

988,846.

Patented Apr. 4, 1911.

Fig. 1.

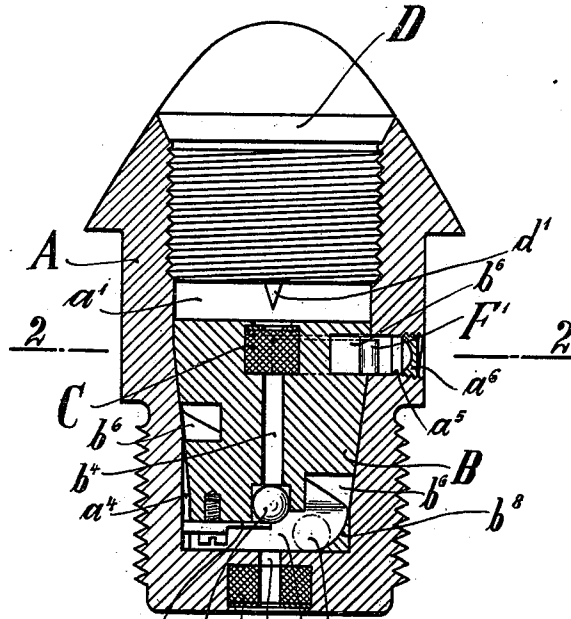


Fig. 2.

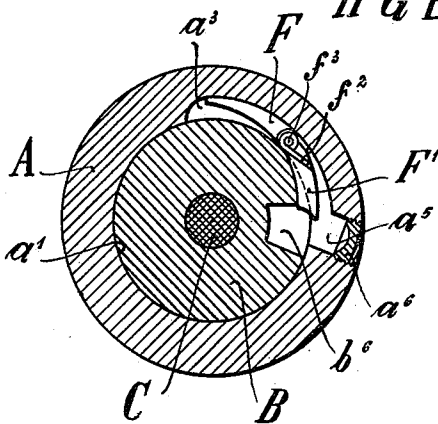


Fig. 3.

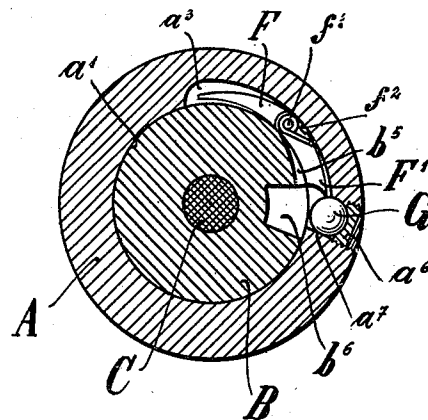


Fig. 4.

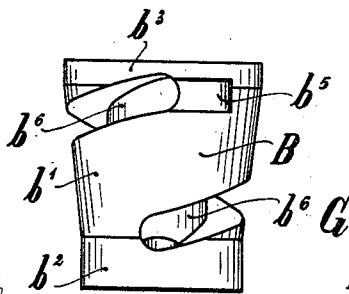
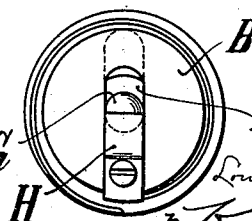


Fig. 5.



Witnesses
 J. M. Wynkoop.
 Ida J. Stanley.

Inventor
 Louis Abendroth,
 by Knight & Papp
 attys.

UNITED STATES PATENT OFFICE.

LOUIS ABENDROTH, OF ESSEN-ON-THE-RUHR, GERMANY, ASSIGNOR TO FRIED. KRUPP
AKTIENGESSELLSCHAFT, OF ESSEN-ON-THE-RUHR, GERMANY.

IMPACT-FUSE.

988,846.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed October 29, 1908. Serial No. 460,143.

To all whom it may concern:

Be it known that I, LOUIS ABENDROTH, a subject of the Emperor of Germany, and a resident of Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Impact-Fuses, of which the following is a specification.

The present invention relates to the type of impact fuses which is provided with a safety device which delays the readiness for action of the fuse.

