

(No Model.)

C. D. TISDALE.  
AUTOMATIC ELECTRIC FIRE ALARM.

No. 565,188.

Patented Aug. 4, 1896.

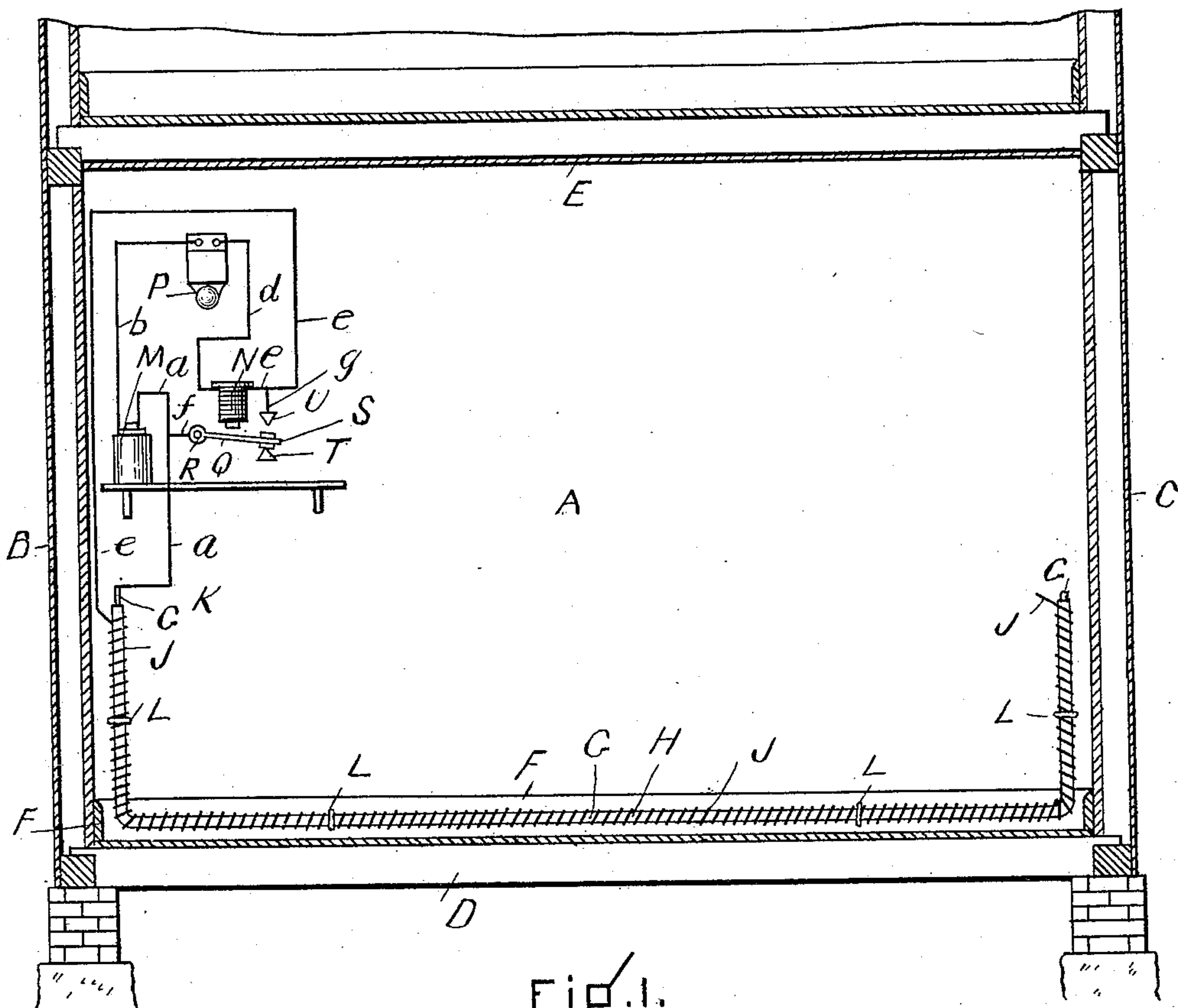


Fig. 1.

