

# UNITED STATES PATENT OFFICE.

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## IMPROVED COMPOSITION FOR EXPLOSIVE SHELLS.

Specification forming part of Letters Patent No. 39,746, dated September 1, 1863; antedated September 19, 1862.

*To all whom it may concern:*

Be it known that I, JONATHAN P. PERRY, a citizen of the United States of America, and a resident of Foxborough, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Explosive Shells or Compositions Therefor; and I do hereby declare the nature of my said invention to be fully described as follows:

The shell to which my invention appertains is shown in transverse section in Figure 1 of the accompanying drawings, in which A and B are two hollow spheres, one of which is placed within the other and united to it by three or any other suitable number of arms *ee* *f*, through one, *f*, of which there is a fuse-passage, *a*, the whole being so constructed as to completely insulate the two chambers *b* *c* of the two spheres from one another. The outer of these spheres has a charging-orifice made through it. Within the inner chamber, *b*, a charge of gunpowder, or some other suitable explosive material, is to be placed, and to be furnished with a fuse such as is ordinarily used in shells for ordnance. The other or outer chamber is to contain a liquid composition, composed of the following ingredients, in the proportions as set forth, or in such others as circumstances may require—that is to say, such composition consists of one quart of alcohol, one-half a pound of powdered sulphur, and one quart of spirits of turpentine, the whole being mixed together. This composition may be used alone in the outer shell-chamber, or with cotton, flax, or other light fibrous matter, placed within the chamber in a loose state. The object of so using the cotton or such like material is to keep the sulphur diffused throughout the liquid and about the chamber in order to prevent the sulphur from settling and compacting in any one part of the chamber. Furthermore, the cotton serves as a carrier of the sulphur, when in combustion and during discharge of it from the shell, and is useful in other respects.

The mixture of alcohol and spirits of turpentine is an explosive as well as a combustible composition, when set fire to by the exploding charge of the inner chamber, operates therewith to explode the outer case of the shell. Much of the liquid, however, will be scattered in all directions, with pieces of the

shell, and while in an inflamed state will be thrown on any object or objects at or toward which the shell may be discharged from a mortar or piece of ordnance. The effect of this will be to set fire to such object or objects. A shell so made and charged may often be employed with great destructive as well as advantageous results, particularly when exploded among cavalry, as the inflamed liquid scattered upon the horses, as well as upon the men, will operate to render the animals unmanageable, and thereby create confusion in the ranks. Furthermore, a shell of such description, when fired at infantry or artillery, or into a vessel or a building, will so scatter its burning contents on exploding as generally to set fire to whatever they may fall upon.

By the employment of a liquid explosive charge in a shell, and with a solid or gunpowder firing-charge, arranged within the body of such liquid charge, the liquid charge can be employed to great advantage in bursting the outer case of the shell. A very small firing-charge will suffice to effect the rupture of the inner shell and the explosion of the liquid charge. I would furthermore remark that, preparatory to charging the outer case with the liquid charge, bullets or various other missiles may be introduced into it, the liquid charge being employed to fill up the spaces or interstices between them. In this way the destructive effects of the shell will be increased, as it will combine the advantages of the shrapnel-shell with others, to which reference has heretofore been made. Fig. 2 represents a section of a shell thus made. In this figure A B are the shell-cases, *b* being the firing-charge, *c* the double charge of balls and the liquid explosive composition, the latter being shown in red color.

I am aware that alcohol, spirits of turpentine, kerosene, benzole, and various other inflammable liquids have been used either alone or in connection in explosive shells. I am also aware that a solid compound of sulphur and niter has been used in an explosive shell. Therefore, I do not claim any such applications of such substances, my invention differing materially therefrom, as I employ sulphur in a powdered state, in connection with an explosive liquid composition of alco-

hol and spirits of turpentine, the sulphur when therein retaining its state of powder. I also employ, with the sulphur and explosive fluid, as described, cotton or a fibrous material, and a series of bullets or balls, in order to diffuse the sulphur and keep it from packing, and to be productive of advantages in other respects.

What, therefore, I claim as my invention is—

1. A liquid shell-mixture, as made of pow-

dered sulphur, and an explosive liquid or composition of alcohol and turpentine.

2. The combination, as described, of cotton, or a like material, or a series of bullets or balls, with the sulphur, when combined with an explosive liquid composed of alcohol and spirits of turpentine, and used in a shell provided with a bursting-charge, as explained.

Witnesses: JONATHAN P. PERRY.

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