

No. 722,913.

PATENTED MAR. 17, 1903.

N. SCHMITT & J. KRANNICHFELDT.
ELECTRIC IGNITION DEVICE.

APPLICATION FILED FEB. 25, 1902.

NO MODEL.

Fig. 1.

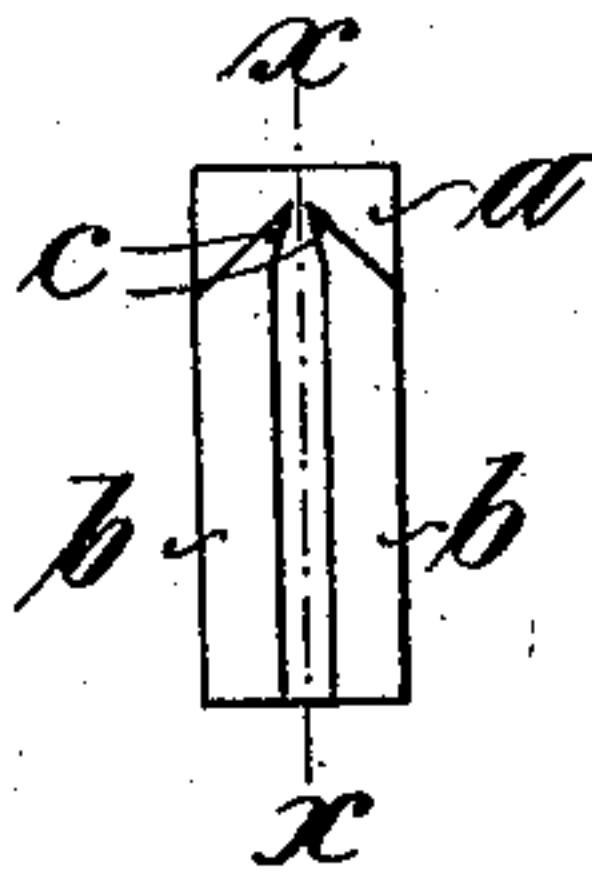


Fig. 2.

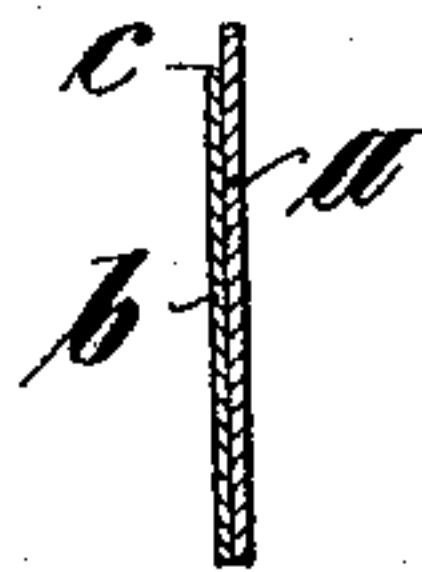


Fig. 3.

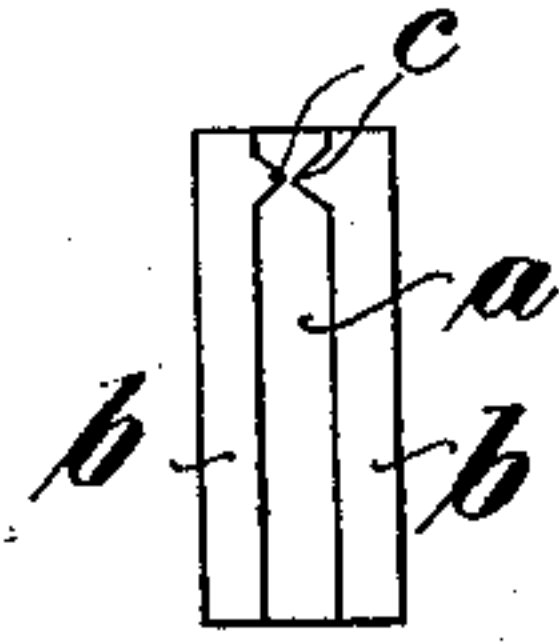


Fig. 4.

