E. SCHNEIDER.

APPARATUS FOR DIMINISHING THE RECOIL OF GUNS.

APPLICATION FILED FEB. 28, 1920.

1,363,058.

Patented Dec. 21, 1920.

6 SHEETS—SHEET 1.

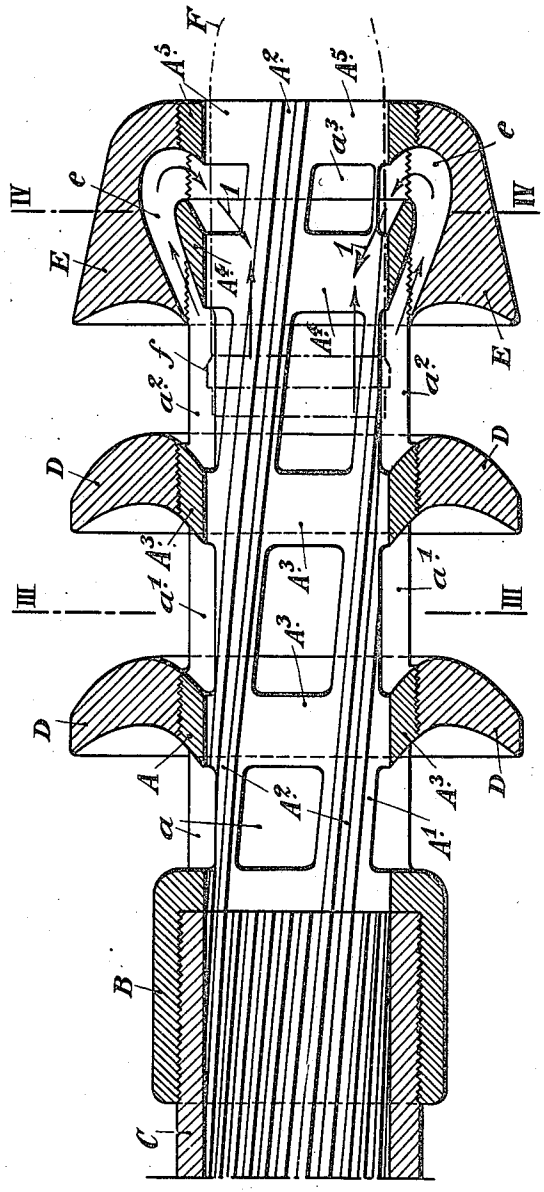

Fig. 1.

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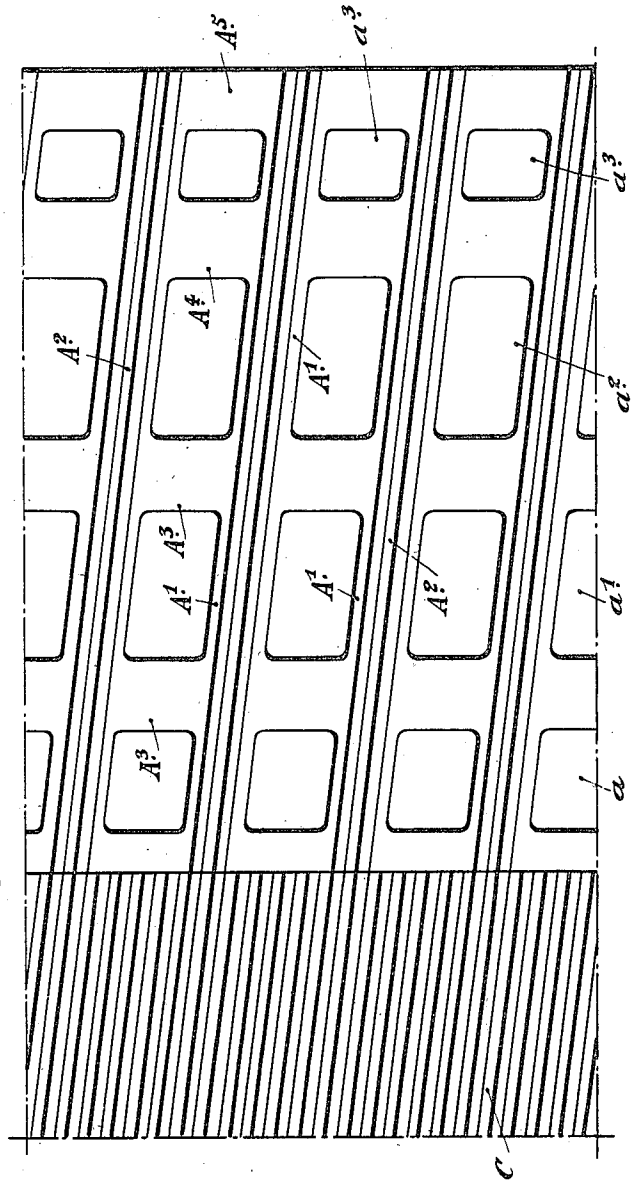

