W. M. WILHELM & K. RUSHTON.

TIME FUSE FOR EXPLOSIVE PROJECTILES.

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1,242,501.

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Fig. 1.

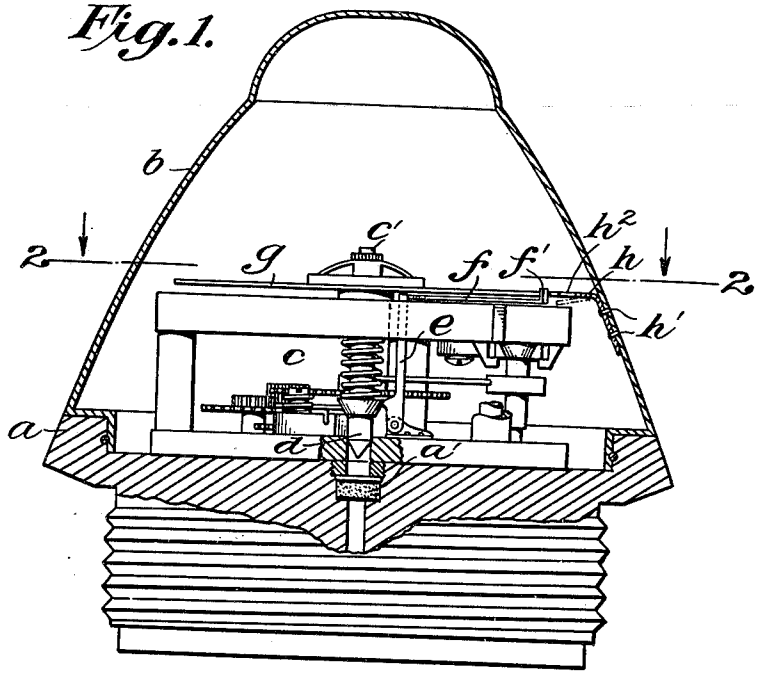
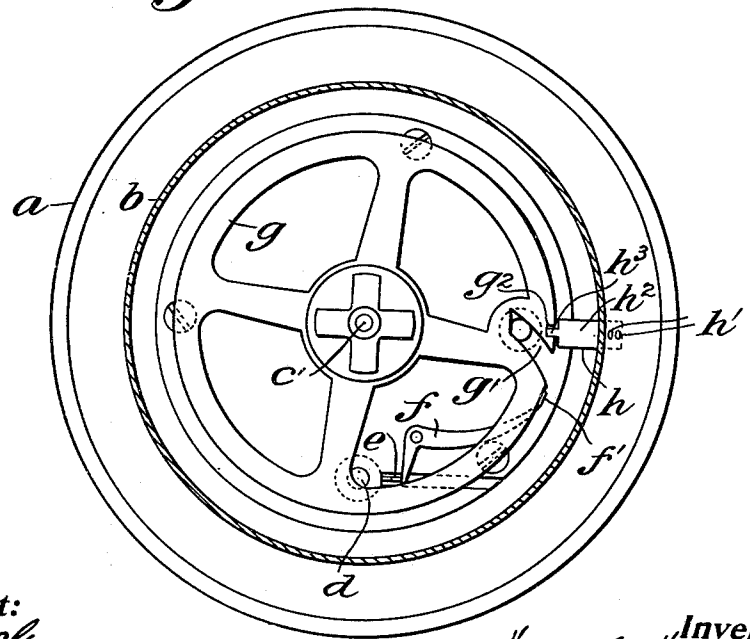


Fig. 2.



Attest:

by

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UNITED STATES PATENT OFFICE.

WALTER M. WILHELM, OF SWARTHMORE, AND KENNETH RUSHTON, OF WYNNEWOOD, PENNSYLVANIA.

TIME-FUSE FOR EXPLOSIVE PROJECTILES.

1,242,501. Specification of Letters Patent. Patented Oct. 9, 1917.

Application filed August 16, 1916. Serial No. 115,159.

