(No Model.)

F. J. RABBETH.

SUBCALIBER AMMUNITION.

No. 587,857. Patented Aug. 10, 1897.

Fig. 1.

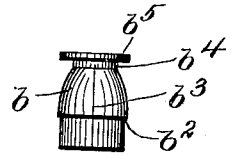


Fig. 2.

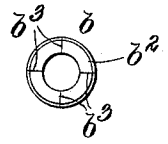


Fig. 3.

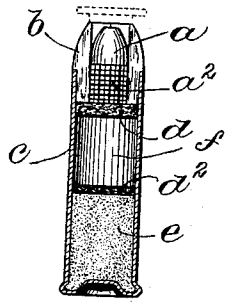
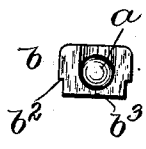


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANCIS J. RABBETH, OF BOSTON, MASSACHUSETTS.

SUBCALIBER AMMUNITION.

SPECIFICATION forming part of Letters Patent No. 587,857, dated August 10, 1897.

Application filed March 15, 1897. Serial No. 627,664. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS J. RABBETH, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Subcaliber Ammunition, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to subcaliber ammunition for use in rifled guns, the object being to produce a subcaliber projectile, or one that can be shot efficiently and accurately in a gun of substantially larger caliber than the diameter of the projectile, and to utilize therewith the ordinary shell, which will properly fit the chamber of the gun, while the charge of powder is materially reduced.

There are frequently conditions under which it is desirable to be able to shoot properly a smaller projectile than the one for which the gun is designed—as, for example, in small arms used for sporting purposes when small-game is encountered when the sportsman has only a rifle intended for large game, or for military purposes to admit of target practice in an armory or elsewhere when the regular military cartridge could not be used on account of the weight and power of the projectile, although it is desirable that the practice should be with the regular arm.

Similar conditions may exist with guns of large caliber, such as are used on shipboard or in fortifications, and the present invention is equally applicable to ammunition for large ordnance, although for convenience it is shown as embodied in a projectile for small-arms, such as military or sporting rifles.

The invention consists, essentially, in a sectional jacket or bushing of relatively light material—such, for example, as wood—of proper size and shape externally to fit the cartridge-shell and to take the grooves of the rifle like the regular projectile which is commonly used in the rifle, said jacket being adapted to support the small projectile concentric with its axis and to engage with the outer surface of said projectile with sufficient firmness to impart the rotary movement to the said projectile that is given to the said surrounding bushing or jacket by the grooves of the rifle. The said jacket, owing to its sectional construction and its lightness or relatively low specific gravity, flies apart immediately after leaving the muzzle of the gun, so that the flight of the small projectile is unimpeded, and experiment has shown that a projectile can by these means be fired with substantially equal accuracy to that of a projectile which is itself of proper size to take the grooves of the rifle.

Figure 1 is a side elevation of a projectile embodying this invention; Fig. 2, a rear end elevation thereof; Fig. 3, a sectional elevation of a cartridge loaded with such a projectile in accordance with this invention, and Fig. 4 a sectional elevation showing a modified construction of the subcaliber projectile.

The invention is shown as embodied in a subcaliber projectile for a small-arm, such as a sporting or military rifle, for the purpose of enabling a bullet or projectile *a* (see Fig. 3) of much smaller diameter than the bore of the rifle to be shot accurately and successfully—as, for example, when it is desired to shoot a bullet adapted for a caliber of twenty-two or twenty-five one-hundredths of an inch in a rifle of substantially larger caliber—as, for example, one of forty or forty-five one-hundredths of an inch. To this end the small bullet *a* is incased in a bushing or jacket *b* of relatively light material, such as wood, and of external diameter and shape corresponding substantially to that of the projectile regularly used in the rifle, the said jacket *b* being herein shown as slightly enlarged just in front of the mouth of the shell *c* to form a shoulder b^2, which prevents the jacket from being forced into the shell beyond the desired position, the enlarged portion, moreover, being adapted to coöperate with the grooves of the rifling. Such construction, however, is not essential, since with quick powder it is found that in most cases the rear end of the bullet will be upset sufficiently to force the sections of the jacket apart sufficiently to properly coöperate with the grooves of the rifling. The said bushing or jacket has a central bore or recess of proper size to receive the small bullet *a* snugly within it, and is compressed into firm engagement therewith in the operation of setting the jacket and bullet in the cartridge-shell, as shown in Fig. 3, and being forced into still firmer engagement therewith by the compression due to the jacket taking

the rifling of the gun when shot and the upsetting effect due to the pressure of the gas and wad against the breech end of the projectile.