Fig. 2.

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Fig. 3.

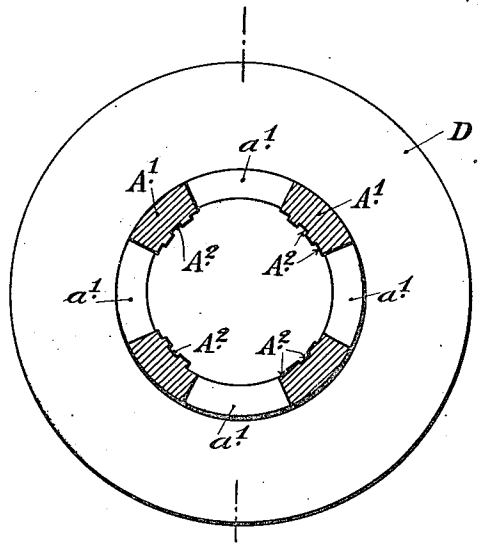
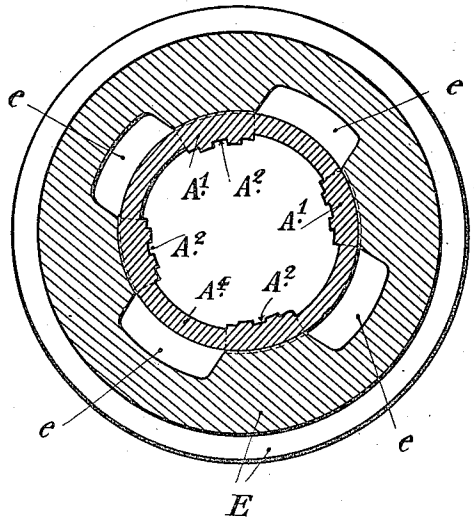


Fig. 4.



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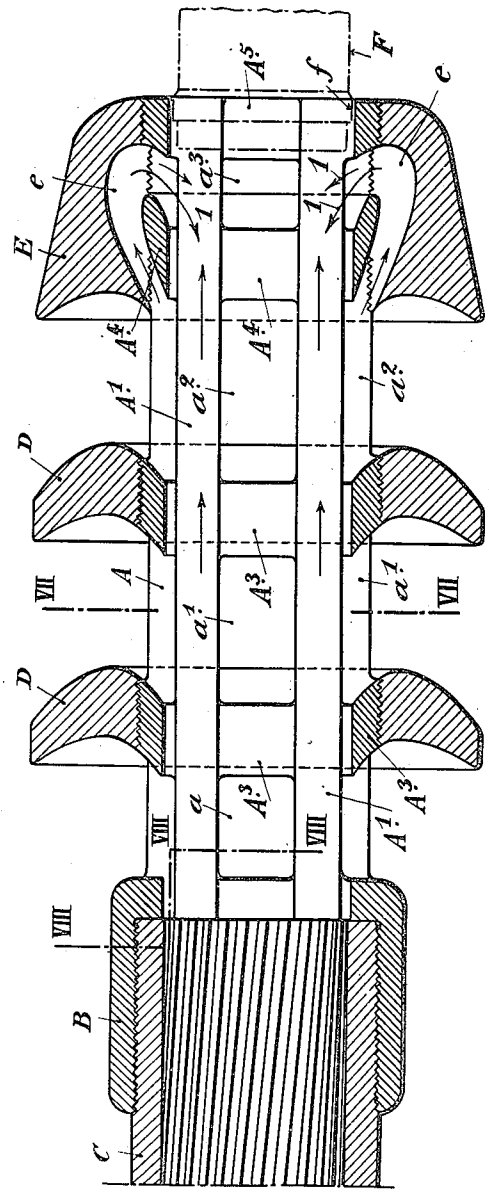
6 SHEETS—SHEET 4.

