

(No Model.)

T. NORDENFELT.

SHELL FUSE.

No. 379,025.

Patented Mar. 6, 1888.

Fig. 1.

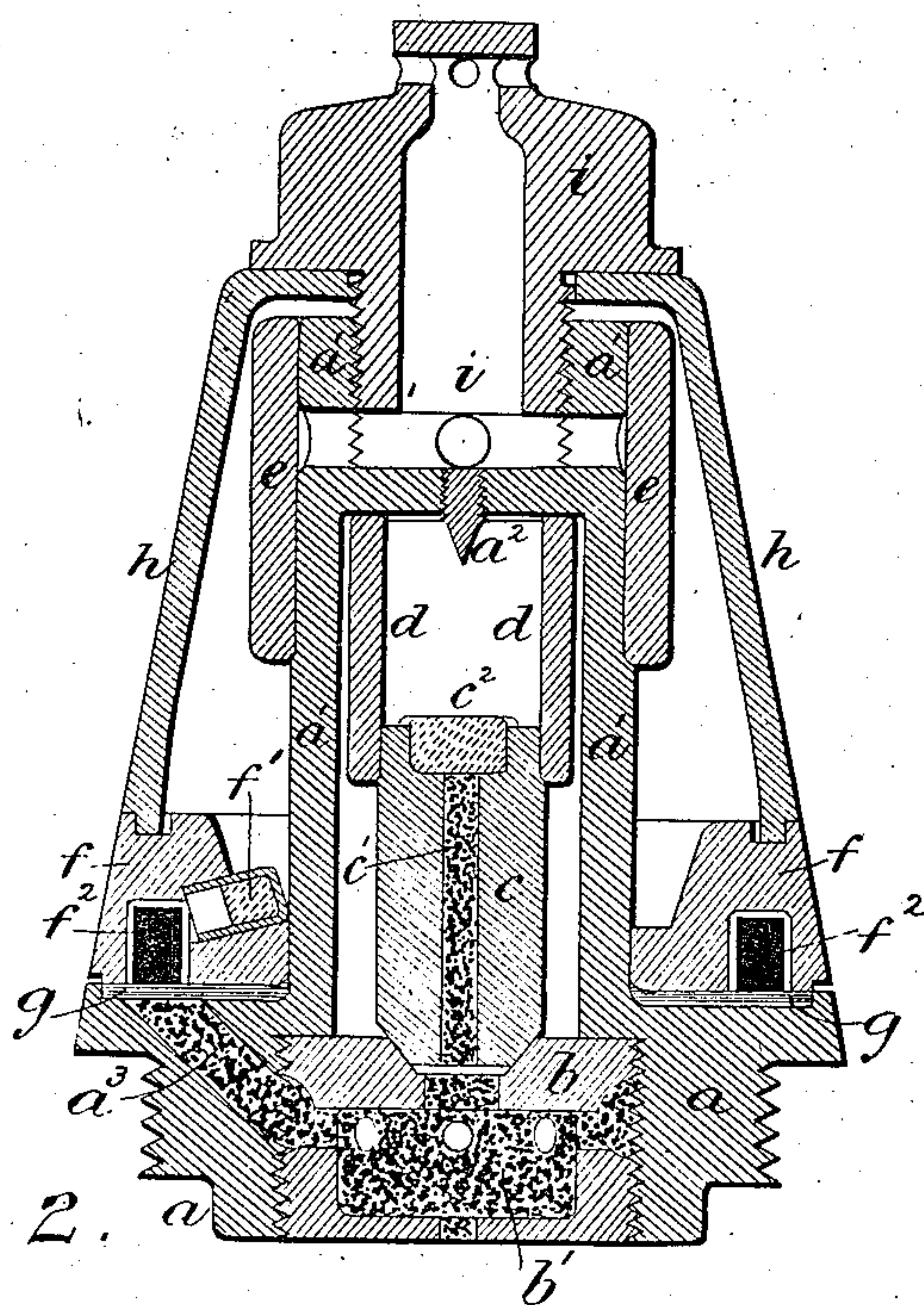


Fig. 2.

