(No Model.) 2 Sheets—Sheet 1.

A. MARTIN.

PERCUSSION FUSE.

No. 431,273. Patented July 1, 1890.

FIG. 1

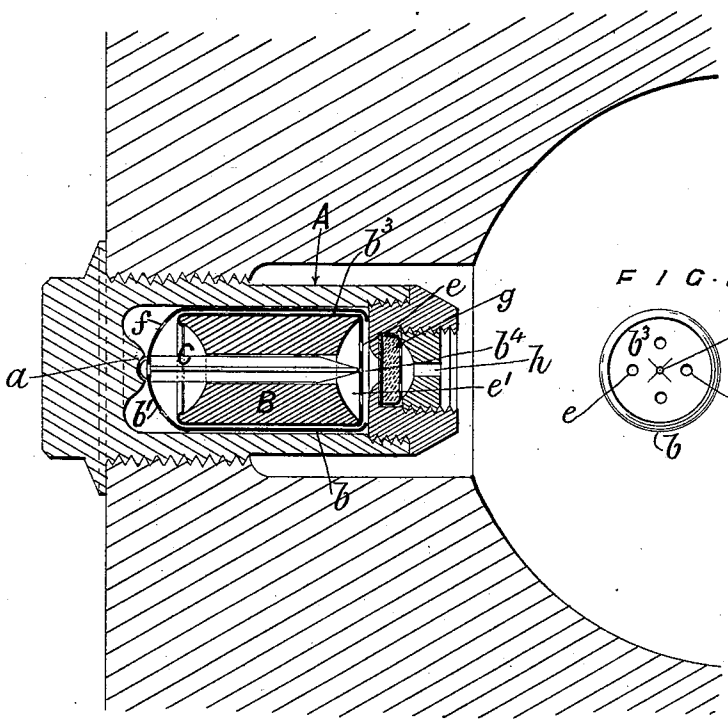
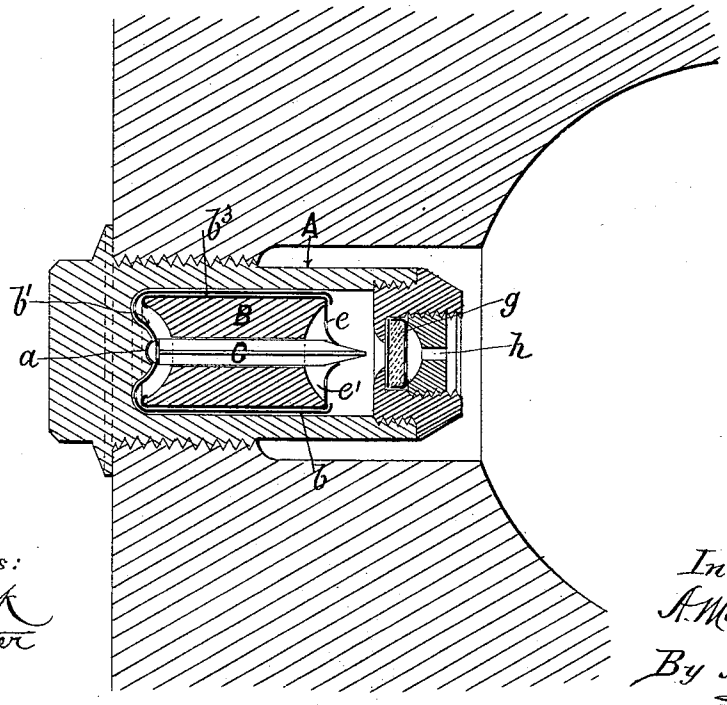


FIG. 2.

FIG. 3



Witnesses:
C. Sedgwick
J. M. Ritter

Inventor:
A. Martin
By Munn & Co
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

A. MARTIN.

PERCUSSION FUSE.

No. 431,273. .Patented July 1, 1890.

FIG. 4.

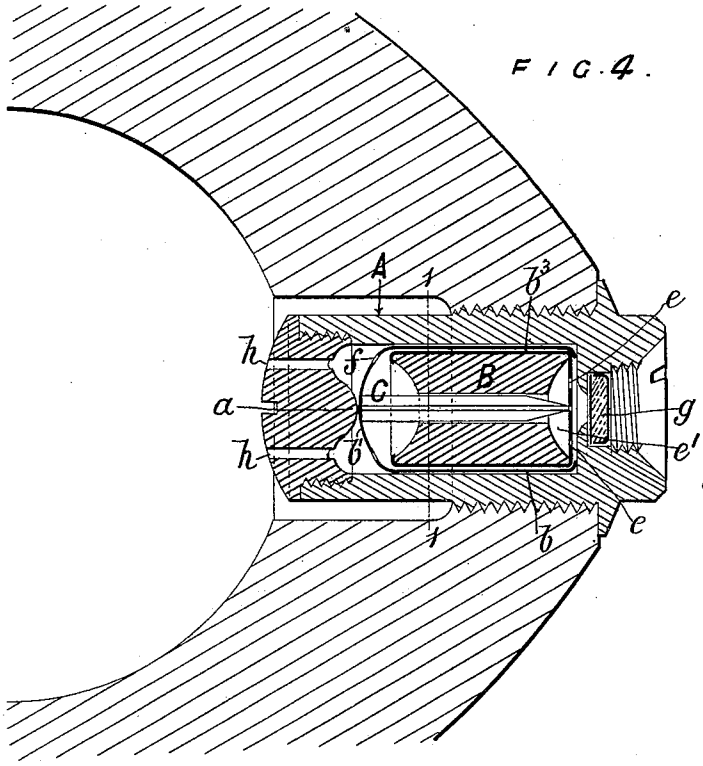


FIG. 6.

