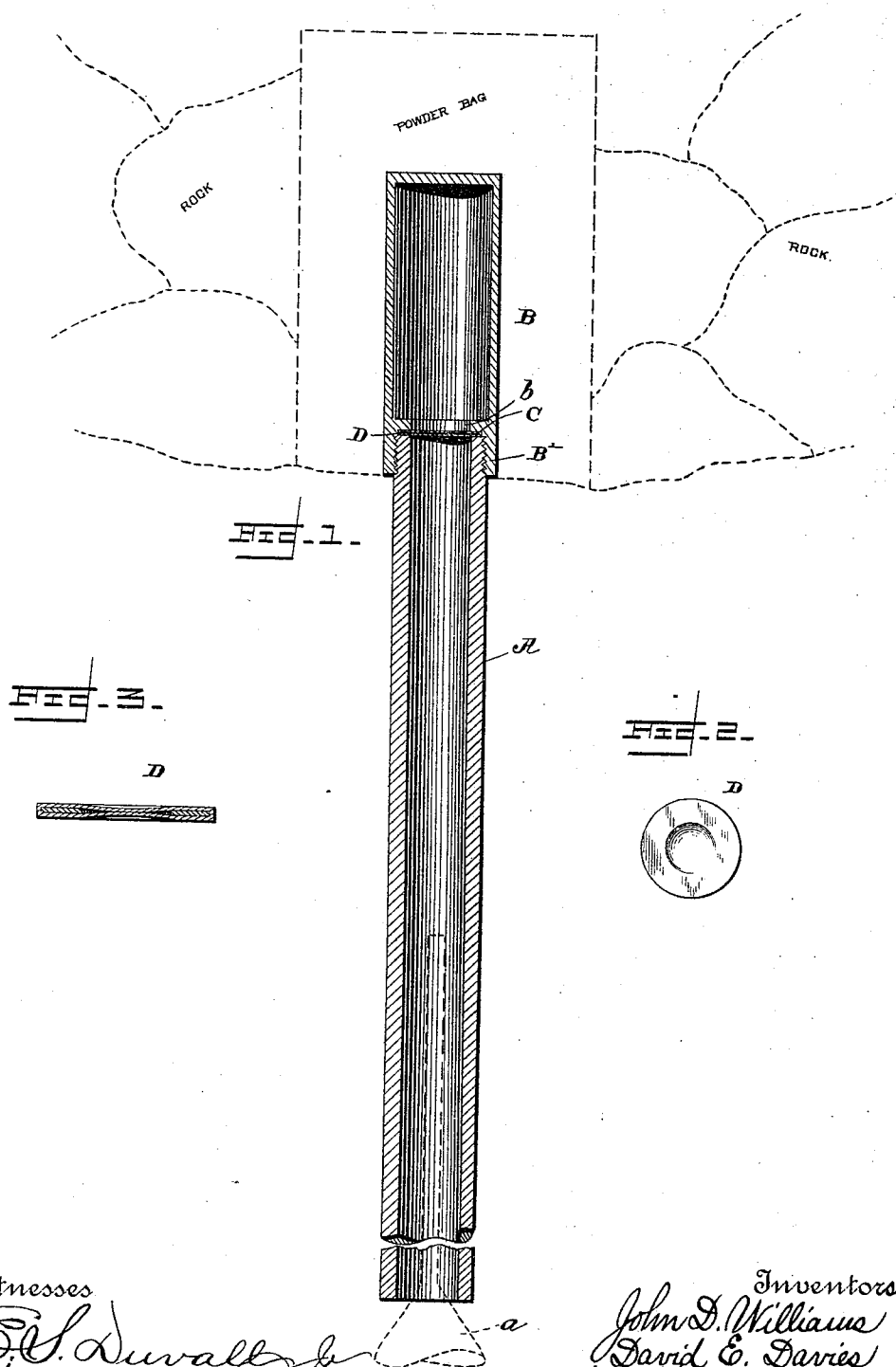


(No Model.)

J. D. WILLIAMS & D. E. DAVIES.
GAS CAP.

No. 476,852.

Patented June 14, 1892.



Witnesses

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UNITED STATES PATENT OFFICE.

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GAS-CAP.

SPECIFICATION forming part of Letters Patent No. 476,852, dated June 14, 1892.

Application filed January 13, 1892. Serial No. 417,963. (No model.)

To all whom it may concern:

Be it known that we, JOHN D. WILLIAMS and DAVID E. DAVIES, citizens of the United States, residing at Nanticoke, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Caps; and we 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.

This invention relates to an improvement in a gas-cap, having for its object the protection of miners when blasting in gas; and the invention consists, essentially, in the combination, with an ordinary blasting barrel or tube, of a powder-containing chamber or cap; and it also consists in certain other elements in the combination and in numerous details in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the annexed drawings, illustrating our invention, Figure 1 is a longitudinal section of our improved gas-cap shown as applied in operative position to a blasting-tube, which is likewise illustrated in longitudinal section. Fig. 2 is a plan view of the disk which is located between the blasting-tube and the cap. Fig. 3 is an enlarged cross-section of the same.

Like letters of reference denote like parts throughout the several figures of the drawings.

