

E. O. SCHWEITZER.
FUSE DEVICE.
APPLICATION FILED NOV. 3, 1913.

1,240,795.

Patented Sept. 18, 1917.

Fig. 1.

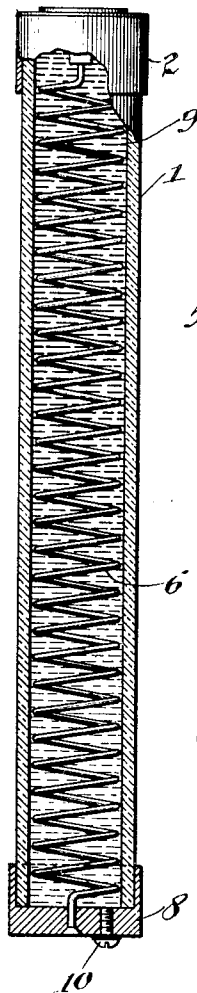


Fig. 2.

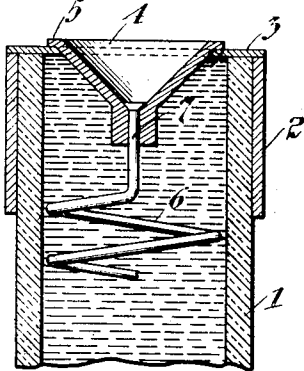


Fig. 4.

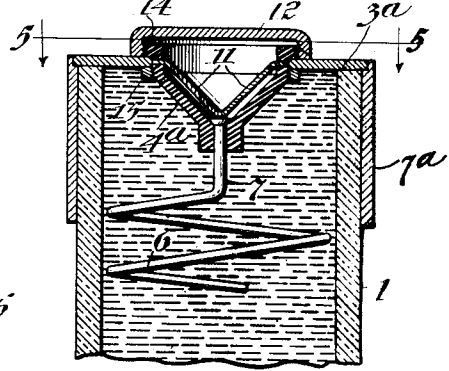


Fig. 3.

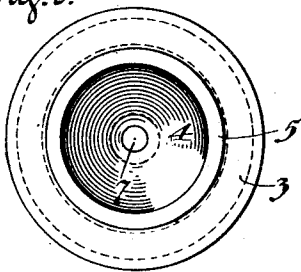
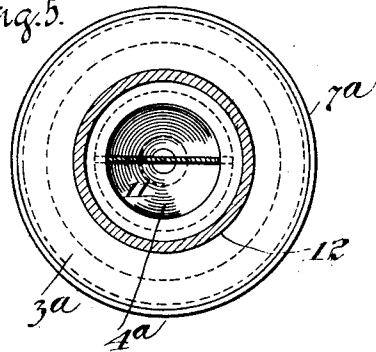


Fig. 5.



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UNITED STATES PATENT OFFICE.

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FUSE DEVICE.

1,240,795.

Specification of Letters Patent.

Patented Sept. 18, 1917.

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To all whom it may concern:

Be it known that I, EDMUND O. SCHWEITZER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Fuse Devices, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to fuse devices, and especially fuse devices for extra high potential work.

Prominent objects of the invention are to provide a simple and practical device of the class mentioned; to arrange for the taking care of large currents in such devices; to avoid arcing and explosions and other objectionable results upon the operation of the device; to secure accuracy and efficiency; and to secure other desirable results in a simple and practical manner.

In the accompanying drawings Figure 1 is a view largely in longitudinal or vertical section of a fuse device embodying my present invention;

Fig. 2 is a view of a top of said device shown in longitudinal section on an enlarged scale;

Fig. 3 is a plan of the device shown in Fig. 2;

Fig. 4 is a view similar to Fig. 2, of a modification;

Fig. 5 is a plan of the device shown in Fig. 4.

