Feb. 24, 1931. C. L. BLOCH-JØRGENSEN 1,794,141

CARTRIDGE WITH PROJECTILE FOR SMOOTH BORE FIREARMS

Filed July 12, 1929

Fig. 1.

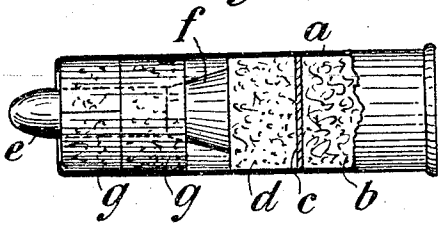


Fig. 2.

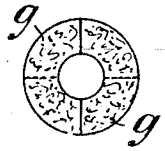


Fig. 3.

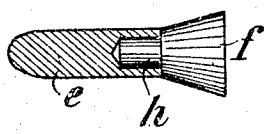


Fig. 4.

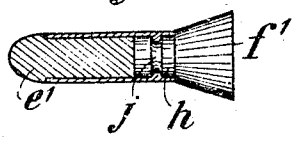


Fig. 5.

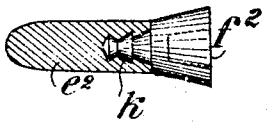


Fig. 6.

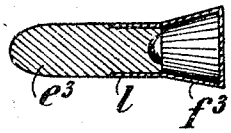


Fig. 7.

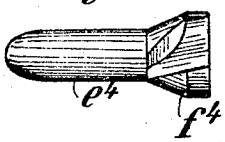


Fig. 8.

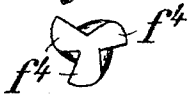
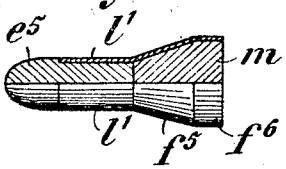


Fig. 9.



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UNITED STATES PATENT OFFICE

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CARTRIDGE WITH PROJECTILE FOR SMOOTH-BORE FIREARMS

Application filed July 12, 1929, Serial No. 377,791, and in Denmark August 4, 1928.

This invention relates to a cartridge with projectile adapted for smooth bore fire-arms, particularly small arms, and the invention contemplates mainly, but not exclusively cartridges for shot guns.

Various constructions of projectiles for shot guns are already known but these projectiles have a diameter equal to the generally comparatively large bore of the barrel and thus owing to the high air resistance, which they offer, afford a rather short range only, and besides they are not well adapted for keeping the point forward during the flight unless the projectile is provided with screw-shaped internal wings or the like, which by the pressure produced by the air will cause it to rotate around its axis. Such projectiles furthermore can only exceptionally and with some risk of bursting the barrel be fired through choke-bore barrels, and further, to a certain gun projectiles of one caliber only, i. e. corresponding to the bore of the gun, can be employed.

According to the present invention the cartridge for smooth-bore fire-arms is mainly characterized by the combined use of the following measures or devices:

The projectile body or bullet has a diameter substantially smaller than that of the cartridge case or, more generally, the caliber of the gun, and is held firmly in the cartridge case by one or more split rings or the like surrounding the projectile and adapted to follow it through the barrel, thereby keeping it centered, but which rings are blown away by the air pressure when the projectile leaves the muzzle, and that the projectile is provided at its rear end with a stiff tail or flight guiding member serving to keep the point of the projectile forward during the flight through the air.

It is to be remarked that it is previously known per se to provide projectiles with flight-guiding tails or the like of various designs, and that in rifled fire-arms, such as ordnances, it is also known to center a projectile of smaller diameter in the bore by means of longitudinally split annular supporting members consisting of a comparatively hard and strong material so that the rifle-grooves by acting on these supporting members can rotate the projectile in the usual way on the firing of the charge in order to keep the point of the projectile forward during flight.

By the present invention relating only to cartridges and projectiles for smooth bores there is, however, by the combined means indicated above obtained the particular effect that such a fire-arm is enabled to carry projectiles far and accurately, and that such projectiles also without any risk being incurred may be fired through full choke barrels.

For this latter purpose the centering ring or rings is or are made from felt or another (eventually impregnated) somewhat compressible material which although capable of centering the projectile in the barrel do not involve any danger of bursting small-bore barrels. Furthermore the material selected for the centering rings preferably should neither produce too great friction in passing through the barrel nor be destroyed by being pressed through the narrow part of full choke barrels. While the projectile body may be formed substantially as ordinary or standard bullets for rifles it has been found that particularly good results as to long range and accuracy of shooting are obtained when the tail of the projectile wholly or partly is substantially frustoconical, the wide end of the same facing rearwardly. The frustocone may be continued by a short cylindrical portion. The guiding tail ought to be made wholly or partly of a comparatively light material, for instance wood or aluminium, or it may be more or less hollow. By one embodiment of the projectile according to the invention the guiding tail or part of the same may be formed integral with a metal cover or casing for the bullet or projectile body. If the tail is provided with a rearwardly open cavity the latter may, if desired, be filled up with a suitable light material such as wood, cork or a composite mass.

