R. M. TOWSON.

RECOIL NEUTRALIZER AND MUFFLER.

APPLICATION FILED JUNE 1, 1917.

1,390,658. Patented Sept. 13, 1921.

Fig. 1.

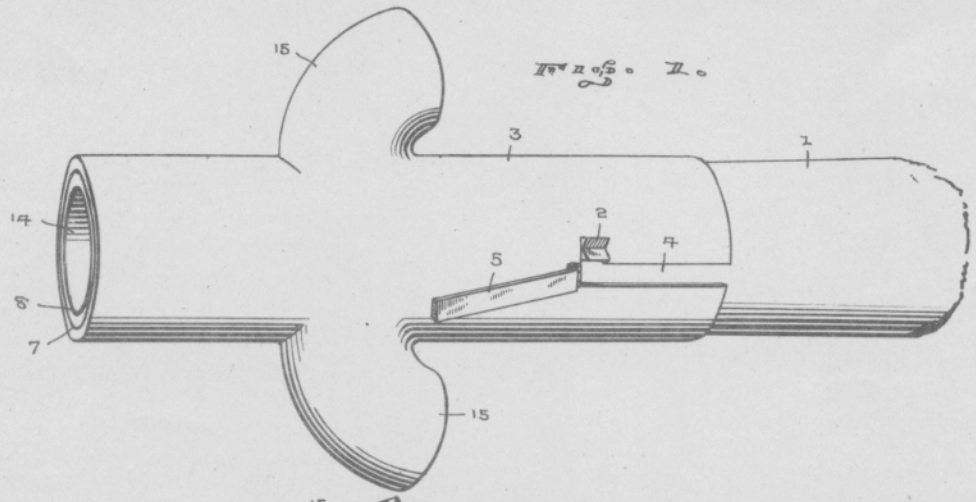


Fig. 2.

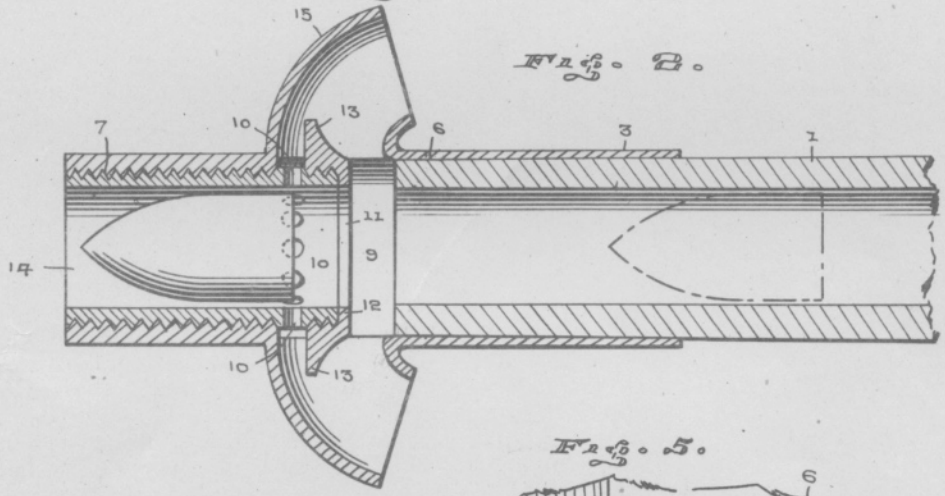


Fig. 5.

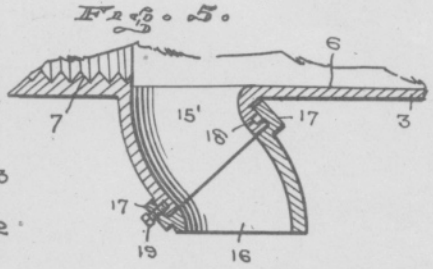


Fig. 3.

