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SELF-DESTROYING FUZE FOR ROTATING PROJECTILES

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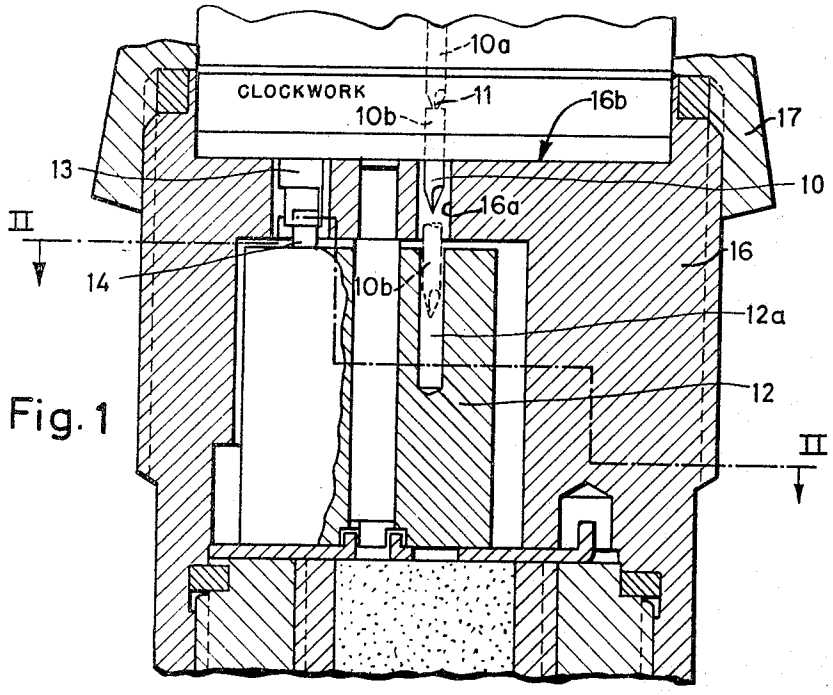
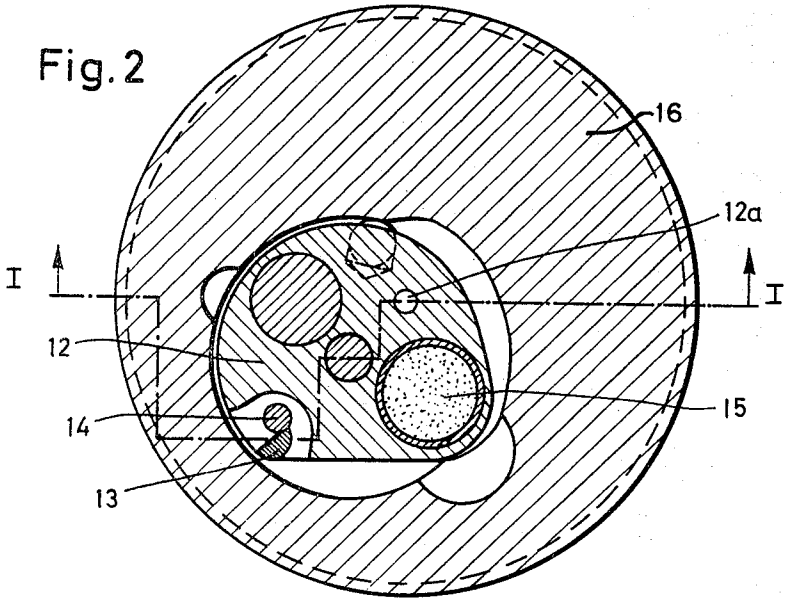


Fig. 1

Fig. 2



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SELF-DESTROYING FUZE FOR ROTATING PROJECTILES

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4 Claims. (Cl. 102—71)

The invention relates to an improvement of the safety of self-destroying fuzes for rotating projectiles.

