C. A. WATERBURY.

Projectile.

No. 39,977. Patented Sept. 15, 1863.

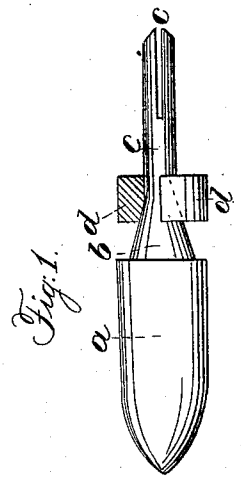


Fig. 1.

Witnesses

L. M. Maynard

L. F. Britton

Charles A Waterbury
by his attorney
I. P Simpson

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES A. WATERBURY, OF NEW YORK, N. Y.

IMPROVEMENT IN PROJECTILES FOR FIRE-ARMS.

Specification forming part of Letters Patent No. **39,977**, dated September 15, 1863; antedated November 8, 1862.

To all whom it may concern:

Be it known that I, CHARLES A. WATERBURY, of the city, county, and State of New York, have invented a new and useful Improvement in Projectiles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawing, making a part of this specification.

My invention is an improvement in the construction of projectiles for fire-arms, having special reference to all kinds of rifled arms.

The nature of the first part of my invention lies in the method of packing the shot and imparting rotary motion; and the nature of the second part consists in attaching a gage to regulate the distance of the shot or projectile from the breech, irrespective of the space occupied by the explosive material, in order to secure an air-space between the breech and the shot in addition to the space taken up by the powder. By my improvement I am enabled to avoid the injurious effects produced by the use of metal packing, either in leading the grooves when lead is used, or otherwise injuring and wearing out said grooves when the packing is of harder metal. The projectile I employ consequently is only required to fit snugly in the bore, and I can thus substitute shot of iron, or even glass, for lead in all kinds of small-arms. The principle of this part of my invention lies in the method of expanding the packing, as well as in the character of the packing itself, and it is to be specially observed that in the act of packing by the concussion produced by the explosion of the powder the projectile itself, so far as its shape is concerned, is wholly unaffected, the result produced being simply to cause rotary motion in the act of discharging it, as well as to prevent windage. In all other shot with which I am acquainted used in rifled guns the act of firing produces some change in its character, such as "slugging" or expansion of lead bands or rings, or of some portion of the ball itself.

In the drawing is represented a shot as I make it for small-arms, having the expansible packing attached, shown partly in section. The body of the shot is shown as cylindrical, with the forward end pointed or rounded, and, as shown at *a*, the rear end, or that which is to be presented toward the breech in loading, has a conical piece projecting from the base, as shown at *b*, and this again terminates in a projecting spindle or tail, *c*. The expansible packing is shown at *d*, being a disk of some flexible material, such as leather, rubber, or other like article. I prefer, on many accounts, leather, as effecting the purpose completely, at least for small-arms. For heavy ordnance some other article may be found to be better adapted; but whatever it be it should be of such nature that it may be expanded or enlarged by action from the center of the disk. These disks *d* are to be of about the same circumference as the shot, so as to be easily inserted from the muzzle. The hole in the disk is just large enough to receive the spindle *c*, and it is then pushed up until arrested by the enlarged or conical base *b*. The spindle *c* is shown as slotted at *c'*. This part will be immersed in powder or have the cartridge formed upon it, and the object of the slot is that the fire may be thereby communicated to the center of the charge. The purpose of the spindle is to act as a gage to stop the body *a* always at a given distance from the breech. The length of this tail is intended, therefore, to be such as to arrest the descent of the ball before it shall strike the powder, thus leaving the latter loose and uncompacted, and also forming, when desired, an air-space between the powder and the projectile.

The operation is as follows: The charge of powder being put in, the shot is inserted with the tail or spindle *c* toward the breech and rammed down until the point *c'* strikes the breech. In firing, the explosion drives the packing-disk *d* forward upon the cone *b*, which, it will be seen, expands the backing from the center equally all round, thereby enlarging its diameter and forcing the outer edge against the barrel, and as this packing must be made of some yielding material, this edge necessarily takes into the groove. As the packing is brought up hard against the base of the shot, it is then condensed and compacted in all directions, so that by the frictional action of the packing the shot is made to revolve as the former is forced round by the spiral of the groove of the gun. It will now be seen that the recoil must be greatly diminished by the movement of the packing-disk forward before the shot itself is started; and it will also be seen

that by the use of such packing the interior of the barrel must be kept perfectly clean, and the necessity for the use of grease avoided; or, if the use is preferred, each charge will always clean out any excess.

In the case of breech-loading arms, the shot will of course be inserted first and the powder put in afterward, except in cases where the explosive is attached, so as to form a complete cartridge. In cartridges prepared for breech-loading, the fulminate or cap may be put upon the end of the tail and the firing be performed as in the needle-gun.

What I claim is—

The method of giving the revolving motion to the projectile—that is to say, by forming a conical projection and spindle upon the base of the shot and combining therewith a movable ring or disk of an expansible material—in the manner and for the purpose described herein.

In testimony whereof I have hereunto subscribed my name.

CHARLES A. WATERBURY.

Witnesses:
J. P. PIRSSON,
J. H. MAYNARD.