

Feb. 23, 1960

W. H. STENBY
SIGHTING DEVICES

2,925,657

Filed Aug. 27, 1956

2 Sheets-Sheet 1

FIG. 1

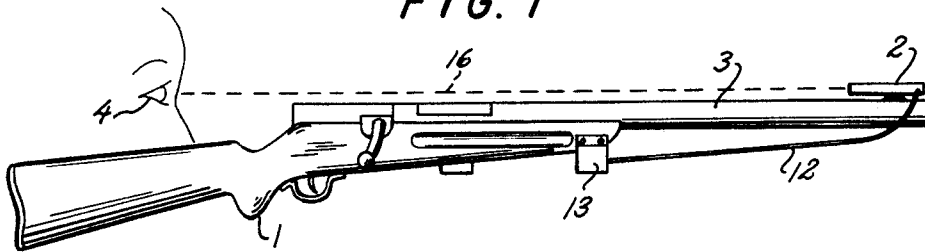


FIG. 2

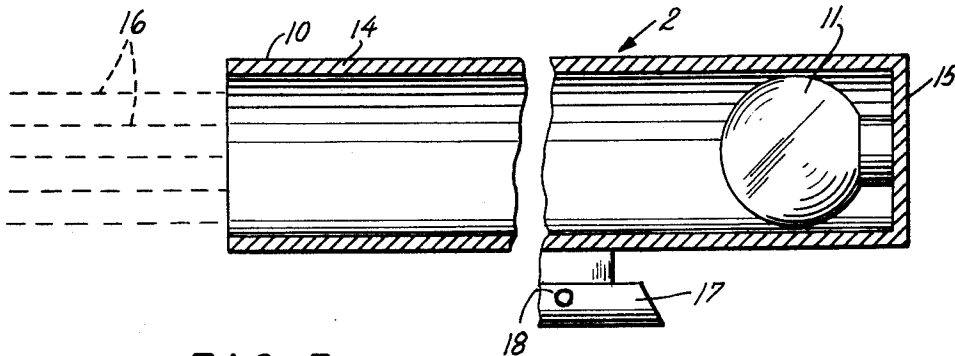


FIG. 3

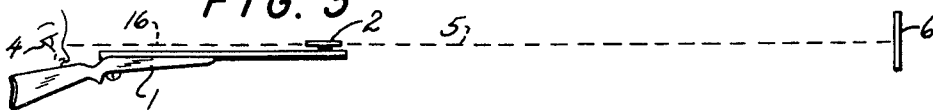


FIG. 4

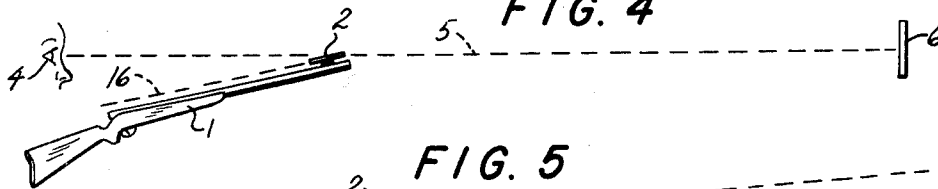
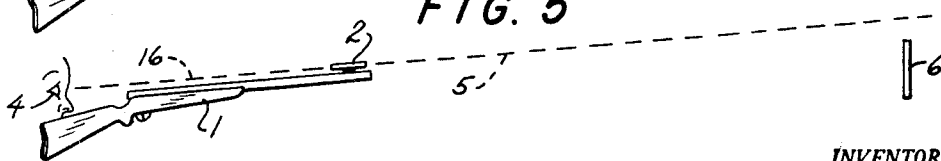


