F. C. CRUTCHFIELD.

FIRE ALARM SIGNALING DEVICE.

APPLICATION FILED MAY 3, 1907.

910,118.

Patented Jan. 19, 1909.

Fig. 1.

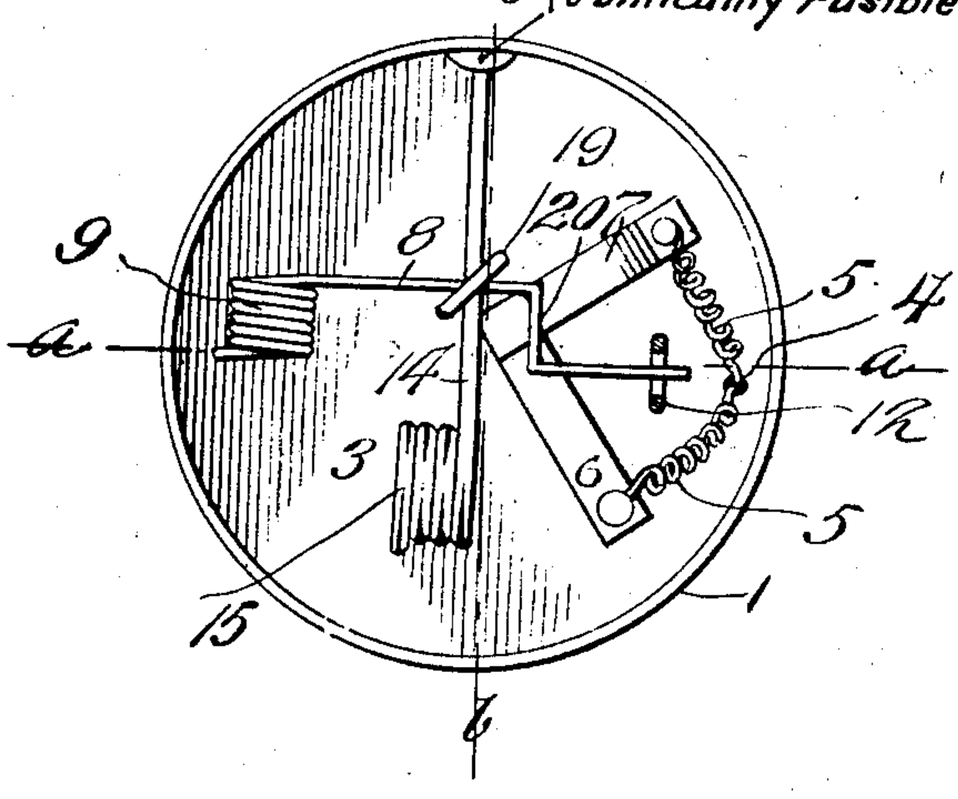


Fig. 3.

Fig. 2.

