

E. SCHNEIDER.
FUSE FOR EXPLOSIVE PROJECTILES.
APPLICATION FILED APR. 19, 1909.

969,497.

Patented Sept. 6, 1910.

4 SHEETS—SHEET 1.

Fig. 1.

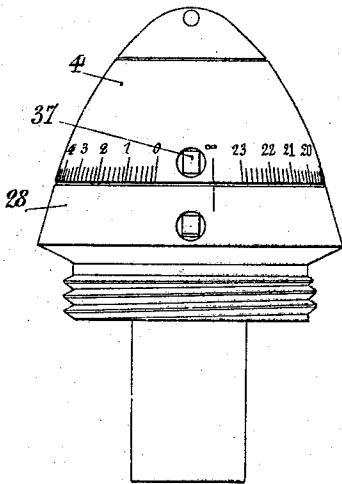


Fig. 3.

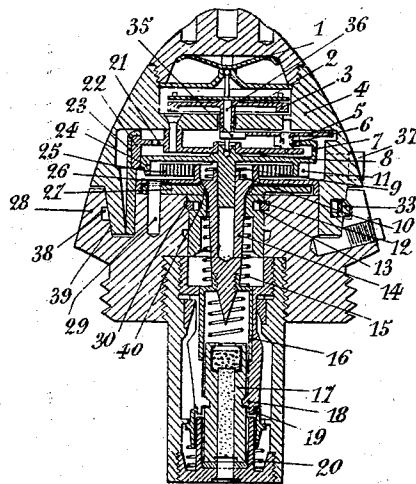


Fig. 2.

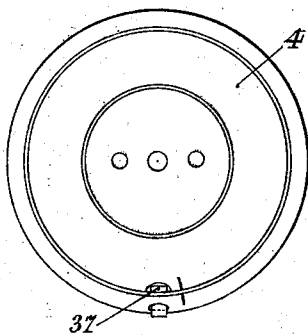
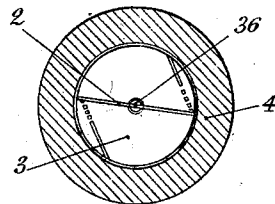


Fig. 8.



Witnesses:

Ruth C. Fitzhugh.
M. A. Hood.

Inventor:

Eugene Schneider.

by

Mauro Cameron, Lewis & Mason.
Atty's.

E. SCHNEIDER.
FUSE FOR EXPLOSIVE PROJECTILES.
APPLICATION FILED APR. 19, 1909.

969,497.

Patented Sept. 6, 1910.

4 SHEETS—SHEET 2.

Fig. 5.

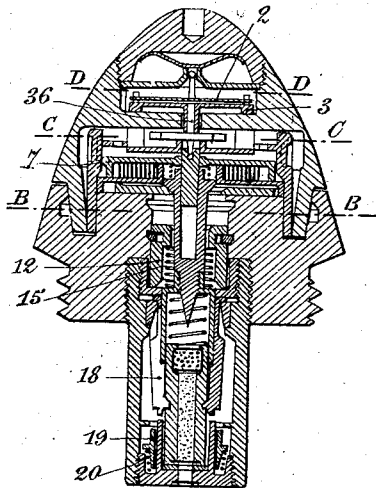


Fig. 4.

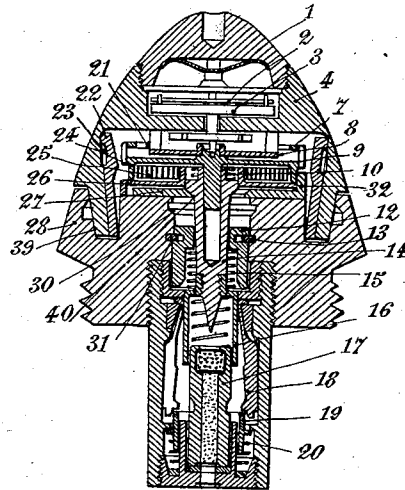


Fig. 6.

