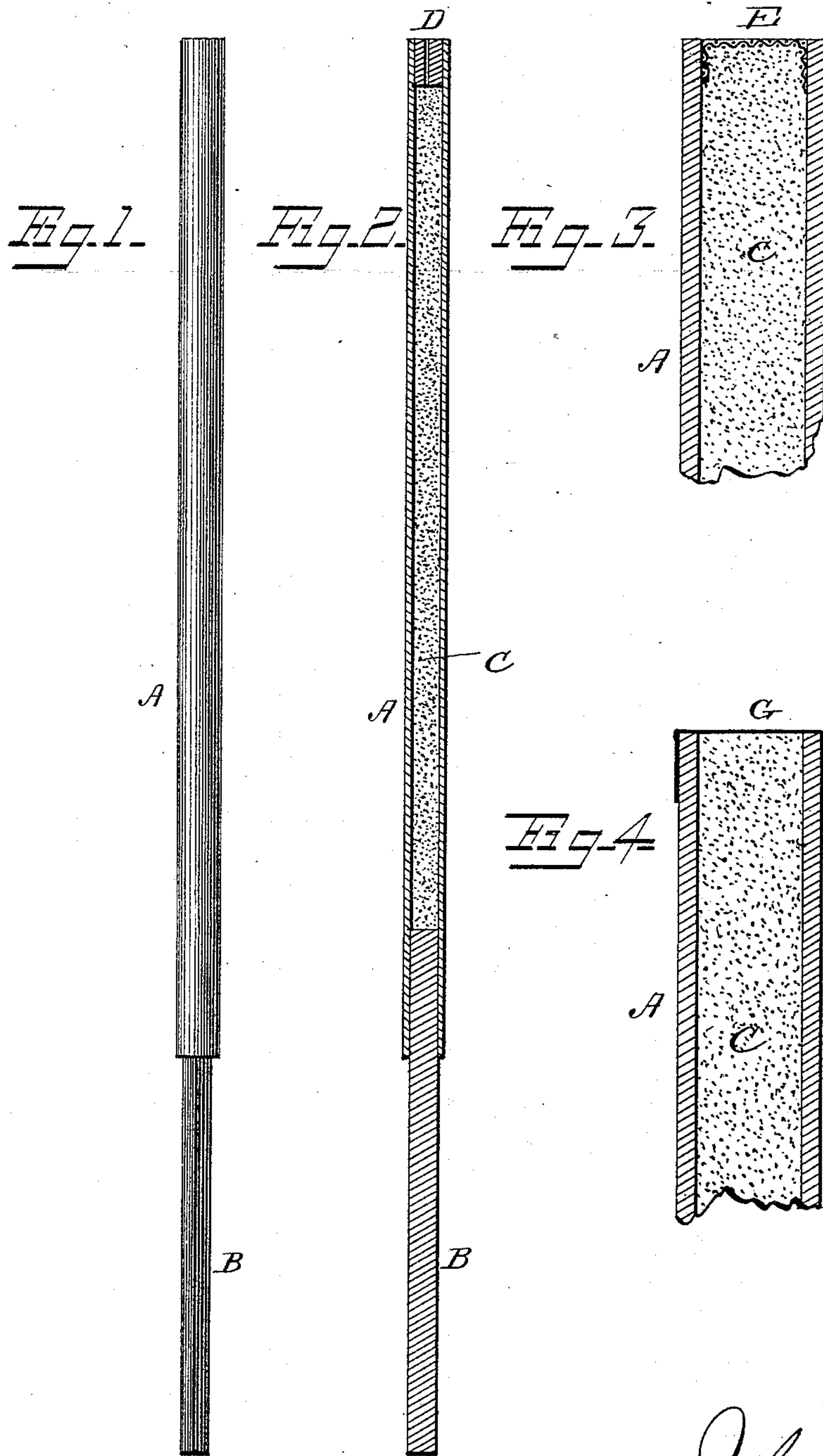


(No Model.)

