B. CAMET.
CASE SHOT FOR SHOTGUNS.
APPLICATION FILED FEB. 28, 1907.

900,913.

Patented Oct. 13, 1908.

FIG_1

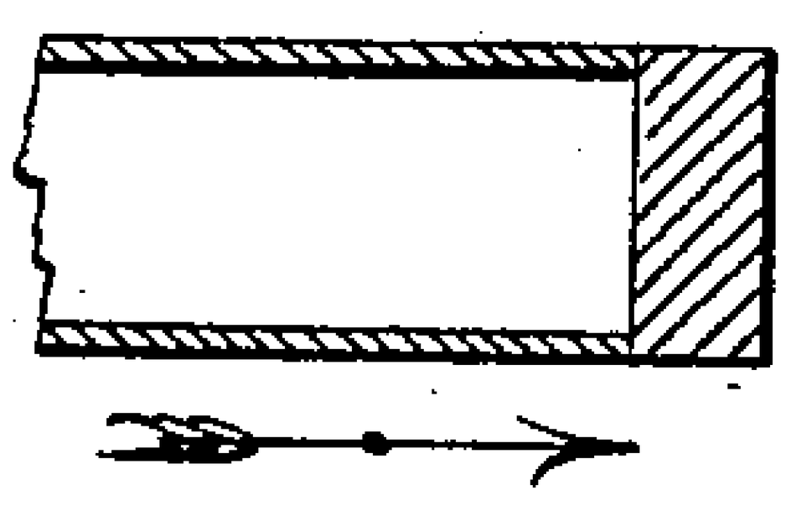


FIG_2

