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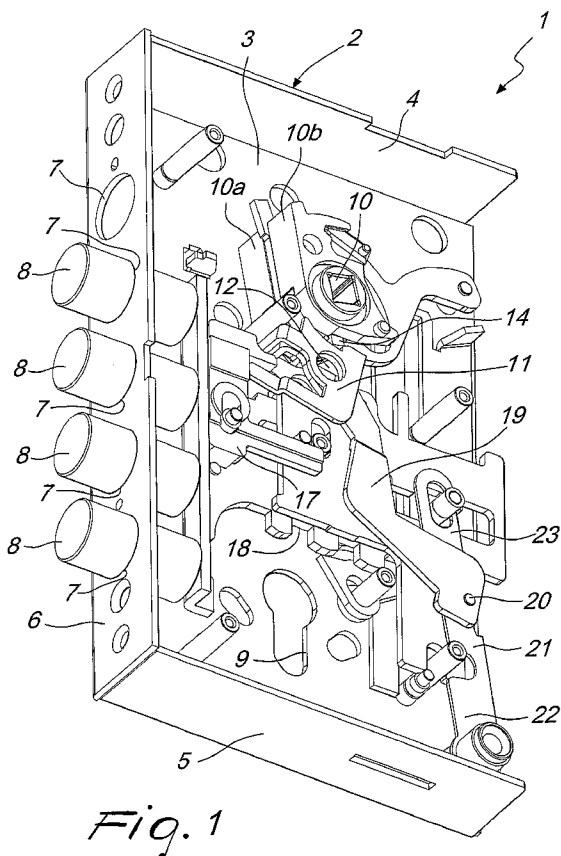
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(54) Title: LOCK FOR REINFORCED DOORS AND THE LIKE



(57) Abstract: A lock (1) for reinforced doors and the like, of the type that comprises a box-like containment body (2) which has suitable lateral openings (7) for the passage of at least one latch and at least one bolt (8), the box-like body accommodating a plurality of substantially laminar elements which are functionally associated with a cylinder, which is actuated by a respective key, and a rotating element (10) for the engagement of a handle, which is associated with the at least one latch by means of lever systems and is designed to move the latch. The lock (1) further comprises a unit (11) which can rotate, with respect to a pivot (12) which is rigidly coupled to the box-like body (2), and is arranged proximate to the rotating element (10) and has a beak (13) which protrudes and is functionally associated with a crest (14) of the rotating element (10), the unit (11) being provided with a lower tab (15), which is associated with a translational lever (16) which is rigidly coupled to the laminar element (17) associated with the lever (16) causing the uncoupling of the laminar element (17) from the cylinder, the element (17) being free to perform a translational motion along the direction of extraction of the bolts (8).

WO 2009/008015 A1

LOCK FOR REINFORCED DOORS AND THE LIKE

Technical field

The present invention relates to a lock for reinforced doors and the like.

5 Background art

A reinforced door, typically used as an entrance door for apartments and offices, has suitable laminar reinforcement elements which are designed to provide overall stiffening and make it difficult to damage for break-in purposes.

10 For a door of this type, it is necessary to provide components which have the same degree of security against break-ins as the door itself: the hinges will be oversized (in order to bear the great weight of the door and withstand any break-in impacts), and the lock will have bolts which protrude appropriately and are adapted to engage within respective selvages
15 of the jamb which are particularly deep and rigidly coupled to the wall.

Locks of this type usually provide for the actuation of the latch by means of a handle (in some cases provided only on the inner side of the door and in other cases on both sides) and of the bolts by turning the key within the cylinder.

20 All known types of lock having standardized shapes and dimensions for mounting on any reinforced door, cannot move the bolts into the fully extracted condition without using the key. This possibility is instead of particular practical interest, since any user can arrange the lock (and therefore the reinforced door) in a secure configuration (bolts extracted to
25 prevent the access of unauthorized individuals) even if he/she does not have the key (which is provided for example only to a specific and controlled number of people).

