E. S. HUNT.

Pyrotechnic-Cartridge.

No. 217,534. Patented July 15, 1879.

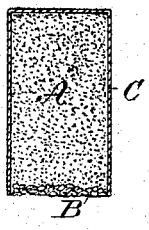

Fig. 1

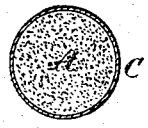

Fig. 2.

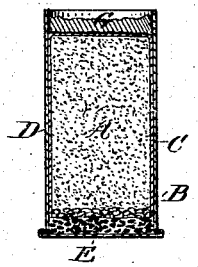

Fig. 3.

Witnesses:

Frankly Parker

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Inventor

Edmund S. Hunt

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his Attys.

UNITED STATES PATENT OFFICE

EDMUND S. HUNT, OF WEYMOUTH, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN T. LOVELL, OF SAME PLACE.

IMPROVEMENT IN PYROTECHNIC CARTRIDGES.

Specification forming part of Letters Patent No. **217,534**, dated July 15, 1879; application filed October 2, 1878.

To all whom it may concern:

Be it known that I, EDMUND S. HUNT, of Weymouth, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Pyrotechnic Cartridges, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, making a part hereof.

My invention consists mainly in a cylinder made of the proper chemicals to produce a star (so-called) of the required color, and having a fulminate at one end of it, by which it is ignited when shot from a gun or cartridge-shell.

In the drawings is shown a cartridge embodying my invention, in which—

Figure 1 shows a side view, and Fig. 2 a cross-section, of the pyrotechnic star—that is, the cylinder of suitable chemicals, which, when ignited, produce what is well known among makers of fire-works as a "star"—embodying my invention, Fig. 3 showing a cartridge-shell loaded with such a star, a charge of powder, and the usual priming.

A represents what is commonly called in this art a "star;" B, the fulminate; C, a covering of tin-foil or some like substance, for the purpose hereinafter described. D is a primed cartridge-shell in which my star is loaded, E being the charge of powder for shooting it, as now to be set forth.

My improved star is made of chemicals capable of producing a star of the desired color, such chemicals being well known to all skilled in the art of making fire-works. It is allowed to harden in substantially the shape shown and of a proper diameter to fit snugly in the shell or the barrel from which it is to be shot. To shoot such a star into the air from an ordinary fire-arm, only a little powder is required, enough to cover the bottom of an ordinary cartridge-shell or gun-barrel, if a muzzle-loader be used, being sufficient for the purpose.

The explosion of the powder is not sufficient to ignite the star with certainty, and some additional means must therefore be used for igniting the star. I therefore use a small quantity of some fulminate, placed at that end of the star which rests on the gunpowder, so that when the gunpowder is exploded the fulminate will be ignited, and thus insure the igniting of the star.

The fulminate used should burn comparatively slowly, in order to thoroughly heat the star and ignite it. The best fulminate for this purpose is composed of thirty-two parts of chlorate of potash, sixteen parts of sulphur, and one part of lamp-black, the whole being mixed with shellac dissolved in alcohol—that is, thin shellac-varnish—a sufficient quantity of the powdered chemicals being added to it to make it about the consistency of molasses. A fulminate mixed with shellac dissolved in alcohol attaches itself more firmly to the star, as the alcohol in which the shellac is dissolved permeates the end of the star and dissolves a little of the powdered shellac with which the star is mixed, after which the fulminate and the end of the star dry together, thus causing the fulminate to adhere firmly to, and be practically incorporated with, the star, which is important. By experiment I have found that one drop of this compound upon the end of a star of the kind above described will be sufficient to insure its ignition.

It is found that stars composed in part of chlorate of potash—*i. e.*, all stars for producing colored light—are liable to be exploded while being shot out of a gun or pistol. The cause of this explosion is the friction produced by the inside of the gun on the star when expelled by the powder, the friction being especially great after three or four discharges when the barrel has become foul. To obviate this difficulty the whole of the star, except that part which comes in contact with the gunpowder, and upon which is the fulminate, should be covered with some such material as tin-foil. I have found tin-foil the best for this purpose, as it gives greater weight to the star.

The star so formed is adapted to be loaded in a cartridge-shell, such as is ordinarily used to hold the powder and bullet for breech-loading guns and pistols, and may be used either as a means of signaling at night or in fire-

work displays. It requires a very small amount of powder to discharge it, and may be very easily and cheaply made.

When loaded in a cartridge-shell, the star should be kept in place and from the air by a drop of tallow or wax, G, Fig. 3.

What I claim as my invention is—

1. The improved star above described, composed of suitable chemicals A, and having a drop of fulminate, B, firmly secured to and incorporated with its base by shellac dissolved in alcohol, as described.

2. The improved cartridge above described, consisting of the primed cartridge-shell D, of usual construction and adapted to remain in the fire-arms, loaded with the expelling-charge E and the projectile A B C, the projectile being a star composed of suitable chemicals A and a drop of fulminate, B, adhering to its base, and wrapped with metal foil C, to prevent it from exploding by friction in the barrel of the fire-arm.

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Witnesses:

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C. H. SLADE.