June 29, 1943. A. M. JACKSON 2,322,806

FLASH-HIDER FOR AUTOMATIC WEAPONS

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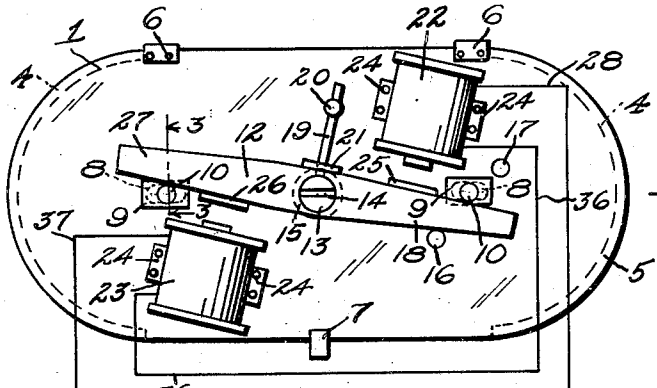

Fig. 1

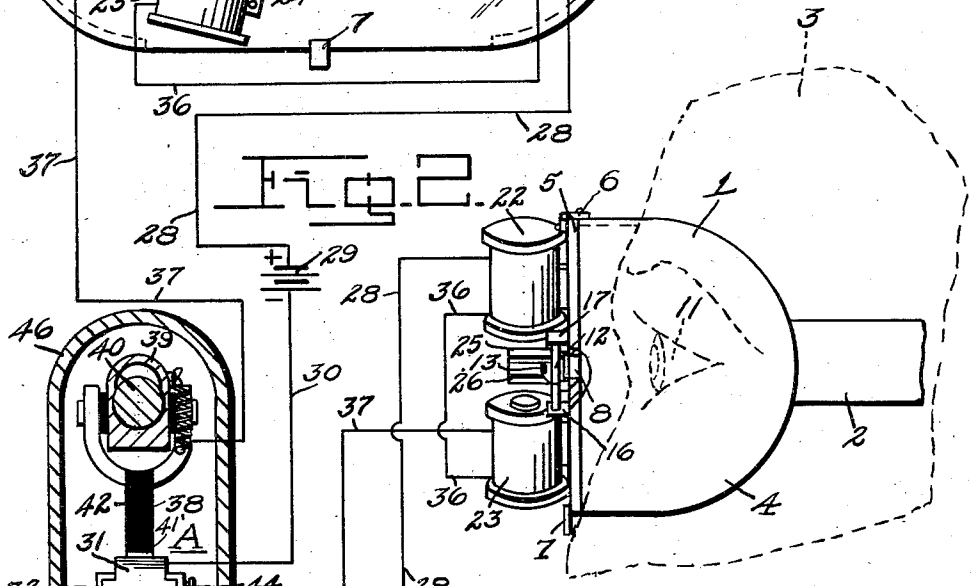

Fig. 2

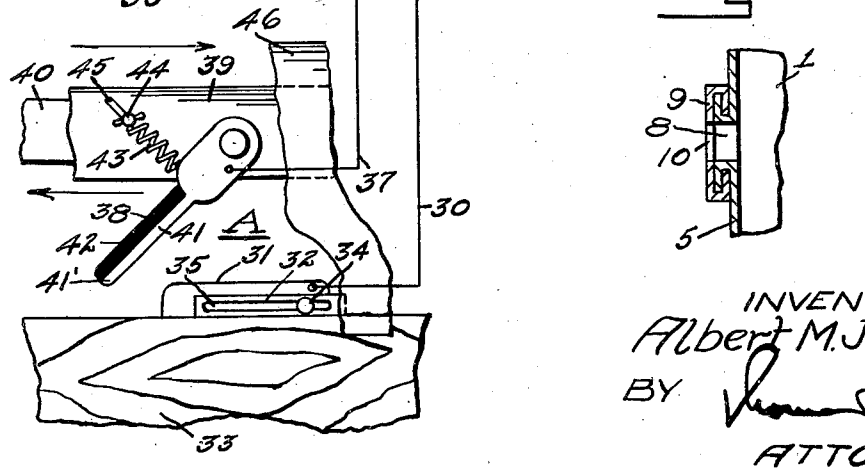

Fig. 3

INVENTOR
Albert M. Jackson
BY
ATTORNEY

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FLASH HIDER FOR AUTOMATIC WEAPONS

Albert M. Jackson, Reno, Nev.

