June 1, 1948. J. E. SIEG 2,442,382

COMPENSATOR FOR FIREARMS

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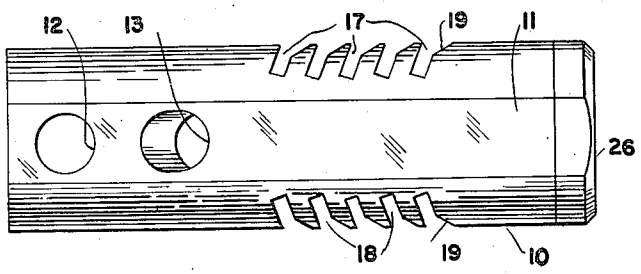


FIG. 1

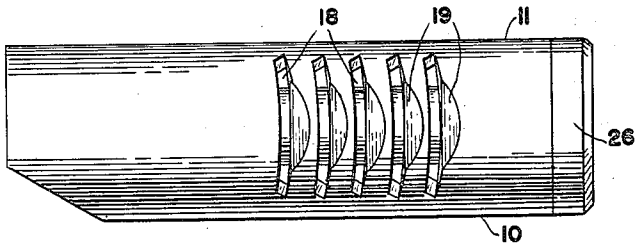


FIG. 2

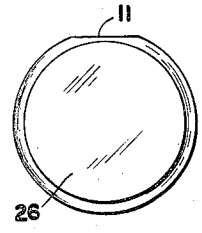


FIG. 3

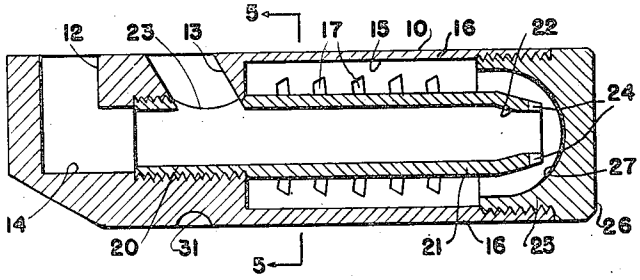


FIG. 4

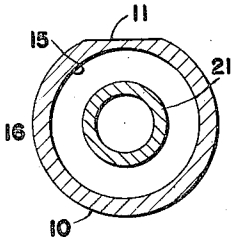


FIG. 5

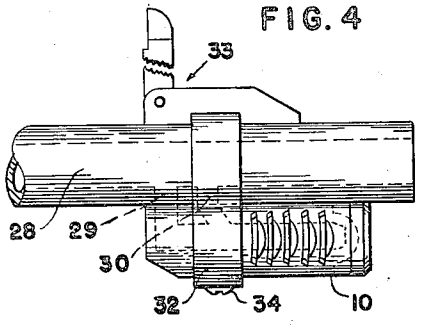


FIG. 6

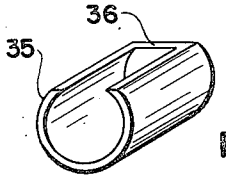


FIG. 7

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COMPENSATOR FOR FIREARMS

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2 Claims. (Cl. 89—14)

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

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This invention relates to a compensator and more particularly to a device for decreasing the recoil and jump of a gun to which it is attached.

Heretofore, compensators for rifles have been of the type fitting over the end of the muzzle of the rifle and through which the bullet passes, the gases discharged from the barrel striking deflecting surfaces adjacent the path of the bullet beyond the effective end of the barrel to counteract the recoil caused by the discharge of the bullet. These deflecting surfaces are arranged in such manner that the muzzle blast of the gun with which they are used is materially increased, an objectionable feature in night firing. These compensators are objectionable when used with shoulder weapons for the reason that they must be removed before a bayonet, grenade launcher or flash hider can be attached to the muzzle of the rifle barrel, an obviously objectionable procedure under most conditions. Compensators so mounted do not act to suppress recoil until after the bullet leaves the muzzle of the gun, thus decreasing the effectiveness of the discharged gases in counteracting the force due to the discharge of the bullet.

