

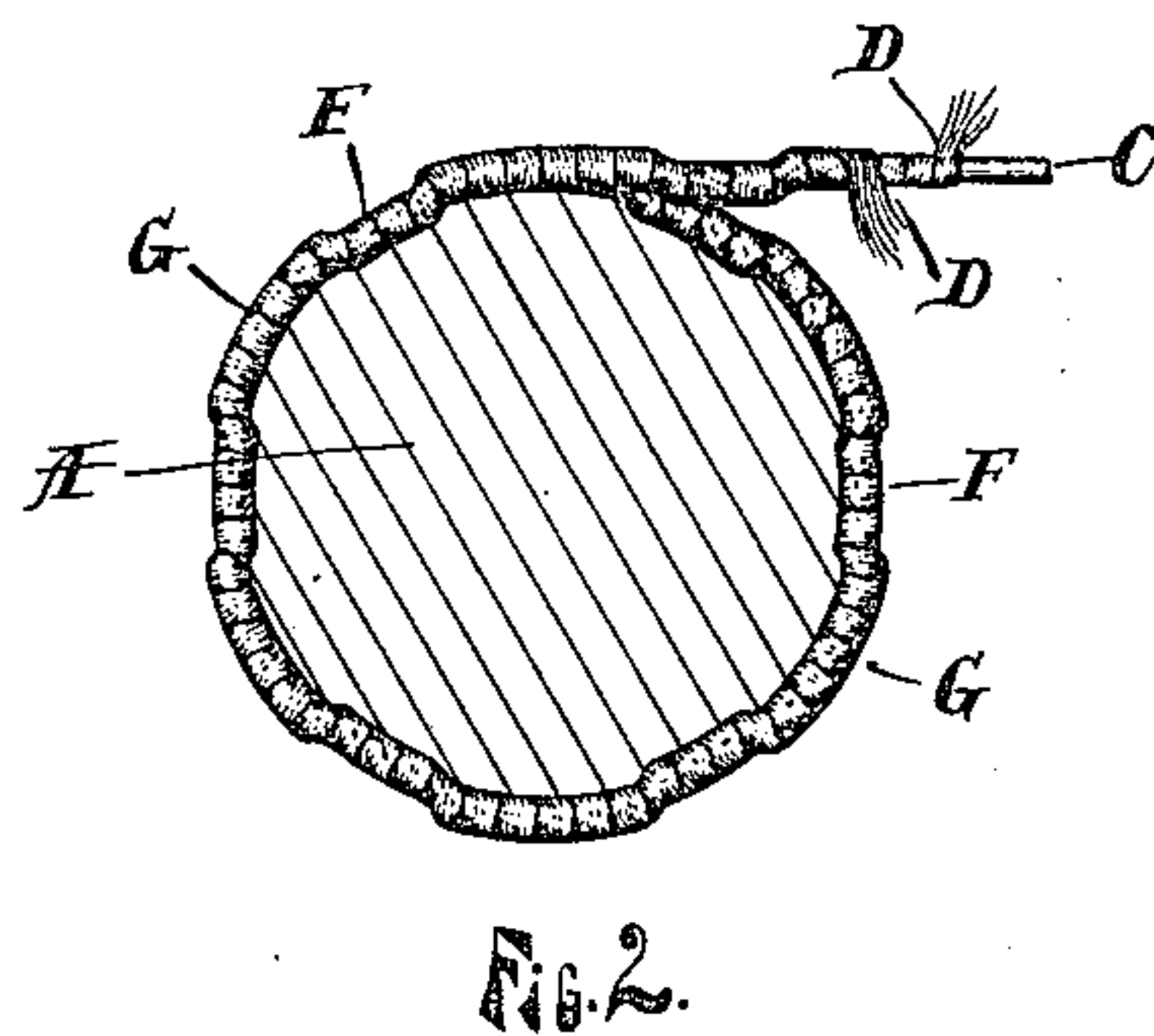
