

[54] **EVENT RECORDER**

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[51] Int. Cl. **G03b 29/00**

[58] Field of Search. **95/12, 12.5, 1.1; 346/107**

[56] **References Cited**

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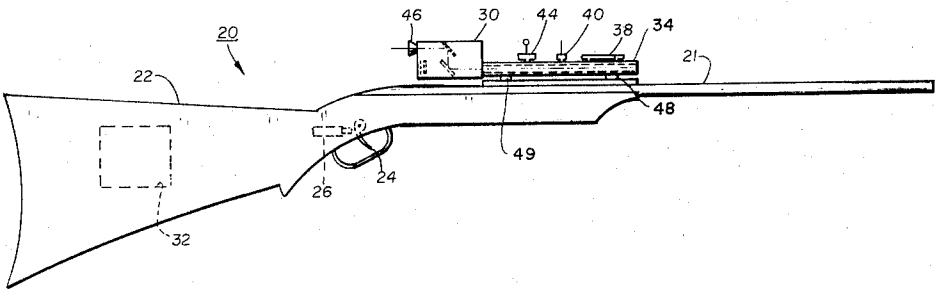
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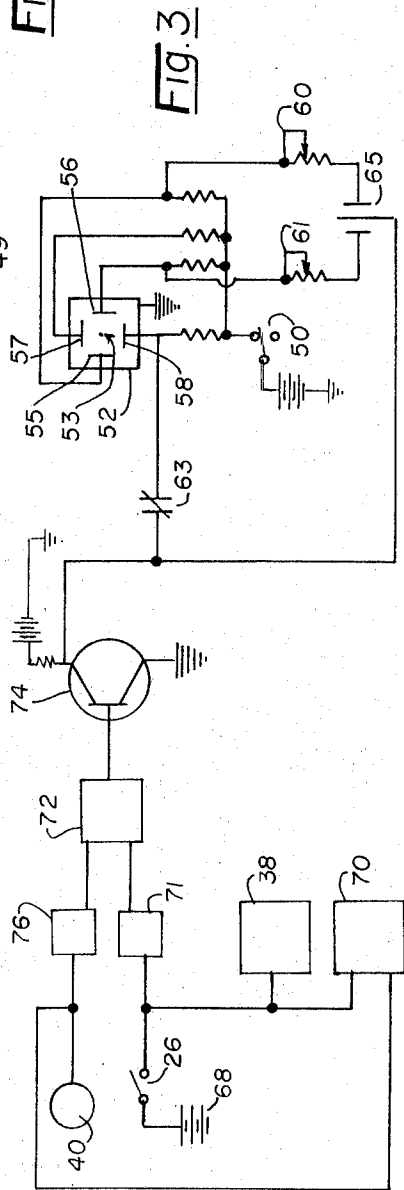
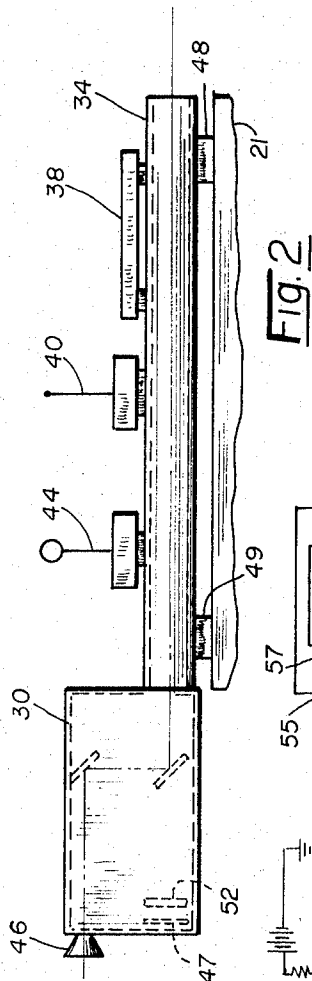
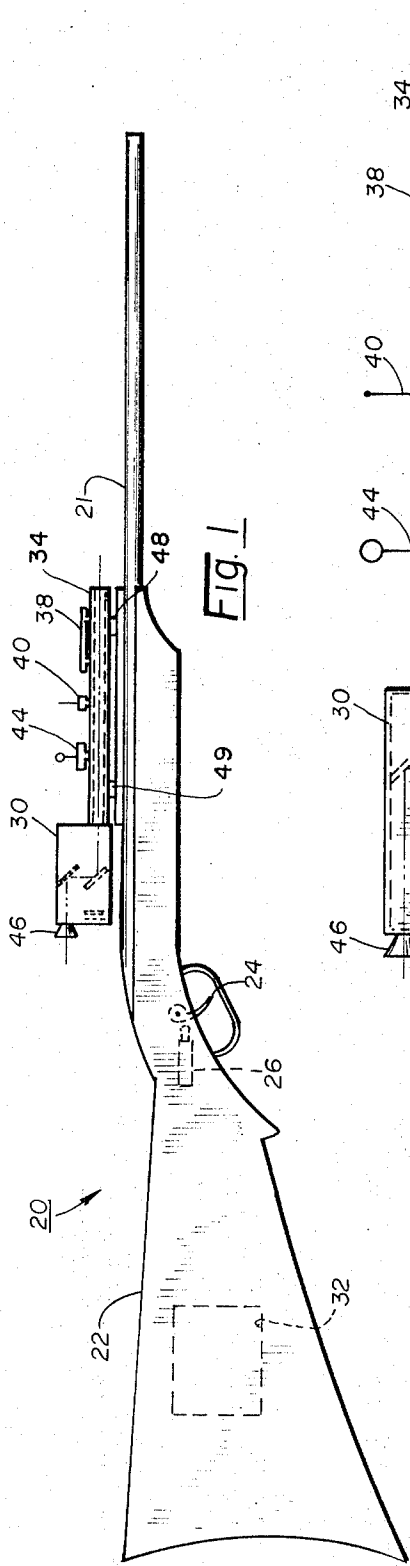
Primary Examiner—John M. Horan
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[57] **ABSTRACT**