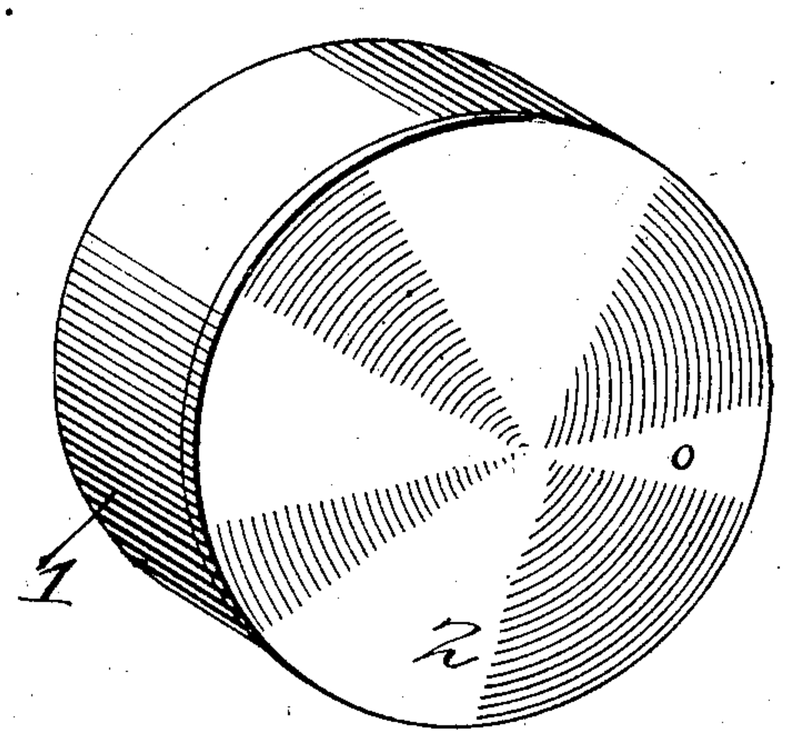


Fig. 4.

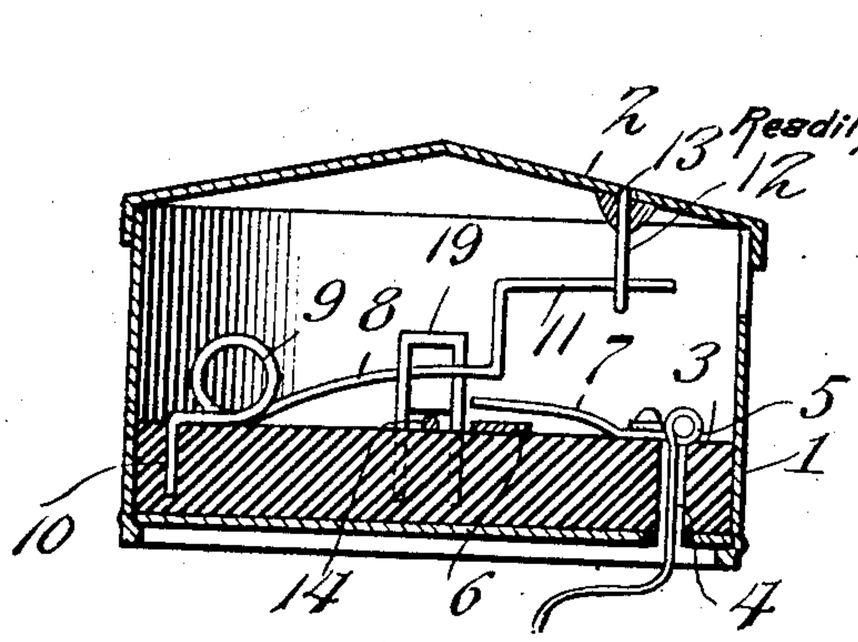
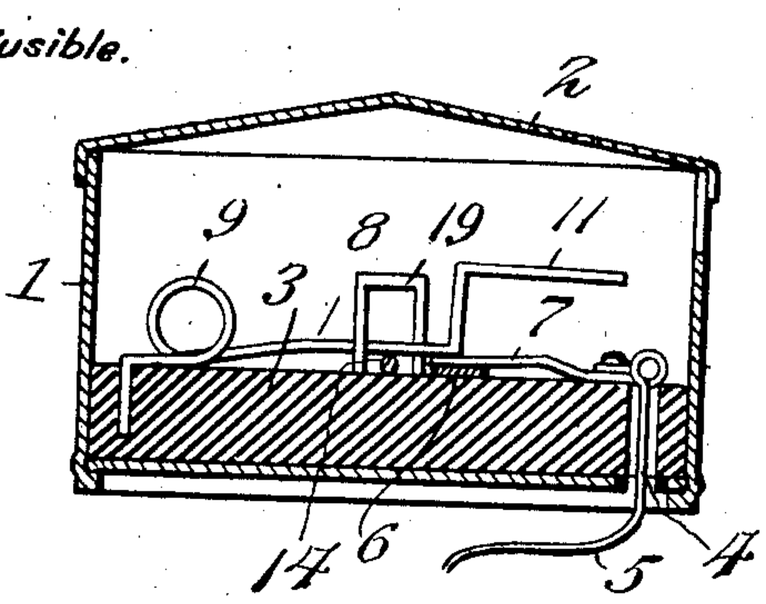
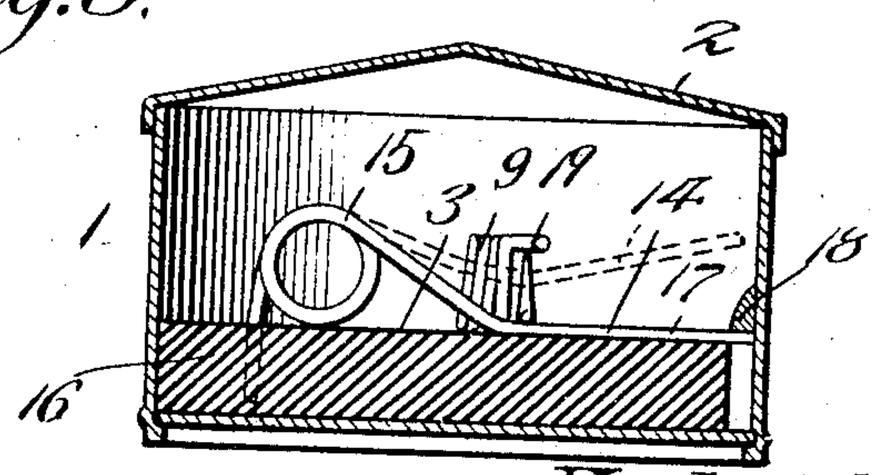