Disclosure of the invention

The aim of the present invention is to provide a lock for reinforced
30 doors and the like which is adapted to extract the bolts by turning the handle

while maintaining the same dimensions as a lock for reinforced doors of the standard type.

Within this aim, an object of the present invention is to provide a lock for reinforced doors and the like which has a low cost, is relatively simple to provide in practice, and safe in application.

This aim and this object, as well as others which will become better apparent hereinafter, are achieved by the present lock for reinforced doors and the like, of the type that comprises a box-like containment body which has suitable lateral openings for the passage of at least one latch and at least one bolt, said box-like body accommodating a plurality of substantially laminar elements which are functionally associated with a cylinder, which is actuated by a respective key, and a rotating element for the engagement of a handle, which is associated with said at least one latch by means of lever systems and is designed to move the latch, characterized in that it comprises a unit which can rotate, with respect to a pivot which is rigidly coupled to said box-like body, and is arranged proximate to said rotating element and has a beak which protrudes and is functionally associated with a crest of said rotating element, said unit being provided with a lower tab, which is associated with a translational lever which is rigidly coupled to said laminar element associated with the at least one bolt, an upward translational motion of the lever causing the uncoupling of said laminar element from said cylinder, said element being free to perform a translational motion along the direction of extraction of said bolts.

Brief description of the drawings

Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of a lock for reinforced doors and the like, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a partially sectional perspective view of a lock for reinforced doors and the like according to the invention;

Figure 2 is a partially sectional perspective view of a lock for reinforced doors and the like according to the invention;

Figure 3 is a partially sectional perspective view of a lock for reinforced doors and the like according to the invention;

5 Figure 4 is a partially sectional perspective view of a lock for reinforced doors and the like according to the invention.

Ways of carrying out the invention

With reference to the figures, the reference numeral 1 generally designates a lock for reinforced doors and the like.

10 The lock 1 for reinforced doors comprises a box-like containment body 2: the body 2 is substantially shaped like a parallelepiped, with two mutually opposite faces 3 which have a large surface and four lateral edges, an upper one 4, a lower one 5, a front one 6 and a rear one (not shown in the figure). The box-like body 2 can be provided by adopting the standard size
15 specifications for this type of lock, with the advantage that it can be installed in any reinforced door without requiring any modification thereof.

The box-like body 2 is provided with suitable lateral openings 7 for the passage of at least one latch (not shown in the figure) and of at least one bolt 8: according to the embodiment shown in the figure, the at least one
20 bolt 8 is constituted by four cylindrical elements, which are arranged parallel to each other and can slide transversely with respect to the lock 1. There are embodiments which adopt additional bolts which protrude from the upper edge 4 and from the lower edge 5 for association with link rods which are adapted to actuate pins which perform a translational motion with
25 respect to the door and are arranged at any distance from the lock 1.

A plurality of substantially laminar elements are accommodated within the box-like body 2 and are functionally associated with a cylinder (only the seat 9 of which is visible in the figure), which is actuated by a respective key.

30 A rotating element 10 is also present within the body 2 for engaging a

handle: the element 10 is associated with the at least one latch by means of suitable lever systems of a known type which are designed to move said latch.

The lock 1 comprises a unit 11 which can rotate with respect to a pivot 12 which is rigidly coupled to the face 3 (and to the opposite face) of the box-like body 2. The unit 11 is arranged proximate to the rotating element 10 and has a protruding beak 13, which is functionally associated with a crest 14 of the rotating element 10.

The unit 11 has a lower tab 15, which is associated with a translational lever 16, which is rigidly coupled to the laminar element 17 associated with the at least one bolt 8.

An upward translational motion of the lever 16 causes the uncoupling of the laminar element 17 from the cylinder: in practice, the laminar element 17 normally cannot perform a translational motion due to the presence of the bit of the cylinder at one of the sets of teeth 18 provided on its lower side. The lifting of the element 17 ensures the exit of the bit of the cylinder from the set of the teeth 18 and thus allows translational motions of the element 17 even without turning the key in the cylinder (rotation aimed at causing the extraction and/or retraction of the bolts 8).

