

(No Model.)

G. M. HATHAWAY,

SHELL FUSE.

No. 547,850.

Patented Oct. 15, 1895.

Fig. 1-

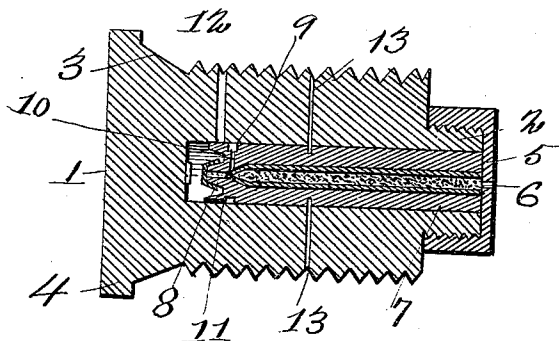
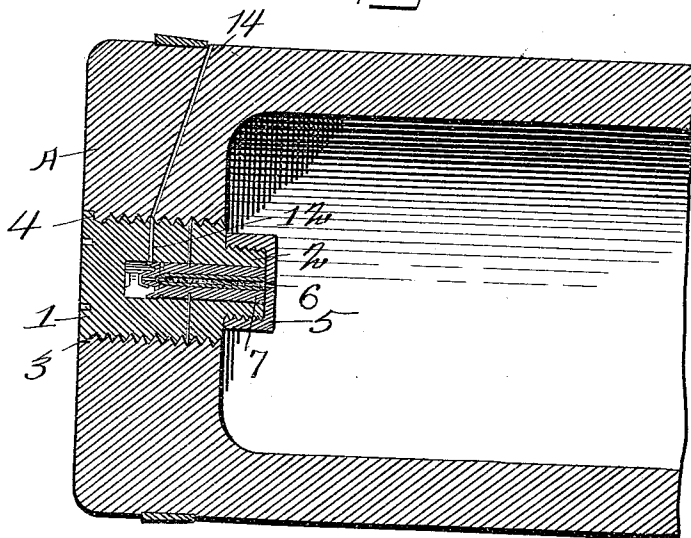


Fig. 2-

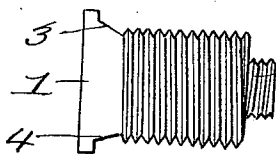


Fig. 2a-

WITNESSES-

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SHELL-FUSE.

SPECIFICATION forming part of Letters Patent No. 547,850, dated October 15, 1895.

Application filed December 27, 1894. Serial No. 533,121. (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 certain improvements in shell-fuses for that class of explosive shells or projectiles in which powder is employed as the explosive medium; and it consists in providing the fuse-case with a fuse and firing devices by means of which said fuse is ignited by the explosion of a percussion-cap or fulminate, as will be hereinafter more fully explained.

The invention has for its object to insure the proper ignition and combustion of the fuse and the explosive charge in the shell and prevent the explosive action of the gases of the exploded fulminate from prematurely exploding the shell.

Another object of the invention is to prevent the pressure of the gases either in the gun or within the chamber of the fuse-case from impacting the powder of the fuse and thereby preventing its ignition, as more fully hereinafter explained.

The above-mentioned objects are attained by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a longitudinal sectional view of the breech portion of a shell, showing my improved fuse and its firing devices applied thereto; Fig. 2, a similar sectional view of the fuse-case and firing devices somewhat enlarged; and Fig. 2^a, a side elevation of the fuse-case, showing right and left screw-threads.

Referring to the drawings, the letter A indicates the breech portion of a shell, and the numeral 1 the fuse-case, which consists of a cylindrical block of metal of suitable diameter to fit the breech-opening of the shell, and is provided with a forward extension 2 of less diameter than the body. The body is provided at its rear with a beveled annular shoulder 3 and with a flange 4. The body, forward of the flange, has formed upon its exterior a left-

handed screw-thread to fit a similar internal thread at the breech-aperture of the shell. The extension is formed with a right-handed screw-thread on its exterior to receive a cap 5, which is internally screw-threaded for the purpose and provided with a central vent 6, the object of which will be hereinafter explained.

