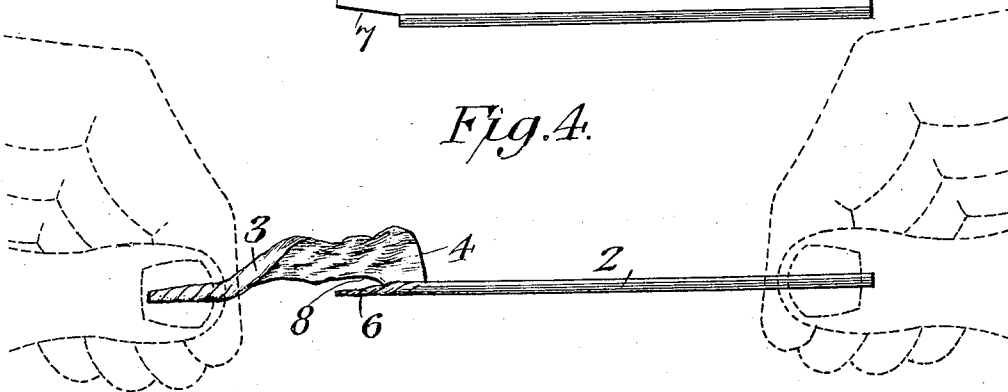
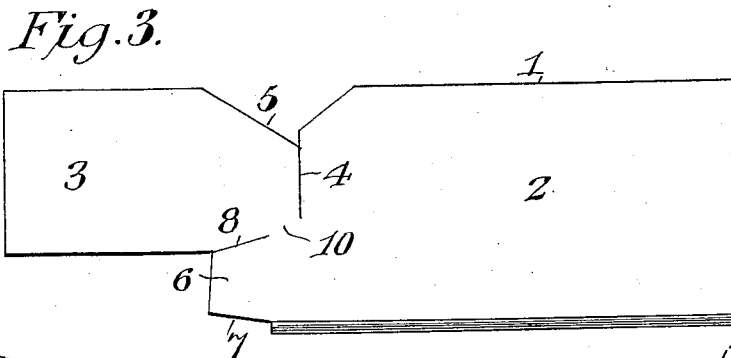
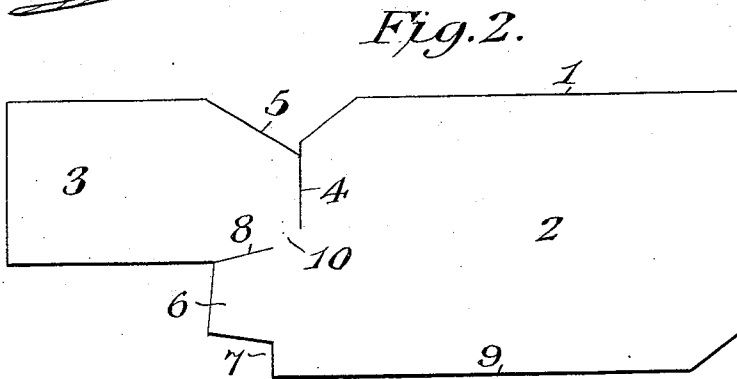
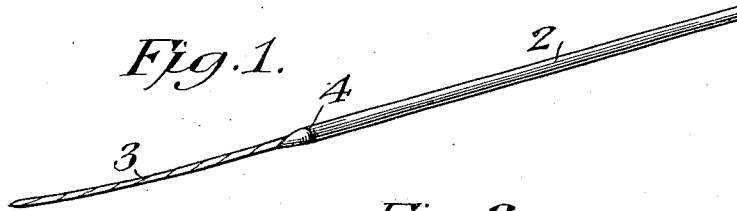


J. R. POWELL.
MINER'S SQUIB.
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1,050,390.

Patented Jan. 14, 1913.



WITNESSES

Jas. F. McLaughlin
F. J. Chapman.

John R. Powell, INVENTOR.

BY

E. F. Figgers

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN R. POWELL, OF PLYMOUTH, PENNSYLVANIA.

MINER'S SQUIB.

1,050,390.

Specification of Letters Patent.

Patented Jan. 14, 1913.

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To all whom it may concern:

Be it known that I, JOHN R. POWELL, a citizen of the United States, residing at Plymouth, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Miner's Squib, of which the following is a specification.

This invention has reference to improvements in miners' squibs, and its object is to provide ready means whereby a miner may ascertain whether or not the match end of the squib contains any powder, the presence of which would render the use of the squib dangerous.

In Letters-Patent No. 518699, granted to me April 24, 1894, there is shown and described a squib of the same general character as the squib of the present invention, but in the squib described in said Letters Patent there is a liability, on the miner loosening the match end, of also loosening the closure at the corresponding end of the powder containing portion of the squib, so that some grains of powder may escape into the match end unobserved by the miner, whereby the squib is liable to burn faster than anticipated and the explosion may occur prematurely because of the too rapid burning of the match.

With the present invention the match end of the squib, though in general resembling the like end of the squib shown in the aforesaid patent, differs therefrom in certain respects to be hereinafter described, whereby the match end may be wholly opened up without any danger whatsoever of disturbing the closure at the adjacent end of the powder containing portion of the squib, and on the retwisting of the match end it may be left looser than before to hasten the burning of the match end, but not to such speed as would cause danger to the miner, and, furthermore, renders the burning more certain and practically eliminates the chance of so slow a burning of the match end as to give the impression that the fuse had gone out, while the liability of the actual extinguishing of the fuse is reduced to a negligible minimum.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that the invention is not confined to any exact conformity with the

showing of the drawings, but may be variously changed and modified so long as such changes mark no material departure from the scope of the invention.

