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(54) Mechanism for a munition device.

(57) Mechanism for a muniton device. The mechanism includes a housing (1) containing an arming element (3) and a spindle (9) capable of giving the arming element an axial movement. The spindle (9) is operatively connected to the arming element (3) via a conveyor means (10) which has a thread profile (12), the conveyor means being pivotally journalled in the arming element such that it is able to be turned between a first position (Figures 1 and 2), wherein the thread profile (12) is in engagement with the spindle (9), to a second position (Figures 4 and 7) wherein the thread profile (12) of the conveyor means is disengaged from the spindle. Spring means (4, 13), are arranged, in the armed position of the conveyor means, to return the arming element to said engagement with the movable member.

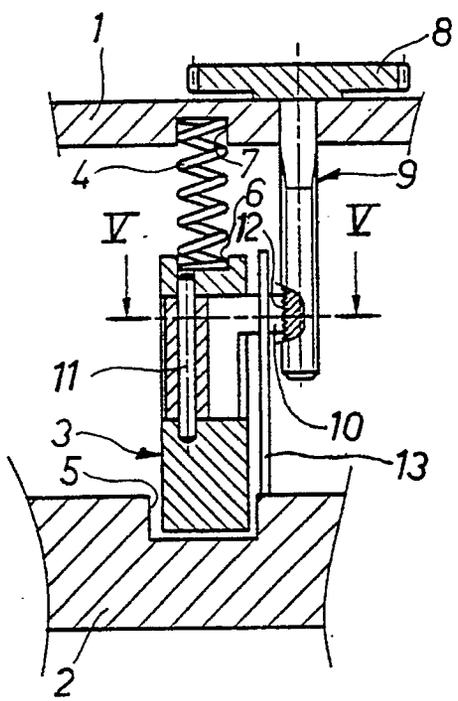

FIG. 1

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MECHANISM FOR A MUNITION DEVICE

TECHNICAL FIELD

The present invention relates to a mechanism for a munition device, including a housing with an arming element, a rotatable spindle for transmission of a rotary movement in a first direction of rotation of the spindle to an axial movement of the arming element, and a movable member, for instance being part of a timing mechanism, the movable member being for instance a rotor, which may be in the form of a detonator block, the arming element being axially movable between a safe position, in which it is in engagement with the movable member such that the latter is unable to move, and an armed position, in which the arming element is disengaged from the movable member so that the latter is able to move. The invention relates particularly, but not exclusively, to a mechanism for arming and disarming of a munition device in the form of an anti-tank mine.

BACKGROUND PRIOR ART

Such mechanisms are previously known from for instance US-A-3,066,605. The known mechanisms are either uncapable of being disarmed, or are able to perform such disarming act only by using a large amount of energy, often by means of a complicated structure.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a mechanism of the kind indicated by way of introduction, which enables a disarming or neutralization of the mechanism with the use of only minimal forces.

This object will be achieved by providing the mechanism in accordance with the invention with the characterizing features set forth in Claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in further detail below with reference to the accompanying drawings, which illustrate a preferred embodiment of the invention.

Figure 1 is a sectional view of a portion of a mechanism in accordance with the invention in a safe position. Figure 2 illustrates the same sectional view as Figure 1, but with the mechanism in an armed position. Figure 3 illustrates a partial sectional view taken along the line III-III of Figure 4 of an alternative embodiment of the mechanism shown in Figure 2. Figure 4 shows the mechanism in accordance with Figure 2 in a position wherein a disarming of the mechanism has started. Figures 5-7 show a sectional view along the line V-V of Figure 1, VI-VI of Figure 2, and VII-VII of Figure 4, respectively.

PREFERRED EMBODIMENT

In Figure 1 there is shown a portion of a housing 1 for an anti-tank mine incorporating a mechanism according to the invention. The mechanism includes a partially shown movable member 2 incorporated in a timing mechanism not shown, the member 2 being in the form of a rotor, for instance, which may, for instance, constitute a detonator block having a detonator which, in a predetermined angular position (armed position) of the detonator housing is aligned with a firing train in a way generally known and therefore not shown. The mechanism according to the invention also includes a substantially elongated arming element 3 being axially movable against the action of a helical spring 4, below referred to as the return spring, from a safe position, shown in Figure 1, to an armed position, shown in Figure 2. In its safe position the arming element 3 engages a mating recess 5 in the movable member 2 such that this is retained in the safe position shown in Figure 1. The return spring 4 is biassed between a recess 6 in the arming means and a recess 7 in the housing 1. A starwheel 8, which is controlled by a motor not shown, is rigidly connected to one end of a threaded spindle 9 being rotatably journalled in the housing 1. The spindle 9 is, via a thread connection 10-12, operatively connected to the arming element 3 such that a rotary movement of the spindle 9 will transmit an axial movement to the arming element 3.

