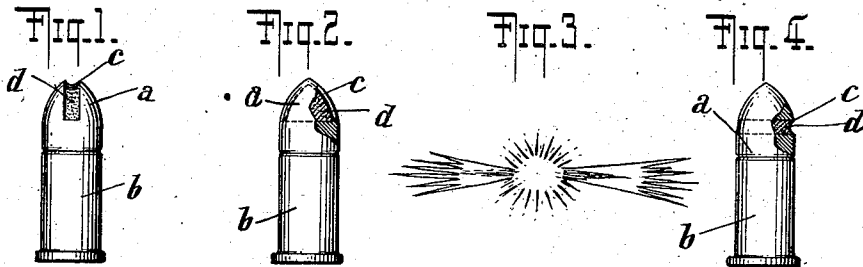
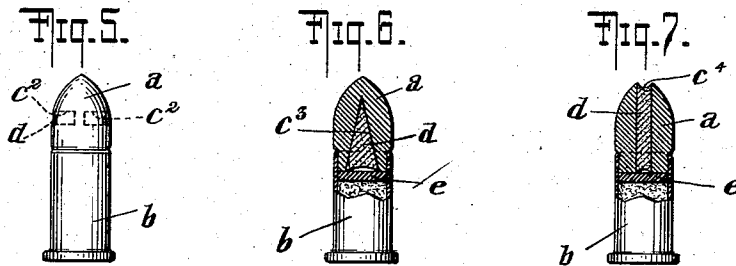
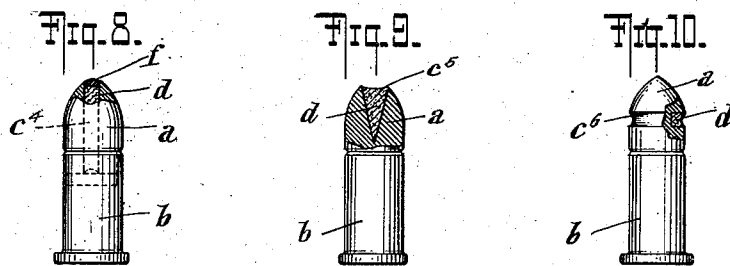


E. KEEN.
BULLET FOR PLEASURE TARGET SHOOTING.
APPLICATION FILED AUG. 19, 1913.

1,094,402.

Patented Apr. 21, 1914.



WITNESSES:
George Du Bon
Charles W. Young

INVENTOR
ELIOT KEEN
BY
Wm. H. Smith
ATTORNEYS

UNITED STATES PATENT OFFICE.

ELIOT KEEN, OF NEW YORK, N. Y., ASSIGNOR TO WINCHESTER REPEATING ARMS CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

BULLET FOR PLEASURE TARGET-SHOOTING.

1,094,402.

Specification of Letters Patent.

Patented Apr. 21, 1914.

Application filed August 19, 1913. Serial No. 785,465.

To all whom it may concern:

Be it known that I, ELIOT KEEN, a citizen of the United States, and resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Bullets for Pleasure Target-Shooting, of which the following is a specification.

My invention relates to a bullet which may be fired from a rifle, pistol or other firearm in the usual manner and which will, when it encounters a target or other obstacle, produce a sudden flash of light.

My improved bullet may be fired either as such from a muzzle loading weapon or, preferably, it may be incorporated with the usual breech loading cartridge of commerce.

The object of my invention is to provide a bullet of the character specified which may be used in target practice of various kinds as an aid in determining the range and errors of shooting.

My improved bullet, while it may be employed for ordnance, will probably find its greatest field of usefulness in connection with small caliber guns and particularly in small caliber rifle practice at fixed targets. It is well known that unless the surface of such a target be frequently refinished by painting or otherwise, it soon becomes impossible to say exactly where a given bullet has struck as the target surface is so discolored and disfigured by previous shots. In the case of my improved bullet, however, the exact spot hit is indicated by a vivid spot of light even when used in broad daylight.

The noise made by my improved bullet when it strikes the target is sharp and snappy, being of the character almost of a second shot, but is generally very much louder than the original shot, and hearing this noise and seeing the flash of light adds to the satisfaction of the shooter and is much more stimulating than the bare knowledge that he has hit the target at a certain point indicated by one black spot among many. The noise making feature is not, however, an essential feature of my invention. When used in shooting galleries the added noise made by my improved bullet aids in attracting attention and thereby increasing trade.

My improved bullet is of particular utility

when shooting at a moving image forming part of a moving picture, as here the figure is necessarily shown in a dark environment where otherwise the effect of the shot would be difficult to perceive, except by some special method.

