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(54) **Bolt for locks, particularly for panic-safe locks for double doors**

Riegel für Schlösser, insbesondere für paniksichere Doppeltürschlösser

Verrou pour serrure, notamment pour serrures anti-paniques pour portes deux battants

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Description

The present invention relates to a bolt for locks, particularly for panic-safe locks for double doors.

In double doors, used as emergency doors, both doors open outward, and the door normally used to enter and to exit (hereinafter termed door A) is provided with a panicsafe lock having a spring latch and a bolt and designed so that the spring latch and the bolt can be moved simultaneously into their release position by operating the handle. The other door (hereinafter termed door B) acts as lock stile for door A and has an upper catch and a lower catch which are connected by means of rods to a so-called panic-safe strike lock actuable by means of a handle of its own.

The particularity of emergency doors of this kind is that the spring latch and the bolt of the lock installed on door A engage selvages of the strike lock of door B, the mechanism of which is set so that if only the lock of door A is operated to open it, i.e. if the latch and the bolt are retracted, it is possible to open only door A, since the strike lock keeps its catches in locking position.

On the other hand, in the strike lock of door B there is a pusher which, when the strike lock is actuated, is expelled by said strike lock and acts on a sort of push-button that releases the mechanism of the lock of door A, causing the retraction of the latch and of the bolt. Therefore, if the strike lock is actuated, door B opens and door A opens as well.

In known locks there is the drawback that the release pushbutton can be accessed from the outside, so that it is relatively easy to open it, with a suitable tool, in order to unlawfully open the strike lock.

The technical aim of the present invention is to provide a bolt including a release mechanism that is designed so that it can be activated only when the bolt is inserted in the respective selvage of the strike lock, so as to ensure maximum security against break-in attempts.

With the above aim in view, the invention provides a bolt for a lock, particularly of the panic-safe type, which is installed in one door of a double door and is operatively associated with a strike lock installed in the other door, characterized in that it comprises a flat sliding plate accommodated in a seat of the bolt and guided, against the biasing action of elastic transmission means, at right angles to the sliding direction of said bolt, said sliding plate having a lug for abutment against a fixed element of the lock when the bolt is engaged in the strike lock, a slider being furthermore provided which is guided in said bolt parallel to the sliding direction of said bolt and has a tang protruding frontally from the bolt, said slider co-operating with said sliding plate so that when the bolt is engaged within the strike lock, the release action produced on the tang by means of the strike lock causes the slider to move the sliding plate into a position in which said lug does not abut against said fixed element, allowing retraction of the bolt into the lock due to the

release action.

Further particularities of the present invention will become apparent from the following description of a preferred embodiment, illustrated only by way of nonlimitative example in the accompanying drawings, wherein:

figure 1 is a side view of the bolt;

figure 2 is a top view;

figure 3 is a sectional view, taken along the plane III-III of figure 1;

figure 4 is a sectional view, taken along the plane IV-IV of figure 1;

figure 5 is a side view of the sliding plate and of the slider.

With reference to the above figures, the reference numeral 1 designates the faceplate of the casing of a panic-safe lock, in which there is a rectangular opening 2 through which the bolt 3 protrudes outside.

The bolt 3 is guided not only in the opening 2 but also in the sliding direction A by a plate 4 the opposite ends whereof are fixed in the rear plate 5 and in the covering plate 6, which close the sides of the casing.

The plate 4 slidably engages a notch 7 which is open on the rear edge 8 of the bolt 3 and extends toward the front edge 9 along the direction A. A laminar seat 10 is formed in the bolt 3 on the plane thereof and is open toward the rear edge 8. The seat 10 is furthermore open upward, where it forms an opening 11, and downward, where it forms a shoulder 12 and a recess 13. Below the shoulder 12 there is a tooth 14 protruding downward and suitable to cooperate with the tumbler of the bolt actuation cylinder 25 which is described hereinafter.

An extension 15 rises from the upper edge of the bolt, and a seat 16 is formed therein for a spring 17 the upper end of which is retained against a short pin 18 driven through a hole 19 of the extension.

The spring 17 acts by compression on a flat sliding plate 20 accommodated in the seat 10.