Fig. 5.





Witnesses

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UNITED STATES PATENT OFFICE.

FREDERICK C. CRUTCHFIELD, OF WASHINGTON, DISTRICT OF COLUMBIA.

FIRE-ALARM SIGNALING DEVICE.

No. 910,118. Specification of Letters Patent. Patented Jan. 19, 1909.

Application filed May 3, 1907. Serial No. 371,703.

To all whom it may concern:

Be it known that I, FREDERICK C. CRUTCHFIELD, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Fire-Alarm Signaling Devices, of which the following is a specification.

My invention is an improved fire alarm signaling device for use in a building or other structure to give an alarm in case of fire by closing an electric circuit and for subsequently reopening the electric circuit after the alarm has been sounded, and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a plan view of an electric fire alarm signaling device embodying my invention with the cover of the casing removed and the holder of the circuit closing spring shown in cross section. Fig. 2 is a perspective view of my improved fire alarm signaling device. Fig. 3 is a sectional view of the same, taken on the plane indicated by the line *a*—*a* of Fig. 1, and showing the circuit closing and opening springs in their normal positions, the circuit closer being shown open and the circuit closing spring being shown in its normal restrained position. Fig. 4 is a similar view showing the circuit closed by the circuit closing spring, and Fig. 5 is a transverse sectional view taken on the plane indicated by the line *b*—*b* of Fig. 1, showing the releasing spring in full lines in its normal restrained position and in dotted lines in released position to release the circuit closing spring from the circuit closer.

In the embodiment of my invention herein shown the fire alarm signaling device is inclosed in a box or casing 1, which has a cover 2 fitted on one end thereof. In the bottom of said box or casing is a base 3 of non-conducting material. The said base is provided with an opening 4, through which the wires 5 of an electric circuit, including means for sounding a fire alarm, are passed, and the said wires are respectively attached to electrodes 6—7, which constitute a circuit closer. The electrode 7 is here shown as a spring plate fastened at one end and free at the other end and which normally springs from the electrode 6 and is in open position with respect thereto so that the circuit is normally open.

In connection with the circuit closer I employ a circuit closing spring 8, which is here shown as having a coiled portion 9, an end 10, which extends into and is secured to the base, and an arm 11, which has an off-set portion 20 adapted to engage the electrode 7, when said spring is released, and close said electrode against the electrode 6 to close the circuit. The said circuit closing spring is normally held in restrained or inoperative position, out of contact with and separated from the spring electrode 7, by suitable fusible means or means including a fusible element. The said fusible holding or circuit closing spring restraining device is here shown as an eye 12 to engage the arm 11 and solder 13, which is readily fusible, and which secures the said eye or holder to the cover 2.

