

No. 760,046

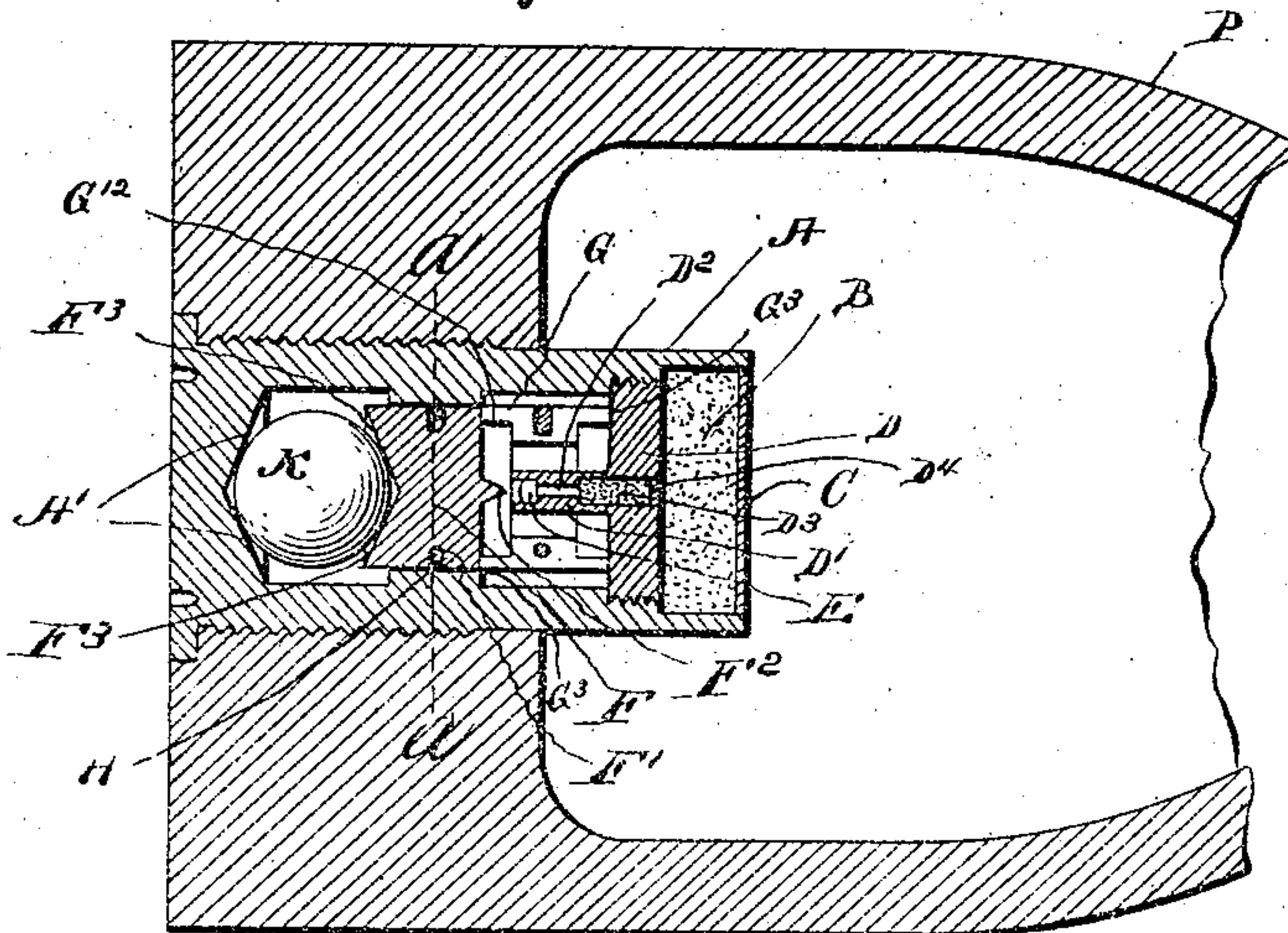
PATENTED MAY 17, 1904.

H. WILSON & A. H. CHASE.
PERCUSSION FUSE.

APPLICATION FILED JULY 30, 1903.

