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(54) Burglar-proof device for a lock with swivel bolt.

(57) A burglar-proof device for a lock with swivel bolt, wherein the bolt (18) is articulated in the lock case (2,3) and is rotatable, by means of a plate (30) actuated by the plug (32) of a cylinder (32a), between a position in which it is inside the case (2,3) and a position in which it is outside the case (2,3) and engages a selvage. A pawl (45) is articulated in the case (2,3) and cooperates with the plate (30) so that, when the plate (30) has actuated the bolt (18) into the external position, the pawl (45) is in a bolt blocking position, whereas when the plate (30) is actuated to move the bolt (18) into the internal position, the pawl (45) is first actuated into the bolt release position by the plate (30).

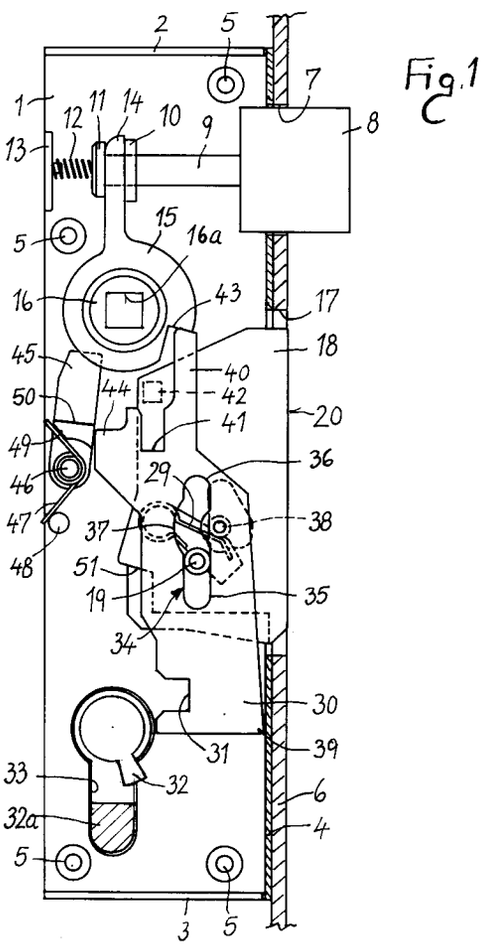


Fig.1
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The present invention relates to a burglar-proof device for a lock with swivel bolt.

As is known, in locks of this type the bolt moves outwards by rotation instead of in a linear manner. Rotation of the bolt into the position for engagement in the selvage is actuated by a plate slideable inside the lock and actuated by the plug of a cylinder lock (hereinafter simply termed "cylinder" to avoid misunderstandings).

A technical aim of the present invention is to propose a device which prevents the unauthorized retraction of the swivel bolt into the lock once it has been rotated into the engagement position in the selvage.

Within the scope of this aim, an object of the present invention is to provide a device which is structurally simple and therefore such that it does not negatively affect the cost of the lock and that it ensures the reliability of the lock in operation.

This aim and this object are achieved with a burglar-proof device for a lock with a swivel bolt wherein the bolt is articulated in the lock case and is rotatable, by means of a plate actuated by the plug of a cylinder, between a position in which it is inside the case and a position in which it is outside the case and engages the selvage, characterized in that a pawl is articulated in the case and cooperates with said plate so that, when the plate has actuated the bolt into said external position, said pawl is in a bolt blocking position, whereas when said plate is actuated to move said bolt into said internal position, said pawl is first actuated into the bolt release position by said plate.

Further characteristics and advantages of the present invention will become apparent from the following description of a preferred embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figures 1 to 5 are views of a lock with a swivel bolt in five operating positions of the burglar-proof device; and

figure 6 is a side view of the bolt, illustrating some constructive details.

With reference to the above figures, the lock comprises a case including a side wall 1 from which rise an upper wall 2, a lower wall 3 and a front wall 4, as well as a series of threaded bushes 5 in which respective screws for fixing a lateral closure cover of the case, not shown in the drawing, are screwed.

