

(No Model.)

J. B. SEMPLE.
PROJECTILE.

No. 581,946.

Patented May 4, 1897.

FIG. 1.

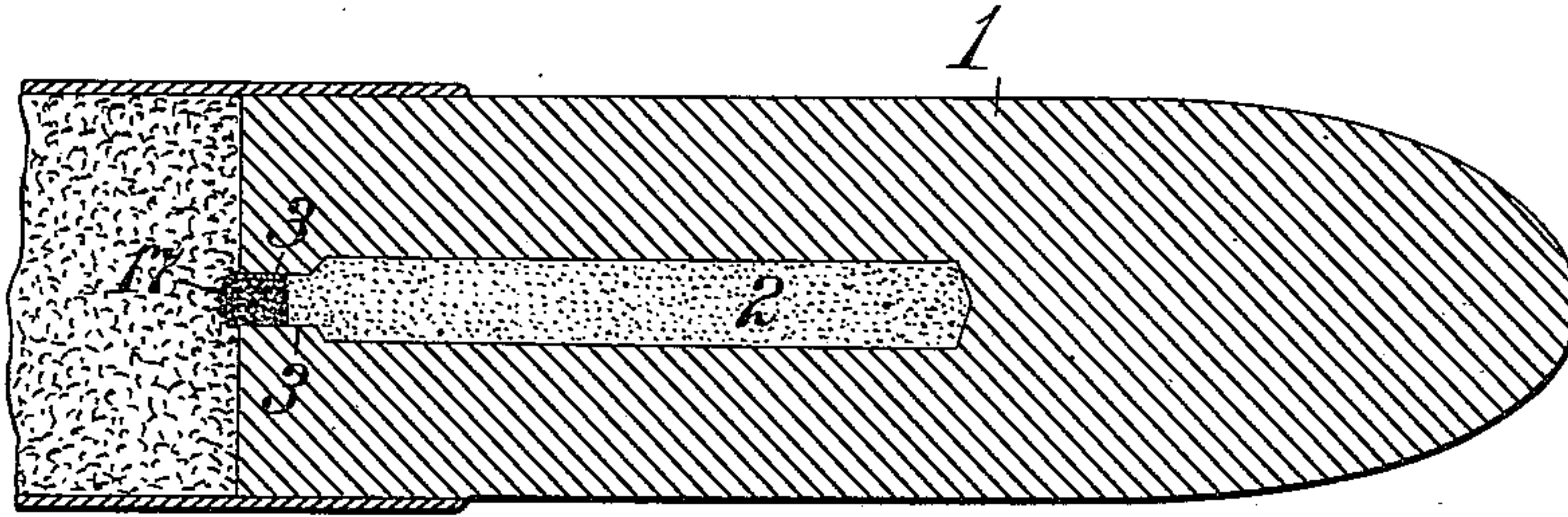


FIG. 2.

