

T. P. Shaffner. Electric Fuse.

N^o 60,569.

Patented Dec. 18, 1866.

Fig: 1.



Fig: 2

B

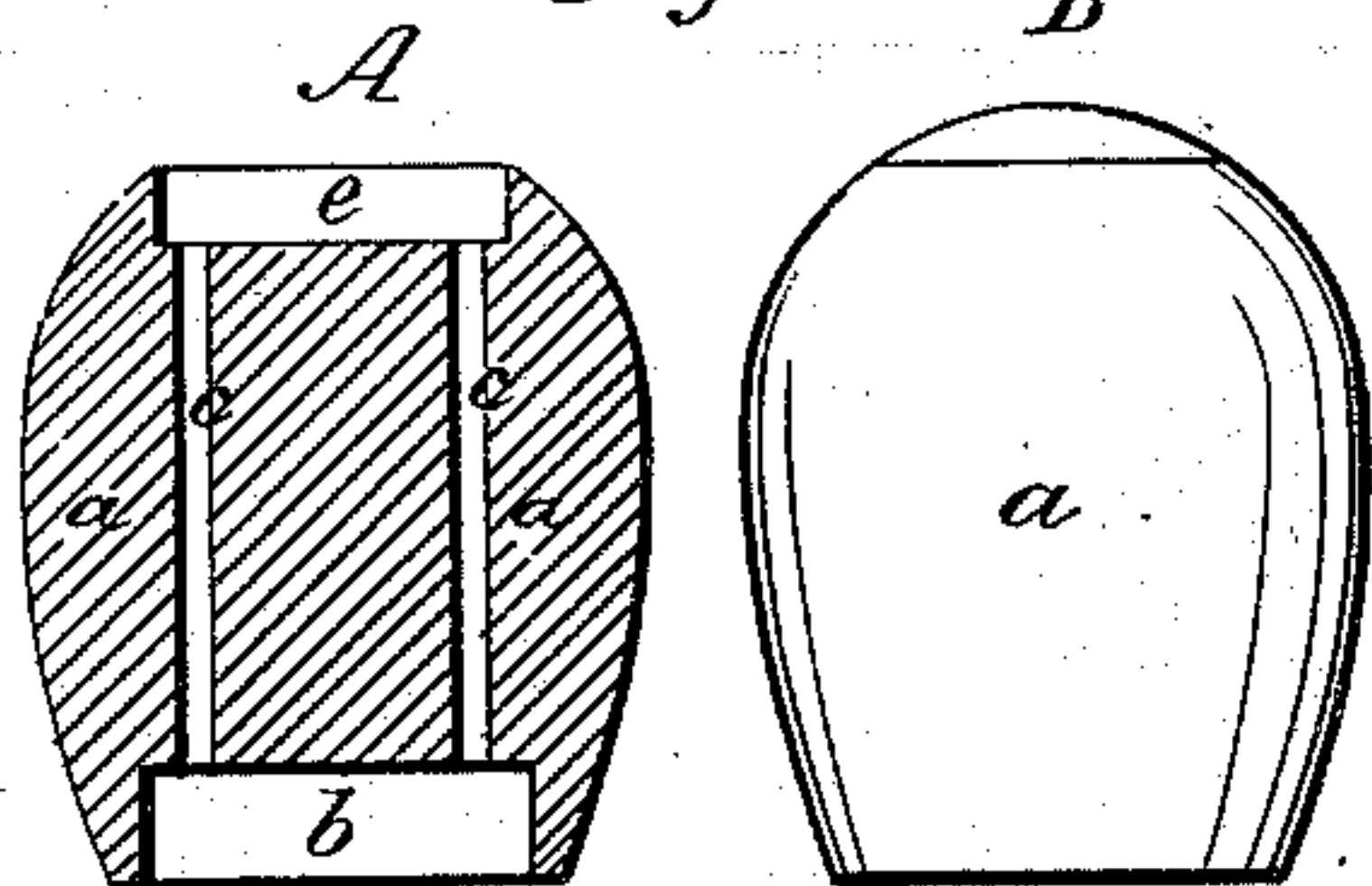


Fig: 4.