Fig. 5.



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6 SHEETS—SHEET 5.

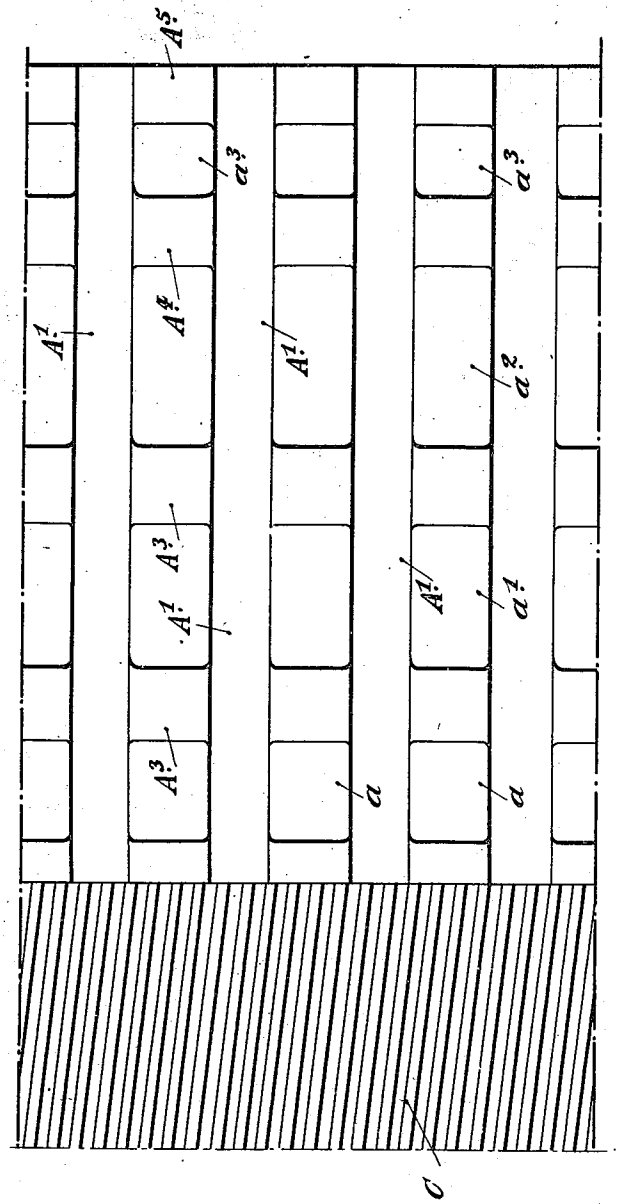

Fig. 6.

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6 SHEETS—SHEET 6.

Fig. 7.

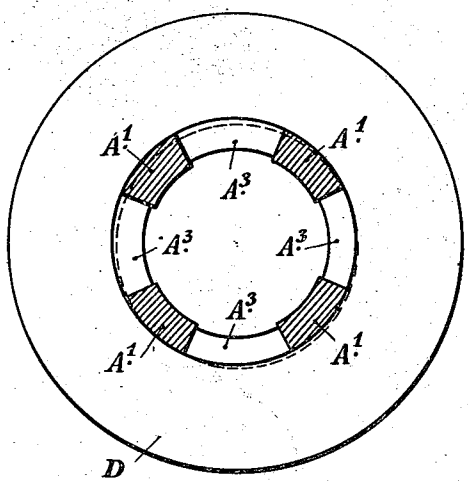
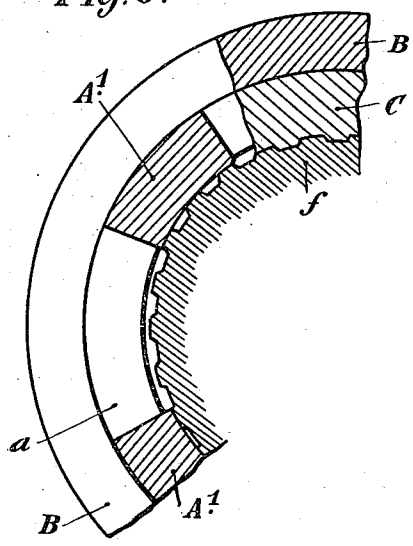


Fig. 8.