The sliding plate 20 is substantially rectangular and is guided in the seat 10 in the direction B at right angles to the direction A by the engagement of pins 21, 22 driven through the bolt in slots 23, 24 of the sliding plate which are elongated in the direction B. The spring 17 keeps the sliding plate 20 pressed downward so that it rests on the plate 4, where the lower edge of the sliding plate can be accessed through the recess 13 for the engagement of the tumbler of a cylinder lock 25, by means of which the bolt can be operated manually with a key.

The opposite ends of the pin 22 engage slots of the rear plate 5 and of the covering plate 6 which are elongated in the direction A and set the stroke of the bolt.

As more clearly shown in figure 5, the sliding plate 20 is affected, in its central region, by a rectangular slot 26 having two sides 27, 28 that are parallel to A and an end side 29 which is parallel to B.

A lug 30 extends from the upper side 27 of the slot 26 toward the lower side 28 and has an inclined edge

31 toward the front edge 9 of the bolt and a step 32 toward the rear edge 8. The distance between the crest of the lug 30 and the lower side 28 of the slot 26 is greater than the thickness of the plate 4. The inclined edge 31 forms, together with the upper side 27, a step 33 the distance of which from the end side 29 is slightly greater than the width of the plate 4. When the bolt 3 is fully retracted into the lock and the sliding plate 20 rests on the plate 4, said plate is recessed between the side 29 and the tooth 33 and locks the sliding of the bolt, since the sliding plate is axially retained by the pins 21, 22. However, if the cylinder 25 is actuated, the tumbler of said cylinder engages the recess 13, lifting the sliding plate 20 and allowing the plate 4 to slide along the notch 7.

An additional seat 34 is formed in the bolt 3 laterally to the seat 10; a slider 35, substantially constituted by a rectangular plate, is guided in the direction A in said seat 34. The slider 35 has, toward the rear edge of the bolt, a pin 36 protruding laterally and engaging a slot 37 of the bolt which is elongated in the direction A. A cylindrical tang 38 is rigidly coupled to the slider 35 on the side directed toward the front edge of the bolt 3, is guided in a hole 39 of said bolt and has a hemispherical end. The hole 39 is open on the front edge of the bolt, and the tang 38 has such a length that in practice only the hemispherical end can protrude from the front edge of the bolt.

A polygonal slot 40 is formed in the slider 35 and forms an inclined plane 41 with one of its sides. A pin 42 is engaged in the slot 40, protrudes from one side of the sliding plate 20 and is operatively associated with the inclined plane 41.

The operation of the described device is as follows. When the bolt 3 is inserted in locking position in the appropriately provided selvage of the strike lock, the tooth 14 is proximate to the faceplate 1. In this position, the lug 30 is to the left of the plate 4, which thus engages the step 32.

In this situation, if the strike lock is operated, the appropriate element provided to release the lock, for example a pusher controlled by the actuation of a handle, acts on the tang 38, making the slider 35 slide in the direction A from the front edge 9 toward the rear one 8.

In this manner, the inclined plane 41 acts on the pin 42, forcing the sliding plate 20 to rise until the step 32 passes beyond the plate 4 and thus allowing the pusher to push the entire bolt inside the lock.

When the plate 4 has passed beyond the lug 30, the action of the spring 17 makes the sliding plate 20 engage the plate 4, which is retained between the end side 29 and the step 33 of the lug.

In order to restore the door closure condition, one operates the cylinder 25, which lifts the sliding plate 20 and then, as soon as said sliding plate has disengaged from the step 33, pushes the bolt out into its locking position.

