same enlarged and bent. Fig. 10 is a horizontal section on the line 10—10 of Fig. 8, showing the improved form. Fig. 11 shows one side of the casing with the wires as they appear in the casing—on an enlarged scale—with a burglar's drill inserted. Fig. 12 is a section on the line 12—12 of Fig. 8.

In the drawings there is shown the bottom 10 and the sides 11 of a window casing having cleats 12 and 13 secured thereto, between which a window or window screen frame 14 is slidably mounted. In the drawings a screen 15 is shown, for the purpose of explaining certain features of the invention.

At each side of said window or screen frame 14 there is secured a vertically disposed casing 16 open at its outer side. Tubes 18 are extended at intervals horizontally through the screen frame through each of which a wire 19 is stretched on leaf springs 20 which bear against insulation 21 within the casing 16. Bars 22 are placed across the outer edge of the casing 16 at points opposite the ends of said tubes 18. Near the lower end of the window or screen frame 14 contact posts 23 are secured to and insulated from the inner walls of the casing 16, so that when the frame is in its lowered position said contact posts will engage the contact springs 24 secured to the insulating blocks 25 in the sides 11 of the window casing. Said contact posts 23 and the springs 20 at the ends of the tubes 18 are alternately connected by wires 26 so as to form a circuit running from the spring 24 on one side, through a contact post 23, a wire 26, a spring 20 and a wire 19 to the other side of the window or screen frame and thence up to the wire 19 above and back to the other side of the window or screen frame until the circuit reaches the spring 24, at the other side of the window frame. In the circuit there is a voltage-reducing means 28, such as a resistance coil. The tubes 18 are in electrical communication with the metal casings 16 and a contact spring 30 that is secured beside the spring 24 at one side of the window screen frame (see Fig. 4), and is mounted like the spring 24 beside it, and the upper end of the spring 30 engages a contact post 31 that is in electrical communication with the casing 16, so that all of the tubes 18 and the two casings 16 and the post 31 and the spring 30 are in electrical communication with each other.

There is a battery 35 which through wire 36 is in communication with one of the springs 24. The current then passes through the circuit in connection with a window or screen frame and through the other spring 24, out through the wire 37 to the magnet 38. Thence the current passes through the wire 39 to the magnet 40 and thence through wire 41 back to the battery. The circuit just described is normally closed, so that the current passes through it all the time when the device is in its normal condition. The magnet 38 and its armature 42 on the switch arm 43 are so arranged that if the current exceeds a certain strength, say one volt, the magnet will attract the armature and move the switch arm 43 against the contact 44 so as to close the bell circuit, hereafter described. The magnet 40 is provided with a double switch arm 45 fulcrumed at 46. The current through the circuit, so far described, causes the short arm of said switch 45 to be attracted by the magnet 40 so as to hold the long arm out of engagement with the contact 146 and thus close the bell circuit hereafter described, when the circuit heretofore described has been broken. If a burglar should undertake to enter through the screen window shown, he would bend one of the tubes 18. The tube at the bend would come in contact with the wire 19 extending through it, and thus cause a shunt circuit or change of circuit. In that instance the circuit, instead of going out through the spring 24 and wire 39, would pass out through the tube 18, the casing 16, the spring 30 and wire 50 to the battery. In that event, as soon as the current ceases passing through the magnet 40, the switch arm 45 would drop down and close the bell circuit, causing the ringing of the bell. In the bell circuit there is a bell 51 and a battery 52. A wire 53 extends from the battery 52 to the switch arm 45 and from the contact 146 a wire 54 extends to the bell and from the bell the wire 55 passes to the battery, thus completing the circuit. To keep the bell continuously ringing and prevent the burglar from stopping its ringing, a switch lever 56 is provided. It is a bell crank lever fulcrumed at 57 and having a weight 58 which is normally elevated. The other end of the bell crank is held by the armature bar 59 out of engagement with the switch bar 60. When the circuit last described is established the current, passing through wire 54, energizes the magnet 61 which attracts the armature bar 59 and releases the switch lever 56, whereupon the weight 58 throws the upper end of said switch lever down upon the switch bar 60 and closes the circuit through the battery and bell including the wire 62 and the portion of the wire 54, which lies between the wire 62 and the bell, and thence through the wire 55, the battery and the wire 63 running from the battery to the switch bar 60. In that event the bell will continue to ring until somebody returns the switch lever 56 to the position shown in the lower part of Fig. 1, and breaks the bell circuit. The magnet 61, lever 56 and bars 59 and 60 are mounted on the board 64. If the burglar in attempting to enter should break one of the wires 19, as indicated in Fig. 6, then the first and main circuit would be broken, and the same result would happen as before, namely: the current would cease to pass through and energize the magnet 40, which would cause the switch arm 45 to close the bell circuit.

