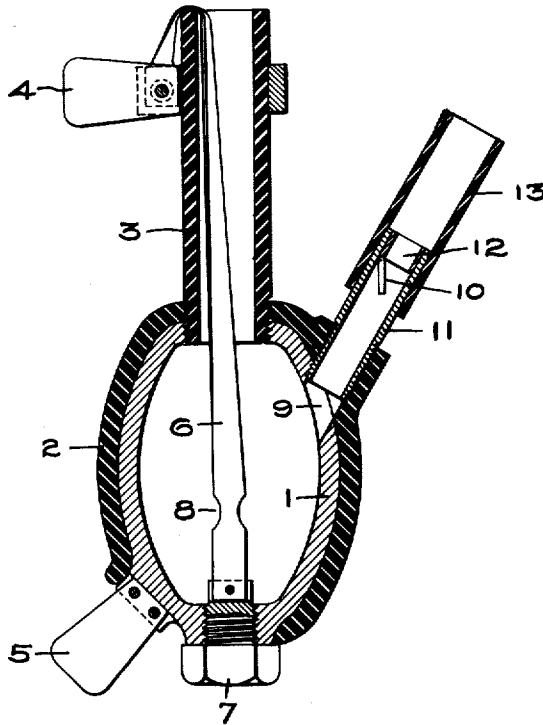


E. M. HEWLETT.
VENTILATED FUSE.
APPLICATION FILED AUG. 26, 1909.

947,235.

Patented Jan. 25, 1910.



Witnesses:
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UNITED STATES PATENT OFFICE.

EDWARD M. HEWLETT, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

VENTILATED FUSE.

947,235.

Specification of Letters Patent. Patented Jan. 25, 1910.

Application filed August 26, 1909. Serial No. 514,681.

To all whom it may concern:

Be it known that I, EDWARD M. HEWLETT, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Ventilated Fuses, of which the following is a specification.

This invention relates to thermal cut-outs or fuses for electric circuits of the type in which a wire of low melting point gives way under the heating action of a current passing through it whenever such current exceeds a predetermined value. When fuses of this type are used on circuits of high voltage and large amperage, an arc is formed between the ends of the ruptured fuse wire, and some means must be provided for extinguishing this arc. One way of doing this is to cause the gases and vapors developed by the arc to be expelled away from the fuse conductor with sufficient force to snap the arc. My invention has especial reference to fuses of this "expulsion" type, such, for instance, as the one shown in the patent to C. E. Eveleth, dated March 27, 1906, No. 816,443.

In this device the fuse-wire is inclosed in a casing which comprises an enlarged chamber and an open-ended tube extending therefrom. The fuse-wire is stretched through both portions of the casing, and when it gives way under the stress of an excessive current, the resulting gases and vapors create a pressure in the chamber which causes a prolonged blast through the tube, thereby effectually blowing out the arc.

The value of a fuse depends largely upon its carrying the current up to a predetermined value without giving way. Its breaking point is a function of the temperature to which it is raised by the heating effect of the current. This effect is intensified in fuses of the Eveleth type, by the enveloping casing, which comprises the hot air within it and tends to produce a rupture of the fuse-wire before the current rises to the predetermined voltage.

The object of my invention is to prevent this abnormal heating of the fuse-wire, and I accomplish this by arranging the casing with its open end uppermost, and providing an inlet for air near the lower end of the casing, so that there may be a circulation of air up through the casing. The fuse-wire

will be kept thus in an atmosphere which is at a normal temperature, and premature melting will be obviated.

The accompanying drawing is a longitudinal section of one form of my ventilated fuse.

The chamber 1 is preferably in the form of a bulb, and is made of metal adapted to withstand the pressure of the explosion of the gases developed by the blowing of the fuse. The bulb is covered on its outer surface with a coating of insulating compound 2. The tube 3 is composed of non-inflammable insulating material such as indurated fiber. One contact blade 4 is secured to the tube and a second blade 5 is attached directly to the bulb. The fuse-strip 6 is attached to a screw-plug 7, which is screwed into a threaded opening at the lower end of the bulb, adjacent to the contact blade 5 and in line with the tube. The fuse runs up through the bulb and the tube and its upper end is bent over the edge of the tube and secured to the contact blade 4. The strip 6 may be narrowed at 8 to cause the rupture to begin in the chamber.

At some convenient point in the bulb an opening 9 is made, to serve as an inlet for air. Means are provided for automatically closing this opening when the fuse blows, in order to prevent the escape of flame therethrough. I prefer to use an ordinary check valve 10 arranged preferably in a pipe 11 screwed into the opening 9, and containing also an annular seat 12 against which the valve seats. By giving the pipe an oblique upward direction and hinging the valve at its upper edge, it will hang vertically, as shown, keeping the pipe partially open for the free admission of air, but being in a good position to be caught and closed by the rush of gas when the fuse blows, and thus prevent the escape of fire through the air inlet. A nozzle 13 of fiber or the like confines any flame which may momentarily shoot out as the valve closes.

Under normal conditions the heat developed by the fuse in the bulb and tube causes an upward current of air therein, fresh air entering through the pipe. In this way the temperature of the air in the casing is prevented from rising above normal, and premature explosion of the fuse is avoided. When the fuse does blow, the automatic closing of the valve compels the blast to

take place through the tube as in the case of the standard Eveleth fuse.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In an expulsion fuse, means for ventilating said fuse under normal conditions, and means for confining the blast of exploding gases to the region occupied by the fuse.

2. The combination with an expulsion fuse comprising an upright casing, having an opening for admitting air, of means for closing said opening automatically when the fuse blows.

3. In an expulsion fuse, the combination with a casing open at the top, of means for admitting air to the lower part of said casing, and means for shutting off the air when the fuse blows.

4. A casing for an expulsion fuse, comprising a bulb and a tube rising therefrom, said bulb having an air inlet.

5. A casing for an expulsion fuse, comprising a tube, a bulb connected therewith and having an air inlet, and an outwardly-closing check valve controlling said inlet.

6. A casing for an expulsion fuse, comprising a tube, a bulb connected therewith and having an air inlet, a pipe extending from said inlet, and an outwardly-closing check valve in said pipe.

In witness whereof, I have hereunto set my hand this 25th day of August, 1909.

EDWARD M. HEWLETT.

Witnesses:

BENJAMIN B. HULL,
MARGARET E. WOOLLEY.