A faceplate 6 is associated with the front wall 4 and is meant to close the seat of the door in which the lock is flush-fitted.

An opening 7 is formed in the faceplate 6 and in the wall 4 adjacent thereto; the spring-latch 8 of the lock protrudes outwards through said opening. The spring-latch 8 is provided with a tang 9 guided in a wing 10 which rises from the wall 1 and is provided with a collar 11 on which a spring 12 acts; said spring rests on a lug 13 obtained by folding the rear edge of the wall 1. The end of an arm 14 is interposed between the wing 10 and the collar 11; said arm extends radially from a pivoting ring 15 pivoted on a ferrule 16 which is in turn rotatably supported in seats of the wall 1 and of the cover. The ferrule 16 (also provided with an arm, not shown in the drawing, which acts on the collar 11 independently of the arm 14) is crossed by a square hole 16a for the side-fitting coupling of a handle for the manual actuation of the spring-latch 8. Below the opening 7 of the spring-latch 8 there is a second opening 17 through which a bolt 18 acting as a swivel bolt can protrude outside.

The bolt 18 is articulated inside the case by a pivot 19 inserted in the wall 1, with which it is rigidly associated; said bolt is rotatable between a position in which it is inside the case (see figure 1) and a position in which it is outside said case (see figure 5).

The bolt 18 is substantially rectangular, with an edge 20 which frontally closes the opening 17 when the bolt is in closure position and is perpendicular to the faceplate 6 when the bolt is in protruding position.

Two recesses 21 and 22 are formed in the bolt 18 on the face directed towards the cover. The recess 21 is triangular, with a side 23 substantially parallel to the edge 20 and a side 24 substantially perpendicular to said edge which form angles 25, 26 and 27.

The recess 22 intersects the recess 21 at the corner 26 formed between the sides 23 and 24, and is shaped so that it accommodates a spring 28 having a portion 29 which passes through the angle 26 and is foldable within the recess 22.

A plate 30 is arranged adjacent to the bolt 18 and has, at its lower end, a notch 31 in which the plug 32 of a cylinder 32a is engageable; said cylinder is placed, in a conventional manner, in its seat 33 formed in the wall 1 and in the cover.

A slot 34 is formed in the plate 30, is elongated parallel to the faceplate 6 and comprises two portions 35 and 36 aligned and mutually connected by a portion 37 shaped like a circular arc.

A pivot 38 is fixed at the center of curvature of the portion 37 in the plate 30, protrudes from the face opposite to the one shown in the figure and engages the recess 21. The slot 34 is crossed by the pivot 19 which, in cooperation with the wall 4 against which the corner 39 of the plate 30 slides, keeps said plate 30 guided parallel to the faceplate 6.

The plate 30 has, at its upper end, a finger 40 on the side whereof an upwardly open recess 41 is formed. Said recess 41 is engaged by a tooth 42, shown in dashed lines in the drawing since it

protrudes from the cover closing the case of the lock. The finger 40 is suitable to act against a shoulder 43 formed in the pivoting ring 15 when actuating the spring-latch by acting with the key of the cylinder 32.

On the side of the recess 41 which is opposite to the finger 40, the plate 30 forms an angle 44 on which a pawl 45 rests; said pawl is articulated by a pivot 46 rigidly coupled to the wall 1. The pawl 45 is kept resting on the corner 44 by a spring 47, one end of which abuts on a pin 48 inserted in the wall 1 and the opposite end of which abuts on a step 49 of the pawl 45.

The pawl 45 furthermore has a depression 50 which, during the actuation of the lock, allows it to pass below the plate 30 to enter a seat 51 formed on the edge of the bolt which is opposite to the edge 20.

Operation of the described device is as follows.

When the bolt is inside the lock, see figure 1, the pivot 19 is at the portion 35 of the slot 34, whereas the pawl 45 rests on the corner 44 of the plate 30. In this situation, rotation of the bolt about the pivot 19 is prevented by the fact that the side 23 of the recess 21 abuts on the pivot 38.