This invention pertains to apparatus adapted to make an immediate record as by a photograph of a theoretical hit such as in hunting wild game. There is shown both a mechanical and an electrically actuated means for causing this theoretical hit to be exposed on the film of a camera which is carried by and actuated with the pulling of the trigger of the gun. The distance, trajectory and windage factors are reflected in this photographic record. The hunter using the gun fires a blank cartridge rather than a real cartridge so that this photographic record indicates what results this hunter would have achieved had a real bullet been fired.

5 Claims, 10 Drawing Figures





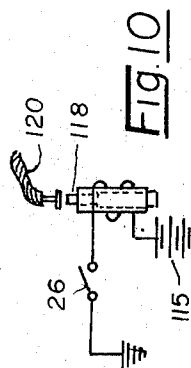
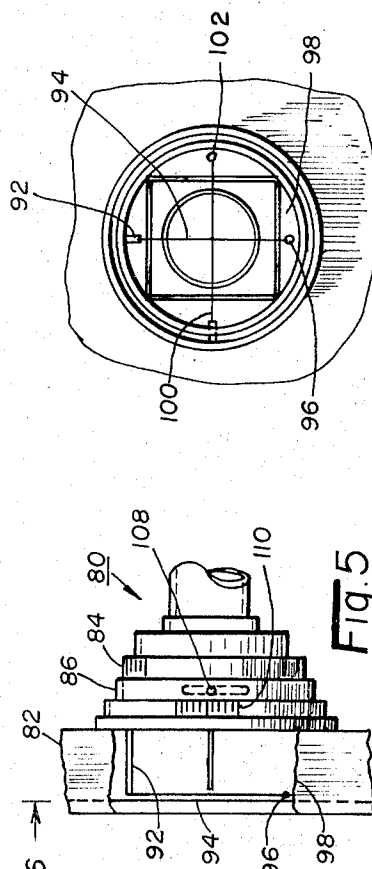
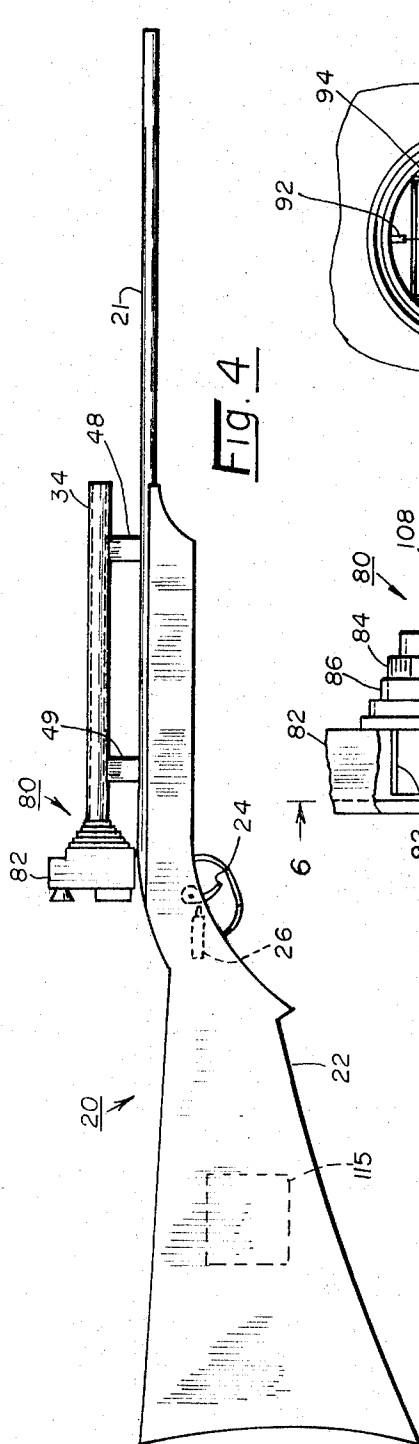
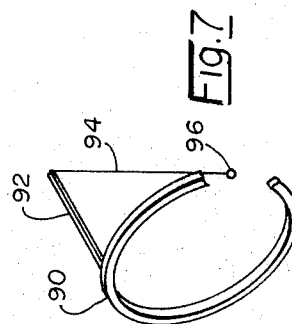
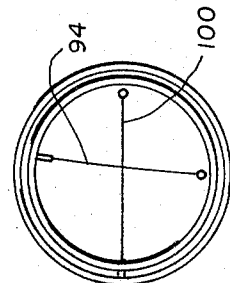
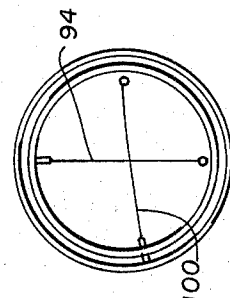


Fig. 6



EVENT RECORDER

BACKGROUND OF THE INVENTION

1. Field of the Invention

With reference to the classification of art as established in the U.S. Patent Office this invention pertains to the general class entitled, "Education" and in particular to the subclass entitled, "war." Other pertinent art is found in the general class of "Photography" and in the subclasses of "cameras in combination with sighting means" and of "cameras — aerial." Other art of interest pertains to laser beam systems as found in the general class of "Radiant Energy" and the subclass of "light wave communication systems."

2. Description of the Prior Art

The protection laws for endangered species and the reluctance of many to kill game only for the sport has caused many who thrill and appreciate the skill required for big game hunting and the like to cease their hunting. This invention provides apparatus which may be mounted on a rifle or gun of the user and which will record the ability to the hunter to "kill" his game without actually killing the game. Such hunting requires the skill and provides the thrill, exercise and perseverance of regular hunting. This hunting does not kill or, worse yet, wound game which many times cannot be found as proof of a "kill."