NO MODEL.

Fig. 1.



Thơ. 2.

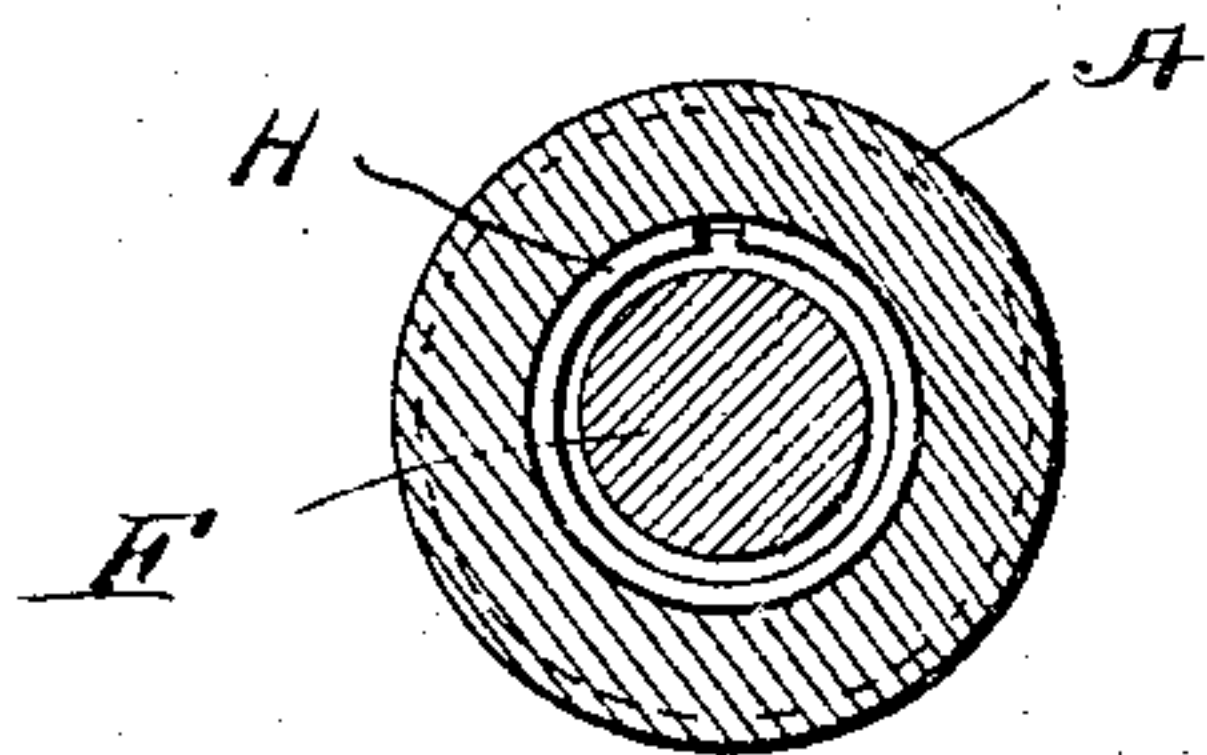


Fig. 3