FIG. 5



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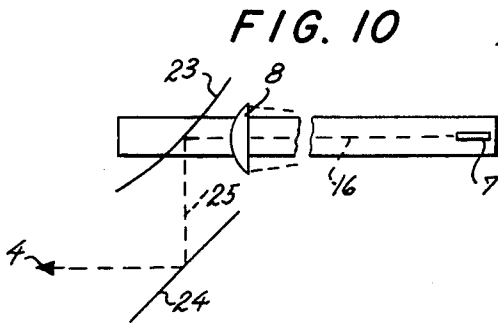
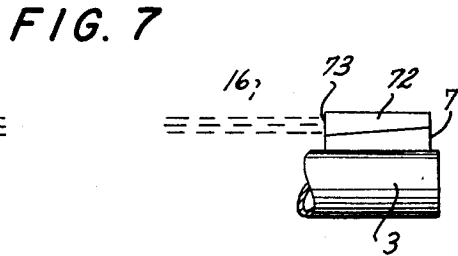
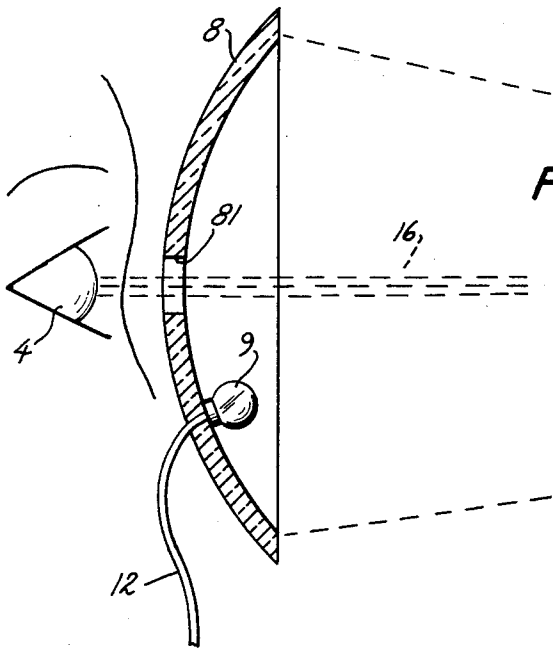
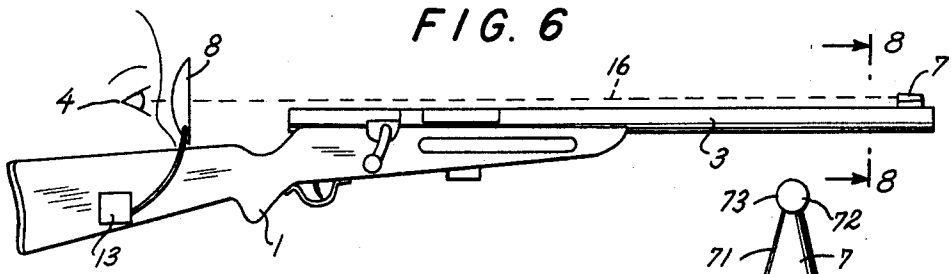
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SIGHTING DEVICES

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5 Claims. (Cl. 33—47)

The present invention relates to a sighting device, and more particularly to a sighting device for aiming an elongated member such as the barrel of a firearm, by means of a beam of light.

Most sighting devices according to the known art include a front sight and a rear sight which have to be aligned in a line of sight extending between the eye of an aiming person and a target. A normal aiming operation requires first the fixing of the eye on a target whereby a line of sight is determined, then placing the front sight in such line of sight, and then placing the rear sight in the line of sight. Consequently, the aiming person has to align three points, namely, the target point, the front sight and the rear sight.

According to other known sighting devices, both eyes are used for aiming. This type of sighting device is based on the principle that the images seen by the two eyes of a person appear to be superimposed. When this type of sighting device is used, the aiming person fixes one eye on the target, and the other eye on a sighting device which in accordance with some known constructions, is an illuminated element.

However, the disadvantages of aiming with both eyes are well known, and sighting devices of this type have never been accepted by the public to any great extent.

Illuminated sighting devices according to the known art employ diffused light, that is light which can be seen from different angles. Consequently, the illuminated sighting devices according to the known art require the use of both eyes or of a front and rear sight.

It is one object of the present invention to overcome the disadvantages of the known sighting devices, and to provide a sighting device which permits rapid and accurate aiming under any light conditions.

It is another object of the present invention to provide a sighting device which includes only one sight means directing a beam of light toward the eye of the aiming person.

It is another object of the present invention to provide a sighting device in which only two points have to be aligned by the aiming person, namely, the target and a single sight.

It is another object of the present invention to provide a sighting device for a firearm permitting aiming of the firearm by moving the gun until a single sight appears to cover the target.

It is another object of the present invention to provide a sighting device for an elongated member which is to be aimed such as a gun barrel, in which aiming is carried out by means of a beam of light extending parallel to the elongated member, or to the axis of the gun barrel.

