

GANSTER & SCHUYLER.

Shell-Fuse.

No. 42,082.

Patented Mar. 29, 1864.

Fig. 1.



Fig. 2.



Fig. 3.



Witnesses,

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN CONCUSSION-BULBS FOR FUSES.

Specification forming part of Letters Patent No. 42,082, dated March 29, 1861.

To all whom it may concern:

Be it known that we, GEORGE P. GANSTER and ISAAC S. SCHUYLER, of the city, county, and State of New York, have invented a certain new and useful Improvement in Fuses; and we do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side view of our improved fuse. Fig. 2 is a similar view, with the paste or coating, hereinafter referred to, removed. Fig. 3 is a central section of the same.

Similar letters of reference indicate corresponding parts in the several views.

The subject of this invention is a fuse consisting of a hollow bulb or vessel, of glass or other frangible material, containing sulphuric or other suitable acid, and provided on the exterior with a coating or paste composed of chloride of potash and sulphur, or other equivalent chemicals which will generate heat and combustion by contact of the acid, caused by the breaking of said bulb.

In order that others skilled in the art to which our invention appertains may be enabled to fully understand and use the same, we will proceed to describe it.

In the accompanying drawings, A may represent a fuse formed of glass or other frangible material, and provided with a small neck or tube, *a*, having an opening at top to facilitate the introduction of the acid to be employed. This fuse is, by preference, made in the form of a bulb or pellet, as illustrated; but it may be made in any other form which convenience or experience may render desirable. The bulb thus formed is filled with sulphuric acid through the opening in the neck *a*, when said opening is hermetically sealed or closed by means of a blow-pipe, or in any other suitable manner. The exterior of the bulb is then covered with a paste consisting of chloride of potash and sulphur, when the article is ready for use.

This fuse is designed to be employed in connection with a shell or grenade of any size to be thrown by a gun or cannon or by hand, and to ignite the explosive material with which it may be surrounded by the breaking of the

bulb, and consequent contact of the acid with the chloride. For this purpose the bulb may be deposited within a chamber separate from the main exploding-chamber, but communicating therewith through stoppered apertures, and having a small quantity of gunpowder or other explosive material and a sliding plunger or a number of small bullets or balls placed therein, so that when the shell or grenade is fired from a gun or thrown by hand the concussion produced by the contact thereof with the ground or any opposing body will cause the plunger or balls to break or crush the bulb. The heat evolved by the contact of the acid and chloride will ignite the sulphur, and the latter communicate combustion to any surrounding explosive substance. This explosion will expel the stoppers from the apertures leading into the main exploding-chamber and cause the ignition of the charge in the latter.

We are aware that percussion-fuses have long been in use consisting of frangible tubes hermetically closed, and containing sulphuric acid and covered with cotton soaked in a composition of chlorate of potassa, sulphur, and sugar moistened with alcohol. We therefore do not claim, broadly, the use of a frangible bottle as means of carrying two substances, which, being thrown into contact by the breaking of the bottle, will thereby produce combustion.

Our invention is superior to those previously in use both in cheapness and efficiency.

The manner of applying the chloride of potash in the form of a paste covering the exterior of the bottle renders it less liable to become detached in transportation and causes it to offer less impediment to the breaking of the bottle. Its peculiar shape also adapts it to operate with greater certainty. A narrow neck or stem is necessary, in order that it may be readily closed by fusing the end; and the main part of the flask or bulb is made in globular form, so that in whatever direction a hard body may strike the blow will be so nearly perpendicular to the surface as to render the fracture certain.

This feature of the invention is of great importance in grenades or other shells which may strike in an uncertain position or direc-

tion, and also in shells where a number of balls or hard bodies are employed, instead of a sliding plunger, for breaking the fuses.

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

A percussion-fuse consisting of a pear-shaped bulb formed of glass containing sulphuric acid hermetically sealed, and having on its

exterior a paste composed of chloride of potash and sulphur, all as herein described, and for the purpose specified.

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