

(No Model.)

J. D. GOULD.  
ELECTRICAL FIRE ALARM SYSTEM.

No. 565,410.

Patented Aug. 4, 1896.

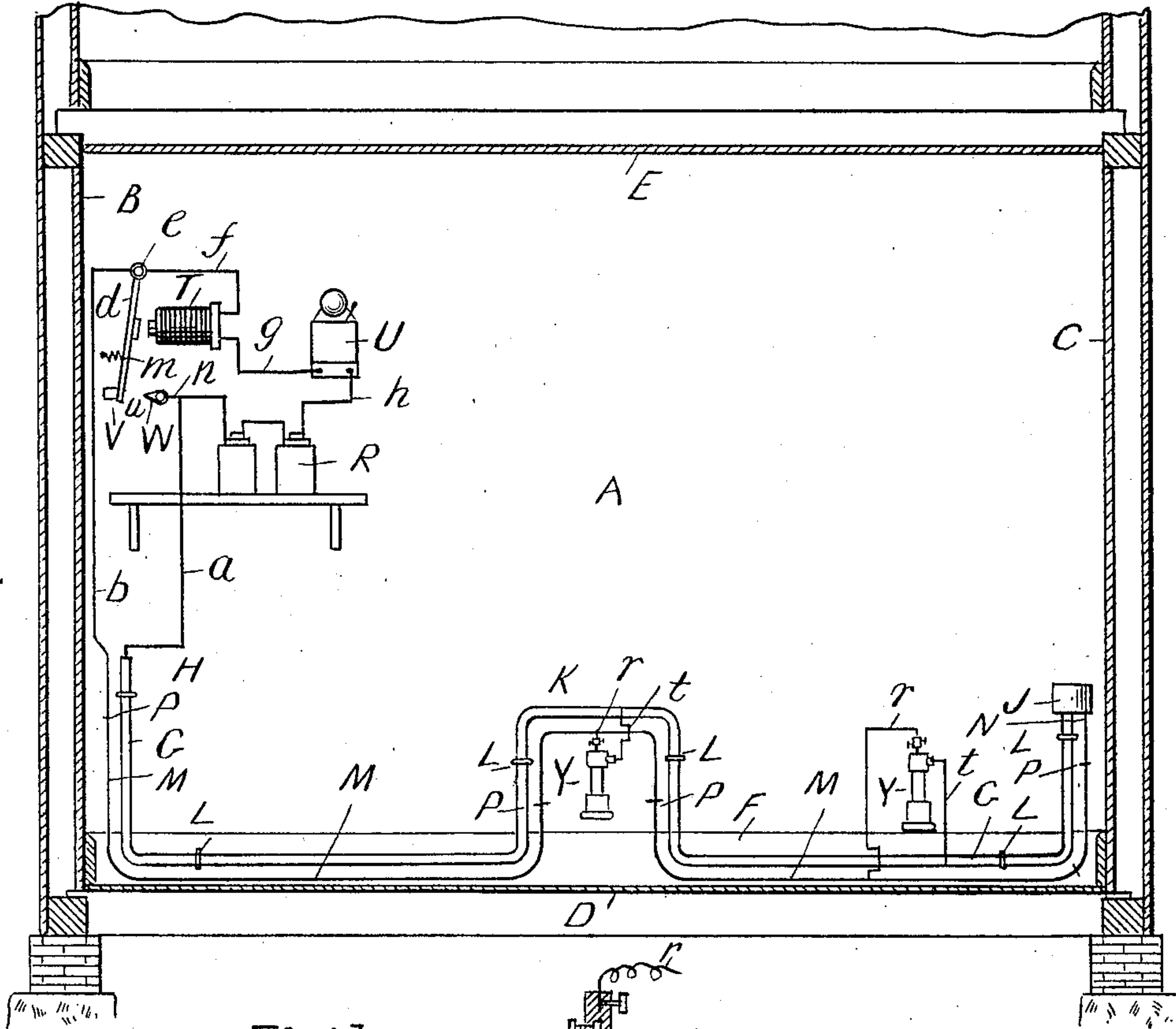


FIG. 1.