A substantial prerogative of the present invention is

constituted by the fact that when the bolt is inserted in the strike lock, the tang 38 cannot be accessed from the outside, so that it is not possible to retract the bolt into the lock with unauthorized actions which instead a tang that can be accessed through the adjacent rabbets of the doors would facilitate.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Bolt for a lock, particularly of the panic-safe type, which is installed in one door of a double door and is operatively associated with a strike lock installed in the other door, characterized in that it comprises a flat sliding plate (20) accommodated in a seat (10) of the bolt and guided, against the biasing action of elastic transmission means (17), at right angles to the sliding direction of said bolt, said sliding plate having a lug (30) suitable to abut against a fixed element (4) of the lock when the bolt is engaged in the strike lock, a slider (35) being furthermore provided which is guided in said bolt parallel to the sliding direction of said bolt and has a tang (38) protruding frontally from the bolt, said slider (35) cooperating with said sliding plate (20) so that when the bolt is engaged within the strike lock, the release action produced on the tang (38) by means of the strike lock causes the slider (35) to move the sliding plate (20) into a position in which said lug (30) does not abut against said fixed element (4), allowing retraction of the bolt (3) into the lock due to the release action.
2. Bolt according to claim 1, characterized in that said sliding plate (20) has a slot (26) which is open on the rear edge of the bolt (3) and has an upper side (27) from which a lug (30) protrudes, said lug forming two opposite steps (32, 33) suitable to abut against a plate (4) which is fixed in the lock and is guided through a notch (7) of the bolt which is parallel to the sliding direction thereof, said bolt (3) having a seat (16) for accommodating a spring (17) which acts on said sliding plate (20) so as to make it rest with said upper side (27) on said plate (4) in the position in which it abuts against said steps (32, 33) and retains the bolt.
3. Bolt according to claim 2, characterized in that said slider (35) has a slot (40) forming an inclined edge (41) and engaged by a pin (42) protruding laterally from said sliding plate (20), said inclined edge (41)

being suitable to act on said pin (42) when said tang (38) is pushed into the bolt (3) so as to lift the sliding plate (20) into a position in which said lug (30) disengages from said plate (4) to allow the retraction of the bolt into the lock, said spring (17) being suitable to lower the sliding plate (20) into the position for engagement on said plate (4) and for retention of the bolt after the lug (30) has passed beyond said plate (4).

4. Bolt according to one of the preceding claims, characterized in that said slider is constituted by a plate (35) which is guided in a seat (34) that lies laterally to the seat (10) for the accommodation of the sliding plate (20), and in that said tang (38) has a hemispherical end protruding from the front edge of the bolt.

Patentansprüche

1. Riegel für ein Schloß, insbesondere für ein Panikschloß, der in einem Flügel einer zweiflügeligen Tür installiert und einer Schließplatte in dem anderen Flügel betriebsmäßig zugeordnet ist, **gekennzeichnet** durch eine flache Schiebeplatte (20) in einem Sitz (10) des Riegels, die gegen die Spannwirkung eines elastischen Übertragungsmittels (17) rechtwinklig zur Schieberichtung des Riegels geführt ist und eine Nase (30) hat, die zum Anschlag gegen ein festes Element (4) des Riegels geeignet ist, wenn dieser mit der Schließplatte in Eingriff kommt, durch einen in dem Riegel parallel zur Schieberichtung geführten Gleiter (35) mit einem frontal aus dem Riegel vorstehenden Zapfen (38), der mit der Schiebeplatte (20) so zusammenwirkt, daß beim Eingriff des Riegels mit der Schließplatte die durch diese auf den Zapfen (38) ausgeübte Lösewirkung ein Bewegen der Schiebeplatte (20) durch den Gleiter (35) in eine Position bewirkt, in der die Nase (30) nicht an das feste Element (4) anschlägt, so daß ein Rückziehen des Riegels in das Schloß durch die Lösewirkung möglich ist.
2. Riegel nach Anspruch 1, dadurch **gekennzeichnet**, daß die Schiebeplatte (20) einen an der Hinterkante des Riegels (3) offenen Schlitz (26) mit einer von seiner Oberkante (27) abstehenden Nase (30) hat, die zwei voneinander abgewandte Stufen (32, 33) hat, welche zum Anschlag gegen eine in dem Schloß befestigte und durch eine Nut (7) des Riegels parallel zu dessen Schieberichtung geführte Platte (4) geeignet sind, und daß der Riegel (3) einen Sitz (16) zur Aufnahme einer Feder (17) hat, die auf die Schiebeplatte (20) derart einwirkt, daß sie in eine Ruhestellung kommt, in der die Oberkante (27) des Schlitzes (26) an der Platte (4) liegt, in der die Platte (4) gegen die Stufen (32, 33) an-

schlägt und den Riegel festhält.