My invention will be better understood by referring to the drawings which show various forms of my invention as forming part of a small caliber rifle cartridge and in which—

Figures 1 and 2 represent two side elevations, the latter partly in section, taken 90° apart, of a preferred form of the invention; Fig. 3 represents the appearance of the target just at the instant when it is struck by the bullet of the form shown in Figs. 1 and 2; Fig. 4 represents a side elevation partly in section of a modified form of my invention; Fig. 5 represents a side elevation of another modification; and Figs. 6, 7, 8, 9 and 10 represent respectively, side elevations, partly in section, of five other modifications of my invention.

Referring to the figures, all of which show the bullet as part of an ordinary small caliber rifle cartridge, *a* represents a bullet of usual form attached to the usual shell, *b*, in the usual way. In the form shown in Figs. 1 and 2, this bullet is provided with a preferably parallel walled slot *c* which extends downwardly from its tip a little over half way to the top of the shell (see dotted line Fig. 2), although the exact dimensions and relative proportions of this slot are immaterial. This slot is filled with a special percussion igniting flash light composition or mixture *d* constituted preferably as follows: 100 parts potassium chlorate, 50 parts antimony sulfid, 4 parts red phosphorus, 80 parts glue solution.

In preparing the mixture one part glue is dissolved in five parts water to constitute the glue solution. The remaining materials are then separately pulverized and mixed with the glue solution to form a paste, and this paste is then placed in the slot in any convenient manner and allowed to harden. As the paste hardens it shrinks so that it is drawn within the edges of the slot as indicated in Figs. 1 and 2.

In the modification shown in Fig. 4, a transverse hole or bore *c'* is substituted for the slot *c*. This bore is filled with the same

flash light mixture which, when hard, will contract so as to have concave ends, which are well within the surface of the bullet.

The modification shown in Fig. 5 is similar to that of Fig. 4 except that a short bore c^2 is placed in the bullet from each side, the two bores being separated from one another by a solid part of the bullet.

In the modification shown in Fig. 6, an axial conical bore c^3 is drilled into the bullet from the base, filled with the paste, and then placed in the shell with a wad e between the shell and the bullet.

The modification shown in Fig. 7 is similar to that of Fig. 6 except that the bore c^4 is straight and goes clear through the bullet from end to end.

The modification shown in Fig. 8 is exactly the same as that of Fig. 7 except that the percussion igniting material at the tip of the bullet is protected by a covering f of paper, felt, fiber, wax or other suitable inert material.

Fig. 9 shows a bullet having an axial conical bore c^5 extending from the tip part way through the bullet.

Fig. 10 shows a bullet having a peripheral ring or recess c^6 which is filled with the same mixture as before.

In operation, the instant the bullet strikes the target there is a crack similar to the crack of the original shot itself, but usually much louder, and a vivid spot of light at the point of impact. This spot of light is of limited area and its dimensions should not exceed those of a figure capable of imparting to the eye a centering impression, the centering being located at the point of impact. In other words, it is not intended to produce a large area of light such as will illuminate the whole target and its surroundings, for example, but only a flash of light, which will identify rather than illuminate the point where the bullet strikes the target. In the case of the bullet shown at Figs. 1 and 2 the flash of light has the appearance indicated in Fig. 3, the light appearing to dart out of the slot from each side of the bullet in the form of a widening brush, but it will be noticed that this figure is not only of limited area, but also tends to fix the visual attention upon the center of the circle, that being the spot where the impact actually occurred. In the modification shown in Figs. 4 and 5 the light effect is much the same as indicated by Fig. 3. There is substantially no smoke produced at the target so that shots may be made in quick succession.

In the modification of Figs. 6 to 10, where the paste is arranged symmetrically as to the axis of the bullet, the light spot is circular.

The color of the light given by the mixture, according to the above formula, is

orange. By adding a little strontium nitrate to the paste the light becomes red, and if, instead of adding strontium nitrate, I add a suitable cobalt compound, the light becomes blue. Other colors may be secured by using other suitable chemicals, as is well known. By using bullets of a distinctive color for each individual shooter, a number of persons may shoot at the same target at the same time and their hits be distinguished from one another.

My improved bullet prepared as above described will not explode in the gun but requires impact against a solid target. In the various forms shown, the paste is so combined with the bullet that the edges of the paste are protected from accidental scratching, rubbing or striking in handling so that the bullet and cartridges made thereof are perfectly safe to manipulate. When the bullet strikes the target, the shape of the bullet is of course instantly and violently changed, thus tearing the paste and giving the necessary shock required to explode it.

