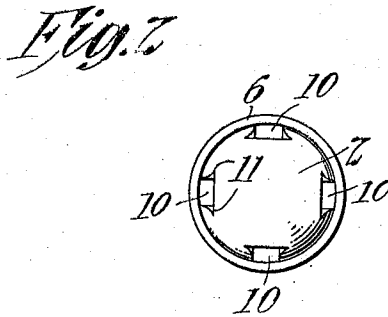
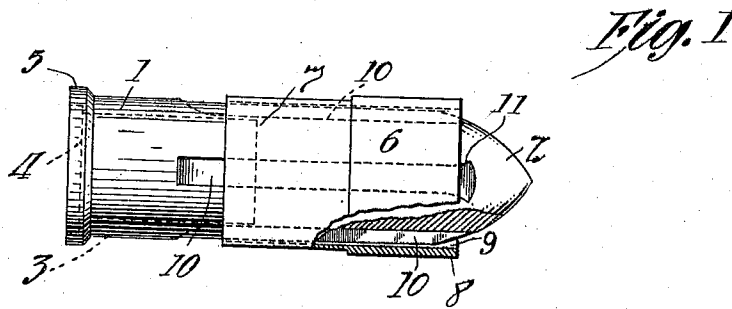


T. A. EDISON.
PROJECTILE.

APPLICATION FILED FEB. 12, 1916. RENEWED DEC. 14, 1918.

1,300,709.

Patented Apr. 15, 1919.



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UNITED STATES PATENT OFFICE.

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PROJECTILE.

1,300,709.

Specification of Letters Patent.

Patented Apr. 15, 1919.

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To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, and a resident of Llewellyn Park, West Orange, Essex county, New Jersey, have invented certain new and useful Improvements in Projectiles, of which the following is a description.

My invention relates to projectiles and especially to projectiles designed for use in guns of large caliber, being in some aspects an improvement on the invention disclosed in my copending application Serial No. 73868, filed January 24, 1916, and entitled Projectiles.

The object of my invention is the provision of an improved type of projectile, whereby it will be unnecessary to employ guns having rifled bores for discharging the same in order to overcome any tendency the projectile may have to turn end over end or "hurtle" in its flight. Another object of my invention is to provide a projectile with improved means for accomplishing this result which also prevents rotary movement of the projectile about its longitudinal axis while in flight and thereby permits the attainment of certain other desirable results which are impossible to obtain with projectiles which rotate while in flight. My invention also contemplates a projectile of such construction that the friction thereof on the bore of a gun from which the same is discharged will be reduced to a minimum.

As a smooth bore gun is employed in discharging a projectile made in accordance with my invention, the erosion and the frictional wear of the bore of the gun are greatly reduced, and accordingly the life of the gun is increased and a high degree of accuracy is obtainable therewith for a great number of rounds. Consequently, my invention renders much more practicable the use of guns of very large caliber, which has heretofore been limited because of the great cost involved in repairing and replacing such guns.

Other objects and features of my invention will be hereinafter more fully described and claimed.

For a clearer understanding of my invention, attention is directed to the accompanying drawing, forming a part of this specification, and in which:

Figure 1 is a view in side elevation, partly in section and partly broken away, of a pro-

jectile made in accordance with my invention; and

Fig. 2 is an end view of the projectile looking from the right in Fig. 1.

Referring to the drawing, the projectile comprises a cylindrical body portion 1 and a reduced portion at the forward end thereof, preferably in the form of a pointed head or "nose" 2. The forward or head end portion of the projectile is preferably made heavier than the rear end portion thereof, as by providing the rear end portion of the projectile with a cylindrical longitudinally extending recess or cavity 3. This results in the projectile having a tendency to travel "head on" in its trajectory. If the projectile is to be used as a shell, the recess 3 may be filled with any suitable explosive, or with an explosive and shot. The recess 3 is preferably closed at its rear end by a suitable member or cap 4 which is preferably flush with the rear end of the projectile. At its rear end the projectile is preferably provided with a suitable collar 5, which may be integral therewith but which is preferably in the form of a copper ring suitably applied and secured to the projectile. The copper ring 5 is preferably slightly greater in diameter than the main bore of the gun for which the projectile is designed, whereby when the gun is discharged and the projectile forced through said main bore, the said ring will be compressed so as to tightly fit the latter and will act as a packing to prevent the escape of the gases past the projectile. The forward end portion of the projectile is provided with a cylindrical collar 6, preferably of more than half the entire length of the projectile, and preferably having an extension 8 projecting a slight distance beyond the body portion 1 and over the reduced portion or "nose" 2, thereby providing an annular space 9 between the extension 8 and the "nose" 2. The collar 6 may be formed integrally with the body portion 1, but is preferably in the form of a cylindrical sleeve which is shrunk on or otherwise applied and secured to the body portion 1.