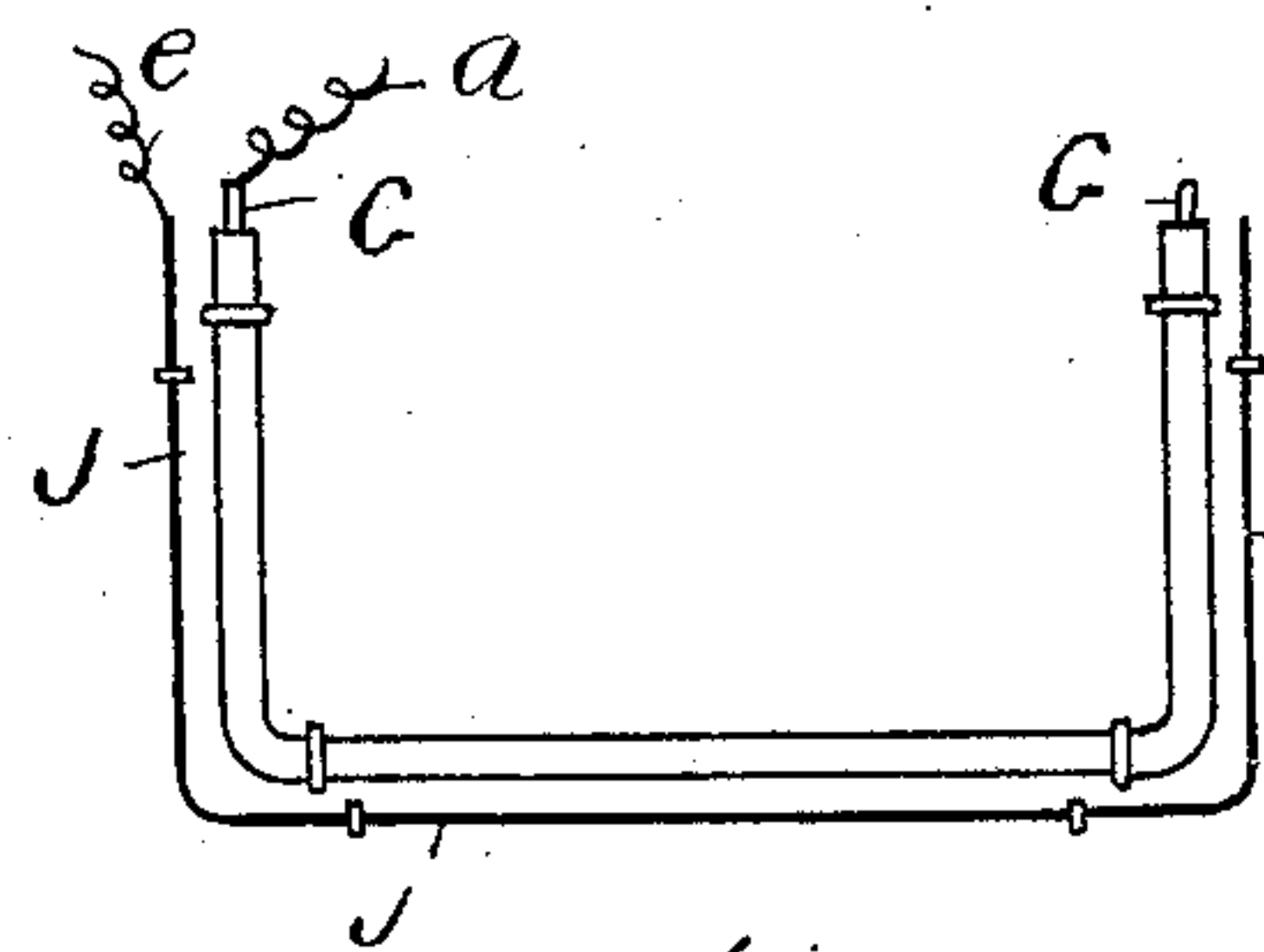


Fig. 3.