Insofar as is known, there is no simple device which may be mounted on a rifle and with a reflex camera and film therein record a theoretical shot at an animal or the like. This record will in a first embodiment automatically compute the distance, trajectory and windage and set this result for recording. The second embodiment shows a manual adjustment for the distance and windage. Patents of interest noted in a preliminary search included the hit indicator apparatus seen in U.S. Pat. No. 3,083,474 to KNAPP as issued on Apr. 2, 1963. Other patents include U.S. Pat. No. 3,545,356 issued to NIELSEN on Dec. 8, 1970; U.S. Pat. No. 2,943,547 issued to MARTIN on July 5, 1962 U.S. Pat. No. 3,062,114 issued to PALOS on Nov. 6, 1962. A combined sighting mechanism and laser range finder is shown in U.S. Pat. No. 3,464,770 as issued on Sept. 2, 1969. In these and other patents many ways are shown by which a camera and/or scope may be mounted on a rifle and the like, but in none of these are the various factors computed and integrated for an automatic record or are the results of necessary manual adjustment recorded. The adjustments to be performed by the hunter are wind velocity and distance (gravitational effect on bullet). The manual apparatus in the present invention tests the judgement of the hunter in determining distance, trajectory and windage by the adjustments he makes to the apparatus before the pulling of the trigger. The event record indicates what would have occurred in an actual firing of a bullet.

SUMMARY OF THE INVENTION

This invention may be summarized at least in part with reference to its objects.

It is an object of this invention to provide, and it does provide, apparatus which makes an immediate record of an event such as firing at an animal and imposing upon that record in the nature of a photograph an indication of what would have taken place with the actual firing of a bullet.

It is a further object of this invention to provide, and it does provide, an event recorder which is electronically actuated with the pulling of a trigger of a gun carrying said recorder, said record indicating the results of windage, distance and trajectory factors to automatically indicate the skill of the hunter without killing.

It is a further object of the invention to provide, and it does provide, an event recorder which uses mechanical means for changing a cross-hair positioning to record on a film the hunter's judgement of windage and distance necessary to accomplish an accurate shot.

In the context of this invention an event recorder is a device for making a record of an event, as by a photograph, upon which is made a mark indicating a result or happening which may or may not have taken place. The most obvious use appears to be in connection with bloodless hunting while using a rifle. The apparatus to be hereinafter more fully disclosed as electronic or mechanical embodiments of such a recorder does not render the rifle inoperative thereby enabling the user to record an event, hunt conventionally and if desired to simultaneously record the event and to fire the rifle.

In the electronically actuated recorder a rifle scope is mounted on the barrel of the rifle. Secured to the scope is a laser transmitter and receiver, a modified reflex camera attached in way of the rear of the scope, a windage indicator and transducer. The rifle includes a trigger switch and needed circuitry connected to a battery power supply to permit a signal to record the event as well as compensating for the several factors.

In the mechanical event recorder the rifle is provided with a rifle scope and a modified reflex camera. Windage and elevation rings move connected cross-hairs to a desired position in front of the film so that when the trigger is pulled the camera lever is actuated to take a picture as seen through the scope and at the same time the adjusted cross-hairs are defined on the picture.

In addition to the above summary the following disclosure is detailed to insure adequacy and aid in understanding of the invention. This disclosure, however, is not intended to prejudice that purpose of a patent which is to cover each new inventive concept therein no matter how it may later be disguised by variations in form or additions of further improvements. For this reason there has been chosen a specific embodiment of the event recorder as adopted for use with bloodless hunting and the like and showing the recorder in both an electronic and a mechanical embodiment. These specific embodiments have been chosen for the purpose of illustration and description as shown in the accompanying drawing wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 represents a side view of a rifle with the event recorder apparatus of this invention carried upon the barrel of the rifle and in the butt of the rifle, and with the event being viewed through the eyepiece of a reflex camera attached to a scope carried on the barrel of the rifle;

FIG. 2 represents in an enlarged view the event recorder of FIG. 1 showing a partly diagrammatic representation of the arrangement and mounting of the apparatus;

FIG. 3 represents a schematic electronic diagram showing the circuitry for recording the event of the apparatus of FIG. 1;

FIG. 4 represents a rifle like that of FIG. 1 but with a mechanically actuated and adjusted event recorder as carried on the barrel of the rifle;

FIG. 5 represents in an enlarged view and with a portion partly broken away, the event recorder of FIG. 4 as modified for use with a reflex camera;

FIG. 6 represents an end view, partly fragmentary and diagrammatic and taken substantially on the line 6—6 of FIG. 5 and looking in the direction of the arrows;

FIG. 7 represents an isometric view of a cross-hair support and retainer as used to locate one function on the film of the camera;

FIG. 8 represents a diagrammatic end view showing an arrangement of the cross-hairs in which is shown an adjustment of the cross-hair for windage prior to recording on a camera film;

FIG. 9 represents the cross-hair arrangement of FIG. 8 but with the other cross-hair moved to record the distance-trajectory adjustment, and

FIG. 10 represents a firing circuit in which a solenoid is actuated by the trigger being pulled and causes the camera shutter to be actuated.

