

No. 876,273.

PATENTED JAN. 7, 1908.

F. B. HALL.
FUSE DEVICE.

APPLICATION FILED DEC. 30, 1906.

Fig. 2.

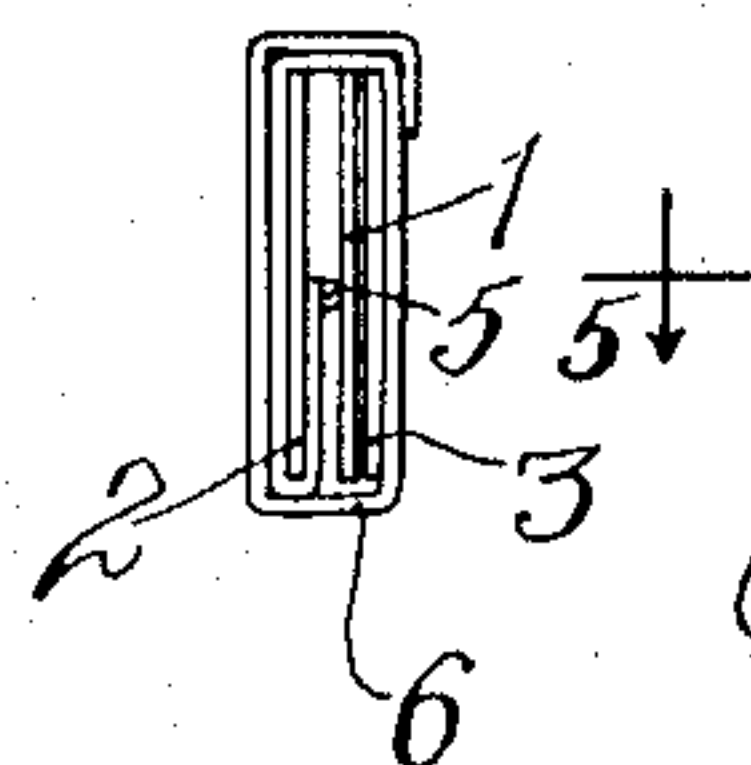


Fig. 1.

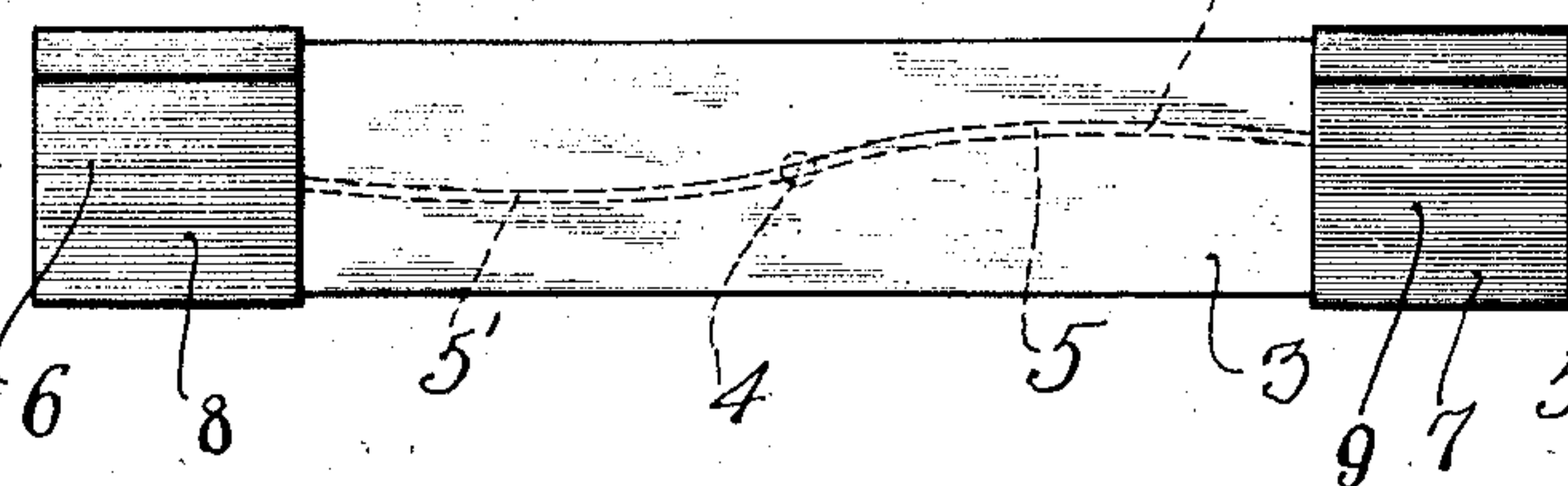


Fig. 3.