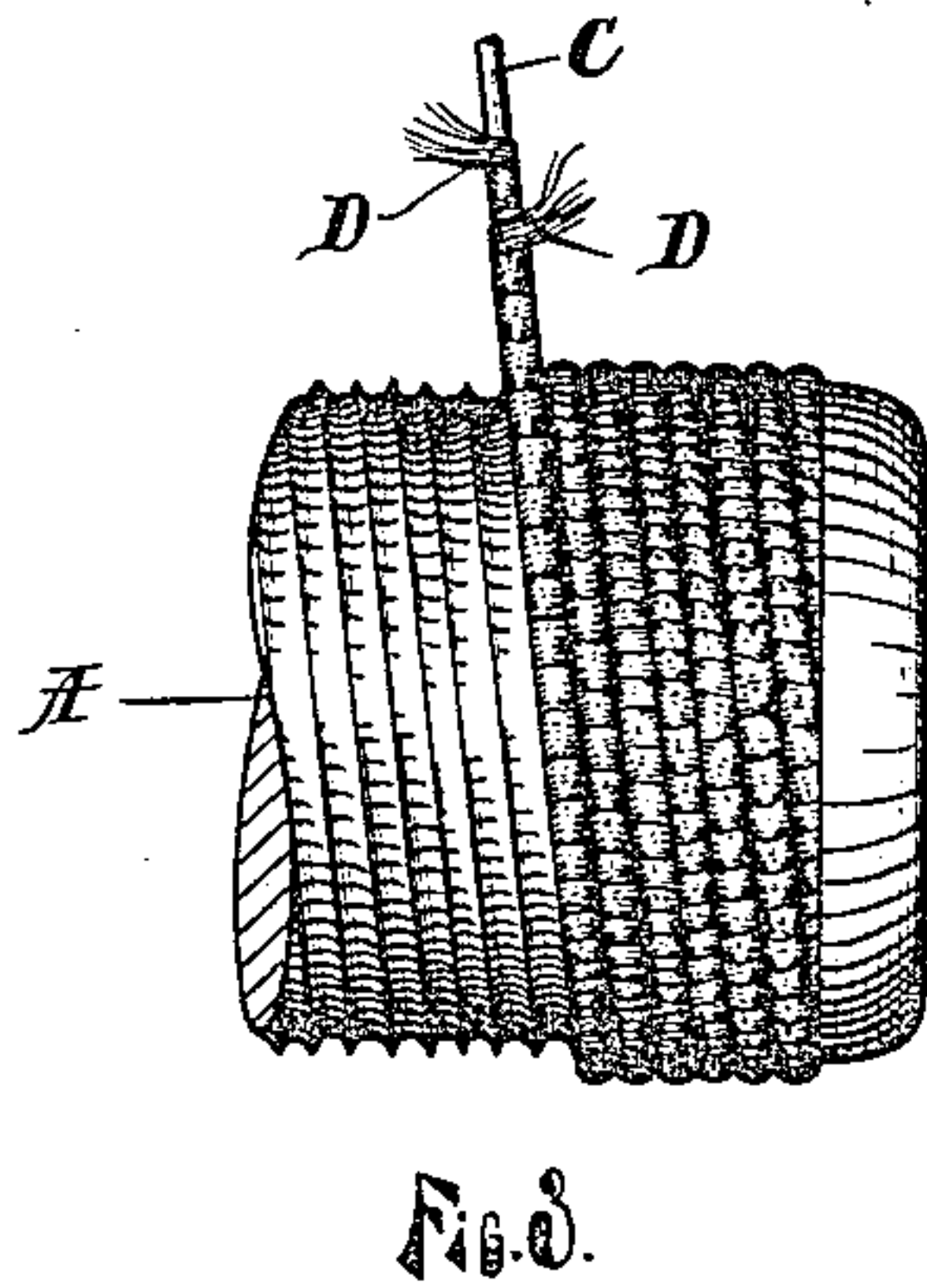
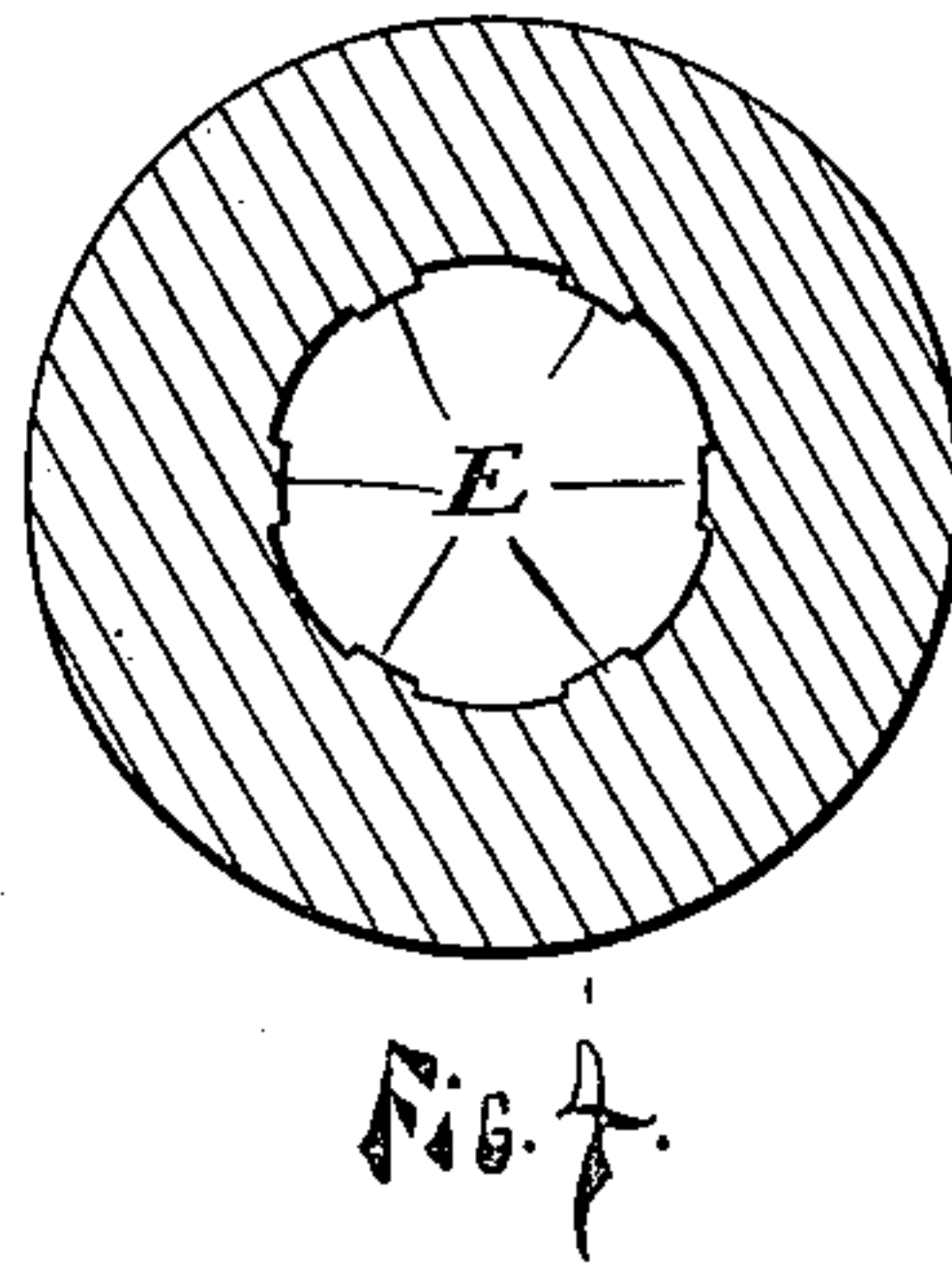
