

E. SCHNEIDER.
PERCUSSION FUSE FOR EXPLOSIVE PROJECTILES.
APPLICATION FILED AUG. 17, 1911.

1,016,368.

Patented Feb. 6, 1912.

2 SHEETS—SHEET 1.

Fig. 3.

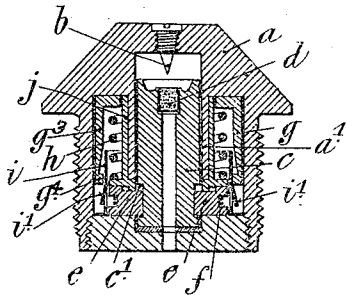


Fig. 4.

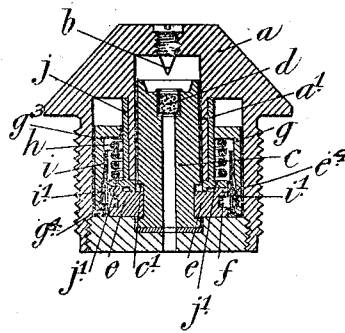


Fig. 5.

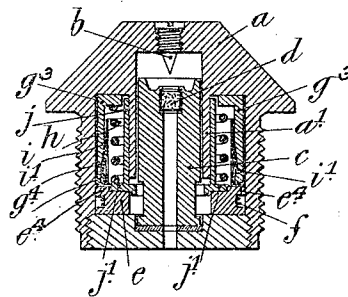


Fig. 1.

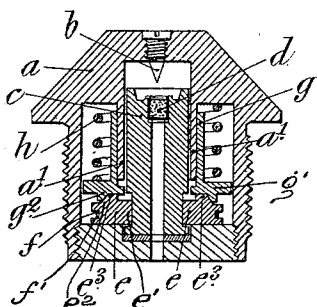
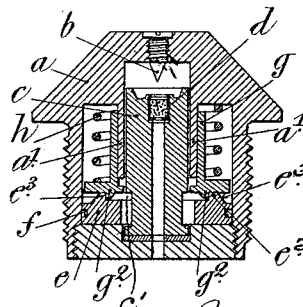


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 6.

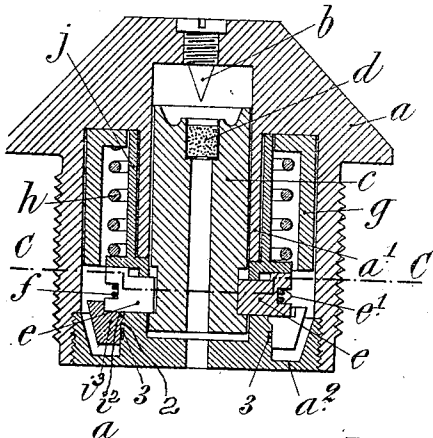


Fig. 7.

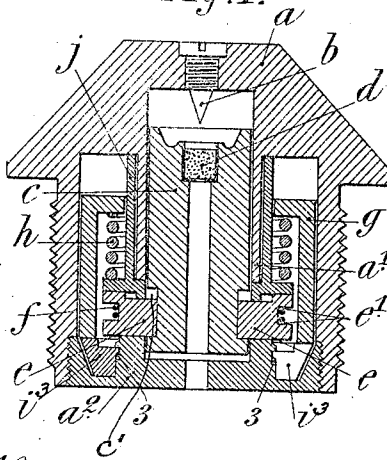


Fig. 10.

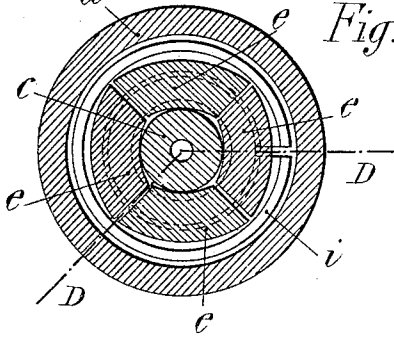


Fig. 8.

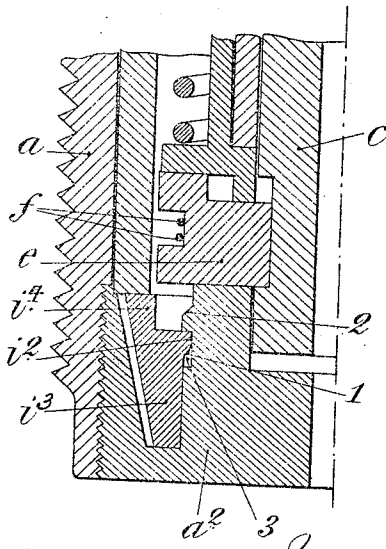
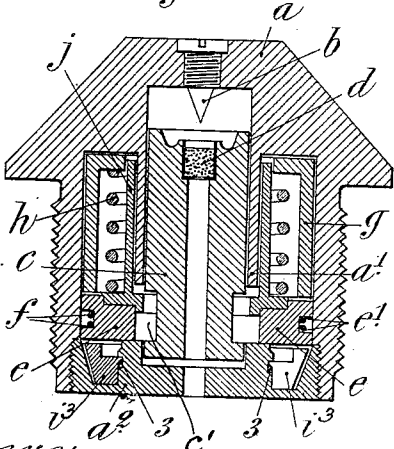


Fig. 9.