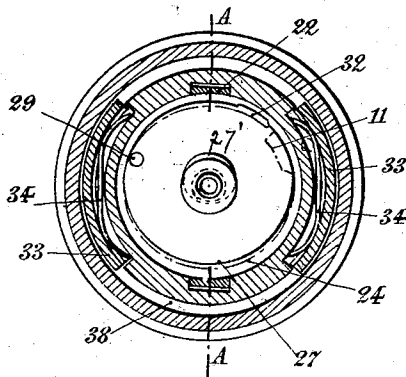
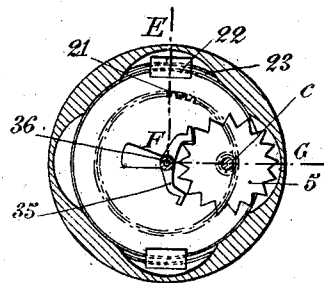


Fig. 7.



Witnesses:

Ruth C. Fitzhugh.
M. A. Hood.

Inventor:

Eugene Schneider.

by

Mauro, Cameron, Lewis & Harris,
Attys.

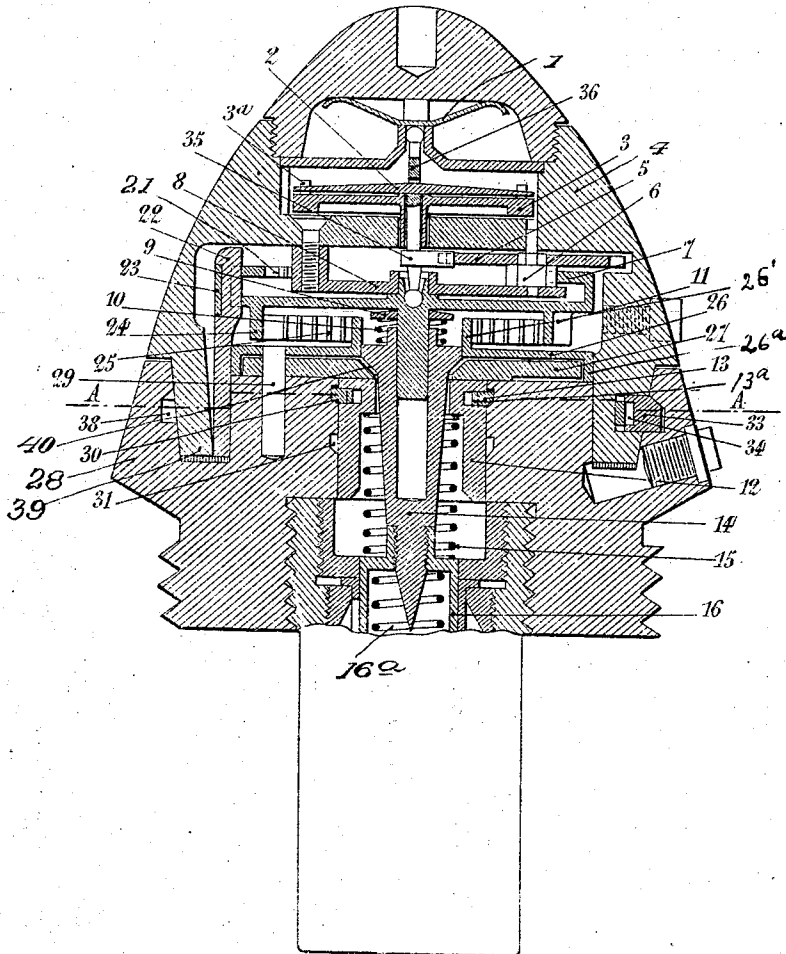
E. SCHNEIDER.
FUSE FOR EXPLOSIVE PROJECTILES.
APPLICATION FILED APR. 19, 1909.

969,497.

Patented Sept. 6, 1910.

4 SHEETS—SHEET 3.

Fig. 9.



