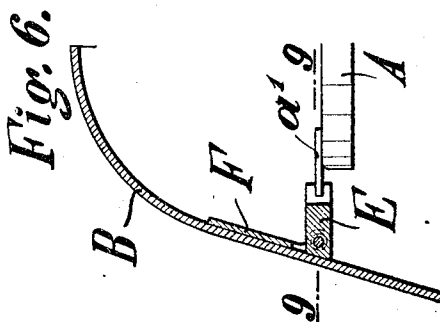
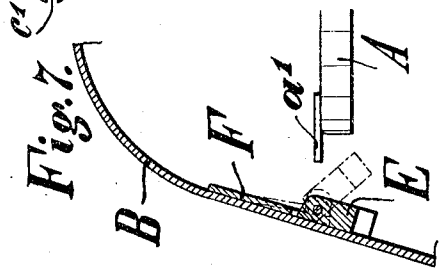
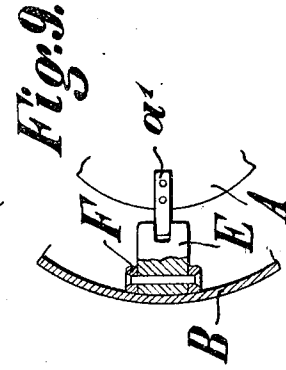
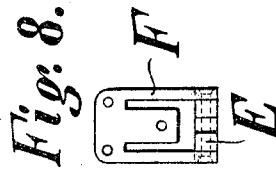
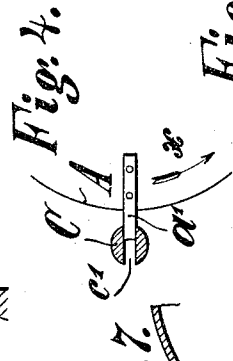
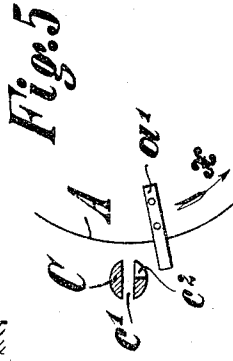
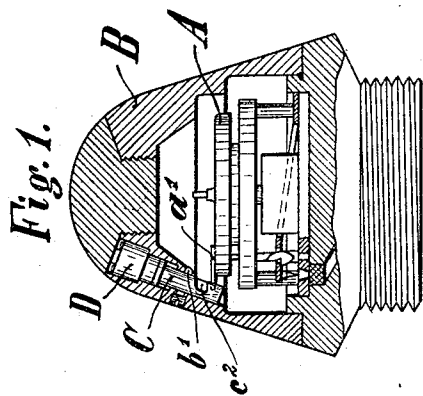
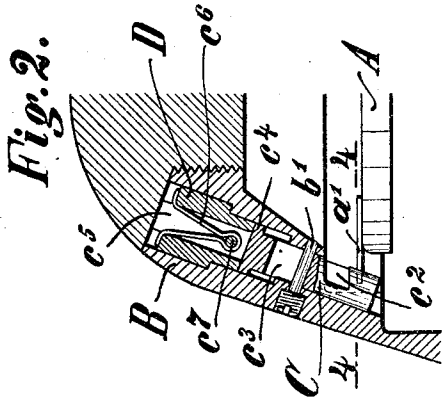
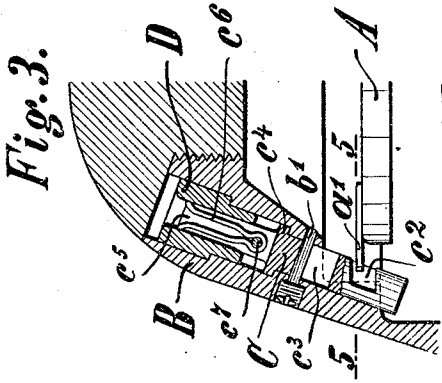


1,003,078.

Patented Sept. 12, 1911.



Witnesses  
 J. W. Skylesop,  
 Ida T. Stanley.

Inventor,  
 Karl Wieser,  
 By *[Signature]*  
 his attorneys.

# UNITED STATES PATENT OFFICE.

KARL WIESER, OF BREDENEY, GERMANY, ASSIGNOR TO FRIED. KRUPP AKTIEN-GESELLSCHAFT, OF ESSEN-ON-THE-RUHR, GERMANY.

## MECHANICAL TIME-FUSE.

1,003,078.

Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed July 1, 1910. Serial No. 569,911.

To all whom it may concern:

Be it known that I, KARL WIESER, a subject of the Emperor of Germany, and a resident of Bredenev, Germany, have invented certain new and useful Improvements in Mechanical Time-Fuses, of which the following is a specification.

This invention relates to mechanical time fuses the setting of which is effected by rotating an external part of the fuse, which external part is connected by a clutch, (which releases itself automatically and acts in both directions of rotation) to a locking disk which determines the instant of the release of the igniting apparatus. In known fuses of this kind the clutch consists of a tongue attached to the locking disk and an inwardly bent flat spring attached to the external part of the fuse, and provided with a slot into which the tongue of the locking disk enters. During the flight of the projectile this spring bends outwardly under the action of centrifugal force and at the same time releases the tongue of the locking disk. The disadvantage of this clutch is that the adjustments of the fuse are easily rendered inaccurate. The spring may stretch or bend inward on the rotation of the outer part of the fuse and according to the direction in which the rotation takes place. When the fuse is set, the revolving external part of the fuse advances beyond the locking disk, by the amount by which the spring has become lengthened or shortened, whereby errors in the setting of the fuse are caused.

Now the object of this invention is to provide for mechanical time fuses of the kind hereinbefore mentioned, a clutch which will enable the fuse to be accurately set by means of the external revolving part thereof. This end is attained, according to this invention, by the use of a clutch in which both that member thereof which is mounted on the locking disk, and the one mounted on the external revolving part of the fuse, is unyielding in the direction of rotation.

In the drawing are shown two constructional forms of a mechanical time fuse constructed according to this invention, and provided with a clockwork movement.

Figures 1 to 5 refer to the first constructional form, and of these figures Fig. 1 is a longitudinal section, (partly in elevation) through the fuse. Figs. 2 and 3 each show,

on a larger scale, a longitudinal section of the fuse in its transport state and after firing respectively. Fig. 4 is a section on the line 4—4 of Fig. 2 and Fig. 5 is a section on the line 5—5 of Fig. 3. Figs. 6 to 9, which are drawn to the same scale as Figs. 2 to 5, refer to the second constructional form, and of these figures Figs. 6 and 7 show sections corresponding to Figs. 2 and 3. Fig. 8 is a detail, and Fig. 9 is a section on the line 9—9 of Fig. 6 looking from above.

The first constructional form of the invention will be described first.

A denotes the locking disk which determines the instant of the release of the igniting apparatus, and can be rotated by the clockwork in the direction of the arrow  $x$ . (see Figs. 4 and 5), and B is the external revolving part of the fuse which is made in the shape of a cap. The cap B is coupled to the locking disk A by a tongue  $a^1$  attached to the locking disk A, and projecting radially beyond the periphery of the locking disk, and which, when the fuse is in the transport state, enters without lateral play into a slot  $c^1$  (see Fig. 4) in a bolt C which is movably mounted in the cap B in the manner shown in the drawing. Both the tongue  $a^1$  and the limb of the fork formed by the slot  $c^1$  are made of such a strength that they do not yield in the direction of rotation when the cap is rotated. One limb of the fork is provided with a lateral opening  $c^2$ , through which the tongue  $a^1$  can emerge when the bolt C is in the position shown in Fig. 3, and when the locking disk rotates in the direction of the arrow  $x$  (see Fig. 5).

Above the slot  $c^1$  the bolt C has a longitudinal hole  $e^3$ , (see Figs. 2 and 3) through which a pin  $b^1$  screwed into the cap B passes, and prevents the bolt C from rotating. The movement of the bolt is limited in both directions by a collar  $e^4$ , which in the transport position of the fuse bears against the lower end of a sleeve D rigidly inserted in the cap B and receiving the upper end of the bolt. In the stem of the bolt, which is surrounded by the sleeve, is cut a slot  $e^5$ , which contains a V-shaped bent spring  $e^6$ . This latter is attached to the bolt C by means of a pin  $e^7$ . Its upper laterally bent ends bear, in the transport position of the fuse, upon the upper end of the

sleeve D, and thus prevent any movement of the bolt C during transport.

Since both the tongue  $a^1$  and the bolt C do not yield in the direction of rotation of the cap B the locking disk will be rotated, during the adjustment of the fuse made by rotating the cap B, through exactly the same angle as the cap B, so that errors cannot arise in the setting of the fuse.

