(12) UK Patent Application (19) GB (11) 2 074 642 A

(21) Application No **8111681**
(22) Date of filing **13 Apr 1981**
(30) Priority data
(31) **8009389**
(32) **25 Apr 1980**
(33) **France (FR)**
(43) Application published
**4 Nov 1981**
(51) **INT CL³**
**F16B 21/00**
(52) Domestic classification
**E2A** 423 CAM
(56) Documents cited
**GB 1322142**
**GB 1317752**
**GB 1317725**
(58) Field of search
**E2A**
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(54) **Fastener device**

(57) A fastener device comprises an element having a head portion 3 which is movably mounted in a sleeve 4 and a body portion 1 having two parallel slots (9) for engagement with respective resilient limbs 8. As shown, limbs 8 are engaged in the slots to fasten together members A and B. By rotating the element through a quarter turn the limbs are disengaged from the slots (Fig. 2 not shown) and a compression spring 5 urges head portion 3 outwards to move apart members A and B. Undesirable return of the element to its locked position is thus prevented.

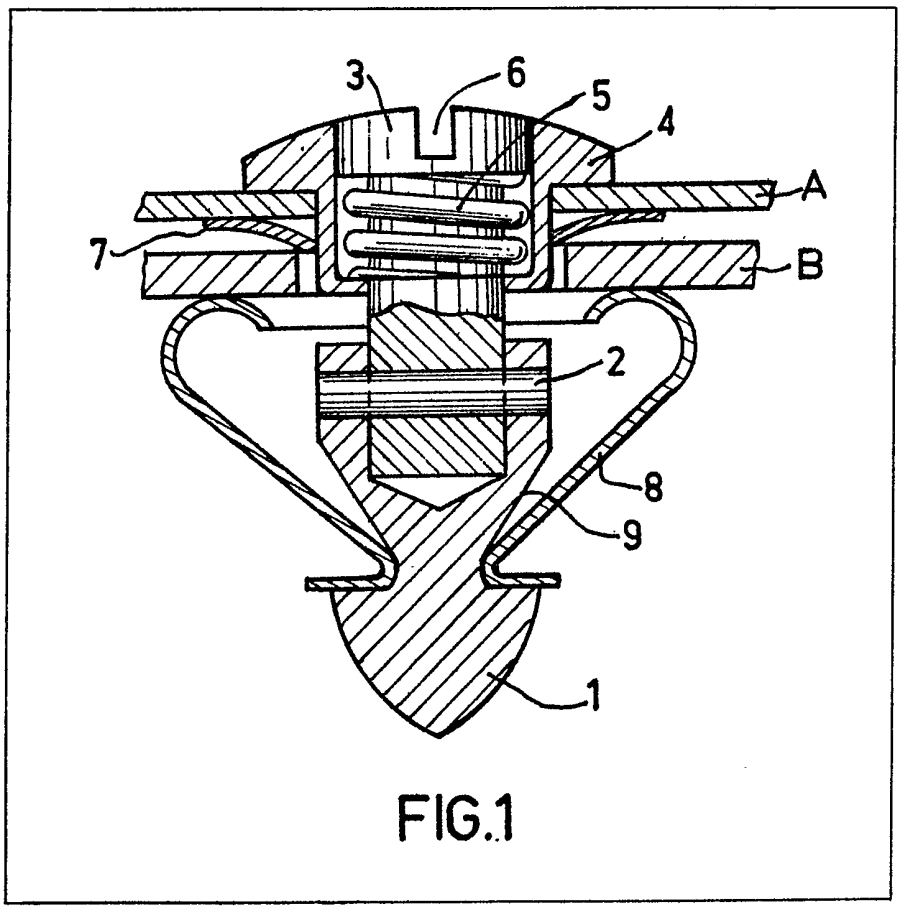


FIG.1

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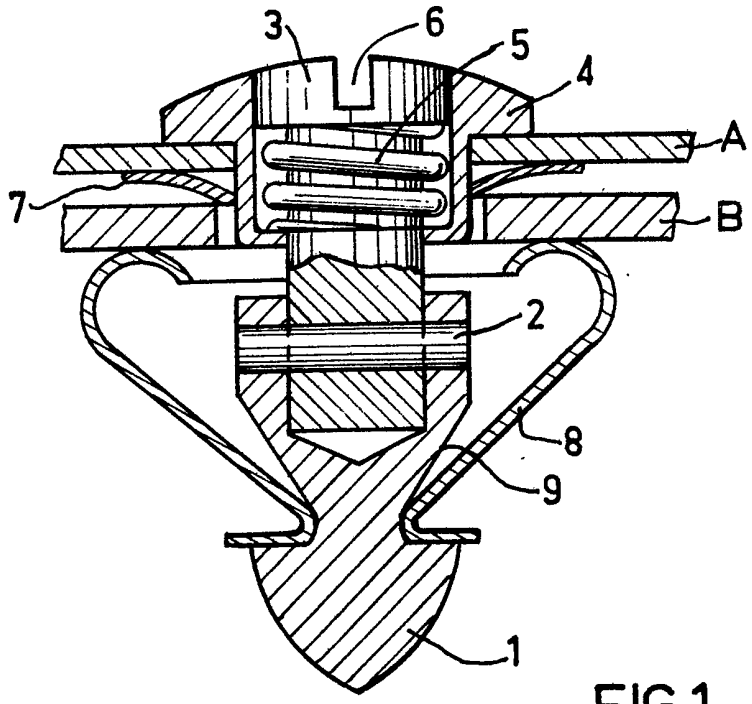


FIG.1

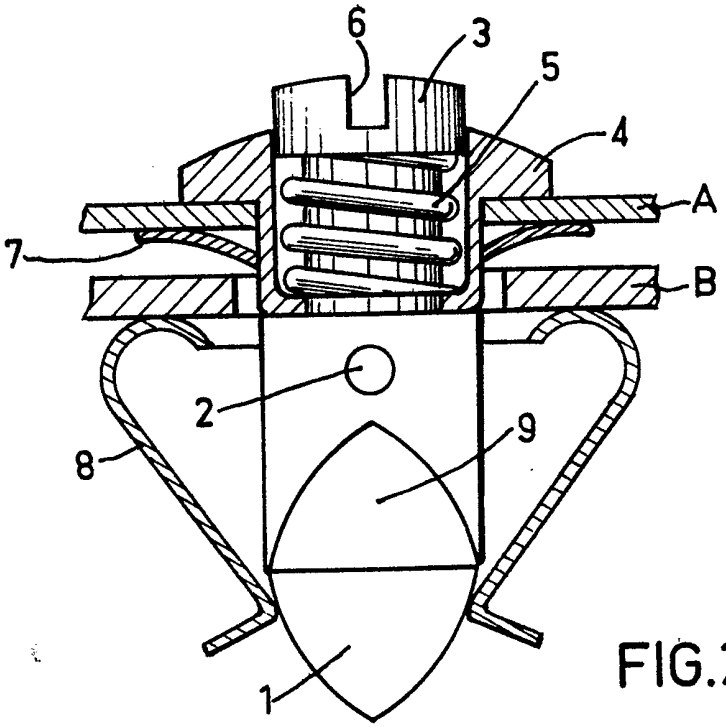


FIG.2

SPECIFICATION

**Fastener device**

This invention relates to fastening devices and more particularly to rapid fasteners which allow a movable member to be fastened onto a fixed member.

In devices of this type a member which is integral with an element may, by its rotation, be released from another element which comprises two resilient limbs which come into engagement with two slots on the first member. These devices, however, have the disadvantage that each time they are used a high degree of precision is required during engagement and therefore several models are necessary in order to meet various requirements.

In one improvement on this there is provided a divergence between the faces of the slot in an element, on which faces rest the resilient limbs of a retaining collar or shoulder. The divergence may be up to 45 degrees in relation to the axis of the element in order to permit the fastener to be used at different heights between the two members to be joined. This has the disadvantage that it cannot guarantee to retain the two members when they are subjected to violent reaction, such as shock, impact or vibrations.

According to the present invention there is provided a fastener device comprising an element having a first portion mounted for rotatable and axial movement in a housing with a spring acting between the first portion and the housing, and a second portion integral with the first portion and having two parallel slots for engagement with a pair of resilient limbs for retention of the element, the arrangement being such that depression of the first portion against the action of the spring will enable engagement of the limbs in the slots and upon predetermined subsequent rotation of the element the limbs and the slots are disengaged.

In a preferred arrangement the device is unlockable by a quarter turn of the element, the spring then causing axial movement of the element to prevent undesired return of the element to its locked position.

There are preferably a range of axial positions of the element with respect to the housing which permit engagement of the limbs in the slots. This allows a single fastener device to be used for a range of separations between the two members to be fastened together.

The strength of the spring which may be a compression spring may be chosen in dependence on the clamping force it is required to exert on the two members when fastened together.