By actuating the cylinder 32a, the plug 32 engages the notch 31 and causes a downward movement of the plate 30, the pivot 38 of which, by acting on the portion 29 of the spring 28 and overcoming its resistance, moves at the corner 26, whereas the pivot 19 reaches the connecting point between the portions 35 and 37. The movement of the plate simultaneously causes the disengagement of the tooth 42 from the recess 41 (position of figure 2). The further action of the plug 32 on the plate 30, by virtue of the thrust of the pivot 38 against the wall 24 of the recess 21, causes the rotation of the bolt about the pivot 19, during which the pivot 19 moves along the arc-like portion 37 of the slot 34. It should be noted that while the pivot 19 moves along the first half of the arc of the portion 37, the plate 30 oscillates about the point of contact of the corner 39 with the wall 4 and thus moves slightly closer to the wall 4. At the end of this step, the bolt 18 is partially rotated outside the lock according to the orientation shown in figure 3. It should be noted that the pawl 45, by virtue of the spring 47 keeping it in contact with the corner 44, follows the movement of the plate 30.

When the pivot 19 has reached the connecting point between the portion 37 and the portion 36 by virtue of the subsequent stroke of the plate 30, the bolt 18 (see figure 4) is fully extracted from the lock. In this position, the pawl 45 is located exactly above the seat 51.

At this point the side 24 of the recess 21 is parallel to the portion 36 of the slot 34 so that, by virtue of the spring 28, the pivot 38 is slideable in the recess 21 along the side 24, producing a further stroke of the plate 30 by virtue of which the pawl 45 engages the seat 51 of the bolt 18 (see figure 5), preventing its rotation if it is actuated to move into the lock by unlawful lock-picking or tampering actions. The pivot 19 simultaneously enters the portion 36 of the slot 34.

It should be noted that the blocking action of the pawl 45 adds to the locking action performed by the engagement of the pivot 38 in the recess 21, which has often turned out to be insufficient on its own due to the low strength of the coupling of the pivot 38 to the plate 30. In fact, in case of unlawful stresses on the bolt, the pivot 38 might disengage from the recess 21, allowing the forced retraction of the bolt into the lock.

The pawl 45 does not hinder the normal actuation of the bolt by means of the cylinder 32. In fact, since the portion 36 is parallel to the side 24 of the recess, the plate 30 can perform a first stroke sufficient to raise the pawl 45 out of the seat 51 to allow the subsequent rotation of the bolt in reverse with respect to the above description, i.e. according to the sequence of figures 3, 2 and 1.

When the bolt is fully retracted into the lock, it is possible to actuate the spring-latch by virtue of the action of the finger 40 against the shoulder 43 of the pivoting ring 15, the arm 14 of which, by oscillating, moves the tang 9. The same result is obtained by turning the ferrule 16 with the handle.

The device according to the invention is susceptible to numerous constructively equivalent modifications and variations. For example, the pawl 45 can be operatively connected to the plate 30 with a slot link instead of using a spring 47.

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. Burglar-proof device for a lock with a swivel bolt, wherein the bolt (18) is articulated in the lock case and is rotatable, by means of a plate (30) actuated by the plug (32) of a cylinder (32a), between a position in which it is inside the case and a position in which it is outside the case and engages a selvage, characterized in that a pawl (45) is articulated in the case and cooperates with said plate (30) so that, when the plate has actuated the bolt (18) into said external position, said pawl (45) is in a position blocking the bolt (18), whereas when

said plate (30) is actuated to move said bolt (18) into said internal position, said pawl (45) is first actuated into the position for releasing said bolt (18) by said plate (30).

