

(No Model.)

W. A. BARNES.

CONDUCTOR FOR ELECTRICAL FIRE ALARM SYSTEMS.

No. 378,078.

Patented Feb. 21, 1888.

Fig. 1.

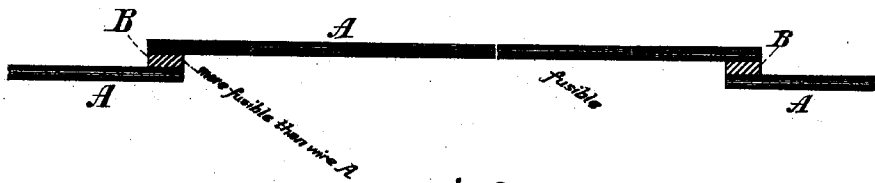
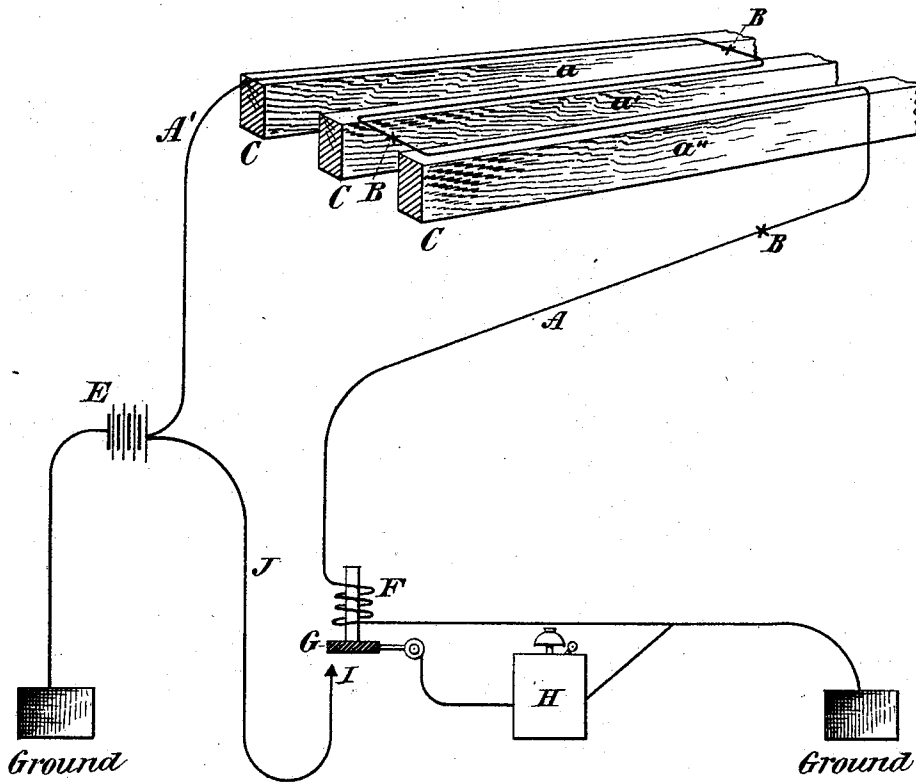


Fig. 2.



WITNESSES:

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CONDUCTOR FOR ELECTRICAL FIRE-ALARM SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 378,078, dated February 21, 1888.

Application filed September 26, 1887. Serial No. 250,643. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. BARNES, of Bridgeport, Fairfield county, Connecticut, have invented a new and useful Improvement in Conductors for Electrical Fire-Alarm Systems, of which the following is a specification.

My invention relates to a conductor designed for use in connection with electrical fire-alarm systems; and it consists in a wire composed of lengths or sections of a metal or alloy fusible at a low temperature, the said lengths or sections being united by joints formed of a metal or alloy fusible at a temperature still lower than that at which the wire sections will melt.

In the accompanying drawings, Figure 1 represents a portion of my new conductor. Fig. 2 is an electrical diagram showing an arrangement of the said conductor with the mechanism of a fire-alarm system.

Similar letters of reference indicate like parts.

The object of this invention is to provide a means of detecting the presence of an unduly high temperature under two different conditions—namely, first, at certain points when the temperature of the adjacent atmosphere exceeds a certain degree, and, second, at all points along and in the vicinity of the conductor when the temperature exceeds a certain higher degree.

