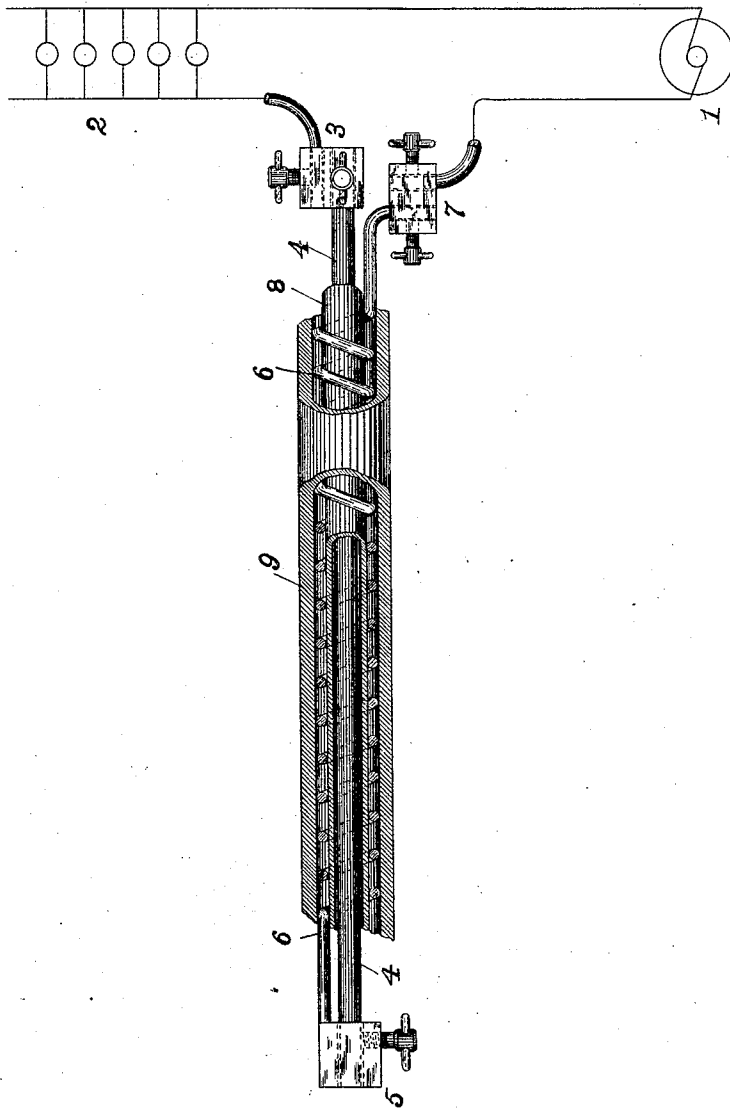


(No Model.)

H. N. POTTER.
FUSE BLOCK.

No. 546,475.

Patented Sept. 17, 1895.



WITNESSES:

Hubert C. Tenner
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INVENTOR

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BY

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRY NOEL POTTER, OF ALLEGHENY, ASSIGNOR TO THE WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF PITTSBURG, PENNSYLVANIA.

FUSE-BLOCK.

SPECIFICATION forming part of Letters Patent No. 546,475, dated September 17, 1895.

Application filed October 17, 1894. Serial No. 526,126. (No model.)

To all whom it may concern:

Be it known that I, HENRY NOEL POTTER, a citizen of the United States, residing in Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Fuse-Blocks, (Case No. 615,) of which the following is a specification.

My invention relates to that class of devices commonly known as "fuse-blocks," which are employed in connection with electric circuits for the purpose of automatically interrupting the same whenever the current increases to such a degree as to endanger the translating devices fed thereby; and it has for its object to provide a device of this character which will operate in such a manner as to maintain the fuse unimpaired during the passage of a normal current, and which will insure the immediate blowing of the fuse whenever an excess of current relatively small, as compared with that required to blow ordinary fuses of equal conducting capacity, occurs. In order to secure the best results with devices of this character, it is necessary that the fuse shall carry a normal current indefinitely without deterioration, and that it shall blow within a brief interval of time whenever there is a dangerous increase of current beyond the normal.