2. Device according to claim 1, characterized in that a slot (34) is formed in said plate (30) and comprises two portions (35, 36) aligned and connected by a portion (37) shaped like an arc of a circle, in the center of curvature of which a pivot (38) is fixed, said pivot (38) engaging a recess (21) of said bolt, said recess (21) having two sides (23, 24) which, when the bolt is in its internal position, are respectively parallel and perpendicular to the aligned portions (35, 36) of said slot, said sides (23, 24) forming a corner (26) into which a spring (28) extends, said spring (28) acting on said pivot (38) so that, when said bolt (18) is in said external position, said plate (30) is kept in a position in which said pawl (45) blocks the bolt (18).

3. Device according to claim 1 or 2, characterized in that it comprises elastic means (47) keeping said pawl (45) rested on a corner (44) of said plate (30) which is shaped so that, when the bolt (18) is in its external position, said pawl (45) is in blocking position in a seat (51) of said bolt (18).

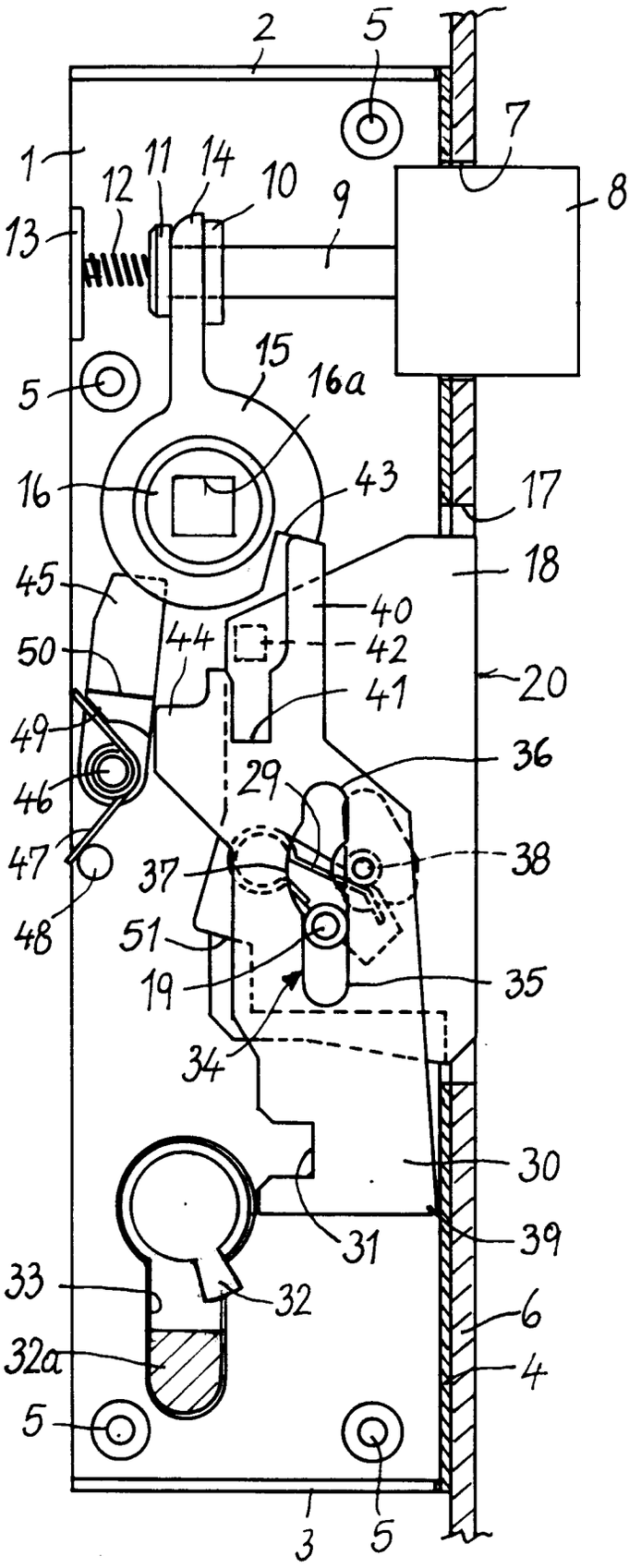
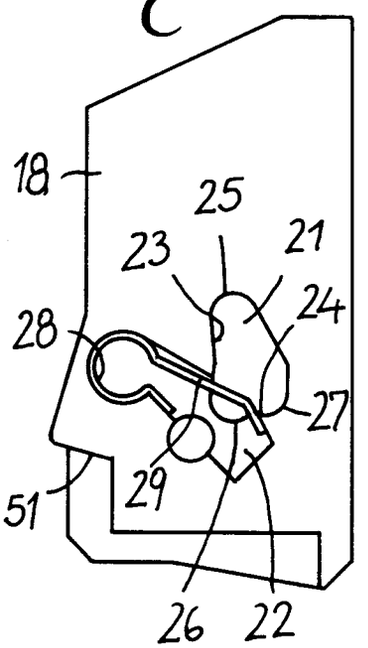