Application April 27, 1940, Serial No. 332,062

5 Claims. (Cl. 42—1)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a flash-hider for use in gunnery, more particularly it is directed to a device of this character to protect the eyes of a gunner from the flash incident to the firing of a gun and is especially adapted for use in conjunction with automatic weapons.

One of the objects of the invention is to provide a flash-hider, including a portion adapted to be applied to the head of a gunner and another portion adapted to be mounted on a gun and which is of such construction and operation that it will not interfere with the ordinary aiming of the gun.

Another object of the invention is to provide a flash-hider for automatic weapons, including contact members mounted on a weapon and connected to operate a shutter to close a sight passage during a predetermined period in the operation of the weapon and thus protecting the gunner's eye from the effect of a flash produced by the weapon and means for operating the shutter to open said sight passage.

The flash produced by the burning powder gases used in gunnery after the projectile has left the muzzle of a weapon is an undesirable feature thereof. The use of the so-called flashless powders has reduced this undesirable feature to a certain extent. Certain devices known as flash-hiders placed on a gun have further minimized the effect of flash. The flash produced from a gun should be minimized not only for the purpose of concealment from an enemy but also in the case of a rapid-firing weapon, such as a machine gun or automatic cannon, the flash should be reduced or caused to disappear from the view of the gunner in certain cases. A notable instance of this requirement is where a gunner is firing against aircraft at night where only natural illumination is available. In such a case not only does the intermittent flashing of the weapon disclose its position but also it seriously hampers the gunner's vision.

It is therefore the aim and purpose of this invention to provide a device for use in gunnery which will eliminate the effect of the flash of a gun from view of a gunner, thereby preventing the flash from seriously hampering the gunner's vision, the said invention being based on the phenomenon of apparent continuity of vision due to persistence of visual stimuli where vision is intermittently interrupted.

With the above and other objects and advantages in view, the invention consists of certain features of construction and operation of parts which will hereinafter appear, and in which—

Fig. 1 is a front elevation of the component parts of the invention, including a portion adapted to be applied to the head of a gunner and another portion attached to a gun shown in section with the greater portion of the gun broken away;

Fig. 2 is a fragmentary side elevation partly in section thereof; and

Fig. 3 is a fragmentary cross-sectional view of an eyeslot adjusting member used in carrying out the invention, taken on the line 3—3 of Fig. 1.

In the illustrated embodiment characterizing the invention, 1 indicates an eyepiece which may be in the form of a shield, mask or goggles, having a strap 2 provided thereon for engagement with the head 3 of a gunner, indicated by the fragmentary dotted outline in Fig. 2. The eyepiece is provided with side portions 4 and with a lid 5 on the front thereof which may be movably mounted thereon by the hinges 6, whereby the lid 5 may be lifted or swung upwardly by means of the member 7 suitably secured to the lower surface of the lid, thus permitting the unhindered vision by the gunner when the device is not in use. The hinged lid 5 is provided with two elongated slots or apertures 8 which are partially closed by means of slides 9 having eye apertures 10 provided therein of sufficient diameter and spaced at such distance on the front of the eyepiece 1 from the ocular pupils 11 of the gunner as to produce sufficient angular vision. The slides 9 shown in section in Fig. 3 permit the apertures 10 therein to be adjusted along the eye slots 8 on the lid 5, so as to accommodate the interpupillary distance of the individual gunner.

The eye apertures 10 on the slides 9 are adapted to be opened or closed simultaneously by means of a screen or shutter 12 which is pivotally mounted on the front of the lid 5 and at the center thereof by means of a pivot pin 13, having a kerf 14 provided in its head for engagement with a screw driver. Spacing means in the form of a washer 15 is mounted on the pin 13 in back of the shutter 12 for holding the shutter beyond the slides 9 on the eye slots 8.

The ends of the shutter 12 extend outwardly

from the pivot pin 13 a sufficient distance to cover the apertures 10 in the slides 9 and are adapted to control the opening or closing of the eye apertures simultaneously from opposite directions. In order that the shutter 12 will not be operated more than necessary to open or close the eye apertures 10, stop members 16 and 17 are mounted on the lid 5 which are adapted to be engaged by the lower and upper edge, respectively, of the shutter at one end 18 thereof. A spring member 19, which is secured at 20 to the lid 5 and to a projection 21 on the shutter 12, is provided for moving the shutter to an inoperative position to open the apertures 10, as indicated in Fig. 1.