An advantage of shooting with my improved bullet is that the shooter sees instantly and without special effort, just where his shot has struck and is thus enabled to shift his gun very quickly in one direction or another, and shoot again. With a pump gun, even a poor shooter may almost trace a line of fire leading to the bull's-eye of the target toward which he is shooting. In this way the muscular tensions and positions corresponding to one shot are made to guide and aid the shooter in making his next shot whereas, if the gun must be lowered and the spot hit must be located in the usual way by slow and tedious inspection accurate shooting becomes purely a matter of sighting.

Various changes may be made within the spirit of my invention. Thus, for example, in the form of bullet having a slot as in Figs. 1 and 2 I do not limit the invention to a bullet with one slot, nor in the form shown in Fig. 4 do I limit the invention to a bullet having a single transverse bore. Similarly in the form shown in Fig. 5 I do not limit the invention to a single pair of opposite short bores or even to opposite bores. Similarly while I prefer to use the particular percussion igniting flash light mixture described above other mixtures may be substituted therefor within the spirit of my invention provided they have the characteristics above set forth.

I am cognizant of United States Patent No. 734,966, dated July 28, 1903, to Cecil V. Schou wherein is described a bullet for range finding and analogous purposes which is said to produce a flash of light when it strikes the target. But my improved bullet differs from that of Schou in several important particulars: (1) The Schou bullet produces dense smoke when it strikes the

target while mine is substantially smokeless; (2) the sound produced by the Schou bullet when it strikes is but little, if any, more than that due to its impact while my bullet may be made to produce a report louder than the report of the original shot; (3) the Schou bullet contains material which inflames on exposure to the atmosphere and must, hence, have this substance in a closed container or "capsule", whereas my bullet employs substances having their own supplies of combustible material; (4) because of Schou's smoke and light producing material requiring a containing capsule, a certain care in handling is required lest the capsule be broken, whereas my bullet may be handled without risk of explosion like any other unprepared bullet; (5) the Schou bullet, because of its required capsule, is more costly to manufacture than the bullet herein described; other differences have been set forth in the specification preceding. By a non-explosive bullet I mean one that carries no disruptive charge by means of which the bullet, after it is fired, is burst asunder or mechanically disintegrated. By a bullet "free from obscuring or slowly burning material" I mean one that has no attached charge of magnesium or other substance which can ignite and provide continued luminosity, or which, in any other way, can defeat the result desired, to wit, the production of a momentarily visible flash of light of limited area centered at the point of impact.

I claim:

1. A projectile for target shooting comprising a non-explosive bullet free from obscuring material and carrying a charge of percussion igniting flash light composition adapted, upon impact of the bullet, to produce a momentary flash of light of limited area and centered at the point of impact.

2. A projectile for target shooting comprising a non-explosive bullet of deformable metal free from slow burning material and carrying a charge of percussion igniting flash light composition adapted, upon impact of the bullet, to produce a momentary flash of light of limited area and centered at the point of impact.

3. A projectile for target shooting com-

prising a non-explosive smokeless bullet free from slow burning material and carrying a charge of percussion igniting flash light composition adapted, upon impact of the bullet, to produce a momentary flash of light of limited area and centered at the point of impact.

4. A projectile for target shooting comprising a non-explosive bullet free from slow burning material and carrying a charge of percussion igniting flash light composition a portion of which is exposed to the atmosphere and adapted, upon impact of the bullet, to produce a momentary flash of light of limited area and centered at the point of impact.

5. A projectile for target shooting comprising a non-explosive bullet free from slow burning material and provided with an interior space opening to the surface of the bullet, said space being substantially filled with a charge of percussion igniting flash light composition adapted, upon impact of the bullet, to produce a momentary flash of light of limited area and centered at the point of impact.

6. A cartridge comprising a shell and a non-explosive bullet said bullet being free from slow burning material and carrying a charge of percussion igniting flash light composition adapted, upon impact of the bullet, to produce a momentary flash of light of limited area and centered at the point of impact.

7. As a new article of manufacture, a bullet for use in pleasure target shooting, carrying a charge of percussion igniting flash light composition igniting upon the impact of the bullet with the production of a brilliant, momentary flash of light of limited area centered at the point of impact, whereby said point of impact is illuminated for the information of the user of the gun from which the bullet was fired.

In testimony whereof, I have hereunto set my hand in the presence of two subscribing witnesses.

ELIOT KEEN.

Witnesses:

ELMER SHULYOUNG,
JOHN A. KEHLENBECK.