I. E. ROSENTHAL.

CIRCUIT CLOSER.

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1,148,931. Patented Aug. 3, 1915.

Fig. 1.

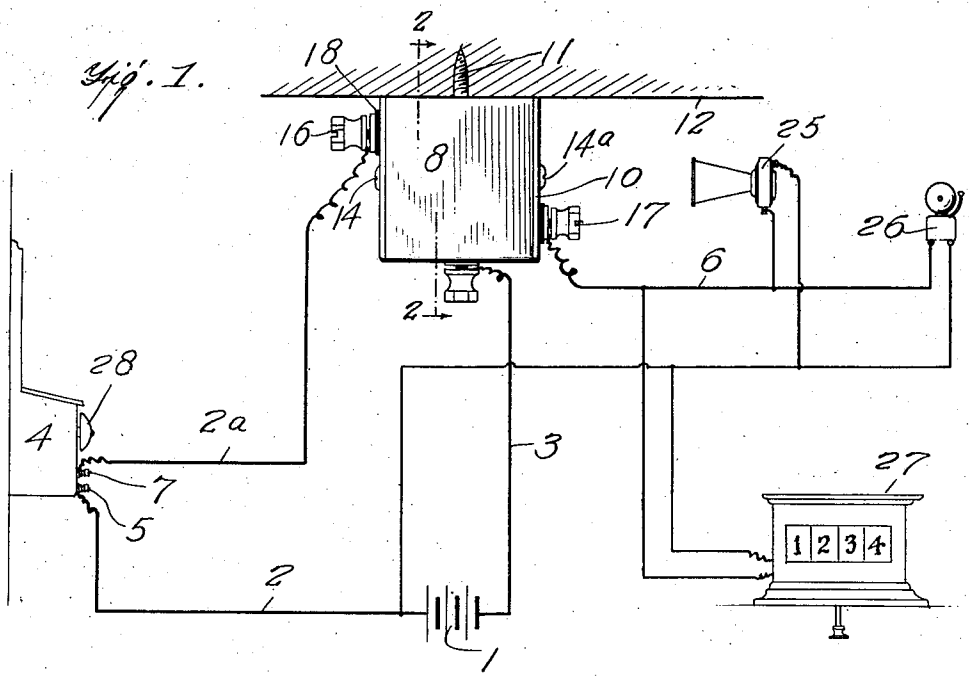


Fig. 2.

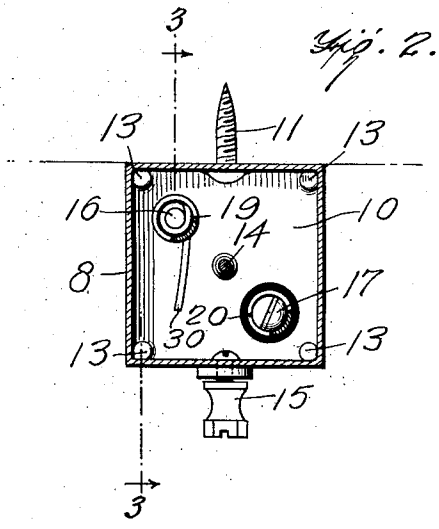
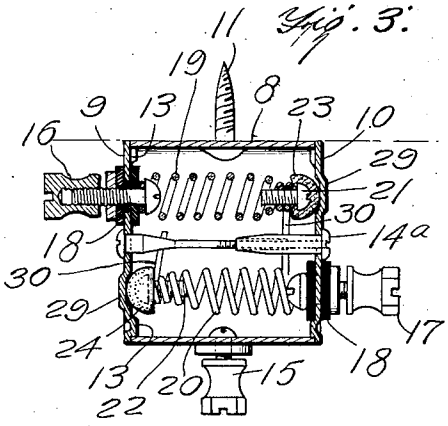


Fig. 3.



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CIRCUIT-CLOSER.

1,148,931. Specification of Letters Patent. Patented Aug. 3, 1915.

Application filed January 12, 1915. Serial No. 1,887.

To all whom it may concern:

Be it known that I, ISRAEL E. ROSENTHAL, a citizen of the United States, and a resident of Argenta, county of Pulaski, and State of Arkansas, have made certain new and useful Improvements in Circuit-Closers, of which the following is a specification.

My invention is an improvement in circuit closers for electrical fire alarms, and has for its object to provide a simple, inexpensive and efficient device of the character specified, operated by excessive heat for automatically closing an electrical circuit to cause the same to actuate an alarm or a series of alarms, as for instance bells, automobile horns, electric whistles and annunciators.

In the drawings: Figure 1 is a diagrammatic view of the improved circuit closer in use, Fig. 2 is a section on the line 2—2 of Fig. 3, and Fig. 3 is a section on the line 3—3 of Fig. 2, both Figs. 2 and 3 looking in the direction of the arrows adjacent to the respective lines.