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UNITED STATES PATENT OFFICE.

EUGÈNE SCHNEIDER, OF LE CREUZOT, FRANCE.

PERCUSSION-FUSE FOR EXPLOSIVE PROJECTILES.

1,016,368.

Specification of Letters Patent.

Patented Feb. 6, 1912.

Application filed August 17, 1911. Serial No. 644,638.

To all whom it may concern:

Be it known that I, EUGÈNE SCHNEIDER, of Le Creuzot, Saône-et-Loire, France, have invented a new and useful Improvement in Percussion-Fuses for Explosive Projectiles, which is fully set forth in the following specification.

This invention relates to percussion fuses for explosive projectiles and has reference to fuses in which the plunger which is normally prevented from moving by an extensible engaging device is liberated under the influence of centrifugal force which separates the elements of the said engaging device. In the known fuses of this type the elements of the engaging device are liable to separate during transportation under the influence of a lateral shock.

The present invention has for its object a safety device for avoiding similar accidents and is characterized by the fact that it is combined with another ordinary safety device preventing the segments from separating upon firing so long as the projectile has not completed its acceleration, the combination of these two safety devices (safety device during transportation and safety device preventing premature explosion during firing) may, in accordance with the invention, be obtained either by means of a single element or by means of two coöperating elements, the device preventing bursting during firing remaining the only one operative at the proper moment in any case during the acceleration, while the other safety device is rendered inoperative by the first.

Figures 1 and 2 of the accompanying drawing are sectional views illustrating one embodiment of the two combined safety devices in normal position and in the fuse cocked position respectively. Figs. 3, 4 and 5 illustrate a second embodiment of the inventive idea, said views being sectional elevations and showing the parts in three different positions. Figs. 6-10, inclusive, illustrate a third embodiment of the inventive idea; Fig. 6 illustrates the parts of the fuse in the position that they occupy normally and during transportation, the said view being a section on the line D-D of Fig. 10; Fig. 7 illustrates the parts in the position that they assume immediately after firing, and which they retain during the entire period of acceleration, said view being a sectional elevation;

Fig. 8 is a partial section on a larger scale corresponding to Fig. 7; Fig. 9 is a sectional elevation showing the position of the parts after the separation of the segments under the influence of centrifugal force; and Fig. 10 is a section on the line C-C of Fig. 6.

In the known manner the fuse comprises a fuse body *a* in which there are arranged a fixed element (striker or plunger carrying the priming) and a movable element (plunger carrying the priming or striker). In the examples represented by the drawings the striker *b* is supposed to be fixed while the plunger *c* carrying the priming *d* is assumed to be movable. This plunger, the front part of which is guided in a tubular extension *a'* of the fuse body is normally retained in the position shown in Fig. 1 by means of segments *e*. By means of an inner flange *e'* these segments engage in a groove *c'* in the plunger where they are held engaged by a spring *f* common to them all coiled in an external groove *f'* in the said segments.

The elements *e* of the engaging device thus constituted tend to separate under the influence of a lateral shock during transportation and, similarly, during firing they tend to separate as soon as the projectile begins to move, and this separation would result in inopportune or premature firing and bursting. In order to obviate this double inconvenience, in the example illustrated in Figs. 1 and 2 the segments are combined with a safety ring *g*, a flange *g'* of which is subjected to the action of a spring *h* which bears upon the bottom of the fuse body *a*. On its edge *g'* the ring *g* is provided with a collar *g²* the inner surface of which is inclined outward and by means of this surface it bears normally on a corresponding external inclined surface *e³* of a flange *e²* on the segments *e*. Normally the mass of the ring *g* and the action of the spring *h* are added to the effect of the spring *f* so as to maintain the segments *e* united and prevent their separation under the influence of a shock during transportation. On firing, the inertia of the ring *g* contributes to prolong this retention until the moment when the acceleration ceasing, the predominant effect of centrifugal force is sufficient to compress the spring *h* and displace the ring *g*. The flanges *e²* of the segments *e* then engage behind the collar *g²*

thereby preventing any subsequent fortuitous coming together of the separated rings as shown in Fig. 2. It will be seen that in this example the flanged ring $g-g'$ with its counter spring h plays the triple role of a safety ring during transportation, of a safety ring during the acceleration and finally of a member for retaining the segments after their separation under the influence of centrifugal force.

In the embodiment shown in Figs. 3, 4 and 5 the segments e are normally maintained engaged in the groove c' in the plunger c not only by the spring f but also by an additional movable ring i which incloses them, an extension of this ring projecting into a safety ring g^3 subjected to the action of a spring which normally tends to maintain it in the pressed-back or inoperative position Fig. 3. Projecting from its outer face the ring i carries resilient noses i' cut from the metal of the ring. Normally the ring i is prevented from displacement by means of its noses in contact with the ring g^3 .

