(No Model.)

D. B. WESSON.

PROJECTILE FOR FIRE ARMS AND ORDNANCE.

No. 440,672. Patented Nov. 18, 1890.

Fig. 1.

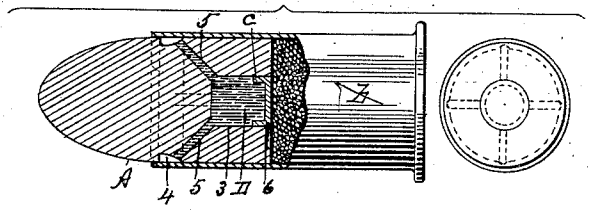


Fig. 2.

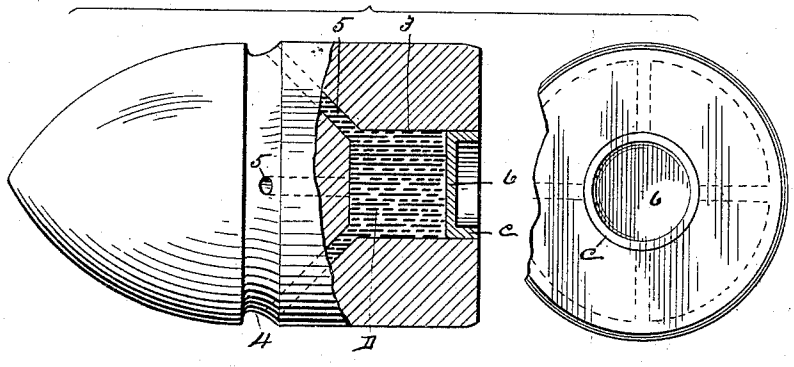


Fig. 3.

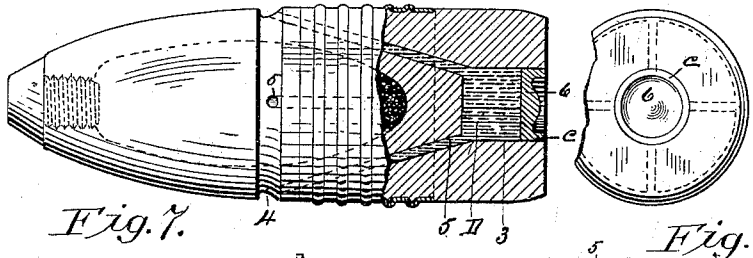


Fig. 7.

Fig. 8.

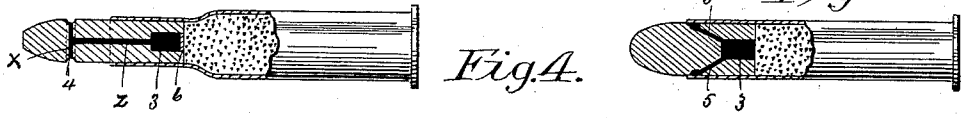


Fig. 4.

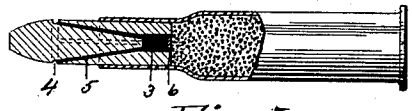
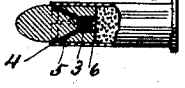


Fig. 5.



Fig. 6.



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UNITED STATES PATENT OFFICE.

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PROJECTILE FOR FIRE-ARMS AND ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 440,672, dated November 18, 1890.

Application filed May 22, 1890. Serial No. 352,761. (No model.)

To all whom it may concern:

Be it known that I, DANIEL B. WESSON, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Projectiles for Fire-Arms and Ordnance, of which the following is a specification.

This invention relates to projectiles for ordnance and for small-arms, pistols, &c., the object being to provide improved projectiles for the above-mentioned uses in respect to means for lubricating the same, whereby the movement of the projectiles in the barrels of the guns or arms is attended with reduced frictional resistance, and injury to the interior of said barrels by the movement of the projectiles therethrough is in a great measure, if not wholly, prevented.

