

J. KRANNICHFELDT.
ELECTRIC IGNITER.
APPLICATION FILED JULY 15, 1908

981,432.

Patented Jan. 10, 1911.

Fig. 1.

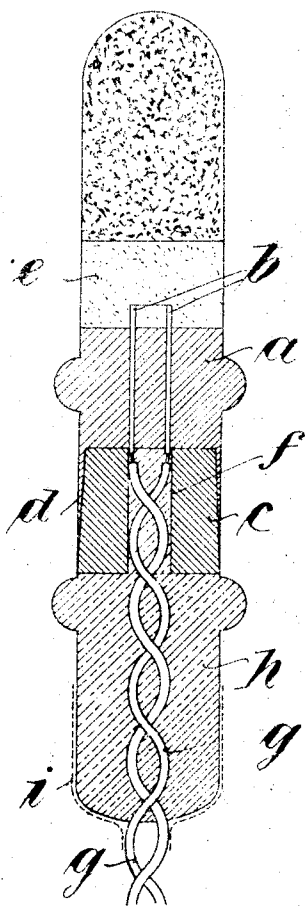


Fig. 2.

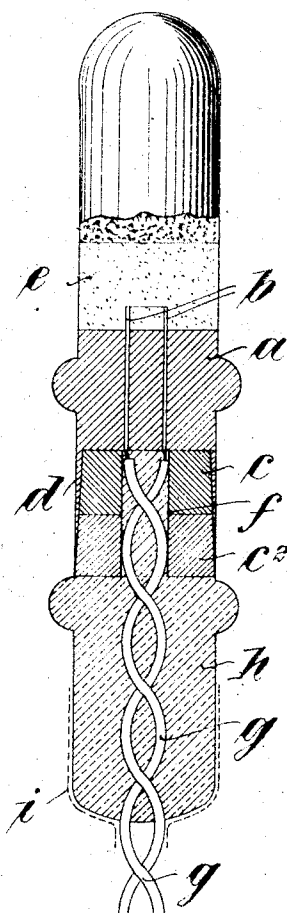
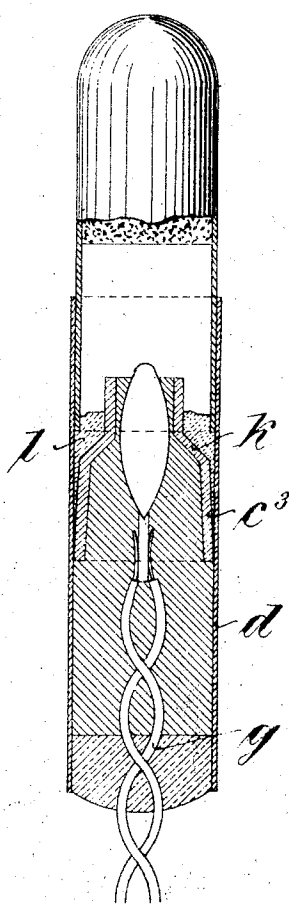


Fig. 3.



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JOHANN KRANNICHFELDT, OF COLOGNE, GERMANY.

ELECTRIC IGNITER.

981,432.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed July 15, 1903. Serial No. 443,315.

To all whom it may concern:

Be it known that I, JOHANN KRANNICHFELDT, a subject of the King of Prussia, residing at Cologne-on-the-Rhine, in the Kingdom of Prussia and German Empire, have invented new and useful Improvements in Electric Igniters, of which the following is a specification.

In making electric igniters or fuses for mining purposes, considerable difficulty is encountered in rendering the same sufficiently tight to bear a high water pressure. Even on taking the utmost care in tightening the igniters according to the methods heretofore adopted, fissures and cracks are easily formed, in the course of their manipulation, through which the water can enter sooner or later. In most cases the moisture penetrates between the cast filling of the igniter and the outer wall of the metal tube, and this capillary action is especially strong when there are small hollow spaces in the igniter, so that in such cases the moisture reaches the priming in a very short time.

The object of my present invention is to provide means to enable electric igniters and the explosive charge to be used under water at a considerable depth or pressure, without danger of the priming or charge being spoiled.

In the accompanying drawing my invention is illustrated by way of example. Figures 1 and 2 being longitudinal sections of two different constructions of the igniter in combination with the explosive charge, and Fig. 3, a cross section of a third construction.

Like letters refer to similar parts throughout the several views.

Behind the pole support *a* of wood or cast material, by which the poles *b* of the igniter are kept in position, a conical plug *c* of cork, felt, paper, wood, metal, or other suitable material is driven into the tube *d*, said plug thus tightly fitting and hermetically closing said tube at the side. According to the particular construction of, and purpose for which, the igniter is to be used, the plug *c* can be partially or entirely impregnated with some water-tight material. If desired,

the plug can be divided into two parts *c'*, *c''*, provided one behind the other (Fig. 2), one of which (*c'*) is impregnated, while the other (*c''*) only serves to absorb such moisture as may penetrate into the interior of the tube and thus to retard the passage of said moisture to the priming *e*. The plug has a hole *f*, through which the connecting wires *g* pass. Behind the plug *c* and projecting into the same there is a further body or coating *h* of some water-tight material, and the end of the tube is preferably closed by a lid *i*.

In the construction shown in Fig. 3, the conical plug *c'* is provided with a shoulder *k*, by which the water-tight and insulating packing material *l* previously rubbed against the interior of the tube is compressed, so that it fills out the space between the tube and plug. Said packing material is, further, pushed forward by the shoulder *k* so as to form a ring, which, on inserting the tube containing the explosive charge, tightly closes the end thereof.

The conical plug in this construction is not behind the pole support or igniter head but surrounds the same, the conducting wires being kept in position and the end of the sleeve being closed by a casting of sulfur and by a layer of any other water-tight material.

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

1. The combination with an electric igniter, of a tube adapted to contain said electric igniter, a conical water-tight plug tightly driven into said tube over said electric igniter, and a body of water-tight material behind said conical plug, substantially as, and for the purpose set forth.

2. The combination with an electric igniter, of a tube, a conical plug having a shoulder tightly driven into said tube, packing material pressed against the wall of said tube by said plug, and means to secure said igniter in said tube, substantially as, and for the purpose, set forth.

3. The combination with an electric igniter, of a tube, a conical plug having a shoulder driven into said tube, packing ma-

terial pressed against the wall of said tube
by said plug, a charge tube inserted into said
first tube and closed at the top by said pack-
ing material, and means to secure said ig-
5 niter in said tube, substantially as, and for
the purpose, set forth.

In testimony whereof I have signed my

name to this specification in the presence of
two subscribing witnesses.

JOHANN KRANNICHFELDT.

Witnesses:

LOUIS VANDORN,
JACOB BAUER.