Witnesses:
Frederick A. Holtan
Charles B. Kramm

Inventor
Eugene Schneider
by
Mauro, Gurnea, Lewis & Davis
Attorneys

E. SCHNEIDER.
FUSE FOR EXPLOSIVE PROJECTILES.
APPLICATION FILED APR. 19, 1909.

969,497.

Patented Sept. 6, 1910.

4 SHEETS—SHEET 4.

Fig. 10.

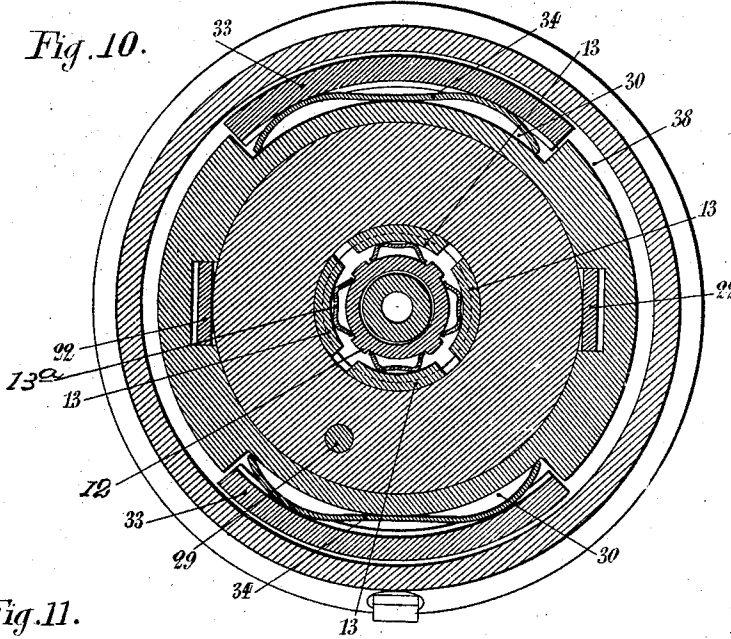


Fig. 11.

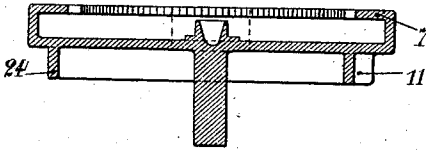


Fig. 12.

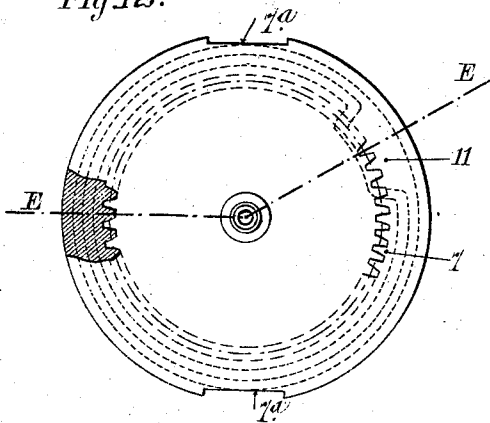


Fig. 13.

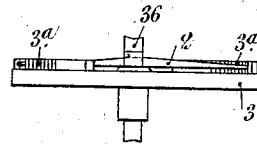
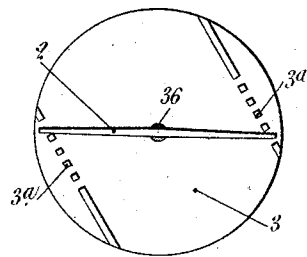


Fig. 14.



Witnesses:-

Friedrich A. Holtzer
Charles B. Kennedy

Inventor.

Eugene Schneider
by
Mauro, Cameron, Linn & Mason
Attorneys.

UNITED STATES PATENT OFFICE.

EUGENE SCHNEIDER, OF LE CREUZOT, FRANCE.

FUSE FOR EXPLOSIVE PROJECTILES.

969,497.

Specification of Letters Patent. Patented Sept. 6, 1910.

Application filed April 19, 1909. Serial No. 490,874.