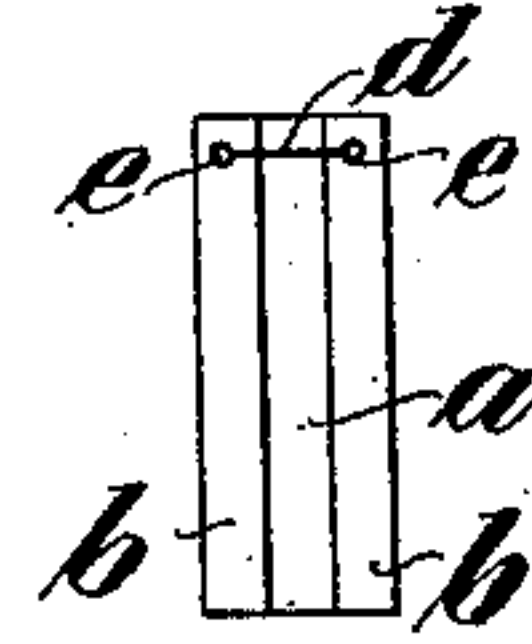


Fig. 5.

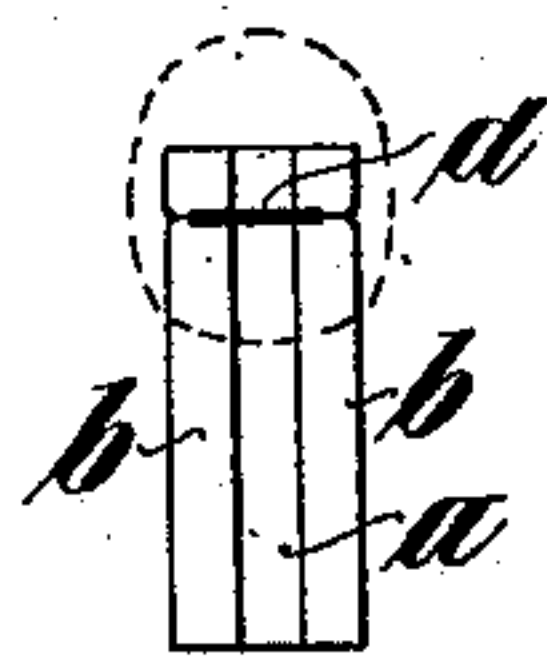


Fig. 6.

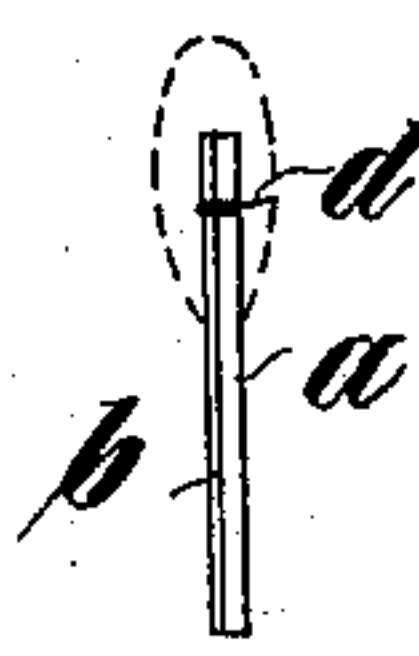


Fig. 8.

