

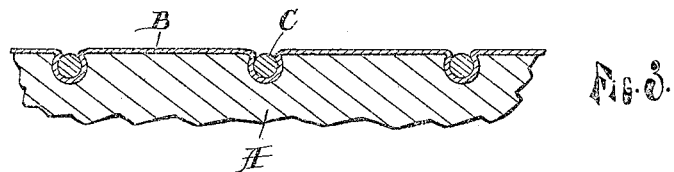
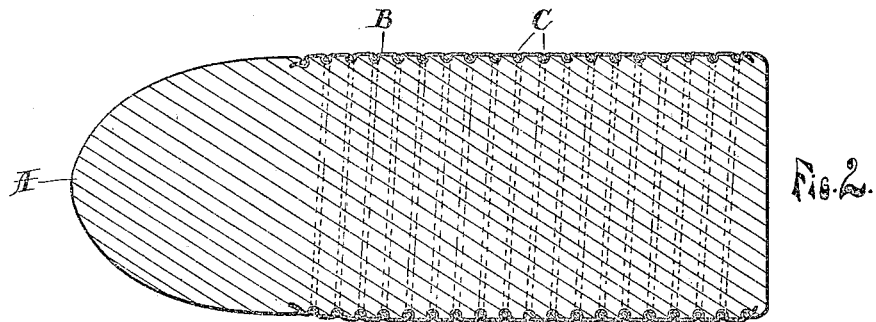
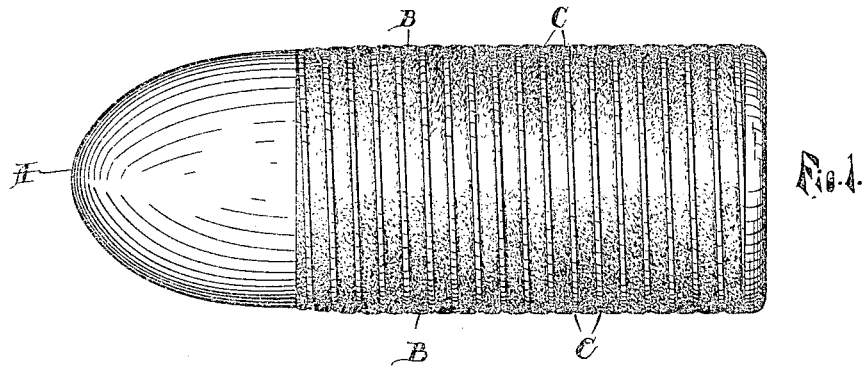
No. 648,515.

Patented May 1, 1900.

G. H. NEWELL.
PROJECTILE.

(Application filed Mar. 20, 1899.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE,

GEORGE H. NEWELL, OF GRAND RAPIDS, MICHIGAN.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 648,515, dated May 1, 1900.

Application filed March 29, 1899. Serial No. 710,872. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. NEWELL, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Projectiles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in projectiles; and its object is to provide a projectile having all of the advantages of a patch of porous material to wipe and lubricate the bore of the gun-barrel and of a strong metallic jacket to hold the soft-metal body from changing form upon impact with the target or unduly expanding in the gun under the sudden impulse of high explosives and to hold to the lands of the barrel and follow the twist of the same under the high pressure of high explosives, to effectually secure the jacket in place on the projectile, and to provide the device with certain new and useful features hereinafter more fully described, and particularly pointed out in the claims.

Heretofore it has been proposed to apply a patch of cloth or other suitable material to the body of a soft-metal projectile, securing the same at the ends only. These are not sufficiently secured and in use are torn off more or less, and the remaining fragments seriously interfere with the flight of the projectile. Furthermore, such patches have no tendency to restrain the soft-metal body from expanding and for these reasons are practically a failure. It has also been proposed to wind the soft-metal projectile spirally with wire of harder and stronger metal. These windings, while serving to hold the body from expanding, are objectionable in that they cannot be properly lubricated, and the metallic contact of the wire heats and cuts the gun-barrel too much to be wholly satisfactory. I avoid all of these objections and secure a highly-satisfactory result by making the body of the projectile of lead or other suitable soft metal and applying to the surface thereof a lubricated patch or covering of cloth, leather, or other suitable porous and yielding material, winding at intervals around the same a suitable wire of soft steel, copper, or other strong and

yielding metal, securing the ends thereof in any suitable manner, and securing each coil of the same by embedding it in the body of the projectile.

Referring to the accompanying drawings, Figure 1 is an enlarged side elevation of a projectile embodying my invention; Fig. 2, a longitudinal section of the same, taken through the axis thereof; and Fig. 3, an enlarged detail in section, showing the way the wire is embedded in the projectile.

Like letters refer to like parts in all of the figures.

A is the body of the projectile, preferably of lead.

B is a patch or covering of cloth, thin leather, or other suitable yielding material, which may be saturated with any suitable lubricant.

C is a wire wound spirally on the outside of the patch and having its coils separated a suitable distance so that the patch will project between the coils of wire and engage the surface of the bore of the gun-barrel. The space between the turns of wire may be varied somewhat according to the service required of the projectile, but should be open enough to permit the patch to project and contact the grooves of the gun-barrel between each turn of the wire and close enough to effectually secure and hold the patch from coming loose and to also effectually prevent expansion of the soft-metal body under the impact of high explosives and contact with the target.

The ends of the patch and of the wire may be secured in any suitable manner, the means of securing the ends of these forming no part of my present invention.

To effectually secure each separate coil of the wire, whereby it will not become detached if broken and will not move longitudinally on the projectile, it is embedded in the surface of the projectile to such an extent that it lies wholly within the plane of the same, and the metal of the projectile surrounds it sufficiently to hold it from detachment even though it should be broken. This is preferably done by first winding the wire around a cylindrical blank of less diameter than the proposed finished projectile and then by a suitable die or swage compressing it longitudinally, whereby the soft metal of the body

expands laterally between the turns or coils of the wire and closes around the wire by contact with the wall of the swage, assuming substantially the form shown in Fig. 3. This tightens the wire and patch about the projectile and at the same time effectually secures the wire in place. The wire and the patch adjacent thereto thus lie in a spiral depression in the body A, and both the patch between the turns of the wire and the wire itself engage the gun-barrel, the wire also serving to secure the patch in place and prevent its leaving the projectile. The wire also prevents undue expansion of the body of the projectile and, directly engaging the lands of the gun-barrel, more readily yields and conforms to the shape thereof than a solid shell or jacket of like material and at the same time has a sufficient hold when under high pressure to follow the twist of the barrel. My projectile does not heat or cut the barrel because of the lubricating and wiping action of the patch between each turn of the wire. It will also be observed that there is a slight space at each side of the wire to catch and hold any substance wiped off the surface of the barrel or any abraded metal from the wire. This also aids in preventing friction and cutting.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a projectile the combination of a soft-

metal body, a patch of porous material surrounding the same and projecting between the turns of wire, to engage the gun-barrel, and a single continuous wire surrounding the patch and body at frequent intervals, whereby the patch is secured in place throughout the entire length, and the body held from expanding, substantially as described.

2. In a projectile the combination of a soft-metal body, a patch of porous material surrounding the same and projecting between the turns of wire, to engage the gun-barrel, a single continuous wire of strong and yielding material wound spirally and at regular and frequent intervals from end to end of said patch, and on the outside of the same, substantially as described.

3. The combination of a soft-metal body, a patch of porous material surrounding the same, and a wire of strong and yielding material wound spirally from end to end on the outside of the patch, the wire and patch being also embedded in the projectile, and the patch projecting between the coils of the wire, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE H. NEWELL.

Witnesses:

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