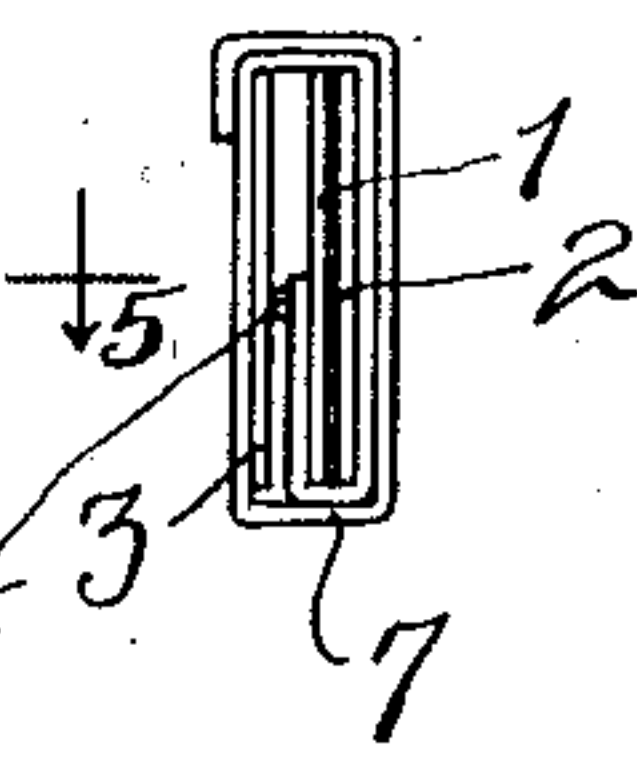


Fig. 4.

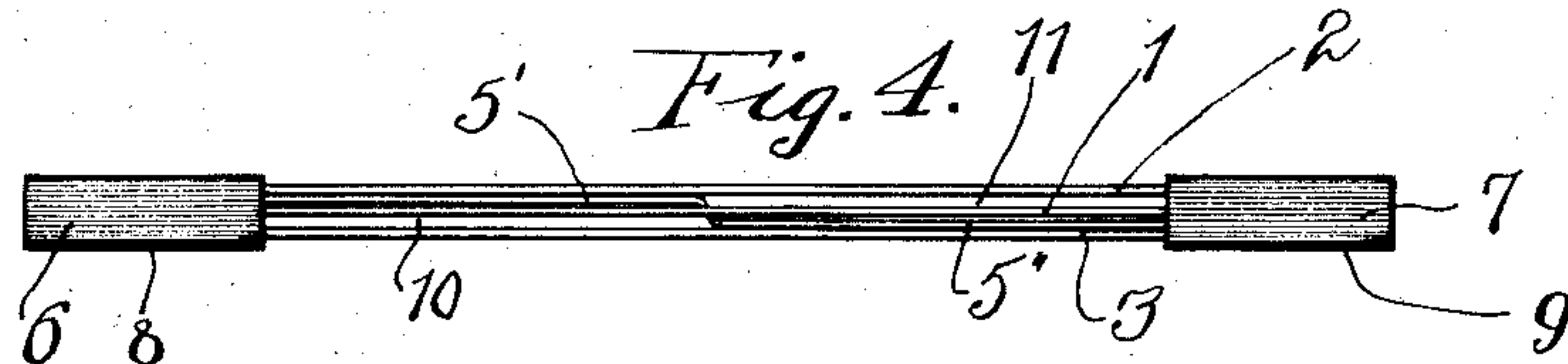


Fig. 5.