Moreover, the lock 1 comprises a rod 19 which is pivoted to the pivot 12 (which, as already mentioned, is rigidly coupled to the box-like body 2) of the rotating unit 11.

The rod 19 can be oriented with the unit 11 and the free end 20 of the rod 19 is engaged on an arm 21, which is pivoted, with one of its ends 22, to the box-like body 2 and, with its opposite end 23, to the laminar element 17.

When the rod 19 turns with respect to the pivot 12 due to a rotation of the handle and therefore of the rotating element 10, the consequence is a rotation of the arm 21, with consequent movement of the end 23 associated with the laminar element 17. Since the element 17 is rigid, the movement of its end portion leads to an advancement of the element 17 (toward the edge

6 of the box-like body 2) and to a protrusion of the at least one bolt 8 from the openings 7 of the edge 6.

According to an embodiment of particular interest in application, the rotating element 10 can comprise a pair of jaws 10a and 10b which are mirror-symmetrical and provided with a respective recess 24 for accommodating the stem of the handle. The recesses 24 can be accessed from the outside of the lock 1 through mutually opposite faces of the box-like body 2 (the face 3 and the face that lies opposite said face).

In this case, the rotating unit 11 can comprise two shells 11a and 11b which are mirror-symmetrical and mutually opposite; each individual shell 11a (or 11b) shall be aligned with a corresponding jaw 10a (or 10b).

A single shell 11a (or 11b) therefore has not only a respective beak 13 associated with an appropriate crest 14 but also a respective lower tab 15a (or 15b), which is functionally associated with the lever 16. Each lower tab 15a (or 15b) is designed to activate the exit of the at least one bolt 8 by turning the handle whose stem is engaged within the recess 24 of the jaw 10a (or 10b).

The operation of the lock 1 according to the invention is as follows.

By using the key (which is engaged in the respective cylinder, accommodated within the seat 9), it is possible to actuate the extraction and retraction of the bolts 8 to ensure the secure closure of the reinforced door in which the lock 1 is fitted.

Likewise, it is possible to retract the latch (which is normally in the extracted configuration due to the action of an elastic element) by way of a rotation of the handle whose stem is engaged in the respective recess 24 of the element 10.

Advantageously, and differently therefore from all known types of lock which have a single element 10 and have standard dimensions, the lock 1 also allows to extract the bolts 8 following a rotation of the handle (and therefore a rotation of the element 10).

This rotation entails the application of a force on the part of the lower tab 15 of the unit 11 to the laminar element 17, with consequent lifting of the lever 16 and disengagement of the cylinder: since the bit of the cylinder is normally engaged within the set of teeth 18, the laminar element 17 cannot perform a translational motion; the lifting of the element 17 ensures the exit of the bit of the cylinder from the set of teeth 18 (and the exit of a second set of teeth provided in an appropriate slot of the lever 16, within which at least one beak rigidly coupled to the body 2 is engaged) and therefore allows translational motions of the element 17 (and therefore of the lever 16 and of the bolts 8 rigidly coupled to the element 17) even without turning the key in the cylinder (rotation designed to produce the extraction and/or retraction of the bolts 8).

When the lever 16 and the element 17 are not raised by the lower tab 15, the set of teeth 18 is engaged in the bit of the cylinder, while the set of teeth of the slot accommodates the beak which is rigidly coupled to the body 2: in this configuration, the bolts 8 are locked and it is not possible to produce their translational motion in the extraction or insertion direction.

At this point, a further rotation of the unit 11 entails a consequent rotation of the lever 19 until its end 20 is forced toward the edge 3 of the box-like body 2. This movement of the lever 19 forces a consequent movement of the arm 21 that is rigidly coupled thereto and is pivoted at the end 22 to the box-like body 2: the end 23 of the arm 21 therefore also moves toward the edge 3, forcing an advancement of the element 17 and therefore the extraction of the bolts.