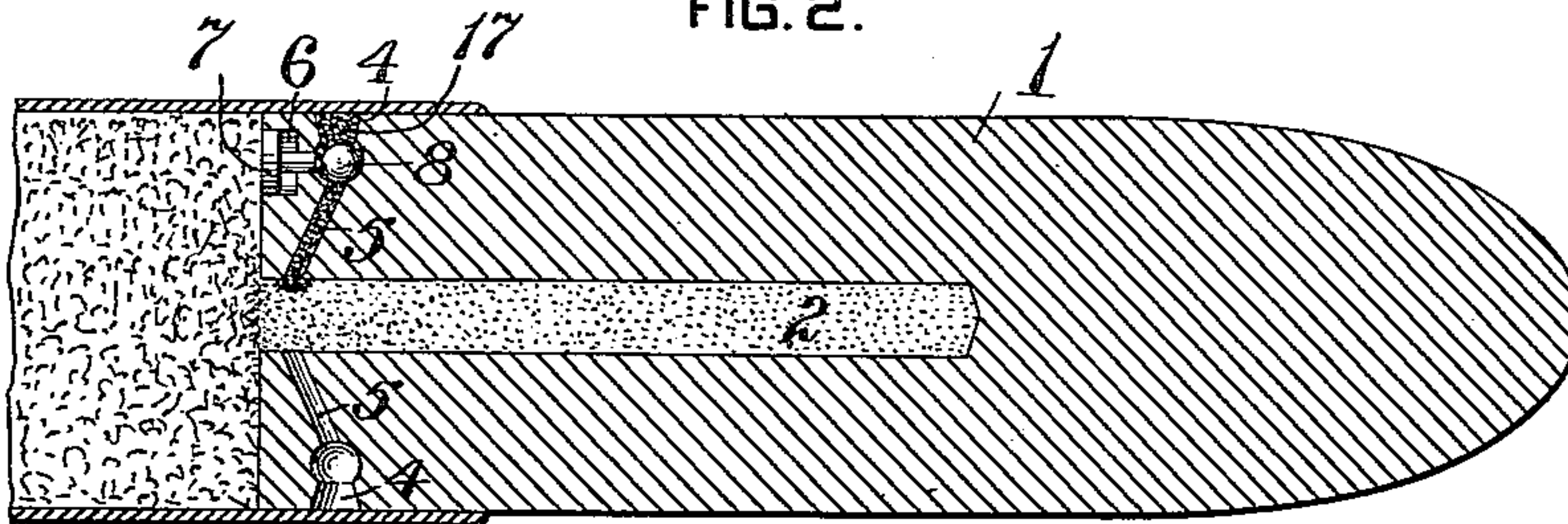


FIG. 3.

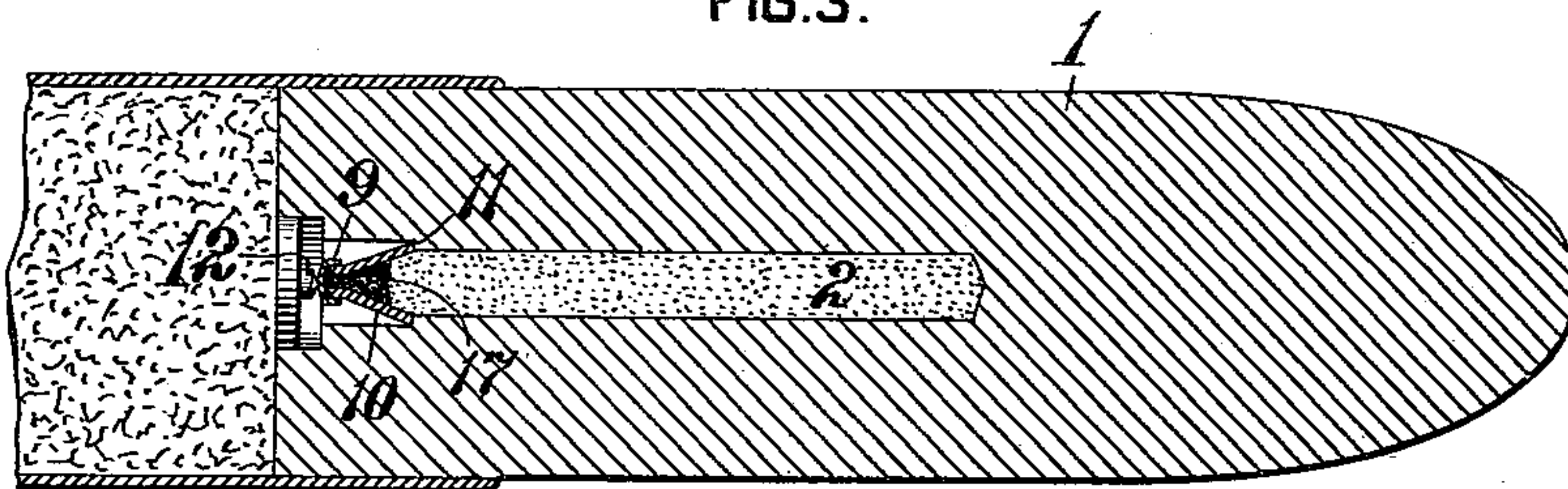
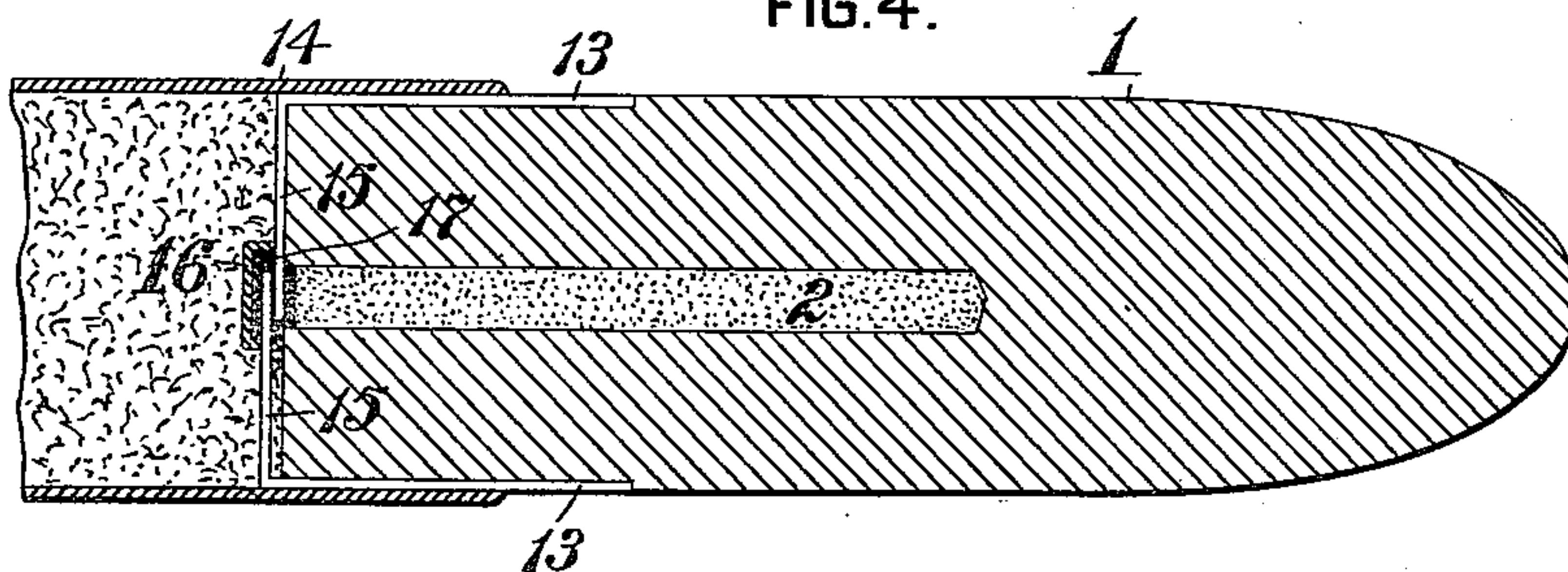