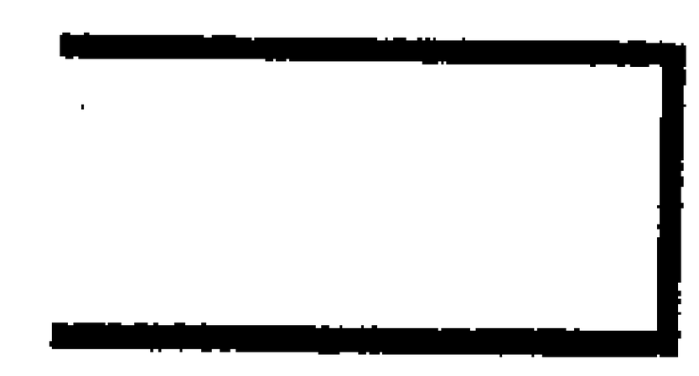


FIG_3

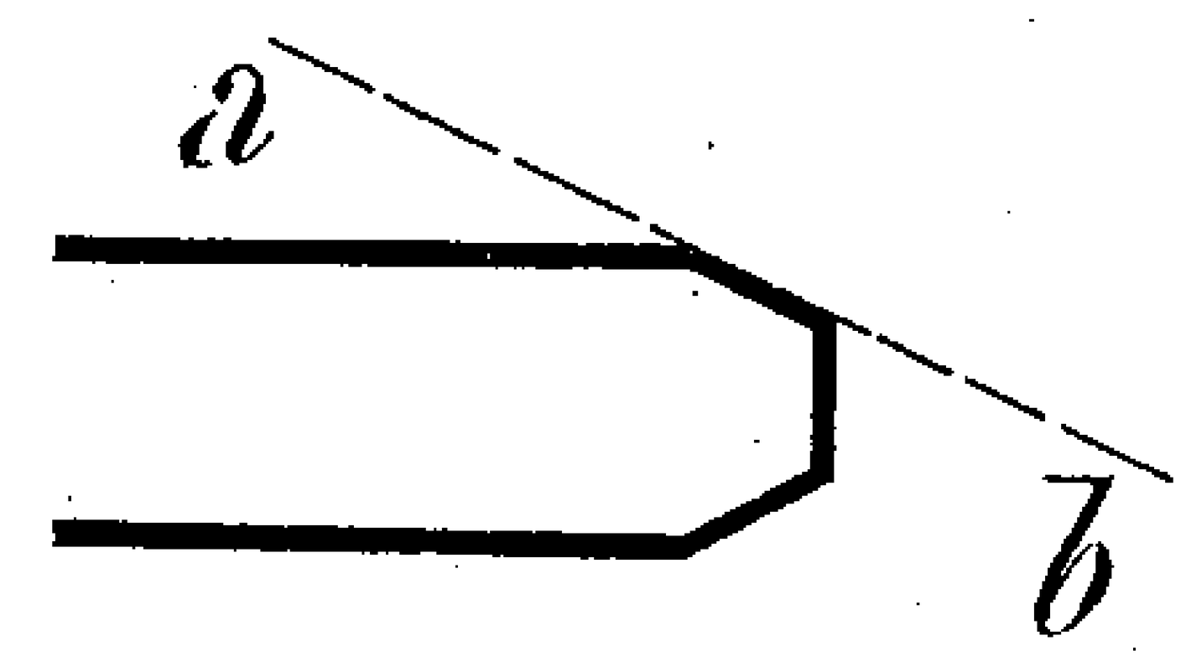


FIG_4

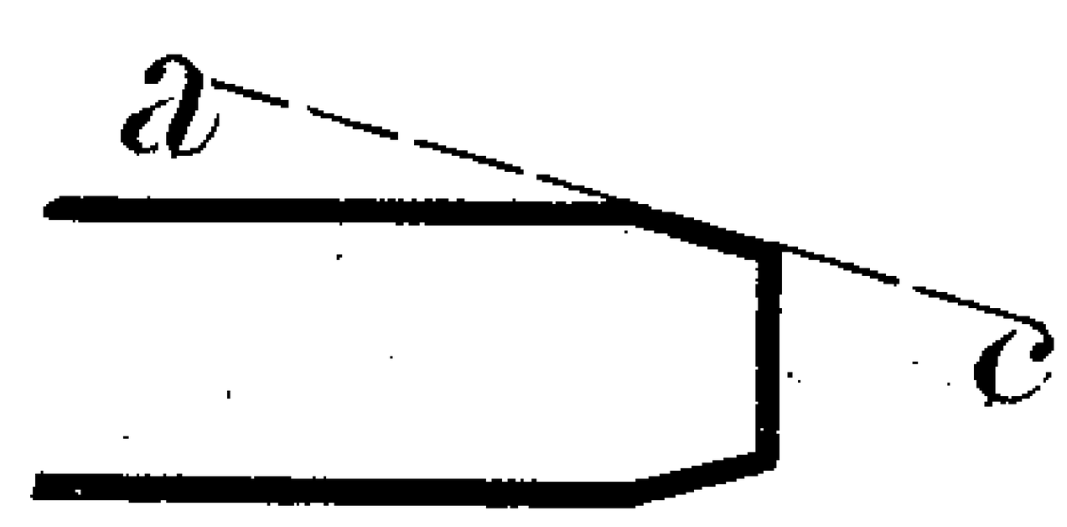


FIG_5

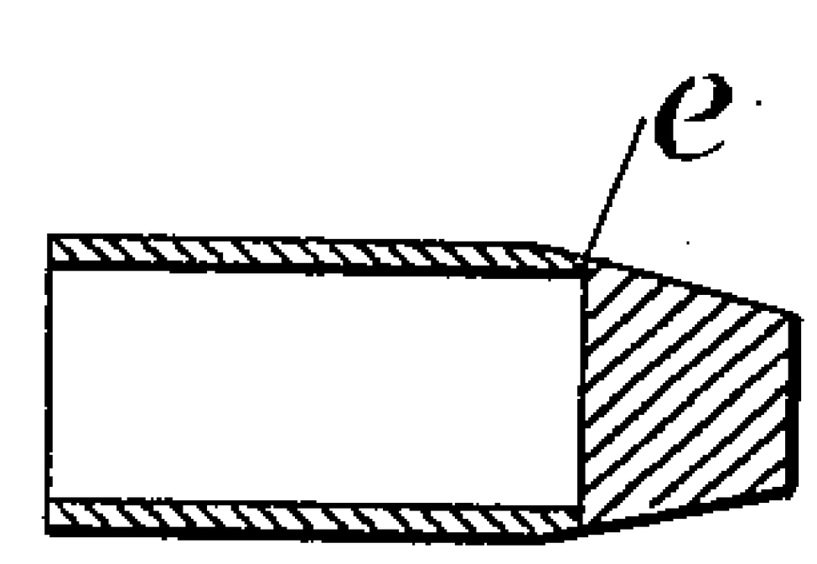


FIG_6