Inventor:-
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UNITED STATES PATENT OFFICE.

EUGÈNE SCHNEIDER, OF PARIS, FRANCE, ASSIGNOR TO SCHNEIDER & CIE., OF PARIS, FRANCE, A JOINT-STOCK COMPANY OF FRANCE.

APPARATUS FOR DIMINISHING THE RECOIL OF GUNS.

1,363,058. Specification of Letters Patent. Patented Dec. 21, 1920.

Application filed February 28, 1920. Serial No. 362,113.

To all whom it may concern:

Be it known that I, EUGÈNE SCHNEIDER, a citizen of the Republic of France, and resident of Paris, France, have invented new and useful Improvements in Apparatus for Diminishing the Recoil of Guns, which invention is fully set forth in the following specification.

This invention has for its object to provide an improved apparatus that will allow of diminishing the recoil of a gun by utilizing the gases of the fired charge.

A rather large number of devices have already been proposed for this purpose, comprising one or more nozzles fixed to the gun and combined with check plates so that the charge gases expand in the said nozzles and impinge upon the check plates in such a manner as to exert upon the latter a propelling action that serves to diminish the recoil of the gun.

One of the chief drawbacks common to all those devices is to be found in the fact that the projectiles travel through them without being suitably guided by them, while being subject to the action of the gases the escape of which is retarded to a greater or less extent. Moreover, the gases impinge upon the check plates of the device in front of the nose of the projectile, thus hindering to a certain extent the proper exit of the latter. Finally, since the gases are not eliminated completely by the device, they also give rise, behind the projectile, at the instant of its exit, to eddies that have an injurious effect upon its stability.

The improved apparatus completely obviates those drawbacks, by providing on one hand a perfect guidance of the projectile up to its point of final exit, and by preventing on the other hand, all injurious action of the gases upon both the front and rear ends of the projectile.

Two constructional forms of this invention are illustrated by way of examples in the accompanying drawings in which:

Figure 1 is a longitudinal section of a first constructional form of the improved apparatus fitted to the muzzle of a gun.

Fig. 2 is a developed view of the inner surface of the improved apparatus and of the muzzle of the gun to which it is fitted.

Figs. 3 and 4 are sections respectively on the lines III—III and IV—IV of Fig. 1.

Figs. 5 to 8 illustrate a modification.

Fig. 5 is a longitudinal section along the axis of the gun and the perforated tube A—B attached to the latter.

Fig. 6 is a developed view of the internal surface of the tube A and the muzzle C of the gun.

Figs. 7 and 8 are cross sections on the lines VII—VII and VIII—VIII respectively of Fig. 5.

The improved apparatus consists of a tube A screwed or fixed in any other suitable manner by means of a union B upon the muzzle end of the gun C. This tube is pierced in transverse planes by a series of circular series of orifices a, a^1, a^2, a^3. These orifices are disposed in such a manner as to leave between them longitudinal partitions A^1 that constitute a continuous extension of the bore of the gun. For this purpose in this first constructional form of the invention, the longitudinal partitions A^1 are formed with rifling grooves A^2, each of the latter constituting an exact prolongation of a groove of the rifling of the gun C. For instance, between the longitudinal rows of orifices of the tube A, four longitudinal partitions A^1 may be provided, situated at the ends of two diameters at right angles to each other; each longitudinal partition being formed with one or more rifling grooves that constitute the prolongation of the corresponding rifling grooves of the gun. The circular series of orifices are separated from one another by transverse partitions or check plates A^3 which may be screw threaded externally for the reception of a disk or shield D on each check plate.

According to the invention the last transverse partition or check plate but one, A^4, has no disk or shield, and the front end A^5 is fitted with a cap E that extends rearward over the last circular series of orifices a^3 and also over the front ends of the the orifices a^2 of the last circular series but one.