IN the following description and in the claims various details will be identified by specific names for convenience. These specific names, however, are intended to be generic in their application. Corresponding reference characters refer to like members throughout the several figures of the drawings.

The drawings accompanying, and forming part of, this specification disclose certain details of construction for the purpose of explanation of the broader aspects of the invention, but it should be understood that structural details may be modified in various respects without departure from the concept and principles of the invention and that the invention may be incorporated in other structural forms than shown.

DESCRIPTION OF THE ELECTRONIC RECORDER AS SEEN IN FIGS. 1-3

Referring now in particular to FIGS. 1-3 there is depicted a rifle 20 having a barrel 21 supported and retained by a stock 22 in the conventional manner. Trigger 24 carried by the gun when pulled to fire a cartridge or blank, also in this modified version, actuates a switch 26 which causes a solenoid to actuate the exposure mechanism of a reflex camera 30. A battery and electronic circuit board 32 is preferably and removably located in the butt portion of the rifle stock. This storage area preferably has an access opening and securing cover permitting the removal and replacement of the battery which is a conventional dry cell type. As a part of this recorder apparatus there is provided a rifle scope 34 which carries on it a laser transmitter 38 and a receiver 40. A windage indicating device generally indicated as 44 is also carried on the top of this scope. The rear end of scope 34 is connected to the reflex camera 30 in a light tight manner. This reflex camera 30 is arranged and connected to the scope so that the user of the gun as he looks through eyepiece 46 sees the view through the scope. This view also is directed to the shutter mechanism of the camera to be hereinafter more fully described. The firing of the gun by pulling the trigger actuates the recording of the event upon a film 47 in the camera. The event being recorded on this film is the same as viewed through the eyepiece of the camera. In order to insure accuracy in recording the

event on the film the scope 34 and associated mechanism of the recorder is carried upon shock absorber mounts 48 and 49 attached to the barrel. The scope and attached equipment which is mounted on the barrel by these shock mounts are shielded from the jarring effect occasioned by the firing of the gun.

CIRCUIT DIAGRAM OF FIG. 3

Referring next to the circuit diagram of FIG. 3 as applied to the device of FIGS. 1 and 2 there is a provided electronic circuit which is activated by an on-off switch 50 which may be carried in the butt portion 22 of the rifle. The switch may be carried next to compartment 32 carrying the circuit board or concealed in the shoulder cushion portion of the butt of the rifle. The position indicator in this apparatus contemplates a vacuum box 52 having clear glass electronically charged front and back panels. In this box is a charged particle 53 freely movable therein. Four electrically charged plates 55, 56, 57 and 58 are arranged at 90° to each other and near the sides of the box 52. Variable resistors 60 and 61 are adjusted to carry current to oppositely disposed plates 55 and 56 to position particle 53 precisely at a determined horizontal position in the box. Also in the position indicator circuit is a variable capacitor 63, which is set to develop charge plates 57 and 58 and the trajectory curve of the bullet theoretically fired by the rifle. A windage device 44 carried on the scope includes a transducer 65 which cooperates with the circuit including the two variable resistors 61 and 62 to effect the horizontal position of particle 53 and compute the windage curve for the length of shot produced by the rifle. In this circuit the rearward movement of the trigger 24 causes the switch 26 to be closed. From battery 68 is fed a pulse to laser transmitter 38 and to the shutter circuit 70 which is energized for a picture to be taken or causes the shutter to be open in way of the film 47 when the laser beam is returned. Also at the same time the laser receiver 40 is actuated to receive the reflected laser beam.