Such fuzes are already known which have a clockwork-operated automatic self-destroying device and a time control for a detonator cap safety slide which is located behind the clockwork mechanism and behind the firing pin. The detonator cap safety slide, also called the rotor, is constructed as detonator cap holder centrifugal swing slide and carries eccentrically the primer capsule besides having a known eccentric blind bore which, when the rotor is in rest position, is located behind the firing pin. Its object is to arrest the firing pin and jam it with the rotor if the projectile should unintentionally fall on its point and the firing pin be driven through the rotor. If the clockwork mechanism is then involutarily released, the rotor remains in the safety position with the firing pin driven through it.

However it sometimes happens that, when the projectile falls in this manner, the fuze cap is torn off with the clockwork mechanism and the primer thereby pulled forward out of the locked rotor. The rotor can then swing into its live position and open the ignition path. Accidental ignition would then be possible, although highly undesirable.

The object of the invention is to avoid this objection. It ensures that the rotor is maintained in locked state in any case. This is attained according to the invention in that the firing pin has at a place preceding its point and which is still in front of the front face of the rotor when the firing pin is locked, a predetermined breaking zone which is the weakest zone of the whole needle, where the firing pin breaks off when the fuze cap is torn off and the firing pin pulled out therewith, so that the point of the firing pin remains sticking in the rotor and continues to secure it against turning into the live position.

The invention is illustrated by way of example in the accompanying drawings which show only the parts which are necessary for understanding the invention,

FIG. 1 being a longitudinal section through the fuze and rotor taken on line I—I of FIG. 2, and

FIG. 2 a cross section taken on line II—II of FIG. 1.

Behind the axial firing pin **10** the pellet holder swing slide **12** constructed as a known rotor, is located as detonator cap safety slide. Eccentric therein are the primer pellet **15** and a known blind bore **12***a*. In the locking or safety position the firing pin pellet is maintained displaced behind the firing pin **10** and the blind bore **12***a* behind the firing pin **10**. The rotor **12** is held in locking or safety position in known manner by a locking pin **14** in that this pin engages the control shaft **13** rotated by the clockwork mechanism and is released thereby after a certain time has elapsed. This construction of the fuze is known and does not constitute part of the invention.

The point of the firing pin **10** has, at a place which is still located in front of the front end face of the rotor **12** when the firing pin has entered the blind bore **12***a* of the rotor, a breaking zone, which is the weakest place of the whole firing pin and is formed for example by a notch or nick.

Now if, when the rotor **12** is in locking or safety position, the projectile should fall on its point and the firing pin **10** is struck through, the firing pin will be caught by entering the blind bore. If it does not jam, it can again withdraw from the blind bore **12***a* when the fuze will again be in firing state.

If, however, the projectile drops with such force that—as sometimes happens—the fuze cap and the clockwork mechanism are torn off, the penetrating firing pin point will be pulled forward with such violence that it breaks off at the weak zone and remains in the rotor. As the broken off piece projects forward out of the face of the rotor, the rotor cannot turn into its live position in which the firing path is clear.

As clearly shown in FIG. 1, the clockwork mechanism may be provided above a surface **16***b* in a depression in the top of the element **16** in which the rotor **12** is provided. The cap **17** for the fuze is screw-threaded on the member **16** and, as shown, the firing pin **10** is provided with the breaking zone **11** between the parts **10***a* and **10***b*. The element **16** is also provided with a bore **16***a* through which the firing pin will extend.

What is claimed is:

1. Fuze for projectiles, comprising a housing consisting of a cap and a base portion with a penetrating axial bore in the base portion, a firing pin which is mounted axially movable into the bore so that its front end prior to the impact of the projectile is located at the front opening of the axial bore of the base portion, and that its back end reaches up into the area of the cap of the fuze housing, a clock mechanism-self-destroying device in the base portion of the fuze, a cylindrical rotor mounted in the base portion of the fuze housing and which is rotatable around an axis which is eccentric and parallel to the fuze axis, means to turn the rotor from a rest position into a firing position, a primer capsule provided in the forward front surface of the rotor so that in a rest position it is located outside and in a firing position it is located in the firing axis and in the path of the inner end of the firing pin, means partly on the clock mechanism and partly on the rotor to hold the rotor in the rest position during a predetermined return time of the clockwork, said rotor having a blind hole in the forward front surface thereof which in the rest position of the rotor is located below a point of the firing pin whereby the depth of the blind hole and its diameter are maintained at a size large enough so that the blind hole can receive and hold a portion of the firing pin, said pin having a weakened section therein which is the weakest part of the entire firing pin with the weakest part provided at such a distance from the point of the firing pin that in the case of an impact of the projectile on the point of the fuze, while the rotor is still in rest position and in the case of a subsequent tearing off of the cap, said firing pin is driven into the blind hole with its front end jamming into the blind hole and thus said firing pin will break at the weakest part, thereby the cap together with its part of the firing pin remain as a torn off section, while the part of the firing pin that is wedged in the rotor is of a length so that a portion thereof will still project from the front surface of the rotor and will find a support against any rotation of the rotor at a fixed part of the base portion of the housing.