On firing, the bolt C moves into the position shown in Fig. 3 under the action of inertia. At the same time the spring  $c^3$  contracting is withdrawn into the sleeve D, and the opening  $c^2$  in the bolt comes in front of the tongue  $a^1$  of the locking disk A. At the same time the clockwork comes into action, and causes the locking disk A to rotate in the direction of the arrow  $x$  (see Fig. 5). This can take place unhindered as the tongue  $a^1$  can now emerge from the slot  $c^1$  in the bolt C through the opening  $c^2$ .

The second constructional form of the fuse shown in Figs. 6 to 9 differs from the first one only by the formation of the member of the clutch mounted on the cap B. This member consists of a lever E, which is mounted on the free end of a flat spring F secured to the cap B and forms one limb of a trip catch. The free end of the lever E is forked (see Fig. 9). The limbs of the fork embrace, when the fuse is in the transport position (see Fig. 6), the tongue  $a^1$  of the locking disk A of the fuse without lateral play, and, like the corresponding parts of the bolt C in the first constructional form, are made of such a strength that they will not yield in the direction of rotation of the cap B. The front of the other end of the lever lies, in the transport state of the fuse, snugly against the inner wall of the cap B.

Since the cap B and locking disk are unyieldingly coupled in the direction of rotation of the cap by the lever E and the tongue  $a^1$ , no errors in the setting of the fuse can arise in the second constructional form either.

On firing the lever is tilted downward under the action of inertia. The flat spring F is at the same time first lifted from the wall of the cap, and then approaching the wall of the cap again, forces the lever, after it has overstepped the tilting position, (see Fig. 7, dotted position), into the position shown in Fig. 7 by full lines, in which the lever releases the locking disk A.

What is claimed is:—

1. A mechanical time primer having an outer part for effecting adjustment, a rotatable member which effects the release of the priming mechanism and a non-yielding coupling between the rotatable member and said outer primer part said coupling comprising a slidable bolt forwardly inclined at an acute angle to the longitudinal axis of the fuse, carried by the outer primer part and

adapted to be released through inertia on firing to disconnect the coupling and permit of rotation of the rotary member.

2. A mechanical time-primer having an outer primer part for effecting adjustment, a rotatable member which effects the release of the priming mechanism, and a non-yielding coupling between the rotatable member and said outer primer part, said coupling comprising a slidable bolt carried by the outer primer part and adapted to be released through inertia on firing to disconnect the coupling and permit of rotation of the rotary member.

3. A mechanical time-primer having an outer primer part for effecting adjustment, a rotatable member which effects the release of the priming mechanism, and a non-yielding coupling between the rotatable member and said outer primer part, said coupling comprising a forked and slidable bolt carried by the outer primer part, and having one of its fork members provided with a lateral opening, and a tongue carried by the rotatable member adapted to engage within said fork and hold the rotatable member against rotation, said bolt adapted to be released through inertia on firing and bring the lateral opening of the fork member adjacent the tongue to disconnect the coupling and permit of rotation of the rotary member.

4. A mechanical time-primer having an outer primer part for effecting adjustment, a rotatable member which effects the release of the priming mechanism, and a non-yielding coupling between the rotatable member and said outer primer part, said coupling comprising a slidable bolt carried by the outer primer part, and having a lateral opening, a part carried by the rotatable member adapted to engage with the bolt and hold said rotatable member against rotation, said bolt adapted to be released through inertia on firing to bring the lateral opening thereof in position adjacent the rotatable member part and permit of rotation of the rotatable member, and a pin passing transversely through the bolt and holding the same against rotation and determining the extent of its movement.

5. A mechanical time-primer having an outer primer part for effecting adjustment, a rotatable member which effects the release of the priming mechanism, and a non-yielding coupling between the rotatable member and said outer primer part, said coupling comprising a casing mounted within an aperture in the outer priming part, a forked bolt slidable within the casing, a spring carried by the bolt and adapted to engage with the casing and hold said bolt in position, a tongue carried by the rotatable member and adapted to engage within the fork of the bolt and hold the rotary member against

rotation, one of the fork members having a lateral slot adapted to permit of the release of the tongue from the bolt, said bolt adapted to disconnect its engagement with the casing through the inertia of the bolt on firing, and bring the slot portion adjacent the tongue and permit of rotation of the rotary member.

The foregoing specification signed at Bar-men, Germany, this 14th day of June, 1910.

KARL WIESER. [L. s.]

In presence of—  
CHAS. J. WRIGHT,  
WALTER VONNEGUT.