It has thus been shown that by means of a simple rotation of the handle (for example with a direction of rotation which is opposite to the opening direction of the latch) it is possible to achieve the complete extraction (or optionally even only a partial one) of the bolts 8: positively, this function is obtained with a lock 1 which has the same shape and dimensions as any standard lock for reinforced doors, with the advantage of

using a single element 10 (the one known in the jargon of the field as handle hole). In practice, the lock 1 according to the invention can replace perfectly any standard lock for reinforced doors, although it ensures the possibility to actuate the extraction of the bolts 8 even by means of the handle.

5 The possibility to provide the element 10 with two jaws 10a and 10b further allows the function of extraction of the bolts 8 actuated by the handle only following the actuation of said handle from one side of the door (usually the inner side), because the jaw 10a (or 10b) that is present is the only one mated to a shell 11a (or 11b) provided with a respective lower tab
10 15a (or 15b) suitable for moving the lever 16. This embodiment ensures that it is possible to actuate the bolts 8 for closure only from the inside, by means of the handle, but it is necessary to use the key to extract them from the outside.

It has thus been shown that the invention achieves the intended aim
15 and objects.

The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

All the details may further be replaced with other technically
20 equivalent elements.

In the exemplary embodiments shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

Moreover, it is noted that anything found to be already known during
25 the patenting process is understood not to be claimed and to be the subject of a disclaimer.

CLAIMS

1. A lock for reinforced doors and the like, of the type that comprises a box-like containment body (2) which has suitable lateral openings (7) for the passage of at least one latch and at least one bolt (8), said box-like body
5 accommodating a plurality of substantially laminar elements which are functionally associated with a cylinder, which is actuated by a respective key, and a rotating element (10) for the engagement of a handle, which is associated with said at least one latch by means of lever systems and is designed to move the latch, characterized in that it comprises a unit (11)
10 which can rotate, with respect to a pivot (12) which is rigidly coupled to said box-like body (2), and is arranged proximate to said rotating element (10) and has a beak (13) which protrudes and is functionally associated with a crest (14) of said rotating element (10), said unit (11) being provided with a lower tab (15), which is associated with a translational lever (16) which is
15 rigidly coupled to said laminar element (17) associated with the at least one bolt (8), an upward translational motion of the lever (16) causing the uncoupling of said laminar element (17) from said cylinder, said element (17) being free to perform a translational motion along the direction of extraction of said bolts (8).

20 2. The lock according to claim 1, characterized in that it comprises a rod (19), which is pivoted with respect to said pivot (12), which is rigidly coupled to said box-like body (2), to which the rotating unit (11) is pivoted, said rod (19) being orientable with said unit (11), the free end (20) of said
25 rod (19) being engaged on an arm (21) which is pivoted with one of its ends (22) to the box-like body (2) and with its opposite end (23) to said laminar element (17), a rotation of said rod (19), imparted by a rotation of the handle, and therefore of said rotating element (10), entailing a rotation of said arm (21), with consequent movement of the end (23) that is associated with said laminar element (17), an advancement of said element (17) and an
30 exit of the at least one bolt (8).

3. The lock according to claim 1, characterized in that said rotating element (10) comprises two mirror-symmetrical jaws (10a, 10b), which are provided with a respective recess (24) for accommodating the stem of a said handle, said recesses (24) being accessible from the outside through
5 mutually opposite faces of said box-like body (2).

4. The lock according to claim 3, characterized in that said rotating unit (11) comprises two shells (11a, 11b) which are mirror-symmetrical and opposite, each individual shell (11a, 11b) being aligned with a corresponding jaw (10a, 10b).

10 5. The lock according to claim 4, characterized in that a single shell (11a, 11b) comprises a respective protruding beak (13) which is functionally associated with a crest (14) of the respective jaw (10a, 10b), and a respective lower tab (15a, 15b), which is associated with the lever (16), for
15 the activation of the exit of the at least one bolt (8), by means of the rotation of the handle whose stem is engaged within the recess (24) of said jaw (10a, 10b).