On the drawing some embodiments of the invention are shown by way of example.

Figure 1 is an elevation partly in longitudinal section of a cartridge for shot guns,

Figure 2 is a front view of the supporting

or centering rings which surround the projectile of the cartridge shown in Figure 1,

Figure 3 is an elevation and partial longitudinal section of the same projectile,

Figures 4, 5 and 6 are similar views of three different embodiments of the projectile,

Figure 7 is a side elevation of a fifth embodiment of the projectile,

Figure 8 is a rear view of the same, and

Figure 9 is an elevation, partly in longitudinal section, of a sixth form of a projectile according to the invention.

In Figure 1 a designates the usual cylindrical cartridge case, b the charge of powder, c a disc of card-board or the like, d a wad of felt and e the projectile body. The latter carries at its rear end a wooden plug f having a stud h, Figure 3, rigidly secured in a bore in the rear end of the lead bullet or projectile body by a suitable adhesive or by a transverse pin (not shown). The projectile e, f, h is supported within the cartridge case by two longitudinally split supporting rings g of felt or the like, the splits of which may be angularly staggered as shown in Figure 2. As will appear from Figure 1 the bullet or projectile body has a diameter substantially smaller than that of the cartridge case and the point of the same projects from the latter, so that one can always easily learn the caliber of the projectile. The pressure exerted by the powder-smoke is transmitted from the wad d to the wooden plug or tail f and from the latter to the lead bullet e. As indicated above the supporting rings composed of segments are carried along with the projectile out through the barrel of the gun thereby keeping the projectile centered and are then blown away from the latter by the air pressure. The tail f having a frustoconical form as shown assures that the projectile is constantly keeping its point straight forward during the flight through the air.

In the embodiment shown in Figure 4 a so-called soft-nose bullet e^1 is provided with a cover or casing of nickel, aluminium or another suitable metal which at its rear part receives the stud h^1 of the tail f^1 and is pressed into a circumferential groove j in the tail whereby a rigid connection between the bullet and the tail is established.

In accordance with Figure 5 a frustoconical guiding tail f^2 made for instance from aluminium is provided with a conical central stud k having circumferential grooves or stepped faces, the lead bullet e^2 being cast around the said stud. The tail f^2 as shown in dotted lines may have a rearwardly open cavity.

In the embodiment shown in Figure 6 a lead bullet e^3 is provided with a short metallic cover or casing 1 formed in one piece with a hollow tail f^3. This and the cover may for instance consist of aluminium, copper, brass, nickel or another suitable metal or alloy.

In the embodiments of the projectile thus far described no means have been provided for causing the projectile to rotate around its axis, as such means have proved to be unnecessary. It is, however, within the scope of the invention to equip the projectile for a cartridge of the type shown in Figure 1 with inclined or helical wings, ribs or the like serving to produce such rotation. As an example of such an embodiment which has proved successful in practice Figures 7 and 8 show a projectile e^4, the tail of which is composed of three screw-shaped wings f^4, consisting for instance of wood. As will appear from Figure 7 the contour of the extreme rear portion of the tail is not conical, but rather cylindrical.

The latter feature is also found in the projectile shown in Figure 9. Here a lead bullet e^5 is provided with a metal cover l^1 formed integral with a hollow guiding tail consisting of a frusto-conical front portion f^5 and a short cylindrical rear portion f^6. The cavity of the tail may be filled up with a light plug m, for instance of wood.

It is to be emphasized that the projectiles according to the invention are not limited to the embodiments shown and particularly described as the material from which the tail is made, the connecting means between tail and projectile body and within certain limits also the shape and relative proportions of the tail may be varied in many ways without departing from the range and scope of the invention.

Having thus fully described my invention I claim as new and desire to secure by Letters Patent:

1. A cartridge for smooth-bore fire-arms, including in combination a cartridge case, a projectile body within said cartridge case having an outer average diameter substantially smaller than that of the cartridge case and provided at its rear end with a tail adapted by the pressure of the air thereon to keep the point of the projectile forward during flight, and split supporting-means surrounding said projectile and adapted to keep it centered during the passage of the projectile and the supporting-means through the barrel of the fire-arm, said supporting-means being adapted to be subsequently blown away from the projectile by the air pressure.

2. A cartridge for smooth-bore fire-arms, including in combination a cartridge case, a substantially cylindrical projectile body within said cartridge case having a diameter substantially smaller than that of the cartridge case and provided at its rear end with a tail, said tail being rigidly secured and comparatively light and having a series of circular cross sections, at least some of said sections having a diameter larger than that of

the cylindrical projectile body, said tail being adapted by the action of the air thereon to keep the point of the projectile straight forward during flight, and supporting-means surrounding said projectile for keeping it centered in the barrel of the fire-arm during its passage therethrough, said supporting-means being adapted to be subsequently automatically removed from the projectile.

3. A cartridge as in claim 1, having a split supporting-means, said means comprising at least one split ring, said ring being of a compressible material producing a small friction only against the barrel of the fire-arm.

4. A cartridge as in claim 1, in which the said split supporting-means for the projectile body comprises a split felt ring.