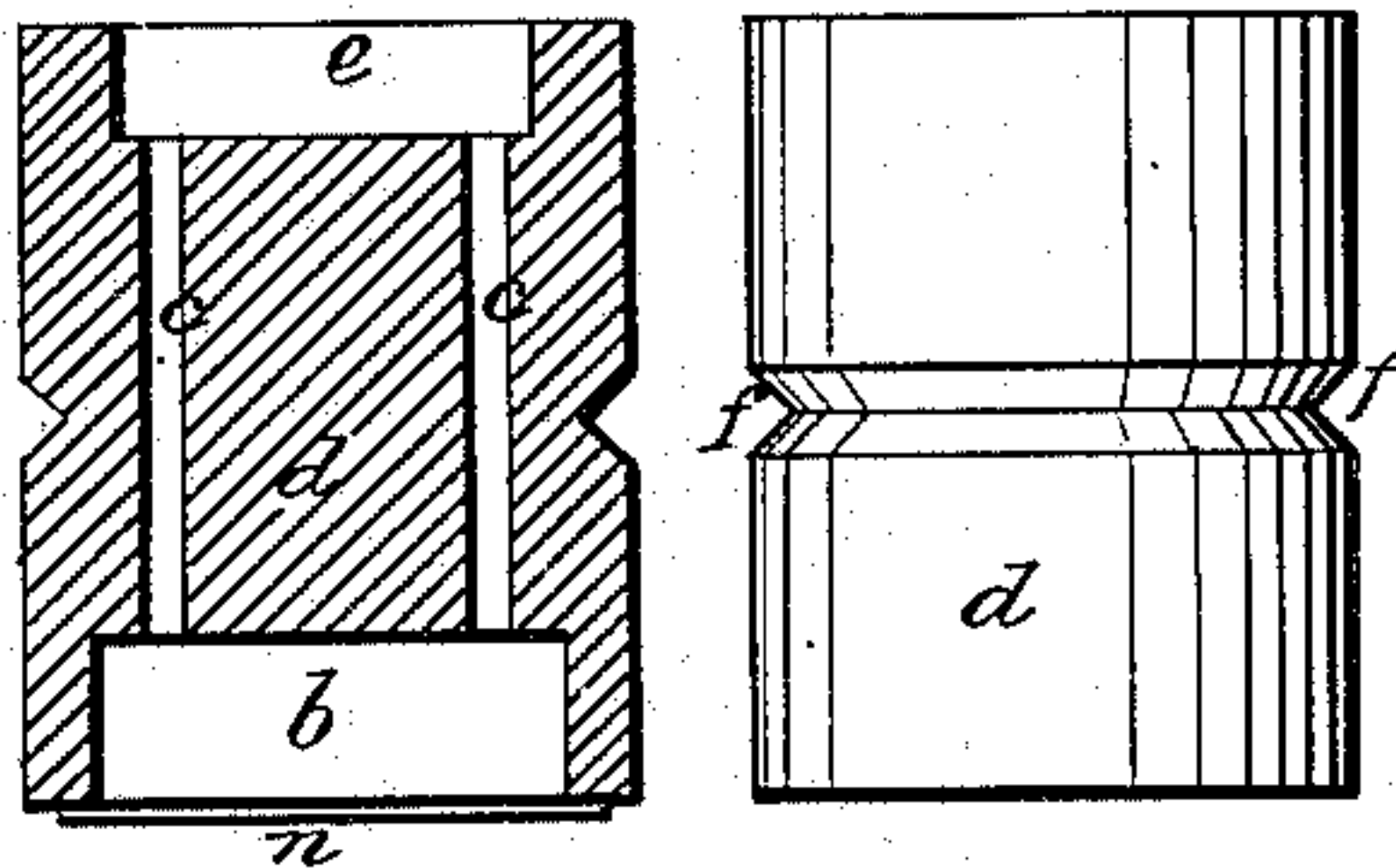


Fig: 3.

