Feb. 14, 1956 J. W. CHRISTOPHER 2,734,310

TOY GUN

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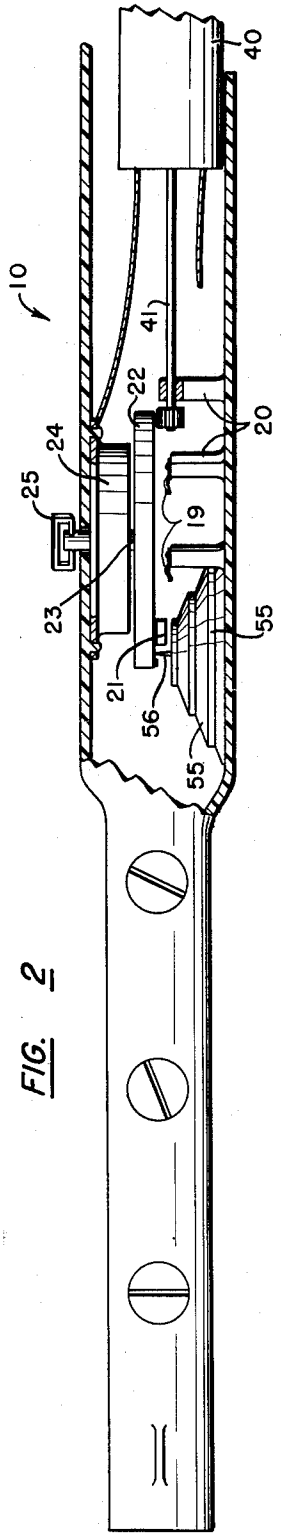