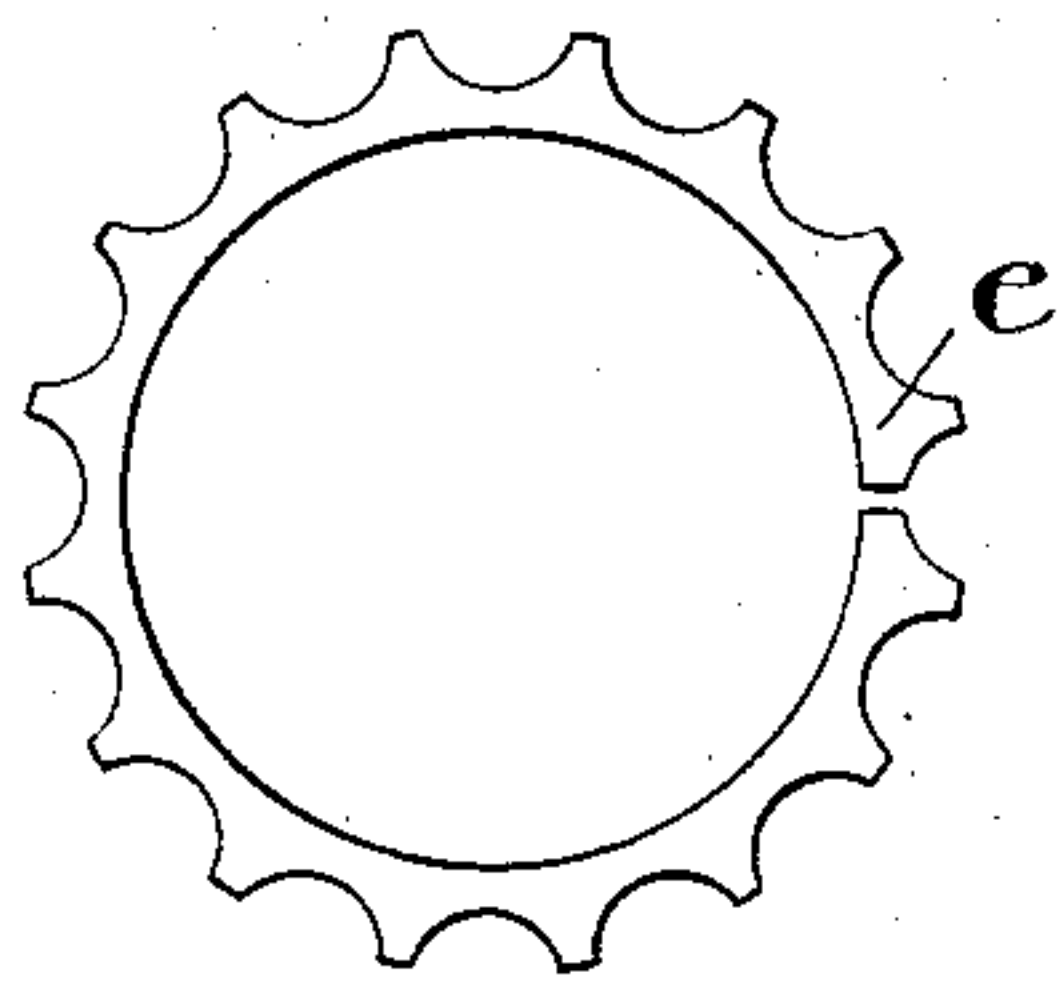
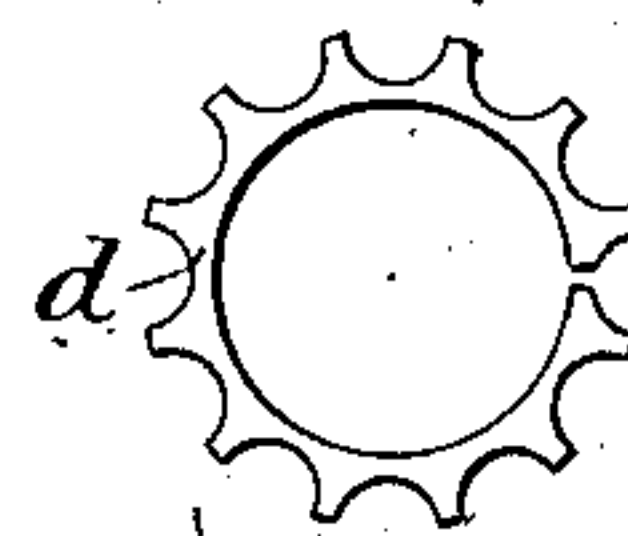