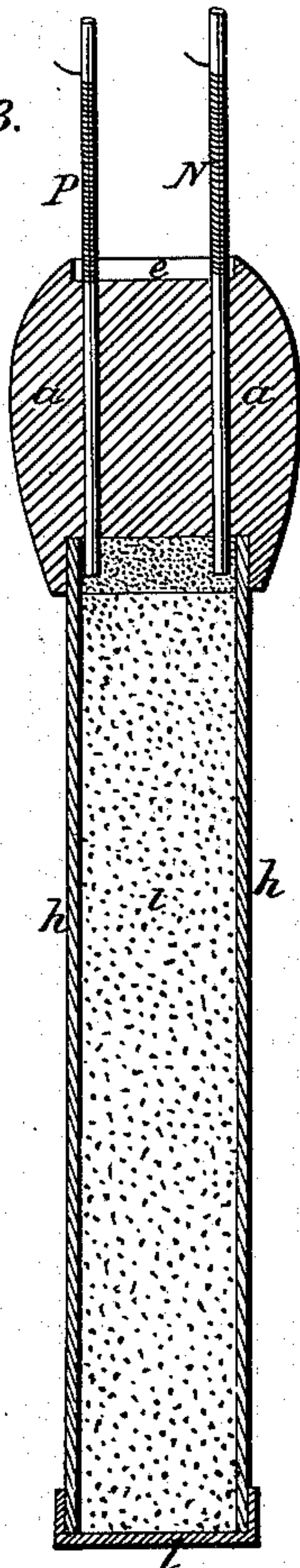


Fig: 6.