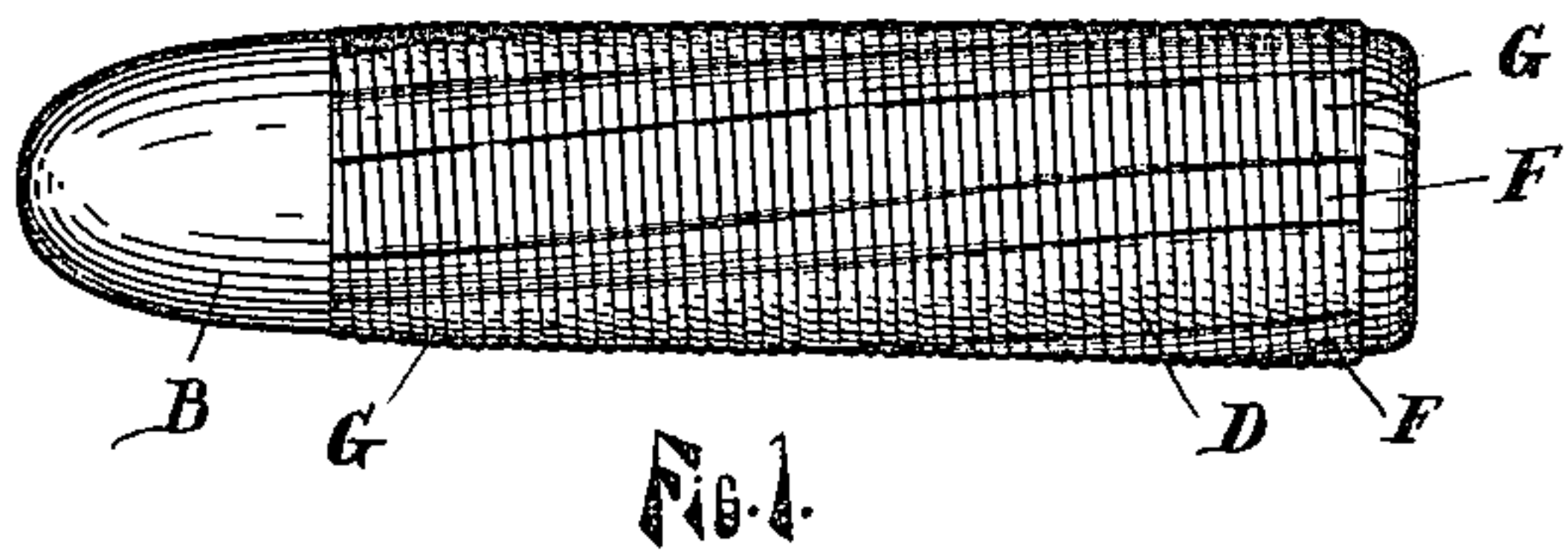
No. 622,772.