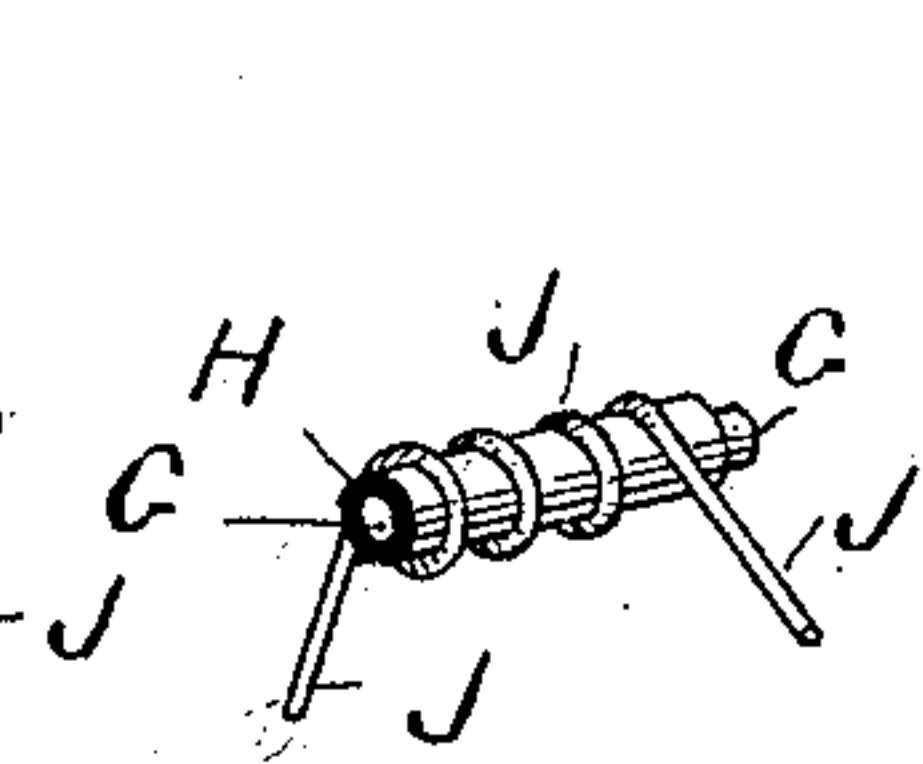


Fig. 2.

