F. ZIEGENFUSS.

PROJECTILE.

APPLICATION FILED OCT. 6, 1909.

945,544. Patented Jan. 4, 1910.

Fig. 1.

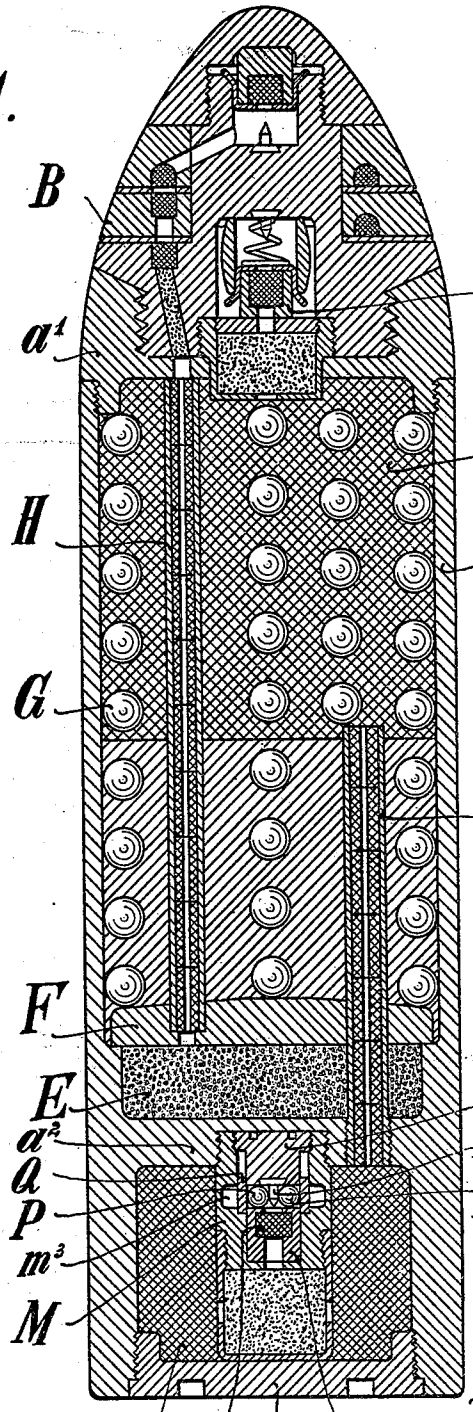
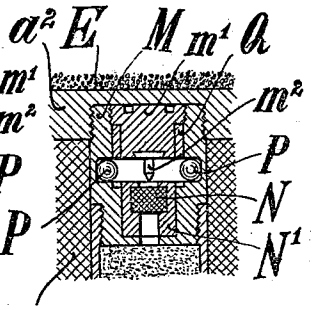


Fig. 2.



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PROJECTILE.

945,544. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed October 6, 1909. Serial No. 521,397.

To all whom it may concern:

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

This present invention relates to the type of projectiles which contain a shrapnel-charge arranged in a base-chamber and a shell-charge remaining in the shell of the projectile when the shrapnel-charge explodes and in which an impact fuse is provided for the shell-charge which fuse remains retained in the inactive position until explosion of the shrapnel-charge takes place. In the known projectiles of this type the impact fuse is retained in its inactive position by a grain of powder made from a delay-action composition, which is ignited by the explosion of the shrapnel-charge and which, when it has been consumed, releases the movable bolt of the fuse. As it takes a comparatively long time for the delay-action composition to burn it may happen, especially when the position of the bursting point is low, that the projectile shell containing the shell-charge hits the target before the fuse has become active so that the shell-charge does not become detonated.

The object of the present invention is to provide a projectile of this type in which the fuse for the shell-charge becomes active immediately after the explosion of the shrapnel-charge. This object is attained by constructing the retaining means for the fuse in such a manner that it is withdrawn by the rearwardly directed shock exerted on the projectile-shell by the explosion of the shrapnel-charge.

In the accompanying drawings, Figure 1 is a longitudinal section of an embodiment of the improved projectile, and Fig. 2 is a part of Fig. 1 showing another position of some of the parts of the impact fuse for the shell-charge.