When the gun is fired the ring g^3 by its inertia assumes the position indicated in Fig. 4; a lower flange g^4 of this ring has then become engaged beneath the noses i' which have yielded upon its passage; consequently the ring g^3 carries with it the ring i when at the end of the acceleration the spring h returns said ring g^3 to its initial position. In this same example the fuse comprises a ring j mounted between the ring g^3 and the tubular extension a' of the fuse body. The spring h bears upon a collar j' (Fig. 4) on this ring which normally rests upon an outer flange e^4 of the segments. When under the influence of centrifugal force the segments e are separated, the flange j' of the ring j is forced by the spring h behind the flanges e^4 and prevents any accidental subsequent coming together of the separated segments. It will be seen that in this example the safety device which is normally constituted by the ring i with noses i' is combined with the safety firing device constituted by the ring g^3-g^4 . Normally the former of these devices is held in place by the second; on firing it is, however, rendered inoperative by the latter which engages and displaces it.

The embodiment illustrated in Figs. 6-10, inclusive, differs from that of Figs. 3, 4 and 5, in that the ring $i-i'$ is replaced by a slit ring i^3 of special construction. Normally an inclined surface 1 on an internal projection i^2 on this ring rests upon a corresponding conical face 2 of the plug a^2 and by means of a forward projection i^4 it embraces the segments e . Its own resiliency maintains it engaged upon the projection 2 during transportation as shown in Fig. 6.

When the projectile is fired the ring g compresses the spring h by inertia and its rear branch in striking the projection i^4 on the ring i^3 forces the latter rearward and causes it to open. On reaching the bottom of the cup provided for it in the plug a^2 the split ring i^3 under the influence of its own elasticity engages by means of its projection i^2 in the groove 3 formed beneath the projection 2 in the plug a^2 (Fig. 8). The ring i is then locked in the position illustrated in Figs. 7 and 8.

When the acceleration is finished the ring g yields and resumes its initial position. The segments e are then able to separate under the influence of centrifugal force and assume the position shown in Fig. 9 in which they release the plunger d carrying the priming.

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

1. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, and a spring-pressed locking element encircling said plunger and holding said segments in engagement with said plunger in one position and out of engagement with said plunger in another position.

2. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, and a movable spring-pressed locking element encircling said plunger and holding said segments in engagement with said plunger in one position and out of engagement with said plunger in another position.

3. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, and a spring-pressed movable locking ring holding said segments in engagement with said plunger in one position and out of engagement with said plunger in another position.

4. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of spring-pressed segments engaging said plunger and movable therefrom under the influence of centrifugal force, and a spring-pressed movable locking ring engaging said segments.

5. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of cen-

trifugal force, a shoulder provided on each segment, and a locking ring associated with said segments and provided with a projection which engages the shoulders on the segments.

5 6. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a shoulder provided on each segment, and a movable spring-pressed locking ring associated with said segments and provided with a projection which engages the shoulders on the segments.

10 7. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking element engaging said segments, a second locking element normally engaging said segments, and means automatically removing the latter from engagement with said segments.

15 8. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking element engaging said segments, a second locking element normally engaging said segments, means automatically removing the latter from engagement with said segments, and means maintaining said second locking element in its disengaged position.

20 In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking element engaging said segments, a second locking element provided with a resilient portion normally engaging said segments, and means automatically removing the latter from engagement with said segment during the flight of the projectile.

25 10. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking element engaging said segments, a second locking element normally engaging said segments, and a movable member operative to remove said second locking element from locking engagement with said segments.

30 11. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence

of centrifugal force, a locking element engaging said segments, a second locking element normally engaging said segments, a movable member operative to remove said second locking element from locking engagement with said segments, and means automatically maintaining said second locking element in its disengaged position.

35 12. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking element engaging said segments, a second locking element normally engaging said segments, and a movable member automatically operated to remove said second locking element from locking engagement with said segments and to maintain said element in its disengaged position.

40 13. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a ring engaging said segments, a second ring normally engaging said segments, and means automatically removing the latter from engagement with said segments.

45 14. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a ring engaging said segments, a second ring normally engaging said segments, means automatically removing the latter from engagement with said segments, and means maintaining said second ring in its disengaged position.

50 15. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking ring engaging said segments, a second ring provided with a resilient portion normally engaging said segments, and means automatically removing the latter from engagement with said segments during the flight of the projectile.

55 16. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking ring engaging said segments, a second ring normally engaging said segments, and a movable member operative to remove said second ring from locking engagement with said segments.

60 17. In combination, a fuse casing, a plunger, a striker mounted on one of said parts

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and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of centrifugal force, a locking ring engaging said segments, a second ring normally engaging said segments, a movable member operative to remove said second ring from locking engagement with said segments, and means automatically maintaining said second ring in its disengaged position.

18. In combination, a fuse casing, a plunger, a striker mounted on one of said parts and a priming on the other, a plurality of segments engaging said plunger and movable therefrom under the influence of cen-

trifugal force, a locking ring engaging said segments, a second locking ring normally engaging said segments, and a movable member automatically operated to remove said second ring from locking engagement with said segments and to maintain said second ring in its disengaged position.

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

EUGÈNE SCHNEIDER

Witnesses:

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R. DE SERELINGER.