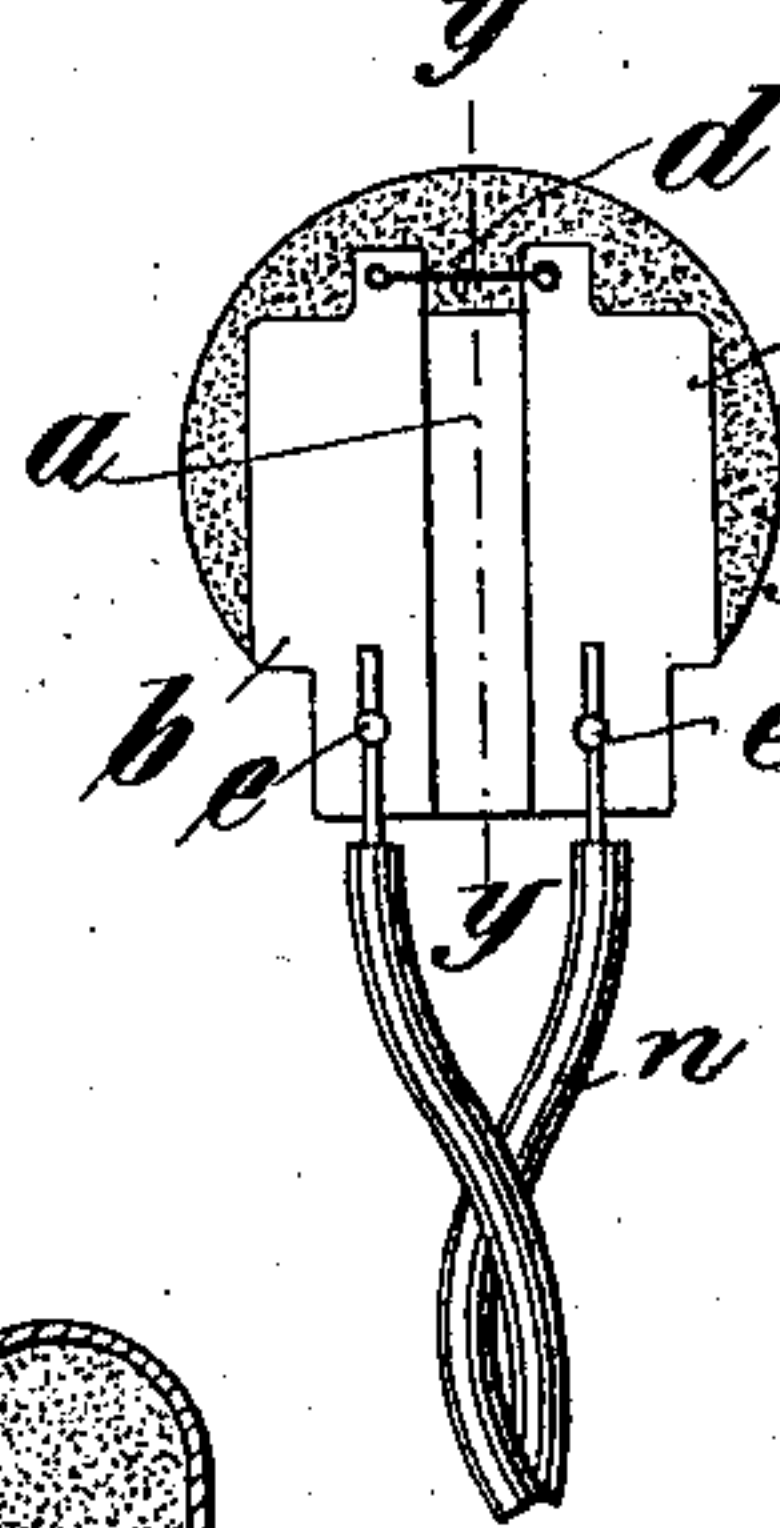


Fig. 9.