The shutter 12 is actuated into a position to close the eye apertures 10 whereby the vision of a gunner is obscured during the flashing of a gun by means of two electro-magnets 22 and 23, which are secured to the lid diagonally thereon by means of the bolts 24 or the like. The electro-magnet 22 on the upper right-hand corner of the lid 5 is arranged in such a manner thereon as to attract a metal projection 25, which extends in a forward direction from the upper edge of the end 18 of the shutter and the electro-magnet 23 on the lower left-hand corner of the lid 5 is arranged thereon in such a manner as to attract a metal projection 26, which extends in a forward direction from the lower edge of the end 27 of the shutter 12.

The electro-magnet 22 is connected at one end by a conductor 28 to a source of electrical supply such as a battery 29, which may be of the type used in a small flashlight and adapted to be carried around in the pocket or other convenient place. The other side of the battery 29 is connected by means of a conductor 30 to an electrical contact 31, which is slidably mounted in a slide 32, mounted on any suitable fixed portion 33 of the gun, indicated generally by A. The electrical contact 31 is adapted to be held in an adjusted position in the slide 32 by means of the adjustable bolt 34, which is adapted to move in a longitudinally extending slot 35 formed in one side of the slide 32. The other end of the electro-magnet 22 is connected by a conductor 36 to one end of the electro-magnet 23, which is in turn connected at its other end by a conductor 37 to an electrical wiper contact 38 in the form of a toggle which is pivotally mounted on a part 39 of the gun A. The part 39 of the gun A should be a portion of the gun such as a bolt carrier which is given a reciprocating motion by the energy of recoil of the gun and the electrical contact 38 should be arranged on the part 39 in such a manner as to make contact with the electrical contact 31 only on the rearward stroke of the bolt 40 of the gun. The electrical contact 38 is provided with an elongated end 41 having a contact side 41' and a side 42, which is suitably insulated for a purpose which will hereinafter appear.

In order that the electrical contact 38 may be sufficiently held in engagement with the electrical contact 31, when in contact therewith a compression spring 43 is provided, having one end secured to the electrical contact 38 and secured at its other end to a bolt and nut construction 44, which is adapted to be adjustably mounted in a slot 45 in the part 39 of the gun. The part 46 may be mounted on the gun to act as a receiver.

In the operation of the device, assuming that the eyepiece 1 has been placed on the head 3 of a gunner with the strap 2 holding it in place thereon, and that the gun A has been fired causing the reciprocating part 39 and bolt 40 to have moved in a forward direction, as indicated by the lower arrow in Fig. 2, with the electrical wiper contact 38 out of contact with the electrical contact 31 and with the shutter 12 in its normal inoperative position as indicated in Fig. 1, upon the rearward stroke of the bolt 40 the energy of recoil of the gun reciprocates the part 39 in a rearward direction as indicated by the upper arrow carrying the electrical contact 38 therewith, thus causing the contact side 41' thereof to make contact with the electrical contact 31, completing the circuit from the battery 29 through the electro-magnets 22 and 23, thus energizing the electro-magnets which attract the metal projections 25 and 26, respectively, on the upper and lower edge of the shutter 12, whereby the ends 18 and 27 of the shutter are pulled in opposite directions against the action of the spring member 19, thus simultaneously closing the eye apertures 10 during the flash produced by the burning powder gases used in firing a projectile from the gun and obscuring the flash from the gunner's vision. The shutter 12 is held in an operative position for holding the eye apertures 10 closed for a predetermined period, depending on the length of the electrical contact 31. The adjustable spring 43 on the wiper contact 38 and the adjustable bolt 34 on the slide 32 of the contact 31 may be regulated to adjust the position of the electrical contacts 31 and 38, so as to cause the contacts to be engaged for completing the circuit through the electro-magnets 22 and 23 for closing the shutter 12 at any desired instant during the cycle of firing the gun A, and for a given duration. After the wiper contact 38 has traversed the length of the electrical contact 31, the outer end thereof is pushed rearwardly under the action of the compression spring 43, thereby breaking the circuit from the battery 29 through the electro-magnets 22 and 23 to release the metal projections 25 and 26 on the shutter 12, and thus permitting the shutter to be returned by the action of its spring 19 to its inoperative position to open the eye apertures 10 and permitting vision by the gunner within the limits of the field during the remainder of the cycle of operation of the gun. As the gun is again fired and the bolt 40 and the part 39 thereof are caused to be moved forward in the direction of the lower arrow, the insulated side 42 of the wiper contact 38 engages with the upper surface of the electrical contact 31, thus holding the circuit open during the forward stroke of the bolt and part 39.

The device being adapted primarily for automatic weapons of rapid fire, the shutter 12 will be operated to open and close the eye apertures 10 at such a rate of speed that the gunner will appear to have a continual vision due to the persistence of visual stimuli.