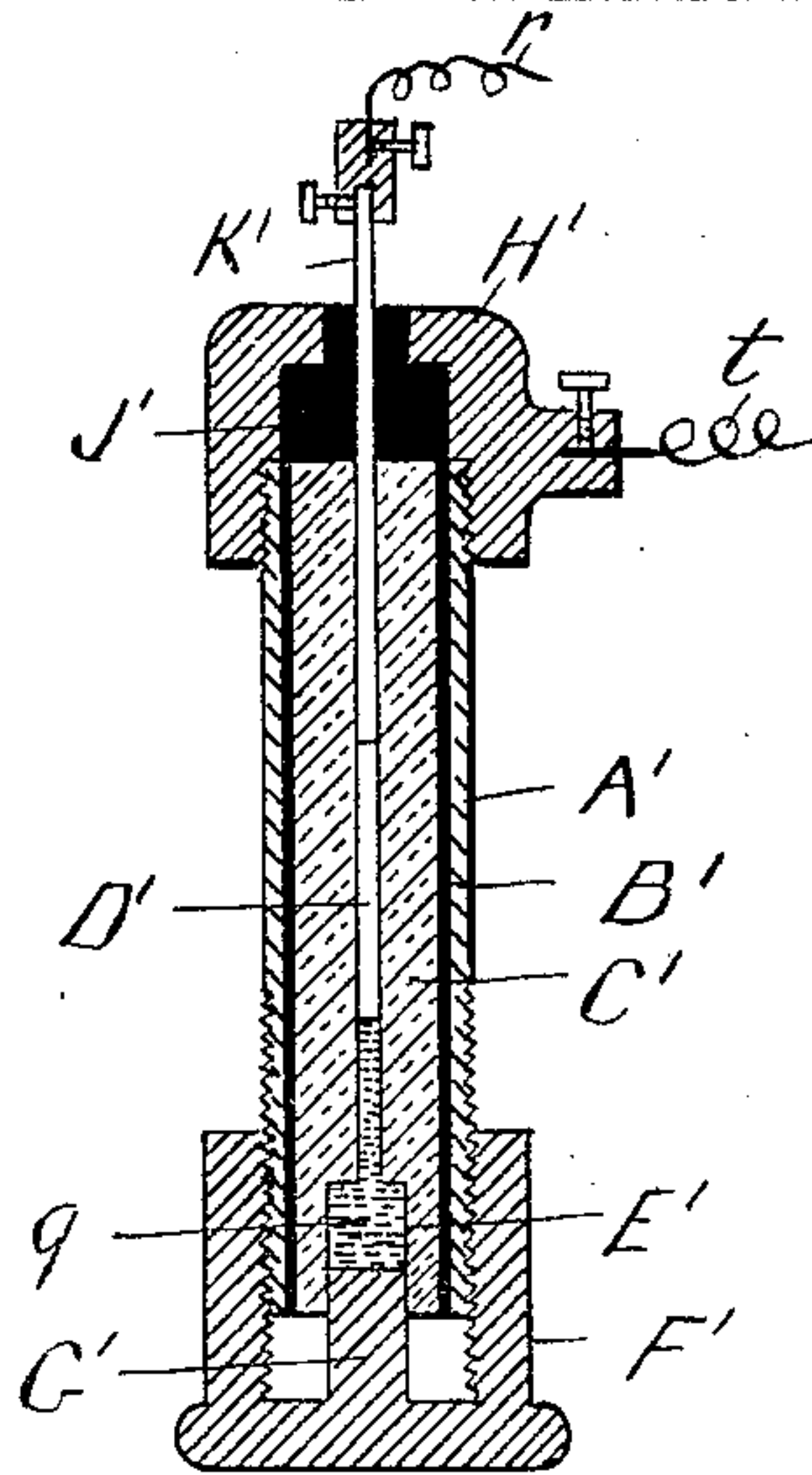


FIG. 2.

WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN D. GOULD, OF BROOKLYN, NEW YORK.

## ELECTRICAL FIRE-ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 565,410, dated August 4, 1896.

Application filed August 27, 1895. Serial No. 560,691. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN D. GOULD, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electrical Fire-Alarm Systems, of which the following is a full, clear, and exact description.

The object of the present invention is to provide a simple, cheap, and efficient automatic electrical fire-alarm system for use more particularly in apartment-houses, dwellings, buildings, &c., although applicable as well to stores, warehouses, factories, &c.; and the invention consists of two wires or other electric conductors, one of which is made of any suitable fusible material that will fuse at the desired degree of heat, the two wires or conductors being located and extending or running side by side or close to each other, but not in contact with each other, round the room or building, as desired, an open electric circuit, a series of thermostats electrically connected to the two wires or conductors at various points along the conductors round the room or place, as desired, and a sounding device, all constructed and arranged for operation substantially as hereinafter fully described, reference being had to the accompanying sheet of drawings, in which is illustrated the present invention.