In the known fuses of this type the readiness for action of the fuse is delayed by the fact that the safety member under the action of the centrifugal force moves in a long path from its transport-position to the position in which it releases the movable member of the fuse, the path of movement of the safety member being located between the movable part of the fuse and a fixed part of the fuse. During the time the safety member moves, forces, such as the reaction of shock caused by firing, come into play, which forces tend to effect a movement of the part to be secured, and the safety member may therefore become jammed between the movable part and the fixed part thereby preventing the fuse from becoming active.

The object of the present invention is to provide an impact fuse with a safety device delaying the readiness for action of the fuse, which does not possess the aforesaid drawback. In accordance with the invention this object is attained by providing the fuse with a self-retaining locking member for the movable part of the fuse which member cannot be released by the forces coming into play during the flight of the projectile, and by providing a member for releasing the locking member, which releasing member, in the transport-position of the fuse, is secured against movement to release the locking member, is set in motion on firing and must move in a long path from its transport-position to the position in which it releases the locking member.

One embodiment of the invention is shown in the accompanying drawings by way of example.

Figure 1 is an axial longitudinal section through the secured fuse; Fig. 2 is a section on line 2-2, Fig. 1, looking from above; Fig. 3 is a view corresponding to Fig. 2 and

showing the fuse in released condition; Fig. 4 is a detail view, and Fig. 5 is a bottom view of Fig. 4.

The primer-bolt B, which carries the primer C and the shape of which is most clearly shown in Fig. 4, is slidably mounted in the bore a^1 of the fuse body A. The intermediate part of the surface of the bolt B is formed by a conical surface b^1 which toward the end faces of the bolt merges into cylindrical surfaces b^2 b^3 (Fig. 4). The shape of the bore a^1 of the fuse-body A corresponds to that of the bolt B. The bore a^1 is closed by the fuse-head D which carries the firing pin d^1 . An igniting channel b^4 , the axis of which coincides with the axis of the fuse, leads from the primer C to a channel a^2 which is arranged in the bottom of the fuse-body A and which passes through a powder-body E.

In the transport-position of the fuse the primer-bolt B is secured against forward movement in the fuse-body A by means of a two-armed latch F F^1 . The latch is pivoted on a bolt f^3 in a recess a^3 in the fuse-body A and engages with its arm F^1 in a notch b^5 (Figs. 3 and 4) in the primer-bolt. The bolt f^3 is arranged parallel to the axes of the fuse. A spring f^2 tends to hold the latch F F^1 in engagement with the notch b^5 in the primer-bolt. The latch is of such shape that, when the latch is in the withdrawn position (Fig. 3), all the parts of the latch are out of the path of movement of the primer-bolt B. The weight of the latch is distributed in such a manner relatively to the axis of rotation of the latch that the centrifugal force created by the rotation of the projectile is incapable of withdrawing the latch.

The lower part of the igniting channel b^4 is enlarged and, in the transport-position of the fuse, the enlarged portion of the channel b^4 contains a ball G which is held in position by a leaf-spring H of small elasticity. The office of the ball is to withdraw the latch F F^1 from the notch b^5 of the primer-bolt after firing to release the primer-bolt B. To that end a helical groove b^6 is cut in the surface b^1 of the primer-bolt B which groove has its lower end communicating with the part of the igniting channel b^4 containing the ball G, through the

medium of a channel b^7 which extends radially to the axis of the fuse. The wall b^8 (Fig. 1) of the channel b^7 extends upwardly and outwardly in the direction of the direction of flight of the projectile. The upper end of the helical groove b^6 terminates opposite to the inclined free end of the arm F^1 of the latch F F^1 . The channel b^7 and the spiral groove b^6 are of such cross-section that the ball G can pass freely through the channel b^7 and the groove b^6 . An inclined bore a^5 is provided in the fuse-body A opposite to the upper end of the groove b^6 . The bore a^5 is closed by a screw-plug a^6 and is of such dimensions that the ball G , after leaving the spiral groove b^6 , can pass completely into the bore a^5 .

The outer end of the spring H is enlarged and engages in a groove a^4 extending parallel to the axis of the fuse in the fuse-body A , whereby the primer-bolt B is secured against rotation.