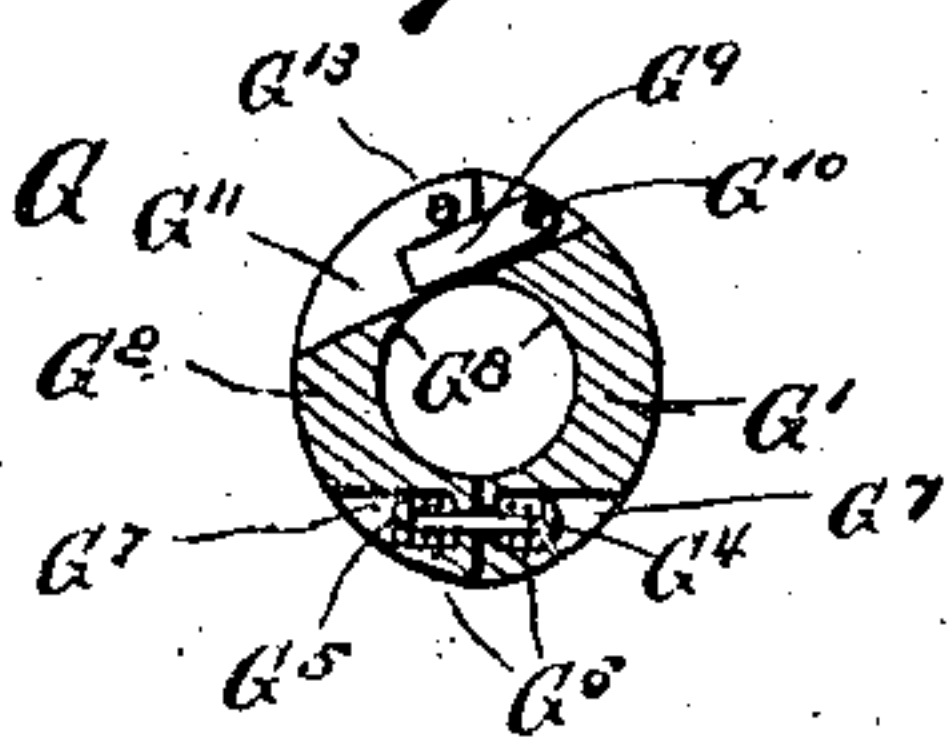


Fig. 4.

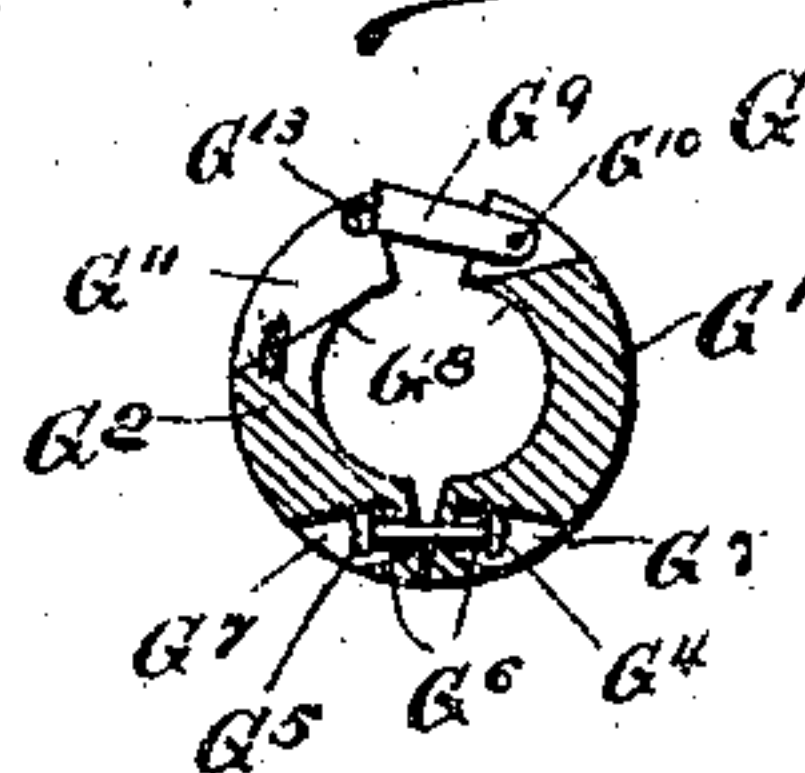


Fig. 5.

