(No Model.)

J. J. DETWILLER.

FIRE WORK.

No. 377,730. Patented Feb. 7, 1888.

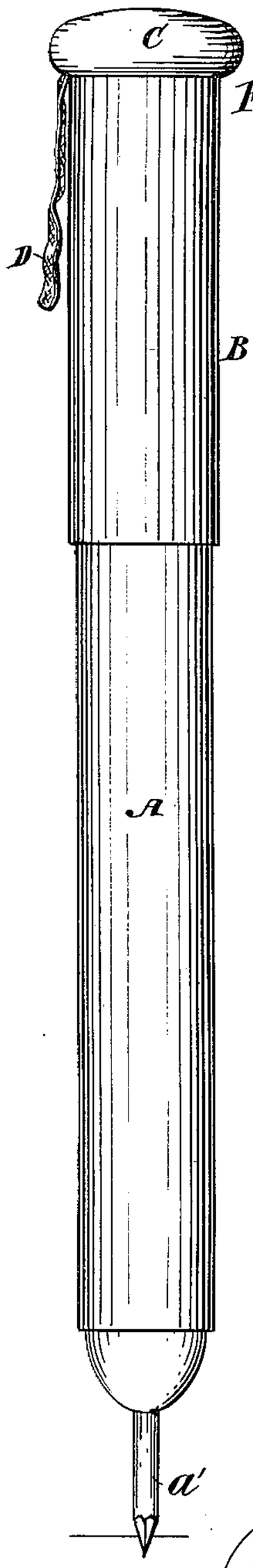


Fig. 1.

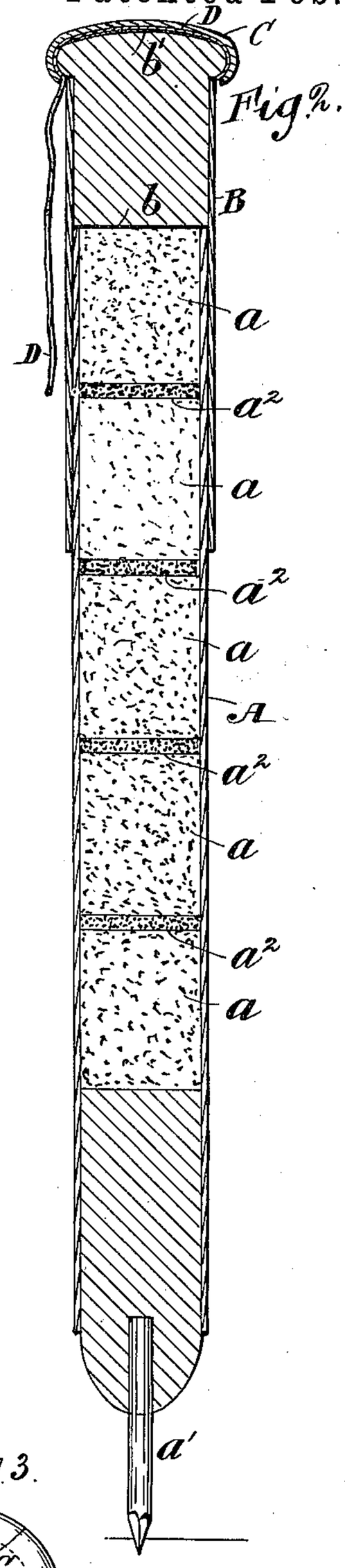
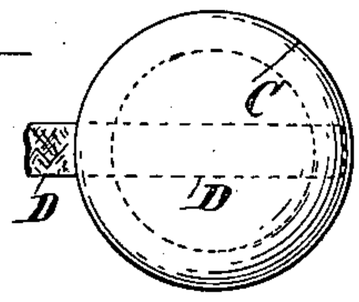


Fig. 2.

Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

JACOB J. DETWILLER, OF JERSEY CITY, NEW JERSEY.

FIRE-WORK.

SPECIFICATION forming part of Letters Patent No. 377,730, dated February 7, 1888.

Application filed April 18, 1887. Serial No. 235,203. (No model.)

To all whom it may concern:

Be it known that I, JACOB J. DETWILLER, of Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Fire-Works, of which the following is a specification.

