T. P. SHAFFUER.

Lightning Rod.

No. 87,371. Patented March 2, 1869.

Fig. 1.

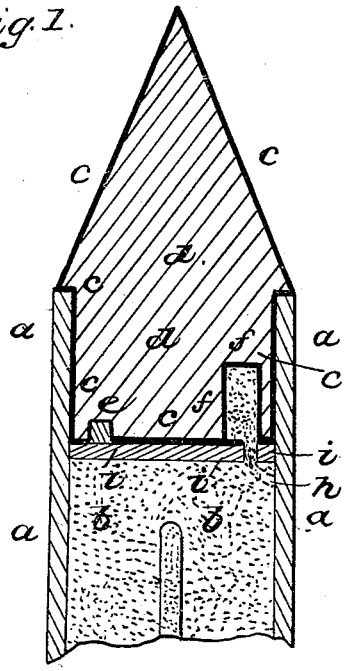
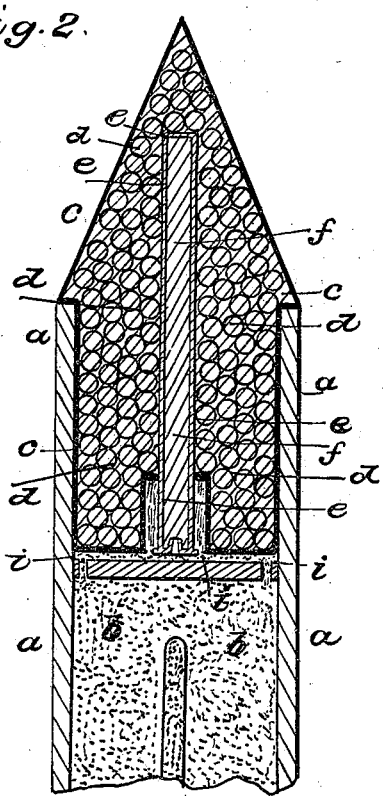


Fig. 2.



Witnesses

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TALIAFERRO P. SHAFFNER, OF LOUISVILLE, KENTUCKY.

Letters Patent No. 87,371, *dated March* 2, 1869.

IMPROVEMENT IN WAR AND SIGNAL-ROCKETS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, TALIAFERRO P. SHAFFNER, of Louisville, Jefferson county, and State of Kentucky, have made new and useful Improved "War and Signal-Rockets;" and I hereby declare the following to be a full and exact description of the same, their nature and description, sufficient to enable one skilled in the arts to construct the same.

The nature of my invention consists in the charge and construction of war and signal-rockets, so as to be far more effective than has hitherto been accomplished by rockets, more fatal in battle by scattering metal, and, as signals, by making very loud reports in the air. The former, I style "The Shaffner War-Rocket," and the latter, "The Shaffner Signal-Rocket."

Figure 1 represents "the Shaffner signal-rocket," charged with nitroleum, commonly called nitro-glycerine, or other equivalent combustible liquid, and fastened to or at the top of the ordinary rocket-casing.

a a represent the rocket-casing, ordinarily made of paper.

b b, the rocket-composition, made according to the known rules.

c c is the cone, or nitroleum-casing, made of tin or any desired metal.

d d is the nitroleum charge.

e is the orifice and stopper, which, for durability should be covered with gut, India rubber, or other substance that will not be subject to the action of acids.

f f is a projecting tin tube, in which is packed gun-cotton or gunpowder, *g*, with the train-fuse *h* to connect with the rocket-composition.

i i is a layer of clay, to prevent an untimely explosion, and to cap the rocket-composition.

When the rocket is ignited, its ascent will be as usual, and, when the fire reaches the gun-cotton, *h*, it rapidly spreads to the priming-charge *g*, which explodes the tube *f f*, and that will produce percussion sufficient to create at least 360° of heat, the temperature at which nitroleum explodes. The report produced by the explosion of two ounces in the air will equal the report produced by the discharge of a twelve-pounder cannon on the earth.

Figure 2 represents "the Shaffner war-rocket." Its construction is somewhat similar to the signal-rocket.

a a may be either iron or paper; interior arrangement the same as described in fig. 1.

The casing *c c* may be made of tin.

d d are shot or fragments of metal.

e e is a tin tube, filled with nitroleum, *f f*.

Around the lower part of the tube *e e* is another strong tin casing, filled with gun-cotton or other suitable explosive substance, *g* and *h*. This tin case may be placed inside the nitroleum-tube *e e*, if desired.

In fig. 1, the priming-charge chamber is surrounded by nitroleum, and the walls of the chamber should have less resistance than the walls of the vessel containing the nitroleum, so that, on the bursting of the former, the walls of the two will be violently forced together, which will produce an explosion of the nitroleum by concussion.

In fig. 2, the nitroleum-tube should be of lesser resistance than the walls of the priming-chamber *g g*, so that, on the explosion of the priming-charge, the tube will burst and mingle or scatter the nitroleum in the confined flame of the priming-charge, by which process the nitroleum will be exploded by heat, that being, in this case, greater than 360° Fahrenheit, at which nitroleum explodes.

The fuse-charge may be at the top, and exploded by a percussion-cap, or the cap may be used to explode the nitroleum at the top or elsewhere, as desired.

i i is the train-fuse.

When the rocket-fire reaches the train-fuse, it immediately spreads to the tin case *g*, and explodes the nitroleum, which scatters the shot or metal with great force in all directions.

The signal-rocket can be used to communicate intelligence at a great distance. It produces a very loud report, which can be heard several miles, and the flame of fire, without smoke, can be seen at least ten miles in time of darkness. Exploding amidst cavalry, is very effective in producing consternation, and an explosion within five feet of a horse will produce his death. It will be useful at sea.

In case the rockets are not likely to be used for several months, the following conditions should be observed:

First. To prevent the bursting of the nitroleum-vessels by congelation, as that liquid freezes at 42° Fahrenheit, there should be space allowed for the usual expansion, say about one-ninth additional area.

Second. To prevent the formation of nitrous-acid gas or oxalic-acid salts, which result from a decomposition of the nitroleum, a small quantity of pure water should be put in each charge, say about one ounce of water to every ten or twenty ounces of nitroleum.

Third. The charged vessels, if convenient, should be stored so that the corks will lie above the water; and this can be effected by placing the corked end of the vessel uppermost, as, in that case, the water will remain at the top of the charge, it being lighter than nitroleum, the latter having a specific gravity of 1.6.

Having described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The construction of the walls of the priming-charge chamber *f f*, in fig. 1, or *g g*, in fig. 2, in or around the nitroleum, in such manner that the walls of the two apartments, as in fig. 1, will be forced together on the explosion of the priming-charge, or, as in fig. 2, by compressing the sides of the nitroleum-tube, by which, in both cases, the explosion of the nitroleum is effected by concussion.

2. The construction of the priming-charge chamber, as in fig. 1, in such manner that the walls of the same will burst on the explosion of the priming-charge, and allow the flame to penetrate the confined nitroleum charge, or, as in fig. 2, the tube containing the nitroleum shall burst on the explosion of the priming-charge, and thus scatter the liquid in the flame of the said priming-charge, by which, in both cases, the explosion of the nitroleum is effected by the required 360° of heat, Fahrenheit.

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Witnesses:
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