The thread connection consists of the thread of the spindle 9 and of a conveyor means in the form of a conveyor plate 10. The conveyor plate 10 has one end pivotally journalled on a shaft 11 which is journalled in the arming element 3. Another end of the conveyor plate 10 is provided with a thread profile 12 mating with the thread profile of the spindle. In the safe position, see Figure 1, a strip spring 13, below referred to as the control spring, holds the thread profile 12 of the conveyor plate into engagement with the thread of the spindle 9. In this position the control spring 13 urges the conveyor plate 10 against a stop means 14 (see Figure 5) in the arming element 3. Thus, the return spring 4 and the control spring 13 will form return means for returning the arming element 3 from an armed to a safe position when a disarming or neutraliza-

tion of the mechanism is desired.

The engagement between the thread profile 12 of the conveyor plate and the thread of the spindle 9 is dimensioned to give such a friction between the conveyor plate and the spindle during its rotation in a first direction of rotation, see arrow 15 in Figure 6, that a rotary force will act on the conveyor plate in order to retain the conveyor plate 10 in a very firm engagement with the spindle 9.
The function of the mechanism is as follows.

In order to arm the mechanism, the spindle 9 is turned in the direction of arrow 15 (Figure 6) by means of the above mentioned motor, not shown, to which it is connected via the starwheel 8. The thread profile 12 of the conveyor plate will now function as a threaded nut, and will move axially along the spindle 9. The arming element 3 will be conveyed by the conveyor plate 10 and will then bias the return spring 4 sunch that energy for any later disarming act will be stored therein. The friction between the conveyor plate 10 and the spindle 9 will, as has been mentioned above, give a rotary force on the conveyor plate, such that the latter will be retained in engagement with the spindle. The positon of the arming element 3 is detected in a predetermined point of its movement by means of sensor means, not shown, and the motor (not shown) is stopped when the arming movement (Figure 2) has been completed.

If a disarming or neutralization of the mechanism is to be carried out, the motor will be driven in a reverse direction of rotation, see arrow 16 in Figure 7, a short distance. The friction between the conveyor plate 10 and the spindle 9 will now give the conveyor plate a rotary force which turns the latter out of engagement with the spindle (see Figures 4 and 7). The arming element 3 is now entirely released from the spindle and is, by means of the return spring 4, brought back into engagement with the movable member 2, i.e. to the safe position shown in Figure 1. The control spring 13 will simultaneously bring the conveyor plate 10 again into engagement with the spindle 9. The mechanism is thus brought back to its starting position.

In an alternative embodiment, a wedge element 17, see Figure 3, is arranged in the arming element 3 in the way of the conveyor plate. In this alternative embodiment, a disarming act may be accomplished by continuing to drive the motor in its original direction of rotation. The wedge element 17 will then urge the conveyor plate 10 out of engagement with the spindle 9, whereupon the return and control springs will bring the mechanism back to the starting position in the same manner as in the first embodiment.

Although the return means 4 and 13 are shown as springs it is conceivable within the scope of the invention to alternatively design them as electromagnetic means.

Claims

1. Mechanism for a munition device, including a housing (1) with an arming element (3), a rotatable spindle (9) for transmission of a rotary movement in a first direction of rotation (15) of the spindle to an axial movement of the arming element, and a movable member (2), for instance being part of a timing mehanism, the movable member being for instance a rotor, which may be in the form of a detonator block, the arming element being axially movable between a safe position (Figure 1), in which it is in engagement with the movable member (2) such that the latter is unable to move, and an armed position (Figure 2), in which the arming element is out of engagement with the movable member (2) so that the latter is able to move, **characterized** in that the arming element (3) and the spindle (9) are interconnected by a thread connection (10-12) which is able to open in order to release the arming element from the spindle, return means (4, 13) being arranged to return the arming element, when this is released, to said engagement with the movable member in order to accomplish a disarming of the mechanism.

2. Mechanism according to claim 1, **characterized** in that the thread connection (10-12) is able to open as a result of a turning of the spindle (9) in a second direction of rotation (16).

3. Mechanism according to claim 1 or 2, **characterized** in that the thread connection has a thread on the spindle (9) and a conveyor means (10) in the arming element, the conveyor means having a thread profile (12), the conveyor means being journalled in the arming element such that it can be turned between a first position (Figures 1 and 5), in which the thread profile of the conveyor means is in engagement with the threaded spindle, to a second position (Figures 4 and 7), wherein the thread profile of the conveyor means is disengaged from the threaded spindle.