The cap E is formed with one or more passages e establishing communication between the orifices a^2 and a^3. These communication passages e are made of suitable cross sectional shape such as that shown in Fig. 1. This cross sectional shape is such that the passage or passages e in the cap E constitute respectively a continuous annular nozzle or a series of separate nozzles whereby the gases are guided away from

the axis of the tube at their point of entry, whereas the said gases are returned by the said nozzle or nozzles rearwardly toward the said axis at their point of exit.

In the example shown, each orifice a^2 is assumed to be connected to the corresponding orifice a^3 by a passage e (Fig. 4).

The projectile receives perfect guidance in the attached tube A by reason of the engagement of its band in the rifling of the tube that constitutes a continuation of the corresponding rifling of the gun C.

As soon as the projectile has uncovered the last but one annular series of orifices a^2, a portion of the gases that has not yet escaped through the orifices a, a^1, now escapes through those orifices a^2, while the other portion of these gases is intercepted by the passage e.

The remaining body of gas which follows the projectile during the latter's passage through the check plates A^4 and the outlet A^5, meets the current of the gas that was intercepted by the passages e. This latter current of gas having been returned toward the interior of the tube as indicated by the arrow 1, thus forces back the current of gas that is tending to follow the projectile issuing from the outlet A^5. As a matter of fact the projectile passes out of the outlet A^5 without being subjected in any way to the action of the charge gases.

Figs. 5 to 8 illustrate a modification.

In the example shown in Figs. 5 and 8, the tube A comprises a series of rings of orifices a, a^1, a^2, a^3 between transverse partitions or check plates A^3, A^4, A^5 and longitudinal partitions A^1 formed along generating lines of the tube. These longitudinal partitions, which may be arranged for instance at the ends of two diameters at right angles to each other, provide by their internal surfaces an accurate guidance for the band f of the projectile F.

As is shown clearly in Fig. 8 the band f of the projectile on issuing from the rifling of the gun barrel C, is still guided accurately by the internal surface of the partitions A^1, since the internal diameter of the tube A at the places of these partitions, is practically equal to the diameter taken at the bottom of rifling grooves of the gun barrel.

What I claim is:

1. An apparatus for utilizing the gases of the exploded charge in a gun for the purpose of diminishing the recoil of the gun, which consists of a tube forming a continuation of the muzzle of the gun, said tube having its wall perforated by a plurality of series of orifices arranged in annular and longitudinal succession, said orifices being separated by annular and continuous longitudinal partitions in the wall of the tube, said continuous longitudinal partitions forming guides for the projectile through the tube, and a series of annular check plates mounted on the periphery of the tube and interspaced with the annular series of orifices, said check plates serving to receive the forward impact of the gases discharged through the orifices to diminish the recoil of the gun.

2. An apparatus for utilizing the gases of the exploded charge in a gun for the purpose of diminishing the recoil of the gun, which consists of a tube forming a continuation of the muzzle of the gun, said tube having its wall perforated by a plurality of series of orifices arranged in annular and longitudinal succession, said orifices being separated by annular and continuous longitudinal partitions in the wall of the tube, said continuous longitudinal partitions having rifling grooves in continuation of the rifling grooves in the bore of the gun to engage the band of the projectile to guide the latter through the tube, and a series of annular check plates mounted on the periphery of the tube and interspaced with the annular series of orifices, said check plates serving to receive the forward impact of the gases discharged through the orifices to diminish the recoil of the gun.

3. An apparatus for utilizing the gases of the exploded charge in a gun for the purpose of diminishing the recoil of the gun, which consists of a tube forming a continuation of the muzzle of the gun, said tube having its wall perforated by a plurality of series of orifices arranged in annular succession with the first and second annular series of orifices from the front end of the tube spaced apart a distance less than the length of the projectile, and a cap mounted on the front end of the gun covering the first annular series of orifices and the forward part of the orifices of the second annular series, said cap having a passage to form a communication between the orifices of the two annular series, said passage serving to conduct part of the gases escaping from the orifices of the second, or rear, series of orifices through the first, or front series of orifices into the bore of the tube after the passing projectile has uncovered the front series of orifices, the gas so entering the bore operating to neutralize the force of the gases following the projectile in the bore of the tube.

In testimony whereof I have signed this specification.

EUGÈNE SCHNEIDER.

Witnesses:
ANDRÉ NOSTICKER,
LOUIS GARDET.