The case is provided with a cylindrical axial recess extending from near the rear portion thereof to the forward end of the same. Within this recess is located the fuse-holder 7, consisting of a cylindrical metallic tube which closely fits the bore of the recess, but is less in length than said recess, for the purpose hereinafter explained. The inner or rear end of the said fuse-holder is provided with a nipple 8 for the reception of an ordinary percussion-cap. Near the rear end the fuse-holder is provided with an annular groove or recess 9, which communicates with its interior by means of apertures 10 and with the rear of the recess in the bore by means of a channel 11, for the purpose hereinafter explained. Extending from the chamber of the case to the outside thereof is a channel 12, which is located in such relation to the fuse-holder that its inner end is covered by the rear of said fuse-holder when the same is fastened in normal position in the shell by means of the pins 13, provided for the purpose, but which will register with the annular groove 9 in the fuse-holder when the shell is fired and the fuse-holder falls back, so as to permit the gases caused by the explosion of the fulminate to escape and allow the fuse to be quietly and surely ignited. The channel or passage 12 registers normally with a passage 14 in the wall of the shell or projectile when the fuse-case is seated therein, and in order that the gas may escape freely the opening of the outer end of the passage 14 is in advance of the usual band near the rear of the shell, as shown in Fig. 1. To charge the fuse-case a suitable fuse is placed in the fuse-holder and the percussion-cap is placed on the nipple. The holder is then placed in the chamber of the case and the cap 5 screwed upon the extension 2. After being placed in the chamber the fuse-holder is fastened in position by means of the pins 13, when the fuse-case is ready to be placed in the shell.

The operation of my invention is as follows: When the shell or projectile provided with my improved fuse-case is fired from a gun, the inertia of the fuse-holder is overcome by the momentum of the shell shearing or breaking the holding-pins, and said fuse-holder, acting as a striker, is forced into instantaneous and violent contact with the rear of the recess, exploding the cap. The flame of the cap passes through the nipple and quietly ignites the end of the fuse without impacting it or prematurely discharging the shell, as the pressure which would otherwise occur in the chamber of the fuse-case and at the rear end of the fuse-holder is relieved by the vents formed by the annular recess and passages of the fuse-holder, and the registering passage through the wall of the fuse-case permitting the gases to escape. It will be observed that the extension at the forward end of the fuse-case projects well into the powder-charge of the shell, so as to insure its ignition and explosion when the fuse burns to a limit, the fuse being so timed as to explode the shell at any period of its flight. It will be noticed, also, that the fuse-holder, being the movable portion of the firing device of the breech-plug, acts also as the striker to explode the cap.

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

1. The combination, with the body of the fuse-case having a forward extension and an internal axial recess, of the fuse-holder normally fastened in said recess and provided with an annular groove near its rear, com-

municating with its interior and the recess in the fuse-case by means of suitable passages, the body of the said case being provided with a passage which is closed by the rear of the fuse-holder when the same is in normal position and which registers with the annular groove in the fuse-holder when the same falls back at the discharge of the shell, to permit the escape of the gases, substantially as specified.

2. A chambered fuse-case having a combined fuse-holder and striker, normally fastened in said chamber, the said fuse-holder being provided with vents which register with a vent in the fuse-case when it is displaced at the discharge of the gun, to permit the escape of the gases developed, substantially as specified.

3. A shell-fuse for projectiles, consisting of a cylindrical case having a forward cylindrical extension of less diameter than the body of said case and an internal chamber for the firing-devices, the body of the case being provided with left-handed screw-threads and the extension with right-handed screw-threads, for the purpose described, and a perforated removable cap seated on the end of said extension to confine the fuse-holder and fuse within the internal chamber during the flight of the shell.

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

GEORGE M. HATHAWAY.

Witnesses:

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J. R. NOTTINGHAM.