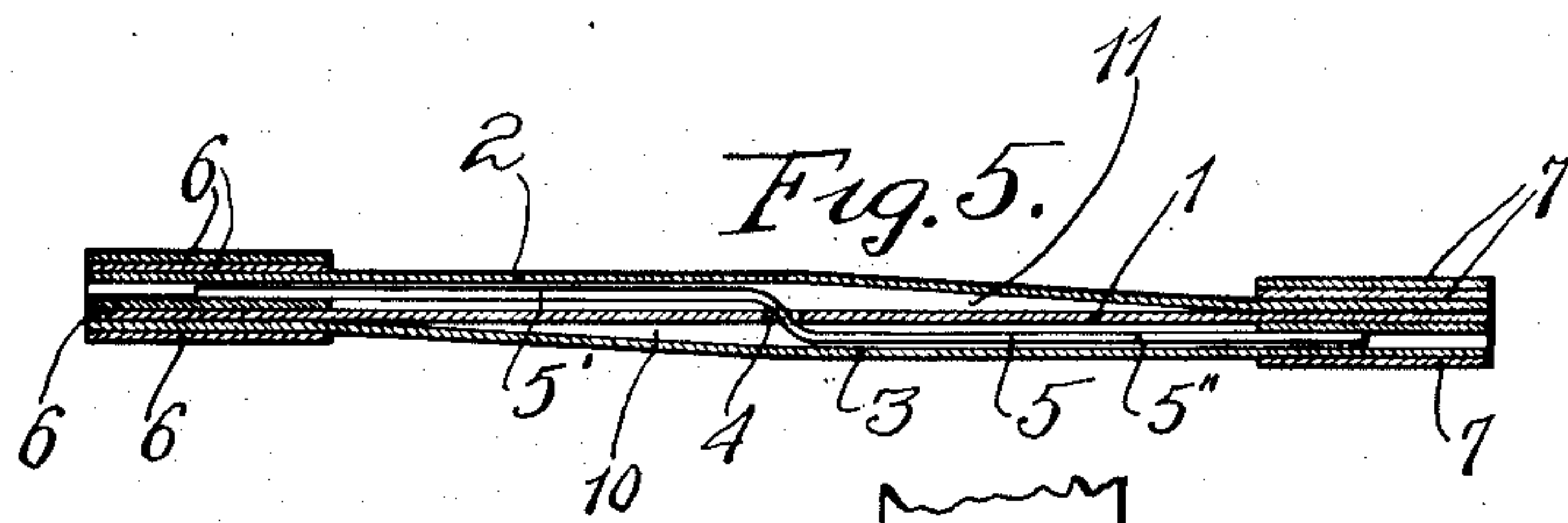


Fig. 6.