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Fig.1
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Fig.6
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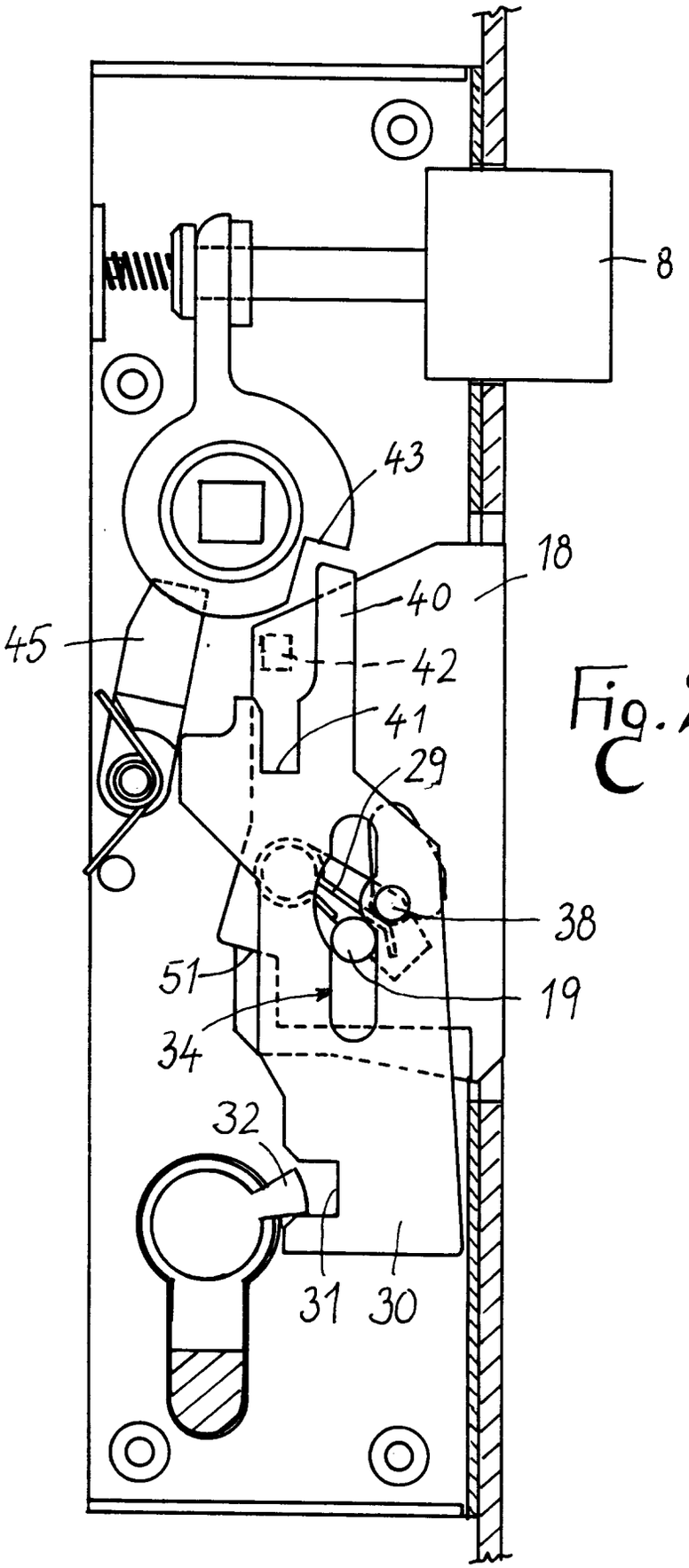