FIG. 4.



WITNESSES:

Chas. F. Miller.
A. E. Gaucher

INVENTOR,

John B. Semple
by Danvers B. Wolcott

Att'y.

UNITED STATES PATENT OFFICE.

JOHN B. SEMPLE, OF SEWICKLEY, PENNSYLVANIA.

PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 581,946, dated May 4, 1897.

Application filed November 1, 1895. Serial No. 567,586. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. SEMPLE, a citizen of the United States, residing at Sewickley, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Projectiles, of which improvements the following is a specification.

The invention described herein relates to certain improvements which are applicable to all styles or kinds of projectiles, but are more especially and beneficially applicable to the projectiles for machine-guns or rapid-firing ordnance, such as is used for the destruction of torpedo-boats, &c.

On account of the impossibility of a gunner's following the path of a projectile, or where the projectile strikes, (except in the daytime, when the striking point may be sometimes ascertained by the splashing of water,) it is exceedingly difficult to correctly aim the gun toward an object, and the difficulty of finding the range is far greater when the object is a rapidly-moving one, as in the case of a torpedo-boat, and the gunner is blinded by the practically-continuous flash from machine-guns.

The object of the invention is to provide the projectile with a suitable material which can be ignited by the flash of the charge in the gun or in any other suitable manner and by its combustion during the flight of the projectile will render the path thereof visible.

The invention is hereinafter more fully described and claimed,

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional view of a projectile having my improvement applied thereto. Figs. 2, 3, and 4 are similar views illustrative of different means for igniting the illuminating charge.

