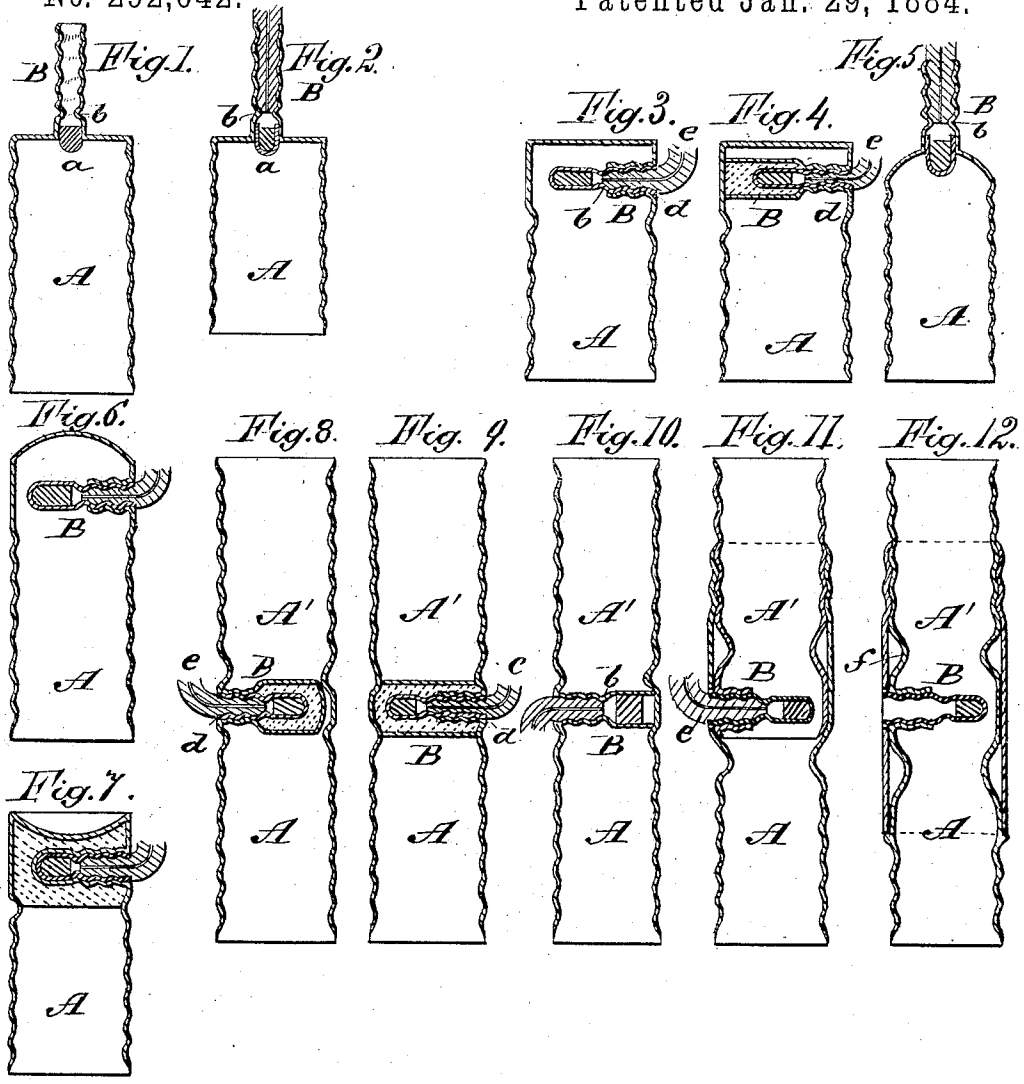
(No Model.) 2 Sheets—Sheet 1.

G. FREUND.

SAFETY SHELL FOR BLASTING.

No. 292,642. Patented Jan. 29, 1884.



WITNESSES:

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INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 13.

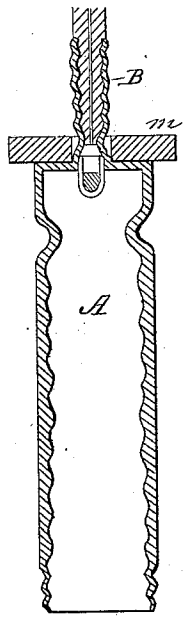


Fig. 14.

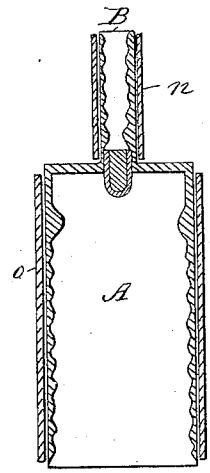


Fig. 15.

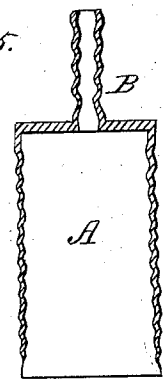
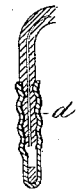


Fig. 16.



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UNITED STATES PATENT OFFICE.

GEORGE FREUND, OF DURANGO, COLORADO.

SAFETY-SHELL FOR BLASTING.

SPECIFICATION forming part of Letters Patent No. 292,642, dated January 29, 1884.

Application filed June 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FREUND, of Durango, in the county of La Plata and State of Colorado, have invented a new and useful Improvement in Safety-Shells for Blasting, of which the following is a full, clear, and exact description.