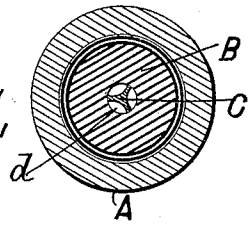
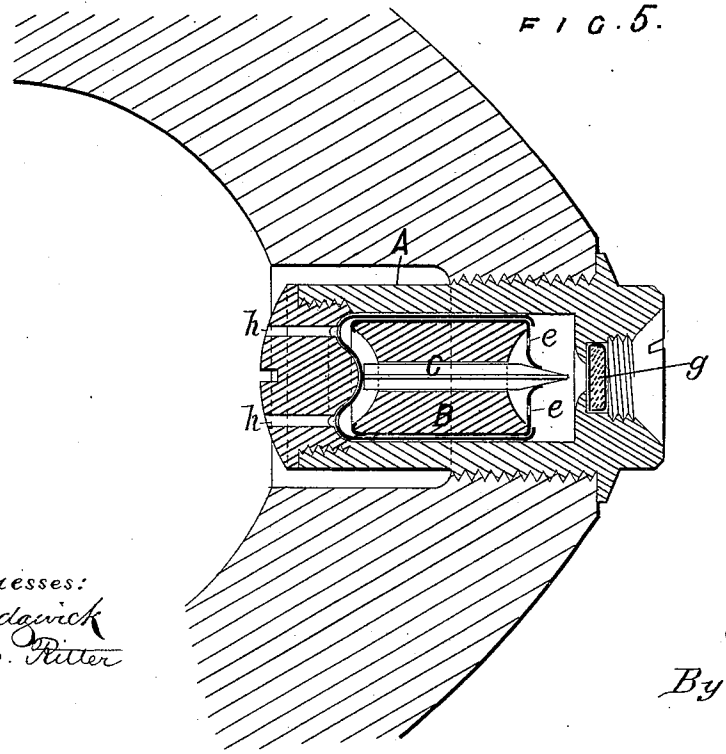


FIG. 5.



Witnesses:
C. Sedgwick
J. M. Ritter

Inventor:
A. Martin
By Munn & Co.
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ABRAHAM MARTIN, OF BIRMINGHAM, COUNTY OF WARWICK, ENGLAND.

PERCUSSION-FUSE.

SPECIFICATION forming part of Letters Patent No. 431,273, dated July 1, 1890.

Application filed January 25, 1890. Serial No. 338,051. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM MARTIN, engineer, of 177 Aston Lane, Birmingham, in the county of Warwick, England, have invented new and useful Improvements in Percussion-Fuses, of which the following is a full, clear, and exact description.

My fuse is of that class in which the plunger acts merely by its inertia and momentum to bring into operative position and give percussive force to a part which is not integral therewith, but which is so connected thereto as to admit of a change of the relative position of the two parts in order to bring them from the safety to the firing position, such change of relative position being brought about by the impact consequent on the inertia of the plunger and the sudden motion of the projectile.

The invention will be hereinafter fully described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a longitudinal section of the fuse as fixed in the base of the projectile, and showing the normal form and position of the plunger. Fig. 2 is a corresponding front end view of the plunger only. Fig. 3 is a longitudinal section similar to Fig. 1, showing the form and position assumed by the plunger on the firing of the gun. Figs. 4 and 5 are views similar to Figs. 1 and 3 of the fuse as fixed in the point of the projectile. Fig. 6 is a cross-section on line 1 1, Fig. 4.

The same letters of reference indicate like parts in all the figures.

A is the fuse-case, screwed into the body of the projectile in the ordinary way, either at the base or the point thereof.

B is the plunger, being a cylinder (of copper or other metal, preferably tungsten, in the form of compressed powder) having an axial orifice for the reception of the part C to be operated by the plunger. The plunger is incased in a sheath constituted essentially of a solid drawn thin brass capsule *b*, closed at the rear end *b'*, which is normally convex or dome-shaped, while the rear end of the plunger is concave, so that there is a hollow space between it and the end *b'* of the sheath. The sheath is secured to the plunger by its edges being bent over the front end of the plunger by pressure in a die. If the plunger be of solid metal, the sheath may consist solely of the part *b b'*; but it is preferred, especially when the plunger is made of compressed tungsten, to also inclose the plunger in an inner capsule or sheath b^3, over which the outer one *b* fits tightly, the inner one being closed at the front end, with the exception of a central aperture, hereinafter referred to.

The rear end of the fuse-case A has an internal convex boss *a* directly opposed to the dome-shaped end *b'* of the sheath *b*.