2. Fuze according to claim **1**, in which between the cap part and the base portion of the housing, an intermediate surface is provided on the base portion and having a bore hole therein for penetration by the firing pin.

3. Fuze for projectiles, comprising a housing consisting of a cap and a base portion with a penetrating axial bore in the base portion, a firing pin which is mounted axially movable into the bore so that its front end prior

to the impact of the projectile is located at the front opening of the axial bore of the base portion, and that its back end reaches up into the area of the cap of the fuze housing, a clock mechanism-self-destroying device in the base portion of the fuze, a cylindrical rotor mounted in the base portion of the fuze housing and which is rotatable around an axis which is eccentric and parallel to the fuze axis, means to turn the rotor from a rest position into a firing position, means partly on the clock mechanism and partly on the rotor to hold the rotor in the rest position during a predetermined return time of the clockwork, said rotor having a blind hole in the forward front surface thereof which in the rest position of the rotor is located below a point of the firing pin whereby the depth of the blind hole and its diameter are maintained at a size large enough so that the blind hole can receive and hold a portion of the firing pin, said pin having a weakened section therein which is the weakest part of the entire firing pin with the weakest part provided at such a distance from the point of the firing pin that in the case of an impact of the projectile on the point of the fuze, while the rotor is still in rest position and in the case of a subsequent tearing off of the cap, said firing pin is driven into the blind hole with its front end jamming into the blind hole and thus said firing pin will break at the weakest part, thereby the cap together with its part of the firing pin remain as a torn off section, while the part of the firing pin that is wedged in the rotor is of a length so that a portion thereof will still project from the front surface of the rotor and will find a support against any rotation of the rotor at a fixed part of the base portion of the housing.

4. Fuze for projectiles, comprising a housing consisting of a cap and a base portion with a penetrating axial bore in the base portion, a firing pin which is mounted axially movable into the bore so that its front end prior to the impact of the projectile is located at the front opening of the axial bore of the base portion, and that its back end reaches up into the area of the cap of the fuze housing, a clock mechanism-self-destroying device in the base portion of the fuze, a cylindrical rotor mounted in the base portion of the fuze housing and which is rotatable around an axis which is eccentric and parallel

to the fuze axis, a primer capsule provided in the forward front surface of the rotor so that in a rest position it is located outside and in a firing position it is located in the firing axis and in the path of the inner end of the firing pin, means partly on the clock mechanism and partly on the rotor to hold the rotor in the rest position during a predetermined return time of the clockwork, said rotor having a blind hole in the forward front surface thereof which in the rest position of the rotor is located below a point of the firing pin whereby the depth of the blind hole and its diameter are maintained at a size large enough so that the blind hole can receive and hold a portion of the firing pin, said pin having a weakened section therein which is the weakest part of the entire firing pin with the weakest part provided at such a distance from the point of the firing pin that in the case of an impact of the projectile on the point of the fuze, while the rotor is still in rest posiiton and in the case of a subsequent tearing off of the cap, said firing pin is driven into the blind hole with its front end jamming into the blind hole and thus said firing pin will break at the weakest part, thereby the cap together with its part of the firing pin remain as a torn off section, while the part of the firing pin that is wedged in the rotor is of a length so that a portion thereof will still project from the front surface of the rotor and will find a support against any rotation of the rotor at a fixed part of the base portion of the housing.

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