It is the object of this invention to provide means for decreasing recoil and muzzle jump in a rifle.

A further object of this invention is to provide a compensator for a rifle which does not interfere with auxiliary equipment used therewith.

A further object of this invention is to provide a compensator for attaching to the side of a rifle barrel which will decrease recoil and muzzle jump of the rifle.

A further object of this invention is to provide a compensator receiving gases from the rifle barrel before the discharge of the bullet.

A further object of this invention is to provide a compensator which will serve to reduce muzzle blast and noise.

In the drawing,

Fig. 1 is an enlarged plan view of the compensator.

Fig. 2 is an elevation of the compensator.

Fig. 3 is an end view of the compensator.

Fig. 4 is a longitudinal vertical cross sectional view taken along the axis.

Fig. 5 is a cross sectional view taken along the line 5—5 of Fig. 4.

Fig. 6 shows a compensator attached to a rifle barrel, the scale being smaller than that used for Figs. 1 to 5.

Fig. 7 is a perspective view of a cover for the compensator drawn on approximately the same scale as Fig. 6.

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The compensator comprises a cylindrical body 10 of some suitable material such as steel. The upper side of the cylinder, that is the side adapted to be placed adjacent the rifle barrel, is provided with a flat surface 11. Two ports 12 and 13 drilled in the surface 11 radially to the body 10 extend to an axial bore 14 in the body. The diameter of this bore is less than half the diameter of the cylindrical body 10. Port 12 is normal to the bore 14 while port 13 intersects the bore 14 at an angle of about 60 degrees. The remainder of the body 10 has a large expansion chamber 15 coaxial with the bore 14 and extending over half the length of the body. The annular wall 16 of this chamber 15 is provided with two series of slots 17 and 18, one on each side thereof. Each slot comprises a vertical cut made in the side of the cylinder at an angle to the axis thereof, the angle being such that gas discharged from the expansion chamber is directed laterally and slightly forwardly therefrom as shown in Fig. 1. The leading edges of the slots are beveled as at 19 along a portion of the vertical length thereof to assist in directing the gas forwardly.

A nozzle 21 has a threaded end 20 which is adapted to be screwed in the bore 14 which is threaded along a portion thereof adjacent the chamber 15. The nozzle is thus axially positioned in the chamber 15 and as it is of a relatively small diameter there is an appreciable space between the chamber wall 16 and the nozzle. The nozzle 21 has the end 22 thereof slightly tapered to increase the velocity of flow of gases discharged therefrom. An aperture 23 in the wall of the nozzle aligns with port 13. Diametrically opposed notches 24 in the lip of the nozzle end 22 provide means for receiving a tool to permit inserting and removing the nozzle from the bore 14.

The inner side of the wall 16 is threaded adjacent the free end thereof to receive the threaded portion 25 of a cap 26 designed to close the end of the expansion chamber. The inner side of the cap 26 is provided with a semispherical recess 27 spaced a short distance from the end 22 of the nozzle and designed to receive the gases discharged therefrom to reverse their direction of flow.

A recess 31 in the lower side of the body 10 is adapted to receive the end of a setscrew carried by the front sight band.

The mounting of the compensator on the rifle barrel is illustrated in Fig. 6. The underside of

the barrel 28 is provided with a flat surface corresponding to the flat surface 11 on the compensator. The barrel is provided with apertures 29 and 30 spaced to align with the ports 12 and 13. The front sight band 32 binds the compensator as well as the front sight 33 to the barrel with the axes thereof parallel and the cap end adjacent the muzzle. A setscrew 34, threaded in the lower side of the sight band, engages the recess 31 in the compensator to hold it in position. The compensator is shown spaced a short distance from the muzzle of the barrel to permit a bayonet (not shown) to be attached thereto. For weapons not requiring auxiliary equipment the compensator would be placed with the end thereof flush with the muzzle of the rifle.