In order to facilitate the closing in of the jacket upon the bullet, so as to grip it firmly and also to enable the jacket to clear the projectile as soon as it leaves the muzzle of the gun, the said jacket is divided longitudinally into sections, as clearly shown in Figs. 1 and 2. Where the jacket is made of wood, which has been found very efficient for this purpose, it may be conveniently made, as shown in Fig. 1, by turning a deep groove b^4 near the forward end and leaving a small button or flange b^5, connected with the body of the jacket by the neck or reduced portion formed by the groove b^4.

The grain of the wood should be straight and lengthwise of the projectile, and when thus made the body portion may be split longitudinally, preferably on two planes at right angles to one another, as indicated at b^3, Figs. 1 and 2, the reduced portion or neck b^4 preventing the splits from passing through the collar or button b^5, which thus serves to hold the sections of the jacket together while the bullet is introduced therein, and together therewith is introduced into the cartridge-shell, after which the button b^5 may be cut off, as indicated in Fig. 3, leaving the sections of the jacket nearly or wholly separated.

While the jacket constructed as above described, with a button connected with the body thereof by a thin neck to provide for the splitting of the body without the complete separation of the sections thereof from one another, is convenient and efficient and is believed to be novel and constitutes a part of this invention, this construction is not essential to the main invention, as the totally or partially separated sections of the jacket may be held together until the cartridge is prepared or the gun loaded by other temporary fastenings adapted to be removed before firing or in the act of firing, so that the sections of the jacket will readily separate directly after leaving the muzzle of the gun.

In another application, filed March 15, 1897, Serial No. 627,665, I have shown and described a loading-tool adapted to hold a jacket made without the button, as above described, and to maintain the parts thereof properly assembled during the insertion of the bullet into the shell. Unless the jacket freely clears itself of the bullet directly as it issues from the bore of the gun there is liability of disturbing the flight of the bullet, so that the shooting will be inaccurate. The splitting of the jacket should therefore be such as to wholly separate the sections, and by having the forward end of the jacket project to or beyond the end of the projectile, as shown, air is compressed in the bore of the jacket around the bullet during the rapid forward movement, and thus tends to separate the sections if they should adhere to one another or if the grain should not be completely separated throughout the entire length of the meeting edges of the section.

It is further desirable that the construction should be such that the bullet will not extend beyond the end of the jacket, because by this construction the jacket affords protection for the bullet, which might otherwise be displaced laterally if the forward end thereof projected beyond the jacket, such disturbance, which would throw the bullet out of line, being obviously objectionable, as it would result in inaccurate shooting.

In magazine-firearms, moreover, where a number of cartridges are supported end to end in the magazine, danger would be encountered if the small projectile or bullet extended beyond the end of the jacket, since it would be in contact with the primer of the adjacent cartridge and would be liable to explode the same, owing to the recoil of the gun when fired. In this connection it may be stated, moreover, that the enlarged portion or shoulder b^2 of the jacket in front of the shell is of importance for the same reason, since it prevents the jacket from being forced back into the shell by the pressure of the magazine-spring or the shock caused by the recoil of the gun. It is advantageous also to have the jacket tapered or rounded externally toward its forward end, as shown, giving it substantially the external form of the full-sized bullet fitted to the bore of the gun, as the cartridge is thus entered readily into the chamber in the breech of the gun.

In order to insure the equal and uniform movement of the jacket and its inclosed projectile through the bore of the gun, the jacket or projectile should be backed up by a suitable wad or gas-check d, as shown in Fig. 3, to properly distribute the gas-pressure on the base of the jacket and inclosed projectile.