USE AND OPERATION OF THE ELECTRONIC EVENT RECORDER

Referring now in particular to FIGS. 1-3 and in particular to the circuit diagram of FIG. 3, the sequence of operational steps by the user of the event recorder as mounted on a rifle 20 is as follows: the power switch 50 is moved to the "on" condition which causes the circuit to be connected to one side of the battery. The operator aims the rifle at the target through the eyepiece 46 of the camera and by means of the reflex design within the camera sights upon the target. He visually and mentally computes the amount of compensation necessary for the elevation and windage for this particular shot and aims the rifle at the target. The operator or user then squeezes the trigger closing switch 26, mono-stable multivibrator 71 is kicked or passes a pulse of current setting flip-flop 72, the camera shutter circuit 70 is energized. Transistor 74 conducts and amplifies the current charge or flow, and causing the vertical control capacitor 63 to start changing the charge on position indicator plate 58 causes the indicating charge dot 53 to be moved vertically. When wind is a factor the indicator 44 is moved and causes transducer 65 to be actuated which will unbalance the control circuit flowing through previously adjusted resistors 60 and 61 to plates 55 and 56 causing one side of this circuit to

discharge at a greater rate than the other. This produces a horizontal movement of the position indicator particle 53. The combination of the vertical and horizontal forces applied to position indicator particle 53 will establish the final position of the particle 53. When the laser beam sent by transmitter 38 returns to the receiver 40 the signal will cause mono-stable multivibrator 76 to reset the flip-flop 72 which will then turn off the transistor 74 permitting a slow charging of the capacitors and causing the position indicator plates 55, 56, 57 and 58 to bring their charge to their normal condition. At the same time that the laser signal was returned and received by receiver 40 the signal from the receiver caused the shutter circuit 70 to be actuated and the camera shutter to open to take a picture with the position indicator particle 53 at its furthestmost displacement. With the flip-flop 72 set to its initial condition the circuit now changes to normally position the dot 53.

MECHANICAL EVENT RECORDER

Referring now to the drawings and FIGS. 4-10 there is depicted in FIG. 4 the rifle 20 having a barrel 21, stock 22 and trigger 24 all of which correspond to the rifle seen in FIG. 1. The solenoid actuating switch 26 is closed when trigger 24 is pulled in the manner as in FIG. 1. Mounted upon the barrel 21 of this gun 20 is a rifle scope 34 which also is suspended by means of shock mounts 48 and 49 in the manner of FIG. 1. At the rear end of this scope 34 there is carried height and windage setting ring section 80 to which is attached a reflex camera 82. This adjustment section 80 is better seen in FIGS. 5 and 6 in which a windage setting ring 84 and adjacent height setting ring 86 are rotatable retained on journals formed on ring section 80. These rings are rotated to give the windage setting and the height setting for this gun. These setting rings 84 and 86 are constructed so as to retain a cross-hair device such as seen in FIG. 7 wherein an internal ring 90 has attached and extending therefrom an arm 92 to the end of which is attached a stiff, quite thin cross-hair 94. The other end of this cross-hair is attached to a pivot or swivel ring 96 which is fastened to a retaining plate 98. This hair is positioned immediately ahead of the film carried within the camera 82. The elevation ring 86, as depicted, includes an inner ring like ring 90 and an arm extending therefrom and like arm 92 has attached to it the horizontal cross-hair 100. As seen in FIGS. 5 and 6 the height adjusting ring 86 moves one end of the cross-hair 100 up and down while the pivoted end 102 is fixed. The arm member carrying cross-hair 100 extends rearward from the ring 86 to align its end and cross-hair 100 with plate 98. As ring 86 is rotated by the hunter or user to correspond to the desired elevation it moves an indicator dot 108 in a radius which extent of movement is read on spaced inscribed lines 110 carried on the adjacent fixed circular base portion of section 80. The windage setting ring 84 has the arm 92 attached thereto and cross-hair 94 is attached to the end and extends to pivot or swivel connector 96 which is fixed to plate 98. Cross-hairs 94 and 100 lay in parallel planes and only a couple of thousandths of an inch from each other.

