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J. W. F. LAMONT

1,699,595

AIM INDICATING DEVICE FOR SMALL ARMS

Filed Oct. 6, 1927

2 Sheets-Sheet 1

Fig. 1.

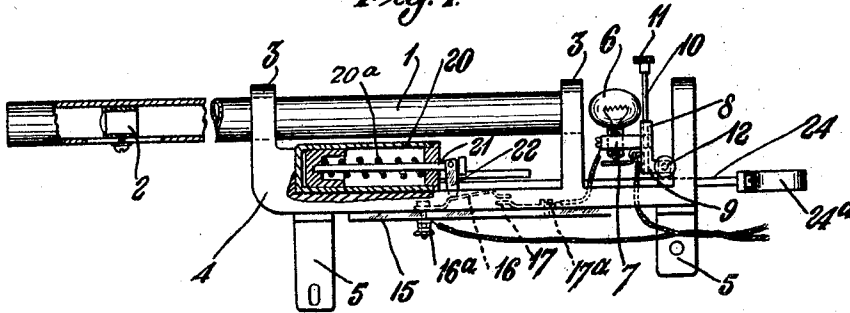
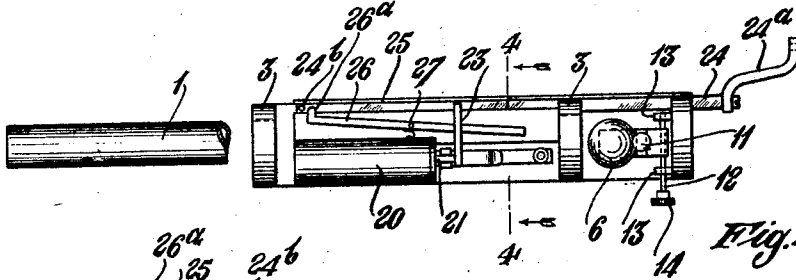


Fig. 2.



H 2451
X 250

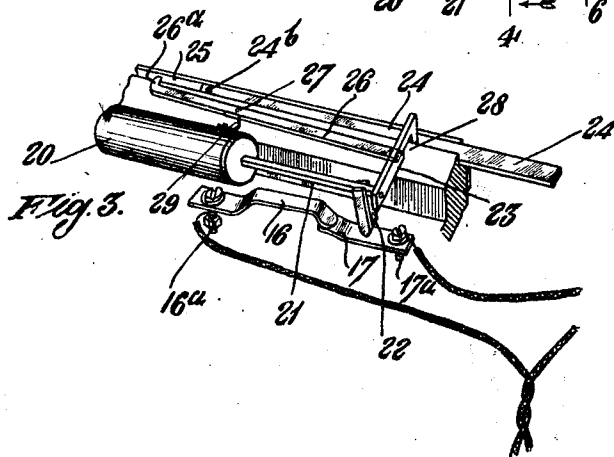


Fig. 4.

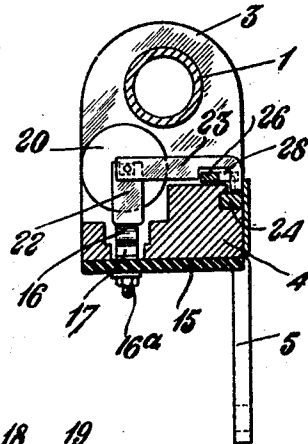
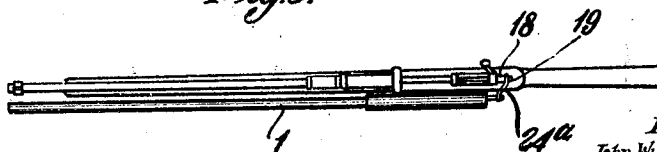


Fig. 5.



INVENTOR
John William Fraser Lamont
PER *Rayner & Co.*
Attorneys.

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J. W. F. LAMONT

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2 Sheets-Sheet 2

Fig. 6.

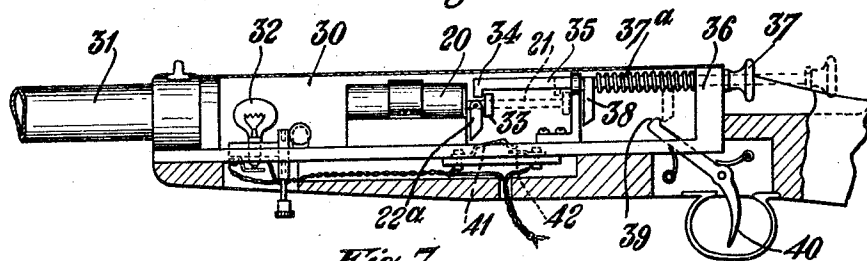


Fig. 7.