Figure 1 represents the sides of a room or building, with the walls, ceiling, and flooring in vertical section, with this invention applied thereto. Fig. 2 is a vertical central section of one of the thermostats, enlarged, as detached from the conductors.

In the drawings, A, B, and C represent the side walls of a room or building, two, B C, of which are in vertical section; D and E, the floor and ceiling, respectively, in cross-section, and F the mop-board, all of which is as usual in the construction of a room or building.

G is an electric wire or conductor made of metal or compound that will fuse at any desired heat, and, as shown, this fusible wire extends from a point H on the wall down and then along the mop-board F across the side of the room and then upward, where it terminates in a block or head-piece J of any

suitable insulating material, such as india-rubber. At its central portions it extends upward in a wide and square bend, as shown at K, and it is secured to the wall by staples L or in any suitable manner.

M is a plain or bare electric wire or conductor which extends along the under side and with the fusible wire G, to be close to its under side, but not in contact with it, and its end N is inserted in the insulating-block J, it being secured to the wall by staples P or in any suitable manner.

From the end of the fusible wire G connects a wire *a* with one pole of an electric battery R, and from the end of the wire M extends a wire *b* to an armature *d*, pivoted at *e*. From thence a wire *f* extends to a magnet T, and from the magnet a wire *g* extends to a bell mechanism U, and from the bell U a wire *h* runs to the opposite pole of the electric battery R to that of the fusible wire G. The armature *d* has a spring *m* secured to it, which holds it against a block V of insulating material or insulated in any suitable manner.

A metal block W is properly secured in front of the armature, and from this block W extends a wire *n*, which connects with the electric wire *a*, extending from the fusible wire G to the battery.

Y are two electric thermostats and are located as shown in the drawings, and although only two are shown there can be more of them and placed at any desired spot in the building or room. Each is constructed as follows:

A' is a metal tube in which is secured by cement B' a glass tube C', its chamber D' of small diameter extending through the same, it being enlarged at the bottom, as at E', as a receptacle. Screwing onto the lower end of the metal tube A' is a cap F', which has a central plunger G', arranged to extend up into the receptacle-chamber E' in the glass tube C'. In the glass tube is placed mercury of a sufficient quantity to extend up into the tube C', as desired, its height therein being regulated by screwing on or off the cap F'.

H' is a cap which screws onto the upper end



end J' of the tube A', its central portion being filled with any suitable insulating material J'. A wire K' extends centrally down through this insulating material J' into the glass tube C', and it is adapted to slide sufficiently free, so it can be moved up and down therein, as desired, to adjust it to a determined height. An electric wire *r* connects with this wire K' and extends to and connects with the electric wire M running around the room, and another electric wire *t* connects with the cap H' and extends to and connects with the fusible wire G, as shown in Fig. 1. Thus each thermostat is connected with the battery through the two wires running around the room.

As shown, the device is in position for operation and action, and if a fire occurs in any part of the room or building where the fusible wire and other wire are located the fusible wire at such place quickly becomes heated and at the temperature determined melts and runs down onto or connects with the wire M, which makes the electric circuit with the battery and magnet and bell, through these wires G and M and connecting wires *a*, *b*, *f*, *g*, and *h* sounding the bell, also causing the magnet to attract the armature *d*, which moves to and its end *u* then rests and bears upon or against the block W, when another or shorter electric circuit is made, independent of the fusible-wire circuit, through the block W, wire *n*, wire *a*, battery R, wire *h*, bell, wire *g*, magnet T, wire *f*, and armature *d* to block W, completing the circuit, the magnet holding the armature in such contact and causing the bell to continue to sound as long as the battery lasts or some person comes who has been warned by the sounding of the bell.

If the fusible wire should not fuse or melt and thus make the circuit, the thermostat near the place of the fire or heat might operate to make the circuit, and in such case the mercury in the nearest thermostat being heated would expand and rising in the glass tube would make contact with the end of the adjustable wire, making the electric circuit through the fusible wire G and wire M, as before, sounding the alarm.

In practical use the two wires can be run round the room at any and all places at any desired height, along the mop-board up at the sides, along the ceiling, cornices, into closets and other small places, &c. It is preferable to have both wires continuous and of same length; also, as many thermostats as is deemed advisable can be electrically secured to the two wires or conductors and in any desired place near to the wires or farther from them.