In the practice of my invention a suitable material—such, for example, as a mixture of magnesium, gunpowder, and an oxidizing agent bound in compact mass by a binder, as shellac—is secured to the projectile in such manner as not to be dislodged by the explosion of the gun charge or during the flight of the projectile and not to materially interfere with such flight. These conditions can be conveniently complied with by forming an axial chamber 2 in the rear end of the projec-

tile 1 and constructing the hole with a contracted mouth, as by the formation of shoulders 3. These shoulders will prevent the material from dropping out during the flight of the projectile and the contracted opening will prevent any injury to the material by explosion of the charge.

The location of the chamber with its mouth at the rear end of the projectile permits of the employment of a material, such as the mixture mentioned, capable of being ignited by the flash of the propelling charge; but the invention is not limited to the use of such a material, as mechanically and chemically operating means for igniting the charge may be employed. For example, in the construction shown in Fig 2 a hollow ball or a tube 8, formed of a frangible material, may be arranged in a recess or chamber 4 at one side of the axial chamber 2 and connected therewith by a passage 5. The tube or ball is charged with some suitable material, as phosphorus and bisulfid of carbon, which will ignite on exposure to air, and the recess and passage 5 are filled either with the same material as that placed in the axial chamber or any other suitable material which will be ignited by the burning phosphorus. An opening 6 extends from the recess 4 to the rear end of the projectile, and in this opening is placed a pin 7, having an enlarged head and adapted to push forward and break the ball or tube by the explosion of the charge in the gun. The pin 7 may be omitted, if desired, as in most cases the tube or ball will be broken by explosion of the charge.

In the construction shown in Fig. 3 provision is made for igniting the illuminating material by means of a cap 9, placed upon an anvil 10, which is made in the form of a hollow truncated cone. The outer portion of the axial chamber is slightly enlarged, forming a shoulder 11, against which the anvil bears. The cap is exploded by means of a pin 12, having an enlarged head and adapted to be forced inward against the cap by the explosion of the charge in the gun.

In Fig. 4 springs 13 are arranged in grooves in the sides of the projectile, and are held under tension by the cartridge-shell 14 or by any other suitable band, which will be ruptured or forced off the projectile when dis-

charged, thereby permitting the springs to move outwardly from the projectile. The inner ends of the springs are provided with arms 15, which extend across the rear end of the projectile and overlap in line with the axial chamber containing the illuminating charge. The overlapping portions are coated with a material, such as some compound of phosphorus, which will be ignited by friction. The coated portions of the arms are protected by a cap 16, which will also protect the illuminating charge from injury by the explosion of the gun charge.

The material employed should not be of such a rapid burning character as to produce an explosion or exert any material disruptive force on the projectile, but should burn with sufficient rapidity to produce a brilliant light during the flight of the projectile.

My improvement has no connection with and is not to be used in lieu of the explosive charge of shells nor in lieu of the fuses for such charges, but when applied to shells the illuminating material is so located that the two charges will not affect each other.

In order to render the paths of projectiles from a number of guns adjacent to each other distinctive, and to distinguish the light of the projectile from other lights, a material, such as barium, copper, &c., capable of coloring the light or flame, is added to the illuminating charge.

While I have shown and described the chamber for the illuminating charge as coinciding with the axis of the projectile, I do not wish to limit the invention to such an ar-

rangement of the chamber, nor to the number of such chambers, as a variety of changes in the location and number of chambers for the illuminating material will readily suggest themselves to those skilled in the art.

In order to render the ignition of the illuminating charge certain, it is preferred to use a primer or fuse formed of easily-ignitable material, such as guncotton, treated with gunpowder paste. This primer 17 is placed at the rear end of the illuminating material in the constructions shown in Figs. 1, 3, and 4, or in the passage 5 in the construction shown in Fig. 2.

I claim herein as my invention—

1. A projectile having an axial bore open at the rear end of the projectile, in combination with a combustible non-explosive or pyrotechnic compound arranged in said bore, and means for igniting said compound on the discharge of the gun, substantially as set forth.

2. An armor-piercing shell having a chamber open at the rear end of the shell and independent of the chamber containing the explosive charge, a combustible non-explosive or pyrotechnic compound arranged in said chamber in combination with means for igniting the pyrotechnic compound on the discharge of the gun, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN B. SEMPLE.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.