Fig. 2
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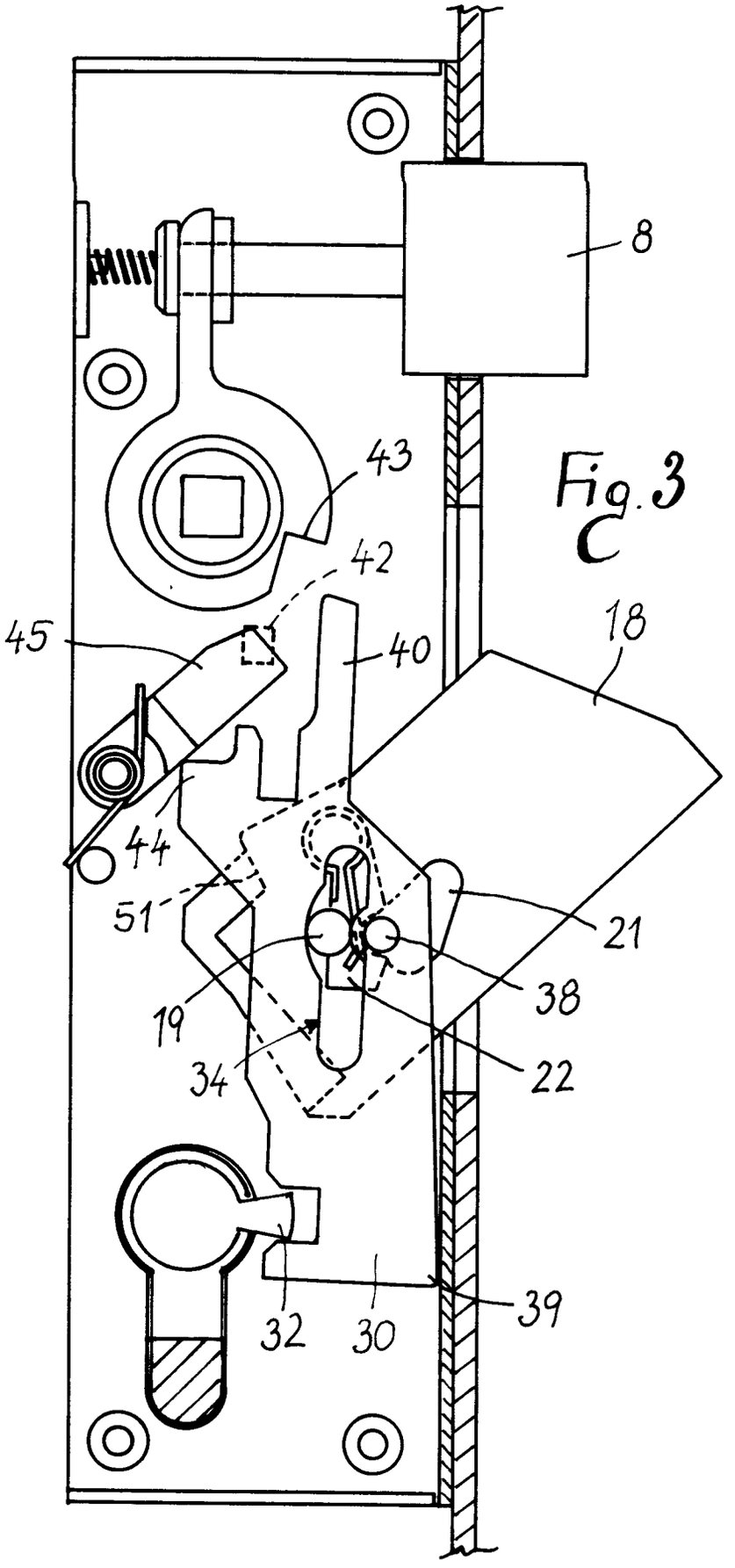