The conductor to this end is made of sections of wire A, Fig. 1, integrally formed of fusible metal, fusible alloy, or any other known metal compound which is fusible at a comparatively low temperature. In practice it is better to select for this purpose any fusible alloy which will melt at about 500° Fahrenheit—such, for example, as tin two parts and zinc four parts, or tin three parts, zinc four parts, or the series of alloys of bismuth, lead, and tin ranging in proportions from eight parts bismuth, sixteen parts lead, and eighteen parts tin to eight parts bismuth, thirty-two parts lead, and forty parts tin. The sections of wire made from such an alloy are united by joints B, which may be formed by soldering with a fusible alloy which will melt at a much lower temperature—such, for example, as five parts bismuth, three parts lead, and two parts tin, which melts at 199° Fahrenheit, or bismuth, lead, and tin alloys, such as the preceding, to which a small percentage of mercury is added,

thus still further lowering the fusing-point. A great many so-called fusible alloys melting at widely-varying temperatures are well known in the arts, from which selections can readily be made to suit the special circumstances under which this conductor may be employed, so that further detailed reference to particular compositions is unnecessary. The advantage of this construction is as follows: The sections A may be made of any desired length, and the wire be led wherever protection from fire is needed, and especially through concealed localities, as between the beams of buildings, under floors, through plastering, &c., the parallel or adjacent parts (*a a'*, Fig. 2) of the wire being in such proximity—say three or four feet apart—as that an incipient fire cannot far progress before meeting a wire and melting it.

The joints B of the wire, as has been stated, which will melt at a still lower temperature, furnish a further safeguard, especially in open places, where, for particular reasons, it is important not to exceed a certain atmospheric temperature, as in certain chemical workshops, curing-houses, drying-rooms, &c. The aforesaid conductor therefore serves the double purpose of guarding against undue rise in atmospheric heat and against actual conflagration. Actual flame will rupture the conductor at any point, but a temperature, say, equal to that of boiling water, for example, may cause its rupture only at a joint. The body of the conductor-sections A may therefore be made of alloys of greater tensile strength than would be possible were the whole conductor to be integrally formed of the material used in forming the joints.

Fig. 2, which shows in diagram a simple arrangement of fire-alarm system, illustrates the above-described mode of using the conductor. At C is shown a series of beams, along the tops of which the conductor may be laid. The sections A of the conductor may come in direct contact with the beams, and the joints B may come in the spaces between the beams, as shown. Now the parts A on top of the beams might be completely covered by flooring or otherwise inclosed in material poorly conducting heat, so that an undue elevation in adjacent atmospheric temperature might not be transmitted through the shielding material promptly.

ly. The joints B, however, are exposed, and therefore any undue increase of heat of the air between the beams at once causes rupture of the conductor at these joints.

5 The mechanism in the illustrative fire-alarm system shown in Fig. 2 is as follows: E is a battery or other source of electricity, to one pole of which is connected the conductor A', the other pole being grounded. The current from
10 the battery passes through the conductor to the coil of an electro-magnet, F, which thus becomes energized, and thence to ground. The magnet F therefore normally attracts an armature, G, which is in shunt-circuit J with
15 any form of electrical alarm H, battery, and ground. When the conductor is ruptured at any point, the magnet F releases its armature, which, meeting a contact-point, I, establishes circuit through the shunt J, and so causes the
20 alarm to operate.

It is of course to be understood that in the above mechanism the line-circuit only is to be made of the compound fusible wire above described, and not the coil of magnet F.

25 In another application for Letters Patent filed simultaneously herewith by me, Serial No. 250,642, I have described and claimed a conductor for electrical fire-alarms consisting of a wire integrally formed of a fusible metallic compound; and in still another applica-
30 tion for Letters Patent, also filed simultane-

ously herewith by me, Serial No. 250,644, I have specifically described and claimed a conductor for electrical fire-alarms consisting of sections of wire of copper, iron, or other metal
35 having a comparatively high fusing-point united by joints of fusible metal. These inventions I do not herein claim. The particular alarm system herein set forth is merely illustrative. I do not claim the same nor limit
40 my invention to use therewith.

I claim—

1. As a new article of manufacture, a conductor for electrical fire-alarms, consisting of a wire formed of sections of metallic compound
45 fusible at a certain comparatively low temperature, united by joints formed of a metallic compound fusible at a temperature lower than that of the fusing-point of said sections, substantially as described. 50

2. In combination with an electrical-alarm system, a conductor formed of sections of wire of a metallic compound fusible at a certain comparatively low temperature, united by joints formed of a metallic compound fusible
55 at a temperature lower than the fusing point of said sections, substantially as described.

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Witnesses:

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