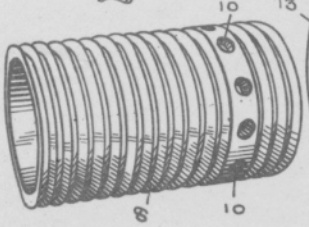
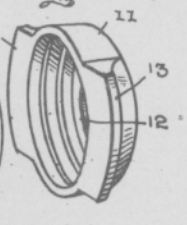


Fig. 4.



Inventor

Richard M. Towson

By W. T. Fitz Gerald & Co.

Attorneys

UNITED STATES PATENT OFFICE.

RICHARD M. TOWSON, OF STAFFORD, VIRGINIA.

RECOIL NEUTRALIZER AND MUFFLER.

1,390,658. Specification of Letters Patent. Patented Sept. 13, 1921.

Application filed June 1, 1917. Serial No. 172,285.

To all whom it may concern:

Be it known that I, RICHARD M. TOWSON, a citizen of the United States, residing at Stafford, in the county of Stafford and State of Virginia, have invented certain new and useful Improvements in Recoil Neutralizers and Mufflers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in recoil neutralizers and mufflers for guns, and has for its principal object to provide a device of this character which when rigidly attached to the gun muzzle, causes the escaping gases to expand and exert a force in a direction opposite to the recoil force of the gun, incident to the firing thereof.

A further object of the invention is to provide a device of this character embodying a cylindrical casing provided with radially and rearwardly curved tubular branches and an expansion chamber therein which communicates with these tubular branches whereby the expanding gases may exert a force through the tubular branches and in a rearward direction of the gun against the atmosphere surrounding it to produce a combined force sufficient to counteract the recoil force of the gun.

A still further object of the invention is to produce a device of this character which can be quickly and readily attached to or detached from the gun muzzle so as to effectively neutralize the recoil of the gun and at the same time muffle the sound incident to firing of the gun.

A still further object of the invention is to provide each radial tubular branch with an angular swivel extension whereby the escaping gases may be discharged rearwardly of the gun at any desired angle with respect to the bore of the gun.

With these and other objects in view as will appear as the description proceeds, the invention comprises the various novel features of construction, combination and arrangement of parts, as will be more fully described hereinafter and set forth with particularity in the appended claims.

Referring to the drawings,

Figure 1 is a perspective view of my improved construction of recoil neutralizer and muffler shown attached to a gun muzzle.

Fig. 2 is a vertical longitudinal sectional view through the device.

Fig. 3 is a detail perspective view of the removable sleeve.

Fig. 4 is a detail perspective view of the collar carried thereby, and

Fig. 5 is a detail sectional view showing a form of angular swivel extension for each of the tubular branches.

Similar characters of reference are used to denote corresponding parts throughout the accompanying drawings and the following description.

Referring more particularly to the drawings, the reference numeral 1 represents the muzzle of an ordinary gun, and which in this instance carries a sight 2. The recoil neutralizer consists primarily of a cylindrical casing 3 which is provided in its rear end with a bayonet slot 4 adapted to receive the gun sight 2 when the casing has been positioned over the gun muzzle, a suitable latch member 5 being hingedly connected at the inner end of the bayonet slot and adapted to be swung into the bayonet slot and close the same to hold the gun sight therein. If desired, the cylindrical casing 3 can be provided with a pair of bayonet slots for the reception of suitable studs diametrically disposed on the gun muzzle, this construction being preferable with heavy ordnance.

As will be apparent from Fig. 2, the rear end of the casing 3 is provided with a bore 6 having a diameter corresponding to the outside diameter of the gun muzzle, while the forward end is provided with a bore 7 of less diameter and is threaded for the reception of a sleeve 8, the inner end of which extends into the central part of an expansion chamber 9 formed at the forward end of the larger bore 6 and adjacent the gun muzzle.