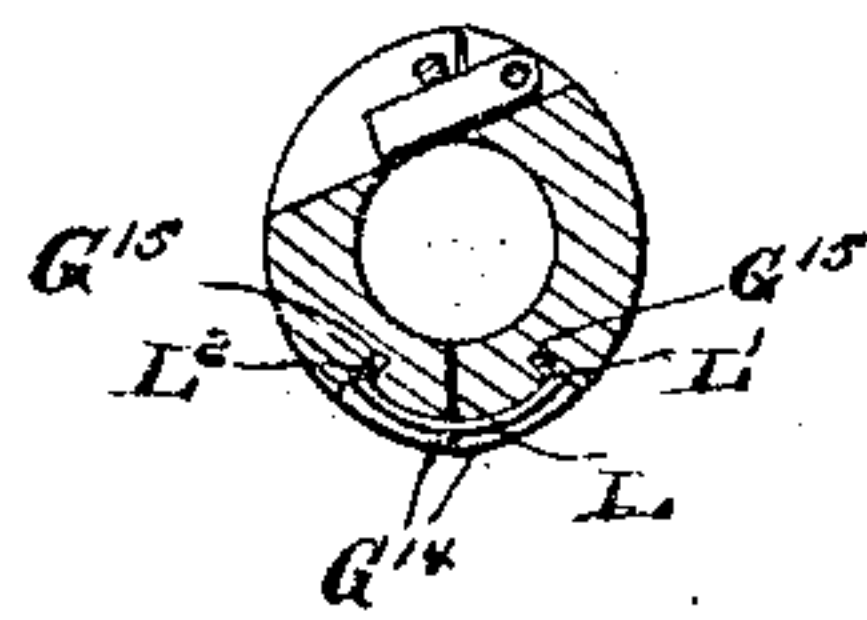
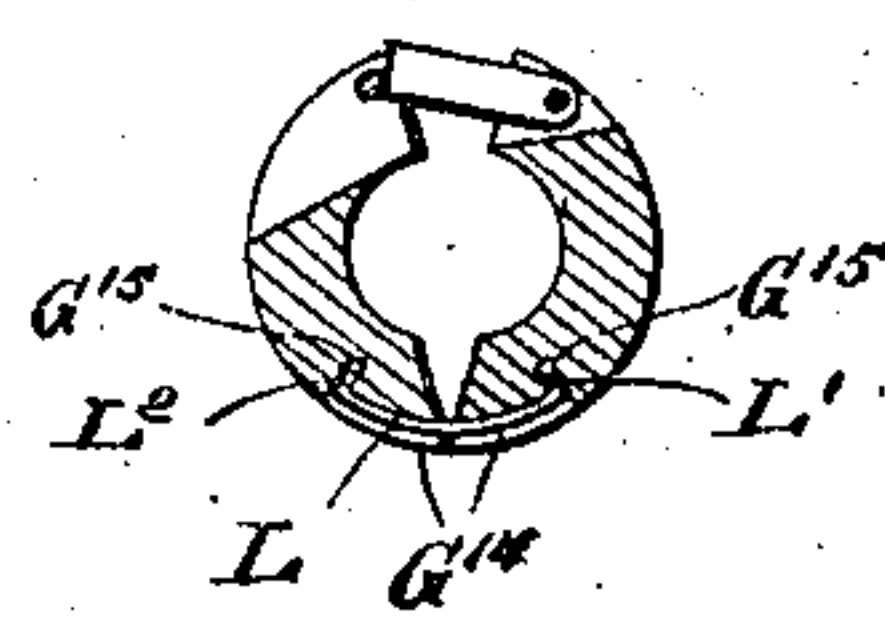


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

HARRY WILSON AND ARTHUR H. CHASE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS TO UNITED STATES ORDNANCE COMPANY, OF WASHINGTON, DISTRICT OF COLUMBIA, A CORPORATION OF VIRGINIA.

PERCUSSION-FUSE.

SPECIFICATION forming part of Letters Patent No. 760,046, dated May 17, 1904.

Application filed July 30, 1903. Serial No. 167,584. (No model.)

To all whom it may concern:

Be it known that we, HARRY WILSON and ARTHUR H. CHASE, citizens of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Percussion-Fuses for Explosive Projectiles, of which the following is a full, complete, and exact description, reference being had to the accompanying drawings.

Our invention relates to that class of fuses in which the percussion element is released only by centrifugal force, such as is due to the rotation of the projectile in flight when fired from a rifled gun.

The object of our invention is to provide a fuse which (when assembled in an explosive-charged projectile) may be safely subjected to the various shocks and accidents liable from transportation and handling and yet which is sufficiently sensitive (when fired in an explosive-charged projectile from a rifled gun) to insure the bursting of the projectile upon sudden retardation of its forward movement, whether such retardation is very marked, such as is the result of direct impact against an object normal to the line of fire, or very slight, such as might result from the lateral slap or graze of the projectile against water or other objects.

