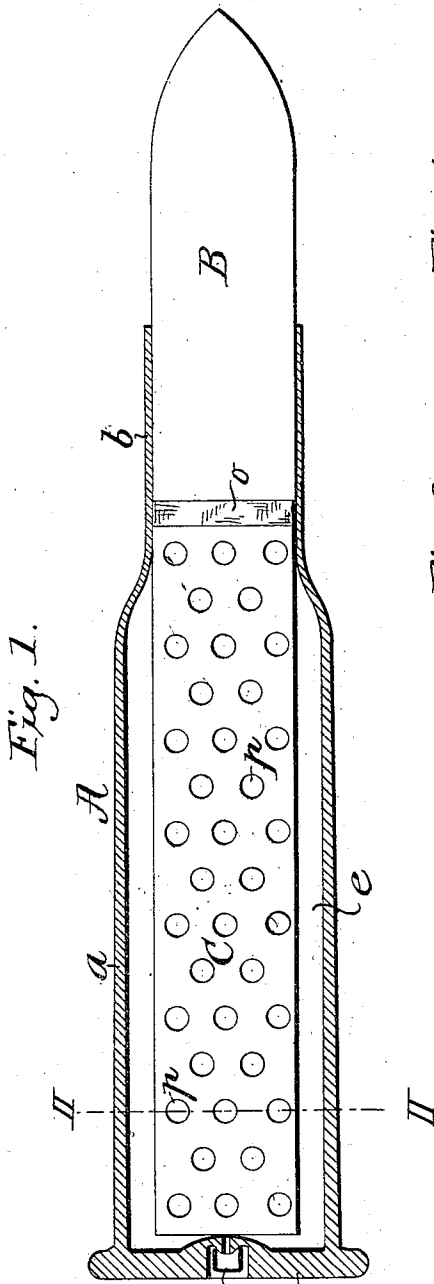


(No Model.)

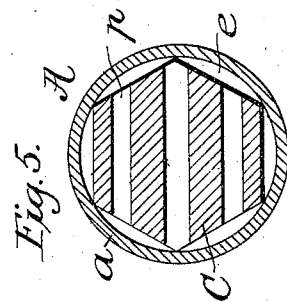
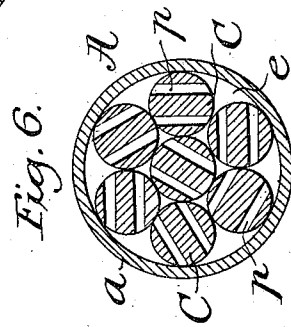
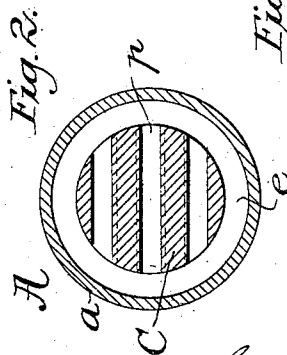
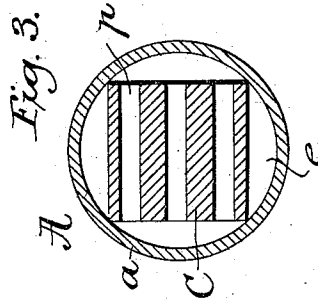
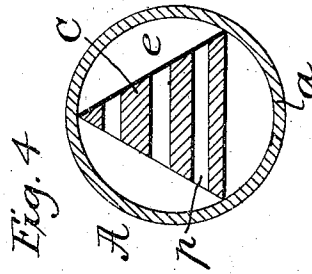
H. MAXIM.
CARTRIDGE.

No. 547,222.

Patented Oct. 1, 1895.



Witnesses:
J. E. Hutchinson
Joe H. Melans



Inventor:
Hudson Maxim
by *Graham & Low*
attys

UNITED STATES PATENT OFFICE.

HUDSON MAXIM, OF NEW YORK, N. Y.

CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 547,222, dated October 1, 1895.

Application filed April 13, 1895. Serial No. 545,607. (No model.)

To all whom it may concern:

Be it known that I, HUDSON MAXIM, a citizen of the United States of America, residing at the city, county, and State of New York, have invented certain new and useful Improvements in Cartridges, of which the following is a specification.

This invention relates generally to cartridges for guns and the like, and more particularly to the powder or explosive charge for such cartridges, it being understood, however, that the charge may be manufactured and made an article of commerce independent of a casing or carrier and ready to be combined therewith or to be otherwise used.

The improvement contemplates, preferably, the use of a powder-charge of an impervious nature—that is to say, impervious to the gases of combustion—as distinguished from charges which are granular or friable in structure, though of compressed or cake form, such impervious powder being, for instance, of the character described in my Letters Patent No. 411,127, dated September 17, 1889, consisting of an impervious colloid of pyroxylin made by means of a volatile solvent of the pyroxylin, with or without an admixture of nitro-glycerine and constituting an amorphous solid, or mass, which, while in plastic condition, is capable of being shaped, molded, pressed, or rolled to any desired form.

