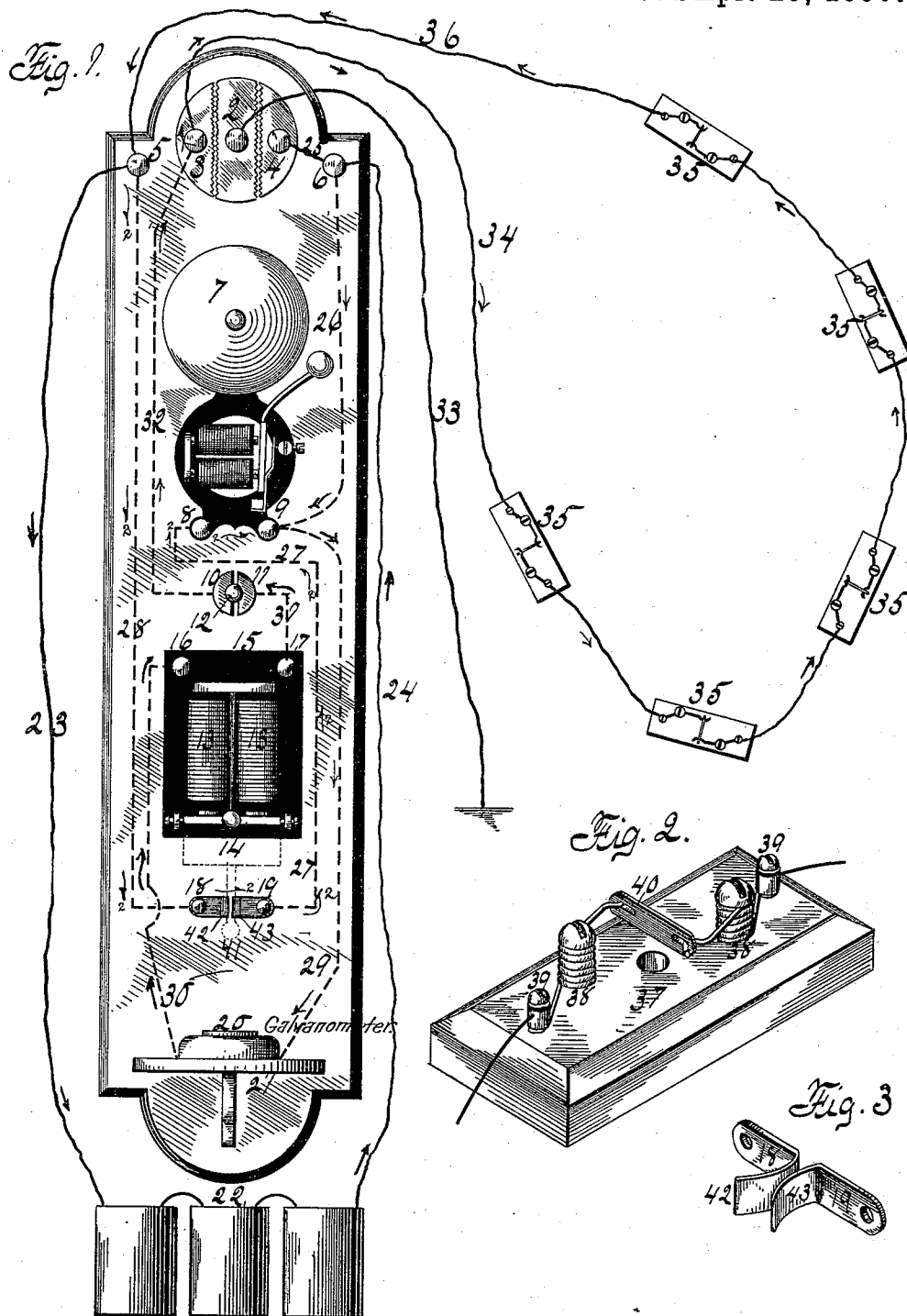


(No Model.)

C. H. SHAFFER.
ELECTRIC FIRE ALARM.

No. 426,688.

Patented Apr. 29, 1890.



Witnesses:
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Att'y.

UNITED STATES PATENT OFFICE.

CHARLES H. SHAFFER, OF ROCKFORD, ILLINOIS, ASSIGNOR OF ONE-HALF TO
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ELECTRIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 426,688, dated April 29, 1890.

Application filed May 25, 1889. Serial No. 312,048. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. SHAFFER, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Electrical Fire-Alarms, of which the following is a specification.

The object of this invention is to construct a fire-alarm on the closed-circuit system.

In the accompanying drawings, Figure 1 is a face view of an electrical fire-alarm embodying my invention. Fig. 2 is an isometrical representation of the thermostat used in my fire-alarm. Fig. 3 is an isometrical representation of metallic plates used to close the circuit through the alarm-bell.

To the base-board 1 are secured the various instruments making up my system of fire-alarm, and I will now proceed to describe them: At the top of the board is located a lightning-arrester, composed of a center plate 2 and two outside plates 3 and 4, each plate provided with a binding-post. At the upper corners of the base are secured binding-posts 5 and 6. Below the lightning-arrester is located an electrical bell 7 of the vibrating variety, which is provided with binding-posts 8 and 9.

The line-tester consists of plates 10 and 11 and a center plug 12. An electro-magnet 13, with its armature 14, is secured to its base 15, and binding-posts 16 and 17 connect with the coils of the magnet. This armature is provided with an arm 41, as shown in dotted lines, for a purpose to appear hereinafter. Plates 18 and 19 are secured to the base by screws, of which an enlarged view is shown at Fig. 3. The arms 42 and 43 are outwardly flaring, thus forming inclined surfaces, between which the arm 41 of the armature 14 will wedge, forming an electrical connection with the plates.

