

J. F. CLEU.
Shell Fuse.

No. 45,024.

Patented Nov. 15, 1864.

Fig. 1.

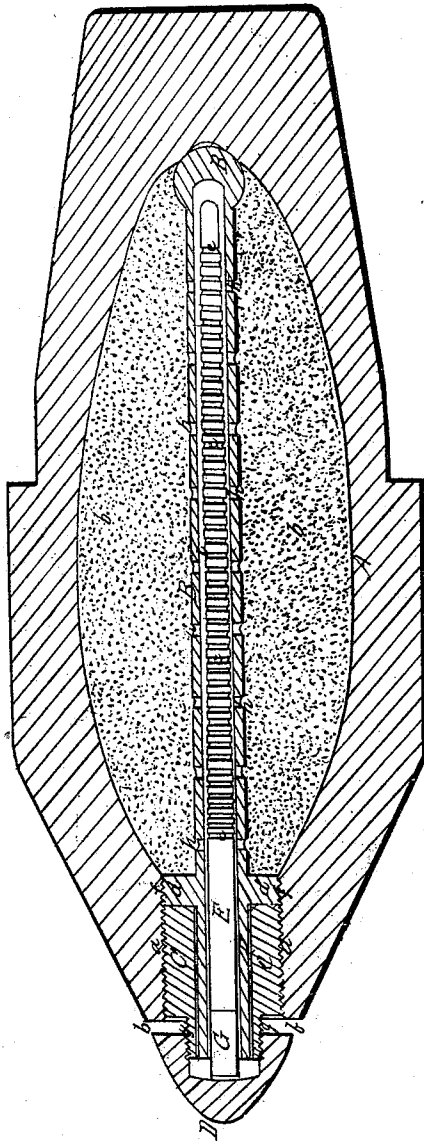
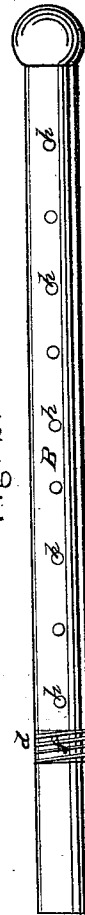


Fig. 2.



Witnesses.

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IMPROVEMENT IN FUSE FOR EXPLOSIVE SHELLS, &c.

Specification forming part of Letters Patent No. 45,024, dated November 15, 1864.

To all whom it may concern:

Be it known that I, JOHN F. CLEU, of the city, county, and State of New York, have invented a new and useful Improvement in Percussion or Friction Fuses for Explosive Projectiles and other Purposes; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central longitudinal section of an explosive shell having my invention applied. Fig. 2 is a longitudinal exterior view of the fuse.

Similar letters of reference indicate like parts.

The principal object of this feature of my invention is to produce the ignition of the bursting-charge of an explosive projectile—the charge of a cartridge for ordnance or that of a blast—along its whole length, or at several points in its length simultaneously; and to this end it consists in a tube inserted directly through and extending the whole or nearly the whole length of the charge, and perforated at as many points as desired, and a metal rod or pin inserted into and extending the whole or nearly the whole length of the said tube, and cemented therein by interposed fulminate compound, which is inserted in the condition of paste and allowed to dry. The longitudinal movement of the rod or pin produced by pressure or percussion applied to one end thereof, which protrudes from the tube, causes friction to be produced upon the priming along the whole length of the tube, and thus produces the explosion of the priming, and the fire passing through the several perforations of the tube ignites the surrounding charge, as desired.

A represents the shell, having at its front end a suitable hole, *a*, for the insertion of the fuse-tube B and of the bursting-charge of gun-powder *b*. The fuse-tube is a long straight tube closed at its inner end, and having near its open outer end two wings, *d d*, on the outer faces of which are cut portions of a screw-thread, *f*, to enable the tube to be screwed into the hole *a*, the said wings serving to center the tube in the said hole, but leaving openings on opposite sides of the said tube between it and

the interior of the hole *a* for filling shell. The length of the said tube is sufficient to enable it to bear against the back of the cavity of the shell and protrude a short distance through the hole *a*. Between the wings *d d* and its inner end the said tube has numerous perforations, *h h*, in its sides.

C is a hollow socket, of cast metal, fitted to the exterior of that portion of the tube B in front of the wings *d d*, and having upon its exterior a screw-thread, *f*, to screw into the hole *a*. The front portion of this socket C, which protrudes from the front end of the projectile, is of reduced size, and has soldered on it a screw-thread, *g*, of lead, for the reception of a cap, D, which has soldered into it a female screw-thread, of lead, to fit the thread *g*.

E is the igniting rod or pin, somewhat shorter than the tube B, made of iron or other hard metal, of a size to fit quite loosely in the said tube. The exterior surface of this rod is grooved or roughened like a file or rasp, as shown at *e e* in Fig. 1. This rod is put into the tube after a suitable quantity of fulminate composition *i* in the form of paste, and the composition thus caused to surround the said rod, so that when it dries it will serve as a cement to hold the rod firmly, except when any very considerable force is applied endwise thereto. Care must, however, be taken that the rod or pin does not bear upon the back or inner end of the tube, as it is required to be capable of a movement toward the said end for the purpose of producing the ignition of the fulminate.

G is what may be termed the “safety-pin,” consisting of a straight iron pin inserted into the outer end of the tube B, and of such length that its outer end will protrude from the tube while its inner end bears against the outer end of the igniting-pin.

To prepare the shell, the tube having been charged with fulminate, and had the igniting rod or pin E applied, and the fulminate having been dried, the tube is screwed into the hole *a* till its inner end comes to a form bearing against the back of the cavity of the shell. The shell is then charged, and the plug C screwed in close up to the wings *d d*, and the cap D is then put on, the safety-pin not being inserted until the shell is to be used, when the cap D is taken off, the said pin G put in, and the cap replaced, taking care not to screw it

on so far as to press upon the pin. A washer of india-rubber or other soft material may be in the space *b*, which must be left between the head of the cap and the front of the shell. When the shell is projected against a resisting body, the cap *D*, striking, meets with a resistance, which arrests it to such an extent that the shell moves forward to some extent independently of it, tearing off or crushing up the screw-thread *g*, and the tube *E*, moving forward with the shell, while the pins *G* and *E* are held back by the cap, causes such a friction to be produced on the fulminate between the roughened surface of the latter pin and the interior of the tube as to produce its ignition, and the fire entering the charge *b* through the several perforations *h h* fires it at as many points, and causes the explosion of the whole charge instantaneously, and leaves none of it unconsumed.

Instead of perforations *h h*, there may be one or more longitudinal slits along the whole or nearly the whole length of that portion of the tube *B* contained within the cavity *b*, to fire the whole length of the charge at once.

Instead of using a solid cap, *D*, as described, the pin *E* may extend right through the said cap

or the point of the shell, so that when the shell is projected against a resisting body the pin may strike.

The perforated tube *B* and pin *E* may be used for firing blasts, the tube being inserted into the hole drilled for the blast, and the pin to be struck by a hammer, which may be liberated and brought into action by pulling a string of suitable length, or by a clock-movement. The same means may also be used for firing the cartridges in ordnance and fire-arms, the tube-key inserted into the cartridge and the pin being long enough to protrude through a hole in the breech of the gun, so that it may be struck by a hammer.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of the perforated tube *B*, extending through the charge to be exploded, and the pin or rod *E* inserted into the said tube and cemented or held therein by the fulminate priming, substantially as herein specified.

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Witnesses:

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