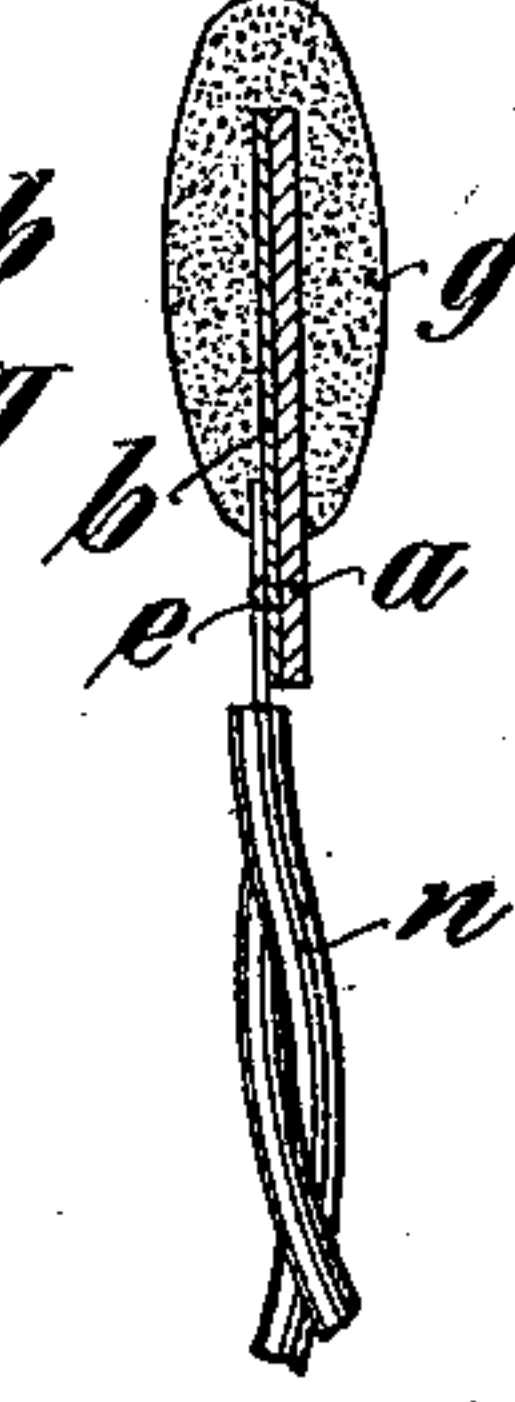


Fig. 7.

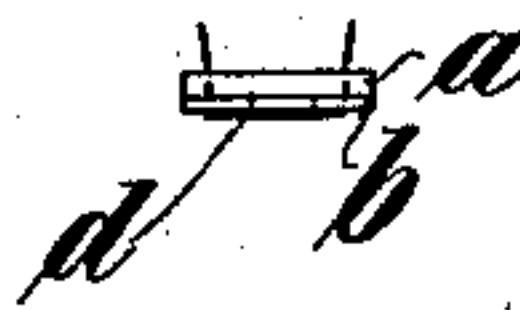


Fig. 11. Fig. 12 Fig. 13.