A galvanometer 20 of the ordinary construction rests upon a shelf 21, secured to the base-board near its lower end. A battery 22 of any number of jars of the closed-circuit variety may be used for generating the electric current necessary for the operation of my system of fire-alarms.

The wires used to connect the various parts of the system will now be described.

A wire 23 connects the binding-post 5 with one pole of the battery. Wire 24 connects the other pole with the binding-post 6. From the binding-post 6 a short wire 25 connects it with the plate 4 of the lightning-arrester. A wire 26 connects the binding-post 6 with the binding-post 9 of the electric bell. A wire 27 connects the binding-post 8 of the bell with the plate 19, and the plate 18 is connected with the binding-post 5 by wire 28. Starting from the binding-post 9 of the bell, a wire 29 runs to the galvanometer 20, from which a wire 30 connects with the binding-post 16 of the electro-magnet, a wire 31 connects the binding-post 17 of the electro-magnet with the plate 11 of the line-tester, and a wire 32 connects the plate 10 of the line-tester with the plate 3 of the lightning-arrester. A ground-wire 33 connects with the center plate 2 of the lightning-arrester.

The line-wire 34 is connected at one end to the plate 3 of the lightning-arrester, and at its other end with a thermostat 35. A number of thermostats are placed in circuit, and the line-wire 36 connects the last one with the binding-post 5. The thermostat used in this instance is shown enlarged at Fig. 2, and consists of a base 37, of insulating material, having mounted thereon two spring-arms 38. One arm of the spring is connected to the binding-post 39, having its free end in hook form. The free ends of the springs are connected by a link 40 of fusible alloy. To the binding-posts 39 the line-wires are connected. This form of thermostat I have claimed in Letters Patent No. 413,568, dated October 22, 1889, and therefore do not seek to claim it as such in this application, but in combination with other parts herein shown and described.

With the system arranged as shown in Fig. 1 and the thermostats placed in the building to be protected, and the base-board 1, with its various instruments, as shown, placed in the fire-station or other suitable place, all will be ready for the protection of the building, and the circuit will be as follows: starting from the battery by wires 24, 26, and 29 to the galvanometer 20, through the galvanometer, by wire 30, through the electro-magnet 13 and by wire 31 to the line-tester, thence to the plate 3 (by line 32) of the lightning-arrester, where it connects with the line-wire 34,

through the thermostats 35 and by the return-wire 36 and 23 to the battery. Thus I have a complete electrical circuit, including the battery, electro-magnet, and thermostats.

5 While this circuit is closed and the current kept up to the standard the armature 14 will be held to the electro-magnet 13, as shown. When a fire occurs, one or more of the links 40 of fusible alloy will be melted, thus causing a break in the circuit. The breaking of
10 the circuit will cause the electro-magnet to release its influence upon the armature, thus allowing it to fall, which, by means of its arm 41, will make an electrical connection between
15 the plates 18 and 19, as shown in dotted lines. The armature of the electro-magnet in dropping will close an electric circuit through an alarm-bell, which will be as follows: from the plate 19, by wire 27, through the bell 7,
20 by wires 26 and 24, through the battery 22, by wires 23 and 28, to plate 18, and by means of the arm 41 to plate 19. This ringing of the bell will notify the persons in charge that there is a fire at the building in which the
25 thermostats are located. Upon re-establishing the electric current through the thermostats the circuit will be closed through the electro-magnets and the armature will be held thereby, thus breaking the circuit through
30 the alarm-bell.

By means of the plug 12 of the line-tester the main circuit may be broken, allowing the armature to drop, thereby testing the battery with respect to its strength for ringing the
35 bell.

The galvanometer is used for the purpose of ascertaining the condition of the battery.

By the employment of the link of fusible alloy the circuit may be re-established much
40 more quickly than when a soldered connection is used.

I claim as my invention—

1. In an electrical fire-alarm, the combination of a normally-closed circuit and a normally-open circuit, a battery common to both
45 circuits, the closed circuit, including removable thermostats, said thermostats consisting of a base, the circuit-wires connected to the base, and a detachable link of fusible alloy

connecting the circuit-wires, an electro-magnet, and an armature held by said electro-magnet, whereby the opening of said closed circuit by the action of heat releases the armature, which moves out of the field of the electro-magnet, thereby closing the open circuit and transferring the battery force from the closed circuit to the open circuit, in which is located an alarm-bell, substantially as set forth.

2. In an electrical fire-alarm, the combination of a normally-closed circuit and a normally-open circuit, a battery common to both circuits, the closed circuit, including a galvanometer, removable thermostats, said thermostats consisting of a base, the circuit-wires
65 connected to the base, and a detachable link of fusible alloy connecting the circuit-wires, an electro-magnet, and an armature held by said electro-magnet, whereby the opening of said closed circuit by the action of heat releases the armature, which moves out of the field of the electro-magnet, thereby closing the open circuit and transferring the battery force from the closed circuit to the open circuit, in which is located an alarm-bell, substantially as set forth.

3. In an electrical fire-alarm, the combination of a normally-closed circuit and a normally-open circuit, a battery common to both circuits, the closed circuit, including a galvanometer, removable thermostats, said thermostats consisting of a base, the circuit-wires connected to the base, and a detachable link of fusible alloy connecting the circuit-wires, an electro-magnet, and an armature held by
85 said electro-magnet, whereby the opening of said closed circuit by the action of heat releases the armature, which moves out of the field of the electro-magnet and is received between spring-arms, thereby closing the open circuit and transferring the battery force from the closed circuit to the open circuit, in which is located an alarm-bell, substantially as set forth.

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Witnesses:

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