With these objects in view, the present invention mainly consists in a sighting device which comprises, in combination, a source of artificial light; sight means for transforming rays of light emitted by the source of light into a thin beam of light having a predetermined cross-sectional area; and means for securing the sight means to an elongated member in a position in which the beam

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of light extends parallel to the elongated member. Consequently, the elongated member is exactly aimed at the target when the bright spot appears to be located on the target to the eye of the aiming person.

5 A person aiming in accordance with one method of the present invention, will hold the aimed member, for instance a gun, in a position in which the sight means direct the beam of light directly into one eye. In this position, the beam of light appears to the aiming person as a bright spot. The aiming person now moves the gun and his head until the bright spot appears to cover the target.

According to one embodiment of the present invention the source of light is located at the forward end of the aimed member, and the sight means are provided in the form of a thin tubular member whose axis is parallel to the axis of the aimed member.

According to another embodiment of the present invention, the sight means is a reflecting bead member having a small transverse reflecting face. The source of light is located rearwardly of such reflecting face, and the reflecting face is so positioned that part of the light emitted by the source of light is reflected in a beam of light extending parallel to the aimed member.

10 In this embodiment, the cross-section of the beam of light corresponds to the area of the reflecting face which has approximately the size of the bead of a standard front sight. Thereby it is possible to aim at targets which are located far away, and consequently appear to be very small. For aiming at such targets, it is essential that a sight located at the forward end of the aimed member, is very small, since otherwise the target may be covered by the sight, and accurate aiming would become impossible. A sighting device according to this embodiment of the present invention will be particularly advantageously used for heavy arms, such as machine guns and bazookas.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

15 Figure 1 is an isometric view of a gun provided with a sighting device according to one embodiment of the present invention;

Figure 2 is a longitudinal sectional view of a sighting device according to the embodiment illustrated in Figure 1 shown on an enlarged scale;

20 Figures 3, 4 and 5 are schematic views illustrating the operation of the sighting device according to the present invention;

Figure 6 is an isometric view illustrating another embodiment of the present invention;

25 Figure 7 is a side view, partly in section, illustrating details of the embodiment of Figure 6;

Figure 8 is a fragmentary cross-sectional view of a detail taken on line 8—8 in Figure 6; and

30 Figures 9 and 10 are schematic side views of corresponding modifications of Figures 1 and 6, respectively.

Referring now to the drawings, and more particularly to Figures 1 and 2, a gun 1 is provided with a sighting device 2 according to the present invention. The sighting device is illustrated to be positioned near the forward end of the gun barrel 3, but as will be understood as the description of the present invention proceeds, the sighting device 2 may also be placed anywhere along the gun barrel 3. While Figure 1 shows a gun 1 and a gun barrel 3 it will be understood that a sighting device according to the present invention may be used with any

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other elongated member which is to be aimed, such as a bazooka or a telescope.

Figure 2 shows in a sectional view a sighting device 2 according to the present invention. The sighting device comprises an elongated tubular member 10, which is closed at one end, and a source of artificial light 11 illustrated to be an electric lamp which receives current through wires 12 from a battery 13 which is secured to the gun 1. The tubular member 10 is open at its rear end, and has a black inner surface 14, and a reflecting end face 15. A reflector of suitable parabolic shape may be arranged at the closed front end of the tubular member 10. The ratio between the diameter and the length of the tubular member 10 is such that only parallel rays of light pass through the rear end of the tubular member 10 in the form of a beam of light 16. Rays of light which are emitted by the lamp 11 at an angle to the axis of the tubular member 10 are absorbed by the black inner surface of the tubular member 10. The tubular member 10 is mounted on the gun barrel 3 in such a manner that the beam of light 16 extends exactly parallel the axis of the gun barrel 3. The beam of light 16 is illustrated in Figure 1 as a dotted line.

The sighting device 2 is mounted by means 17 on the gun barrel in a position in which the beam of light 16 extends exactly parallel to the axis of the gun barrel 3, or in other words parallel to any member which is to be aimed at a target. The mounting means 17 preferably include a pivot means 18 by which a desired elevation of the sight means 2 can be produced. Thereby, when the gun is aimed at a target by the sighting device according to the present invention, the gun barrel is actually pointed at a point above the target to compensate for the deviation of the bullet from the straight path due to the action of gravity. When the sight means 2 is adjusted in such a manner, the beam of light 16 is not exactly parallel to the axis of the gun barrel but only substantially parallel as will be understood by a person skilled in the art.