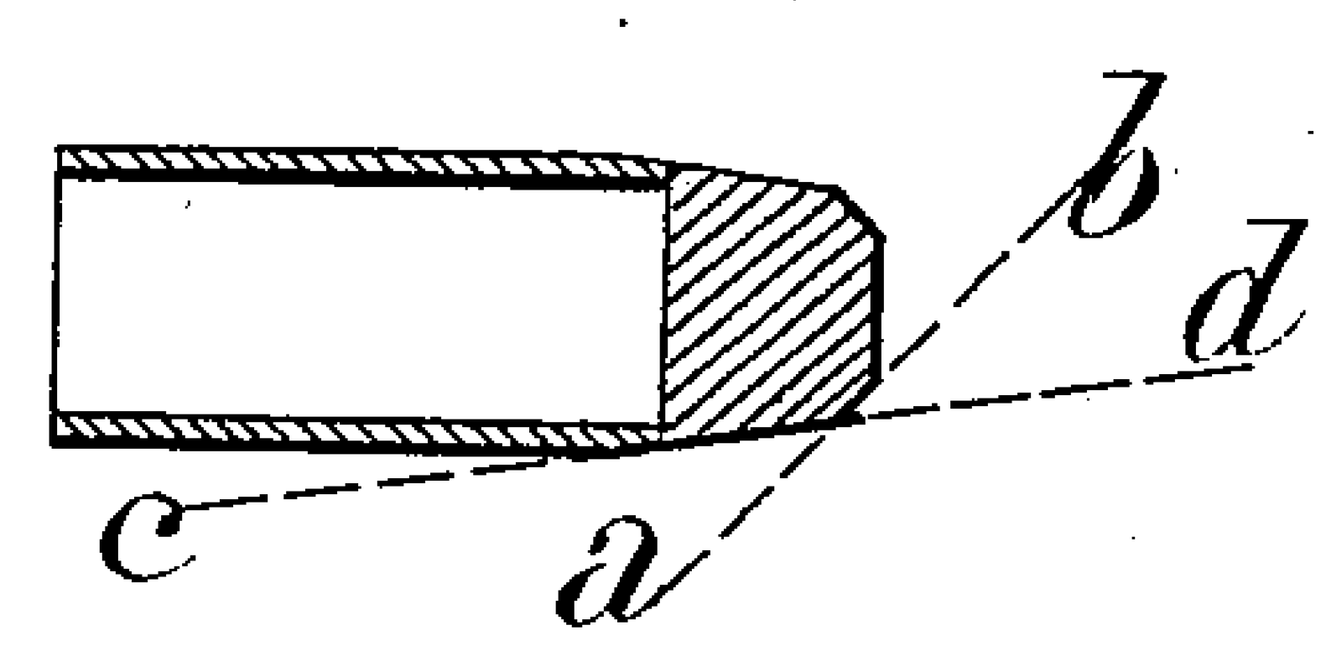


FIG_7

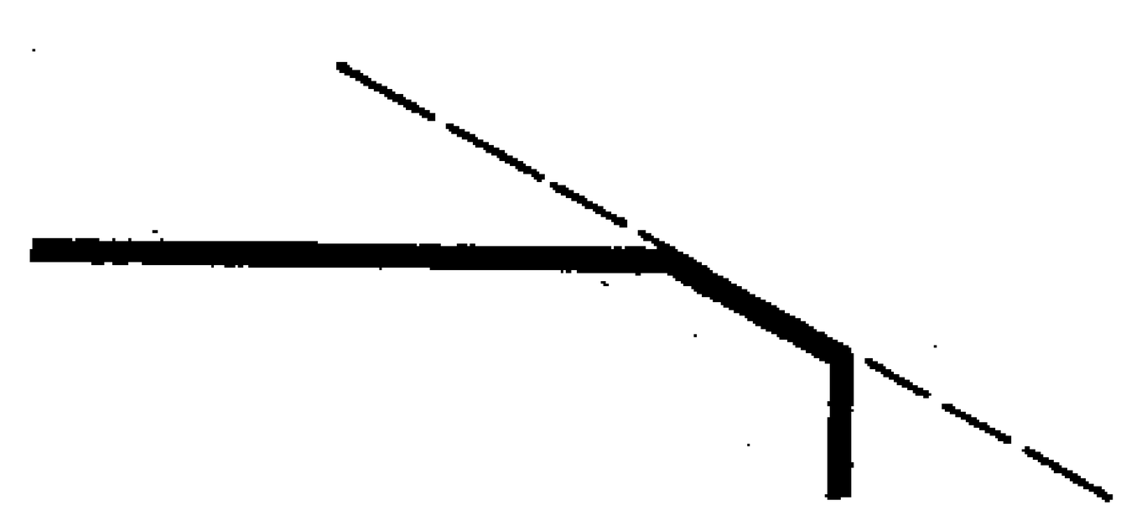


FIG_8

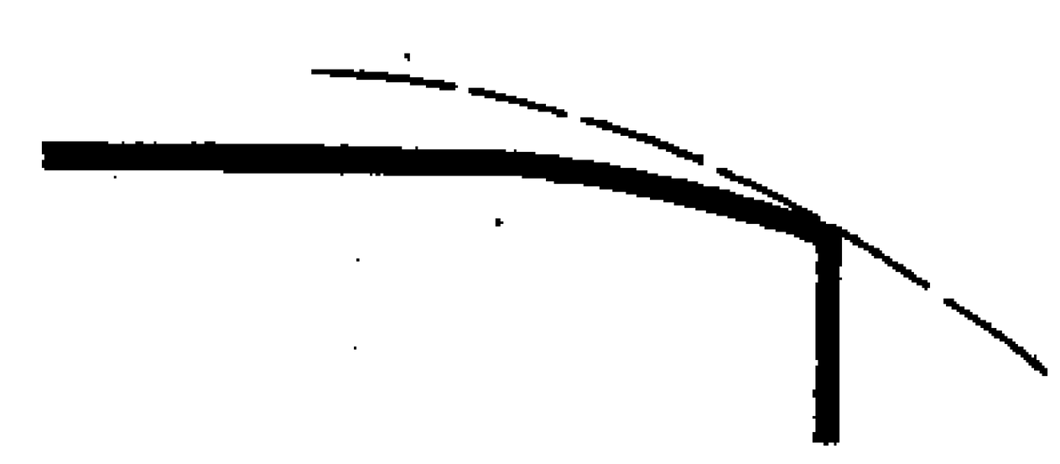
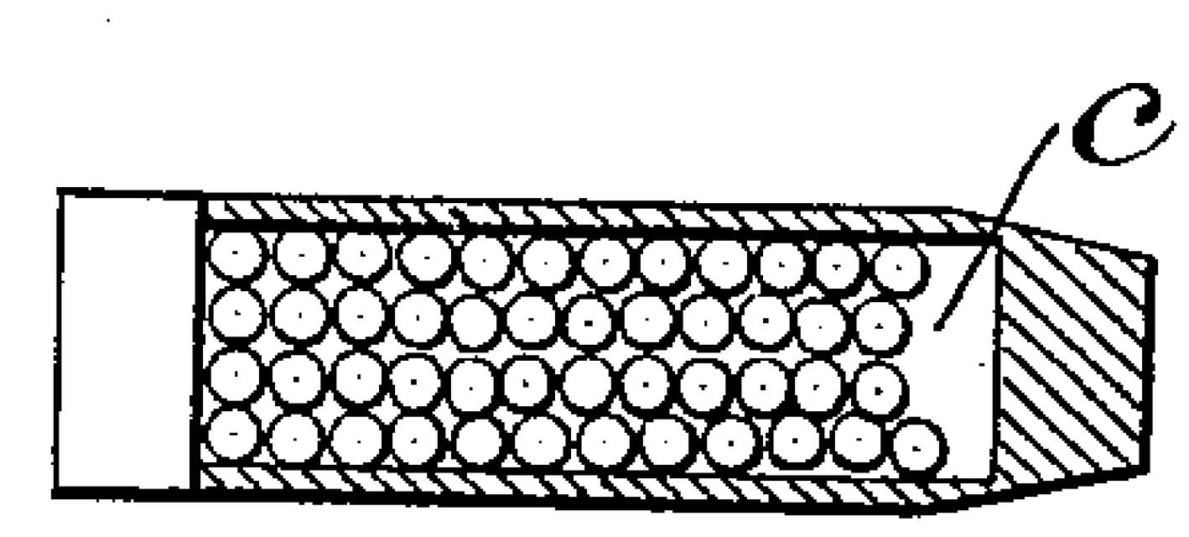


