No. 711,006. Patented Oct. 14, 1902.

F. SCHROEDER.

ELECTRIC FUSE FOR EXPLOSIVES.

(Application filed Jan. 15, 1902.)

(No Model.)

Fig. 1.

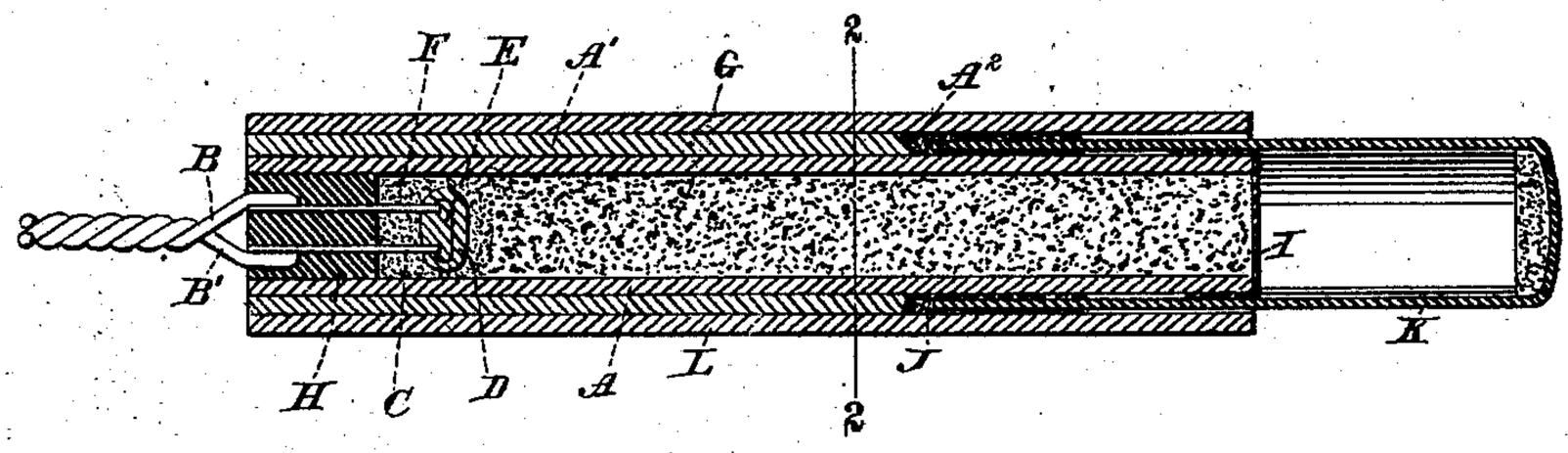


Fig. 2.

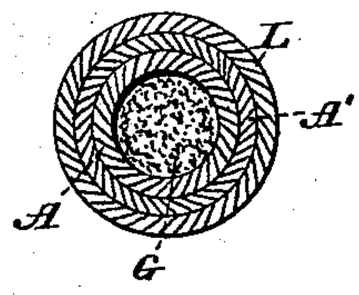


Fig. 3.

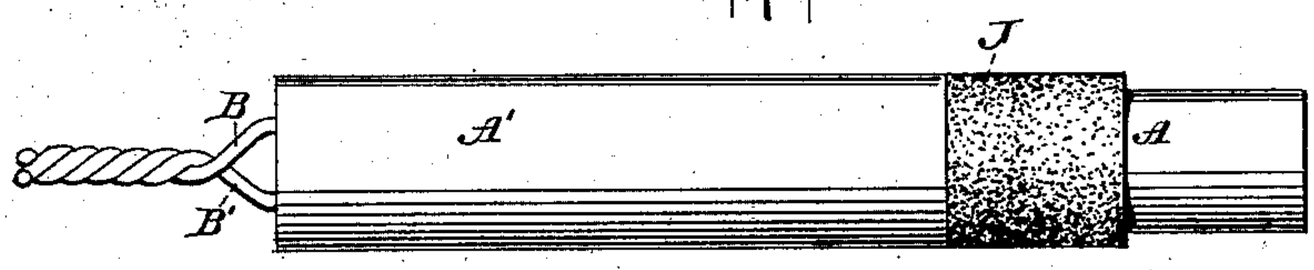
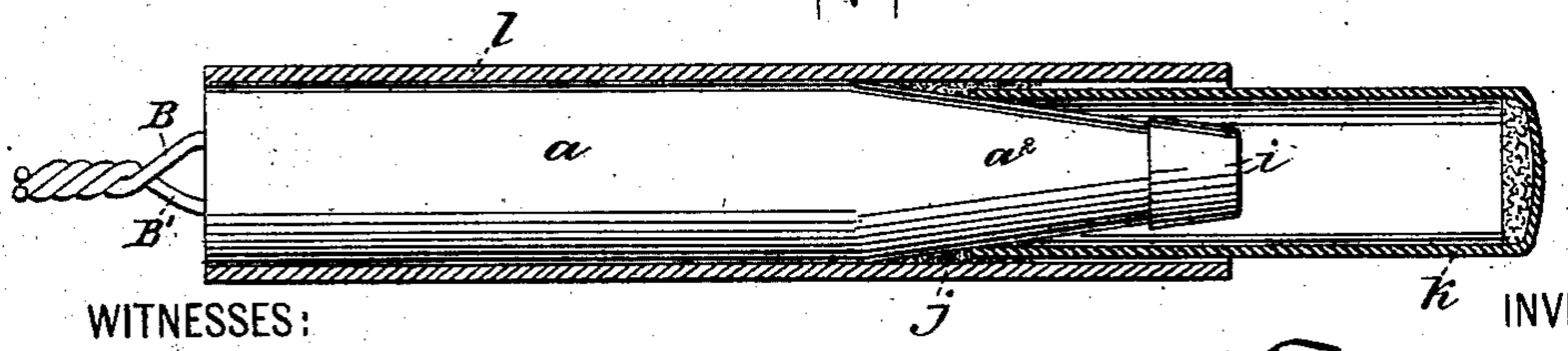


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK SCHROEDER, OF NEW YORK, N. Y.