My invention relates to safety-shells of the character shown in the Letters Patent granted to Reed and Freund, February 27, 1883, and numbered 273,156, for use with high explosives, the object being to secure safety in the handling of the material, the tamping of the charge, and in the connection of the fuse to the stick, candle, or other form of explosive material.

The present invention consists in certain novel forms of construction, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, the figures in which from 1 to 14 represent sectional views of safety-shells, various modifications being shown as hereinafter specified; and Figs. 15 and 16 are sectional elevations of one of the safety-shells and its threaded firing-pin, respectively, showing them detached.

In all the figures, A represents the shell, which is made of sheet metal or any suitable material in cylindrical or other form, and of any diameter or size suitable to the sticks, candles, or other forms of the explosive material that are used.

B is a nozzle or tube formed upon the shell for receiving the fulminate and for connection of the fuse.

In Fig. 1 the shell A with its nozzle or tube B are both formed in one piece, and both screw-threaded internally and externally. The thread upon the shell is to facilitate its attachment to the explosive charge, the shell being screwed upon the stick or candle, so that a firm and reliable connection is made between the two. The thread upon the nozzle B is to hold the fuse, which may be screwed either upon or into the said nozzle, so that it is held securely in place, and the screw-thread may be made either right or left handed. The fulminating material shown at *a* is contained in the lower end of the nozzle B, and above the straight portion of the nozzle that is made to receive the fulminate is a neck or annular shoulder, *b*, that prevents any contact between the end of the fuse and the fulminate or the fulminate-cap, as illustrated in Fig. 2, which shows the fuse in place and a cap inserted.

In Fig. 3 the nozzle B is formed upon the side of the shell A, extending inward to receive a threaded firing-cap, *d*, to which the fuse *e* is attached. This shell is made with a flat base, and the object of placing the nozzle at one side is to make room for the tamping or filling.

In Fig. 4 the shell is substantially the same as in Fig. 3, except that the nozzle B extends across the entire diameter of the shell, so that when the screw-threaded cap is inserted a vacant space is left between its end and the end of the nozzle.

The shell shown in Fig. 5 is the same as that in Fig. 2, except that the end or base is made in rounded form, so as to more readily resist the blows in the tamping operation.

Figs. 6 and 7 show shells with the nozzle at one side, and with the end of the shell convex in Fig. 6 and concave in Fig. 7.

The shell shown in Fig. 8 is intended to receive a charge at each end, each end being internally and externally threaded, and the nozzle B formed at its mid-length to receive the threaded cap *d* and fuse *e*. The nozzle in this case extends through or across the inner space of the shell. Fig. 9 is the same, except that the nozzle extends only partly into the shell.

In Fig. 10 a double shell is shown with a nozzle, B, that is threaded to receive the end of the fuse, and the fulminating material is placed in the nozzle without the use of a cap, the neck *b* being provided, as shown in Fig. 1, to prevent any contact between the fuse and the fulminating material.

In Fig. 11 a double shell is formed by two shells or sections, A A′, screwed one upon the other, the nozzle B being formed upon the end of one of the sections.

In Fig. 12 a double shell is formed by the two sections A A′, connected by a central section or thimble, *f*, which is externally and internally threaded upon one end and plain upon the other end; or, if desired, the middle section may be screw-threaded on each end, as found most convenient.

In Fig. 13 the shell A and its nozzle B are formed with internal threads, only their outer surface being plain and smooth, and around the nozzle B is fitted a wad, *m*, of leather, felt, rubber, or other suitable material. The wad gives additional safety in the tamping of the charge, as the elasticity of the wad will resist the blows of tamping and prevent concussion.

In Fig. 14 the nozzle is covered by a tube, *n*, and the threaded shell A is also provided with a cover, *o*.

In Fig. 15 is shown a shell similar to those shown in Figs. 1 and 2, and adapted for receiving the threaded firing-cap *d* shown in Figs. 3 and 4 and separately in Fig. 16.

It will be understood that a shell in any of the forms named is to be used according to the circumstances or the character of the work being done. I do not limit myself to a shell in any of the forms shown, as the different features may be combined together and arranged as found most convenient and desirable.

I do not abandon or dedicate to the public any patentable features set forth herein and not hereinafter claimed, but reserve the right to claim the same either in a reissue of any patent that may be granted upon this application or in other applications for Letters Patent that I may make.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A screw-threaded blasting-shell having a screw-threaded nozzle or tube, substantially as herein shown and described.

2. In safety-shells, the tube or nozzle B, for receiving a fuse, formed with an annular inwardly-projecting shoulder or neck, *b*, forseparating the fuse from the fulminate or fulminate-cap, substantially as herein shown and described.

3. A screw-threaded blasting-shell having a screw-threaded nozzle, in combination with a threaded firing-cap, substantially as herein shown and described.

4. A screw-threaded blasting-shell formed with a screw-threaded nozzle or tube at one side, substantially as herein shown and described.

5. A double screw-threaded shell for blasting, formed with a screw-threaded tube or nozzle at its mid-length to receive a fuse for firing charges in both ends of the shell, substantially as shown and described.

6. The combination, in a blasting-shell, of the screw-threaded sections A A′, provided with a screw-threaded nozzle or tube, B, substantially as shown and described.

GEORGE FREUND.

Witnesses:
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GEO. W. MELVILLE.