FIG_9



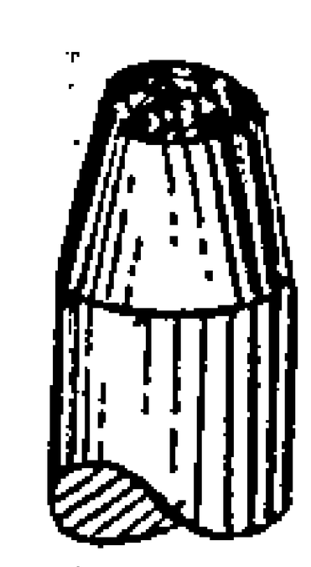


FIG_18

FIG_10

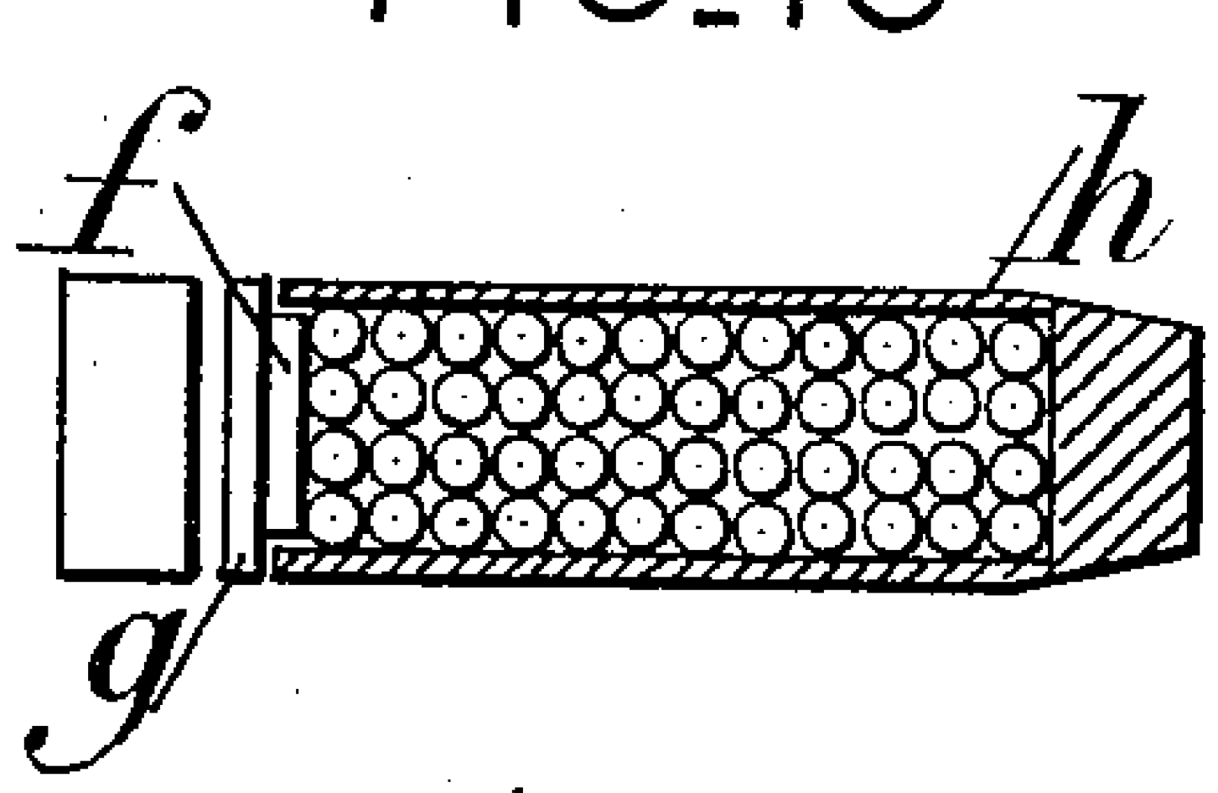


FIG_12

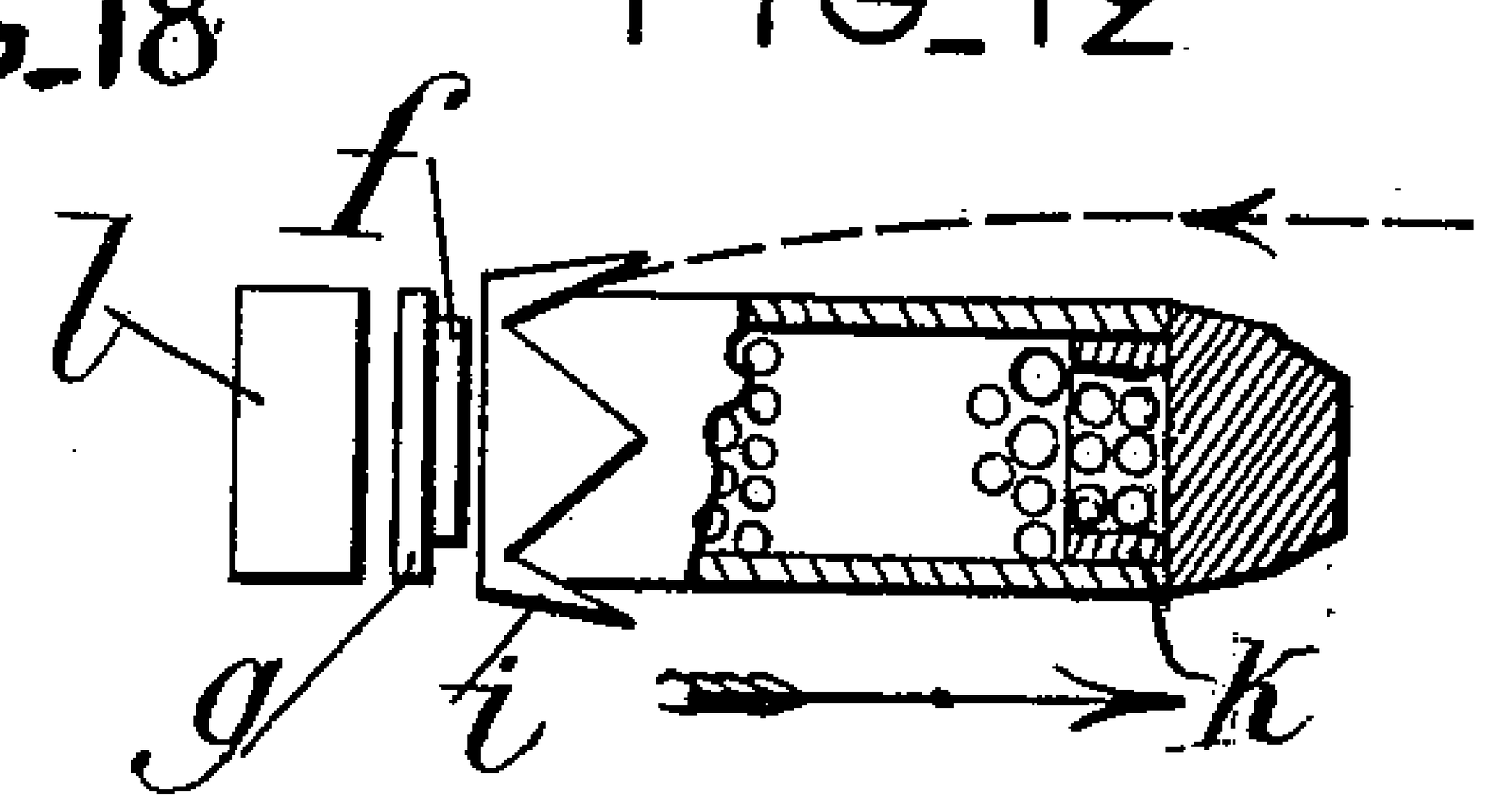


FIG_11

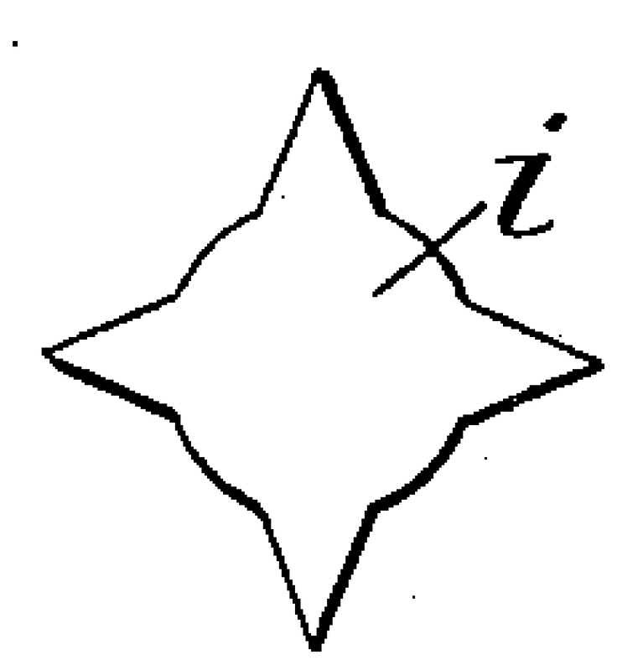


FIG_13

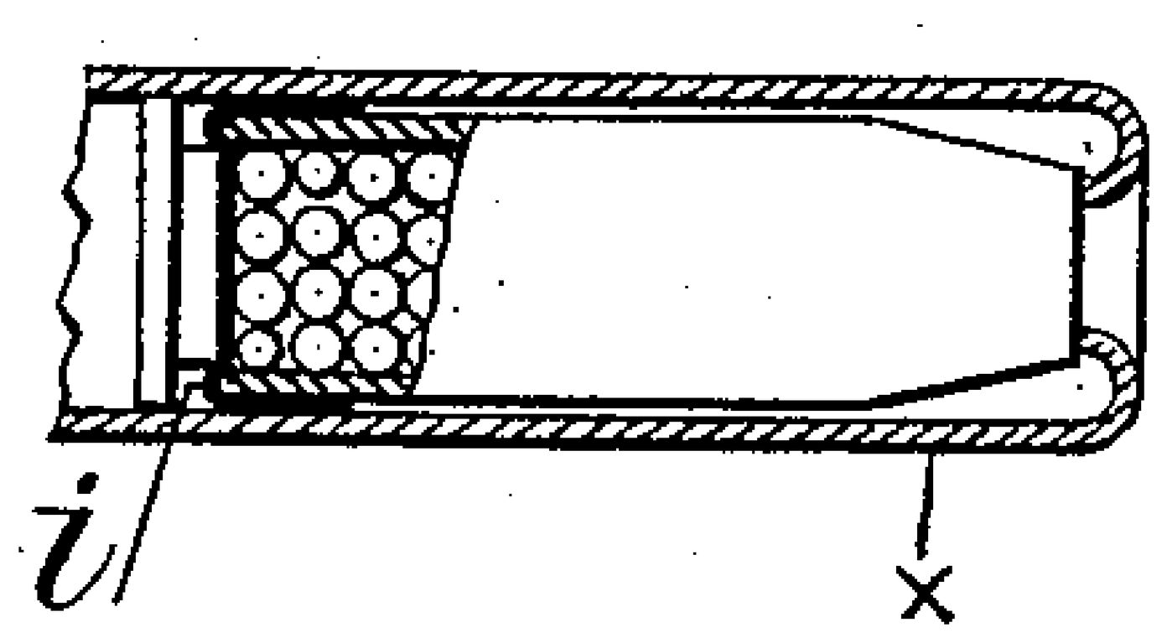


FIG.14

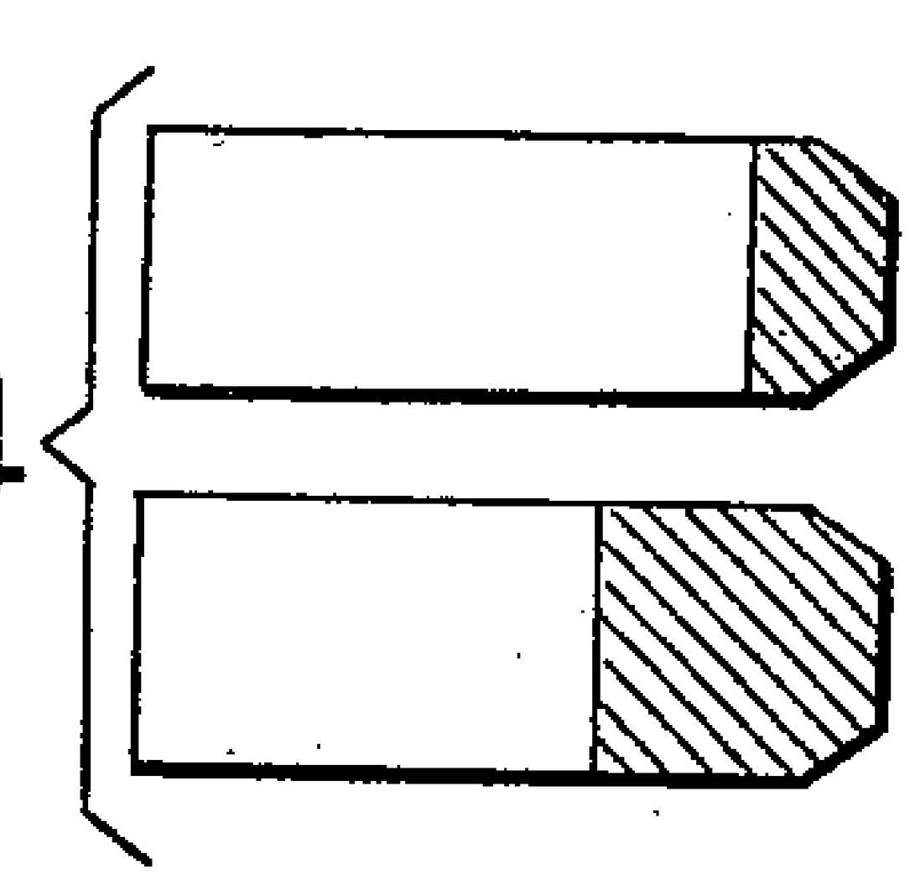


FIG_15

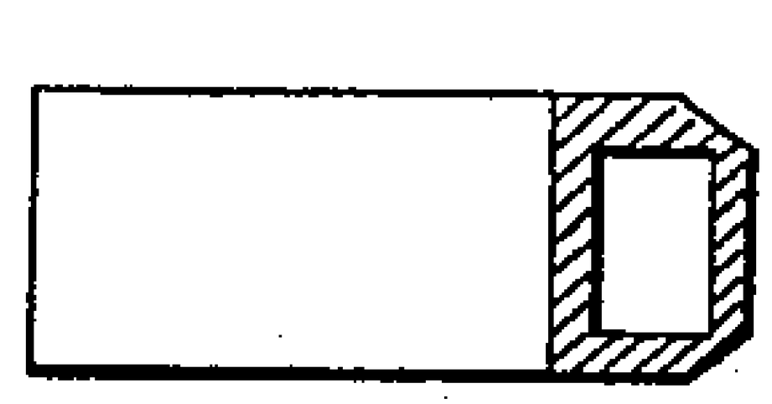


FIG_16

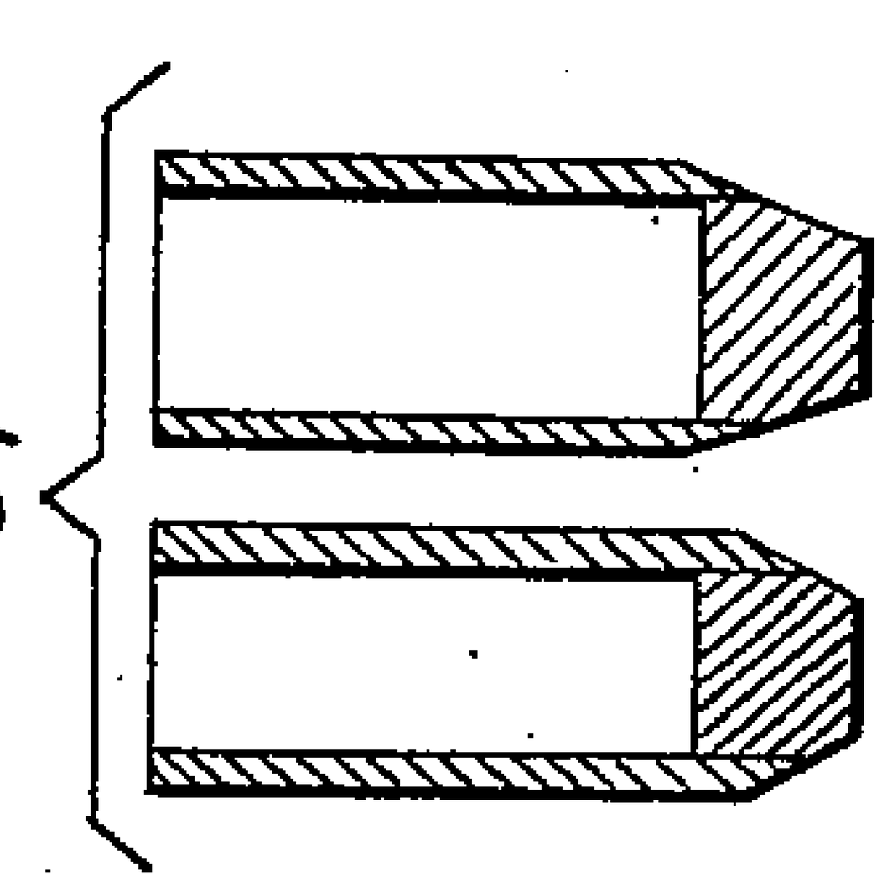
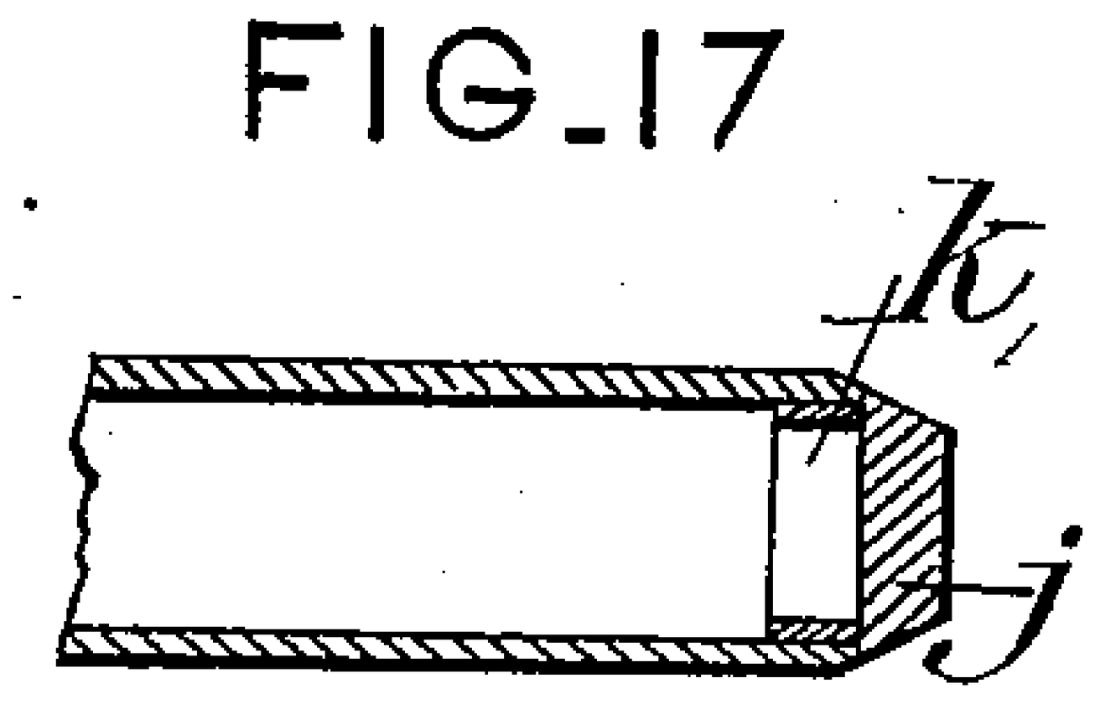


FIG_17



WITNESSES
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UNITED STATES PATENT OFFICE.

BLAISE CAMET, OF LYON, FRANCE.

CASE-SHOT FOR SHOTGUNS.

No. 900,913. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed February 28, 1907. Serial No. 359,923.

To all whom it may concern:

Be it known that I, BLAISE CAMET, a citizen of the French Republic, residing at Lyon, Rhône, France, have invented a certain new and useful Case-Shot for Shotguns, of which the following is a specification.

