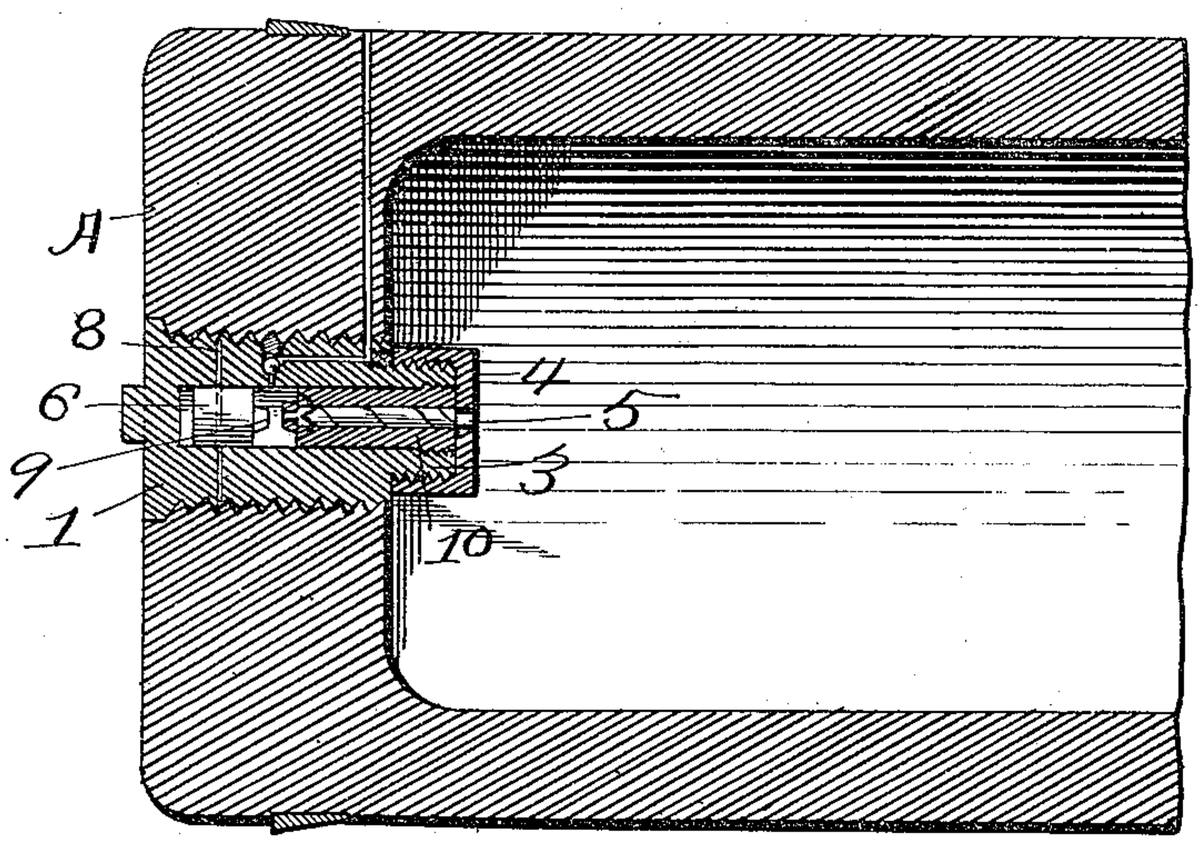
(No Model.)

G. M. HATHAWAY.

SHELL FUSE.

No. 547,852. Patented Oct. 15, 1895.

Fig. 1



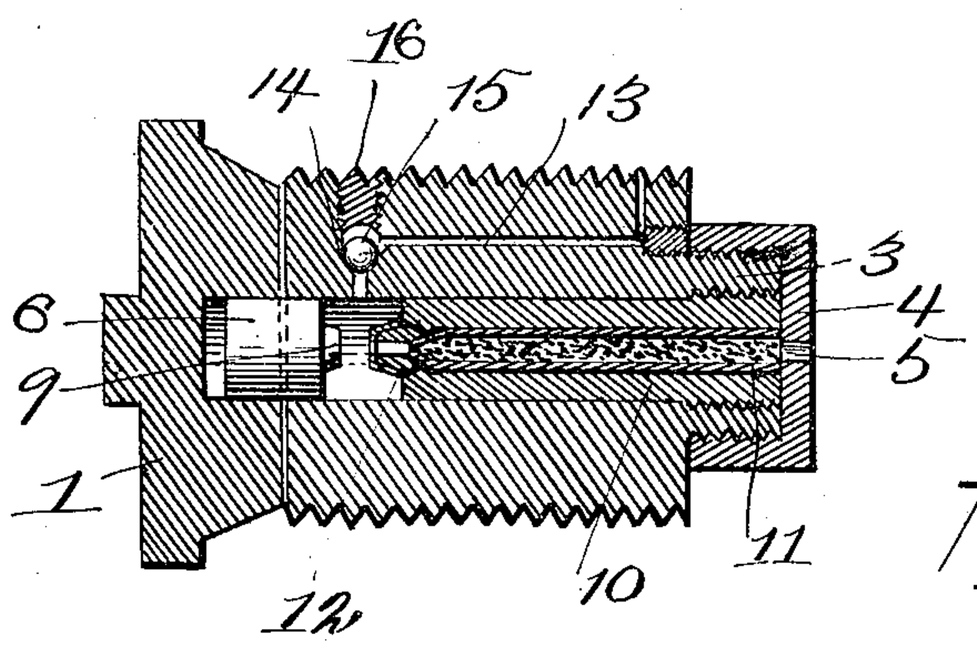


Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORGE M. HATHAWAY, OF NEW YORK, N. Y.