Still referring to FIGS. 4 through 10 it is to be noted that in the butt portion of the stock 22 is carried a battery 115 and a switch not shown. A switch 26 is carried behind trigger 24 and is closed when the gun is fired

causing a circuit to be energized and actuated to move a solenoid plunger 118 as the trigger 24 is moved. Switch 26, when closed, causes solenoid 118 to mechanically pull the attached cord 120 to cause the shutter in the camera 82 to be opened to expose a frame of film.

USE AND OPERATION OF THE RECORDER OF FIG. 4

As in the event recorder of FIG. 1 the event recorder of FIG. 4 is an apparatus which is attached to a rifle or like gun for making a record of the hunting event with the result of the event being a photograph upon which the adjusted cross-hairs indicate the computed adjustment for the firing of the gun and recording of the event which may or may not have taken place. As with the event recorder of FIG. 1, the user surveys the scene and after determining the range by a range finder and the like, sets the distance or trajectory compensation by moving the horizontal cross-hair 100 with a rotation of the ring 86. This will cause the cross-hair 100 to move downwardly or upwardly as the case may be as seen in FIG. 9. At the same time the user evaluates and sets the windage ring which in this particular case is ring 84 and by rotating this ring causes the cross-hair 94 to be moved transversely as for example as seen in FIG. 8. The user then aims the rifle at the target by viewing the target through the eyepiece 42 and the connected scope 34 and when the scope appears to the hunter to be sighted in upon the target, with the proper allowance for distance and windage that the user of the rifle determines should be made, he then squeezes the trigger.

The squeezing of the trigger 24 causes switch 26 to be closed and current flowing through solenoid 118 draws the attached cord 120 toward the solenoid and causes the camera shutter to momentarily open and take the picture. As the film is exposed the cross-hairs 94 and 100 just in front of the film and shutter will place their intersection on the scene at which the theoretical bullet trajectory adjusted for windage and elevation has been made.

As particularly seen in FIGS. 6, 7, 8 and 9 it is to be noted that the modification of this camera 82 will include the cross-hair support adapter 80 which is attached to the opening of the housing of the camera so that the two rings 84 and 86 will be concentrically mounted in holding forms and the rotation of these rings will be indicated against graduations inscribed on the fixed housing. These graduations enable these rings to be precisely set at portions above and below, or to the right and left of, a normal or central position. Carried by these rings are arms such as 92 seen in FIG. 7 and to the end of this arm is attached a very fine but rigid cross-hair with these cross-hairs retained normally at 90° to each other. One end of these cross-hairs is fixed to an arm and the other end is attached to a pivot member attached to the body of the camera or a plate carried by the body. These cross-hairs are set just in front of the shutter of the camera or may be set immediately in front of the film of the camera but out of contact with the reflex member. The scene carried through the scope 34 and viewed by the reflex eyepiece 42 is the scene photographed by the camera. When the film in the camera is exposed the scene seen through the scope includes the positioned cross-hairs of the scope itself. The resulting photo will show the sighting

response of the scope itself as seen upon the film and the position of the cross-hairs also imposed upon the same film. This photographic result may then be evaluated as to the accuracy of the sighting and pulling of the trigger of the gun.

It is contemplated that in the bloodless hunting provided by the above event recorder that a blank cartridge will be used. This blank cartridge when it is fired will cause certain vibrations or a jump to the gun as is normally experienced when firing a bullet of like caliber. This firing in all respects will cause a jar to the shoulder and a requirement to hold the gun in a fixed condition, or allow for the jump of the gun during the firing thereof. The game which is being hunted will also be alerted by the firing of the blank cartridge and seek an escape so that if a further firing of the gun at the same game is desired it will require a different positioning and likely a recalculating of the shot to be made.

Terms such as "left," "right," "up," "down," "bottom," "top," "front," "back," "in," "out" and the like are applicable to the embodiments shown and described in conjunction with the drawing. These terms are merely for the purposes of description and do not necessarily apply to the position in which the event recorder may be constructed or used.

While a particular embodiment of the apparatus and alternate embodiment have been shown and described it is to be understood the invention is not limited thereto since modifications may be made within the scope of the accompanying claims and protection is sought to the broadest extent the prior art allows.