In the drawings forming part of this specification, Figure 1 is a side elevation, partly in section, of a metallic cartridge containing a projectile constructed according to my invention, there being embraced in this figure a rear end view of the said projectile. Fig. 2 is a side elevation, partly in section, of a solid projectile or shot for cannon and a rear end view of the same. Fig. 3 is a side elevation, partly in section, of a shell for cannon and a rear end elevation of the same. Figs. 4, 5, and 6 are side elevations, partly in section, of various descriptions of cartridges, these cartridges, as well as the shot and shell shown in Figs. 2 and 3, illustrating the manner of applying my improvements to different projectiles, all as hereinafter fully described. Fig. 7 is a sectional view of a cartridge projectile having an arrangement of ducts or conduits, as below described, differing slightly from those shown in the preceding figures. Fig. 8 shows a projectile in which the reservoir-cap is omitted.

Heretofore projectiles for fire-arms have been lubricated by applying lubricating material in various ways to the surface thereof, or by putting said material into the shells of metallic cartridges directly behind the ball thereof; but said ways of applying the lubricant have proved unsatisfactory from the fact that rarely, if ever, do they effect the thorough lubrication of the surfaces of ball and barrel during the entire movement of the ball from breech to muzzle of the latter; but the improved means of lubrication herein described insures the effectual lubrication of the abrading parts of barrel and projectile during the entire movement of the latter in the barrel.

In the drawings, referring now to Fig. 1, which illustrates (somewhat enlarged) a metallic cartridge, *b* is the shell thereof, of usual form and construction, and A is the bullet, made preferably of lead, as usual, but in detail constructed as follows:

In the base of the bullet A is formed a chamber or lubricant-reservoir 3, of any suitable form, but preferably cylindrical, said reservoir being adapted to contain a sufficient quantity of lubricating material, preferably tallow or similar substance, to lubricate the surface of the ball during its entire passage through the barrel. The ball is made preferably with an annular groove or recess 4 in its surface between its base and tip. One or more lubricant-ducts 5 are formed in the ball A, extending from said reservoir to the surface of the ball or to the base of said groove or recess, as shown in the several figures, said ducts being adapted to convey the lubricant from said reservoir to the surface of the ball, as below described. The said reservoir 3 having been filled with lubricating material D, and preferably filling the ducts 5 at the same time, as shown in the drawings, a movable cap or plate 6 is placed in the open end of said reservoir, thereby inclosing and retaining the lubricant therein until such time as the projectile shall be fired from the cartridge or from a gun. The said cap or plate 6 is made preferably of the forms shown in Figs. 2 and 3—that is to say, circular and having a pending border or brim *c;* but said cap may consist simply of a flat disk, as shown in Figs. 4, 5, and 6, if desired. Said cap 6 acts, when subjected to the force of an ignited charge of powder or other explosive in a cartridge or in a gun, as a piston to force the lubricant D through the ducts 5 in the projectile and to discharge said lubricant outwardly against the adjoining inner surface of the barrel of the gun or fire-arm. It is obviously desirable that the cap 6 shall fit tightly within the walls of the reservoir 3 to prevent

the escape of any of the lubricant rearwardly when said pressure acts on the cap to force it through the ducts 5, and hence the said form of cap shown in Figs. 2 and 3, and placed in the projectile as there shown, is preferable, for the pressure acts directly against the outer surface of the cap to drive it inward, and more or less laterally against the pending brim *c*, thereby forcing the latter so closely against the walls of the reservoir as to prevent undue leakage. The action of the pressure against the outer side of the cap 6, (shown in Fig. 1,) when said cap is placed in the reservoir with its border *c* extending inwardly, is to crowd the extremity of said border tightly against the walls of the reservoir. This action tends (more or less) to prevent leakage around the border of the cap; but this arrangement of the latter is objectionable, for the reason that the edge of the border is apt to cut into the walls of the reservoir and hinder the proper movement of the cap inwardly.

The cap shown in Fig. 3 is substantially like that shown in Fig. 2, but varies somewhat from the latter, in that its central portion within the brim or border *c* is strengthened by making it of convex form to prevent any inward deflection under great pressure, and this convex form of cap is particularly adapted to be used in large projectiles, in which the cap may be from two to three inches in diameter, this preventing central deflection, which would tend to draw the lower edge of the brim *c* away from the walls of the reservoir, and thus permit leakage around the border of the cap. Said convex form of cap may, if desired, be used in the cap of the description shown in Figs. 4, 5, and 6, which has no brim or border *c* extending at right angles to the plane of the cap.

