J. J. DETWILLER.

PYROTECHNIC SIGNAL-CARTRIDGES.

No. 191,843. Patented June 12, 1877.

Fig. 1.

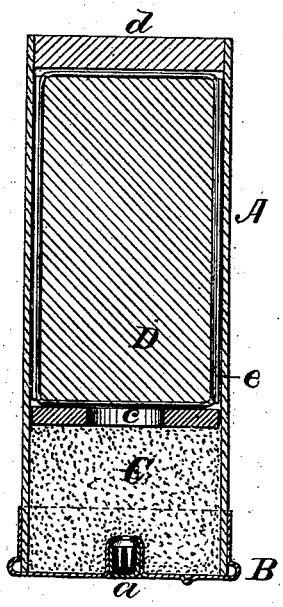


Fig. 2.

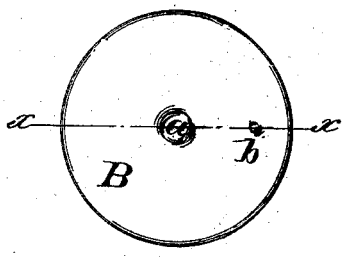


Fig. 3.

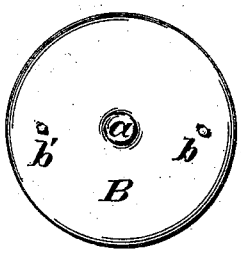
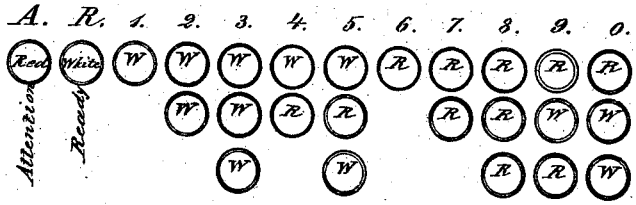


Fig. 4.



WITNESSES:

H. Rydquist

J. H. Scarborough.

INVENTOR:

J. J. Detwiller.

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JACOB J. DETWILLER, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN PYROTECHNIC SIGNAL-CARTRIDGES.

Specification forming part of Letters Patent No. **191,843**, dated June 12, 1877; application filed February 26, 1877.

To all whom it may concern:

Be it known that I, JACOB J. DETWILLER, of Jersey City, in the county of Hudson and State of New Jersey, have invented new and Improved Night-Signals, of which the following is a specification:

In the accompanying drawing, Figure 1 is a longitudinal section of a cartridge, taken on line *x x*, Fig. 2. Figs. 2 and 3 are end views. Fig. 4 represents the code adapted to the signal.

Similar letters of reference indicate corresponding parts.

My invention relates to night-signals for army, navy, railroad, and other purposes; and it consists, mainly, in a cartridge having the usual percussion-priming, and containing a propelling-charge of gunpowder, a perforated wad, and a cylinder or ball of highly-combustible composition, capable of giving out a red or white light when burned, and a closing wad, which completes the cartridge. It also consists in forming, on the percussion end of the cartridge, one or more projections, by which the color of the cartridge may be determined in the dark.

My invention further consists in a code to be used, in connection with the cartridges, by which two colors are made to represent numerals.

The object of my invention is to provide a convenient and effective signal of small dimensions, that may be readily carried about, and rapidly fired from a breech-loading pistol or gun, so that the operator may, by the simplest means, produce the desired signal.

Referring to the drawing, A is an ordinary paper cartridge-shell, having the flanged metallic end B, in which is placed an ordinary percussion-priming, *a*, and upon the surface of which one or two slight projections, *b b'*, are formed. A charge, C, of gunpowder is placed in contact with the percussion-priming *a*, and upon it there is a centrally-perforated wad, *c*, above which a cylinder, D, of highly-combustible composition is placed, and secured by a wad, *d*, which is fastened in the end of the cartridge-shell by a water-proof cement.

The cylinder D is made of such materials as are commonly employed by pyrotechnists in making fire-balls for emitting a colored light. It is grooved longitudinally on opposite sides and also around the ends to receive a fuse, *e*. This fuse consists of a continuous thin cotton wick wound many times around the cylinder, thus filling the grooves with an endless fuse, which is afterward saturated with a highly-combustible preparation or varnish, such as a solution of nitrate of potash.

The wad *d* that is placed in the end of the cartridge-shell and cemented with water-proof cement is painted to represent the color produced by the combustion of the cylinder contained by the cartridge.

By means of the projections *b b'*, formed on the percussion end of the cartridge, the color of the charge may be determined in the dark.

In the present case one projection indicates a white light, and two a red light.

Fig. 4 is a diagram of the signal-code, in which one white signifies 1, two whites 2, three whites 3, one white and one red 4, and so on, as represented in the drawing, W representing white, and R red.

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

1. The pyrotechnic signal herein described, consisting of a combustible material formed into a single mass or star capable of emitting one colored stream of light when propelled by an explosive charge of gunpowder, in connection with a primed and charged cartridge-shell adapted for use in an ordinary fire-arm, as and for the purpose set forth.

2. The herein-described endless fuse for pyrotechnic stars or signal-balls, consisting of a thin cotton wick saturated with a combustible fluid or varnish and wound continuously around the signal-ball, as and for the purpose set forth.

3. The cartridge-shell having projections formed on the end to indicate the color of the signal at night, as herein set forth.

JACOB J. DETWILLER.

Witnesses:

GEO. M. HOPKINS,

ALEX. F. ROBERTS.