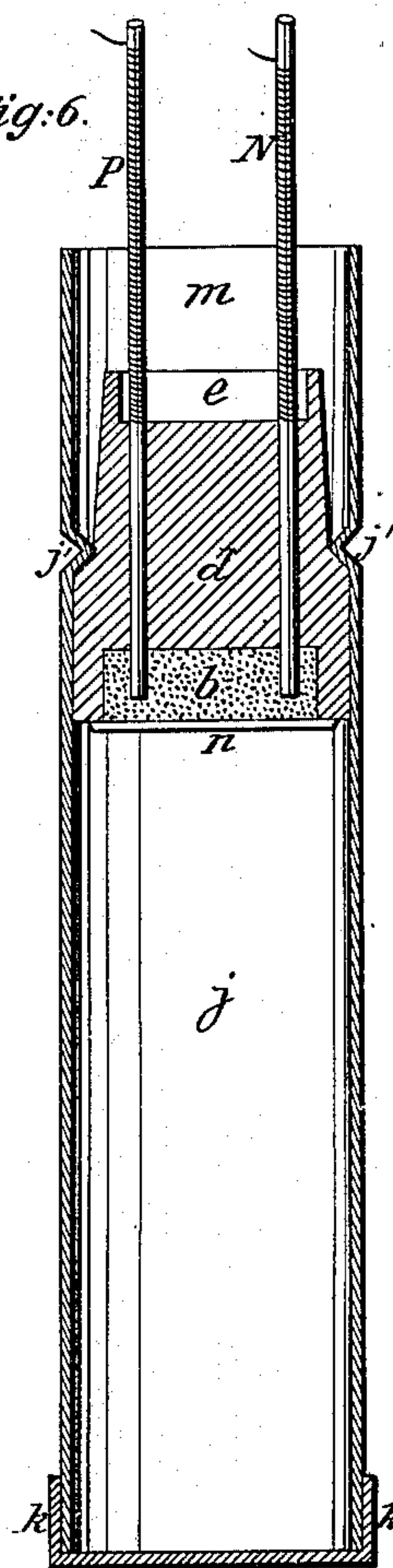
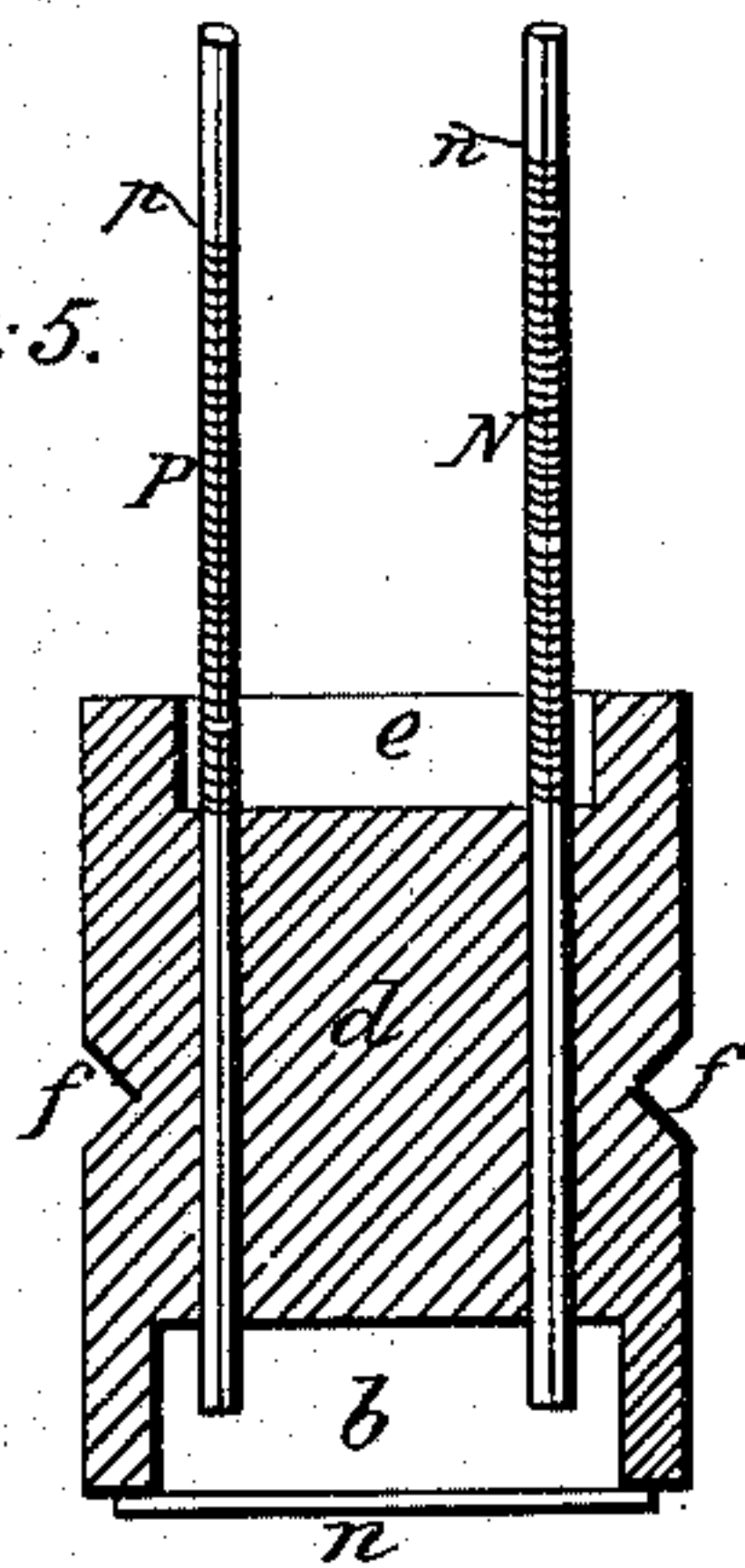


Fig: 5.



Witnesses

Edward H. Knight
Alex. A. C. Klaucke.

Inventor.

T. P. Shaffner.

UNITED STATES PATENT OFFICE.

TALIAFERRO P. SHAFFNER, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN ELECTRIC FUSES.

Specification forming part of Letters Patent No. 60,569, dated December 18, 1866.

To all whom it may concern:

Be it known that I, TALIAFERRO P. SHAFFNER, of Louisville, in the county of Jefferson and State of Kentucky, have made new and useful Improvements in Fuses; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a view of one of the wires, partially insulated, and with the ends laid bare; Fig. 2, A is a sectional view, and B an elevation of the head of a primer-fuse for ordnance, which is shown complete in Fig. 3; Fig. 4, A is a sectional view, and B an elevation of a head of an artillery, mine, or torpedo fuse, which is shown at Fig. 5 with the battery-wires attached, and at Fig. 6 *in situ*, in the cylindrical chamber which contains the charge.