The sleeve 8 is provided circumferentially and adjacent its inner end with a plurality of radially disposed apertures 10. A collar 11 having a radially and inwardly extending flange 12 is threadedly mounted on the inner end of the sleeve and is provided exteriorly with a pair of diametrically opposite deflecting shoulders 13. Each of these shoulders 13 is concaved from the rear surface of the collar to a point adjacent the for-

ward surface thereof, so as to deflect the gases laterally and forwardly of the gun bore. The collar 11 is turned up on the end of the sleeve 8 until the flange 12 rests against the inner end thereof. The sleeve 8 is provided with a bore 14 which is a trifle larger than the gun bore, so as to permit of the projectile passing freely through it without in any way interrupting its true direction of travel.

The casing 3 is provided with any desired number of radially and rearwardly curved tubular branches 15 which are disposed at points adjacent to the forward end of the larger bore 6 and communicate with the expansion chamber 9. These tubular branches are adapted to be so positioned radially of the casing that the escaping gases through them will in no way interrupt or destroy the true aim of the gun at the time of its firing, and are also to be so positioned that they will not interfere with an accurate sighting of the gun.

As clearly shown in Fig. 2 of the drawings, the sleeve 8 is so constructed and positioned within the casing that the deflecting shoulders 13 are positioned axially of the tubular branches and so that the radially disposed apertures 10 will be in a position between the deflecting shoulders 13 and the forward wall portions of the tubular branches.

In Fig. 5 will be seen a form of angular swivel extension 16 that is provided at its inner end with an enlarged annular flange 17 adapted to receive the outer end of the tubular branch 15′, which latter is provided in its outer circumference with an annular groove 18 which is adapted to receive set-screws 19 that are threaded through the flange 17 and serve to rotatably mount the swivel extension with respect to the adjacent tubular branch. By rotating the swivel extension 16, the escaping gases from the device can be directed rearwardly at any desired angle with respect to the gun bore axis so that they can be controlled and eliminate possible injury to the gunner.

In the operation of the device, the escaping gases which follow the projectile out of the gun bore, incident to firing, will first expand within the expansion chamber 9 and then pass radially outwardly into the tubular branchs 15. In their passage into these tubular branches, they will strike against the arcuately curved deflecting shoulders 13 and be deflected into engagement with the rearwardly curved forward wall portions of the tubular branches and thence be deflected rearwardly of the gun. The gases that follow the projectile through the expansion chamber and into the sleeve 8 will escape through the radial openings 10 into the tubular branches and be directed rearwardly therethrough by their coming into contact with the curved forward wall portions of the tubular branches. The gases as they escape and expand will exert an increased force in a forward direction against the deflecting shoulders 13 and the tubular branches sufficient to neutralize the recoil force of the gun incident to the firing and the shell leaving the gun. Not only will the escaping and expanding gases exert a forward force on the gun, but the gases will be discharged rearwardly thereof into frictional engagement with the surrounding atmosphere which will tend to offer sufficient resistance to enable the escaping gases to increase their forward propelling force. While the device acts primarily as a recoil neutralizer, it will at the same time serve as a muffler or silencer for the noise or report incident to the firing of the gun.

I claim:—

1. The combination with a gun, of a recoil neutralizer comprising a casing attached to the gun muzzle, radial tubular branches carried by said casing intermediate its ends, a sleeve rigidly mounted in the outer end of said casing and having its inner end terminating in a plane substantially with the centers of the entrances to said branches, and means carried by the inner end of said sleeve for deflecting the expanding gases rearwardly through said tubular branches.

2. The combination with a gun, of a recoil neutralizer comprising a casing detachably connected to the gun muzzle, radially and rearwardly curved tubular branches carried by said casing intermediate its ends, a sleeve rigidly mounted in the outer end of said casing and having its inner end terminating in a plane substantially with the centers of the entrances to said branches, and means carried by the inner end of said sleeve for deflecting the expanding gases rearwardly through said tubular branches.