In carrying out my invention this impervious powder-charge is formed, preferably, into more or less long rods or strips of any desired shape and in cross-section, being either of round, prismatic, oval, or other form, each rod, piece, or strip having a plurality of parallel perforations extending crosswise or transverse of its length, the perforations being preferably arranged in series, the perforations of one series alternating with those in the other, and in this manner provide equal masses of the explosive between the perforations, so that during combustion, as the perforations gradually enlarge, increased combustion-surface is presented and the entire mass or charge is finally consumed throughout its extent simultaneously. These rods, pieces, or strips may be formed of the required diameter, preferably approximating the length of the powder-chamber of the gun or in such lengths as will

adapt them to a casing or carrier, and may also be of such size that a single rod or strip may be used as a charge or a plurality of rods or strips employed as a charge. Such an explosive charge may be ignited at the end by any suitable means, such as a fulminate-cap and an igniting disk or charge in the base of the shell.

In order to aid a more ready understanding of the improvement, a detailed description thereof will now be given, reference being had to the accompanying drawings, forming a part thereof.

In said drawings, Figure 1 is a longitudinal sectional view of a cartridge-charge embodying my invention. Fig. 2 is a transverse section on the line 2 2 of Fig. 1. Figs. 3 to 5, inclusive, are similar sections showing different forms of the charge. Fig. 6 is a like section illustrating a charge composed of a plurality of rods of any proper shape.

Referring to the drawings, the improvement is illustrated with a cartridge shell or case A, of any suitable form, having, for instance, a body portion *a*, which near its forward end contacts to a neck *b*, that is arranged to receive a ball or projectile B and a wad *o*, while the rear end of the shell has a closed head *c*, providing a seat for a suitable fulminate-cap *d*, as is common.

The powder-charge C is preferably prepared in the form of a rod or strip of any proper shape in cross-section and of a diameter that will permit the rod or strip to be readily loaded into the shell through the open end of the neck *b*, and of a length suited to extend from the head *c* of the shell to its contracted or neck portion *b*, such neck, if thought desirable, affording a support for the charge to hold it in a central position with respect to the larger diameter or body portion *a* of the shell, and thus provide a surrounding chamber *e* for the passage of the initial flame of combustion from the fulminate-cap to the perforations of the charge. This charge C is formed with a plurality of parallel perforations P, extending transversely through the charge or in a direction across the greatest length or axis of such charge. The perforations are arranged preferably in series, the perforations of one series alternating with those of the other, and thus

provide equal masses of the powder between the perforations to insure the uniform consumption of the entire charge.

The improved explosive charge, in addition to the well-known advantages incident to the use of long rods or strips of powder approximating the length of the powder-chamber of the gun, provides a structure perforated transversely of its greatest length with a large number of short parallel holes to obtain the uniformly-increasing burning-surface for securing the greatest accelerating effect upon the projectile, and the shortness of the holes prevents the charge from being disrupted or broken up during combustion by the pressure of the gases within the perforations, such disrupting action exploding the powder and bursting the rods or strips into fine pieces.

Some of the different forms which the rod or strip-like charge may take are shown in the drawings. Thus in Figs. 1 and 2 the rod is cylindrical, in Fig. 3 it is square, in Fig. 4 it is prismatic, in Fig. 5 it is hexagonal, and in Fig. 6 a number of rods of any shape in cross-section are associated together to form a charge for a gun or the like.

The manner of making the perforated charge I consider immaterial; but it may be stated that the rod may be formed by pressing the material while in a more or less plastic condition through a suitably-shaped die, such rod being then perforated with the transverse holes and cut into suitable lengths, or

the explosive material may be rolled into sheets, the holes either being molded in the sheets or formed therein by suitable perforators and the sheet cut into strips of a size adapting the strips to form a charge.

What I claim is—

1. A charge for a cartridge consisting of an explosive in the form of a rod or strips having a plurality of parallel perforations extending at right angles to or transversely across its greatest length or axis, as set forth.

2. A charge for a cartridge consisting of an explosive in the form of a rod or strips, having a plurality of parallel perforations extending at right angles to or transversely across its greatest length or axis such perforations being arranged in series, the perforations in each series alternating with those in the other, as described.

3. A cartridge containing an explosive charge in the form of longitudinal rods or strips each having a plurality of transverse parallel perforations, whereby when the cartridge is inserted in the bore of a gun said perforations will extend in a direction at right angles to the longitudinal axis of the bore.

In witness whereof I have hereunto signed my name in the presence of two witnesses.

HUDSON MAXIM.

Witnesses:

H. N. LAW,
GEO. H. GRAHAM.