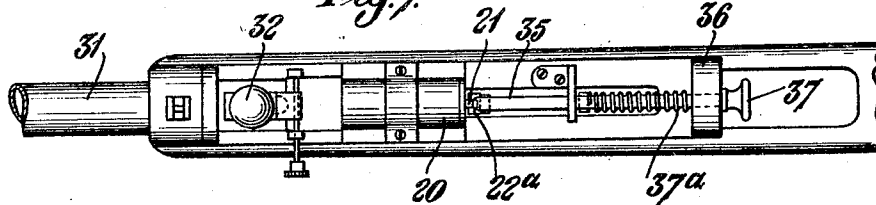


Fig. 8.

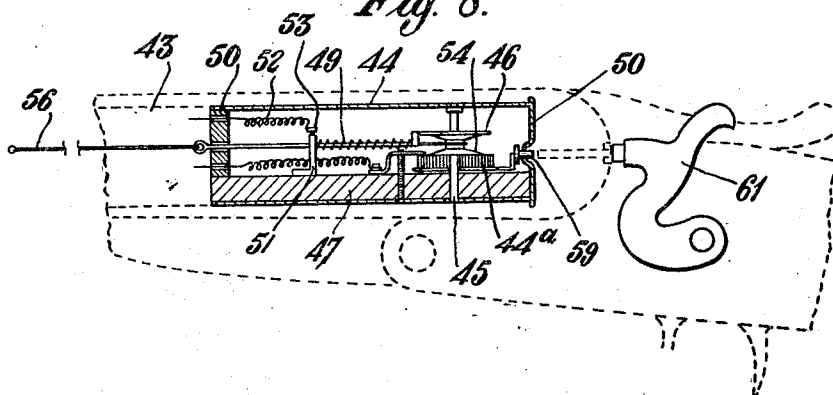


Fig. 9.

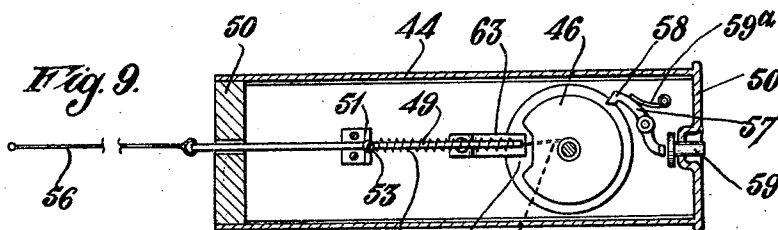
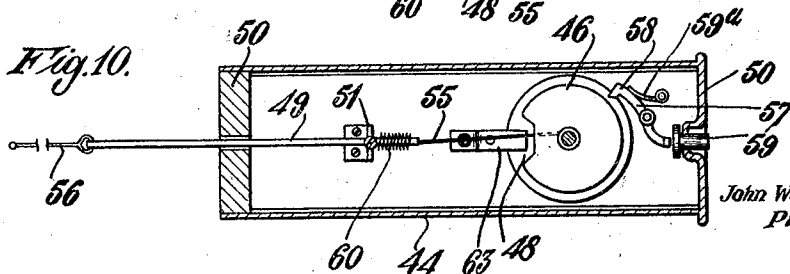


Fig. 10.



INVENTOR
John William Fraser Lamont,
PER. *Raymond*
Attorneys

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1,699,595

UNITED STATES PATENT OFFICE.

JOHN WILLIAM FRASER LAMONT, OF LONDON, ENGLAND.

AIM-INDICATING DEVICE FOR SMALL ARMS.

Application filed October 6, 1927, Serial No. 224,506, and in Great Britain February 28, 1927.

This invention relates to aim indicating devices for gun sights, rifles and other small arms of the kind adapted to project a beam of light in the line of sight at the moment when the trigger is pulled so as to show a spot of light on the target at the point at which the gun or other firearm was aimed, and the object of the invention is to provide an improved aim indicating device of this type.

It has been proposed heretofore to provide coin freed apparatus for practise in aiming rifles, revolvers and the like comprising a gun mounted on a swivel support in which means operated automatically on actuating the trigger lock the gun against movement and also bring into action a light to "spot" the aim taken, the duration of the lighting of the spot being determined by the swing of a weighted lever actuated by a coin.

It has also been proposed to provide aim indicating apparatus for fire arms in which an electric lamp arranged to project a ray of light onto the target to indicate the aim is adapted to be switched on by the movement of the trigger after having been obscured by a shutter which is also operated by the trigger and is designed to determine a definite period during which the light is shown immediately after the trigger has been pulled.