In the transport-position the parts of the fuse assume the position shown in Figs 1 and 2, in which the primer-bolt B is secured by the arm F^1 of the spring-pressed latch F F^1 while the ball G is held in the enlargement of the igniting channel b^4 by the leaf spring H .

When the projectile is fired the inertia causes the ball G to bend the spring H downwardly and the ball then passes into the channel b^7 . The centrifugal force created by the rotation of the projectile thereupon causes the ball G to roll along the wall b^8 of the channel b^7 and along the groove b^6 and finally the ball, in passing out of the upper end of the groove b^6 , hits the arm F^1 of the latch F F^1 and swings the latch outwardly against the action of the spring f^2 until the arm F^1 comes into abutment with the fuse-body A . The ball then passes beyond the edge of the arm F^1 of the latch and comes to rest against the screw-plug a^6 which closes the bore a^5 of the fuse-body A (Fig. 3). When the ball has reached this position the latch F F^1 can swing back to a slight extent, under the action of its spring f^2 , into the position shown in Fig. 3. The latch is held in this position by the ball G and the latch locks the ball by pressing the ball against the wall a^7 (Fig. 3) of the inclined bore a^5 . In this position of the parts the latch F F^1 does not any longer engage in the notch b^5 of the primer-bolt B . The primer-bolt B is therefore released and the fuse is active.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. An impact fuse having a member movable on impact to ignite the fuse, a self-retaining locking member for said movable member, and a member carried by said movable member and spaced from the locking

member and adapted to move on firing to withdraw the locking member to cause the movable member to be released.

2. An impact fuse having a member movable on impact to ignite the fuse, a self-retaining locking member for said movable member, a relatively long track having one end terminating opposite said locking member; and a member carried wholly by the movable member at the other end of said track and adapted to move on the track on firing to withdraw the locking member to cause the movable member to be released.

3. An impact fuse having a member movable on impact to ignite the fuse, a latch for locking said member, and a ball carried by said movable member and adapted to be set in motion by the centrifugal force on firing and adapted to withdraw said latch to release the movable member.

4. An impact fuse having a member movable on impact to ignite the fuse, a latch for locking said member, a helical groove having one end terminating opposite the latch, and a ball mounted at the other end of the groove and adapted to move through said groove on firing to withdraw said latch to release the movable member.

5. An impact fuse having a member movable on impact to ignite the fuse, a latch for locking said member, a helical groove having one end terminating opposite the latch, and a ball mounted at the other end of the groove and adapted to move through said groove on firing to withdraw said latch to release the movable member, said ball and said latch being adapted to enter into interlocking engagement at the end of the movement of the ball, whereby the latch and the ball are locked in position.

6. An impact fuse having a member movable on impact to ignite the fuse, retaining means for the movable member; and means adapted to move on firing to release said member, said releasing means carried wholly by said movable member.

7. An impact fuse having a member movable on impact to ignite the fuse, retaining means for the movable member; and releasing means for said retaining means carried by the movable member, said releasing means operable through centrifugal force to effect the releasing of said movable member.

8. An impact fuse having a member movable on impact to ignite the fuse; means carried by the fuse body for retaining the same in position, and means carried wholly by said movable member for releasing the same, said releasing means adapted to be released from its carried position by its own inertia, and operable through centrifugal force to effect the releasing of the retaining means.

9. An impact fuse having a member movable on impact to ignite the fuse, a self-re-

5 taining locking member for said movable member, said locking member constructed with a part for holding the same immovable against centrifugal forces incident to firing,
10 a releasing member spaced from said locking members when in transport position and adapted to travel on firing, through the action of centrifugal forces, to releasing position; and a delaying means introduced between the locking member and the transport position of the releasing member for pro-

longing the duration of movement of said releasing member and the disengagement of the locking member until after the projectile has left the bore of the gun barrel. 15

The foregoing specification signed at Barmen, Germany, this 1st day of October, 1908.

LOUIS ABENDROTH. [L. s.]

In presence of—

OTTO KÖNIG,

WM. WASHINGTON BRUNSWICK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