Since it is obviously desirable to reduce the charge of powder when a small bullet is to be fired instead of the larger heavier bullet which is itself adapted to fit the bore of the rifle, the ammunition constructed in accordance with the present invention comprises the shell c, which is of the normal or usual size and length, so as to properly fit the chamber of the gun, the said shell containing a relatively small charge of powder e, which is confined by a wad e^2, shown as separated from the projectile by a space f, it thus being apparent that while a comparatively small charge of powder is used the cartridge embodying the invention will be substantially the same in size and shape as the cartridge loaded in the usual way and adapted for use with the gun in which the herein-described subcaliber ammunition is to be used.

A further feature of the invention consists in the use of a mixed powder, this being of importance for the reason that when a small charge of a mechanically mixed or prepared explosive, such as the so-called "black powder," is used in a shell loaded as above de-

scribed much difficulty is encountered owing to the fact that the gun soon becomes fouled. This may be due to imperfect combustion caused by the relatively low pressure, the presence of air in the shell, and the large area of metal in the gun-barrel relative to the amount of explosive in the charge, which rapidly chills the gases, so that the products of combustion are deposited along the interior of the barrel. By mixing with the ordinary explosive some chemically-prepared explosive, such as the so-called "nitropowder," however, a more perfect combustion is obtained and the rapid fouling of the gun to a large extent prevented. If, however, nitropowder alone is used, although it will not rapidly foul the gun, there is liability to hang fire owing to the slow ignition of nitropowder, this difficulty being entirely obviated by the admixture of the ordinary gunpowder or black powder therewith.

In the modification shown in Fig. 4 the recess in the jacket does not extend wholly through the same, and in this construction a lighter wad or gas-check may be used, or in some cases no additional gas-check would be required. This construction is desirable when a spherical bullet or one of comparatively small elongation is used, as is required when the rifling is such as to give insufficient rotation to steady a very much elongated bullet.

In order to more thoroughly insure the rotation of the bullet with the jacket, the bullet may be provided with longitudinal grooves, as shown at a^2, Fig. 3, in addition to the usual circumferential groove, or may have its outer surface otherwise roughened or prepared to interlock with or be securely frictionally held by the inclosing jacket; but such construction is not essential, as without such grooving or roughening the jacket, when properly constructed, will impart the necessary rotation to the inclosed bullet, which in practice is found to shoot substantially as accurately as a bullet which itself fits the bore of the gun.

I claim—

1. A jacket for adapting a bullet of small diameter to a gun of larger caliber, composed of a piece of wood shaped externally to correspond in diameter with a projectile of proper size for the caliber of the gun and having at its forward end an integral button connected with the body portion by a reduced neck, whereby when the body portion is split longitudinally into sections the latter are temporarily held together to facilitate the loading of the projectile, substantially as described.

2. A jacket for a subcaliber projectile adapted to be shot from the gun with the projectile, said jacket being composed of longitudinal separable sections, and of proper size at the rear portion to fit the cartridge-shell, said sectional jacket having a recess concentric with its axis to receive within it the bullet and having an enlarged portion adjacent to said rear portion to coöperate with the grooves of the rifling, and prevent the said jacket from being accidentally forced into the shell beyond its normal position, substantially as described.

3. A jacket for a subcaliber projectile composed of longitudinal separable sections, of proper size to fit the bore of the gun, and having a recess concentric with its axis to receive the bullet, said recess being open at its forward end, the forward end of said jacket being tapered or rounded externally and extending forward as far as the end of the bullet, substantially as and for the purpose described.

4. Subcaliber ammunition comprising a cartridge-shell containing as a charge a mixture of chemically-prepared explosive and mechanically-prepared explosive, a wad adapted to confine the said charge, a bullet of relatively small caliber provided with a jacket adapted to fit the cartridge-shell and conform to the bore of the gun, and made of separable sections of relatively light material, the said jacketed bullet being separated from the said wad by an air-space and the jacket thereof extending forward as far as the end of the bullet and being tapered externally, substantially as described.

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

FRANCIS J. RABBETH.

Witnesses:

H. J. LIVERMORE,

NANCY P. FORD.