In the drawings:—Figure 1 is a perspective view of the complete squib. Fig. 2 is a plan view of a blank from which the squib is made. Fig. 3 is a plan view of the blank in the process of rolling into squib form. Fig. 4 is a view of the squib with match end opened out.

Referring to the drawings there is shown a blank 1 which may be made of manila, or tissue, or similar paper, and this blank is so shaped as to provide two parts 2 and 3, respectively, which ultimately form the powder receptacle and match. The powder receiving portion 2 is divided from the match receiving portion by a slit 4 substantially perpendicular to the length of the blank, and nearer one end of the blank than the other, the match end 3 being usually shorter than the powder containing end 2. Where the slit 4 is formed the blank is notched, as indicated at 5, so that the general width of the blank at this point is reduced by the depth of the notch. The notch 5 is substantially V-shaped and the slit leads from the angle of the notch inwardly partially across the blank.

The powder receiving end of the blank adjacent the match end is formed with a tongue 6 produced by a notch 7 on one side and a slit 8 on the other, the slit extending along the match receiving portion to a point adjacent the corresponding end of the slit 4, and the match receiving portion continues beyond the tongue 6, being considerably narrower than the powder receiving portion 2 of the blank.

The squib is formed by first rolling the blank on a suitable form from the edge indicated at 9, so that a tube is made and the rolling is continued until the entire section 2 of the squib is rolled into a tube, the tongue 6 being twisted as shown in Fig. 4 to close such end of the tube, and after the tube is filled with powder the other end may be closed in any suitable manner. Of course, the tube may be permanently closed lengthwise by appropriately applied paste. The match end 3 is twisted, as indicated in Fig. 1, and being of less width than the powder receiving 2 is more attenuated. The miner receives the squib in the form shown in Fig. 1, it being understood that

the portion 2 is appropriately charged with powder and the match end 3 is assumedly free from powder. Should the match end contain any powder it will burn with much greater rapidity than if no powder were present, and consequently would present the danger of a premature explosion which might be destructive to the life of the miner. In order to assure himself, the miner invariably untwists the match end of the squib and may untwist it to the full extent, as indicated in Fig. 4, thus ascertaining beyond question that powder is absent, or, if present, is removed. It is to be observed that the slit 8 approaches the slit 4 at an angle, so that the tongue 6 is narrower at the free end than at the end where it joins the member 2, and consequently when the tongue 6 is twisted it is thinner at the outer end than at the inner end where it joins the tubular portion of the squib.

The slit 8 as well as the slit 4 are both absent in the squib shown in the aforesaid Letters Patent, and consequently there was a liability of untwisting the tongue 6 and spilling some powder into the match end of the squib without the miner noticing it. With the present invention the only connection between the match end of the squib and the powder containing end of the squib is by a short neck 10 between the base end of the twisted tongue 6 and the slit 4, and by no possibility can the unwrapping of the match end 3 affect the twisted tongue 6, so that the match end may be spread out flat if so desired without any effect upon the remainder of the squib. The miner having ascertained the safety of the squib rerolls or twists the match end, and then may twist it either tightly or loosely, as desired, a loose twisting of the match end causing it to burn more freely, and being in surrounding relation to the twisted tongue 6 more readily fires such twisted tongue and so with certainty communicates the spark to the powder containing end of the squib to positively assure the communication of the fire to the powder and the explosion of the charge. Were the match end of the squib in some other relation to the powder containing portion of the squib it might easily transpire that the match end would burn to the powder end without communicating the spark to such powder

containing end, but being in surrounding relation to a portion of the powder containing end for a material length thereof, the spark is communicated to the powder containing portion of the squib before the corresponding end of the match is reached, and the liability of a missfire is eliminated.

It is customary to impregnate the paper with some suitable material which will cause a progressive action of the spark without flame and without liability of ceasing as might occur with untreated paper, thus converting the match into what is known as a slow match and giving ample time for the miner to reach a point of safety after having lighted the tip of the match end of the squib. When the match end of the squib is unwrapped the twisted tongue 6 projecting beyond the junction of the match end with the body portion of the squib serves as a guide or mandrel upon which the match end is readily retwisted, the operation being performed easily and quickly.

What is claimed is:—

A blank for miners' squibs having a tube-forming portion and a match-forming portion defined by a substantially V-shaped notch formed in an edge of the blank, and a slit leading inwardly from the angle of the notch partially across the blank nearly to the longitudinal center of the blank and perpendicular to the length thereof, the match-forming portion being narrower than the tube-forming portion, and a tongue projecting from the end of the tube-forming portion of the blank and arranged alongside the match-forming portion, said tongue being formed by a notch on one side and a slit on the other, the last-mentioned slit extending along the match-forming portion and approaching at an angle thereto the inner end of the first-mentioned slit, the two slits being separated by a short neck, said neck, when the squib is completely formed, providing the sole connection between the match and the tube.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN R. POWELL.

Witnesses:

W. G. MORGAN,
PHILIP WALTERS.