FIG. 2

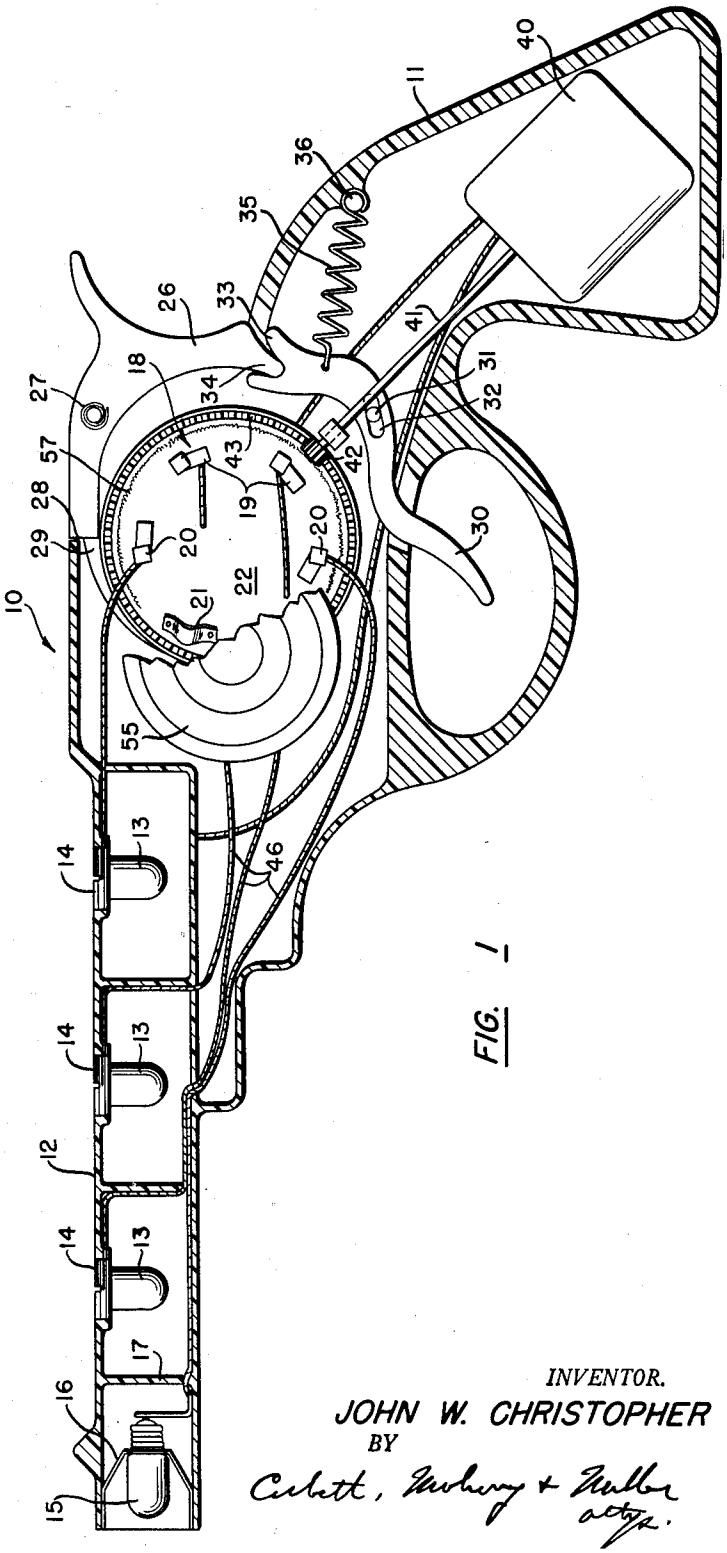


FIG. 1

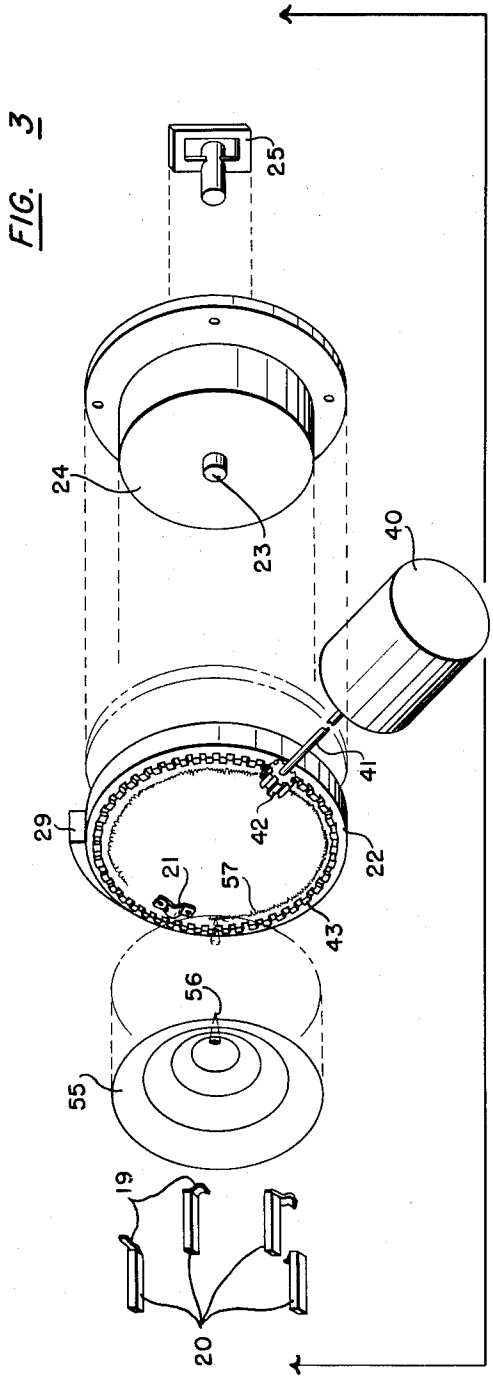
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FIG. 3