To all whom it may concern:

Be it known that we, WALTER M. WILHELM and KENNETH RUSHTON, citizens of the United States, and residing, respectively, at Swarthmore, in the county of Delaware, in the State of Pennsylvania, and at Wynnewood, in the county of Montgomery, in the State of Pennsylvania, have invented certain new and useful Improvements in Time-Fuses for Explosive Projectiles, of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

This invention relates to mechanically controlled time fuses for effecting the explosion of projectiles at predetermined times, in which the time of release of the firing-pin, by which the explosion of the cap or detonator is effected, is controlled by a mechanical device, such as a clock-train, deriving its movement from a spring or other suitable source of power, such as a centrifugally operated device. In time fuses of this general character it is usual to mount the thin metal cap, which covers the clock-train, rotatably on the base of the fuse and to provide between the cap and the controlling disk or wheel which rotates with the time mechanism, a coupling which permits such controlling disk to be set by rotation of the cap for the purpose of determining the exact instant of explosion. In order that the time movement may operate without being impeded by the cap, after the projectile has been fired from the gun, the coupling between the cap and the controlling disk is so arranged that the controlling disk is released, either through the inertia of a relatively movable part at the instant of firing, or through centrifugal action set up by the rotation of the projectile. The present invention is particularly concerned with this coupling and it has for its object to provide an improved coupling which shall operate with certainty to uncouple the cap and the time mechanism at the instant when the projectile is fired from the gun, through the inertia of a relatively movable part, but shall provide the necessary engagement between the cap and the disk for the purpose of setting the disk. The invention will be more fully explained hereinafter with reference to the accompanying drawing in which it is illustrated and in which—

Figure 1 is a view, partly in section and partly in elevation, of a time fuse which embodies the invention.

Fig. 2 is a section on the plane indicated by the line 2—2 of Fig. 1, looking in the direction of the arrows.

The fuse may comprise as usual a base a, adapted to be threaded into the body of the projectile, and a cap b which covers and protects the time mechanism and is mounted rotatably on the base a for the purpose of setting the time mechanism so as to determine the instant when it will act to release the firing-pin. The time mechanism, which may be of any suitable construction, for controlling the release of the firing-pin, is indicated generally at c. A spring-actuated firing-pin d, adapted, when released, to act upon a cap or detonator a', is held in normal position, in the construction shown, by a sear e, pivoted on the lower plate of the time mechanism. A trigger-lever f, pivoted on the upper plate of the time mechanism, coöperates with the sear and with a notched controlling disk or wheel g which is carried frictionally by the time mechanism. The notch g', when presented to the finger f' of the trigger-lever f, permits the same to move so as to release the sear e and the firing-pin d. By rotation of the controlling disk on the staff c' of the time mechanism, on which it is mounted frictionally, the position of the notch g' may be shifted with respect to the position of the finger f' of the trigger-lever f so as to regulate the time which must elapse between the starting of the time mechanism and the release of the firing-pin. For this purpose a coupling is provided between the controlling disk and the rotatable cap b of the fuse. The improved coupling, in which the present invention is embodied, consists of a plate or piece h of relatively thin and soft metal, preferably of soft copper, which is secured to the cap, as by rivets at h', and has its free end h^2 bent substantially into the plane of the controlling disk g and formed to engage the same, so that it shall be rotated with the cap b. Preferably the part h^2 of the coupling has a substantial breadth, both to give it sufficient stiffness in a plane at right angles to the axis of rotation of the cap, and to give it sufficient mass, and is formed at its end with a narrow tongue h^3 to enter a corresponding notch g^2 in the controlling disk g.

When the parts are in their normal relations and the projectile is about to be prepared for firing the cap b is rotated to an extent determined by a given mark. This action effects, through the coupling h, a corresponding rotation of the controlling disk g. When the projectile is placed in the gun and fired, the inertia of the part h^2 of the coupling, of relatively soft metal, such as soft copper, causes the part h^2 of the coupling to be bent rearwardly out of the plane of the controlling disk g', as indicated by dotted lines in Fig. 1. This relative movement of the coupling disengages the coupling from the controlling disk and permits the time mechanism to begin its movement.

We claim as our invention:

1. In a time-fuse for an explosive projectile, the combination of a base, a cap mounted rotatably thereon, a time mechanism supported on the base and comprising a controlling disk, and a coupling member comprising a piece of relatively soft metal fixedly secured at one end to the cap and having its other end bent substantially into the plane of the controlling disk to engage the same normally and to be moved by flexing out of such plane to release the time mechanism through its inertia when the projectile is fired from the gun.

2. In a time fuse for an explosive projectile, the combination of a base, a cap mounted rotatably thereon, a time mechanism supported on the base and comprising a notched controlling disk, and a coupling member comprising a wide piece of relatively soft metal secured at one end to the cap and having its other end bent substantially into the plane of the controlling disk, and provided with a tongue to engage the same normally and adapted to be moved out of such plane to release the time mechanism through its inertia when the projectile is fired from the gun.

This specification signed this 7th day of August A. D. 1916.

WALTER M. WILHELM.
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