In shooting with shot-guns at long range it is a common practice to make a circular incision in the cartridge-case so that a portion of the case passes out of the barrel with the shot and temporarily holds the charge together; after traveling a certain distance this part of the case turns over and allows the charge to spread. It has also been proposed to use what may be called "tumbling" projectile, consisting of a cylinder closed at one end by a thick wad or plug engaged by the edge of the cylinder. The contrivances of this kind hitherto known are not reliable in their action, and are therefore of no practical value.

The purpose of the present invention is to provide a shell which is charged with shot and the action of which is regulated by the air-resistance and gravity so that it turns over at a predetermined moment and allows the shot to spread.

Figures 1 to 18 of the annexed drawings show various diagrams of cases or shells for shot, constructed according to this invention.

By suitably regulating certain features which will be enumerated hereinafter the improved shell can be caused to deliver, at different, predetermined ranges, approximately two thirds of its charge within a circle of 0.76 meters diameter.

The features referred to are the following:—1. The shape given to the nose of the projectile. 2. The degree of roughness of the nose and the degree of smoothness of the cylindrical part. 3. The manner in which the projectile is plugged. 4. The position of the center of gravity and the distribution of weight per unit of section.

The part which is referred to as the nose is the closed end of the cylinder. The open end of the latter will be referred to as the base. The projectile is always projected with the nose in front (Fig. 1).

1. If the nose is hemispherical or rounded the projectile turns over immediately on issuing from the gun barrel and the effect is the same as that of an ordinary cartridge. To prevent immediate reversal and hold the charge together while it is completing a portion of its trajectory the surface of the nose must be flat; the flat formation of this surface is preferably adapted in all the modifications which may be designed, but in some cases the nose may even be slightly concave.

In using a projectile which is perfectly cylindrical, like that shown in Fig. 2, a considerable amount of irregularity is observable in the delivery of the charge, though the nose of the projectile is flat. To secure greater regularity the stability of the projectile must be increased. This is effected by giving the front end of the projectile the form of a truncated cone (Figs. 3 and 4), the conicity depending on the effect to be produced. The degree of conicity also determines the surface area of the nose, to which the air-resistance is proportional, moreover the conicity determines the direction of the layers of air traveling past the sides of the projectile, as indicated by the lines *a*—*b* in Fig. 3 and *a*—*c* in Fig. 4.

If in order to reduce the air-resistance the surface of the nose is considerably reduced, the wall of the projectile is liable to be weakened at the part *e* (Fig. 5) since the internal shape must remain cylindrical. To obviate this, the front part of the projectile may be doubly coned; in Fig. 6 the lines *a*—*b* and *c*—*d* indicate the slopes of the two conical parts. By this means the strength of the projectile remains unimpaired and two directions are given to the air-layers traveling past the projectile.