The improved circuit closer is interposed in an open electrical circuit, comprising a suitable source of electrical energy, as for instance a battery 1, and lead wires 2 and 3 lead from the opposite poles of the battery to the mechanism to be later described.

The improvement is especially designed for use in connection with the safeguard life and telephone attachment forming the subject matter of my U. S. Patent No. 1,113,052, granted to me on Oct. 6, 1914, the said attachment being designated generally at 4, and the lead wire 2 is connected with one of the binding posts 5 of the said attachment. A continuation of the lead wire 2 designated at 2^a leads from the other binding post 7 of the attachment to the circuit closer forming the subject matter of the present application, and the lead wire 3 is also connected with the said circuit closer.

It will be understood that as many of the circuit closers may be used as may be desired, and they may be arranged in different rooms, or in different places in the same room, or in different buildings and preferably they are connected with the ceiling at the point which it is particularly desired to safeguard against fire.

Each of the circuit closers is composed of a metal box, consisting of an open rectangular frame 8 of metal, and the frame is seamless, and no solder is used in the formation of the frame. The box is completed by heads or end plates 9 and 10 respectively, the said plates being of the same metal as the frame 8. A wood screw 11 is passed through an opening in one side of the frame, the said side being hereafter designated as the top, and the wood screw is adapted to engage a fixed support designated at 12, in the place which it is desired to safeguard against fire. The heads 9 and 10 fit against the ends of the frame, and each head is provided on its inner face with four inwardly extending lugs or bosses 13, formed in the present instance by embossment, that is by stamping or pressing inward a portion of the material of the head, and the said bosses are in such position that they will guide in the placing of the heads, that is the said lugs or bosses fit within the frame properly positioning the head with respect to the frame. The heads are held in place by a sectional screw, consisting of an inner section 14 and an outer section 14^a. Each section is provided with a head, having a transverse kerf for engagement by a screwdriver or the like, to turn the section. The inner end of the section 14 is reduced and externally threaded, as shown in Fig. 3, to engage a socket in the inner end of the outer section 14^a, and it will be evident that when the sections are turned with respect to each other in the proper direction, the heads will be tightly clamped against the ends of the frame.

A binding post 15 is connected with that side of the frame opposite the wood screw 11, the said side being hereafter described as the bottom, and other binding posts 16 and 17 are connected with the heads 9 and 10 respectively. The binding post 15 is connected to the frame directly, while the binding posts 16 and 17 are insulated from the respective heads, by means of washers 18 of insulating material arranged on opposite sides of the head, one of the washers having an axial extension passing through the opening in the head through which the binding post extends.

A coil spring 19 is connected with the binding post 16, and a similar spring 20 is connected with the binding post 17, one end of each spring being held between the head of the screw that connects the binding post to the head and the adjacent insulating washer 18, and the said springs are of a length to extend nearly through the frame,

that is nearly to the opposite head. A screw 21 is connected with the inner end of the spring 19, the coils of the spring at the end remote from the binding post being of a smaller size than those between the binding post and the outer end of the spring, that is being reduced to fit the screw, and the screw is arranged with the head extending in the opposite direction to the binding post. A similar screw 22 is connected with the spring 20 in the same manner, and the head of each screw is covered by a sheath, shield or hood 23 and 24 respectively of easily fusible material, as for instance wax. Directly opposite the binding post of the other head each head is provided on its inner face with a depression 29, formed by stamping or embossing the metal, the said depression being designed for engagement by the sheath or hood of the other binding post. The coil springs 19 and 20 are of such length that when the heads are clamped on the frame, the sheath or hood of each binding post will be pressed firmly against the bottom of the depression of the opposite head.

As before stated one of the lead wires, 3 in the present instance, of the open circuit is connected with the binding post 15, that is with the frame. The other lead 2 or its extension 2^a is connected with the binding post 16, that is with the head 9, and another lead wire 6 leads from the binding post 17 of the head 10 to the lead wire 2, upon which the said wire is branched. Alarms, as for instance horns, indicated at 25, electric bells, indicated at 26, or annunciators, indicated at 27 may be interposed in the length of the lead wire 6 either in parallel as shown for the horn 25, and the annunciator 27 or in series, as shown for the bell 26.

The attachment forming the subject matter of my above-mentioned patent is designed to be arranged adjacent to a telephone, beneath the hook that supports the transmitter, and the arrangement is such that when the circuit in which the attachment is interposed is closed, a slide will be released, and the slide will be forced upward by a spring and will engage the hook, and will sound the alarm by means of the telephone at any desired place, as for instance the nearest fire station, or a watchman's room. The attachment is also provided with an electrically operated bell 28 actuated by the closing of the circuit that releases the slide. The annunciator 27 may be placed in the fire department station, or in the janitor's office, or in a watchman's room, and it will be understood that the annunciator is connected with the different circuit closers, to indicate the respective closer that has been acted upon by excessive heat to close the circuit.