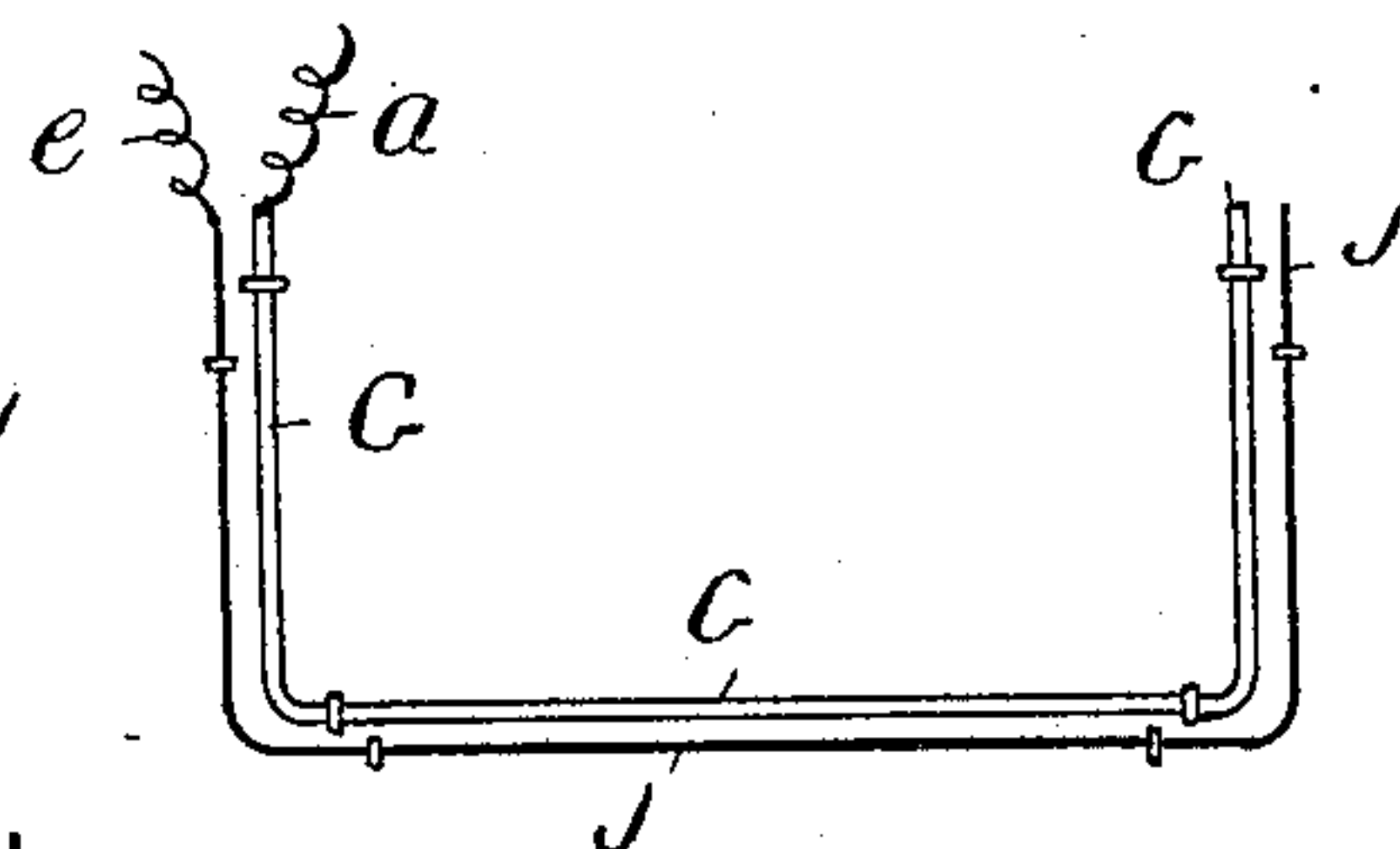


Fig. 4.

WITNESSES

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# UNITED STATES PATENT OFFICE.

CHARLES D. TISDALE, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO JOHN D. GOULD, OF BROOKLYN, NEW YORK, AND CHARLES A. HANSON, OF EAST ORANGE, NEW JERSEY.

## AUTOMATIC ELECTRIC FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 565,188, dated August 4, 1896.

Application filed July 11, 1895. Serial No. 555,613. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES D. TISDALE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Automatic Electric Fire-Alarms, 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, around the room or building, as desired, an open electric circuit, 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 detail perspective view of the wires and in cross-section, and Figs. 3 and 4 are two detail side views to be hereinafter referred to.

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 made of a metal or a metal compound that will fuse at any desired heat, and it is preferably covered with an insulating material H along its length, which can be of paper or of any suitable insulating material. J is another electric wire, which can be of the usual material and is a plain bare wire. It is not intended to be fusible, and this wire J, as shown in Figs. 1 and 2, is wound around the outside of the insulated material

on the fusible wire, preferably its whole length, substantially as shown, to have it close to the fusible wire and also as a means of support for the wire J. These two wires thus combined together, but insulated from each other by the insulated material on the fusible wire, extend substantially as one from a point at K on the wall A down close to the wall B, down and then along the mop-board F, and up a short distance on the wall A, close to the wall C, being secured at intervals by staples L or in any suitable manner. These two wires are connected to an electric battery M, magnet N, and electric bell P in the following manner: A wire *a* is connected to the end of the fusible wire G, which runs to and connects with one pole of the electric battery M. From the other pole of the electric battery a wire *b* extends to and connects with the electric bell P and from the bell a wire *d* runs to and connects with the electromagnet N, and from the magnet a wire *e* runs to and connects with the wire J, wound upon the insulated fusible wire. Q is an armature for the electromagnet, pivoted at R to swing up and down and to rest by its free end S upon a block T, secured to a support, but which block is of insulated material or insulated in any suitable manner. From the armature Q runs a wire *f*, which connects with the wire *a*, connecting the battery and fusible wire G. A short distance above the free end of the armature is a metal block U, secured to the wall or support, which is connected by an electric wire *g* with the wire *e*, connecting the electromagnet and the wire J.