The above-referred-to annular groove or recess 5 in the surface of the projectile, in which the outer ends of the ducts 5 terminate beneath the surface proper thereof, prevents the closing of any of the said outer ends of the ducts by the usual formation of "land-marks" or grooves on the projectile caused by the rifling of the barrel when the latter passes through it. When, however, the projectile is constructed without said groove or recess 4, and with several ducts communicating with the lubricant-reservoir, it is seldom, if ever, that such a number of ducts are interfered with from the above cause as to seriously interfere with the lubrication of the barrel, as above described.

Fig. 4 illustrates the application of the within-described lubricating improvements to a cartridge projectile adapted to be fired in a barrel of very small caliber. Fig. 5 similarly illustrates the application of said improvements to the regular United States service cartridge of 45-caliber, and Fig. 6 similarly illustrates the application of the same improvements to an ordinary Smith & Wesson pistol-cartridge.

In all of the above-referred-to application of said improvements, whether to projectiles for small-arms or for cannon, it is preferable to so arrange the lubricant-ducts 5 that their outer ends shall, as shown in the drawings, terminate at or about at the forward end of the cylindrical portion of the projectile, in order that the lubricant may be discharged at such a point thereon (and also against the adjoining inner surface of the barrel) as shall insure its distribution over the entire surface of the projectile from the outer ends of said ducts to the rear end thereof during its passage through the barrel, and to this end the capacity of the reservoir, the supply of lubricant therein, and the diameter of the ducts 5 are properly adjusted to meet the conditions required for each description of projectile, so that the lubricant shall be continuously delivered from the sides of the projectile from the instant of the first effect of the force of the ignited charge of the arm upon the cap 6 to the escape of the projectile from the muzzle of the barrel, thereby effecting complete and continuous lubrication, coinciding with the movement of the projectile, as aforesaid.

Ordinarily, when the length of the ball will permit, it is preferable, as shown in Figs. 1, 5, and 6, that the upper end of the shell of a cartridge shall extend more or less over the outer ends of the ducts 5, in order to preserve them in good condition for the delivery of the lubricant, and also to keep any of the latter that may be present at or in the outer end of the ducts from becoming dry and hard by exposure to the air.

The projectile, Fig. 7, illustrates an arrangement of the ducts between the reservoir 3 and the surface of projectile, which may be adopted, if desired, instead of that shown in the preceding figures of the drawings, which consists in forming a transverse duct *x* through the projectile from side to side, having communication with the reservoir 3 by means of a duct *z*, forming a communication between the reservoir and said transverse duct.

The useful purposes of the cap 6 are above set forth to a considerable extent, but it further serves to prevent the escape of any of the explosive force of the charge through the ducts 5 after the lubricant may have been fully discharged from the reservoir. But by the exercise of care as to such an excess of lubricant as will not be wholly exhausted from the reservoir and the ducts during the passage of the projectile through the barrel of the arm said cap may be omitted, as shown in Fig. 8, if desired, especially when the projectile is to be used soon after it shall have been charged with lubricant, but in order to best answer all the requirements of service it is preferable to invariably provide the projectile with a cap.

What I claim as my invention is—

1. A projectile having a reservoir for a lubricant in its rear portion and a duct leading from said reservoir to the outer surface of the

projectile and opening near the front of that part of the projectile which has a bearing on the walls of the gun, whereby pressure on the rear of the projectile may expel the lubricant during the passage of the projectile along the gun-barrel, substantially as described.

2. A projectile having in its rear portion a reservoir containing a lubricant and one or more ducts communicating with said reservoir and with the exterior of the projectile and provided with a cap fitting and movable forwardly in the rear of said reservoir and adapted to receive the impact of the firing-charge, for the purpose set forth.

3. A projectile having a lubricant-reservoir therein and one or more ducts communicating with said reservoir and extending thence to the base of a recess in the surface of the projectile, combined with a movable cap closing the open end of said reservoir, substantially as set forth.

4. A projectile having a lubricant-reservoir therein and one or more ducts communicating with said reservoir and extending thence to the surface of the projectile, combined with a movable cap closing the open end of said reservoir, having a border extending at right angles to the plane of the cap, substantially as set forth.

5. A projectile having a lubricant-reservoir therein and one or more ducts communicating with said reservoir and extending thence to the surface of the projectile, combined with a movable cap closing the open end of said reservoir, having its central portion of convex form and a border extending at right angles to the plane of the cap, substantially as set forth.

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