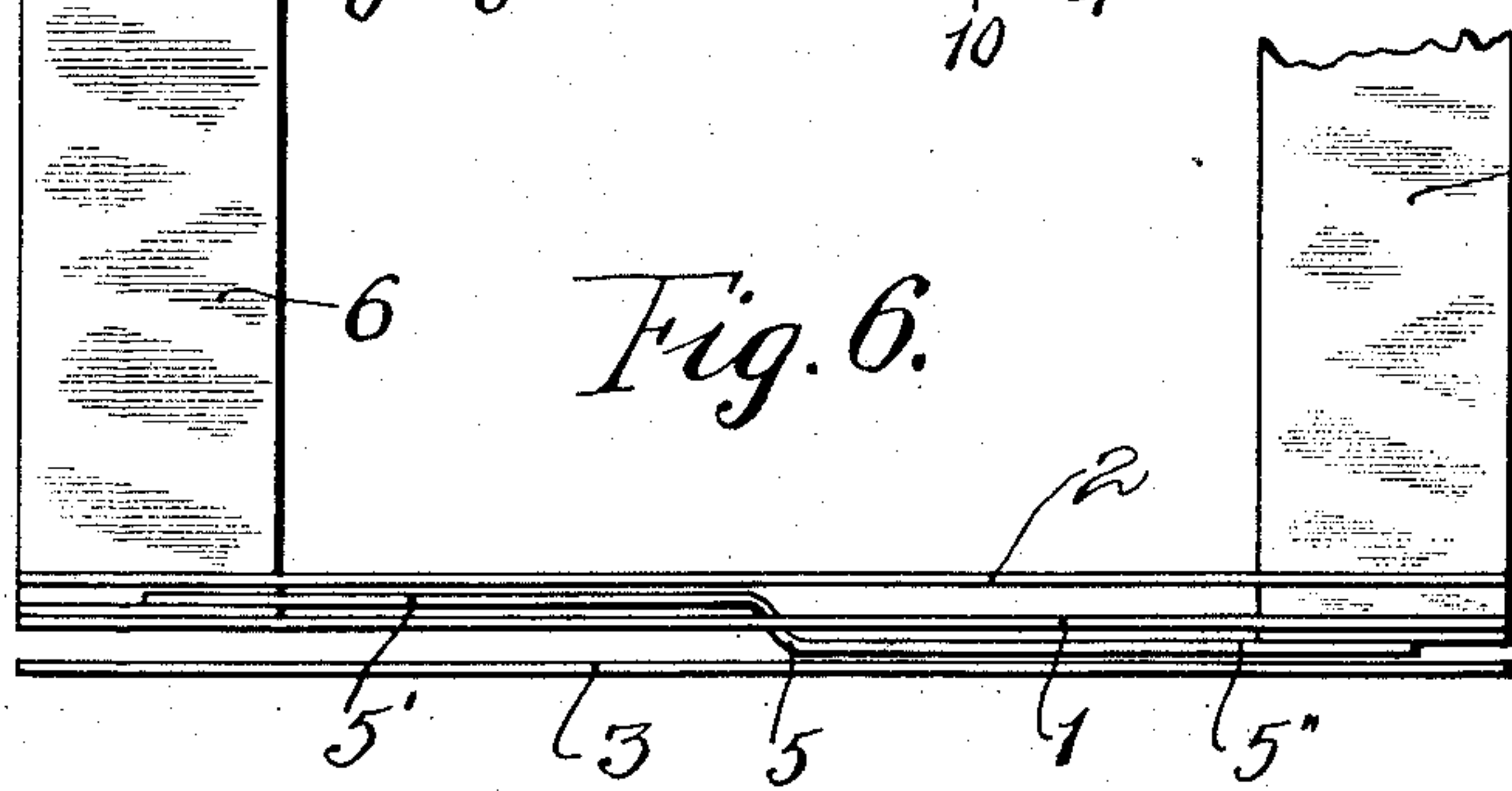


Fig. 7.