Fig. 3 C

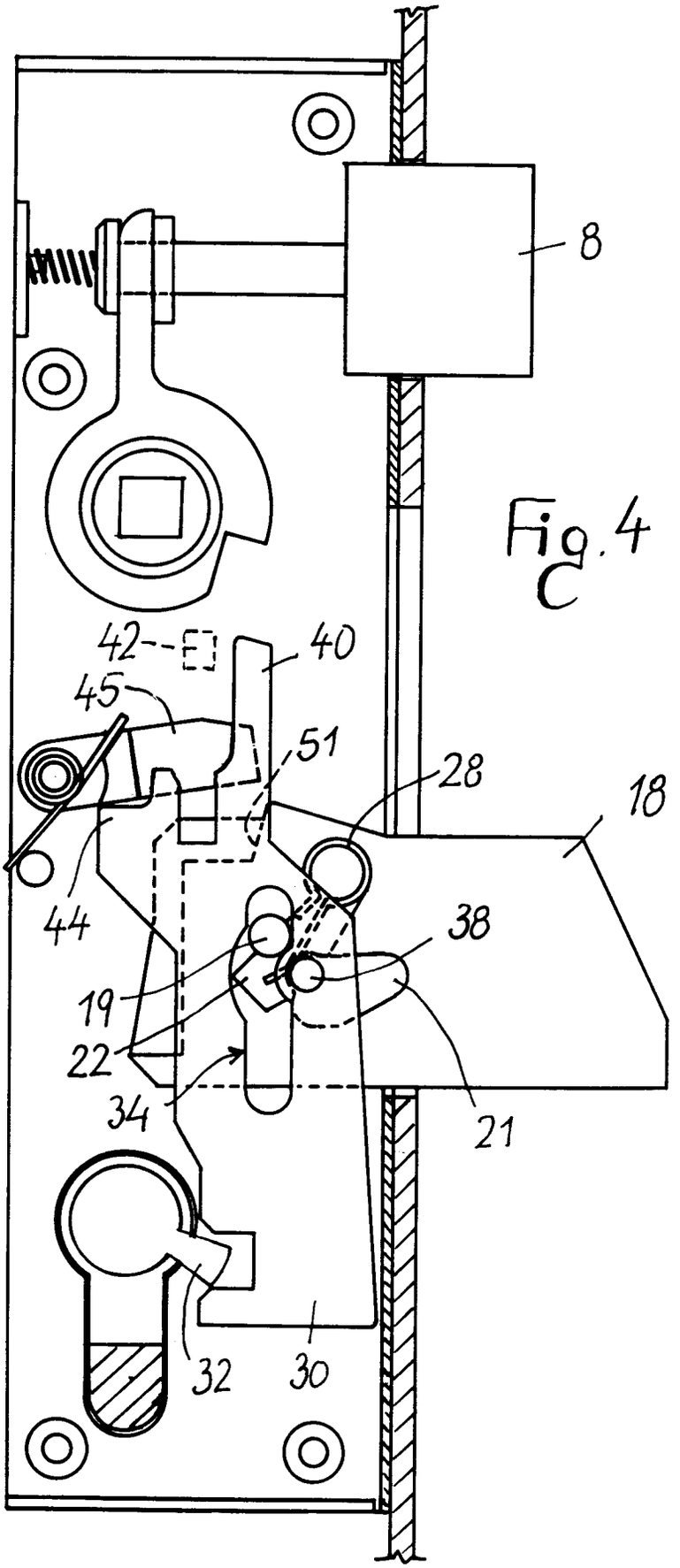


Fig. 4
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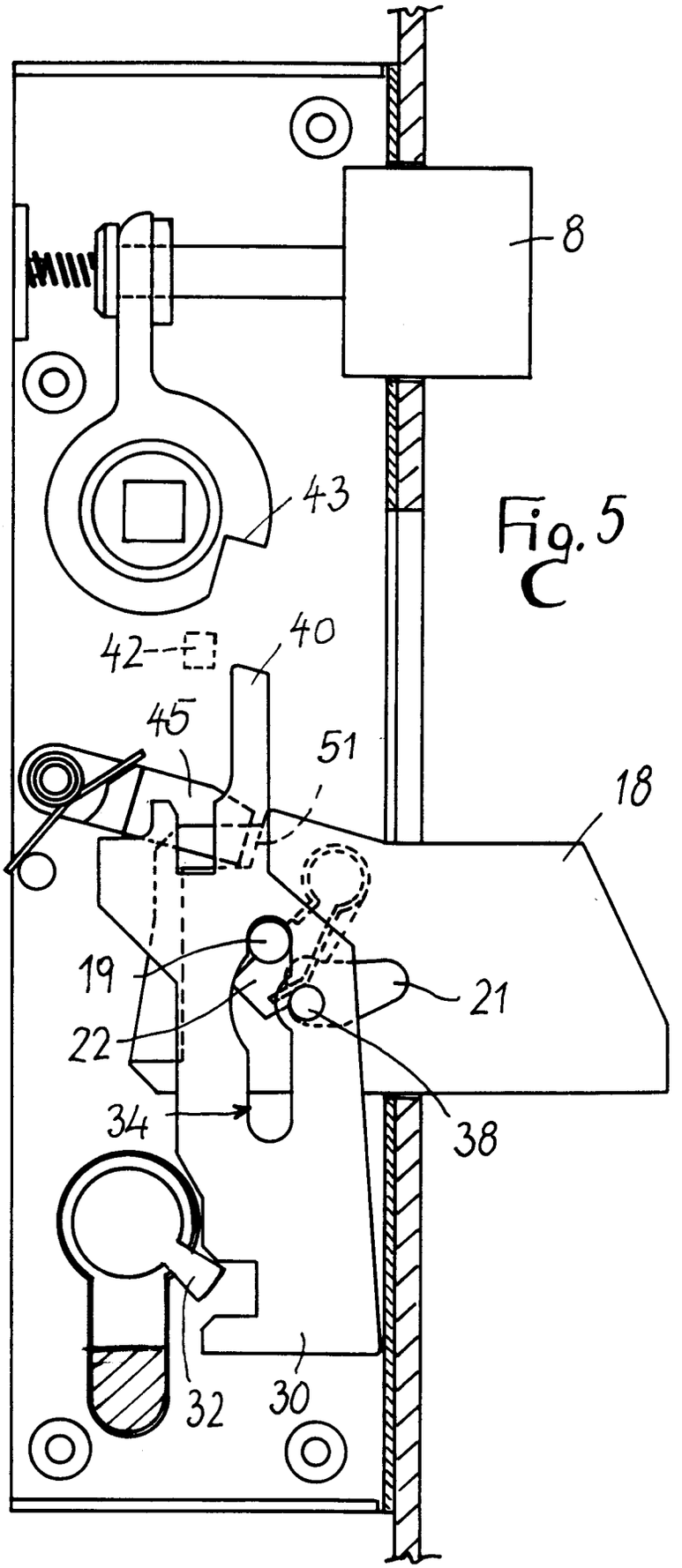


Fig. 5
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EUROPEAN SEARCH REPORT

Application Number

EP 93 11 0019

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X A	US-A-3 235 298 (CHECK) * the whole document *	1,3 2	E05B63/00
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TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18 OCTOBER 1993	VESTIN K.

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