As shown in Fig. 1, 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 is located the insulating material H will melt and the fusible wire at such place quickly becomes heated, and at the temperature determined melts and runs down onto or connects in some way with the wire J, which makes the electric circuit with the battery and magnet and bell through these wires G and J, and connecting wires *a*, *b*, *d*, and *e*, sounding the bell also causing the magnet to attract the armature Q, which moves up to and its end S then rests and



bears upon or against the block U when another or shorter electric circuit is made, independent of the fusible-wire circuit, through the block U, wire *g*, wire *e*, magnet N, wire *d*, bell, wire *b*, battery, wire *a*, and wire *f*, to armature, to block U, 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.

In practical use the combined wires can be run around the room at any and all places desired at any desired height, along the mop-board, up at the sides, along the ceiling, cornice, into closets and other small places, &c., but both wires should be continuous and the wire J preferably wound upon the wire G throughout its length.

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 J.

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; also, the insulating material should be of a substance or substances that will melt, or burn, or dissolve at a temperature at least as low as that at which it is desired the fusible wire shall be affected by the heat of the fire, and preferably it might be acted upon by the heat at a lower temperature to insure that the heat of the fire shall reach the fusible wire or conductor to soften and melt it for the proper operation of this system. 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 has 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 around the room or building indefinitely, and into all places connected therewith, making what may be called a "continuous fusible open electric circuit," so that the instant a flame or extreme and 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 J, making the electric circuit and sounding the alarm. This extensive use and arrangement of the fusible wire and electric wire 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 this wire 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.

In lieu of winding the plain or bare wire J upon the insulating material on the fusible wire G it can run alongside of and on the same and be secured to it or near to it in any suitable manner, but not in electric contact with the wire G, but so it will be near or close to it along its length to insure the contact of the two when the fusible wire melts to make the electric circuit for the sounding of the alarm. This is shown in Figs. 3 and 4, Fig. 3 representing the insulated fusible wire and the plain electric wire as running along close to each other side by side, and in Fig. 4 the two wires as bare wires, without any insulating material on the fusible wire, running close to each other side by side, but not in contact to keep the electric circuit open, in both cases close enough for the necessary contact of the two when the fusible wire melts to insure the making of the electric circuit to sound the alarm. It is preferable, however, to use the two wires combined, as shown in Fig. 1, as in arranging it about the room, &c., it is practically laying only one wire.

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 J 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 electric 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.

Having thus described my invention, what I claim is—

1. In an electric fire-alarm, the combination of two wires arranged in close proximity side by side but electrically separated one from the other, one of said wires being formed of a metal fusible at a low temperature, and placed above the other wire, said wires at one end being respectively connected to the poles of an electric battery and electrically



separated at their other ends, and a bell or other sounding device located in the battery-circuit, substantially as described.

2. In an electric fire-alarm, the combination  
5 of two wires, one of which is formed of a metal fusible at a low temperature and covered with an insulating material destructible by a low degree of heat, and one of said wires being wound about the other throughout the  
10 length of the latter, said wires at one end being respectively connected to the poles of an electric battery and electrically separated at their other ends, and a bell or other sounding device located in the battery-circuit, sub-  
15 stantially as described.

3. In an electric fire-alarm, the combination of two wires arranged in close proximity side by side but electrically separated one from the other, one of said wires being formed of  
20 a metal fusible at a low temperature, and placed above the other wire, one of said wires being connected to one pole of a battery and the other wire being connected to the other

pole thereof and including an electromagnet and a bell, an armature controlled by said 25 magnet and electrically connected to one of said wires, and a contact connected to the other wire and adapted when the armature is attracted by the magnet to form a short circuit through said electromagnet, bell and 30 battery, substantially as described.

4. An electric cable or conductor composed of two wires one of which is formed of a metal fusible at a low temperature and covered with an insulating material destructible 35 at a low degree of heat, and the other of said wires being wound about the insulating material on the first wire throughout its length.

In testimony whereof I have hereunto set 40 my hand in the presence of two subscribing witnesses.

CHARLES D. TISDALE.

Witnesses:

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