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

THORSTEN NORDENFELT, OF WESTMINSTER, ENGLAND, ASSIGNOR TO THE
NORDENFELT GUNS AND AMMUNITION COMPANY, (LIMITED,) OF SAME
PLACE.

SHELL-FUSE.

SPECIFICATION forming part of Letters Patent No. 379,025, dated March 6, 1888.

Application filed November 8, 1887. Serial No. 254,616. (No model.)

To all whom it may concern:

Be it known that I, THORSTEN NORDENFELT, a subject of the Queen of Great Britain, residing at 53 Parliament Street, in the city of Westminster, England, civil engineer, have invented certain new and useful Improvements in Fuses for Projectiles, of which the following is a specification.

This invention relates to time-fuses for projectiles and to time and percussion fuses combined, and is applicable with most advantage to projectiles in which it is necessary to make the fuse perfectly safe against accidental ignition during transport without the necessity of using safety-pins, as is generally done. When the improved fuses have percussion devices, these devices are contained within a chamber of cylindrical shape formed in a pillar of the plug or piece which screws into the nose of the projectile. This chamber is closed at its inner end by a screw-stopper in which is a central cavity filled with powder or explosive to make a magazine. The cylindrical chamber of the pillar contains within it a pellet primed with fulminate, and a split ring or mantlet which embraces the pellet and rests upon a shoulder on the pellet, which it holds in its place. On firing, the inertia of the split ring or mantlet causes it to slide along the cylindrical surface of the pellet, so as to leave the pellet free within the chamber. On the projectile striking, the pellet with the mantlet upon it passes to the front end of the chamber within which it is contained, and a point fixed at the end of the chamber strikes the priming of fulminate and fires it. The flash passes to the composition in the central cavity of the stopper which closes the chamber, and the fire from this composition enters the interior of the shell and fires the bursting charge.

So far as above set forth the fuses (the percussion devices) are not herein claimed, as they are substantially the same as shown in my prior application, No. 244,084, filed July 12, 1887.

I now, in accordance with my present invention, provide a second mantlet or split ring resting on a shoulder upon the exterior of the cylindrical pillar containing the percussion mech-

anism, and this second mantlet or split ring, when the projectile is fired from the gun, is caused by its inertia to pass toward the rear end of the chamber, and in doing so it strikes upon and fires percussion-caps or other like priming. These percussion-caps are set in a ring, which, in the usual way, can be turned round for the purpose of adjusting the time which the fuse shall burn before igniting the bursting charge within the projectile. In the ring, on its rear face, there is a groove charged with fuse composition, and this face of the ring abuts upon another face on an annular shoulder of the plug-piece which is screwed into the nose of the projectile. Beneath the ring of fuse composition a passage is formed which itself is charged with gunpowder or other explosive. This passage leads to the central cavity previously referred to, which is also charged with explosive material. When the composition in the adjustable ring is ignited, it burns until it reaches the passage leading inward to the central cavity, and then the explosion takes place. The time occupied in reaching the passage depends, of course, as in the ordinary time-fuse, upon the position of the ring. The ring is kept in its place by a conical cover, which in turn is held in position by a nose-plug which screws into the head of the cylinder containing the percussion apparatus. When the composition in the time-ring burns, the gases produced pass up within the conical cover and find a vent by perforations in the nose-piece, or an escape may be otherwise provided.