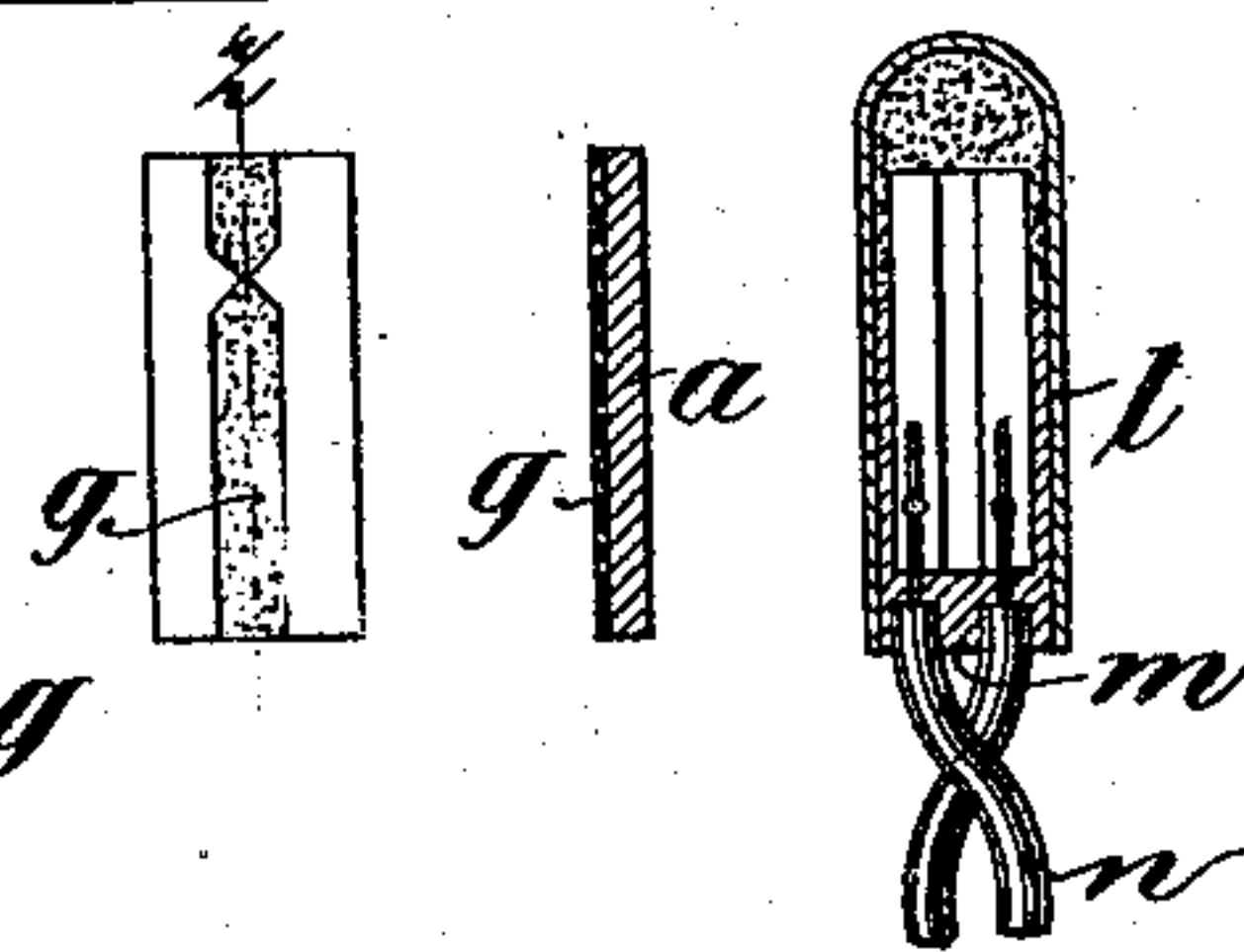


Fig. 10.