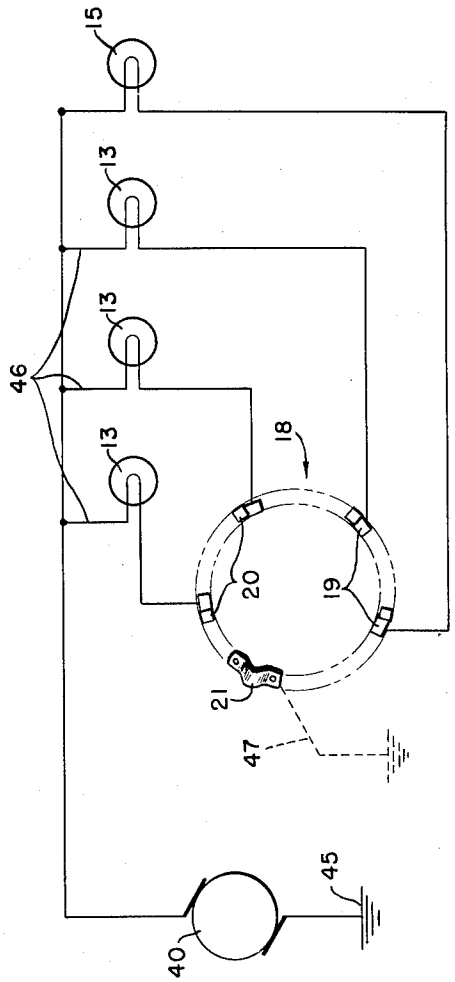


FIG. 4

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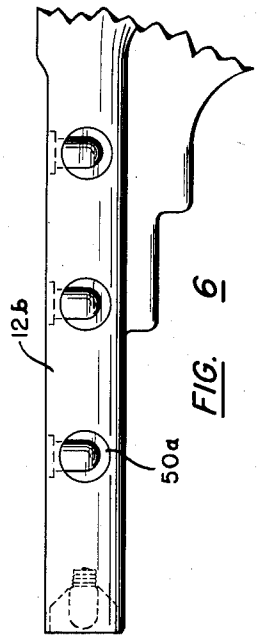


FIG. 6

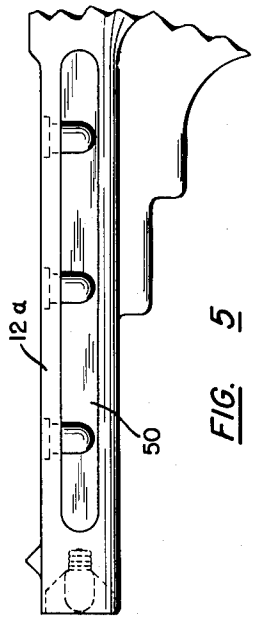


FIG. 5

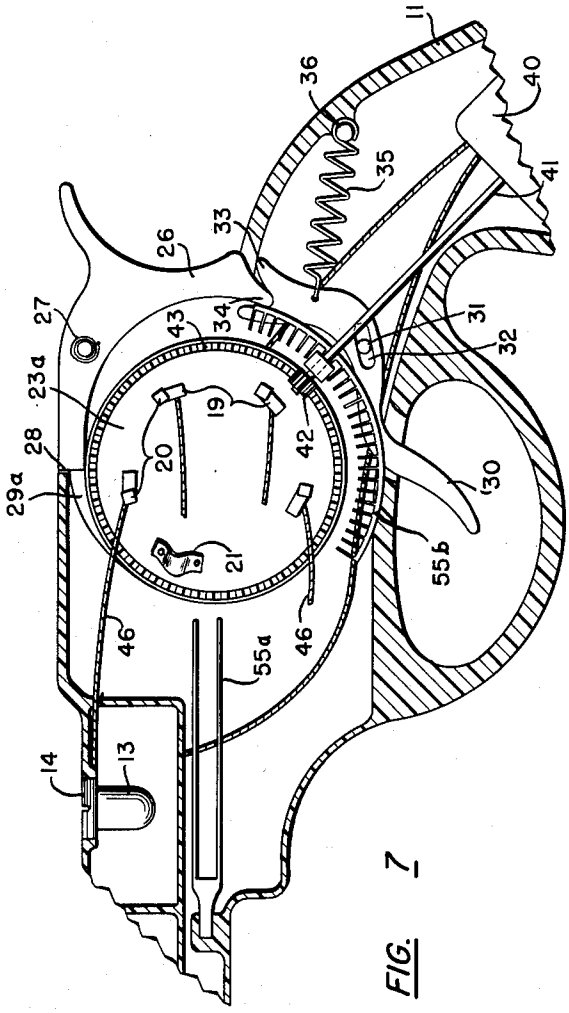


FIG. 7

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United States Patent Office 2,734,310 Patented Feb. 14, 1956

2,734,310

TOY GUN

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Application April 2, 1952, Serial No. 280,037

11 Claims. (Cl. 46—228)

My invention relates to a gun. It has to do, more particularly, with a gun which does not actually fire a projectile but in which the movement and discharge of a projectile is simulated and in which recoil and various sounds produced by an actual cartridge discharged from a gun are simulated.

This application is a continuation-in-part of my copending application, Serial No. 186,012, filed September 21, 1950, now abandoned.