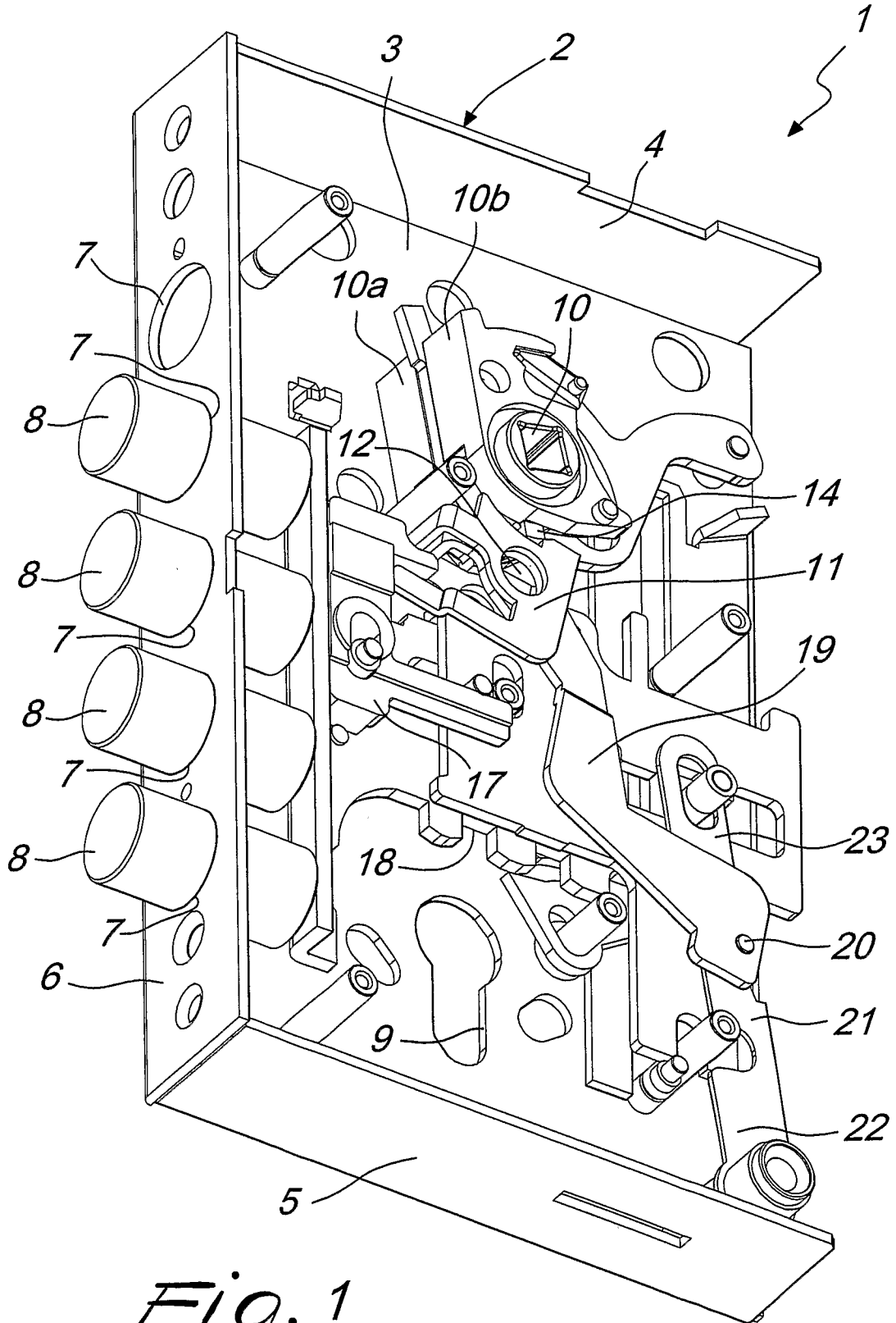


Fig. 1