The generators of the cones may be straight (Fig. 7) or they may be curved as shown in Fig. 8 in order to impart another direction to the moving air surrounding the projectile.

2. *Nature of the projectile's surface.*—In order that the air resistance at the nose of the projectile shall have the same value for all projectiles traveling with the same velocity it is essential that the air does not glide over the nose-surface but is thrust forward by the latter, so that at a certain moment, when the deviation is sufficient, it is caused to instantaneously turn over. This result may be obtained by applying pulverized wool or cloth-shearings to the surface of the nose as shown in Fig. 18. By this means interstices are formed, which remain even after the application of pressure for closing the projectile. The air enters these interstices and is retained thereby. Any other suitable means can be used to produce the same result. In order that the air-resistance at the lateral parts of the projectile has

the same value for all projectiles traveling with the same velocity the sides of the projectiles must have a uniform degree of smoothness. For this purpose an alcohol varnish may be applied to the lateral surfaces, or other suitable means may be adopted for the same purpose.

3. *Closure of the projectile.*—At the moment when the cartridge bursts the shot contained in the shell is thrust against the wad of the cartridge, so that a vacuum is liable to be produced at *c*, Fig. 9. This vacuum interferes with the uniformity of the effect. To prevent the production of the vacuum the projectile is provided with a stopper (Fig. 10), the narrower part *f* of which is of somewhat smaller diameter than the interior of the projectile, so that it pushes the shot *h* into the interior of the projectile, without strongly compressing them, and the shot thus fills the cylinder during the passage of the latter out of the gun. The rear edge of the cylinder abuts against the part *g* of the stopper. If at the moment of reversal the stopper did not become detached the projectile would act as a bullet. To prevent this, a star-shaped piece of strong paper *i* (Figs. 11 and 12) is fastened to the stopper, so that the latter is detached when the projectile issues from the gun-barrel. Since the diameter of the projectile corresponds to the bore of the barrel, or is slightly smaller, the paper serves to somewhat tighten the joint between the projectile and the cartridge-case *x* (Fig. 13) so that there is no displacement of the parts when the cartridge is closed.

4. *The action of gravity.*—The effect of gravity depends on the position of the center of gravity, or on the distribution of weight per unit of section of the lateral part of the projectile. Various means may be adopted for controlling the position of the center of gravity. For example, shells of equal length may be made of different capacity (Fig. 14), or shells of equal capacity may have different lengths or the closure at the front end may be of materials of different specific weights, or may be made hollow (Fig. 15). The weight per unit of section is controlled by varying the thickness of the walls of the shells, the weight per unit of length being increased by reducing the thickness of the wall, other things remaining equal (Fig. 16).

The shell may be constructed of a piece of tubing similar to that used for ordinary sporting cartridges and is closed by means of cardboard disks *j* (Fig. 17) firmly attached to the end thereof. If these disks are too weak to resist the air-pressure they are reinforced by means of a disk *k* of strong paper fastened inside to act as an abutment. Said disk may also be used in the other constructions as shown in Fig. 12.

The cartridge besides the ordinary shell *a* comprises the following parts: 1. The powder; 2. An isolating disk 1 millimeter thick; 3. The wad *l* (Fig. 12). 4. The stopper *g f* (Fig. 12); 5. The paper *i;* 6. The projectile, placed with its open end against the stopper. The front end is closed in the same way as an ordinary cartridge.

For the construction of the different parts those materials are used which are best suited for the particular purpose.

The following is an example of dimensions for a projectile for a 12-bore gun, adapted to deliver at 50 meters two-thirds of its charge within a circle of 0.76 meters, provided that the initial velocity is 330 meters per second.

Total length	26	millimeters
Length of cone	10	"
Diameter of nose	17.3	"
External diameter of base	18.4	"
Length of shot-space	18.4	"

Details of construction may be modified to suit particular requirements. The front part of the projectile may comprise any desired number of conical parts terminating at the flat surface of the nose, the bases of the cones being circular or polygonal.

The following advantages are secured by the invention. The projectile travels with the same velocity as the shot until the moment of reversal. At distances of 50 and 60 meters two-thirds of the charge can be delivered within a circle of 0.76 meters, and these distances can even be increased. The shape of the projectile renders it possible to shoot with the same precision as with a rifled firearm. A single gun can be used with ordinary cartridges for ranges of 25 or 30 meters and with the improved projectile for ranges of 50 or 60 meters. The distribution of the shot is the same as that obtained with the best shot guns.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. A shell, the external shape of whose head is a truncated cone, the front surface of which is absolutely flat and rough while its side wall is polished.

2. Case shot for shot guns, comprising in combination a smooth cylindrical hollow body and a truncated conical nose having a roughened surface the smooth body being coated with a spirit varnish.

3. A shell, having a head of truncated cone shape, the front surface of which is absolutely flat and rough, a cylindrical body and converging portions connecting the body with the cone shaped head.

4. Case shot for shot guns comprising in combination a cylindrical hollow body, a truncated conical nose, at one end of said body and a removable wad at the other end comprising cylindrical parts of two different

diameters, the smaller diameter being less than that of the interior of the hollow body.

5. Case shot for shot guns, comprising in combination a cylindrical hollow body, a truncated conical nose at one end of said body and a removable wad at the other end comprising cylindrical parts of two different diameters, the smaller diameter being less than that of the interior of the hollow body together with a disk of paper having projecting portions and interposed between the wad and body.

6. Case shot for shot guns, comprising in combination a smooth cylindrical hollow body and a truncated conical nose having a roughened surface together with a stiffening ring within the body adjacent the nose.

In witness whereof I have signed this specification in the presence of two witnesses.

BLAISE CAMET.

Witnesses:
GASTON JEANNIAUX,
MARIN VACHON.