Experience has demonstrated that an ordinary lead fuse, or one composed of any of the commercial alloys which will melt within a reasonable time under the direct heating effects of a given electric current, will not carry much more than one-third of such current for any considerable period of time without material deterioration from oxidation and other causes. Such impaired condition of the fuse, due to currents of less than sufficient quantity to melt the same, results in many secondary attendant inconveniences known to those skilled in the art, and it is the purpose of the present invention to reduce to a minimum such condition and attendant inconveniences by generating the heat for blowing the fuse in a conductor having a high temperature-resistance coefficient and a high melting-point, and by using in connection therewith a fusible strip composed of material the melting-point of which is as low as, or lower than, that of any of the metals or alloys in ordinary

use for like purposes. By this arrangement the fuse may be of such size that it would carry the melting-current without blowing if used without the heating-coil. This heating-conductor I locate in proximity to the fuse and in electrical connection therewith, so that the heat generated therein may be transmitted to the fuse through whatever medium may be interposed between the said devices. By such a combination and arrangement of parts, it is clear that any increase in current in the heating-coil will cause a much more than proportional increase in the temperature by reason of the large temperature-resistance coefficient of the material of which it is composed. The heat thus generated will be instantly and directly transmitted to the fusible strip, thus raising its temperature at a rate and to a degree greatly in excess of the rate and degree which could occur under any conditions of self-heating, because of the comparatively insignificant temperature-resistance coefficient of any of the fuse-alloys or even of pure lead.

In the accompanying drawing I have shown an electric circuit and a fuse-block which is illustrative of my invention in connection therewith, the former being shown diagrammatically and the latter partially in section and partially in plan.

Referring to the drawing in detail, 1 is a suitable electric generator and 2 represents a series of translating devices. Connected with one branch of the generator or circuit, by means of a binding-post 3, is one end of a fusible wire or strip 4, such wire or strip being composed of any desired material commonly employed in such connections and of any desired form. The other end of this fusible strip is connected, by means of a binding-post 5, to one end of a coil of iron wire 6, the said coil being, in the present instance, shown as wrapped about the fuse 4 and connected at the end opposite the binding-post 5 in circuit with the generator 1 and translating devices 2 by means of a binding-post 7. I have specified iron as the material of which the wire 6 is composed, because it has the highest coefficient of increase of resistance per unit of increase of temperature, and for that reason it is the most suitable for this purpose. Any of the pure metals, however, have a suf-

5 sufficiently large temperature-resistance coefficient to permit of their use in this connection, but with less desirable results. Interposed between the fuse 4 and the coil 6 is a
 10 body of non-combustible insulating material 8, the said material having the form of a tube surrounding the fuse when the form and relation of the several parts of the device are as indicated in the drawing. I have found
 15 asbestos a suitable material to be employed in this connection; but any other material having the properties specified above may be employed, if desired. Surrounding the coil 6 and the fuse 4 is a casing or sheath 9, com-
 20 posed of non-conducting material, which is designed to serve merely as a protective covering for the said parts, the form and dimensions of which may be varied to conform to the wishes of the constructor.
 25 It is to be understood that the particular form of connection between the fuse and the heating coil, as well as that between the main circuit and the said devices, is immaterial, so far as my invention is concerned; and it is
 30 also to be understood that the form and relative location of the heating coil and fuse may be varied, as desired, the particular form shown and described being intended merely as illustrative of the broad principle of the invention.
 Any increase of current through the fuse-block will raise the temperature of the heating-coil 6, which will increase its resistance, and this increase in resistance will in turn
 35 further raise the temperature until the critical point is reached, when the heat transmitted from the coil 6 through the insulating material 8 will melt fuse 4 and interrupt further current flow.
 40 My invention is particularly well adapted

for use in connection with fuses which are intended to be blown by small currents, plain lead fuses for such currents being impracticable, owing to their necessarily small size and consequent mechanical weakness. In the
 45 present device the fuse may be made of the necessary strength, for the reason that the source of heat is external thereto.

What I claim is—

1. In a fuse block, a fuse and a heating coil 50 surrounding the same and in series therewith, substantially as described.

2. A fuse and insulating material surrounding the same, combined with a heating coil surrounding said insulating material and in 55 series with said fuse, substantially as described.

3. In a fuse block, a fuse, an iron wire coil surrounding the same and in series therewith, and insulating material interposed between 60 said coil and fuse, substantially as described.

4. A fuse block comprising a heat generating conductor formed of material having a high temperature resistance coefficient and an adjacent conductor formed of material 65 fusible at a comparatively low temperature in series therewith, substantially as described.

5. A fuse block comprising a fuse, an adjacent heat generating conductor electrically connected in series therewith, interposed non- 70 conducting material and an insulating shell or casing, substantially as described.

In testimony whereof I have hereunto subscribed my name this 13th day of October, A. D. 1894.

HENRY NOEL POTTER.

Witnesses:

CHARLES IRA YOUNG,
JAS. W. SMITH.