According to the present invention, a device of the kind referred to is provided wherein the period during which the beam of light is projected is determined by a contact device arranged to be operated by the firing mechanism of the gun and adapted first to close the lamp circuit immediately upon actuation of the firing mechanism and thereafter to open the lamp circuit automatically after a short time interval.

In carrying the invention into practice for use with service rifles and the like in which a bolt has to be pulled rearwards and pushed home again to charge the rifle and to set the firing mechanism, I utilized this operation of the bolt to set in position ready for operation a dash pot controlled device which is released for operation by the operation of the firing mechanism, the slow action of the dash pot being utilized to close and maintain closed during its operation a pair of contacts which close the circuit to the said electric incandescent lamp.

Instead of a dash pot controlled mechanism a slow acting spring operated mechanism may be employed, particularly for use with sporting guns, dummy rifles and guns made solely for the purpose of sighting practice.

In order that the present invention may be clearly understood and readily carried into effect, I have appended hereto two sheets of drawings somewhat diagrammatically illustrating embodiments of same, and wherein:—

Fig. 1 is a side elevation view of a dash pot controlled device suitable for use with service and like rifles.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is a perspective view of the device.

Fig. 4 is an end view in section on the line 4—4 of Fig. 2.

Fig. 5 is a diagrammatic plan view showing the device attached to a service rifle.

Fig. 6 shows in part sectional side elevation a modified form of dash pot controlled device adapted to a dummy rifle.

Fig. 7 is a plan view of Fig. 6.

Fig. 8 is a part sectional side elevation showing a clock spring operated device adapted to a sporting gun.

Fig. 9 shows in part sectional plan the device illustrated in Fig. 8 when not in use, and

Fig. 10 is a plan view partly in section showing the same device in the "set" position.

Referring to the drawings (Fig. 1, 2, 3, 4 and 5) the beam of a spot light projector consists of an elongated tube 1 accommodating a suitable number of lenses 2 and supported at one end in a pair of lugs 3 integral with a bracket 4 adapted to be attached to the stock of a rifle or a convenient part of other sighting apparatus, for instance to the open sights of a field gun. Clamps 5 are provided to enable this attachment to be effected. The front lens, being the lens 2 shown in Fig. 1, is preferably endwise adjustable to enable the area of projected beams to be varied. The source of light is a small electric incandescent lamp 6 supported for adjustment in vertical and horizontal planes, so that correct axial alignment of the lamp with the tube 1 can be effected. For the purpose of this adjustment the lamp socket 7 is slidably supported in a vertically disposed U shaped bridge 8

in the horizontal portion of which and a horizontal base bar 9 bridging the limbs of the U shaped member 8 is engaged an axially rotatable traversing screw 10 threaded through the socket 7 and having a milled head 11. The base bar 9 is similarly supported by a horizontally disposed traversing screw 12 engaged in lugs 13 and having a milled head 14.

10 The filament of the lamp 6 is preferably a horizontally disposed filament as this gives a projected beam more suited for the particular purpose in view.

The bracket 4 has secured underneath it 15 an insulated strip 15 carrying a pair of resilient leaf contacts 16 and 17 normally separated as shown in Fig. 1. Terminals 16^a and 17^a enable the lamp 6 to be connected via these contacts to one pole of a 20 small dry battery or other suitable source of current, the lamp being connected without interruption to the other pole of the said source of current. The two contacts 16 and 17 are adapted to be engaged upon 25 the action of pressing the trigger of the rifle and releasing the firing pin or striker, and the contacts are to be maintained closed for an elapse of time subsequent to the releasing of the firing pin. For this purpose I propose to employ a dash pot operated mechanism which is set by the action of pulling back the rifle bolt 18 (Fig. 5) in well known manner, and is set into operation by the movement of the striker 19 (Fig. 5) upon 35 pressing the rifle trigger.

The dash pot mechanism comprises the usual form of cylinder 20 having a restricted orifice at one end and accommodating a sliding plunger secured to a rod 21 slidable 40 through the other end of the cylinder, this rod being loaded by a spring 20^a disposed within the dash pot. This plunger rod 21 carries an insulated depending finger 22 at its rear end which is adapted to ride over 45 the contacts 17 and 16. The finger is pivotally supported in such a manner that when moving rearwards over the contacts 16 and 17 it exerts no pressure upon the contacts, but when the finger 22 moves forwards (i. e. 50 towards the muzzle of the rifle) it abuts against the plunger rod 21 so as to be prevented from swinging rearwards relative to the rod 21 and consequently exerts a pressure upon the upper contact 16 which is 55 formed bridge shaped for most of its length (see Fig. 3) for this purpose.