Patented Apr. 11, 1899.

M. C. LISLE.
PROJECTILE.

(Application filed May 9, 1898.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

MYRON C. LISLE, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF
TO FRANK A. SIMONDS, OF SAME PLACE.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 622,772, dated April 11, 1899.

Application filed May 9, 1898. Serial No. 680,213.. (No model.)

To all whom it may concern:

Be it known that I, MYRON C. LISLE, 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 more especially to projectiles for small arms using high explosives; and its objects are to provide the same with a metal jacket which is sufficiently firm to engage the lands of the gun and be guided thereby, to provide a fabric covering for said metal jacket to prevent its contact with the gun and to carry a lubricant and which will not be detached from the projectile or destroy its accuracy, and to provide the same with certain other new and useful features hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is an enlarged side elevation of a projectile embodying my invention after having been passed through the gun-barrel and showing the indentations made by the lands of the same; Fig. 2, an enlarged transverse section of the same; Fig. 3, an enlarged detail showing the covering of the wire and the manner of winding; and Fig. 4, an enlarged transverse section of a gun-barrel, showing the lands.

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

I am aware that projectiles of this class have been provided with smooth hard-metal jackets; also, that projectiles having a soft-metal body have been spirally wound with lubricated cord, that projectiles having a hard-metal body have been provided with a soft-metal jacket or packing and wound with a cord, and that hard-metal projectiles having spiral grooves engaged by a band of soft metal have been made; but the smooth hard-metal jackets, while they effectually engage and retain their hold upon the lands of the gun, are so firm that it requires a great pres-

sure to force them into the bore, and, there being a metal contact, there is a great amount of friction and consequent heat and abrasion. The cord-wound soft-metal projectiles effectually clean and lubricate the barrel and prevent the metal contact; but they do not so effectually prevent the expansion of the soft-metal bullet as do the metal jackets. The fabric jacket is liable to become loosened and deflect the ball from its true course, and they cannot be used with any degree of accuracy with a high-pressure explosive, as the soft metal of the body or the jacket is not firm enough to engage the rifling and hold, but will be formed down by the lands and pass out on the "inner bore" without receiving the required rotary motion.