The improvement relates particularly to fire-works used for signaling.

The improvement consists in the combination, with a signal, of igniting material applied to the end portion thereof which is to be lighted, and a part or appurtenance provided with complementary material which, when rubbed against the igniting material upon the end of the fire-work, will serve to light the same. The igniting material upon the end of the fire-work is intended to be similar to that used upon safety-matches. It will preferably be protected from dampness or water by the cover, and in such case the complementary material may advantageously be applied to the exterior of the cover. It cannot ignite when rubbed against any material other than the complementary material, nor can it ignite by percussion; hence the fire-work will be perfectly safe to carry. If a cover is used and coated with complementary material, as described, the cover will be removed whenever the fire-work is to be ignited, and that portion which has applied to it the complementary material will be rubbed against said igniting material, whereupon the fire-work may be easily ignited. The complementary material, when applied to the exterior surface of the cover, will be protected, preferably, by a cap of rubber or like material, which may be slipped over it, and this will constitute a feature of my improvement.

In the accompanying drawings, Figure 1 is a side view of a signal embodying my improvement. Fig. 2 represents a central vertical section of a fire-work and cover embodying my improvement. Fig. 3 is an end view thereof.

Similar letters of reference designate corresponding parts in all the figures.

A designates the case or shell of the fire-work. It may be made of a thin tube of paper, wood, or metal. As this fire-work is specially intended for use as a signal, the tube A is intended to contain a composition which will produce a slow-burning colored fire. At intervals this composition will, however, preferably be divided up into sections *a*. These sections may be advantageously made of about an inch in length. Between these sections there will be a small charge of gunpowder or quick-burning composition, a^2, which, after the combustion of each section of slow-burning composition, will operate quickly to throw off the accumulated scoria.

The signal at one end is provided, as here shown, with a spike, a', whereby it may be fastened in an upright position to any desirable support—as, for instance, a railroad-tie—behind a train as a signal to an approaching train.

The upper end of the signal will be coated with an igniting material, *b*, which preferably will be of the same character as the material applied to those friction-matches which can only be ignited by striking them upon a specially-prepared surface which is usually applied to the containing-box. The complementary material b' in the present example of my invention is applied to the exterior of the closed end of a cover, B, which is intended to be slipped upon that end of the signal to which the said igniting material is applied. The cover will protect the igniting material from dampness and water. As the complementary material is on the exterior of the cover, there is no danger of its coming in contact with the igniting material of the signal. To ignite the signal, the cover will be removed and that end or portion which has the complementary material applied to it, and will be rubbed across the igniting material, whereupon the signal may be easily ignited. The cover will be made of a thin tube of paper. Its closed end may consist of a plug of wood fitted into it. This end will preferably have fitted to it a rubber cap, C. This rubber cap will protect the complementary material from moisture or water. It will adhere to the cover. I preferably provide the cover with a strip of tape or like material, D, fastened to it by one end and adapted to pass across the closed end of the cover before the cap C is applied thereto. By pulling the free end of this strip the cap C may be easily and quickly removed.

I do not wish to be restricted to the applica-

tion of the said complementary material to the cover, as I may apply it to some other part or appurtenance of the fire-work.

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

1. The combination, with a case or shell, of composition for producing an illuminated signal contained therein, and provided at one end with igniting material capable of ignition only when brought into contact with a certain complementary igniting material, and a cover having said complementary material applied to its exterior surface, substantially as specified.

2. The combination, with a case or shell, of composition for producing an illuminated signal contained therein, and provided at one end with igniting material capable of ignition only when brought into contact with a certain complementary material, and a cover consisting of a tube closed at one end by a plug of wood, whose exterior surface has said complementary igniting material applied to it, substantially as specified.

3. The combination, with a case or shell, of composition for producing an illuminated signal contained therein, and provided at one end with igniting material capable of ignition only when brought into contact with a certain complementary igniting material, a cover having said complementary igniting material applied to its exterior surface, a cap adapted to fit over the portion of the cover which has this material applied to it, and a strip of tape or like material, whereby such cap may be easily and quickly removed, substantially as specified.

JACOB J. DETWILLER.

Witnesses:

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