The forward end portion of the collar 6 is preferably of substantially the same diameter as the main bore of the gun for which the projectile is designed so as to fit closely in said main bore, but the rear end portion of this collar is preferably reduced, as shown at

7, so that the same will not engage with the said main bore and the friction on the latter will be reduced when the gun is discharged. The projectile is preferably provided on the exterior of the body portion 1 and beneath the collar 6 with a plurality of straight longitudinally extending open-ended grooves 10, and these grooves are preferably equally spaced circumferentially of the projectile. Each groove 10 is preferably parallel to the axis of the projectile and terminates at its forward end, which is flared as shown at 11, in the head or "nose" 2. Each groove 10 also extends rearwardly beyond the collar 6 for a short distance, and this rearwardly extending portion of each groove gradually decreases in depth until the groove merges in the surface of the body portion 1.

When the projectile described herein is discharged from a gun, air is entrapped or caught in the annular space 9, and forced through the grooves 10. The air forced through the grooves 10 coacts with the walls of these grooves to overcome any tendency which the projectile may have to turn end over end or "hurtle" in its flight, and to also overcome any tendency the projectile may have to turn about its longitudinal axis. During the flight of the projectile, the air also exerts an action on the collar 5, the forward portion of which is preferably beveled, to prevent tipping of the rear end of the projectile and thereby the "hurtling" of the latter. By reason of the flared forward end portions 11 of the grooves 10, a greater quantity of air is entrapped in and forced through these grooves, with a consequent increase in the resistance to the "hurtling" and turning of the projectile in its flight.

While I have shown and described the preferred embodiment of my invention, it is to be understood that the same is subject to various changes and modifications without any departure from the spirit of the invention and the scope of the appended claims.

Having now described my invention, what I claim and desire to protect by Letters Patent of the United States is as follows:—

1. A projectile comprising a body portion and a reduced end portion, said body portion having a cylindrical extension projecting therefrom and over said reduced end portion thereby providing an annular space between such extension and reduced end portion, the projectile being provided with a plurality of straight longitudinally extending open-ended grooves communicating at one end with said space, substantially as described.

2. A projectile comprising a body portion and a reduced end portion, said body portion having a cylindrical extension projecting therefrom and over said reduced end portion thereby providing an annular space between such extension and reduced end portion, the projectile being provided with a

plurality of straight longitudinally extending open-ended grooves communicating at one end with said space, said grooves being parallel to the axis of the projectile, substantially as described.

3. A projectile provided with a cylindrical collar terminating at a point remote from the rear end thereof and with a plurality of longitudinally extending open-ended grooves beneath said collar, said collar having a portion thereof over said grooves reduced, substantially as described.

4. A cylindrical projectile, the forward end portion of which is heavier than the rear end portion thereof, the forward end portion only of the projectile being provided with a collar and with a plurality of straight longitudinally extending open-ended grooves beneath said collar, substantially as described.

5. A cylindrical projectile, the forward end portion of which is heavier than the rear end portion thereof, the forward end portion only of the projectile being provided with a collar and with a plurality of straight longitudinally extending open-ended grooves beneath said collar, said grooves being parallel to the axis of the projectile and equally spaced circumferentially of the projectile, substantially as described.

6. A projectile comprising a body portion, a reduced portion or "nose" at one end of said body portion, and a collar on said body portion having a cylindrical extension projecting beyond the latter and over said "nose", thereby providing an annular space between said extension and "nose", said body portion being provided with a plurality of straight longitudinally extending open-ended grooves beneath said collar, and said grooves communicating at one end with said space, substantially as described.

7. A projectile comprising a body portion, a reduced portion or "nose" at one end of said body portion, and a collar on said body portion having a cylindrical extension projecting beyond the latter and over said "nose", thereby providing an annular space between said extension and "nose", said body portion being provided with a plurality of straight longitudinally extending open-ended grooves beneath said collar, said grooves being parallel to the axis of the projectile and communicating at one end with said space, and said collar having a portion thereof over said grooves reduced, substantially as described.

8. A projectile provided with a plurality of longitudinally extending open-ended grooves, said grooves being spaced circumferentially of the projectile and the forward ends of said grooves being flared, substantially as described.

9. A projectile provided with a cylindrical collar terminating at a point remote

from one end thereof and with a plurality of longitudinally extending open ended grooves beneath said collar, said collar having a portion thereof over said grooves reduced, and another collar of substantially the same diameter as the larger portion of said first collar applied to said end of the projectile, substantially as described.

10. A cylindrical projectile, the forward end portion of which is heavier than the rear end portion thereof, the forward end portion of the projectile being provided with a collar and with a plurality of straight longitudinally extending open ended grooves parts of which are beneath said collar, said collar and grooves terminating at points remote from the rear end of the projectile, substantially as described.

11. A cylindrical projectile, the forward end portion of which is heavier than the rear end portion thereof, the forward end portion of the projectile being provided with

a collar and with a plurality of straight longitudinally extending open ended grooves beneath said collar, parts of said grooves extending rearwardly beyond said collar and decreasing in depth until they merge in the surface of the body portion of the projectile, substantially as described.

12. A cylindrical projectile provided with a collar terminating at a point remote from one end of the projectile and with a plurality of straight longitudinally extending grooves beneath said collar, the said grooves having portions extending beyond the collar and decreasing in depth until they merge in the surface of the cylindrical body portion of the projectile, substantially as described.

This specification signed and witnessed this 4th day of February 1916.

THOS. A. EDISON.

Witnesses:

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FREDERICK BACHMANN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."