To all whom it may concern:

Be it known that I, EUGENE SCHNEIDER, residing at Le Creuzot, Saône et Loire, France, have invented new and useful Improvements in and Relating to Fuses for Explosive Projectiles, which is fully set forth in the following specification.

This invention relates to fuses of the double acting type generally known as combined time (or distance) and percussion fuses and relates particularly to those in which the regulation is effected by clock-work.

According to this invention a cocking ring forming a safety device for locking the striker when the projectile is being handled prior to firing bears against a spring which rests upon a projection on the said striker. By the shock of discharge when firing takes place, this ring is forced by inertia out of engagement with a recess in the body of the fuse into a similar recess more remote from the cap, during which movement the spring of the striker is compressed leaving the said striker in a cocked position and retained only by a stop member which forms part of the regulating mechanism. This construction permits of arranging all the parts around an axial striker and of utilizing the latter as a step bearing for the drum of the regulating mechanism.

In order that the said invention may be more clearly understood and readily carried into effect, the same will now be more fully described with reference to the accompanying drawings, in which:—

Figure 1 is a side elevation of the fuse. Fig. 2 is a plan of the same. Fig. 3 is a vertical section on the line E—F—G of Fig. 7 showing the mechanism in its inoperative position prior to firing. Fig. 5 is a section on the line A—A of Fig. 6, the parts being represented in the position they occupy on shock of discharge. Fig. 4 is a similar section in which the parts are represented in the position they occupy when the projectile leaves the gun and is subject to the action of centrifugal force. Figs. 6, 7 and 8 are cross sections on the lines B—B, C—C and D—D respectively of Fig. 4. Fig. 9 is an enlarged detail view of a portion of Fig. 3. Fig. 10 is a transverse sectional view on the line A—A of Fig. 9. Figs. 11, 12, 13 and 14 are enlarged details.

The timing mechanism contained in the cap 4 is composed of a drum 7 pivoted on

the axis of the fuse in a recess formed in the interior of the striker 14 and supported vertically between a bridge 8 and a washer 9 which rests upon a spiral spring 10 bearing upon a collar on the striker.

The revoluble drum 7 is provided with a depending crown or flange 24 having a re-entering portion 11. To the flange 24 one end of a spiral actuating spring 25 is secured, the inner end of said spring being secured to a hub 26' on plate 26, which is made fast to the body of the fuse 28 by a pin 29. Plate 26 is also provided with a depending flange 26^a which does not, however, extend around the complete circumference of the plate. Below plate 26 is a disk 27 which is adapted to swing on pivot 29 eccentrically located to the axis of the striker 14. Disk 27 is provided with a centrally located oblong opening 27' through which the head of striker 14 normally projects, the inclined shoulder 40 of the head bearing against the edge portion of the disk 27 surrounding the said opening. On the outer periphery of disk 27 is a nose 32 which extends upward past the edge of plate 26 and outside of revoluble crown 24 against the periphery of which it normally rests to prevent disk 27 from rotating on its pivot 29 to release the head of striker 14, while the latter is in safety position.

The drum 7 on its upper side is provided with an internally toothed rack 21 which engages a pinion 6 (Figs. 3 and 7) keyed on the shaft of an escapement wheel 5, which coöperates with a detent 35 (Fig. 7) on a vertical spindle 36. A governing fly-wheel 3 is loosely mounted upon this spindle and is connected to the detent 35 by a spring 2, the ends of which are held between projections 3^a on the wheel. Bolts 22 held in notches 7^a in the drum 7 by springs 23 prevent release of the drum under action of spring 25. Spring 1 serves as an elastic stop for the vertical spindle 36.

The striker 14 is provided at its lower end with a socket 16 containing a spring 16^a normally pressing against a pellet 17 carrying the priming material. The pellet 17 is held in safety position before firing by centrifugally operated hooks 18 engaging notches in said pellet, the lower ends of the hooks being held by a locking ring 19 normally held in locking position by a spring 20.