We provide an improved, strong, and substantial centrifugal safety-guard which prevents the firing-pin from moving forward at all times except when the projectile is being rotated with great rapidity, such as is imparted to a banded projectile when fired from a rifled gun.

It has been observed that a projectile when fired from a modern gun upon striking the water and ricocheting is appreciably deflected from its proper course and ordinarily misses its target entirely. In our fuse the ball acting upon the cone of the firing-pin fires the primer and explodes the projectile whether the projectile strikes laterally or point first. Of the numerous resulting fragments many are likely to strike the target, causing damage.

To prevent the forward movement of the firing-pin during the flight of the projectile,

(commonly called "creeping,") at which time the centrifugal safety-guard does not retard such forward movement, we provide a split ring normally in tension against the wall of the fuse-body and held within a groove in the firing-pin. This ring is just strong enough to prevent creeping and is not sufficiently strong to retard the firing-pin when the projectile strikes after being fired.

To delay bursting the projectile until it has penetrated the target, we provide a supplemental magazine the mouth of which is sealed by a disk. This magazine contains a slow explosive which gradually exerts sufficient pressure to blow out the disk and explode the main magazine of the fuse.

Figure 1 is a section of the base of a projectile, showing a longitudinal diametrical section of the various parts of our fuse in their normal or safety positions. Fig. 2 is a transverse section through *aa* of Fig. 1. Fig. 3 is a transverse section of the centrifugal safety-guard *G*, showing same in its normal or safety position. Fig. 4 is a similar view of the guard *G*, showing the positions the parts assume during flight of the projectile. Figs. 5 and 6 are similar to Figs. 3 and 4, respectively, showing a modified construction of the guard *G*.

P (see Fig. 1) represents a portion of a projectile fitted with our invention.

A is the fuse-body, having the powder-magazine *B*, the igniting-charge being retained therein by a wad *C*.

D is a plug secured to the body, having a stem *D'*, carrying the cap *E*, and perforated at *D''* to permit the passage of the flame from the cap *E* to the supplemental magazine *D'''*, which contains a slow explosive and which is separated from the magazine *B* by the disk *B'*.

F is a firing-pin grooved at *F'*, having a striking-point *F''*. It is normally retained in the position shown in Fig. 1 by the centrifugal safety-guard *G*.

H is a split ring normally in tension against the wall of the fuse-body and held in the groove *F'* of the firing-pin.

K is a weight, preferably spherical, as shown, loosely supported in the base of the fuse

by the conical seats A' in the fuse-body and F³ in the firing-pin.

The centrifugal safety-guard G is shown more in detail in Figs. 3 and 4. It comprises two curved arms G' G², recessed at front and rear to form flanges G³ and loosely joined together by the bolt G⁴, which has a nut G⁵. Springs G⁶, under the head and nut, respectively, abut against the bottoms of the cavities G⁷. These springs keep the arms G' and G² normally closed, as shown in Fig. 3, and in this position the inner surfaces G⁸ of the arms form an aperture, through which passes the stem D' of the plug D.

G⁹ is a finger loosely pivoted at G¹⁰ in the arm G', normally lying in a slot G¹¹ in the arm G². In this position the aperture between the inner surfaces G¹² of the flanges G³ is smaller than the diameter of the firing-pin F. During rotation in the flight of the projectile, however, centrifugal force is set up in the arms G' G² and they fly apart as far as the walls of the fuse-body will permit. In this position (shown in Fig. 4) the outer surfaces of the arms form a cylindrical surface, as to the inner surfaces G¹² of the flanges G³, and the diameter between the surfaces G¹² is sufficiently great to permit the entrance of the firing-pin F.

When the centrifugal safety-guard G assumes its "armed" position, Fig. 4, the finger G⁹ flies from the slot G¹¹ and engages the pin G¹³, which straddles the slot G¹¹ of the arm G², holding the centrifugal guard G in its armed position against the pressure of the springs G⁶ when the centrifugal force ceases to do so.