The slots are preferably perpendicular to the axis of the body portion. This prevents the element from slipping out of engagement during knocks or vibration.

A preferred rapid fastener device in accordance with the invention comprises a head which is rotatable and can be moved axially in a housing which forms a socket or sleeve, the socket or sleeve being fixed on one of these detachable members which is to be fixed in relation to the other, and a fixed resilient retaining collar or shoulder on the second detachable member. At the opposite end to the head, the pin element may be generally conical or parabolic and comprise two slots provided for engagement with two resilient limbs, after these limbs have been spread out.

The axial displacement of the pin element inside the socket or sleeve, compresses a spring imprisoned between the pin and the socket or sleeve. The pin element is displaced by means of the head which will be provided with a slot for a screwdriver, a milled head or a cut head or some other means or causing rotation and axial displacement. The pin may therefore take up two positions separated by a rotation of the pin by a quarter of a turn. One of the positions is the locking position when the head is pressed so that the slots in the conical or parabolic pin come into engagement and catch with the resilient limbs which are integral with the collar or shoulder.

The other position (rotated by a quarter of a turn) corresponds to the position where the resilient limbs are on the smooth part of the pin after disengagement from the slots, the compression spring at this moment serving to separate the two elements to be fastened. The spring may provide the necessary clamping force between the two members which are to be joined together. The slots making an angle of 90 degrees relative to the axis of the pin when in their snapped in position are not able to slip out of engagement in the case of a jolt or vibration. It is necessary to use rotation to disengage one assembled member from the other. The spring being in compression facilitates disengagement of the catch arrangement without any other intervention.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings of which:

Figure 1 shows a partly sectional view of a fastener device in accordance with the present invention in its locked position;

Figure 2 shows a partly sectional view of the device of Figure 1 in its unlocked position.

In the form shown in the drawings, the device comprises a pin having a head 3, and a parabolic body 1 proviced with two slots 9. The head 3 and the parabolic portion 1 are fixedly attached to each other by means of a linch pin 2 or a thread. The head 3 is provided with an entrainment slot 6 enabling it to be rotated and to be driven in freely inside a sleeve 4 by means of a screwdriver. The head 3 acts on a compression spring 5, the travel of the compression spring corresponding to the different separations at which it is desired to obtain clamping. The sleeve 4 is retained on one of the members to be fastened by a stop ring 7. Resilient retaining limbs 8 are provided on the second member B which is to be fastened by the catch arrangements. When one presses on the member 3, the spring 5 is compressed until the cut slots of the member 1 engages with the

resilient retaining limbs 8, i.e. to fasten the part A to part B. Rotation of the member 3 will release the two members, the spring 5 acting on member 3 which is fixedly connected with 1. The compression spring can allow the same fastener to be used for large ranges of members to be joined. Several applications may be envisaged and this is of particular interest in the field of manipulating tools in the automobile industry, in aviation, marine technology and in the aerospace industry, for machine tools and various electrical cabinets and switchgear or cabinets comprising mechanical elements which have to be opened rapidly.

CLAIMS

1. A fastener device comprising an element having a first portion mounted for rotatable and axial movement in a housing with a spring acting between the first portion and the housing, and a second portion integral with the first portion and having two parallel slots for engagement with a pair of resilient limbs for retention of the element, the arrangement being such that depression of the first portion against the action of the spring will enable engagement of the limbs in the slots and upon predetermined subsequent rotation of the element the limbs and the slots are disengaged.

2. A fastener device according to claim 1 which is unlockable by a quarter turn of the elements, the spring then causing axial movement of the element to prevent undesired return of the element to its locks position.

3. A fastener device according to claim 1 or 2 wherein there is a range of axial position of the element with respect to the housing which permits engagement of the limbs in the slots.

4. A fastener device according to any preceding claims wherein the slots are perpendicular to the axis of the body portion.

5. A fastener device according to any preceding claim wherein the spring is fixedly connected at one end with the housing.

6. A fastener device according to claim 5 wherein the spring is fixedly connected at its other end with the element.

7. A fastener device according to any preceding claim wherein said housing is fixedly connected to one of two members to be fastened together.

8. A fastener device according to claim 7 wherein the limbs are fixedly connected to the other of the two members to be fastened together.

9. A fastener device according to any preceding claim wherein the spring is a compression spring.

10. A fastener device substantially as herein described with reference to the accompanying drawings.

11. A method of fastening together two members substantially as herein described with reference to the accompanying drawings.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1981. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.