3. Riegel nach Anspruch 2, dadurch **gekennzeichnet**, daß der Gleiter (35) einen Schlitz (40) mit einer geneigten Kante (41) hat, mit der ein seitlich von der Schiebeplatte (20) abstehender Stift (42) in Eingriff steht, daß die geneigte Kante (41) zum Einwirken auf den Stift (42) geeignet ist, wenn der Zapfen (38) in den Riegel (3) hineingedrückt wird, um die Schiebeplatte (20) in eine Position zu heben, in der die Nase (30) außer Eingriff mit der Platte (4) kommt, um das Rückziehen des Riegels in das Schloß zu ermöglichen, und daß die Feder (17) geeignet ist, die Schiebeplatte (20) in eine Eingriffsstellung an der Platte (4) abzusenken und den Riegel zurückzuhalten, nachdem die Nase (30) über die Platte (4) hinaus bewegt ist.
4. Riegel nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß der Gleiter eine Platte (35) ist, die in einem Sitz (34) geführt ist, welcher neben dem Sitz (10) für die Schiebeplatte (20) liegt, und daß der Zapfen (38) ein halbkugeliges Ende hat, das von der Vorderkante des Riegels absteht.

Revendications

1. Pène pour une serrure, notamment du type anti-panique, qui est installé dans une porte d'une double-porte et est associé fonctionnellement à une gâche installée dans l'autre porte, caractérisé en ce qu'il comprend une plaque coulissante plane (20) logée dans un logement (10) du pène et guidée, à l'encontre de l'action de sollicitation de moyens de transmission élastiques (17), perpendiculairement à la direction de glissement dudit pène, ladite plaque coulissante possédant une patte (30) convenant pour venir en butée contre un élément fixe (4) de la serrure lorsque le pène est engagé dans la gâche, et qu'il est prévu en outre un coulisseau (35) qui est guidé dans ledit pène parallèlement à la direction de glissement dudit pène et possède une languette (38) qui fait saillie frontalement hors du pène, ledit coulisseau (35) coopérant avec ladite plaque coulissante (20) de telle sorte, lorsque le pène est engagé dans la gâche, l'action de libération produite sur la languette (38) au moyen de la gâche amène le coulisseau (35) à déplacer la plaque (20) dans une position dans laquelle ladite patte (30) n'est pas en butée contre ledit élément fixe (4), ce qui permet le retrait du pène (3) dans la serrure sous l'effet de l'action de libération.
2. Pène selon la revendication 1, caractérisé en ce que ladite plaque coulissante (20) possède une fente (26), qui est ouverte sur le bord arrière du pène

(3) et possède un côté supérieur (27) dont fait saillie une patte (30), ladite patte formant deux parties étagées opposées (32 et 33) convenant pour venir en butée contre une plaque (4) qui est fixée dans la serrure et est guidée dans une fente (7) du pêne, qui est parallèle à la direction de glissement de ce dernier, ledit pêne (3) possédant un logement (16) pour loger un ressort (17) qui agit sur ladite plaque coulissante (20) de manière à l'amener à s'appliquer par ledit côté supérieur (27) sur ladite plaque (4) dans la position dans laquelle elle est en butée contre lesdites parties étagées (32,33) et retient le pêne.