A modified construction of the centrifugal safety-guard G is exhibited in Figs. 5 and 6. In this form the bolt G⁴, nut G⁵, and springs G⁶ are replaced by the U-shaped spring L, which has inwardly-projecting nibs L' L² at its ends. This spring snaps into the grooves G¹⁴ in the arms G' G², and the nibs L' L² enter the recesses G¹⁵ in the arms G' G², normally holding the arms in their closed or safety position.

We disclaim as our joint invention, so far as same may contain patentable subject-matter, the following: The combination of a fuse-body, a primer, means mounted in the fuse-body to explode the primer, a spherical plunger movably mounted in the fuse-body independent of the primer-exploding means, and centrifugally-released securing means normally holding the primer-exploding means and plunger in inactive position.

We have described our invention so that one skilled in the art may make it; but we do not limit our invention to these details of construction, which may obviously be varied without departing from the spirit of the invention.

We claim—

1. In a percussion-fuse; the combination of a casing provided with a conical recess in its

rear wall, a firing-pin provided with a conical recess in its rear face, a plunger supported by and retained between the conical recesses in said casing and firing-pin, an igniting-cap and a safety-guard lying loosely in the casing between the firing-pin and cap.

2. In a percussion-fuse; the combination of a casing provided with a conical recess in its rear wall, a firing-pin provided with a conical recess in its rear face, an igniting-cap, safety-guard lying loosely in the casing between the firing-pin and cap and an inertia-operated plunger supported by and retained between the conical recesses in said casing and firing-pin; whereby said plunger acts forwardly on said firing-pin upon either forward or lateral impact.

3. In a percussion-fuse; the combination of a casing provided with a conical recess in its rear wall, a firing-pin provided with a conical recess in its rear face, an igniting-cap, a safety-guard lying loosely in the casing between the firing-pin and cap and a spherical weight loosely supported by and retained between the conical recesses in the casing and firing-pin; said weight being thus adapted to act forwardly on said firing-pin upon either forward or lateral shock.

4. In a percussion-fuse; the combination of a casing provided with a conical recess in its rear wall, a firing-pin provided with a conical recess in its rear face, an igniting-cap, a plunger supported by and retained between the conical recesses in the casing and firing-pin and a separable safety-guard loosely interposed between the firing-pin and cap, means for normally holding said guard together to prevent the firing-pin from engaging with the cap and permitting said guard to open under the influence of centrifugal force to release the firing-pin.

5. In a percussion-fuse; the combination of a casing provided with a conical recess in its rear wall, a firing-pin provided with a conical recess in its rear face, an igniting-cap, a separable safety-guard loosely interposed between the firing-pin and cap, means for normally holding said guard together to prevent the firing-pin from engaging with the cap and permitting said guard to open under the influence of centrifugal force to release the firing-pin and an inertia-operated plunger supported by and retained between the conical recess in said casing and firing-pin; whereby said plunger acts forwardly on said firing-pin upon either forward or lateral shock.

6. In a percussion-fuse; the combination of a casing provided with a conical recess in its rear wall, a firing-pin provided with a conical recess in its rear face, an igniting-cap, a separable safety-guard loosely interposed between the firing-pin and cap, means for normally holding said guard together to prevent the firing-pin from engaging with the cap and permitting said guard to open under the in-

fluence of centrifugal force to release the firing-pin and a spherical weight loosely supported by and retained between the conical recesses in said casing and firing-pin; said weight being thus adapted to act forwardly on said firing-pin upon either forward or lateral shock.

7. In a percussion-fuse; the combination of a casing, a firing-pin movably mounted in the casing, an igniting-cap, a safety-guard lying loosely in the casing between the firing-pin and cap; said guard comprising separable arms, a yielding connection secured to and carried by said arms normally holding them together and permitting said arms to open under the influence of centrifugal force against the action of said yielding connection.

8. In a percussion-fuse; the combination of a casing, a firing-pin movably mounted in the casing, an igniting-cap, a safety-guard lying loosely in the casing between the firing-pin and cap; said guard comprising separable arms, spring-actuated means secured to and carried by the arms normally pressing them together and permitting them to open under the influence of centrifugal force against the action of said spring-actuated means.

