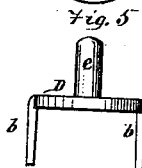
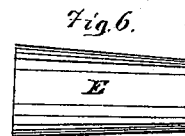
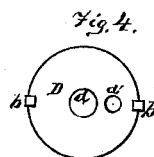
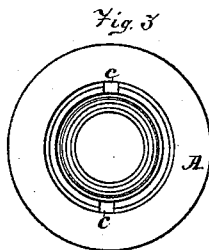
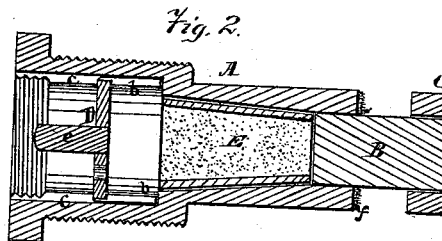
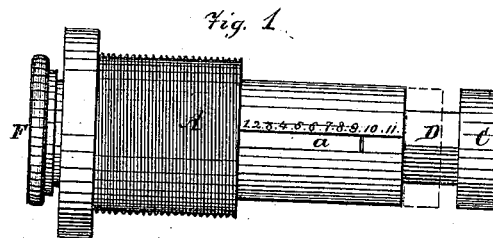


E. DRAKE.

Shell Fuse.

No. 111,823.

Patented Feb. 14, 1871.



Witnesses  
*Chas. J. Capton*  
*Charles Wilson*

Inventor  
*Ellis Drake*  
*by Hiedersheim, Norris*  
*his Attorney*

# United States Patent Office.

ELLIS DRAKE, OF STOUGHTON, ASSIGNOR TO HIMSELF AND JOHN S SMITH, OF LEICESTER, MASSACHUSETTS.

Letters Patent No. 111,823, dated February 14, 1871.

## IMPROVEMENT IN SHELL-FUSES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, ELLIS DRAKE, of Stoughton, in the county of Norfolk and State of Massachusetts, have invented a new and useful improved Fuse for Shells or Projectiles; and I do hereby declare the following to be a full, clear, and exact description thereof sufficient to enable others skilled in the art to which my invention appertains to fully understand and make the same, reference being had to the accompanying drawing making part of this specification, in which drawing—

Figure 1 is an elevation of the device in the direction of its length.

Figure 2 is a central longitudinal section of the same.

Figure 3 is a top view.

Figure 4 is a top view, and

Figure 5 is an elevation of the circular plunger.

Figure 6 illustrates the fuse, which is of a somewhat conical shape.

The object of my invention is to construct and provide, at a small expense, a fuse for shells or projectiles, combining in itself the following characteristics or improvements, namely: a time, a time-regulating, a percussion, and a concussion-fuse within a suitable fuse-case; and

It consists—

First, in providing or forming said case upon its rear end with a square or angular shank, to receive a plunger having an opening, the interior of which corresponds with the external surface of the shank of the fuse-case.

Secondly, in forming within the inner wall of a fuse-case, at its front end, two, more or less, grooves opposite to, or nearly so, each other to receive a circular plunger formed or provided with two legs, more or less, of a size and distance apart to readily slide within the grooves formed in the said fuse-case.

In the drawing—

The letter A designates a fuse-case, of any suitable form or construction, and made of any desired metal best adapted for the purpose.

This fuse-case is formed or provided upon its rear end with a shank, B, made either of angular or square formation, designed to receive a plunger, C, having a circular periphery, and provided with an opening, the interior of which corresponds with the exterior surface of the said shank B.

In the shoulder, at the front end of the shank, is placed a fulminate, which will be discharged by the plunger C at the instant the shell strikes, the object being in making the said shank of an angular or square formation to prevent the plunger C from revolving on the shank, thus preventing it being thrown forward and causing a premature ignition.

If the shank of the fuse-case is made round, wobbling of the shell and centrifugal force would tend to throw the plunger forward and cause an explosion too soon.

The end of the shank B should be headed or otherwise enlarged after the plunger C is placed thereon, to prevent it from being thrown off by inertia at the instant of discharge.

The rear end of the fuse-case, at the inner junction of the shank B, is provided with a fulminate, designated by the letter *f*, and when the fuse is ready to be placed in the shell, the plunger C occupies the position shown in fig. 0, but when the shell is discharged and strikes, the plunger C is driven forward and comes in contact with the fulminate, as shown in dotted lines, fig. 1.

Upon the inside wall of the front end of the fuse-case are formed two, more or less, grooves, *c c*, which extend down to the top of the fuse, or nearly so, and are opposite each other, in order to readily receive and guide the legs *b b* of the circular plunger D, which legs strike the fulminate placed at the rear end of each of the grooves arranged within the inside wall of the fuse-case.

The circular plunger D is formed or provided with the legs *b b*, in order to concentrate the force of the blow at these two points, which renders the explosion more certain, and by having two points of contact it is doubly sure of ignition.

The plunger D is also provided with two openings, *d d'*, the former to receive a pin or rivet, *e*, the end of which extends up through an opening in the center of the cap F, made to screw into the front end of the fuse-case, and is slightly riveted in order to hold the plunger in position until the shell or projectile is discharged, while the latter opening *d* is to admit air when the pin or rivet is withdrawn from the hole in the cap F, for the purpose of supporting combustion when the fuse is ignited.

A longitudinal slot, *a*, is formed in the fuse-case, and is provided with a scale indicating a series of seconds or half seconds in figures, which figures are arranged in a straight line upon either side of said slot.

This slot is arranged opposite to the surface of the fuse, and is designed to allow a knife or other suitable device to be inserted for the purpose of dividing the fuse, as will be described.

E is a fuse incased in paper, tin-foil, or other suitable metal, for the purpose of preventing the flames from said fuse communicating with the longitudinal slot in the fuse-case, until the fuse has burned the required number of seconds, which is indicated by the scale of figures near the slot.

In order to communicate the flame to the charge

in the shell or projectile, a knife or other suitable device is inserted through the longitudinal slot into the tin-foil or other covering of the fuse at the point desired, as indicated by the scale, and drawn toward the rear end until it reaches the terminus or end of said slot in the rear end.

To effectively allow the flame to communicate with the charge, the diameter of the fuse-case is slightly diminished or reduced from the front end of the longitudinal slot to the rear of the fuse-case, thereby creating a space between the shell or projectile and fuse-case.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination and arrangement of parts, as herein shown and described, whereby a time-regulator, a time, a percussion, and a concussion-fuse are contained in the same fuse-case, substantially as described.

2. A plunger, C, arranged loosely upon a square or

angular shank, B, formed with a fuse-case, in combination with a fulminate upon the shoulder of said fuse-case, as and for the purpose set forth.

3. The grooves *c c*, formed upon the inner wall of the front end of a fuse-case, substantially as and for the purpose set forth.

4. The plunger D, formed or provided with legs *b*, in combination with the groove or grooves upon the inner wall of the front end of a fuse-case, when said plunger is connected with the cap, substantially as described.

5. The case A, formed with the slot *a*, shank B, and grooves *c*, in combination with the plungers C and D, and cap F, substantially as described.

To the above I have signed my name this 4th day of January, A. D. 1871.

ELLIS DRAKE.

Witnesses:

JAMES L. NORRIS,  
W. H. FINCKEL.