The projectile-body A is provided at its front end with a double fuse screwed into the bushing a^1 of the projectile and consisting of a time fuse B and an impact fuse C. The hollow space of the projectile-body A is divided into two chambers by a strong partition wall a^2. The rear chamber which has thick walls is closed by a screw-plug a^3 and contains the shell-charge D which consists of high-explosive material. The front chamber of the projectile contains, in the manner shown in the drawing, the shrapnel-charge E, the driving disk F, the filling shot G and the igniting tube H which connects the time fuse with the shrapnel-charge E. The impact fuse C, which is of known construction and does not serve for producing the effect aimed at by the present invention, is in connection with a charge J which consists of a high-explosive material. The charge J is arranged in the front chamber of the projectile in the spaces between the filling shot G and is connected with the shell-charge D through the medium of a tube K which is secured in the partition wall a^2 and is filled with a mass adapted to transmit the detonation.

A special impact fuse which is secured in the partition wall a^2 is provided for the shell-charge D. This is the fuse which is adapted to produce the effect aimed at by the present invention and its construction will be described in detail in the following. A bolt N^1 which carries the primer N is slidable axially in the fuse-body M. A fuse-needle m^2 which is secured on a bolt m^1 screwed into the fuse-body M projects into the path of movement of the bolt N^1. When the fuse is retained in the inactive position, as shown in Fig. 1, the primer-bolt N^1 and the fuse-needle m^2 are separated from one another by retaining balls P. In that case the balls are surrounded by a ring Q which is squeezed on the bolt m^1 in a suitable manner. As shown in the drawing the ring Q is, in the position just described, prevented from moving toward the base of the fuse but under the effect of a sufficiently great force it can move in the opposite direction to such an extent that it, as shown in Fig. 2, does not any longer prevent the retaining balls P from moving out of the path of the primer-bolt N^1. A groove m^3 in the fuse-body M serves for receiving the balls P when they move out from the retaining position.

When the projectile is fired, the ring Q remains in the position shown in Fig. 1. When, on shrapnel firing, the shrapnel-charge E is exploded by the time fuse B the filling shot G, the bushing a^1 and the double fuse B C are ejected. As the explosion of the shrapnel-charge imparts an acceleration to the ejected parts the explosion does not cause the impact fuse C to enter into action.

The impact fuse which is secured to the partition wall a^2 is also prevented from coming into action in spite of the rearwardly directed shock exerted by the explosion of the shrapnel-charge E on the wall a^2, as the fuse is retained in position by the ring Q. However when the shrapnel-charge explodes and while the projectile body A continues its flight the effect of the rearwardly directed shock exerted on the partition wall a^2 causes the ring Q to snap into the releasing position shown in Fig. 2 and the action of the centrifugal force then causes the retaining balls P to move in an extremely short time out of the path of the primer-bolt N thereby releasing the primer-bolt. The fuse is therefore active immediately after the explosion of shrapnel-charge and on impact of the projectile body A the fuse therefore effects detonation of the shell-charge D also in case the bursting point lies very low, which for instance is the case when shielded batteries are fired at. Ineffective shots are therefore prevented in an effective manner.

On impact firing the charge J which consists of a high-explosive is caused to become detonated by the impact fuse immediately after the impact of the projectile. As the charge J is connected with the shell-charge D by the tube K the detonation of the shell-charge D takes place at the same time. In that case the impact fuse M m^2 N does not come into action.

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

1. A projectile having a base chamber, a shrapnel-charge in said base chamber, a shell-charge adapted to remain in the projectile-shell after explosion of the shrapnel-charge, an impact fuse for the shell-charge, and means for retaining the impact fuse in its inactive position until explosion of the shrapnel-charge takes place; said retaining means being adapted to be withdrawn by the rearwardly directed shock exerted upon the projectile-shell by the explosion of the shrapnel-charge.

2. A projectile having a base chamber, a shrapnel-charge in said base chamber, a shell-charge adapted to remain in the projectile-shell after explosion of the shrapnel-charge, an impact fuse for the shell-charge, and means for retaining the impact fuse in its inactive position until explosion of the shrapnel-charge takes place; said retaining means being adapted to be withdrawn by the rearwardly directed shock exerted upon the projectile-shell by the explosion of the shrapnel-charge; said retaining means comprising movable locking members interposed between the relatively movable members of the fuse, and a ring movable longitudinally of the projectile and holding said locking members in their locking position; said ring being located nearer to the base of the projectile when in the retaining position than when in the releasing position.

The foregoing specification signed at Barmen, Germany, this 18th day of September, 1909.

FRIEDRICH ZIEGENFUSS. [L. S.]

In presence of—
OTTO KÖNIG,
CHAS. J. WRIGHT.