9. In a percussion-fuse; the combination of a casing, a firing-pin movably mounted in the casing, an igniting-cap, a safety-guard comprising separate members lying loosely between the firing-pin and cap normally holding the firing-pin from engagement with the cap, a yielding connection secured to and carried by the members of said safety-guard normally holding them together and adapted to be overcome by centrifugal force to permit said members to open and release the firing-pin.

10. In a percussion-fuse; the combination of a casing, a firing-pin movably mounted in the casing, an igniting-cap, a safety-guard comprising separate members lying loosely in the casing between the firing-pin and cap normally holding the firing-pin from engagement with the cap, a yielding connection between the members of the safety-guard normally holding them together and adapted to be overcome by centrifugal force to permit said members to open and release the firing-pin and centrifugally-actuated means carried by the members to prevent their return to normal position when centrifugal force ceases.

11. In a percussion-fuse; the combination of a casing, a firing-pin movably mounted in the casing, an igniting-cap, a safety-guard lying loosely in the casing between the firing-pin and cap; said guard comprising a bifurcated collar, a yielding connection between the segmental members of said collar normally holding them together and permitting said members to open under the influence of centrifugal force against the action of said yielding connection.

12. In a fuse; the combination of a fuse-body, a primer, means mounted in the fuse-

body to explode the primer, a plunger movably mounted in the fuse-body independent of the primer-exploding means, and securing means lying loosely in the casing normally holding said primer-exploding means to prevent the primer from being exploded, said securing means comprising two curved arms normally held together by a yielding connection therebetween and adapted to open under the influence of centrifugal force to release the firing-pin when the gun has been discharged.

13. In a percussion-fuse; the combination of a casing provided with a conical recess in its rear wall, a firing-pin provided with a conical recess in its rear face, an igniting-cap, a safety-guard loosely interposed between said firing-pin and cap and an inertia-operated weight retained between the conical recesses in the casing and firing-pin respectively.

14. In combination with a projectile, a fuse therefor adapted to be inserted centrally of the base of the projectile, comprising a tubular casing, a loosely-mounted plunger in the casing, means mounted in the casing adapted to explode a primer, and a safety device loosely mounted in the casing for normally holding said means to prevent the primer from being exploded, and which when the gun is discharged is unlocked being released entirely by centrifugal force as the projectile is in flight, the plunger moving forward and striking the firing means when the projectile strikes.

15. The combination with a projectile, of a fuse, comprising a casing, a firing-pin, means loosely mounted in the casing engaged by the firing-pin to hold the firing-pin from engagement with the fulminating-cap and when the projectile is in flight to be moved by centrifugal force to release the firing-pin, and means mounted in the casing adapted to strike the firing-pin after the projectile has been impeded in its flight.

16. In a fuse, the combination of a fuse-body, a primer, means mounted in the fuse-body to explode the primer, a plunger movably mounted in the fuse-body independent of the primer-exploding means, and securing means loosely mounted in the fuse-body normally holding said primer-exploding means to prevent the primer from being exploded, said securing means being adapted to be released by centrifugal force after the gun has been discharged.

17. The combination of a fuse-body, a primer supported therein, a firing-pin movably mounted in the fuse-body in operative relation to the primer, a hammer also movably mounted in the fuse-body independent of and in operative relation to the firing-pin, and centrifugally-released securing means loosely mounted in the fuse-body normally holding the firing-pin in its inactive position.

18. The combination of a fuse-body, a primer supported therein, a firing-pin movably

mounted in the fuse-body in operative relation to the primer, a spherical hammer, also movably mounted in the fuse-body independent of and in operative relation to the firing-pin, and centrifugally-released securing means loosely mounted in the fuse-body normally holding the firing-pin in its inactive position.

19. In a fuse for projectiles, the combination of a tubular fuse body or casing adapted to be secured centrally in a projectile, a hammer loosely mounted in the casing, a primer secured in the casing, a firing-pin movably mounted in the casing independently of the

hammer and in operative relation to the primer, and centrifugally-released securing means loosely mounted in the casing normally holding the firing-pin and hammer in inactive position.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HARRY WILSON.
ARTHUR H. CHASE.

Witnesses:

HENRY T. BRIGHT,
A. Y. LEECH, Jr.