The operation of the device is as follows. The bullet is pushed along the barrel 28 by gases under high compression. When the bullet passes apertures 29 and 30 in the barrel the gases flow therethrough into the communicating ports 12 and 13 in the compensator. As the gases flow at right angles to the axis of the barrel they will strike the lower side of the bore 14 to deliver a force thereto which will oppose the inclination of the muzzle to jump when the bullet is discharged from the barrel 28. The gases then flow through nozzle 21 where the velocity is slightly increased upon discharge therefrom by the tapered outlet. The gases discharged from the nozzle strike the curved surface 27 of the cap 26 which reverses the direction of flow thereof. The force generated by the gases striking the cap is in a direction parallel to and opposite in sense from the recoil of the barrel due to the discharge of the bullet and effectively counteracts the same. The gases then pass to the expansion chamber 15 and are discharged in a lateral slightly forward direction at relatively low velocity through the groups of slots 17 and 18 on either side of the compensator to direct such gases away from the operator of the rifle. The gases discharged through the compensator produce little blast because the expansion chamber 15 permits reduction of the velocity of the gases before discharge. This expansion also muffles part of the noise of firing. The muzzle blast of the gun is reduced materially because of the appreciable portion of the gases discharging through the compensator. It will be seen that the gases are introduced into the compensator before the discharge of the bullet from the barrel, thus insuring a flow of gases adequate to generate an appreciable force to counteract the recoil.

The manner of use of rifles for launching grenades makes it unnecessary and undesirable to have compensators operate when so used. To render the compensator previously described ineffective, a sleeve 35, Fig. 7, is provided for closing the slots 17 and 18. This sleeve comprises a metal cylinder closed at one end and having a portion of its cylindrical side wall cut away, as at 36, in the same plane with the flat surface 11 of the compensator. The inner diameter of the sleeve 35 is of a size to permit it to slide over and snugly fit the end of the compensator containing the expansion chamber 15 and is of a length just sufficient to cover the slots 17 and 18, terminating adjacent the band 32 which holds the compensator on the barrel 28. When it is desired to use a grenade launcher on a gun equipped with the instant invention it is merely necessary to slip the sleeve 35 over the compensator which will prevent the discharge of gases from the slots 17 and 18 therein.

While I have described the preferred form of my invention I do not wish to limit myself to the precise details as shown but wish to avail myself of such variations and modifications as may come within the scope of the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. The combination of a gun barrel and recoil reducing means, said means comprising a counterbored substantially cylindrical member having a small bore portion and a large bore portion, means for securing said cylindrical member to the gun barrel adjacent the muzzle thereof with its longitudinal axis parallel to and below the longitudinal axis of the gun barrel, the gun barrel having port openings adjacent its muzzle extending from the gun bore through the bottom of the barrel, port openings in the small bore portion of said cylindrical member aligned with the gun barrel port openings, a nozzle secured in said small bore portion and extending forwardly of the gun barrel from said port openings through the large cylindrical bore portion, the rear end of the small bore being closed, a concave cap closing the forward end of the large bore portion but spaced from the forward end of the nozzle, said cylindrical member having laterally directed slots in opposite sides thereof, whereby projectile gases may pass from the gun barrel through the port openings to the said small bore portion and forwardly through said nozzle against said concave cap to provide a recoil opposing force, and thence through the large bore portion to discharge through the lateral slots.

2. An anti-recoil device of the class described, comprising an elongated housing closed at its ends and having an inlet port opening laterally into one end, its other end having a substantially concave inner surface, means forming an internal elongated tube surrounded by an annular chamber, said tube having one end in communication with said port and its opposite end in proximity to said other end of the housing, and the housing wall surrounding said chamber having two lateral sets of apertures opening into said chamber in zones between the chamber ends.

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