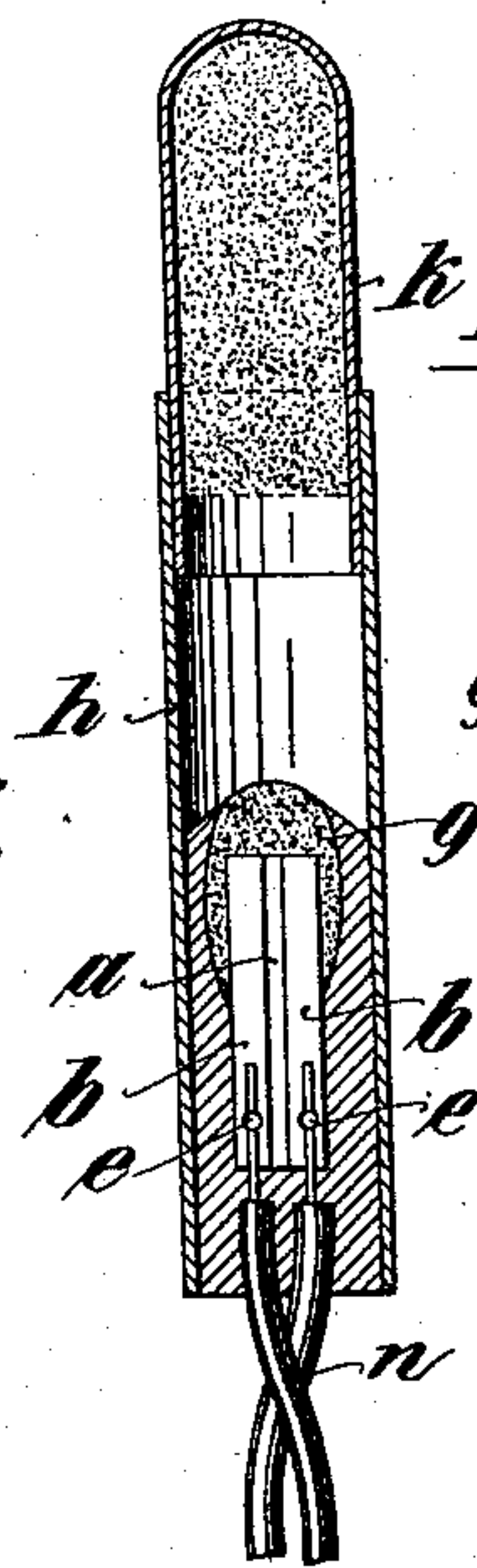
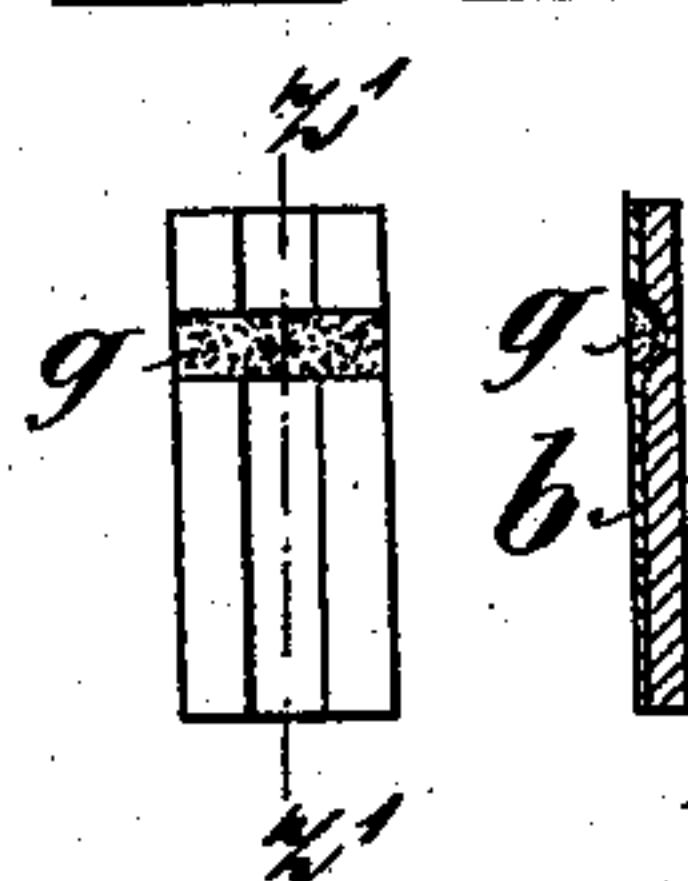


Fig. 14 Fig. 15.



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UNITED STATES PATENT OFFICE.

NIKOLAUS SCHMITT AND JOHANN KRANNICHFELDT, OF COLOGNE,
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ELECTRIC IGNITION DEVICE.

SPECIFICATION forming part of Letters Patent No. 722,913, dated March 17, 1903.

Application filed February 25, 1902. Serial No. 95,623. (No model.)