In my said copending application, I have disclosed a gun which is based on the phenomenon of persistence of vision and the "Phi" phenomenon. If a light of sufficient intensity is flashed before the eyes at sufficiently close intervals, about sixteen flashes per second, the eyes will see a continuous light. This persistence of vision can be used in obtaining the appearance of movement for which there is no obvious physical stimulus. The gun disclosed in said application uses this principle to simulate the movement and discharge of a projectile with realism.

According to my copending application, I provide a gun with a barrel which is translucent throughout its length or has translucent windows therein. In this barrel at longitudinal intervals I provide small bulbs or filaments which are connected in a circuit with a source of current. In this circuit, I provide a switch which, when actuated, will engage the bulbs or filaments along the barrel progressively and successively. The switch is actuated by the trigger of the gun. The switch and the spacing of the bulbs or filaments, as well as the intensity of the light produced by each bulb, are such that the successive flashes will appear as a projectile moving along the barrel and being discharged from the outer end thereof.

According to the said copending application, I employ a battery in the light circuit as a source of current. However, it is an object of the present invention to provide a generating means in the gun for generating the necessary electric current upon actuation of the trigger thereof.

Another object of this present invention is to provide means in the gun for developing, upon the actuation of the trigger, realistic sounds simulating the firing of a projectile from the gun, the ricocheting of a projectile as if it leaves the gun and strikes an object, or various other sounds which will add to the realistic effect of the gun.

A further object of my invention is to provide means in the gun for producing a recoil effect after the trigger is actuated, thereby further adding to the realism of the gun.

The preferred embodiment of my invention is illustrated in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a longitudinal sectional view through a gun made in accordance with my invention and having one type of sound producing means therein.

Figure 2 is an enlarged plan view, partly in section, of the barrel portion of the gun.

Figure 3 is an "exploded" view of most of the actuating mechanism of the gun.

Figure 4 is a diagram of the circuit of the gun.

Figure 5 shows a modification where the gun barrel is provided with a translucent window through which the light flashes can be seen.

Figure 6 shows another modification where the gun barrel is provided with spaced openings through which the light flashes can be seen.

Figure 7 is a detail in longitudinal section showing modified sound-producing means associated with the actuating mechanism of the gun.

With reference to the drawings, I have illustrated in Figures 1 and 2, one form which a gun may take according to my invention. The gun is, for example, in the form of a pistol and includes the body **10** which may be made entirely of plastic. The body includes the handle **11** and the barrel **12**, the barrel preferably being sufficiently thin that it is translucent.

Spaced at intervals along the length of the barrel **3** are the small electric bulbs **13** which are carried by disks **14** that are removably screwed into openings in the barrel. Three of these bulbs **13** are shown but any number may be provided. A fourth bulb **15** is removably disposed in a reflector **16** disposed within the muzzle of the barrel. The bulbs **13** are adapted to create flashes of light visible through the barrel and the bulb **15** will be focused ahead of the muzzle at an imaginary target. The bulbs are shown in separate compartments formed by partitions **17** in the barrel, although this is not necessary. Other arrangements may be provided for obtaining spaced filaments along the barrel.

To create the effect of a projectile moving through and discharging from the barrel **12**, the bulbs **13** and **15** must be energized successively and progressively towards the muzzle at short intervals. This is accomplished with the switch mechanism, indicated generally by the numeral **18**, which is mounted within the body **10** of the gun.

The switch mechanism **18** is shown best in Figures 1, 2 and 4. It includes a plurality of separate angularly disposed spring contacts **19** carried by the insulating posts **20** projecting from one side of the body **10** of the gun. Contact **21** is disposed on a metal disc **22** and is adapted to rotate with such disc. The disc **22** is keyed on a shaft **23** which projects from the opposite side of the body **10** towards posts **20** and which is rotatably mounted on the body. The disc **22** is so located that when it rotates the contact **21** successively engages the contacts **19**.