ELECTRIC FUSE FOR EXPLOSIVES.

SPECIFICATION forming part of Letters Patent No. 711,006, dated October 14, 1902.

Application filed January 15, 1902. Serial No. 89,809. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK SCHROEDER, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Electric Fuse for Explosives, of which the following is a full, clear, and exact description.

My invention relates to electric fuses for explosives, and has for its object to provide a fuse-body so constructed that it may be used in connection with fulminate-caps of different sizes. Considerable difficulty is often experienced in practice in fitting such fulminate-caps for the reason that they are made of different sizes and do not always fit the fuses to which it is intended to apply them.

My invention consists in a novel construction and arrangement of parts by which I am enabled to secure a fulminate-cap in place on a fuse, whatever its size may be, within the limits of sizes in which such caps are furnished.

To better explain my invention, I will now proceed to describe it with reference to the accompanying drawings, which show two forms of my invention as examples, and in which—

Figure 1 is a longitudinal section of the first form of my invention. Fig. 2 is a cross-section thereof on the line 2 2 of Fig. 1. Fig. 3 is an elevation of the parts shown in Fig. 1 with the outside sleeve removed, and Fig. 4 is a longitudinal section of the second form of my invention.

As shown in Figs. 1, 2, and 3, I employ an inner tube A, which is surrounded for a portion of its length by a second tube A′, so that a shoulder A^2 is formed at a distance from the end of the tube A. It will be understood that the making of this part of my invention in two pieces is only for the sake of convenience in manufacture and that the two tubes A and A′ might consist of a single piece. The inner tube A contains any suitable igniting arrangement—such as, for instance, electric wires B B′, connected with plate C, which lead to the ignition-wire D. This wire is shown as embedded in a so-called "match-head" E, which is in contact with fine powder or guncotton F, while the remainder of the tube is filled with coarser powder G. The end at which the wires B B′ enter may be sealed—as, for instance, by a sulfur plug H. At the opposite end I provide any suitable means for preventing the powder G from falling out of the tube A, while allowing this powder when ignited to spread its blaze and explosion to the fulminate-cap. For this purpose I may employ a cover, I made of paper or other suitable material.

That portion of the tube A which is adjacent to the shoulder A^2, I coat with a suitable soft material, such as wax or paraffin, as shown at J. The tube A is made of such a diameter that even the smallest caps K currently made and sold will fit over it, while the outer diameter of the tube L is preferably made slightly smaller than that of the largest blasting-caps supplied for this purpose. Thus when an outer tube L is slipped over the tubes A and A′ an annular space will be formed forward of the shoulder A^2, which space will be of a sufficient width to receive the end of a blasting-cap of any of the ordinary sizes. When this cap is shoved in, its edge will engage and cut into the paraffin or other soft material J and will force this material either inward or outward, or in both directions, according to the size of the cap to be held firmly in place. Not only this, but to a certain extent and at least for a limited period of time the joint so formed at the edge of the cap will be practically water-tight, which is a great advantage when blasting in damp places.

While the outer tube L is of advantage as a protecting-case and also, in connection with large fulminate-caps, acts directly to hold them in place, I desire it to be understood that the use of this outer tube or case is not essential, as it will be obvious that the engagement of the blasting-cap with the paraffin or like material J will be sufficient to hold the cap in place even without the use of the tube L.

As shown in Fig. 4, the shoulder on the inner tube, which is adapted to form an abutment for the paraffin or the like and for the edge of the blasting-cap, is formed in one piece with the inner tube. This tube has a cylindrical portion a, in front of which is located a tapered portion or shoulder a^2, which

is an equivalent of the shoulder A^2 in the form of my invention first described. The filling of the tube a a^2 may be the same as described with reference to Figs. 1, 2, and 3, and a cover i of tissue-paper or the like may be employed for closing the reduced end of the tube. In this case the paraffin or like covering j is applied on the conical portion a^2, so that the cap k will engage the same and will force the paraffin firmly against the tapered portion a^2 and against the outer tube l.

I claim as my invention and desire to secure by Letters Patent—

1. The combination with a tube containing an igniting substance and provided with an external shoulder, of a coating of a soft material applied to said tube at the shoulder thereof.

2. The combination with a tube containing an igniting substance and provided with a shoulder, of an outer tube surrounding the first-named tube, and a soft material located between the tubes.

3. A tube for fuses, provided with an external shoulder and having an external coating of a soft material at its shoulder.

4. A tube for fuses, provided with a shoulder and with a coating of a soft material at said shoulder.

5. The combination with the inner tube containing an igniting substance and provided with an external shoulder, of an outer tube surrounding said inner tube, and a coating of a soft material applied to the inner tube at the shoulder thereof.

6. The combination of two tubes one fitting within the other, one of said tubes having a shoulder on the surface adjacent to the other tube, a soft material located between the tubes, and a suitable igniting substance or filling.

7. The combination of two tubes one fitting within the other, a soft material located between the tubes, and a suitable igniting substance or filling.

8. A tube for fuses, provided with a coating of a soft material for holding caps of different diameters.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK SCHROEDER.

Witnesses:

JOHN LOTTA,

OTTO V. SCHRENK.