The part C which is actuated by the plunger is usually the striking-pin. The rear end of this pin abuts against the dome-shaped end *b'* of the plunger-sheath, and it is preferably riveted into a central orifice therein, so as to be dependent on the form of the domed end *b'* for its position with regard to the plunger. Normally the point of the pin C is held retracted within the front end of the plunger, this position of safety being insured both by the riveted connection to the domed end *b'*, and also by the point of the pin being held in a central orifice b^4 in the front end of the inner sheath b^3, the edges of said orifice being radially slit to enable the conical point of the pin to force its way through at the proper time, such means of keeping the pin retracted affording double safety and being efficient for the purpose if the rear end of the pin merely abuts against without being riveted to the domed end *b'*, as in Figs. 4 and 5. The riveted connection alone is, however sufficient.

The pin C is of winged or triangular form in cross-section, and is received in a cylindrical passage through the body B of the plunger, in which it fits only just tightly enough to be guided and maintained in its central position therein, thoroughfares *d* being left alongside the pin for a purpose hereinafter referred to. For the same purpose orifices *e* are formed in the end of the part b^3 of the sheath, said orifices communicating with a cavity *e'*, formed in the front end of the body of the plunger and communicating with the thoroughfares *d*, above referred to.

Similarly and for the same purpose orifices *f* are made in the domed end *b'* of the part *b* of the sheath, and the depth of the concavity in the rear end of the body B of the plunger is greater than the inward protuberance of the boss *a*, so that when the curvature of the end *b'* is inverted, as hereinafter explained, there will be a continuous thoroughfare from the front to the rear end of the plunger. This is, however, only essential when the fuse is applied at the point of the projectile, as in Figs. 4 and 5, and the object is to enable the gases generated by the detonation of the priming *g* to communicate with the explosive charge of the projectile; but the same form of the parts is applicable when the fuse is applied at the base of the projectile. The inner end of the fuse-case has the usual orifices *h* for the passage of the said gases, said orifices being in the rear end of the fuse-case in the one instance and in the front end in the other instance and the priming *g* is held in place in the fuse-case by the usual means.

At whichever end of the projectile the fuse may be applied, the action of the parts to which my invention has special reference is the same, and is as follows: The parts being in the normal position shown in Figs. 1 and 4, the point of the striking-pin is held retracted, so that in handling the fuse or the projectile the striker cannot be brought into contact with the priming by the slight longitudinal motion permitted to the plunger. When, however, the gun is discharged, the impact (due to the inertia of the plunger) of the part *a* against the hollow domed end *b'* of the plunger-sheath causes the curvature of the latter to be reversed, as in Figs. 3 and 5, whereby the pin C is forced forward until its point projects in advance of the plunger in position to strike the priming *g*. Such is the position of the pin during the flight of the projectile until the latter strikes an obstacle, whereupon the momentum of the plunger carries the pin C forward and causes it to strike with unfailing effect on the priming, the full force due to the momentum being effective in consequence of the rigidity of the end *b'*, due to its inwardly-arched form.

It will be obvious that the relative position of the point of the striking-pin and of the priming might be reversed without departing from my invention—that is to say, the point or anvil might be fixed in the place of the priming, and the latter might be carried at the end of the pin C—such a relative arrangement in itself forming, however, no part of my invention.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a percussion-fuse, the combination, with a plunger having a concave rear end and incased in a sheath having a hollow domed end, of a striking-pin passing through the plunger and riveted to said domed end, and a convex boss at the rear end of the fuse-case for producing the described alteration of shape of the domed end of the sheath, as and for the purpose specified.

2. In a percussion-fuse, the combination, with the tubular plunger having a concave rear end and with a striking-pin loose within it, of a double sheath inclosing the front end of the plunger and having a radially-slitted orifice holding the point of the striking-pin, and having a hollow domed rear end abutting against the rear end of the striking-pin, and a convex boss at the rear end of the fuse-case for producing the described alteration of shape of the domed end of the outer sheath, substantially in the manner and for the purpose specified.

3. A percussion-fuse whereof the striking-pin is normally held retracted within a plunger incased in a metal sheath having a hollow dome-shaped rear end, but is caused to project from the front end of the plunger by the inversion of the curvature of the dome-shaped end of the sheath, consequent on the impact due to the inertia of the plunger, as specified.

4. In a percussion-fuse, the combination, with a tubular plunger having cavities in both front and rear ends, of a striking-pin of triangular or winged cross-section, an inner sheath inclosing the front end of the plunger and holding the point of the striking-pin by a central aperture with slitted edges, and having also orifices communicating through the front cavity with the bore of the plunger, and of an outer sheath having a dome-shaped rear end having orifices communicating with the rear cavity of the plunger, and of an inwardly-projecting boss at the rear end of the fuse-case, provided with channels for the passage of the gases, substantially as specified.

The foregoing specification of my improvements in percussion-fuses signed by me this 18th day of December, 1889.

ABRAHAM MARTIN.

Witnesses:

J. M. HARRIS,
Notary Public, Birmingham, England.

FREDERICK BAXTER,
53 *New Street, Birmingham, his clerk.*