The springs 20 are normally compressed considerably by the wires 19 drawing them toward each other. When the wire 19 is broken, as shown in Fig. 6, the spring 20 bulges laterally into contact with one of the cross-bars 22 and then the current will be short-circuited in the manner above described. If the main circuit, as originally

described, is cut by the burglar, the bell circuit will be closed. If, on the other hand, the burglar should attempt to short-circuit the main circuit, heretofore described, by connecting the wire 37 to the wire 36, there would be an increase of current passing through the magnet 38 which would energize it sufficiently to cause it to actuate the switch arm 43 and close the bell circuit, as any increase in the current above normal, say one volt, would sufficiently energize the magnet 38.

In Fig. 7 the diagram illustrates the various circuits. Thus the main circuit "*a*" is normally closed. The circuit "*b*" is utilized when the window is raised, a tube 18 bent so as to touch a wire 19, or wire 19 broken so as to throw the spring 20 in the position shown in Fig. 6. The primary bell circuit, is indicated by "*c*", and "*d*" is the secondary circuit which causes a continuous ringing of the bell.

In Figs. 8, 9 and 12 a modified form of a part of the device is shown. There a piece of rubber 70 is secured on the wire 19 so that any slight bending of the tube 18 would not cause the signal to operate, but a considerable bending of the tube, as indicated in Fig. 9, would be required to produce that result.

In Figs. 10 and 11 another modification is illustrated, for there the sides of the casing 16 are lined with insulation 75, through the center of which a zinc strip 76 extends and there is a zinc strip 77 on the inside surface of the insulation. The casing 16 and the strip of zinc 77 are connected with wire 150 corresponding with wire 50, shown in Fig. 1 and above described, and the inner strip of zinc 77 is connected with the wire 136 corresponding with the wire 36 and above described, the circuits otherwise being the same as in Fig. 1 above given. The purpose of this arrangement is to prevent drilling through the casing 16. Thus in Fig. 11 a drill 78 is shown that has passed through the casing 16 and a part of the insulation and the inner zinc strip 76 but it has pushed some of the zinc from that strip through the intermediate insulation into contact with the strip 77, enough to throw the two strips 76 and 77 into one electric circuit running out to the battery through the wires 136 and 150. The strip 77 would be needed only when a non-conducting drill 78 were used. If the drill were made of conducting material it would short-circuit through the casing 16 and zinc strip 76 and set the bell to ringing.

Instead of a bell, another electrically operated signal might be employed.

I claim as my invention:

1. The combination of a frame adapted to conduct electricity, a main electric circuit mounted on said frame but normally insulated therefrom and being normally closed, a signal circuit, means for closing the signal circuit, an electromagnet in the main circuit whereby said means is held open by the current passing through the main circuit, and means connecting said frame with said main circuit so as to cut out the signal circuit closing means in said main circuit when the frame and main circuit are manipulated so as to bring them into electrical connection.

2. The combination of a tube, a main electric circuit normally closed, a part of which circuit consists of a wire passing through said tube but held normally out of contact therewith, a signal circuit, means for closing the signal circuit, an electromagnet in the main circuit whereby said means is held open by the current passing through the main circuit, and a connection between said tube and said main circuit which when the tube is brought in contact with the wire passing through it will cut out of said main circuit said signal closing means, whereby the signal circuit will be closed.

3. The combination of a window sash or the like having an electrical conducting strip secured to each side thereof, metal tubes extending transversely of said window sash at intervals and connected with said conducting strip, a main electric circuit mounted on said window sash and insulated therefrom and normally closed, a part of which main circuit consists of a wire passing through each of said tubes and held normally out of contact therewith, a signal circuit, means for closing the signal circuit, an electromagnet in the main circuit whereby said means is held open by the current passing through the main circuit, and an electrical connection between said window sash and said main circuit so that when any tube comes in contact with the wire passing through it the signal closing means in the main circuit will be cut out of the new circuit established, whereby the signal circuit will be closed.

4. The combination of a window sash having an electrical conducting strip secured to each side thereof, metal tubes extending transversely of said window sash at intervals and connected with said conducting strip, an electric circuit mounted on said window sash and insulated therefrom and normally closed, a part of which circuit consists of a wire passing through each of said tubes and held normally out of contact therewith, springs at each side of said window sash to which each of said tube wires is secured so said springs will be normally under tension, means in electrical connection with said window sash to be engaged with said springs when the wire is cut, a signal circuit, means for closing the signal circuit, an

electromagnet in the main circuit whereby said means is held open by the current passing through the main circuit, and an electrical connection between the window sash and said main circuit so that when any tube wire is cut the signal closing means will be cut-out of the newly established circuit.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

ALBERT CLINE.

Witnesses:
G. H. BOINK,
O. M. MCLAUGHLIN.