SHELL-FUSE.

SPECIFICATION forming part of Letters Patent No. 547,852, dated October 15, 1895.

Application filed December 29, 1894. Serial No. 533,370. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. HATHAWAY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Shell-Fuses; 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.

This invention relates to improvements in shell-fuses for that class of shells or projectiles in which ordinary powder is used as the explosive material; and it consists in providing the fuse-case with certain novel firing devices contained within the chamber of the said case, whereby a time-fuse may be caused to be ignited at the moment the shell strikes the object at which it is aimed, said fuse being so timed that the shell will have entered said object before the explosion thereof takes place, as will be hereinafter more fully explained.

One of the principal objects of the invention is to insure the instantaneous and complete escape of the gases arising from the explosion of the percussion-cap and prevent "back-pressure" of the gases arising from the exploding charge in the gun or from air during the flight of the projectile after the same has been fired from the gun. This object is attained by means of the devices illustrated in the accompanying drawings, in which—

Figure 1 represents the breech portion of a shell, showing my improved shell-fuse carrying the firing devices secured in the breech-opening of the shell; and Fig. 2, an enlarged longitudinal sectional view of the shell-fuse and firing devices complete.

Referring to the drawings, the letter A indicates the breech portion of a shell or projectile of the ordinary type, and the numeral 1 the chambered fuse-case, which is adapted to be screwed into the breech-opening of the shell. The fuse-case consists of a cylindrical block of metal having its body portion of a length corresponding to the thickness of the solid breech end of the projectile and is formed with a screw-threaded extension 3, which projects into the powder-charge in the said projectile. This extension is provided with a screw-threaded cap 4, which is designed to protect the fuse and firing devices contained within the chamber of the fuse-case, and said cap is provided with a central firing-vent 5 to permit the flame from the burning fuse to leap through and ignite the charge of powder contained in the shell. Thus far the construction of the fuse-case is similar to that described and claimed in an application filed by me of even date herewith, and it is not my intention to claim herein such construction.

The numeral 6 indicates a striker which is normally held in fixed position within the chamber of the fuse-case by means of pins 8, and is provided at one end with a firing-pin 9. Situated within said chamber, immediately in front of the striker, is a holder 10, which is bored longitudinally to receive and hold a fuse 11, one end of which covers the firing-vent in the protecting-cap 4, and the other end extends well up into a nipple 12, formed on the rear end of the fuse-holder. The inner wall of the case extension is screw-threaded and the exterior of the front portion of the fuse-holder is also screw-threaded to adapt it to be screwed into the chamber of said case and there be rigidly held. The nipple of the fixed fuse-holder is provided with a percussion-cap, which is exploded to ignite the fuse, as will be hereinafter more fully explained. The escape of the gases developed by the explosion of the percussion-cap is provided for by the passage 12′ through the wall of the fuse-case. This passage extends outward from the rear part of the chamber of said case, then longitudinally at a right angle, and then outwardly through the wall at a right angle to the longitudinal portion of the passage. The outer end of said passage registers with a vent or passage 13 through the rear portion of the shell in front of the band thereon. At the first-mentioned angle of the passage is formed a hemispherical valve-seat 14 for a ball-valve 15, the wall of the shell being bored, as indicated, for the insertion of the ball, said bore being screw-threaded and provided with a screw-threaded plug 16, which has a hemispherical recess at its inner end, against which the valve abuts and is held when it leaves its seat. When the ball is forced from its seat, it opens the passage 12′ and permits the escape of the gas. The ball when seated prevents back-pressure of gas from the gun at

its discharge and of air during the flight of the shell, which might unseat the percussion-cap and prevent the explosion of the cap upon the impact of the shell, and consequently the explosion of the charge in the shell.

The operation of the improved shell is as follows: The shell leaves the gun at its discharge with the firing devices all in a normal position, in which position they remain during the flight of the shell. At the instant the gun is fired the inertia of the striker will be overcome by the momentum of the shell shearing or breaking the fastening-pins, and said striker will be forced backward against the rear wall of its chamber, where it remains during the flight of the shell. Upon the impact of the shell the striker is projected forcibly forward, striking the cap and exploding it. The explosion ignites the fuse quietly and surely, and the gases being relieved through the passage 12′ prevent the packing of the fulminate in the fuse, which would render its ignition uncertain. The fuse being so timed as to explode the charge in the shell after the impact the explosion of the shell consequently takes place within the object which the shell has entered.

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

1. A shell fuse, consisting of a cylindrical case formed with an externally screw-threaded extension and carrying a normally restrained striker and a fixed fuse-holder provided with a nipple having gas-vents, and with an internally screw-threaded perforated cap screwed upon said extension to protect the fuse, substantially as specified.

2. A shell fuse, consisting of a cylindrical chambered block of metal, provided with a fixed fuse-holder and suitable firing-devices, a passage leading from the chamber through the wall of the plug, and a valve located in a chamber connecting with the passage, to close the same normally but to permit the gas developed by the explosion of the shell to escape, substantially as specified.

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

GEORGE M. HATHAWAY.

Witnesses:
E. A. PAUL,
J. R. NOTTINGHAM.