To all whom it may concern:

Be it known that we, NIKOLAUS SCHMITT, a subject of the King of Prussia, German Emperor, and JOHANN KRANNICHFELDT, a citizen of the Republic of Chile, both residents of Cologne-on-the-Rhine, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Electric Ignition Devices, of which the following is a specification.

The ignition device which forms the subject of this invention consists of a short, thin, flat, and flexible insulating-body, on one and the same surface of which two short, thin, flat, flexible, and electrically-conductive strips are attached at a slight distance apart. By this arrangement the position of the poles can be conveniently and absolutely fixed with regard to each other and fracture of the priming or ignition wire is avoided. For multiple simultaneous firing these fuses are of great value, as they can be constructed with absolute uniformity and there is no danger of the poles being displaced relatively to each other.

In the accompanying drawings, Figure 1 is a front elevation of a flat insulating part provided with two metallic strips. Fig. 2 is a section on the line xx of Fig. 1. Fig. 3 is a front elevation of a modified constructional form. Fig. 4 is a front elevation of a flat insulating part provided with two metallic strips and an incandescing wire connecting these latter. Fig. 5 is a front elevation of a modified constructional form. Fig. 6 is a corresponding side elevation. Fig. 7 is an upper plan view of the arrangement illustrated in Fig. 5, except that here the ends of the igniting-wires are not shown as twisted together. Fig. 8 is a front elevation, upon a larger scale, of a form of igniting device adapted for producing flash-lights for photographic purposes and the like. Fig. 9 is a section on the line yy of Fig. 8. Fig. 10 is a longitudinal section through a complete igniting device provided with an outer casing and a spring-cap, and Figs. 11 to 15 illustrate further constructional forms of igniting devices in accordance with this invention.

The same letters of reference are employed to indicate like parts.

In Figs. 1 and 2, a is a rectangular insulat-

ing part, which is provided upon one of its sides with two strips b of metal foil or paper, which are stuck, stitched, or otherwise suitably attached thereto. These strips b terminate in points c , which come opposite each other and are separated by a small space. These points serve as poles for the electric discharge.

The constructional form represented in Fig. 3 differs from that described above only owing to a comparatively unimportant modification of the form of the covering-strips b and of the position of the points c .

The arrangement shown in Fig. 4 serves for the production of an incandescing igniter. Upon a flat insulating part a are arranged two covering-strips b , running parallel one with the other, and these strips are connected by means of a fine incandescing wire d . This wire is attached to the strips b by means of beads of solder e .

Figs. 5, 6, and 7 illustrate the manner of manufacturing an incandescing igniting device in which the incandescing wire is not soldered to the strips b . In this form of the device after providing the flat insulating part with the strips b the wire d is wound around the insulating part, fitting in two opposite notches or recesses in the same, as shown in Fig. 5. The extremities of the wire d are then twisted together as tightly as possible, (see Fig. 6,) so as to draw them closely against the metallic strips. Of course the incandescing wire may be so arranged that it passes through two small holes formed in the insulating part a and the strips b somewhat in the position in which the beads of solder e are shown in Fig. 4, the extremities being then twisted together.

When the insulating part has been provided with the strips in one or other of these manners and the incandescing wire attached, (when this is desired,) the igniting device is completed by immersion in a pasty inflammable mass. Instead of this pasty inflammable mass g a pulverulent inflammable mass may be employed. This is introduced into a small cap l , Fig. 13, into which the insulating part carrying the conducting-strips is inserted. This cover or cap is then closed by means of a plug of wax stearine or the like

or by means of a cast block of sulfur or in any other suitable manner. Instead of arranging the inflammable mass around one end of the insulating part *a* it may be spread in
 5 grooves formed in the said part. Fig. 11 shows a longitudinal groove of this kind between the strips *b*. Fig. 12 is a section on the line *z z* of Fig. 11. Fig. 15 is a section on line *z' z'* of Fig. 14. In these two figures
 10 is shown an insulating part *a*, having a transverse groove formed therein after the application of the strips *b*. The inflammable mass is introduced into this groove.