I also employ a circuit opening spring, which is stronger than the circuit closing spring, is normally restrained, and which, after the circuit closing spring has been released and caused to close the circuit operates to release said circuit closing spring from the circuit closer to re-open the circuit and cause the alarm to cease to sound. The said releasing spring is here shown at 14 provided with a coiled portion 15, a securing end 16 extending into the base, and an arm 17, which passes under the arm of the circuit closing spring and is disposed at substantially right angles with reference thereto. The said arm 17 of the releasing spring 14 extends to one side of the box or casing and is held normally in inoperative position on or near the base 3 by means of a holder 18, which may be a mass of solder or other suitable fusible material united to the side of the box or casing and forming a shoulder which bears on said spring arm. This releasing spring or circuit opening spring is stronger than the circuit closing spring. The arms of both of said springs are here shown as passing through a common guide element 19.

The operation of the invention is as follows: The circuit closing spring 8 is normally held in restrained position out of contact with the spring element 7 of the circuit closer by the holder 12. The circuit opening spring 14 is normally held in its restrained position out of contact and engagement with the spring 8 by the fusible holder 18. The said fusible holder is more refractory and less readily fusible than the holder element 13 of the circuit closing

spring. In the event of a fire at or near the place where my improved alarm device is maintained, the holder element 13 of the releasing spring 8 will be first fused, whereupon the said releasing spring will be released and will engage the spring element 7 of the circuit closer and close said spring element against the element 6 of the circuit closer and thereby close the electric circuit and sound the alarm. The circuit closer will continue to be closed by the action of the spring 8 until the holder 18 of the circuit opening spring 14 has become fused, whereupon the said circuit opening spring will be released and being stronger than the circuit closing spring and its arm being adapted to move opposite the direction in which the arm of the circuit closing spring previously moved, said circuit opening spring will engage the arm of the circuit closing spring and will return said circuit closing spring to its initial position and hence will permit the spring element 7 of the circuit closer to move from the element 6 and thereupon open the circuit and cause the signaling instrument to cease to operate.

It will be understood that my improved fire alarm signaling device may be readily produced at a very slight expense, that the same cannot get out of order under ordinary conditions, and that the same will be entirely effective to sound an alarm in the event of a fire.

Having thus described the invention what I claim as new is:—

1. In alarm apparatus of the class described, in combination with a circuit closer, a spring to operate the same, fusible means to normally hold said circuit closing spring in inoperative position, and means including a fusible element to return said spring to inoperative position after the first named fusible means has been fused.

2. In alarm apparatus of the class described, in combination with an electric circuit closer, springs of unequal strength, one to operate the circuit closer and the other stronger than the first to return the first to inoperative position, and fusible means for each of said springs to normally hold the same in inoperative position, the fusible holding means of the stronger spring being more refractory than that of the circuit closer operating spring.

3. In alarm apparatus of the class described, the combination of a circuit closing spring, a circuit opening spring, and fusible holding means for each of said springs, that of the circuit opening spring being more refractory than that for the circuit closing spring.

4. In alarm apparatus of the class described, a casing having a cover, a circuit closer in such casing, a circuit closer operating spring connected to the cover by fusible means and by such fusible means held in restrained position, such spring and fusible means coacting to hold such cover on such casing, and a countervailing spring to move the circuit closer operating spring to released and restrained position, and fusible means more refractory than that which restrains the circuit-closer operating spring, normally holding such countervailing spring in restrained position.

5. In an alarm apparatus of the class described, an electric circuit, a closer therefor including a movable member, a temperature controlled device normally inactive and adapted upon a prescribed rise in temperature to engage and move said member to circuit closed position, and a temperature controlled device normally inoperative and adapted a higher rise in temperature to engage and retract said circuit closing device and permit retraction of said movable member to restore the circuit to initial, normal condition.

In testimony whereof I affix my signature in the presence of two witnesses.

FREDERICK CLIFFORD CRUTCHFIELD.

Witnesses:

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R. L. ALLRED.