It will thus be seen that there is herein provided a novel flash-hider which is well adapted for all the purposes indicated. Even though there has been herein shown certain features of construction and operation of parts, it is nevertheless to be understood that various changes may be made therein, if the changes do not depart from the claims.

Having described my invention, what I claim as new and wish to secure by Letters Patent, is:

1. In a device of the character described, comprising in combination, an eyepiece adapted to engage the face of a gunner, said eyepiece con-

taining apertures, a shutter operatively mounted on said eyepiece and adapted to be actuated to cover and uncover said apertures, a gun, electrical shutter operating means connecting said gun with the shutter, said operating means including contact members carried by and adapted to be actuated into and out of contact with each other by said gun for operating said shutter operating means, said shutter operating means upon the operation of said gun adapted to automatically and intermittently operate said shutter at a speed that a user of said eyepiece will appear to have a continual vision through said apertures due to persistence of visual stimuli whereby the eyes of the gunner are protected from the flash incident to the firing of the gun.

2. In a device of the character described, comprising in combination, an eyepiece adapted to engage the face of a gunner, said eyepiece containing apertures, a shutter mounted on said eyepiece and adapted to be actuated to cover and uncover said apertures, a gun including a stationary part and a movable part, electrical shutter operating means connecting said gun with the shutter and adapted to actuate said shutter for covering and uncovering said apertures, said operating means including contact members, one of said contact members mounted on the stationary part of the gun and another of said contact members mounted on the movable part thereof, and adapted to be automatically and intermittently operated into contacting engagement with each other upon the operation of said gun for actuating said shutter operating means, said shutter operating means upon the operation of said gun adapted to automatically and intermittently operate said shutter at a speed that a user of said eyepiece will appear to have a continual vision through said apertures due to persistence of visual stimuli whereby the eyes of the gunner are protected from the flash incident to the firing of the gun.

3. In a device of the character described, comprising in combination, an eyepiece provided with slots and adapted to engage the face of a gunner, members having apertures therein adjustably mounted on said eyepiece adjacent to said slots for accommodating the interpupillary distance of an individual user of said eyepiece, a shutter mounted on said eyepiece and adapted to be operated to cover and uncover said apertures, a gun, electrical shutter operating means connecting said gun with the shutter and including an electric circuit, said shutter operating means upon the operation of the gun adapted to automatically and intermittently operate said shutter for covering and uncovering said apertures at a speed that a user of said eyepiece will appear to have a continual vision through said slots and apertures due to persistence of visual stimuli whereby the eyes of the gunner are protected from the flash incident to the firing of the gun.

4. In a device of the character described, comprising in combination, an eyepiece provided with slots and adapted to engage the face of a gunner, members having apertures therein adjustably mounted on said eyepiece adjacent to said slots for accommodating the interpupillary distance of an individual user of said eyepiece, a shutter mounted on said eyepiece and adapted to be operated to cover and uncover said slots and apertures, a gun including a stationary part and a movable part, electrical shutter actuating means connecting said gun with said shutter and including an electric circuit having electromagnets, contact members and a source of potential connected therein, said electromagnets mounted on said eyepiece, one of said contact members mounted on the stationary part of said gun and another of said contact members mounted on the movable part thereof, said movable part of the gun reciprocated by the energy of recoil for moving the contact member on the movable part of the gun into wiping engagement with the contact member on the stationary part of the gun, said shutter actuating means adapted upon the operation of said gun to automatically and intermittently actuate said shutter at a speed that the user of said eyepiece will appear to have a continual vision through said slots and apertures due to persistence of visual stimuli, whereby the eyes of the gunner are protected from the flash incident to the firing of the gun.

5. In a device of the character described, comprising in combination, an eyepiece provided with apertures and adapted to engage the face of a gunner, a shutter mounted on said eyepiece and adapted to be operated to cover and uncover said apertures, a gun including a stationary part and a movable part, electrical shutter operating means connecting the gun with the shutter and including a contact member adjustably mounted on the stationary part of the gun and a contact member mounted on the movable part thereof, said last mentioned contact member adapted to be intermittently moved into contact with and out of contact from the contact member on the stationary part of the gun, a spring adapted to normally hold said shutter in an inoperative position, said electrical circuit means upon the operation of said gun adapted to automatically and intermittently operate said shutter at a speed that a user of said eyepiece will appear to have a continual vision through said apertures due to persistence of visual stimuli, whereby the eyes of the gunner are protected from the flash incident to the firing of the gun.

ALBERT M. JACKSON.