When the eye of an aiming person is placed in the beam 16, as shown in Figure 1, the beam 16 will appear as a bright spot since the aiming person will look directly into the open rear end of the tubular member 10. When the eye 4 is not exactly located in the beam 16, the light emitted by lamp 11 will not be seen at all, since the person sees only the black inner surface of the tubular member 10. Since the position of the beam 16 is exactly determined with respect to the gun 1 and more particularly with respect to its butt, the eye 4 has to be always placed in the same position with respect to the gun 1, and a suitable guide may be attached to the butt of the gun for facilitating the finding of the beam of light 16 by the aiming person.

The operation and principle of the present invention will be best understood with reference to Figures 3 to 5. In Figure 3 the gun 1 is shown to be correctly aimed at the target 6. The eye 4 looks at the target 6, and consequently the line of sight 5 extends between the eye 4 and the target 6. The sighting device 2 is placed in the line of sight 5, and the beam of light 16 coincides with the line of sight 5. The aiming person sees a bright spot having an area corresponding to the cross-section of the beam 16 and of the tubular member 10. Such bright spot appears to be located on the target 6. Since the gun barrel 3 of the gun 1 is parallel to the beam of light 16, the gun 1 is exactly aimed at the target 6. By turning the sight means 2 about the pivot 17 a suitable elevation may be obtained.

Figure 4 illustrates a position in which the gun 1 is not yet exactly aimed at the target. The aiming eye 4 looks at the target 6 whereby a line of sight 5 is defined. The person has placed the sight means 2 into the line of sight, as would be generally done with an ordinary front sight, but cannot see the bright spot, since the beam of light 16 extends in a different direction and does not

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reach the eye 4 of the person. In order to properly aim the gun, the person must move the gun until a bright spot appears on the target 6, which means that the gun is now in the position illustrated in Figure 3 in which the beam 16 is aligned with the line of sight 5.

Figure 5 illustrates another possible condition during the aiming operation. The aiming person has placed his eye in the well-defined spot in which the beam of light 16 appears as a bright spot. However, such bright spot does not appear on the target. Consequently, the aiming person must move the gun until the bright spot appears on the target 6 whereby the conditions shown in Figure 3 are obtained. This method of aiming is preferred according to the present invention, since it is very easy to keep the gun in a position in which the person constantly sees the bright spot at the rear end of the tubular member 10. By moving the gun while maintaining the position between eye and sight means 2 it is possible without any difficulty to place the bright spot on the target 6 whereby the gun is exactly aimed.

It will be apparent that by aiming in accordance with Figures 5 and 3, it is only necessary to superimpose two points, namely the target 6 and the bright spot, which of course is the beam of light 16 as it appears to the eye looking directly into the open rear end of the tubular member 10. In contrast thereto, in accordance with the standard gun sights it is necessary to superimpose three points, namely the front sight, the rear sight and the target. While it is simple to superimpose two points, for instance the front sight and the target, or the rear sight and the target during aiming with a standard sighting device, it is well known how difficult it is to exactly superimpose the three points of the rear sight, front sight and target.

It will be noted that in accordance with the present invention it is not necessary to focus the aiming eye onto the sight means 2 since the beam of light 16 will be perceived even if the eye is focused at infinity as is required for aiming at a distant target. Known gun sights employing an illuminated sight means do not emit a beam of light parallel to the gun barrel, but produce diffused light which can be seen at all angles from the rear of the gun. Consequently aiming is carried out in such known sighting devices by means of both eyes, which makes an exact aiming impossible.

In accordance with the present invention, only one eye is used for aiming, and if the eye is not exactly in the beam of light directed rearwardly and parallel to the aimed member 3 by the sight means 2, the beam of light 16 becomes invisible to the person, since only the black inner surface 14 of the tubular member 10 is visible to the eye.

The sighting device according to the present invention permits not only a rapid and exact aiming in daylight, but also an exact aiming under conditions in which the standard front and rear sights are no longer visible due to darkness. At night, when it is entirely impossible to use guns provided with standard sights, the sighting device according to the present invention permits accurate aiming at illuminated targets which may appear as small bright spots at a great distance. The superimposing of two bright spots is, of course, a very simple task.