3. The combination with a gun, of a recoil neutralizer comprising a casing adapted to be rigidly attached to the gun muzzle and provided internally with an expansion chamber adjacent the gun muzzle, radially and rearwardly disposed tubular branches carried by said casing and communicating with said expansion chamber, a sleeve rigidly mounted in the inner end of said casing and extending into said expansion chamber, and means for deflecting the expanding gases from said expansion chamber rearwardly through said tubular branches.

4. The combination with a gun, of a recoil neutralizer comprising a casing detachably connected to the gun muzzle, rearwardly curved tubular branches carried by said casing intermediate its ends, a sleeve rigidly mounted in the outer end of said casing and having its inner end terminating in a plane adjacent the centers of the entrances to said branches, and means for deflecting the ex-

panding gases radially against the forward wall portions of said tubular branches, said tubular branches redirecting the gases rearwardly therethrough to neutralize the recoil action of the gun.

5. The combination with a gun, of a recoil neutralizer comprising a casing having one end formed with a bore corresponding to the outside diameter of the gun, while the other end is formed with a bore of less diameter, radially and rearwardly disposed tubular branches carried by said casing at points adjacent the forward end of said larger bore, a sleeve having a bore slightly larger in diameter than the gun bore rigidly mounted in said smaller casing bore and having its inner end terminating in a plane substantially with the centers of the entrances to said branches, and means carried by the inner end of said sleeve for deflecting the gases through said radially and rearwardly disposed branches.

6. The combination with a gun, of a recoil neutralizer comprising a casing detachably connected to the gun muzzle and provided internally with an expansion chamber adjacent the gun muzzle, radially and rearwardly curved tubular branches carried by the casing and communicating with said expansion chamber, a sleeve rigidly mounted in the outer end of said casing and extending into said expansion chamber, a collar carried by the inner end of said sleeve, and deflecting shoulders carried by said collar and adapted to deflect the expanding gases into said tubular branches.

7. The combination with a gun, of a recoil neutralizer comprising a casing detachably connected to the gun muzzle and provided internally with an expansion chamber adjacent the gun muzzle, radially and rearwardly curved tubular branches carried by said casing and communicating with said expansion chamber, a sleeve detachably mounted in the outer end of said casing and extending into said expansion chamber, a collar detachably connected to the inner end of said sleeve, and deflecting shoulders carried by said collar and adapted to deflect the expanding gases laterally into said tubular branches, said sleeve being provided circumferentially with radially disposed apertures at points between said collar and the forward wall portions of said tubular branches, whereby the gases following the projectile may escape into said tubular branches.

8. The combination with a gun, of a recoil neutralizer comprising a casing detachably connected to the gun muzzle and provided internally with an expansion chamber adjacent the end of the gun, radially and rearwardly curved tubular branches carried by said casing and communicating with said expansion chamber, means arranged within said expansion chamber for deflecting the expanding gases laterally into said tubular branches, and a swivel extension connected to each of said tubular branches whereby the expanding gases may be directed rearwardly at varying angles with respect to the gun bore axis.

9. A recoil neutralizer comprising a casing to be carried by a gun muzzle having a lateral outlet, means within the casing for deflecting the gases through the outlet, and adjustable means for directing the gases rearwardly at different angles from said outlet including a rotatably adjustable angular gas discharging member.

10. A recoil neutralizer for attachment to a gun muzzle comprising a casing having lateral outlets, a support removably positioned within said casing, means removably mounted on said support to deflect the escaping gases through said lateral casing outlets, and means for controlling the direction of travel of said escaping gases from said casing lateral outlets.

11. A recoil neutralizer comprising a casing to be carried by a gun muzzle, having a lateral outlet branch, means within the casing for directing the gases through said branch, and an angular extension swiveled on the branch for directing the gases rearwardly at different angles.

In testimony whereof I have signed my name to this specification in the presence of a subscribing witness.

RICHARD M. TOWSON.

Witness:
S. W. COCKRELL.