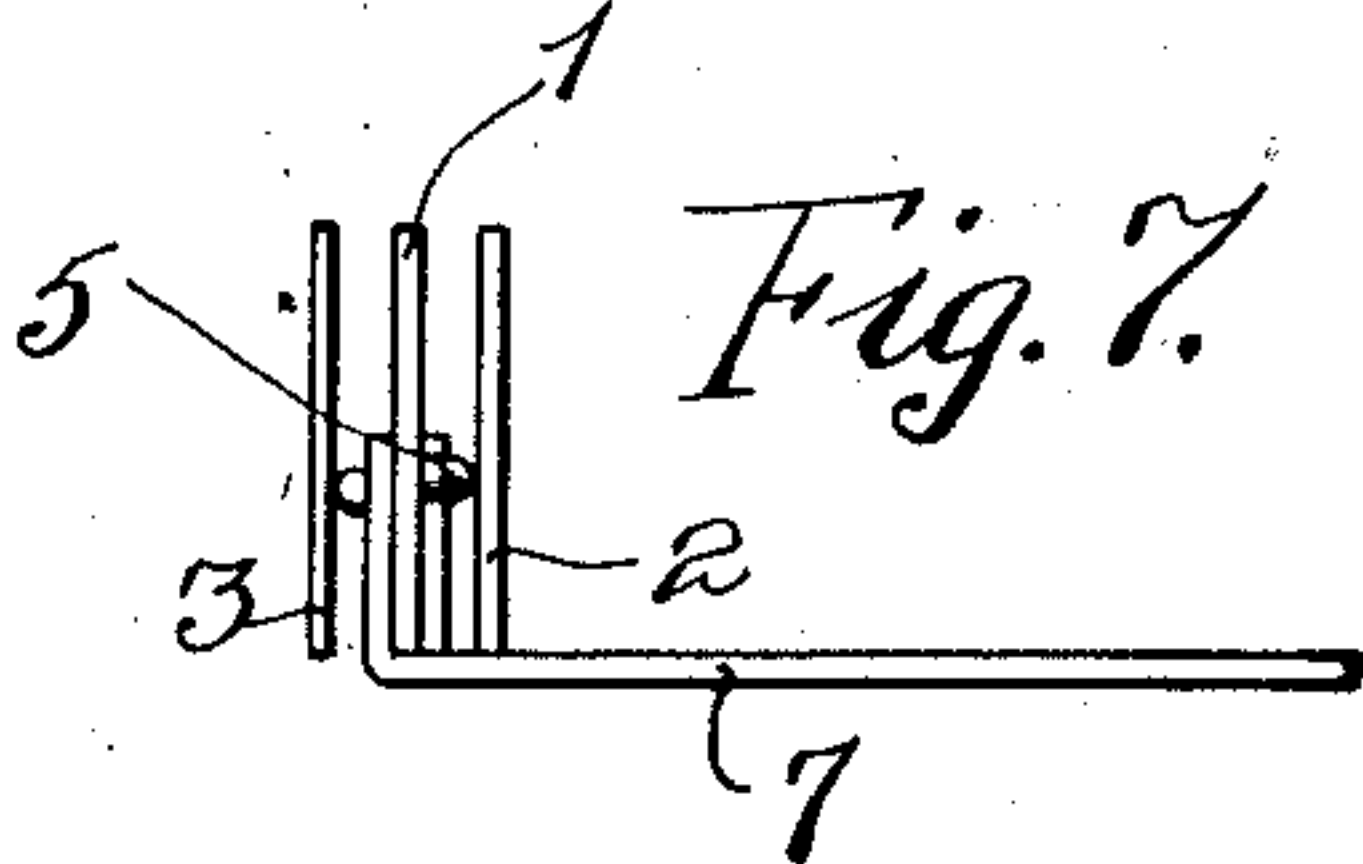
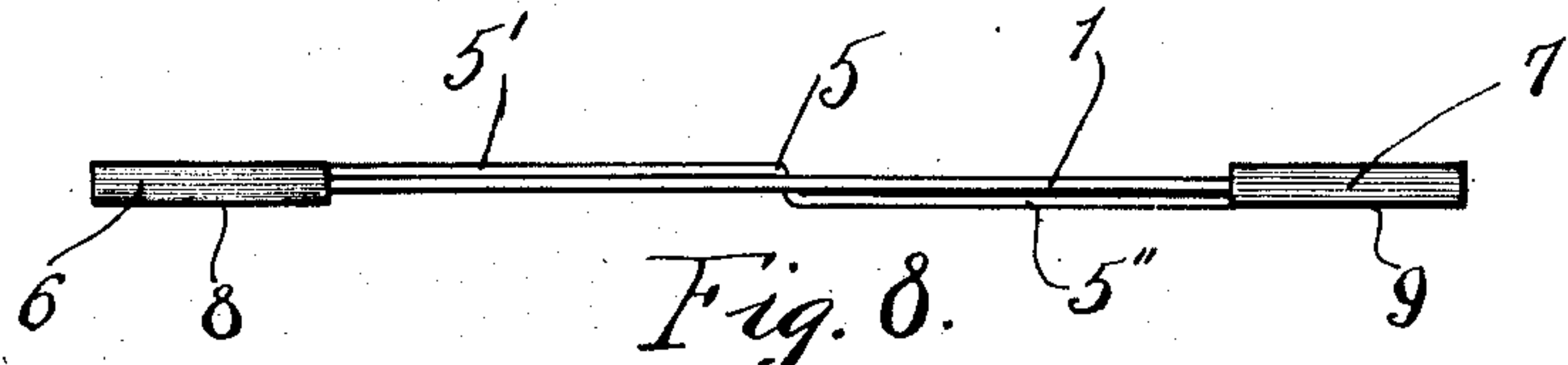


Fig. 8.



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FUSE DEVICE.

No. 876,273.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed December 30, 1905. Serial No. 294,026.

To all whom it may concern:

Be it known that I, FRANK B. HALL, citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, 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 circuit-protecting devices, such as fuses, and its object is to provide more efficient construction and arrangement of the parts thereof.

My invention may be considered an improvement over the well known protecting devices in which a fuse conductor runs along a body of mica or other suitable insulating material, tipped at its ends with metallic terminals, these terminals being adapted for engagement with registering terminals of a fuse mounting block or standard. In these protecting devices of the prior art the fuse conductor proper lies loosely against the mica body or is held in position by shellac or other treatment of the mica body. In these fuses of the prior art the blowing of the fuse proper is very frequently followed by a disastrous arc. When a heavy current passes through the fuse conductor a vapor is formed upon the fusing thereof and the arc establishes itself in this vapor, running to the terminal at either end of the mica body and destroying the registering terminals of the mounting block.