For the purpose of locking the striker

during handling, a cocking ring 12 is provided, which is concentric with the axis of the striker 14 and is provided with an annular recess for receiving beveled segments 13 which are pressed outward by springs 13^a and are thereby forced to engage a recess 30 when the cocking ring is in safety position, and to engage a recess 31 when the ring is in cocked position.

15 is a spring retained between the cocking ring 12 and the striker 14 to actuate the latter when the spring is placed under compression at the time of discharge of the projectile. The cocking ring when in safety position, as shown in Fig. 3, affords a barrier to the downward movement of the striker.

The cap 4 is provided with graduations and a regulating pin 37 (Figs. 1 and 2), and is held upon the body of the fuse 28 by two segments 33 (Figs. 3, 6 and 10) pressed by springs 34 and situated in a circular recess 38 in the said body of the fuse. These segments permit of rotation of the cap for regulating the time for firing of the fuse.

When the projectile is fired, the movable part 4 centered upon the body of the fuse by a cone 39 becomes locked owing to its inertia and prevents any displacement of the cap 4 as a result of the rotation of the projectile.

The operation of the device as thus far described is as follows: Assuming that the projectile is ready to be fired, the parts are in the position shown in Fig. 3. The striker 14 is held in safety position both by engagement of its head with plate 27 which is locked against rotation and can only be released by operation of the time-mechanism, and also by cocking ring 12, which can move only when the shell is fired. The striker is also prevented from moving forward under action of its spring 15 by engagement of the end of the sleeve 16 with the centrifugally operated arms 18, which in turn have their ends locked by spring-pressed ring 19. On shock of discharge the inertia of cocking ring 12 causes displacement of the beveled segments 13 from recess 30. The spring 15 is thereby compressed and held compressed by engagement of segments 13 in recess 31. The striker 14 however retains its initial position under the locking action of plate 27. At the time of discharge spring 20 is compressed by the inertia of ring 19, thereby preparing arms 18 for action by centrifugal force due to rotation of the projectile in the gun bore. Under the action of inertia at the time of discharge, the drum 7 acts against the tension of spring 10 and rests upon plate 26, and the regulating fly-wheel 3 bears upon the bottom of its recess, thereby holding these parts against rotation during the period of

acceleration. Centrifugal force acting in its turn separates the arms of the hooks 18 and the vertical bolts 22, as indicated in Fig. 5. When acceleration of the projectile is completed the drum 7 and the governing fly wheel 3 resume their original position under the action of spring 10. The drum 7 is now actuated by its spring 25 and its movement is regulated by the escapement device which is actuated through rack 21 on drum 7, thereby rotating escapement wheel 5. This wheel engages detent 35 fast on the spindle 36, on which is loosely mounted fly-wheel 3, which is connected with the detent through spring 2, at the same time the spring 20 forces ring 19 to its original position and prevents return of the arms 18, Fig. 5. When the depression 11 in the crown 24 of drum 7 arrives opposite nose 32, the head of striker 14 actuated by its spring 15 forces disk 27 to rotate on its pivot 29, and thereby permits the head to pass through the slotted opening 27'. The striker is now freed and plunges against the primer. The time elapsing between the discharge of the projectile and the moment of its explosion is thus made to depend on the amount of rotation necessary to be given the drum 7 to bring the depression 11 opposite the nose 32. The fuse is also capable of acting by percussion in the usual manner, in which event the primer 17 will advance on the striking pin by being carried forward by its own inertia.

It will thus be seen that the cocking ring 12 serves in the inoperative condition illustrated in Fig. 3 as the principal safety member for the retention of the striker while on shock of discharge the segments 13 being forced by said ring from the recess 30 into the recess 31, the said ring compresses the spring 15, which is then in a position to cause the striker to force back its retaining member 27 as soon as the nose 32 has fallen into the depression 11, the said striker then striking the priming.

The regulation of the time of explosion of the projectile is obtained by the displacement of the regulating cap 4 relatively to the body of the fuse. During its rotation the regulating cap carries with it the barrel 7, which is held by the bolts 22 and the depression 11 of the drum is thus displaced relatively to the nose 32 of the disk-bolt of the striker.