The device shown in the drawings comprises a tube 1 which may be of glass or other insulating material as desired. This is preferably cylindrical and of sufficient length to give good results as hereinafter pointed out. A metal ferrule or collar 2, made of brass or copper or other suitable material, encircles the top portion of the tube 1, fitting closely to the same. A fuse 3 in the form of a washer is mounted upon the top of the tube 1 and ferrule 2 and arranged to make electrical contact with the latter, as for example by soldering said washer fuse 3 to said ferrule 2. A cone shaped member or terminal 4 is arranged in connection with the fuse 3, said cone 4 being conveniently provided with a laterally projecting lip or edge portion 5 which fits against the washer fuse 3, the body portion of said cone 4 thence extending into

the interior of the tube 1. Said cone 4 is in the arrangement referred to shown in Figs. 1 and 3, preferably made of metal and makes electrical connection with the fuse 3, being preferably soldered thereto. A spring 6 is arranged within the tube 1 and extended lengthwise substantially from end to end of the same. The upper end of said spring 6 is extended to the terminal or member 4, so as to make good mechanical and electrical connection therewith, a simple way being to extend the end portion 7 of said spring up through the bottom of the member 4 and bead or head the end of said end 7, as shown in Fig. 2. A cap 8 preferably of brass or copper or other suitable metal is fitted to the lower end of the tube 1, and engages the lower end of spring 6. The arrangement is such that the spring 6 is extended and subjected to tension when extended the full length of the tube 1, and connected at its ends as described. A suitable dielectric or arc extinguishing liquid, such as carbon tetra-chlorid 9, is arranged within the tube 1 and substantially fills the same. The cap 8 is conveniently provided with a screw plug 10 by which said liquid can be introduced into, and if necessary, withdrawn from the tube 1. Connection with a circuit in which the device is to be included is made by means of the ferrule 2 and cap 8 in any suitable or desired manner.

From the foregoing it will be seen that the circuit is made through the spring 6, member 4, and fuse 3. When an overload current traverses the circuit the fuse 3 will be blown, thereby releasing the member 4, whereupon the spring 6 draws said member downward, assisted by gravity, so that the circuit is broken and a wide opening or separation is made between said member 4 and the ferrule 2. The result is that an arc is prevented or extinguished, the liquid within the tube being forced upward along the edges of the member 4 as the same is drawn quickly downward by the spring 6. Also damaging results from explosion are prevented, the break in the circuit occurring at the end of the tube 1, and at or within the space inclosed by the metal ferrule 2. Beside this it will be seen that the device is very simple, the fuse 3 and terminal 4 serving as end pieces or closures, and also as vents for the tube 1, and the

tube being automatically opened for the introduction of a new fuse when the device operates. The number of parts entering into the construction is very small.

- 5 In the modification shown in Figs. 4 and 5 the member 4^a is preferably made of insulating material instead of metal as in the other device. In such case conductors 11, 11, extend from the spring end 7 to the fuse 3^a so as to make connection between the fuse and spring. The fuse 3^a fits against the end of the tube 1 and also within the end of the metal ferrule 7^a. A cap or cover 12 is preferably mounted upon the top of the member 4^a, being conveniently secured upon an upward projection 14 thereon. A washer or collar 15 is fitted upon said member below the portion 14, so that in this way the fuse 3^a is held securely in position. The operation of this device is in substance the same as that of the preceding device. The rating of the fuse may be varied by changing the size of the washer 14.

It will be understood that changes and modifications can be made without departing from the spirit of the invention.

What I claim is:

1. A fuse device comprising a tubular casing, a member forming a cap and closing the end of the tubular casing, said cap including a ferrule, a fusible element mounted upon the end of the ferrule, a terminal held by the fusible element, and means tending to separate the terminal from the cap.
2. A fuse device having an insulated tubular member, a metallic member surrounding the tubular member at each end, a fusible member extending across the end of one of the metallic members, a movable member supported by the fusible member and forming a closure for the end adjacent the movable member, and a conductor extending between the metallic members surrounding the tubular members, said conductor tending to separate the movable member from the fusible member.
3. A fuse device comprising an insulated tubular member, a metallic member surrounding the end of the insulated member, a ring-shaped fuse having one edge connected with the metallic member, a movable member supported by and extending into the aperture of the ring shaped fuse, said members and the ring shaped fuse forming a closure for the end of the tube and means tending to separate the movable member from said fuse.
4. A fuse device comprising a ring shaped fuse, a contact member for engaging the outer edge portion of said fuse, and a terminal device engaging the inner edge portion of said fuse and extending into the aperture of the ring, and means for exerting tension upon said terminal device said means

being secured to the end of the terminal which extends into the aperture in said ring.