With a single circuit closer of course an annunciator is not required, but where several closers are used the annunciator is necessary to quickly indicate the particular location of the fire.

In operation, when the circuit closer is exposed to heat above a predetermined quantity, the interior of the box will become heated, and one or more of the sheaths or hoods 23—24 will melt, permitting the head of the screws 21 or 22 as the case may be to contact with the opposite head 9 or 10 as the case may be. If only the sheath 23 is melted the circuit through the attachment 4 is closed, thus causing the attachment to lift the hook of the transmitter and thus sound the alarm. In addition the circuit through the lead wire 6 is closed, and the horns or the bells 26 are actuated to sound the alarm while the annunciator 27 is operated to indicate that circuit in which the alarm is sounded. In the first instance, that is when the attachment 4 is actuated, the current passes from the battery by way of the lead wire 2, through the attachment 4, by way of the lead wire 2^a, to the binding post 16, and through the spring 19 to the head 10, the frame 8, the binding post 15, and the lead wire 3 to the battery.

It will be noticed that the free end of the strand of wire which forms each spring 19 and 20 is extended radially or at an angle from the spring, for a considerable distance, and the free end or extremity of each extension 30 is flush with the head of the adjacent screw or beyond the same, but not beyond far enough to engage the opposite head until the sheath of wax is melted from the head. This extremity 30 of the spring assists in making a good electrical connection between each binding post and the opposite head. The depressions 29 in which the sheaths 23 and 24 of the screw heads are received prevent displacement of the loose end of the fuse, these elements constituting the fuses that melt to complete the circuit.

The lugs or bosses 13 insure the proper placing of the head, and the state of the fuses may be easily inspected by loosening the sectional screw. The bosses formed on the outer faces of the heads by the depressions 29 also act as guides for the proper placing of the heads. By means of the wood screw 11 the circuit closers may be arranged in any desired location.

It will be noted from an inspection of Fig. 3 that the socket in the section 14^a of the double screw is not threaded throughout its extent, only the inner end being threaded and the inner end is of less diameter than the outer end. Thus the plain portion of the socket serves as a guide for the insertion of the threaded end of the section 14.

I claim:

1. A circuit closer comprising a metal box consisting of an open frame and heads for closing the ends of the frame, a screw

connecting the heads and clamping them on the ends of the frame, a screw connected with one wall of the frame for engaging a fixed support to suspend the circuit closer, a binding post connected with the frame at the opposite side, a binding post connected with each head and insulated therefrom, a coil spring for the binding post of each head and within the frame, each spring being connected at one end to the binding post and insulated from the box, a screw connected with the opposite end of each spring and having its head extending in the opposite direction to the binding post, a coating of fusible non-conducting material protecting the head of each screw and engaging the opposite head, each head having a depression for receiving the screw connected to the other head, and the spring being designed to cause the screw to contact with the head when the fusible material is melted, each spring having a radial extension at the end adjacent to the screw for engaging the opposite head when the fusible material is melted.

2. A circuit closer comprising a metal box consisting of an open frame and heads for closing the ends of the frame, a screw connected with one wall of the frame for engaging a fixed support to suspend the circuit closer, a binding post connected with the frame at the opposite side, a binding post connected with each head and insulated therefrom, a coil spring for the binding post of each head and within the frame, each spring being connected at one end to one of the binding posts and insulated from the box, and a protecting hood of fusible non-conducting material on the outer end of each spring and engaging the opposite head and adapted to melt under the influence of heat to permit the spring to engage the head directly, and means for clamping the heads on the frame.

3. A circuit closer comprising a metal box consisting of a frame and heads fitting the ends of the frame, detachable means for clamping the heads on the ends of the frame, means at one side of the frame for connecting the frame to a fixed support, a binding post connected with the other side of the frame, a binding post connected with each head and insulated therefrom, and a coil spring connected at one end with the binding post of each head and within the box and having at the other end a fusible shield of non-conducting material engaging the opposite head and adapted to melt under the influence of heat to permit the spring to engage the head directly, each spring having a radial extension at the end adjacent to the plug and a support for the plug or shield connected with the spring.

4. A circuit closer comprising a metal box consisting of a frame and heads fitting the ends of the frame, detachable means for clamping the heads on the ends of the frame, means for connecting the frame to a fixed support, a binding post connected with the frame, a binding post connected with each head and insulated therefrom, and a coil spring connected at one end with each of the last named binding posts within the box and having at the other end a fusible shield of non-conducting material engaging the opposite head and adapted to melt under the influence of heat to permit the spring to engage the head directly.

5. A circuit closer comprising a metal box composed of a frame and heads at the ends of the frame, a binding post connected with the frame, a binding post connected with each head and insulated therefrom, a spring connected at one end with each of the last named binding posts within the box and extending toward the opposite head and having a shield of fusible non-conducting material for engaging said opposite head and adapted to melt under the influence of heat to permit the spring to engage the head directly.

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Witnesses:
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