

S. H. DADDOW.

Blasting-Fuses.

No. 134,128.

Patented Dec. 24, 1872.

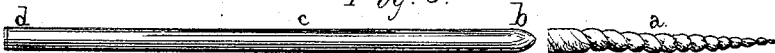
Fig. 1



Fig. 2



Fig. 3



WITNESSES.

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SAMUEL H. DADDOW, OF SAINT CLAIR, PENNSYLVANIA.

IMPROVEMENT IN BLASTING-FUSES.

Specification forming part of Letters Patent No. 134,128, dated December 24, 1872.

To all whom it may concern:

Be it known that I, SAMUEL HARRIES DADDOW, of Saint Clair, county of Schuylkill, and State of Pennsylvania, have invented certain new and useful Improvements in Fuses, of which the following is a specification:

My invention relates to the construction of a rocket fire-proof and water-proof safety-squib to be used in blasting; and consists of a small tube, contracted at one end, filled with powder and provided with a match. The opposite end is provided with a quick, strong powder or a fulminate, and is securely sealed. The tube is coated with a fire-proof paint or varnish to render it incombustible, and the match made with a water-proof substance the inflammability of which is not injured by water or moisture, as will hereafter be more fully set forth and described.

The accompanying drawing represents the squib both sectional and complete.

Figure 1 is the complete squib. Fig. 2 is a sectional view. Fig. 3 shows the match and tube separate to give a better view of the choke or contraction at the vent.

a is the match; *b* is the choke; *c*, the tube; and *d*, the bursting or igniting charge and the stopper to keep the charge in the tube. The tube *c* is made of any suitable material, and in practice I make the stronger and better class of my squibs of any ductile sheet metal, and those less strong and cheaper of paper, which is varnished with soluble glass, or painted with any other fire-proof material, to render the tube incombustible and prevent fatal or serious accidents by smoldering or hanging fire. One end of the tube *c* is contracted so as to form a comparatively small vent to act as a choke and add force to the movements of the squib on the principle of the rocket. The match is attached to the squib at *b*, as shown in Fig. 3, or is attached permanently to the tube, as shown in Fig. 1. It is made of paper or any other suitable material, and coated with sulphur, paraffine wax, or any other inflammable water-proof combustible. It is rigid, and will not drop or melt rapidly before the flame, yet can be bent at any angle, and will remain and consume in the position in which it is set. If bent down it will burn rapidly; if bent up, very slowly; and if straight, it will burn a medium length

of time. At point of attachment to the squib the cavity in the adjustable match is of increasing diameter, so as to provide for its attachment to squibs of different sizes and render its attachment, by reason of friction, secure. When made after this manner the match may be put up in separate packages, as an article of manufacture, and sold to be used with any squib or fuse.

The tube is filled with powder after the match is attached so that it may fill the open end, which communicates fire from the match to the powder in the squib. The careful twist shown in the match *a* is to prevent the powder from getting into the body or in contact with the fire prematurely, and the solid coating of hard sulphur, paraffine wax, &c., which I use on the match, prevents it from untwisting. The tube may be filled with quick powder entirely, or partially with slow powder, on which a charge of rifle powder or fulminate is placed at *d*. This is to ignite the charge with greater force, or to explode duallin and other blasting compounds which require violent concussion. When the tube is charged the end *d* is sealed with wax, soap, or other suitable material.

These squibs are intended for general use, but especially for wet or damp places where other squibs cannot be used, and to overcome the danger of premature explosions and the more serious and fatal dangers of "hanging fire" and smoldering incident to all squibs and fuses hitherto used in mining and blasting. When the match is consumed to *b* it will be immediately extinguished, because the fire-proof coating which covers the tube will not burn or smolder, whether the powder which it contains is ignited or not, and no fragments of the squib are left in a burning condition after the explosion of the blast to ignite the mine gases or the heaps of refuse coal and slack always found in coal-mines. This rocket-squib is, consequently, both fire-proof and water-proof; and a water-proof squib is also a novelty, as the squib, in the technical sense, is not a fuse, and its form and action are quite different.

The operation of the rocket is the same as the straw squib commonly used in blasting, but this squib has much greater strength and force. It is placed loosely in the needle-hole

or blasting-barrel, or slightly fastened when the hole is steep. If the miner requires considerable time to get out of danger the match is bent up, in which condition it will burn from one to three minutes, depending on the angle; but if his hole is wet, and he is in haste to fire the charge, the match is bent down, in which position it will burn from fifteen to forty seconds, depending on the angle of depression. When the powder is ignited it burns with great force through the choke, and forces the tube, like a rocket, into the cartridge, in which it delivers its fire through *d*, or explodes in the heart of the cartridge, whether charged with gunpowder, dualin, dynamite, or other blasting compound.

Having thus described my invention, I claim as new and useful and desire to secure by Letters Patent—

1. The adjustable match *a*, adapted to be combined with or attached to a mining-squib, substantially as and for the purpose described.
2. The choke *b*, in combination with the tube *c*, substantially as and for the purpose described.

In testimony that I claim the foregoing as my invention I hereto affix my signature this 15th day of October, 1872.

SAMUEL HARRIES DADDOW.

Witnesses:

THEOBALD RUFFING,
WM. V. PARMLEY.