In accordance with my invention, I provide a protecting device having a body part preferably composed of three sections or strips of mica or other insulating material. The middle strip is provided with a hole at or near the middle of its length. The fuse conductor passes through this hole, one half lying at one side of the middle strip and the other half at the other side of the middle strip. In order to strengthen the body portion of the device, I find it desirable to place outside strips of mica or other insulating material at either side of the middle strip and outside of the fuse conductor, so that the fuse conductor lies between the middle strip and the outer strip on either side. The ends of the fuse conductor are soldered or otherwise electrically connected to metallic bands wrapped about the ends of the three sections to form the fuse terminals. In con-

structing the tightening device it is desirable to fasten the ends of the fuse conductor to metallic strips which, after the three pieces of the mica body have been assembled, is wrapped around the body portion, as will be more fully explained. When a fuse of my improved construction is blown by the passage of an excessive current any arc which is established must pass through the hole through the central mica strip and will be almost immediately extinguished on account of the irregular path which the arc must follow. Any gas or vapor which may be formed in the blowing of the fuse can readily escape through the openings between the central member of the body portion and the side strips which are associated therewith.

My invention will be better understood by reference to the accompanying drawing, in which—

Figure 1 is a front elevation of a fuse; Fig. 2 is a view of the left end thereof; Fig. 3 is a view of the right end of the fuse; Fig. 4 is a top view thereof; Fig. 5 is a sectional view taken on line 5—5 of Fig. 1; Fig. 6 is a plan view showing the manner of assembly of the fuse parts; Fig. 7 is an end view of Fig. 6, and Fig. 8 shows a modified construction.

The fuse body consists of the single section or strip 1 and the outer sections or strips 2 and 3, these strips being preferably of mica, although any other suitable insulating material may be used. The inner section 1 is provided near the middle of its length with a hole 4, the fuse conductor 5 passing through this hole so that the part 5' thereof will lie at one side of the inner section and the part 5'' at the other side of the middle section. The ends of the fuse conductor are soldered or otherwise electrically connected and fastened to the metallic bands 6 and 7. When first formed these bands are preferably straight, as best illustrated in Fig. 6. The three sections 1, 2 and 3 are assembled as shown in Fig. 6, and the protecting device is completed by wrapping the bands 6 and 7 around the three mica sections or strips, then fastening them together and providing suitable terminals at the ends of the protecting device for electrical connection with the registering terminals of a mounting block. The end of the band 6, secured to the part 5' of the fuse conductor will be disposed between the ends of sections 1 and 2, while the end of the band 7

fastened to the part 5" of the fuse conductor will lie between the ends of the mica strips 1 and 3.

With the exception of Figs. 6 and 7 the drawings show the bands 6 and 7 wrapped around the mica strips to form terminals 8 and 9. When the fuse blows any arc which is formed must pass through the hole 4 and the irregular path of the arc will be too difficult to be maintained and the arc will be almost instantly destroyed. It will be noted that there is a considerable kink in the fuse conductor at the point where it passes through the hole 4. The kink thus formed seems to cause a slight diminution in the cross-sectional area of the fuse conductor at this point, or it may be that the edges of the central mica strip produce slight depressions in the fuse conductor where it is drawn through the hole 4, these indentations causing a sufficient reduction in the conductivity of the fuse conductor to locate the initial rupture at or very near the middle of the length of the fuse conductor. Since, therefore, the arc is initially established at the hole 4, the arc-disrupting effect of the zigzag path will immediately come into play to preserve the terminals from destruction. If the indentations in the fuse conductor caused in the bending of the conductor through the hole are not sufficient to assure the initial rupture of the conductor which passes through the hole, the fuse conductor may be cut down to a slightly smaller size at this point. The gas or vapor generated upon the blowing of the fuse may readily escape through the ventilating passageways 10 and 11 between the inner and outer mica strips.

In Fig. 8 I have illustrated a more simple embodiment of my invention, in which there is a single mica strip having a hole through which the fuse conductor is passed, the ends of the fuse conductor being attached to terminals in a manner similar to that described in connection with the other figures. In a protecting device of this modified construction the arc will be as quickly and effectively destroyed as in the case of the device shown in the other figures, but I prefer to add one or two mica strips on either one or both sides of the inner strip in order to strengthen the device.

While I have illustrated and described certain arrangements coming within the scope of my invention, I do not wish to be limited to the precise constructions shown.