Our improved gas-cap being designed to insure greater safety in mining operations, achieves a great improvement upon the ordinary method of blasting in gas; which ordinary method is performed substantially as follows: First, the hole is drilled in the rock, coal, or other substance where the mining operations are going on. In this hole a powder-bag is placed. In Fig. 1 we have represented in dotted lines a powder-bag located amid the circumjacent rock. Said powder-bag is ordinarily made of water-proof paper. Then a tube, which is called a "blasting-tube," is taken and one end inserted into the water-proof bag. This tube, of which tube A in Fig. 1 is an example, is simply an ordinary iron or metallic barrel of suitable length and diameter. After one end of it has been inserted in the powder-bag the neck of the bag is wrapped tightly

around the end of the tube and bound securely thereto with twine. Then a squib is placed in the other end of the blasting-barrel, running a few inches down thereinto. To the upper end of the squib is connected a piece of paper which extends out the mouth of the tube. The ignition of the projecting paper will not ignite the gas at the time of blasting. After the paper has been ignited the fire will pass down and fire the squib in about a minute, say. The explosion of the squib ignites the powder at the other end of the tube within the powder-bag. Now, although the powder-bag is water-proof, and therefore no danger can ensue from any failure thereof in this respect, yet said bag is not gas-proof, and in some way the gas works through it into the powder and then escapes through the blasting tube or barrel, carrying with it considerable powder. This powder is ignited by the paper which projects from the end of the blasting-tube and is designed to convey the igniting-flame to the squib, and consequently a premature blast or explosion takes place, or else the gas is ignited and exploded, which is usually the case, resulting often in serious injury to the miner, sometimes killing him outright before he is able to get out of the way. Our improved gas-cap is designed to obviate these difficulties and dangers, and it does so very effectually, because it provides a powder-chamber through which the gas cannot pass, and which, unlike the powder-bag, is not only water-proof but gas-proof.

B designates our improved gas-cap, which is a hollow chamber or cap made in substantially-cylindrical or tube-like form of brass, tin, zinc, or other suitable metal or material. Experience will dictate the best substance to make this gas-pipe out of. The blasting tube or barrel A is provided at one end with an external screw-threaded section. The gas-cap B is open at one end. At a short distance from this open end it is provided with an interior annular flange C, having the central opening *b*. The interior of the end portion of the gas-cap between the annular flange C and the periphery of the open end of the cap is screw-threaded, so that the gas-cap may be screwed upon the screw-threaded end of the blasting-tube. Therefore in the practical use of the gas-cap it will be screwed upon the end

of the blasting-tube and then placed into the mass of powder within the powder-bag, which has been inserted into the drill-hole. Before thus inserting the cap B, however, into the powder it will have its interior chamber filled with powder.

Another feature of the invention consists in a disk of lead-paper or other suitable paper. D designates an example of this. It is shown in detail view in Figs. 2 and 3 and in relative position to the other parts of the invention in Fig. 1. This disk may be made as shown in the drawings, where it is represented as consisting of a thin flat annular ring covered with a double layer of lead-foil. The disk B is inserted between the periphery of the screw-threaded end of the blasting-tube A and the annular flange C of the gas-cap.

When my improved gas-cap is used, the paper, as *a*, and likewise the squib, will be placed, as usual, in the mouth of the blasting-barrel, as shown in Fig. 1. The paper will be ignited, which will result in igniting and exploding the squib in about a minute or a minute and a half in the usual manner. The explosion of the squib will drive its force through the lead-paper disk D, situated between the blasting-barrel and the gas-cap into the interior of the gas-cap, thereby igniting and exploding the powder in said cap, thus blowing the cap to pieces and igniting the surrounding powder which forms the blast within the powder-bag, thereby rending the rock or coal.

Thus it will be seen that by the provision of the metallic gas-cap constructed as we have described it for use in connection with the blasting-barrel and the provision of the intermediate thin metallic disk we provide a combination which achieves very valuable and useful results in securing miners against the disastrous consequences which often ensue

from blasting amid surrounding gas, and we afford a cheap and inexpensive substitute for the ordinary powder-bag arrangement, and consequently we deem the invention to be one of efficacy and value which will commend itself to those interested in the art.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination with the blasting-tube, a metallic powder-containing cap or chamber connected at one end thereof and an intermediate disk interposed between the gas-cap and tube, substantially as described.

2. The combination of the blasting-tube, a metallic powder-containing cap which is screwed on the end of said tube, and a thin lead-paper disk interposed between the gas-cap and the tube, substantially as described.

3. The combination of the barrel A, having a screw-threaded end, a gas cap or chamber B, adapted to contain powder, having an interior annular flange and screwed upon the end of tube A, and a thin disk located between the end of the barrel and the flange, substantially as described.

4. The combination of the tube A, gas-cap B, having screw-threaded part B', which engages the screw-threaded end of the barrel A, and having also the annular interior flange C, and the thin lead-paper disk D, interposed between the barrel A and cap B, all substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN D. WILLIAMS.
DAVID E. DAVIES.

Witnesses:

JAMES M. FRITZ,
T. F. JACOB.