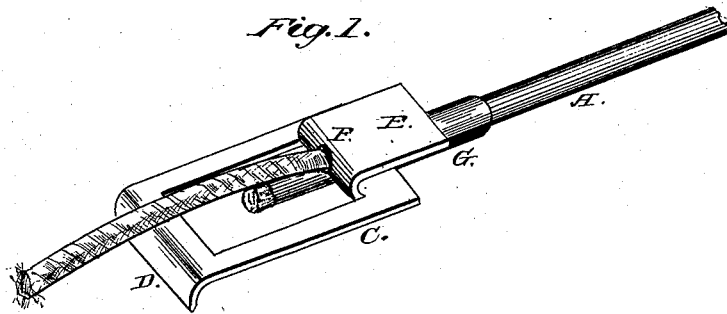


J. R. POWELL.  
Blasting-Fuse.

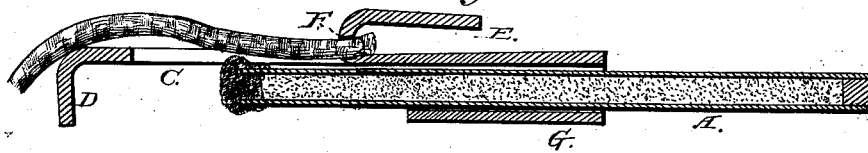
No. 215,395.

Patented May 13, 1879.

*Fig. 1.*



*Fig. 2.*



Witnesses:  
*Ad. G. Dietrich*  
*J. R. Littell,*

Inventor:  
*John R. Powell,*  
By *C. A. Snow & Co.*  
Atty's.

# UNITED STATES PATENT OFFICE

JOHN R. POWELL, OF PLYMOUTH, PENNSYLVANIA.

## IMPROVEMENT IN BLASTING-FUSES.

Specification forming part of Letters Patent No. **215,395**, dated May 13, 1879; application filed April 3, 1879.

*To all whom it may concern:*

Be it known that I, JOHN R. POWELL, of Plymouth, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Miners' Safety-Squibs for Blasting Purposes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a perspective view, and Fig. 2 is a longitudinal sectional view.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to safety-squibs for miners; and it consists in certain improvements in the same, which will be hereinafter fully described, and particularly pointed out in the claims.

Miners' squibs, as usually constructed, are tubes of straw or paper filled with gunpowder, sealed, and provided at one end with a match or fuse. These squibs are adjusted in the drill-holes (in which the charge has been previously placed) and ignited for the purpose of exploding the charge. In vertical or nearly vertical drill-holes squibs of a more complicated and elaborate construction—consisting of two tubes, one within another, the outer one serving as a fastening-tube—have been employed, in order to suitably secure the squib in the drill-hole; and to obviate the necessity of such complicated squibs, and the danger resulting from the frequent premature explosions of squibs now in use, is the object of my present invention.

As already stated, squibs, as usually constructed, have the fuse or match attached to one end thereof. Now, a principal feature of my invention consists in making the match separate and independent of the squib, and so disposing of it that the latter shall be ignited upon the side instead of at the end.

To this end I construct the squibs A of tubes of straw or paper, or other combustible material, sealed at one end with a mixture of Burgundy

pitch and shellac, filled with fine gunpowder, and having the other end sealed with a paste made of plaster-of-paris, wheat flour, and water. The match is made of cotton wick, or other suitable material, drawn through melted rosin or Burgundy pitch, and cut into suitable length. The match made in this manner is essential to the success of my invention, it being of the highest importance that it should burn slowly and steadily with a bright flame in order to ignite the material of which the tube is made.

To connect the squib with the match, and adjust both properly in the drill-hole, I employ the holder represented at C. This consists of a suitably-sized piece of tin or other sheet metal, the rear end of which is bent down to form a shield, D. In the body thereof a tongue, E, is stamped out, perforated at F, and bent forward to form what I term the "match-holder," and in the sides of the blank two incisions are made, forming flaps, which are coiled so as to form a tubular guide, G. This completes the device.

In operation, the squib is fitted loosely in the tubular guide G, and the match is adjusted in the perforation of the holder, the latter being pressed down so as to hold it securely. The device is then adjusted in the drill-hole, which has been previously charged, in the usual manner.

In order to prevent the match from burning too rapidly, it may be turned to a horizontal position, which it readily retains, owing to the nature of the material with which it is prepared.

When ignited it burns slowly and steadily. The down-turned shield D prevents the end of the squib from taking fire, and the explosion does not occur until the side of the squib is ignited through the opening from which the tongue or match-holder has been cut.

This invention is eminently safe and simple, as will be readily appreciated by all skilled in the art to which it appertains.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. A miner's squib-holder consisting of a metallic blank formed with a down-turned

shield, a perforated tongue or holder cut from the body of said blank, and a tubular guide, as set forth.

2. The combination, with a holder constructed as described, of a sealed squib and a loose or independent match, as set forth.

In testimony that I claim the foregoing im-

provement I have hereunto set my hand this 26th day of March, 1879.

JOHN R. POWELL.

Witnesses:

R. B. EDWARD,

VAUGHN RICHARDS.