In Figs. 8 and 9 is shown a modified form
 15 of igniting device and provided with a considerable quantity of inflammable material *g*. This contains magnesium powder or other material adapted for producing a flash-light
 20 suitable for photographic purposes, for visible signals on railways, or for the use of troops in the field. Such igniting devices are preferably provided with conducting-wires *n*.

In Fig. 10 a complete igniting device is illustrated, in which the fuse is inserted in
 25 one end of a tube or casing *h*, and the charge is held in a spring-cap placed in the opposite end of said tube or casing or tube *h*, the cap being open at the end above the fuse.

What we claim, and desire to secure by
 30 Letters Patent of the United States, is—

1. An electric ignition device comprising in combination a short, thin, flat and flexible strip of non-conductive material; short, thin, flat and flexible strips of conductive material
 35 disposed at a short distance apart on one and the same surface of, and carried by, said non-conductive strip; a mass of combustible material provided between, and in contact with, said two conductive strips; and means to assist the passage of the electricity from one
 40 conductive strip to the other through said combustible mass; substantially as set forth.

2. An electric ignition device, comprising in combination a comparatively short, thin
 45 flat and flexible strip of non-conductive material having a depression therein; comparatively short, thin, flat and flexible strips of conductive material disposed on one and the same surface of, and on opposite sides of the
 50 depression in, said non-conductive strip; a mass of combustible material provided between said two conductive strips; and means to assist the passage of the electricity from one conductive strip to the other through
 55 said combustible mass; substantially as set forth.

3. The combination in an electric ignition device of a comparatively short, thin, flat and flexible strip of non-conductive material; comparatively short, thin, flat and flexible strips
 60 of conductive material disposed at a slight

distance apart on one and the same surface of said non-conductive strip; and a mass of combustible material provided between said two conductive strips; substantially as set
 65 forth.

4. An electric ignition device comprising in combination a short, thin, flat and flexible strip of non-conductive material; short, thin, flat and flexible strips of conductive material
 70 disposed apart on one and the same surface of said non-conductive strip; a priming mass connecting said conductive strips; means to assist the passage of electricity from one conductive strip to the other through said com-
 75 bustible mass; a sheath surrounding said strips of conductive and non-conductive materials and said priming mass; a protecting and supporting cast mass inside said sheath and surrounding said conductive and non-
 80 conductive strips and leaving the extreme head of said priming mass free; and a detonating composition placed in said sheath adjacent to the exposed head of said priming mass; substantially as set forth.
 85

5. An electric ignition device comprising in combination a short, thin, flat and flexible strip of non-conducting material; short, thin, flat and flexible strips of conductive material
 90 disposed apart on one and the same surface of said non-conductive strip; a priming mass connecting said conductive strips; means to assist the passage of electricity from one conductive strip to the other through said com-
 95 bustible mass; a sheath surrounding said strips of conductive and non-conductive strips and said priming mass; and a protecting and supporting cast mass inside said sheath and surrounding said conductive and non-conductive strips and leaving the ex-
 100 treme head of said priming mass free; substantially as set forth.

6. An electric ignition device comprising in combination a short, thin, flat and flexible strip of non-conductive material; short, thin, flat and flexible strips of conductive material
 105 disposed at a slight distance apart on one and the same surface of said non-conductive strip; a mass of combustible material connecting said two conductive strips; means to assist the passage of electricity from one con-
 110 ductive strip to the other; and means to connect said conductive strips with a source of electricity, substantially as set forth.

In testimony whereof we have signed our
 115 names to this specification in the presence of two subscribing witnesses.

NIKOLAUS SCHMITT.

JOHANN KRANNICHFELDT.

Witnesses:

CHARLES LESIMPLE,

CARL SCHMITT.