5. A fuse device comprising an insulated tube, a ring shaped fuse at the end of the tube, and a terminal member entering said ring and engaging said fuse, in combination with spring means within the tubular device acting upon said terminal member.

6. A fuse device comprising an insulated tube, a ring shaped fuse device fitted to the end of said tube, a terminal member located within the opening of said fuse and having a portion which is larger than said opening, said fuse and terminal member forming a closure for the end of the tube and a member exerting tension upon said terminal member.

7. A fuse device comprising a tube, a ring shaped fuse device fitted to the end of said tube, a terminal member located within the opening of said fuse, said fuse and terminal member forming a closure for the end of the tube, and means within the tube for exerting tension upon said terminal member.

8. A fuse device comprising a tube, a metallic member at the end of said tube, a ring shaped fuse device fitted to the end of said tube and making contact with said metallic member, a terminal member arranged within the fuse and forming therewith a closure for the tube, and spring means within the tube engaging and drawing upon said terminal member.

9. A fuse device comprising a tube, a metallic member at the end of said tube, a ring shaped fuse device fitted to the end of said tube and making contact with said metallic member, a terminal member arranged within the fuse and forming therewith a closure for the tube, and spring means within the tube engaging and drawing upon said terminal member, said terminal member being in the form of a cone with its smaller end within the tube.

10. A fuse device comprising a tube of insulating material, a metal ferrule surrounding an end portion of said tube, a flat washer-like fuse device fitted against the end of said tube and contacting with said ferrule, a metal cone-shaped member arranged within the opening of said fuse and having its small end pointing inward, the outer end of said member engaging said fuse and the fuse and member forming a closure for the tube, and a spring arranged within the tube and engaging and drawing upon said member.

11. A fuse device comprising a tube of insulating material, a metal ferrule surrounding an end portion of said tube, a flat washer-like fuse fitted against the end of said tube and contacting with said ferrule, a metal cone-shaped member arranged within the opening of said fuse and having its

small end pointing inward, the outer end of said cone engaging said fuse and the fuse and member forming a closure for the tube, and a spring arranged within the tube and engaging and drawing upon said member, and an insulating liquid located within the tube.

12. A fuse device comprising a tube of insulating material, a metal ferrule surrounding an end portion of said tube, a flat washer-like fuse fitted against the end of said tube and contacting with said ferrule, a metal cone-shaped member arranged within the opening of said fuse and having its small end pointing inward, the outer end of said member engaging said fuse and the fuse and member forming a closure for the tube, a spring arranged within the tube and engaging and drawing upon said member, an insulating liquid located within the tube, and a metallic cap fitted to the other end of the tube and engaging the other end of said spring.

13. In a fuse device comprising a tubular casing, a terminal provided in said casing and supported by an apertured fusible element, said terminal engaging the inner edges of the aperture, a spring conductor secured to the terminal and extending into the casing, and tending to separate the terminal and the fusible element.

14. A fuse device comprising a tubular casing, metallic cap members provided upon

opposite ends of said casing, said members forming contact members and closures for the ends of said tube, one of the cap members being composed of an apertured fusible member having its inner and outer edges in contact with said contact member, and a movable terminal member respectively, said terminal member having an end which projects through the aperture in said fusible member, and a spring conductor connecting the cap members provided upon the ends of said casing through said terminal.

15. A fuse device comprising a tubular casing, a cap member at one end of said casing, said cap member having an aperture axial with the casing, a cone-shaped member located at said end of said casing and arranged within said aperture, a fuse located at said aperture and with said cone shaped member closing the same, said fuse being engaged by said member, arc extinguishing liquid within said casing, and spring means for drawing said cone-shaped member inwardly and ejecting the liquid out through the opening in said cap member.

In witness whereof, I hereunto subscribe my name this 30th day of October, A. D., 1913.

EDMUND O. SCHWEITZER.

Witnesses:

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HAZEL ANN JONES.