The discs **22** is rotated by means of a clock motor **24** which is disposed within the body **10** and drives the shaft **23**. This clock motor will be of the usual spring-actuated type and the spring may be wound by means of a key **25** projecting outside the body of the gun. While the motor is being wound up by means of the key **25**, the disc **22** will be prevented from rotating by means of the hammer **26** of the trigger mechanism which is normally in firing position (Figure 1). The hammer is pivoted in a slot in the body **10**, a spiral spring **27** being associated with its pivot point to yieldingly hold its blunt forward end **28** in engagement with a hump or lug **29** formed on the periphery of disc **22**. The key **25** will be turned clockwise to wind up motor **24** and the disc **22** will normally not rotate in such direction. However, if the blunt end **28** of the hammer **26** is swung upwardly, the spring of motor **24** will be permitted to rotate the disc **22** clockwise.

To release disc **22** from hammer **26**, the usual trigger **30** is provided. The trigger **30** is mounted on a pin **31** by means of a slot **32**, the pin being carried by body **10**. The upper end of trigger **30** is notched at **33** and engages an ear **34** on the lower and forward end of hammer **26**. Tension spring **35** is attached to the rear and upper end of trigger **30** and extends rearwardly to an

anchoring pin 36 carried by the handle 11. This spring normally keeps the trigger 30 in the position shown in Figure 1. When the trigger 30 is pulled, the forward blunt end 28 of hammer 26 is moved upwardly, thereby releasing disc 22, until the notched portion 33 of the trigger slips off the ear 34 of the hammer, which allows the hammer then to be swung downwardly by means of spring 27, the spring 35 serving to return the trigger 30 to its original position. The disc 22, when released by the hammer 26, will be rotated in a clockwise direction until the lug 29 again strikes the end 28, of the hammer, that is, through one complete revolution. When the lug 29 does strike the end 28 of the hammer, it strikes it with considerable force because of the spring action and this will produce a rearward movement of the body 10 or a recoil action which will simulate the "kick" of a gun. The lug 29 serves as an eccentric off-balance weight to accentuate this recoil action but if desired the periphery of disc 22 at this point may be further weighted to increase this recoil action.

In the gun of the present invention, I provide means for generating current for the light bulbs or filaments. This means comprises a generator 40 disposed within the handle 11. This generator is driven, when the disc 22 is rotated, by means of a shaft 41 which has a gear pinion 42 on its opposite end that engages a driving ring gear 43 carried by disc 22. Thus while disc 22 is rotated by unwinding of the spring of the clock motor 24 and the contacts to the lights 13 and 15 are successively engaged, the generator 40 is driven to generate current for such lights.

The electric circuit for connecting the generator 40, switch 18, and bulbs 13 and 15 is illustrated in Figure 4. The generator is provided with a ground 45 which may be connected to the metal body of the spring motor 24 (Figure 2). The other side of the generator connects to the individual lines 46 which run to the bulbs 13 and 15, the opposite ends of these lines being connected to the respective contacts 20 and 21. The contact 21 is provided with ground 47 which in the gun is the disc 22 in which this contact is mounted.

Rotation of the disc 22 will be at such speed when the disc is released by the trigger mechanism that the bulbs 13 and 15 will be successively and progressively illuminated. This will create successive flashes which will give the impression of a projectile moving through the barrel and hitting the target. The spacing of contact points 20 and the speed of rotation of disc 22 should be such that the flashes occur at speeds just below that required to give the appearance of a continuous streak of light.

In Figure 5, I have illustrated a barrel 12*a* which is made of opaque material but has a translucent window 50 running its entire length. In Figure 6, the barrel 12*b* is of opaque material but has a series of longitudinally spaced apertures 50*a* through which the flashes are visible. Other arrangements may be provided for simulating the travel of the projectile.

It is desirable, in order to make the gun more realistic, to provide sound-producing means therein for producing various sounds, such as that of a projectile in an actual gun leaving the barrel, of a projectile striking a target and ricocheting, et cetera. I accomplish this in the manner shown in Figures 1 and 2 where it will be noted that a sound-producing cone 55 is mounted on the body 10 of the gun opposite to the side where motor 24 is disposed. This cone carries an inwardly projecting needle 56 which engages a sound-recording groove 57 that is formed in the inner surface of the disc 22. Obviously, this groove 57 may have recorded any sound it is desired to reproduce in the gun to make the gun more realistic. Thus, when the disc 22 is released to actuate the lights 13 and 15, the desired sounds are also produced.