The embodiment illustrated in Figures 1 and 2 has the disadvantage that the cross-section of the front end of the sighting device 2 must be great enough to permit mounting of an electric bulb 11. While very small bulbs 11 may be used, it is preferable for aiming at very small and distant targets to have at the forward end of the gun barrel a very small sight means, since otherwise the small and distant target may be completely covered by the sight means making aiming very difficult. This difficulty is overcome by the preferred embodiment of the present invention in which the source of light is separated from the sight means so that the cross-section of the sight means can be made as small as desired and

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of a size corresponding to the size of the front sight bead of a standard sighting device. In such modified embodiment, the single sight means serves the purpose of directing a beam of light rearwardly and parallel to the aimed member in the manner of the tubular member 10 in the embodiment of Figures 1 and 2.

Referring now to Figure 6 and Figure 7, the gun 1 has a barrel 3 which is to be aimed by the sighting device according to the present invention. A sight means 7 is secured to the front end of the barrel 3 and includes a means 71 for securing the bead member 72 to the barrel 3 of a gun. The bead member 72 has a reflecting front face 73 as best seen in Figures 7 and 8. A concave mirror or other reflecting member 8 is secured to the butt portion of the gun 1. A central hole 81 is provided in the reflector 8 opposite the reflecting face 73. A source of light 9 is secured to the concave reflecting face of the reflector 8, and connected by wires 12 to the battery 13. The position of the bulb 9 is such that most of the light emitted by the same is reflected by the reflecting face of the reflector 8 in a bundle of rays converging toward the small reflecting face 73 of the bead 72 of the sight means 7. The support means 71 of the sight means 7 secure the bead member 72 to the barrel 3 in a position in which the light reflected by the reflector 8 upon the reflecting face 73 is reflected in a beam 16 parallel to the gun barrel axis and through the hole 81 in the reflector 8. Such a beam of parallel rays may be obtained by making the reflecting face 73 convex and parabolic, and by focussing the light rays reflected by reflector 8 in the focus of the parabolic reflecting face 73. When the eye 4 is placed directly behind the hole 81 in reflector 8, it sees the reflecting face 73 as a bright spot. The beam of light 16 has a cross-section corresponding to the area of the reflecting face 73. It will be understood that the reflector 8 may be constructed in a different manner and that the bulb 9 may be placed anywhere rearwardly of the reflecting face 73 and shielded by a suitable means 8 from the eye 4, as long as the reflected beam 16 extends parallel to the axis of the gun barrel. Due to the fact that the bulb 9 is no longer placed in the region of the sight means 7, the bead member 72 can be reduced to any desired size corresponding to the bead of a standard front sight. Consequently the bright spot seen by the eye of the aiming person is no larger than a standard bead, and therefore it is possible to aim exactly at distant targets which appear very small. In the embodiment illustrated in Figures 6 and 7, the hole 81 serves as guide for the eye 4. As shown in Fig. 7, hole 81 is wide enough not to interfere with the thin reflected beam 16 whose cross section is determined only by the area of the reflecting bead face 73. The beam of light reflected by the reflecting face 73 always passes through hole 81, and consequently an eye placed behind hole 81 will always see the bright spot on the reflecting face 73. This corresponds to the position illustrated in Figure 5, and by moving head and gun, the gun barrel can be placed in the position of Figure 3 in which the beam of light 16 coincides with a line vision 5 whereby the gun is directly aimed at the target. Similar to the embodiment of Figures 1 and 2, it is only necessary to place the spot visible to the eye behind the hole 81 on the desired target whereby the gun is automatically directed at the target.

It will be understood that the sight means 7 and the source of light 9 do not have to be placed in a vertical plane passing through the axis of the gun barrel as shown in Figures 6 and 7. It is also possible to arrange sight means 7 and source of light 9 in a horizontal plane passing through the axis of the gun barrel 3. Such construction is advantageous for use with heavy firearms such as bazookas or machine guns.

An advantageous application of the principles of the present invention is illustrated in Figures 9 and 10. The embodiment of Figures 1 and 2 is shown in connection

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with the arrangement of Figure 9 and the embodiment of Figures 6 to 8 may be applied as shown in Figure 10.