In order that my said invention may be fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 shows (enlarged) a longitudinal section of a time and percussion fuse constructed in accordance with my invention. Figs. 2 and 3 are end views of the two split rings.

a is the plug-piece which screws into the projectile, and *a'* is a pillar formed in connection with it and made hollow to constitute a chamber.

b is the plug which closes the chamber of the pillar *a'*. It is hollow and perforated on

all sides, as the drawings indicate and its interior at b' is filled with rammed powder or other suitable explosive.

Within the chamber of the pillar a' , I arrange mechanism for firing the shell by percussion. That which I here show I have employed for some time past. It consists of a pellet, c , bored through and cylindrical externally. It is loaded with rammed powder or other suitable explosive at c' , and is tipped with fulminate at c'' . The pellet is cylindrical externally, but slightly reduced in diameter at its outer end. Here it is embraced tightly by the mantlet d , consisting of a metal ring which is split longitudinally from end to end. The inertia of this ring causes it, on firing, to pass completely onto the pellet, and the momentum of both pellet and mantlet, when the projectile strikes, brings the fulminate c'' against the point a'' at the fore end of the chamber of the pillar a' and explodes it, firing the composition c' and b' , and so the fire passes to the bursting charge of the shell. The cylindrical pillar a' likewise receives upon it a split ring, e . This, on firing, passes along the pillar a' , and in so doing it strikes upon a percussion cap or primer, f' , which is inserted into a perforation in the time-ring f .

f'' is a groove on the rear face of the time-ring. It also is loaded, as usual, with rammed powder or other explosive. The groove does not pass completely around the ring, and the primer f' , when exploded, fires the composition at one end of the groove. The fire burns along the groove until it reaches the passage a'' in the plug-piece a , which passage is also rammed full of composition, and the fire passing along the passage ignites the composition b' , and the ignition of the bursting charge of the shell immediately follows.

g is a packing inserted beneath the ring f , between it and an annular shoulder of the plug-piece. The packing is of such a nature as to be readily burned through as the composition is consumed.

h is a conical cover serving to hold the ring f in place, but allowing it to be turned to adjust the time which the fuse shall burn before igniting the bursting charge.

i is the nose-plug, which, screwing into a socket at the end of the pillar a' , securely holds the cover. The plug i and the pillar a' are perforated to allow the escape of the gases resulting from the burning of the fuse composition in the passages and parts of the fuse.

I claim—

1. The combination of the plug-piece adapted to be screwed into a projectile and having the projecting cylindrical pillar and the annular shoulder with the composition-filled passage therein leading toward the bursting charge in the projectile, the split ring yieldingly embracing the outer end of the pillar, the time-ring surrounding the inner end of the pillar supported on the annular shoulder of the plug-piece, and having the composition-filled groove in its face adjacent to the plug-piece shoulder and communicating with the passage in the shoulder, and the primer in a perforation leading from the interior surface of the time-ring to its composition-filled groove and adapted to be fired by being struck by the split ring when the projectile is propelled, substantially as set forth.

2. The combination of the plug-piece adapted to be screwed into a projectile and having the projecting cylindrical chambered pillar and annular shoulder, the split ring yieldingly embracing the outer end of the pillar, the time-ring surrounding the inner end of the pillar supported upon the annular shoulder of the plug-piece, and having the composition-filled groove in its face adjacent to said shoulder, the primer in the perforation leading from the interior surface of the time-ring to its composition-filled groove and adapted to be fired by being struck by the split ring when the projectile is propelled, the plug closing the base of the pillar chamber and having the side perforations and the cavity filled with explosive composition, the composition-filled passage communicating with the composition-filled groove in the time-ring and with the side perforations of the plug, the longitudinally-perforated pellet within the pillar chamber and resting at the inner end thereof, the split ring within and at the opposite end of the pillar chamber and yieldingly embracing the pellet, the priming carried by the pellet, and the point at the outer end of the chamber, against which the priming strikes upon impact of the projectile by the forward movement of the pellet, together with the split ring previously caused to move along it and to the inner end of the chamber upon the firing of the projectile by the propelling charge, substantially as set forth.

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Witnesses:

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