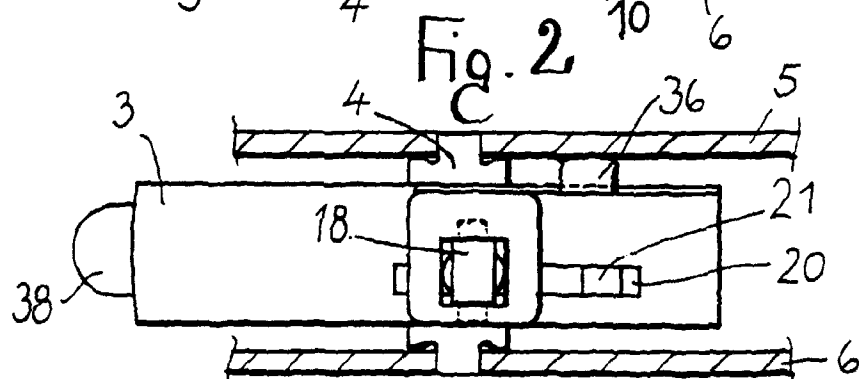
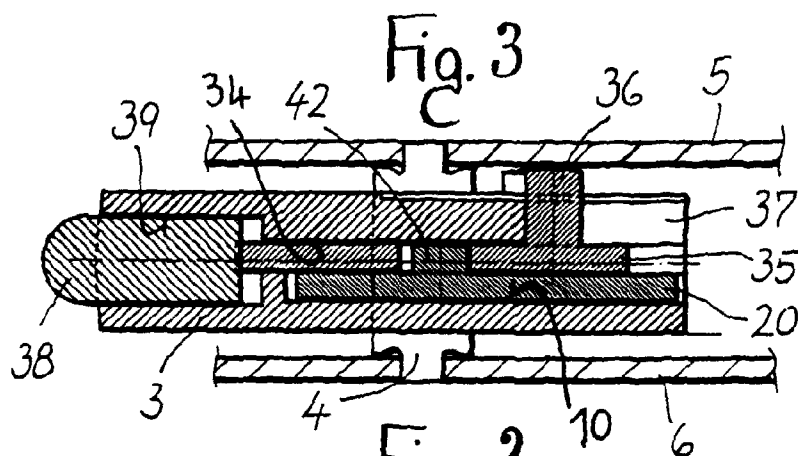
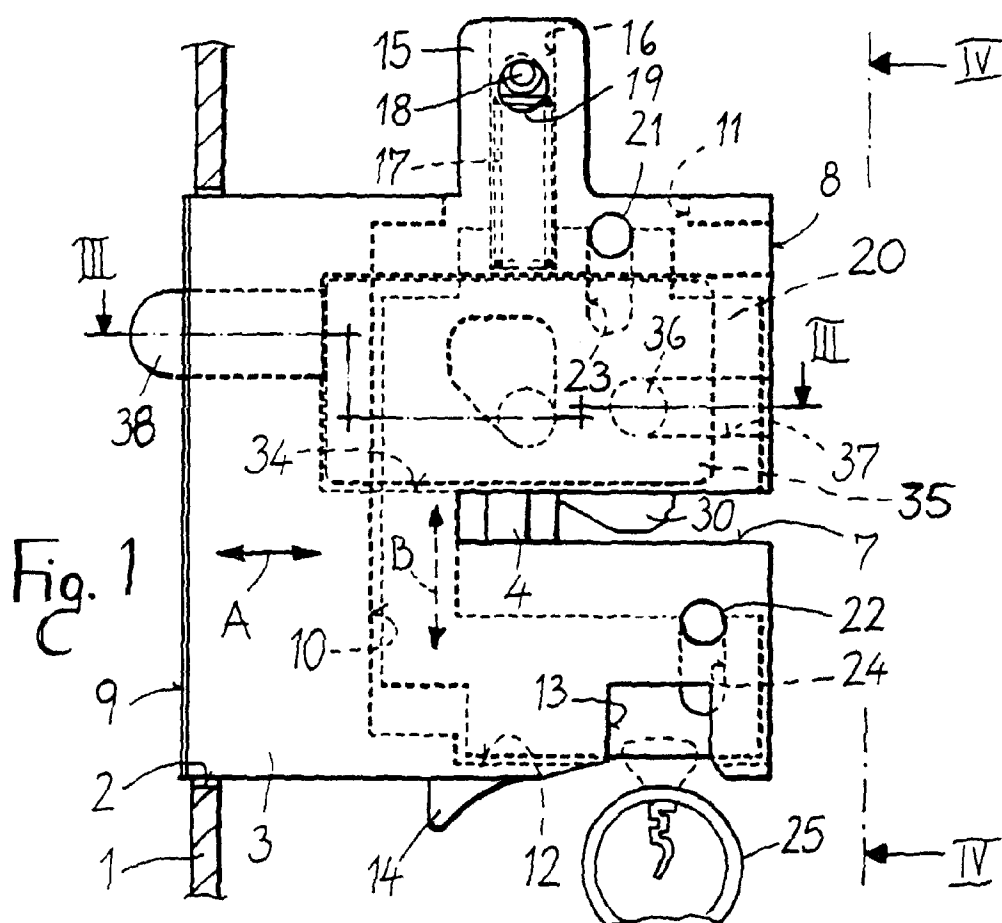
3. Pêne selon la revendication 2, caractérisé en ce que ledit coulisseau (35) possède une fente (40) formant un bord incliné (41) et dans laquelle s'engage un téton (42) qui fait saillie latéralement sur ladite plaque coulissante (20), ledit bord incliné (41) convenant pour agir sur ledit téton (42) lorsque ladite languette (38) est repoussée dans le pêne (3) de manière à soulever la plaque coulissante (20) pour l'amener dans une position dans laquelle ladite patte (30) se dégage de ladite plaque (4) pour permettre le retrait du pêne dans la serrure, ledit ressort (17) étant approprié pour abaisser la plaque coulissante (20) dans la position permettant son engagement sur ladite plaque (4) et pour retenir le pêne une fois que la patte (30) a dépassé ladite plaque (4).
4. Pêne selon l'une des revendications précédentes, caractérisé en ce que ledit coulisseau est constitué par une plaque (35) qui est guidée dans un logement (34) qui est disposé latéralement par rapport au logement (10) servant à loger la plaque coulissante (20) et en ce que ladite languette (38) possède une extrémité hémisphérique qui fait saillie sur le bord avant du pêne.