The electrical apparatus can be placed in another room or in any part of the building, or the bell can be placed outside of the building, as desired, but the fusible wire and electric wire should be connected electrically

with the magnet and bell at all times, but leaving the circuit open by the non-contact of the wires G M.

The fusible wire can be of any size, although it is preferable to have it small, and of a metal or compound to fuse at any desired or very low degree of heat. These wires being small, as is evident, can be laid easily and conveniently in most all places about the room or building, it being necessary, however, to keep the two wires electrically continuous, and each have one of its ends connected with the electric circuit, and close together, so that when the fusible wire melts and runs down it will surely come in contact with the other wire to make the electric circuit and sound the bell as described.

The great advantage of this system of electric fire-alarm is that the fusible wire and other wire can extend round the room or building indefinitely and into all places connected therewith, making what may be called a "continuous fusible open electric circuit;" also, many thermostats may be applied thereto, so that the instant a flame or extreme or dangerous heat touches or warms up any part of the continuous fusible wire it will melt, run down, and make contact with the electric wire M, making the electric circuit and sounding the alarm, or the thermostats will act as described to make the electric circuit and sound the alarm. This extensive use and arrangement of the fusible wire and electric wire and thermostats in a room or other place not only insures that an alarm will be given immediately at the start of the fire, but at all places in the room or building before it spreads and becomes dangerous or of any magnitude, as is obvious, and this is very important. As these wires can be made at a very small cost, it makes a very cheap device, and also its cheapness adds to its effectiveness in that plenty of the wire can be used, and thus every place, corner, &c., in the room or building be protected by it; also, the thermostats can be made quite small and practically inexpensive, so that quite a number can be used.

The electric circuit is maintained by the short circuit through the armature as described, insuring the continuous sounding of the alarm, even if the electric circuit between the conducting-wires should become broken from any cause.

The magnet and armature and its electric circuit can be dispensed with, depending upon the electric circuit made by the contact of the wires G M, after the fusing of the wire G, for the continuous sounding of the bell or alarm, but it is preferable to use the magnet and armature with its short circuit, as in practical use the electrical apparatus will preferably be placed in some room, independent of or some distance from the room or building prepared with the conducting-wires, so that the fire will have no effect on this elec-



tric circuit to interfere with its working to continue to sound the alarm until the parties are warned of the fire.

Any suitable sounding device can be used as desired.

The two wires or conductors can be arranged side by side in any suitable manner. For instance, the fusible wire can be covered with insulating material suitable for the purpose and one that will melt or burn at the desired heat and the other wire wound thereon, thus being close to the fusible wire, but not coming in contact with it, this invention not being limited to any particular manner in which the wires or conductors are arranged side by side or close together, it only being necessary for them to be close to each other along their length, so that in the fusing or melting of the fusible wire it will surely come in contact with the other wire to make the electric circuit.

As many thermostats can be used as desired, as they are an advantage, as in some cases they might be affected by the heat of the fire and cause the alarm to sound before the fusible wire was acted upon by the heat, thus doubly insuring an alarm in case of fire.

Having thus described my invention, what I claim is—

1. In an electric fire-alarm, the combination of two wires arranged close together side by side but not in contact, one of said wires being formed of a metal fusible at a low temperature and placed above the other wire and connected at one end to one pole of an electric battery and the other wire connected at one end to the other pole of the battery, a bell

or other sounding device located in the battery-circuit, and a thermostat in electrical connection with said wires, substantially as described.

2. An electric thermostat composed of a metal tube, a glass tube cemented thereon, an enlargement of the tube-chamber at its bottom for mercury, a cap screwing onto the bottom of the metal tube, a plunger on said cap to fit in the enlarged chamber of the glass tube, a cap screwing onto the upper end of the metal tube, a wire passing down through the upper cap into the glass tube and insulated from the cap, and the wire being connected electrically with one pole of the battery, and the metal tube, and its caps being connected with the other pole of the electric battery.

3. In an electric fire-alarm, the combination of two wires arranged close together side by side but not in contact, one of said wires being formed of a metal fusible at a low temperature and placed above the other wire and connected to one pole of an electric battery and the other wire connected to the other pole of the battery, an insulating-block secured over and separating the ends of said wires, and a bell or other sounding device located in the battery-circuit, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN D. GOULD.

Witnesses:

EDWIN W. BROWN,

FRED B. WENTWORTH.