(Model.)

R. B. F. REED & G. FREUND.

SAFETY SHELL FOR BLASTING.

No. 273,156. Patented Feb. 27, 1883.

Fig. 1.

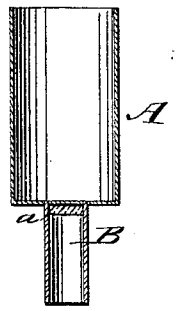


Fig. 2.

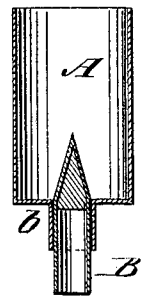


Fig. 3

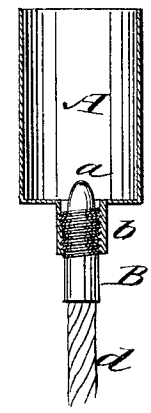


Fig. 4

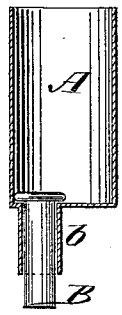


Fig. 5.



Fig. 6

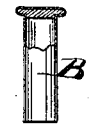


Fig. 7

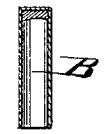
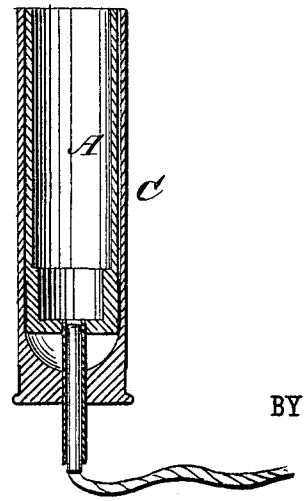


Fig. 8



WITNESSES:

Francis McArdle.

C. Sedgwick

INVENTOR:

R. B. F. Reed

G. Freund

BY Munn & Co

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ROBERT B. F. REED AND GEORGE FREUND, OF DURANGO, COLORADO; SAID REED ASSIGNOR TO SAID FREUND.

SAFETY-SHELL FOR BLASTING.

SPECIFICATION forming part of Letters Patent No. 273,156, dated February 27, 1883.

Application filed October 18, 1882. (Model.)

To all whom it may concern:

Be it known that we, ROBERT B. F. REED and GEORGE FREUND, both of Durango, in the county of La Plata and State of Colorado, have invented a new and Improved Safety-Shell for Blasting Purposes, of which the following is a full, clear, and exact description.

In blasting operations where high explosives are employed—such as giant-powder—the material is used in sticks or candles, and for firing the charges a cap is attached to the end of the stick or candle, the cap being upon the end of the fuse. The method of attaching the cap has heretofore been to bore a hole in the end of the candle and insert the cap, which is held in place by a winding of cloth or other material. This method is both unreliable and dangerous, from the fact that as the candle has to be warmed before it can be bored the charge is liable to be exploded by the warming and the cap to be disconnected, so that the firing of the charge is prevented or delayed so long as to result in an accident.

The object of our invention is to obviate these difficulties and to secure perfect safety in the use of giant-powder and similar materials for blasting purposes.

The invention consists in the combination and arrangement of parts, substantially as hereinafter fully set forth and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal section of a safety-shell embodying our invention. Fig. 2 is a similar view, showing the shell as fitted with a cap of different construction. Fig. 3 is a similar view, showing the shell provided with a screw-cap or primer. Fig. 4 shows one of our improved safety-shells with the cap located at one side. Figs. 5, 6, and 7 represent different forms of caps which we employ, and Fig. 8 shows the covering-shell.

A is the shell, constructed of thin sheet metal, and of a suitable size for receiving the charge or passing upon the candle or stick of explosive material.

B is the cap or primer containing the fulminating material, the same being a tube of suitable length and suitable form, as hereinafter set forth. In Fig. 1 the cap B is shown as attached permanently to the head of the shell A, *a* being the fulminate at the inner end of the cap, the outer end of which receives the fuse. In Fig. 2 the shell A is formed with a circular nipple or nozzle, *b*, for receiving the cap B, the inner end of which is made of conical form for containing the fulminate, and enters within the shell. In Fig. 3 the shell is provided with the nipple or nozzle *b*, the same being internally threaded to receive the cap, which is formed with an external thread to take the thread of the nipple or nozzle. This same cap is shown in section in Fig. 5, and, as will be seen, the thread is upon both the internal and the external surfaces of the cap, the external thread being for securing the cap to the shell, while the internal thread will receive the screw upon the end of the fuse, (represented at *d*,) so as to secure intimate contact and insure the firing of the charge. In Fig. 4 the nipple or nozzle *b* on the shell is placed at one side, instead of at the center, and is fitted with a flanged cap, which is to be inserted before the shell is charged or placed on the candle. This flanged cap is shown separately in Fig. 6. Fig. 7 shows a similar cap, but without any flange, which may be inserted after the shell is charged.

If desired, the inner ends of the caps may be made of oval or rounded or partially-rounded form, as shown in Fig. 3.

It will be noticed that an intermediate space is left between the inner surface of the closed end of the shell or cover C and the closed end of the shell A, the purpose of which is to prevent the transmission to the shell A of the jar produced by the blows received upon the outer end of the shell C.

In preparing a charge it is sometimes necessary to force the shell in with a blow. To prevent explosion of the charge by the blows, we provide the covering-shell C, Fig. 8, which is of a length to inclose the shell and the candle, and is apertured at its rear end for the fuse to pass through. This cover receives the blows, and thereby relieves the inner shell and charge from the concussion.

While we have shown these different forms in the shape of the caps or primers, we do not limit ourselves to any particular shape or ar-

rangement. The shells may also be made of various lengths and diameters, so as to fit the candles of giant-powder or other explosive. It will be seen that to prepare the charge all that is necessary is to place the shell upon the end of the candle and then insert the cap, with the fuse attached, which can be readily done, and with perfect safety, and these not being liable to become separated, and being also in intimate contact, an explosion is insured whenever the fuse is fired.

This safety-shell is applicable to blasting-powder as well as giant-powder, and for ordinary powder the fuse will be inserted through the hole in the shell and the cap dispensed with.

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

1. In a safety-shell for blasting, the shell A, having the external nozzle or nipple, *b*, provided with an internal thread, the cap B, having the external and internal thread, and the screw-threaded fuse *d*, substantially as and for the purpose set forth.

2. In combination with the shell A and its nozzle or nipple *b*, the covering-shell C, with its closed end provided with an aperture for the passage of the nozzle or nipple, said outer shell or covering extending the entire length of the shell A and its charge, and having its chamber extended to form a space between the shell A and its inner closed end, to intercept the jar of the blow, substantially as and for the purpose set forth.

ROBERT B. F. REED.
GEORGE FREUND.

Witnesses:
W. N. ROHRER,
JNO. TAYLOR, Jr.