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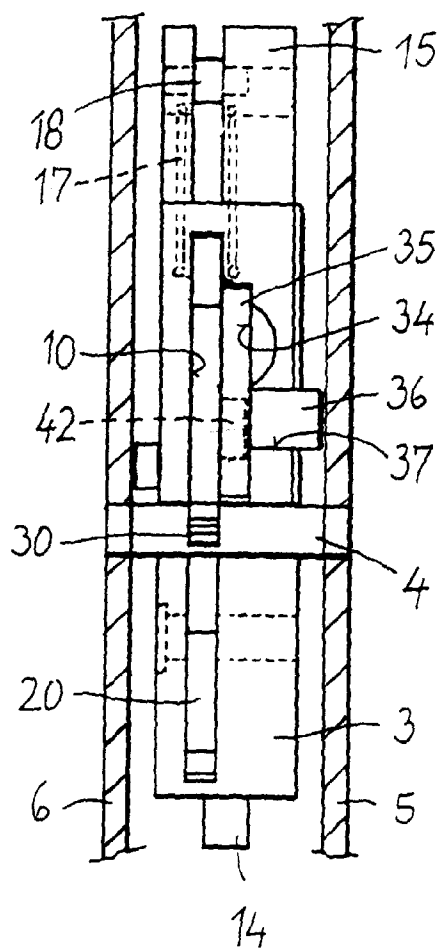


Fig. 4

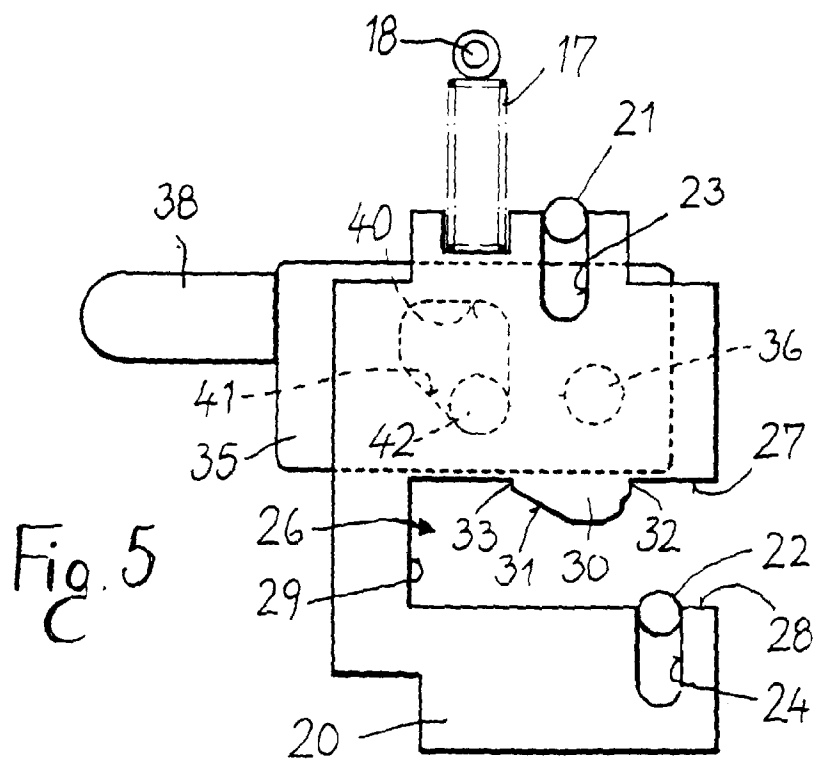


Fig. 5