4. Mechanism according to Claim 3, **characterized** in that the arming element has a stop means (14) in order to prevent the conveyor means from being turned by the spindle (9) past said first position, the engagement between the thread profile (12) of the conveyor means and the spindle (9) being

dimensioned to give such a friction between the conveyor means and the spindle during the turning of the spindle in the first direction of rotation that a turning force on the conveyor means will be obtained, which will retain the conveyor means in firm engagement with the spindle in a rotation position defined by the stop means.

5. Mechanism according to any preceding claim, **characterized** in that the return means consists of spring means (4, 13).

6. Mechanism according to any of the claims 3 - 5,
characterized by a wedge means (17) arranged in the arming means (3) which in a predetermined relative position between the conveyor means (10) and the spindle urges the conveyor means to disengage from the spindle, if the spindle is turned in the first direction of rotation past the predetermined relative position.

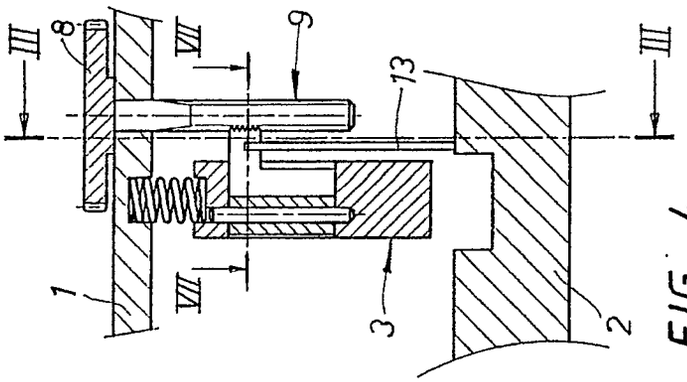

FIG. 4

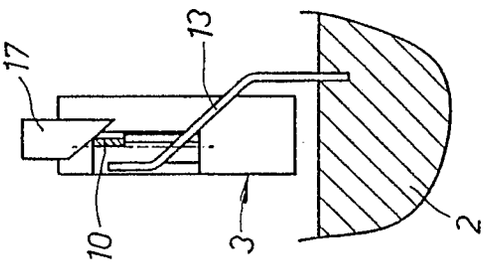

FIG. 3

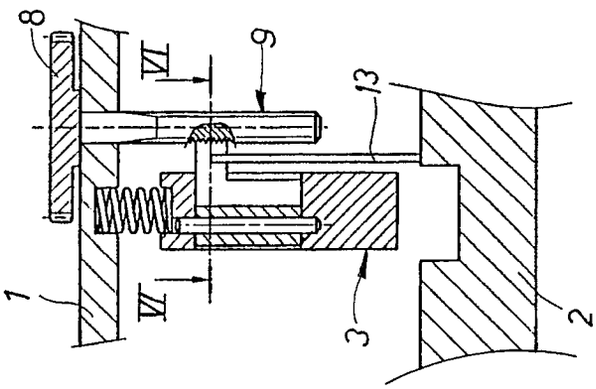

FIG. 2

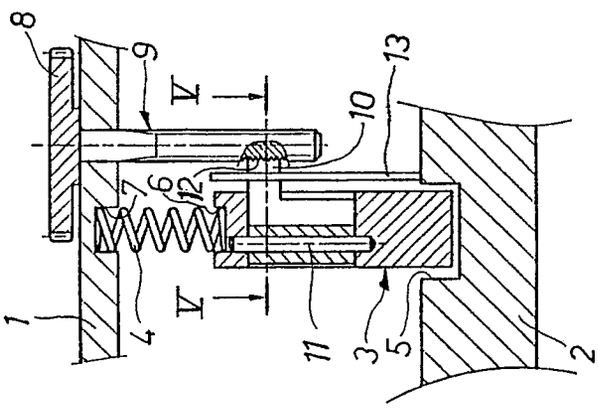

FIG. 1

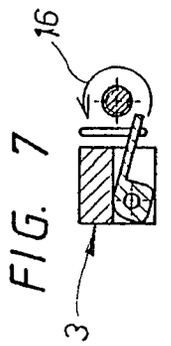

FIG. 7

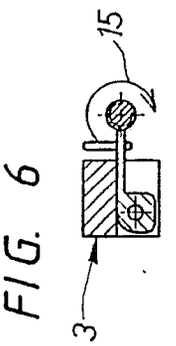

FIG. 6

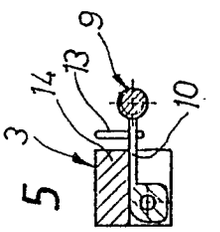

FIG. 5