The arrangements of Figures 9 and 10 serve the purpose of aiming a gun barrel 20 by means of a sighting device according to the present invention. The sighting devices 2 and 7, 8, respectively, are of the type described with reference to Figures 1 and 6, respectively, but are arranged in a horizontal plane passing through the axis of the gun barrel 20. A beam of light is emitted in a direction parallel to the axis of the gun barrel, and at the rear end of the gun barrel 20 is arranged a first reflecting mirror 23 which may be of the convex type. Such mirror 23 shows a reduced image of the target area which is presumed to be in front of the gun barrel 20. The beam of light 16 is also reflected by the mirror 23 and passes as a beam 25 toward another reflecting mirror 24 from which it is reflected into the eye 4 of the aiming person. The aiming person sees in mirror 24 the target area reflected by the mirror 23. Such target area can be scanned by moving the gun barrel 20 together with the fixedly attached mirrors 23 and 24. At all times, the beams 16, 25, and 26 will appear to the eye 4 of the observer as a small bright spot moving over the target area. When such small bright spot appears to cover the desired target detail, the gun 20 is properly directed at the target, and may be fired.

It will be understood that the arrangement of Figure 9 permits exact aiming by a person which is under cover, whereas the firearm 20 may be arranged on top of a tank or outside a concrete bunker. While it is considered an extremely difficult, although not entirely impossible feat, to aim a gun provided with standard front sight and rear sight by means of a mirror, it is comparatively simple to place the bright spot as which the beam 16 appears to the eye of the aiming person.

While the invention has been illustrated and described as embodied in a sighting device employing a beam of light, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

It will be understood that it is not desired to restrict the invention to the described embodiments of the sighting device, but to cover all modifications that may fall within the scope of the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A sighting device comprising, in combination, an elongated member adapted to be aimed; a source of artificial light secured to a rearwardly located portion of said elongated member for projecting rays of light in a bundle converging in forward direction along said elongated member; shielding means located rearwardly of said source of light for preventing projection of light to the rear; a single sight means located forwardly of said source of light and including a small bead having an opaque mirror reflecting face for reflecting light emitted by said source of light in a rearwardly directed beam of light having a cross section corresponding to the total area of said reflecting face and passing said shielding means by, said source of light having transverse to said elongated member an area greater than said reflecting face; and attaching means for attaching said sight means to said elongated member in a position in which said reflected beam of light extends substantially parallel to said member so that said reflecting face appears as a bright spot on the target only when said elongated member is accurately aimed at the target.

2. A sighting device as set forth in claim 1 and further including at least one mirror mounted on said elongated member rearwardly of said single sight means and arranged in the path of said beam of light inclined to said elongated member and to said beam of light for reflecting said beam of light transverse to said elongated

member so as to be observed from a point transversely spaced from said elongated member.

3. A sighting device as set forth in claim 2 and including a rearwardly facing other mirror located transversely spaced from said one mirror in the path of said transversely reflected beam of light for rearwardly deflecting the same; and wherein said one mirror is a convex reducing mirror.

4. A sighting device comprising, in combination, an elongated member adapted to be aimed; a source of artificial light secured to a rearwardly located portion of said elongated member; a concave reflector mounted rearwardly of said source of artificial light on said elongated member for reflecting light in forward direction; sight means located forwardly of said source of light and including a small bead having an opaque mirror reflecting face for reflecting light emitted by said source of light and reflected by said reflector in a rearwardly directed beam of light having a cross section corresponding to the total area of said reflecting face; and attaching means for attaching said sight means to said elongated member in a position in which said reflected beam of light extends substantially parallel to said member so that said reflecting face appears as a bright spot on the target only when said elongated member is accurately aimed at the target.

5. A sighting device comprising, in combination, an elongated member adapted to be aimed; a source of artificial light secured to a rearwardly located portion of said elongated member; a concave reflector mounted rearwardly of said source of artificial light on said elongated member for reflecting light in forward direc-

tion, said reflector having a central opening; a single sight means located forwardly of said source of light and including a small bead having an opaque mirror reflecting face for reflecting light emitted by said source of light and reflected by said reflector in a rearwardly directed beam of light having a cross section corresponding to the total area of said reflecting face; and attaching means for attaching said sight means to said elongated member in a position in which said reflected beam of light extends substantially parallel to said member and passes through said central opening in said reflector so that said reflecting face appears as a bright spot on the target to an eye placed behind said opening in said reflector only when said elongated member is accurately aimed at the target.

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