What is claimed is:

1. A recording system superimposed on a camera carried by a gun, said system adapted to predict the theoretical impact point of a "hit" such as is achieved in bloodless hunting, said system including: (a) a rifle scope; (b) a reflex camera secured to the viewing end of the scope in a light-tight manner so that the image seen in the scope is also seen in the view finder of the camera and when the camera shutter is actuated the image through the scope is also received and recorded on a film in the camera; (c) indicator means for placing in the scope-projected image an accurate indication of those operator compensations required in hunting, these compensations including windage, trajectory and distance of a theoretically fired bullet; (d) an electronic circuit, which when selectively connected to a battery source of power and the trigger of the gun is pulled automatically moves an indicating positioning member in a vertical manner to establish a trajectory allowance and a distance adjustment and by means of a windage indicator transducer which is actuated by a wind-engaged sail-like member moved transversely of the line of sight by the force of the wind, this transducer displacing said positioning member horizontally, whereby both vertical and horizontal movements are at their maximum established condition as and when the film is exposed, and (e) means responsive to the pulling of a trigger of the gun to create a firing condition, said means opening the camera shutter to expose the film in the camera and on said film to record the view through the scope and at the same time to record on this same film the position of the indicator means responsive to the windage trajectory and distance compensation adjustments made by the operator.

2. A recording system as in claim 1 in which the distance computation in the electronic circuit includes a

laser beam transmitter and receiver, each carried on the gun with said transmitter and receiver aligned with the rifle scope, both the transmitter and the receiver actuated with the pulling of the trigger.

3. A recording system as in claim 2 in which the indicating positioning member includes an electrostatic box in which a charged particle is freely movable in a vacuum conditioned means established within said rectangularly configured box having substantially transparent and electrically charged front and rear walls, said box having four charged plates carried within the box and near the sides, one of these at each of the sides with these plates arranged at 90° to each other; the circuit for the distance and windage and in an adjusted balanced condition causing the charged particle to be suspended at a determined central position within said box and at the time of firing the flow to the charged plates is unbalanced by a correction means so as to move the particle from its central position an amount corresponding to the distance and windage influence on a theoretically fired bullet.

4. A recording system as in claim 3 in which said circuit includes two mono-stable multivibrators, a flip-flop and a transistor amplifier and with the pulling of the trigger one mono-stable multivibrator releases a single pulse to set the flip-flop and causing a vertical control capacitor to vertically position the indicating particle, and at the same time the windage transducer is moved by the sail-like attached member to adjust the same indicating particle horizontally and at the pulling of the trigger a transmitted laser beam which is in coincidence with the axis of the gun barrel is sent toward the target and after striking the target and returning to the laser receiver causes the other mono-stable multivibrator to reset the flip-flop to normal condition, this received signal also actuates a camera trigger control circuit to take the picture.

5. A recording system superimposed on a camera carried by a gun, said system adapted to predict the theoretical impact point of a "hit" such as is achieved in bloodless hunting, said system including: (a) a rifle scope; (b) a reflex camera secured to the viewing end of the scope in a light-tight manner so that the image seen in the scope is also seen in the view finder of the camera and when the camera shutter is actuated the image through the scope is also received and recorded on a film in the camera; (c) indicator means for placing in the scope-projected image an accurate indication of those operator compensations required in hunting, these compensations including windage, trajectory and distance of a theoretically fired bullet; (d) a mechanical means for selectively moving a pair of stiff cross-hairs normally arranged at substantially right angles to each other and disposed adjacent the film in the focal plane of the camera, the shifting of the hairs and point of intersection corresponding to the desired compensation for windage and trajectory, this mechanical means including two rotatably mounted setting rings arranged in a substantially parallel condition, each ring carrying a support post to which is secured one end of a cross-hair while the other end of the cross-hair is attached to a swivel ring carried by a fixed support, the cross-hairs normally disposed at right angles to each other and laying in parallel planes and adjacent each other and adjacent the film being exposed, and (e) means responsive to the pulling of a trigger of the gun to create a firing condition, said means opening the camera shutter to expose the film in the camera and on said film to record the view through the scope and at the same time to record on this same film the position of the indicator means responsive to the windage trajectory and distance compensation adjustments made by the operator.

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