The plunger rod 21 has its rear end secured to one end of a transverse bar 23, the other end of which is engaged in a channel 60 25 accommodating a longitudinal rod 24 of square section, slidably engaged in the channel 25 formed in the bracket 4. The front end of the rod 24 carries an upstanding pin 24^b and the rear end of this rod 24 carries 65 rigidly a lateral extension 24^a which is

apertured or otherwise suitably prepared at its free end for attachment to the firing pin or striker 19.

It will be readily appreciated that the action of pulling back the bolt 18 will ultimately pull the plunger rod 21 and its plunger rearwards relative to the cylinder 20 because of the upstanding pin 24^b engaging the member 23, and this operation corresponds to the setting of the mechanism. 75 To prevent the return of the bolt to the loaded position unsetting the mechanism I provide a simple form of trip device in the form of an arm 26 supported upon the upper face of the bracket 4 and adapted to swing 80 a slight amount horizontally on a pivot pin 27. Normally this arm 26 is engaged in a recess 28 in the transverse bar 23, but the length and location of the arm 26 is such that when the bolt 18 is retracted, i. e. in the 85 unloading position, the rear end of the arm 26 will just clear the transverse bar 23, as shown in Fig. 3, and by reason of a spring 29 the rear end of the arm 26 will be deflected away from the recess 28 and will 90 form an abutment against forward movement of the bar 23 and the plunger rod 21.

The forward end of the arm 26 has a small lateral pawl 26^a which normally does not extend over the channel 25, but when 95 the mechanism is set, as in Fig. 3, this pawl is disposed over the channel 25, and forms a movable obstacle in front of the upstanding pin 24^b on the front end of the slidable rod 24. When in this said set position the 100 distance between the pawl 26^a and the pin 24^b is less than the movement of the striker 19 during the firing stroke, consequently when the rifle trigger is pressed to release the said striker, the pin 24^b hits the pawl 26^a 105 and brings the rear end of the arm 26 opposite the recess 28, thereby allowing the dash pot to return the bar 23 and the other parts of the mechanism to normal position. This results in the finger 22 being dragged 110 over the upper contact 16 and pressing it against the contact 17 with a consequent illumination of the lamp 6 and the projection of a spot of light on to the point aimed at on the target, the time of illumination of 115 the lamp corresponding to the time it takes for the finger to travel over the upper part of the contact 16, which could be for a few seconds.

When the mechanism is in the set position 120 the finger 22 will have a slight clearance from the arched part of the contact 16 as shown in Fig. 3 so that it does not interfere with the quick action of the striker 19.

In Figs. 6 and 7 I have shown a form of 125 device substantially similar to that illustrated in Figs 1 to 5, but adapted to a dummy rifle. In this modification a dash pot cylinder 20 is employed and is secured inside a chamber 30 secured over the stock 130

of the rifle, the barrel 31 being utilized as the equivalent of the tube 1, suitable lenses being fitted into the barrel for this purpose, and an electric incandescent lamp 32 fitted
 5 in the chamber 30 in alignment with the axis of the barrel. This lamp 32 is supported for adjustment in practically the same manner as the lamp in Figs. 1 and 2.

The plunger rod 21 of the dash pot has
 10 an abutment 33 at its end against which engages an abutment 34 at the fore end of a longitudinally disposed rod 35 slidably supported in a block 36 at the rear of the chamber 30. This rod 35 has a knob 37 at
 15 its rear end which is pulled rearwards against the influence of a coiled spring 37^a to cock the rifle, a pawl or tripping piece 38 engaging over a projection 39 on the upper end of the trigger 40 for retaining
 20 the rod 35 retracted until such time as the trigger is pulled, which will allow the rod 35 to spring back to its normal position. This action of pressing the trigger and releasing the rod 35 will allow the dash pot
 25 to come into operation and return the plunger rod 21 to its normal position, the rate of travel of the plunger rod being considerably slower than that of the rod 35.

The plunger rod 21 carries a pivotally
 30 depending finger 22^a similar to the finger 22 in Figs. 1 and 3, which travels over a pair of contacts 41 and 42 corresponding to the contacts 16 and 17 in Fig 3, these contacts being electrically connected to the lamp
 35 32 and a suitable source of current.