5. A cartridge as in claim 1, in which the projectile body is cylindrical with a tapered foremost end, said body being of substantially greater axial length than the tail, the latter being mainly of frusto-conical shape, the smallest diameter of the frusto-cone being equal to the diameter of the cylindrical projectile body.

6. A cartridge for smooth-bore fire arms, including in combination a cartridge case, a projectile body having a diameter substantially smaller than that of the cartridge case, and segmental members of felt surrounding said projectile body and supporting it within the cartridge case.

7. A cartridge as in claim 6, in which said projectile body forms a coherent structure with a substantially frusto-conical tail portion of a stiff material adjoining its rear end.

8. A cartridge for smooth-bore fire-arms, including in combination a cylindrical cartridge case, a bullet having a diameter substantially smaller than that of the cartridge case and provided at its rear end with a comparatively light tail portion of approximately frusto-conical formation in part at least, the widest end of the frusto-cone facing rearwardly, and at least one split ring independent of and surrounding the said bullet and supporting it within the cartridge case.

9. A projectile for smooth-bore fire-arms such as shot-guns, comprising a cylindrical bullet with a mainly ogival foremost end and provided at its rear end with a comparatively light and stiff enlarged tail portion, the greatest diameter of which is larger than that of the cylindrical bullet proper, said tail portion being of such shape and proportions as to be able to keep the point of the projectile forward in its flight through the air without the aid of rotation.

10. A projectile for smooth-bore fire-arms such as shot-guns, comprising a substantially cylindrical projectile body, said body being continued rearwardly by a light tail of mainly frusto-conical form, the widest end of the trusto-cone facing rearwardly and said projectile body and tail forming a rigid structure adapted to leave the muzzle of the gun with unaltered shape, the tail being of such proportions as to be adapted to keep the projectile head-on in its flight through the air.

11. A projectile for smooth-bore fire-arms, comprising a lead bullet and a metal cover surrounding the same, and said cover being continued rearwardly beyond the lead bullet to form an enlarged comparatively light tail portion, said portion being adapted to retain its shape and connection with the bullet during its passage through the gun barrel and to keep the point of the bullet forward in its flight through the air by the action of the air upon the tail portion.

12. A projectile for smooth-bore fire-arms, comprising a lead bullet and a metal cover closely surrounding the same and projecting rearwardly from the lead bullet to form an enlarged tail portion, part at least of which has a frusto-conical form, said tail portion being adapted to retain its shape and connection with the bullet during the passage through the gun barrel and to keep the point of the bullet forward in its flight through the air by the action of the air upon the tail portion.

13. A projectile for smooth-bore fire-arms, comprising a projectile body and a metal cover secured thereto, said cover being continued rearwardly beyond the projectile body to form a comparatively light tail, said tail being composed of two portions the foremost of which is frusto-conical and the rearmost of which is substantially cylindrical, the smallest diameter of the frusto-conical tail portion being equal to that of the projectile body and the largest diameter of the same being equal to that of the cylindrical tail portion, the said tail being adapted to retain its shape and its rigid connection with the projectile body during the passage through the gun barrel and to keep the point of the projectile forward in its flight through the air by the action of the air upon the tail.

14. The projectile of claim 12, in which the tail part of the metal cover is hollow, said tail being filled up with a plug of a light material.

15. A cartridge for smooth-bore fire-arms, including in combination, a charge of powder, a wad in advance of said charge of powder, a projectile having an average diameter substantially smaller than that of the wad and provided in the rear with an enlarged tail portion rigidly secured to said projectile and adapted to bear against the front face of said wad, and divided supporting-means surrounding said projectile and adapted upon firing of said charge of powder to be driven through the barrel of the fire-arm by the wad pressing upon said enlarged tail portion, said tail being adapted to act upon said divided supporting-means, the latter being thereby

adapted to center the projectile during its passage through the barrel and being adapted to be subsequently blown away from the projectile by the air pressure.

16. A cartridge for smooth-bore fire-arms, including in combination, a cartridge case, a charge of powder, a substantially cylindrical projectile with a tapered foremost end and an enlarged tail, and at least one divided supporting ring surrounding said projectile in such a manner that a substantial axial distance is left between the rear face of the supporting ring and the rear end of the tail, whereby upon firing of said charge of powder the projectile is adapted to be driven forward and carry the supporting ring with it through the barrel of the fire-arm, the supporting ring thereby centering the projectile and being subsequently blown away from the same by the air pressure.

17. A cartridge for smooth-bore fire-arms as in claim 15, characterized by including a cylindrical cartridge case receiving said charge of powder, wad, projectile and split supporting-means, the diameter of said cartridge case opposite to the split supporting-means being equal to the diameter of the cartridge case opposite to the charge of powder, the projectile apart from the enlarged tail portion being substantially cylindrical and projecting with its point from the cartridge case so as to be visible from outside.

18. A cartridge as in claim 16, characterized by including a plug-like wad interposed between the charge of powder and the said tail, said wad bearing against the latter without touching the divided supporting ring.

In testimony whereof I have affixed my signature.

CHRISTIAN LAURITS BLOCH-JØRGENSEN.