In Figure 7, I illustrate a gun which is exactly like that shown in Figure 1 in the light-producing means but which has a different arrangement for producing sounds. In this instance, the sound is produced by the lug 29*a* on disc 23*a* first striking a sound-making comb 55*b* and then striking a tuning fork 55*a* disposed at successive angular positions around the disc 22. These sound-producing members may be suitably mounted on the body of the gun. The member 55*b* may be tuned, for example, to give a sound of a projectile passing from the gun barrel while the member 55*a*, for example, may give the sound of a bullet ricocheting after striking a target. Other sounds may be produced if desired.

It will be apparent from the above that I have provided a gun in which the discharge of a projectile is simulated both in light and sound. The current for the light is developed in the gun by a generator which is driven by the same clock motor that drives the rotatable switch or circuit-closing means. Thus, the gun is extremely simple and inexpensive and it is not necessary to replace batteries.

Various other advantages will be apparent.

Having thus described my invention, what I claim is:

1. A toy gun comprising a barrel, said barrel being formed to permit the passage of light through the wall thereof, means for producing flashes of light at different points along the length of the barrel, means on said gun adjacent said barrel for timing said flash-producing means to produce the flashes successively and progressively towards the outer end of the barrel at a speed just below that required to give the appearance of a continuous streak of light, a generator on said gun adjacent said second-named means for supplying current for said first-named means and mechanically connected to said second-named means, said timing means comprising a contact disc, a trigger, means for rotating the disc upon actuation of the trigger, and a driving connection between said disc and said generator.

2. A toy gun according to claim 1 wherein the flash-producing means comprises electric light filaments spaced at intervals along the barrel, and said timing means further includes angularly spaced contacts on said gun adapted to be successively contacted by said contact disc and connected in a circuit with said filaments and with said generator.

3. A toy gun according to claim 2 wherein the light filaments are in the form of bulbs removably carried by the barrel.

4. A toy gun according to claim 3 wherein the barrel is translucent.

5. A toy gun according to claim 3 wherein the barrel is opaque but is provided with translucent windows.

6. A toy gun according to claim 1 including sound-producing means, said sound-producing means comprising a sound-amplifier mounted on said gun in proximity to said disc and carrying a needle which engages a recording groove in said disc.

7. A toy gun according to claim 1 wherein the means for driving the disc comprises a spring motor, means normally engaging the disc to prevent rotation thereof by the spring motor, said means being released upon actuation of said trigger.

8. A gun according to claim 7 wherein the disc is provided with a lug and the gun has a locking pawl for normally engaging the lug but releasable upon actuation of the trigger to release the disc, and means for returning said pawl to its initial position to again engage said lug upon one complete rotation of said disc.

9. A toy gun comprising a barrel, said barrel being formed to permit the passage of light through the wall thereof, means for producing flashes of light at different points along the length of the barrel, said flash producing means comprising electric light filaments spaced at intervals along the barrel, and means for timing said flash producing means to produce the flashes successively and progressively toward the outer end of the barrel at a speed just below that required to give the appearance of a continuous streak of light, said timing means being

connected in circuit with said filaments and with a source of current carried by the gun, said timing means including a circuit completing member mounted on the gun for 360° rotation, a trigger operatively mounted on said gun, means connecting the trigger to said timing means so that the timing means can be actuated by the trigger, and sound producing means, said sound producing means including said rotatable circuit completing member which is in the form of a disc having a recording groove therein, and a sound amplifier on the gun carrying a needle which engages the recording groove in the disc.

10. A self-contained portable toy gun comprising a hollow body, said body including a rectilinear barrel terminating in a muzzle and formed to permit the passage of light both transversely through the walls and longitudinally through the muzzle of said barrel, a series of electric light bulbs housed within said barrel at intervals along the length thereof, and means within said

body for flashing said bulbs successively and progressively toward said muzzle to create the illusion of motion of a projectile through and out of said barrel, the last in succession of said bulbs being disposed to emit light longitudinally through said muzzle.

11. The combination of claim 10 including a reflector in said barrel in operative relation to the last in succession of said bulbs to focus the light from said last mentioned bulb through the muzzle of said barrel at an imaginary target.

References Cited in the file of this patent

UNITED STATES PATENTS

2,097,749	Wade	Nov. 2, 1937
2,490,309	Lehman	Dec. 6, 1949
2,497,003	Larson	Feb. 7, 1950
2,529,709	Sigg	Nov. 14, 1950
2,588,036	O'Quinn	Mar. 4, 1952