In Figs. 8, 9 and 10 my invention is shown applied to a sporting gun, the barrel 43 of which has introduced into it a tubular member with lenses and a lamp similar to
 40 that shown in Figs. 1 and 2. The breech chamber is adapted to be charged with a hollow body 44 similar to a cartridge case and accommodating a coiled clock spring 44^a mounted on a vertical pin 45 secured rotat-
 45 ably in an insulated body 47 and having mounted on it a metal disc 46. This disc 46 is an electric conductor and acts as a circuit closing device. The continuity of the periphery of the disc 46 is interrupted as
 50 at 48 (Fig. 9) and normally this interrupted part 48 receives one end of a contact rod 49, the other end of which is engaged in a block 50 in the end of the cartridge case and slid-
 55 able through a small bracket 51. This bracket 51 serves as a terminal to receive a lead 52, for which purpose it is provided with a terminal screw 53.

The spring 44^a is secured at its inner end to a collar 54 carrying the disc 46, and ro-
 60 tatable about the pin 45. This collar 54 has wound round it a fine wire or other flexible ligature 55 secured to the rear end of the contact rod 49. The front end of the contact rod 49 is anchored by a flexible cord
 65 56 to a fixture in the bore of the gun so that

by pulling out the cartridge by its base 50, the spring 44^a is wound and the disc 46 is rotated. A pawl shaped end 58 of a lever
 57 retains the disc in this set position.

The lever 57 is cranked and is fulcrumed
 70 at the junction of its two limbs, one end 58 being pawl shaped and engaging a notch in the spring drum and the other end engaging against a movable stud 59 in the base of the cartridge. The spring 59^a acts on the lever
 75 57. When the cartridge is pulled rearwards the spring 60 is placed under compression, and when released the cartridge returns to normal position, but the disc 46 is prevented from returning owing to the action of the
 80 pawl 58 so that the spring 44^a remains in tension. When the trigger is pulled, the hammer 61 strikes the stud 59 and moves the lever 57 to displace the pawl 58 from the notch in the spring drum, thereby releasing
 85 the disc 46 and allowing the clock spring 44^a to carry the disc back to its original position. This operation brings the end of the rod 49 into contact with the rotating periphery of the disc 46 and a resilient contact 63 con-
 90 stantly engaging the disc 46 closing the circuit of the source of current of the lamp.

I claim:—

1. An aim indicating device for small arms comprising means including an electric
 95 lamp for projecting a beam of light in the line of fire, a contact making device movable in one direction for first making and then breaking contact, said contact making device being connected in circuit with said lamp, a
 100 spring for driving said contact making device, means for moving said contact making device for tensioning said spring, a latch device for holding said contact making device against movement under the action of said
 105 spring and means operated by the action of firing the gun for releasing said latch device.

2. An aim indicating device according to claim 1, including a dash pot device for controlling the movement of said contact mak-
 110 ing device.

3. An aim indicating device for small arms comprising means including an electric lamp for projecting a beam of light in the line of fire, a sliding contact making device movable
 115 in one direction for making momentary contact, said contact making device being connected in circuit with said lamp, a dash pot device acting in one direction upon said sliding contact device, a spring acting in the opposite direction upon said contact making device, a sliding operating member having a lost-motion connection with said contact making device, a latch device for engaging
 120 said contact making device and holding same against the action of said spring, and means operatively connected with the firing mechanism of the gun for releasing said latch device.

4. An aim indicating device according to 130

claim 3 including a pair of spring contact elements connected in circuit with said lamp and a pivoted finger on said contact making device for engaging said contact elements, 5 said contact-making device having means for permitting pivotal movement of said finger in one direction only.

5. An aim indicating device for small arms comprising means including an electric lamp 10 for projecting a beam of light in the line of fire, a pair of spring contact elements connected in circuit with said lamp, a sliding rod, a dash pot having a plunger mounted on said rod and acting in one direction, a 15 spring acting on said rod in the opposite direction, a pivoted finger on said rod for engaging said spring contacts, said finger being free to ride over said contacts during movement of said ride in the non-working 20 direction but being arranged to engage and

close said contacts during a part of the working movement of said rod, an abutment on said rod, a sliding element having an abutment for engaging said first mentioned abutment for moving said rod in the non-work- 25 ing direction of movement, a latch device for holding said rod against movement in the working direction and means operated by the action of firing the gun for releasing said latch. 30

6. An aim indicating device for small arms comprising means including an electric lamp for projecting a beam of light in the line of fire, a momentary contact making device connected in circuit with said lamp, a spring 35 loaded dash pot device for operating said contact making device and means responsive to the act of firing the gun for initiating operation of said contact making device.

JOHN WILLIAM FRASER LAMONT.