My invention consists in the method of connecting and attaching the battery-wires to the head of the fuse, and also in the construction of the said head, whereby a protected recess is provided for the fuse composition, and a recess for the non-conducting cement, which surrounds the wires at their point of entrance into the head of the fuse. It also consists in the construction of the charge-chamber.

The form shown in Figs. 1, 2, 3 is intended for a primer-fuse, and the form shown in Figs. 4, 5, 6 for a torpedo or magazine fuse. It consists of a perforated head of non-conducting material, through which the positive and negative wires of the battery are passed, and through which they project into a composition-chamber, where the electric current, passing between the terminals of the wires, through an inferior conducting but igniting substance or composition, explodes the same.

I will first describe the primer-fuse shown in Figs. 1, 2, 3: *a* is a block of wood, with a recess, *b*, and two perforations, *c c*, Fig. 1, through which pass the positive and negative wires *P N*, which are to be attached to those which proceed from the battery. These wires are wrapped for a portion of their length, Fig. 1, but are naked at the portion embraced in the head *a*; they project a short

distance into the chamber *b*, which has in it a composition which is a comparatively poor conductor, but is readily ignited by a passing electrical current as it passes between the terminals of the wires. This fuse composition is contained in the chamber *b*, a bladder, *n*, Figs. 5 and 6, being fastened over the opening to prevent the access of moisture; or a quill, *h*, with a cap, *l*, is so inserted into the chamber *b* as to be retained therein, and contain the fuse composition *i*. The wall of the chamber *b* is coated with black lead or varnish, to resist moisture. The chamber *e*, at the other end of the head *a*, contains a non-conducting cement, which serves to retain the wires in their proper position relatively to each other and to the head *a*. As will be observed, the wires project only a short distance into the chamber *b*, and it is an object to maintain their exact adjustment, which is attained by gluing or cementing them fast in the chamber *e*.

In everything but its exterior form, the head shown detached in Fig. 4, in its relation to the wires in Fig. 5, and *in situ* in Fig. 6, is similar to that just described, in so far as its orifices *c c* are similar, and its chambers *b* and *e*; but it has a cylindrical form, Fig. 4, or, perhaps, preferably, a form composed of two cylinders of varying sizes, Fig. 6, with a depression or waist, *f*, by which it may be tied in the neck of a bag or cartridge, or by which enlargement it may be retained in a cylinder, *j*, by means of a rib, *j'*, as shown in Fig. 6. The cylinder in the latter figure has a main charge-chamber, *j*, and a cap, *k*, which is blown off by the explosion, throwing a jet of flame into the magazine or torpedo, or whatever charge it may be attached to. This has a superior effect to fuses which scatter fire indifferently in all directions, as the flame by direction becomes more concentrated, and ignition is more effective. The quill *h* in Fig. 3 acts in a similar manner, the cap *l* being blown off by the explosion, and the flame directed into the charge in the piece of ordnance. In the form shown in Fig. 6 the portion *m* of the cylinder may contain the non-conducting cement which holds the wires in their places, and the chamber *e* may be discontinued. The cylinder *j* may be taken to represent a cartridge, which is choked upon the neck *f* of the

head *d* by a tie which passes around the cylinder *j'*.

Having described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The fuse-head *a* or *d*, with its chambers *b* *e*, one or both, as and for the purpose or purposes described.

2. The indented or flanged cylinder *j j'*, with its cap *k* and head *d*, for the direction of the flame of the fuse, as described.

3. I claim the mode of attaching the wires to the fuse-head, by means of a non-conducting

cement inserted into a chamber in said head, or in the cylinder in immediate connection therewith, as described.

4. I claim the protecting water-proof membrane or cover *n*, for closing the mouth of the composition-chamber *b*.

5. I claim the water-proof lining to the composition-chamber *b*, to prevent access of moisture to the said composition.

TAL. P. SHAFFNER.

Witnesses:

EDWARD H. KNIGHT,
ALEX' R. A. C. KLAUCKE.