J. R. POWELL.  
SEAL FOR MINERS' SQUIBS.

No. 288,484.

Patented Nov. 13, 1883.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JOHN R. POWELL, OF PLYMOUTH, PENNSYLVANIA.

## SEAL FOR MINERS' SQUIBS.

SPECIFICATION forming part of Letters Patent No. 288,484, dated November 13, 1883.

Application filed September 8, 1883. (No model.)

*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 Seals for Miners' Straws or Paper Squibs; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to blasting-squibs for the use of miners; and it has for its object to produce a device by means of which down-blasts may be conveniently fired without previously cutting off the seal from the end of the squib.

To this end it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claim.

Miners' squibs of the most novel and recent construction have usually consisted of a tube of straw, paper, or the like, one end of which has been provided with a fuse, and the other end of which has been provided with a seal, to retain in the said tube the charge of igniting-powder. In practice it has been necessary, before exploding the charge, to cut off the end of the squib having the seal, thereby establishing communication between the igniting material and the charge. While in upward blasts this has been easily effected, considerable difficulty has been experienced in exploding downward blasts with squibs of this construction, owing to the liability of the igniting-powder to escape through the seal-opening and enter the blast-hole. It has therefore been necessary to employ experienced hands in exploding downward blasts.

By my invention I propose to obviate the necessity of especially skilled labor, and to provide a squib which may be easily and successfully manipulated by unskilled hands, as will be hereinafter fully described with reference to the drawings, in which—

Figure 1 is a side view of a mining-squib embodying my invention. Fig. 2 is a vertical sectional view of the same, and Figs. 3 and 4 are sectional views, illustrating modifications of my invention.

The same letters refer to the same parts in all the figures.

A in the drawings designates the cylindrical case or tube which constitutes the body of the squib, and at the end of which is secured the fuse B. The latter may be constructed and attached in any suitable well-known manner, preferably as shown and described in patents which have heretofore been granted to me.

The cylindrical case A contains the charge, C, of igniting material, which is secured in the said case or shell by means of a seal, D. My preference, with regard to the construction of the said seal, is the employment of such adhesive material as will serve to plug the end of the case or shell by simple dipping or immersion. Bituminous or hydrocarbonic material of any suitable description will excellently answer the required purpose. The seal, having been once formed, is to be perforated in one or more places by means of a wire or any suitable pointed instrument, which will form one or more distinct holes or perforations that shall admit of communication between the inside of the shell and the blasting-hole without enabling the igniting-charge to escape.

By the modification shown in Fig. 3 of the drawings I substitute for the seal hereinbefore described a piece of wire-netting, E, which may be retained in the shell A by means of friction only, or by means of adhesive material, or any other expedients which it may be deemed necessary to employ. It will be seen that the netting E, while it confines the igniting-charge in the squib-case, does not prevent communication between the igniting and the blasting charge.

In Fig. 4 of the drawings another modification of my invention has been shown. By this modification I do not aim at establishing a direct communication between the respective charges; but I propose in this case to form the seal, which is here designated by the letter G, of easily-combustible material, with regard to the composition of which I do not wish to limit myself. The seal, being, as thus stated, of a combustible nature, will readily admit of communication between the respective charges, as has been heretofore stated to be the object of my invention.

The operation of this invention and its ad-

vantages will be easily understood by those skilled in the art to which it appertains. In firing blasts it is only necessary to adjust and pack the squib in the blast-hole. No matter  
5 what the direction of the blast may be, communication will necessarily be established between the igniting and exploding charges, and a successful blast is always sure to follow.

I claim as my invention and desire to secure  
10 by Letters Patent of the United States—  
An improved mining-squib, consisting main-

ly of a tubular shell or case having a fuse at its upper end, in combination with a netted seal suitably retained in the lower end of the said shell or case, substantially as set forth. 15

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:

JOHN THEWIS,  
GEORGE S. REESE.