The fuse when adjusted to ∞ (Fig. 1) will act as a percussion fuse, the pellet carrying the priming on impact of the projectile then moving against the striker which is held stationary.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a fuse of the character described, the combination of a spring actuated striker adapted to move into firing position under

action of said spring, means normally retaining said striker in inoperative position which on shock of discharge moves into position to compress said spring and cock said striker, other means for restraining said striker from movement and timing mechanism adapted to release said means after a predetermined interval of time and to permit said striker to advance into firing position.

2. In a fuse of the character described, the combination of a spring actuated striker adapted to move into firing position under action of said spring, a cocking ring in operative relation with said striker, spring pressed means normally holding said ring and striker in inoperative position, said ring being adapted under action of shock of discharge to move into position to compress the striker spring and cock said striker, and timing mechanism adapted to release said striker after a predetermined interval of time and to permit said striker spring to advance the striker into firing position.

3. In a fuse of the character described, the combination of a spring actuated striker adapted to move into firing position under the action of said spring, means normally retaining said striker in inoperative position which on the shock of discharge moves into position to compress the striker spring and cock said striker, other means for retaining said striker after the operation of said first named means, timing mechanism normally restraining said second means and centrifugally actuated releasing means for said timing mechanism.

4. In a fuse of the character described, the combination of a spring actuated striker adapted to move into firing position under the action of said spring, means normally retaining said striker in inoperative position which on the shock of discharge moves into position to compress the striker spring and cock said striker, other means for retaining said striker after the operation of said first named means, timing mechanism normally restraining said second means and centrifugally actuated releasing means for said timing mechanism, and means subject to acceleration of projection for restraining the timing mechanism from operation.

5. In a fuse of the character described, the combination of a fuse body having a conical end recess, a fuse cap having a cone-shaped end adapted to be received in said recess, clock mechanism in said cap for determining the time of explosion of the projectile, and means for rotating said cap to set said clock mechanism, said cap and fuse body being adapted to move into wedging engagement with each other on shock of firing to prevent further relative movement of said two parts.

6. In a fuse of the character described, the combination of a spring-pressed striker

movable in the line of the axis of the projectile and having a shoulder; a pivotally-mounted disk having an oblong opening for receiving said striker and adapted to movably lock the latter in inoperative position and means for releasing said disk after a predetermined interval after firing.

7. In a fuse of the character described, the combination of a spring-actuated striker movable in the line of the axis of the projectile, a cocking ring concentric with said striker normally retaining said striker out of firing position, spring-controlled segments normally engaging recesses in the body of the fuse and adapted to be released therefrom on the shock of discharge to engage other recesses in said fuse, thereby cocking said striker and mechanism for releasing said striker to move into firing position after a predetermined interval of time.

8. In a fuse of the character described, the combination of a striker movable in the line of the axis of the projectile, a spring and a cocking ring normally holding said striker out of firing position and adapted on shock of discharge to compress said spring to cock said striker, an eccentrically pivoted disk engaging said striker to hold it out of firing position after cocking of the striker and timing mechanism for disengaging said disk and striker to permit the latter to move into firing position.

9. In a fuse of the character described, the combination of a spring-actuated striker, means normally holding said striker out of firing position and adapted on shock of discharge to cock said striker, other means holding said striker out of firing position after said discharge, clock mechanism for releasing said holding means after a predetermined interval of time, and centrifugally actuated release means for said clock mechanism.

10. In a fuse of the character described, the combination of a spring-actuated striker, means normally holding said striker out of firing position and adapted on shock of discharge to cock said striker, other means holding said striker out of firing position after shock of discharge, clock mechanism for releasing said last named holding means after a predetermined interval of time, said clock mechanism being inoperative during the action of an accelerating force imparted to the projectile and centrifugally actuated release means for said clock mechanism.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EUGENE SCHNEIDER.

Witnesses:

DEAN B. MASON,
J. DES PORTS.