I claim as new and desire to secure by Letters Patent:—

1. In a circuit-protecting device, the combination with a supporting member having an opening therethrough, of a fuse conductor passing through said opening to lie partly on one side and partly on the other side of said supporting member, a strengthening member at each side of the supporting member, the

fuse conductor parts lying between the supporting member and the strengthening members, and terminal members connected with the ends of said fuse conductor, said terminal members serving to clamp the supporting and strengthening members together.

2. An electric protecting device, consisting of an inner supporting member, outer strengthening members, terminals wrapped about the ends of said supporting member and said strengthening members, and a fuse conductor passing between one strengthening member and the inner supporting member at one side thereof and passing between the other strengthening member and the inner supporting member at the other side thereof.

3. An electric protecting system, consisting of an inner supporting member of insulating material, a strengthening member at each side thereof, terminals wrapped about the ends of the supporting and strengthening members, a fuse conductor electrically connecting said terminals, said conductor passing through an opening in the inner member to lie partly between said inner member and one strengthening member and partly between said inner member and the other strengthening member.

4. An electric protecting device, consisting of an inner supporting member of insulating material, a strengthening member at each side of the inner supporting member, terminals securing said supporting and strengthening members together at the ends thereof, and a fuse conductor electrically connecting said terminals, said fuse conductor passing through an opening in the inner supporting member to lie partly between said inner member and the strengthening member at one side thereof and partly between the inner supporting member and the strengthening member at the other side thereof.

5. An electric protecting device, consisting of a body part of insulating material having an opening therethrough, a fuse conductor passing through said opening to lie partly on one side and partly on the other side of said body part, and terminals for said fuse wire in the form of metallic bands wrapped about the ends of the body part.

6. A fuse consisting of a supporting body part and having an opening therethrough, a fuse conductor passing through said opening to lie partly on one side and partly on the other side of said body part, strengthening members at each side of the body part, and terminals for the fuse conductor in the form of metallic bands wrapped about the ends of the body part and the strengthening members to hold the parts rigidly together.

7. In a device of the class described, the combination with three similar strips of insulating material, there being an opening through the center strip, of a fuse conductor

passing through said opening to lie at one side of the central strip at one end and on the other side of the central strip at the other end, and terminals connected with the fuse conductor and holding the three strips together, said fuse conductor serving also to hold the strips apart so as to afford ventilating passageways.

8. In a device of the class described, the combination with three similar strips of insulating material, the central strip being provided with an opening therethrough, of a fuse conductor passing through said opening to lie partly at one side of the central strip and partly at the other side thereof, and between said central strip and the associated strengthening strips at either side, and terminals for the fuse conductor in the form of metallic bands wrapped about the ends of the three strips to hold said strips securely together, said fuse conductor serving also to hold the strips apart to provide ventilating passageways leading from the fuse conductor to the outside.

9. In a circuit-protecting device, the combination with a supporting member having an opening therethrough, of a fuse conductor passing through said opening to lie partly on one side and partly on the other side of said supporting member, a strengthening member at each side of the supporting member, the fuse conductor parts lying between the supporting member and the strengthening members, and terminal members connected with the ends of said fuse conductor, said terminal members being wrapped about the ends of the supporting and strengthening members to thereby hold said members together.

10. In a device of the class described, the

combination with three similar pieces of insulating material, the central piece being provided with an opening therethrough, of a fuse wire passing through said opening to lie partly at one side of the central piece and partly at the other side thereof, and between said central piece of the associated strengthening pieces at either side, and terminals for the fuse wire in the form of copper bands wrapped about the ends of the three pieces to hold said pieces securely together, said fuse conductor serving also to hold the pieces apart to provide ventilating spaces leading from the fuse wire to the outside.

11. In a device of the class described, the combination with three similar pieces of insulating material, the central piece being provided with an opening therethrough substantially at its central portion, of a fuse wire passing through said opening to lie partly at one side of the central strip and partly at the other side thereof, and between said central fuse and the associated strengthening pieces at either side, and terminals for the fuse wire in the form of metallic bands having ends disposed between the supporting member and one of the strengthening members and then wrapped about the ends of the three pieces to hold said pieces securely together, said fuse wire serving also to hold the pieces apart to provide ventilating passageways leading from the fuse wire to the exterior.

In witness whereof, I hereunto subscribe my name this 16th day of December A. D., 1905.

FRANK B. HALL.

Witnesses:

HARVEY L. HANSON,
GEORGE E. HIGHAM.