Projectiles having a hard-metal or cast-iron body are not suitable for small-arms, but if they were the same objections that apply to the soft-metal cord-wound projectiles would apply to those having a hard-metal body and a soft-metal jacket spirally wound, and projectiles wound with a band of soft metal do not prevent the fouling of the gun or heat and wear in consequence of metal contact. All devices in which a cord is wound upon the outside of the projectile are unreliable, as the cord may become loosened therefrom in some manner and deflect the projectile from its proper course.

In my improved projectile I combine the good features of the metal jacket with those of the fabric or cord-wound jacket, and by this new construction I eliminate the objectionable features of both.

Referring to the drawings, A represents the body of the projectile spirally grooved on its cylindrical part and having a tapered and rounded forward end B. Within the spiral grooves is laid a wire C, preferably of copper, which wire is wound with layers of threads D, of cotton or other suitable material, the ends of said wires being firmly secured to the body B by laying the ends in deep grooves and swaging the metal down upon the same or secured in any other suitable manner. Before the wire C, with its covering D, is wound upon the projectile said covering is saturated with a lubricant.

Fig. 4 represents an enlarged transverse section of a rifled gun-barrel, showing the spiral lands E, which engage the projectile and make the depressions or grooves F in the surface of the same when the projectile is forced through the barrel. A projectile having a soft-metal body and a metal jacket formed of wire, each turn representing a separate section, is much more easily indented by the lands and requires much less force to enter it into the bore of the gun than it would were the jacket solid, and at the same time these turns of wire are of sufficient stability to withstand the various strains brought upon it. The lands E compress or form down the parts G of the jacket, and the remainder will fill the grooves of the barrel and impart the required rotary motion to the projectile and retain the pressure of the explosive. Where the lands engage the projective and indent the wire, said wire is embedded into the soft-metal body A, the wire yielding or stretching at the angles of the lands without breaking and remaining on the projectile in its flight, and on striking the target the penetration is greatly enhanced, the wire preventing the soft-metal body from flattening out upon impact. The sudden pressure of the high explosives operates like striking the projectile a sudden blow and tends to expand it unduly, making it too tight in the bore of the gun, thus increasing friction and greatly lowering the initial velocity. This is prevented by the described jacket, and the result is a much higher initial velocity with increased range and penetration and a flatter trajectory. To prevent the metal of the wire from contacting that of the gun and to carry sufficient lubricant, I wind fine continuous threads of cotton, linen, or other suitable fiber C around the wire, which threads absorb and retain the lubricant much better than the cord heretofore used, and being of firmer texture and wound around the wire are not readily severed or disintegrated by friction against the barrel. The wire C being wound transversely on the projectile and the threads D wound around the wire the fiber of the threads runs lengthwise of the projectile. This tends to decrease the wear by friction. As the coils of the wire C lie closely together and firmly

against the body the threads are prevented from unwinding and trailing behind the projectile in its flight to deflect the same, and no fragments of this fiber covering can possibly be detached further than to wear the outer portion of the threads where they pass over the outer surface of the wire. The grooves between the turns of the wire C retain the lubricant, and the roughness of the surface cleans the bore much more effectually than would a smooth fabric. By this construction I am enabled to apply the jackets by machinery and thus greatly reduce their cost, thereby securing a cheap and efficacious projectile which carries a lubricant, cleans the gun, increases penetration, insures a rapid rotary motion, and is particularly adapted for use in high-pressure small-arms.

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

1. In combination with a projectile composed of soft metal, a wire wound around the body of the same and secured thereto, and a covering of suitable fiber on said wire, substantially as described.

2. In combination with a projectile, a wire wound around the same and secured thereto, and a covering of cotton or other suitable thread wound around said wire and securely held thereby, substantially as described.

3. In combination with a projectile having a soft-metal body, a thread-wound wire wound around said body and having its ends secured thereto, and a lubricant applied to the thread covering of said wire, substantially as described.

4. In combination with a projectile having a spirally-grooved soft metal-body, a wire laid in said grooves and having its ends secured to said body, a series of threads wound around said wire and extending lengthwise of said projectile, and a lubricant applied to said threads, substantially as described.

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

MYRON C. LISLE.

Witnesses:

LUTHER V. MOULTON,
LEWIS E. FLANDERS.