(No Model.)

J. R. POWELL.

MINER'S SQUIB.

No. 457,669. Patented Aug. 11, 1891.

Fig. 1.

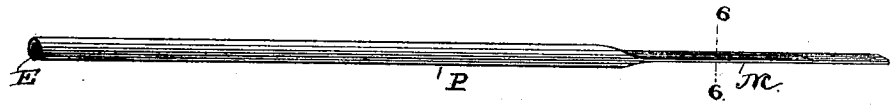


Fig. 6.



Fig. 2.

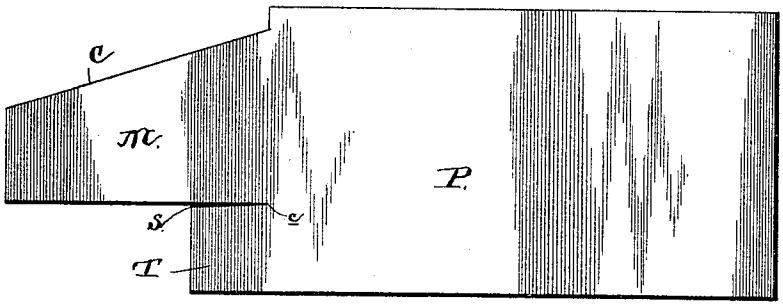


Fig. 3

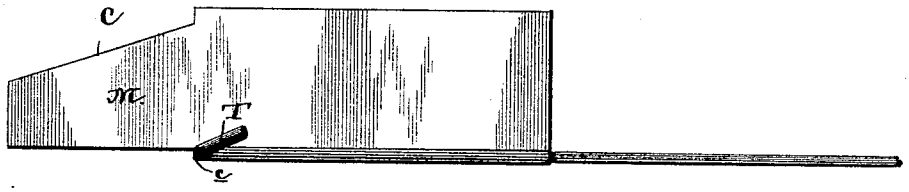


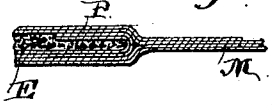
Fig. 4.



Fig. 5.



Fig. 7.



Witnesses
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By his Attorneys.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN R. POWELL, OF PLYMOUTH, PENNSYLVANIA.

MINER'S SQUIB.

SPECIFICATION forming part of Letters Patent No. 457,669, dated August 11, 1891.

Application filed June 9, 1890. Serial No. 354,776. (No model.)

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 relates to miners' squibs; and the object of the same is to construct the squib so that it will furnish perfect safeguards in the use thereof and which will show conclusively to the miner that the squib is perfectly safe and reliable and which will be adapted more especially for use in gaseous mines where no flame-match can be used. I accomplish this by providing a perfect closure for the front end of the squib-tube, so as to prevent powder from escaping down into the match, and, further, in the provision of a match which will be practically transparent, whereby the miner can see at a glance that there is no powder in the match.

To this end the invention consists in the specific details of construction, hereinafter more fully described and claimed, and illustrated in the drawings, in which—

Figure 1 is a perspective view of a miner's squib embodying my improvements. Fig. 2 is a plan of the blank from which the squib is made. Fig. 3 is a perspective view of a needle with the paper wound thereon and turned down at its upper end. Fig. 4 is a similar perspective showing the entire paper rolled and illustrating how the paste is applied. Fig. 5 is a central longitudinal section of the complete squib. Fig. 6 is a transverse section of the match, taken on the line 6 6 of Fig. 1. Fig. 7 is an enlarged sectional view of the connection between the match and the tube to show the tongue.

Referring to the said drawings, the letter P designates the paper case, E the explosive filling, and M the match. The paper is preferably cut by dies or in any other suitable manner from Manila or tissue paper, as is common in this art, and is formed of about the shape shown in Fig. 2. It is provided with a slit S where shown, forming a tongue T at one side, and a piece M, which comprises the match at the other side, the other edge of the match-piece being beveled or cut away, as shown at C. With the exception of this construction of one end of the paper the latter is approximately of rectangular form.

In the construction of my improved squib the paper is first laid upon a flat base, the needle end laid upon the paper at the right-hand edge thereof with its end extending only to the inner end *c* of the tongue T, and the paper rolled upon the needle in a manner which is well known to those familiar with this art. As soon as the paper has been rolled up to the slit S, the rolled tongue T is turned down, as shown in Fig. 3. The rolling is then continued, rolling the turned-down tongue inside the body of the paper and also rolling up the piece M for the match until the whole assumes the shape shown in Fig. 4, when paste is applied along the projecting edge and the needle and paper rolled over said paste to form a complete tube. This tube will be closed at its upper end, or at the junction of the tube-body with the match, which closure will be effected by the turned-down tongue T, as will be obvious. The match M is then flattened by hand, and the squib presents the appearance shown in Fig. 1. The powder or other explosive E is then inserted and the open end of the tube is closed, preferably by the means described and claimed in Letters Patent No. 326,239, granted to me September 15, 1885, although any other form of closure may be used without affecting the present invention.

The advantages of this improved squib over those heretofore made are as follows: The powder or other explosive is confined within the tube between the two ends and cannot escape therefrom, and hence none of the powder can by chance get into the match. Heretofore the objection has been raised that if there were particles of powder in the match the same would burn too quickly and the explosion of the charge would be premature; but by the use of the turned-over tongue T the powder is positively prevented from getting into the match; also, intead of twisting the match, as heretofore, whereby parts of it might be twisted more tightly than others and would burn more slowly when the match is flattened, as in the present instance, it will burn uniformly and can almost be used as a

time-fuse. When saturated with saltpeter and water or some other slow-burning substance which will not blaze up, it is specially desirable when working in gaseous mines. Moreover, when the match was twisted the miner invariably untwisted it before using the squib, in order to ascertain if by any accident particles of powder had escaped thereinto; but in the present instance, where thin paper is used, the match is transparent, and a grain of powder will be easily detected in that manner. Again, by having the edge of the match-paper beveled or cut away no paste is necessarily used in the match, the pasting of the body and the rolling of the match simultaneously therewith holding the paper of the latter in a manner which will be obvious, and the cut-away edge of the match-paper follows a spiral line around the match, as shown in Fig. 1.

The use of this squib is well known to miners, and need not be explained at length.

Having thus described my invention, what I claim is—

1. The herein-described miner's squib, the same comprising a body of paper having a turned-over integral tongue at one end, which is rolled with the body in tube form before being turned over, so as to confine the powder and form a closure, an integral match at the same end, the whole being of tubular form, and the match being flattened and untwisted and being of thin paper and practically transparent, substantially as and for the purpose described.

2. The herein-described miner's squib, the same comprising a body of paper having a turned-over integral tongue at one end, which is rolled with the body in tube form before being turned over, so as to confine the powder and form a closure, and an integral match at the same end, the whole being of tubular form, substantially as and for the purpose described.

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

JOHN R. POWELL.

Witnesses:
J. H. SIGGERS,
R. J. MARSHALL.