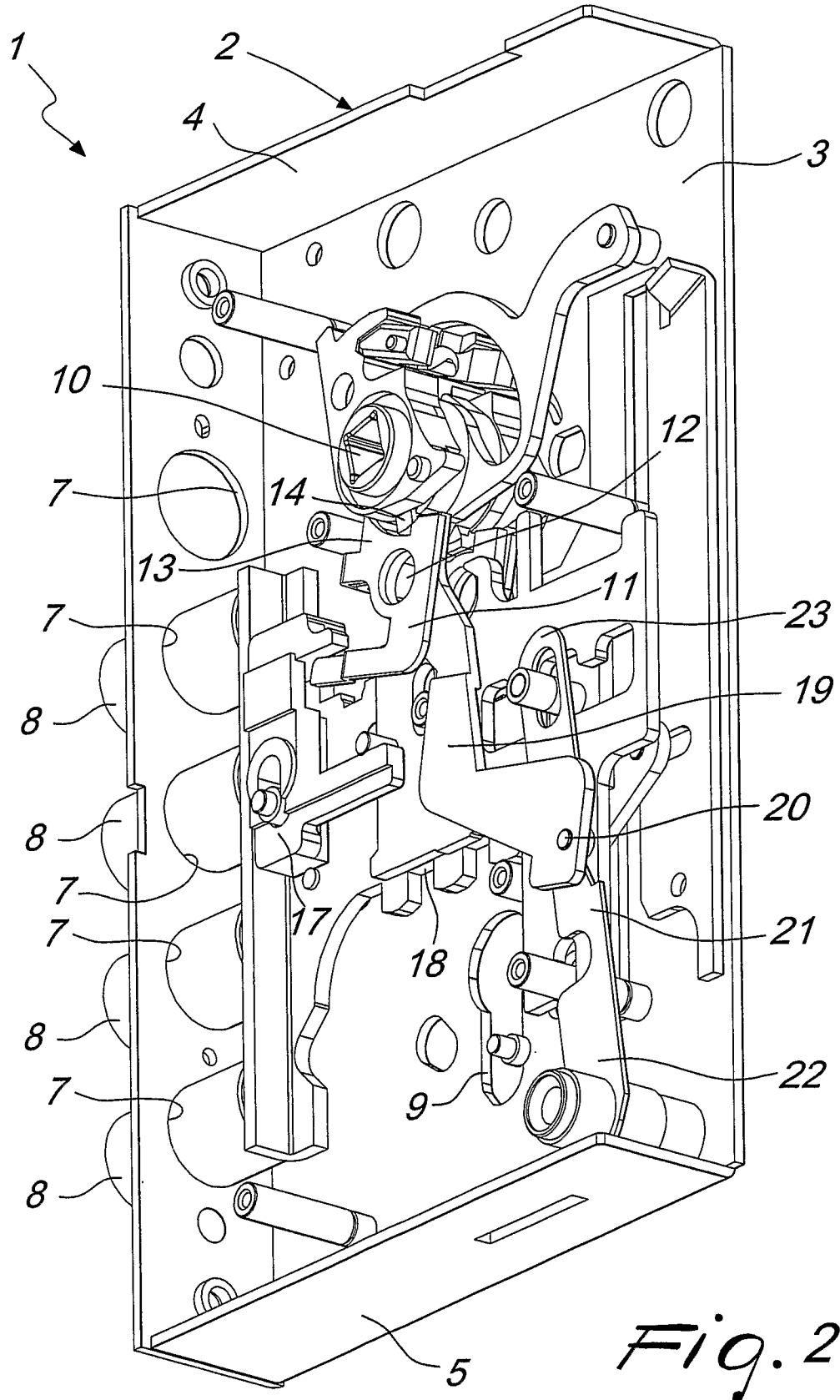


Fig. 2

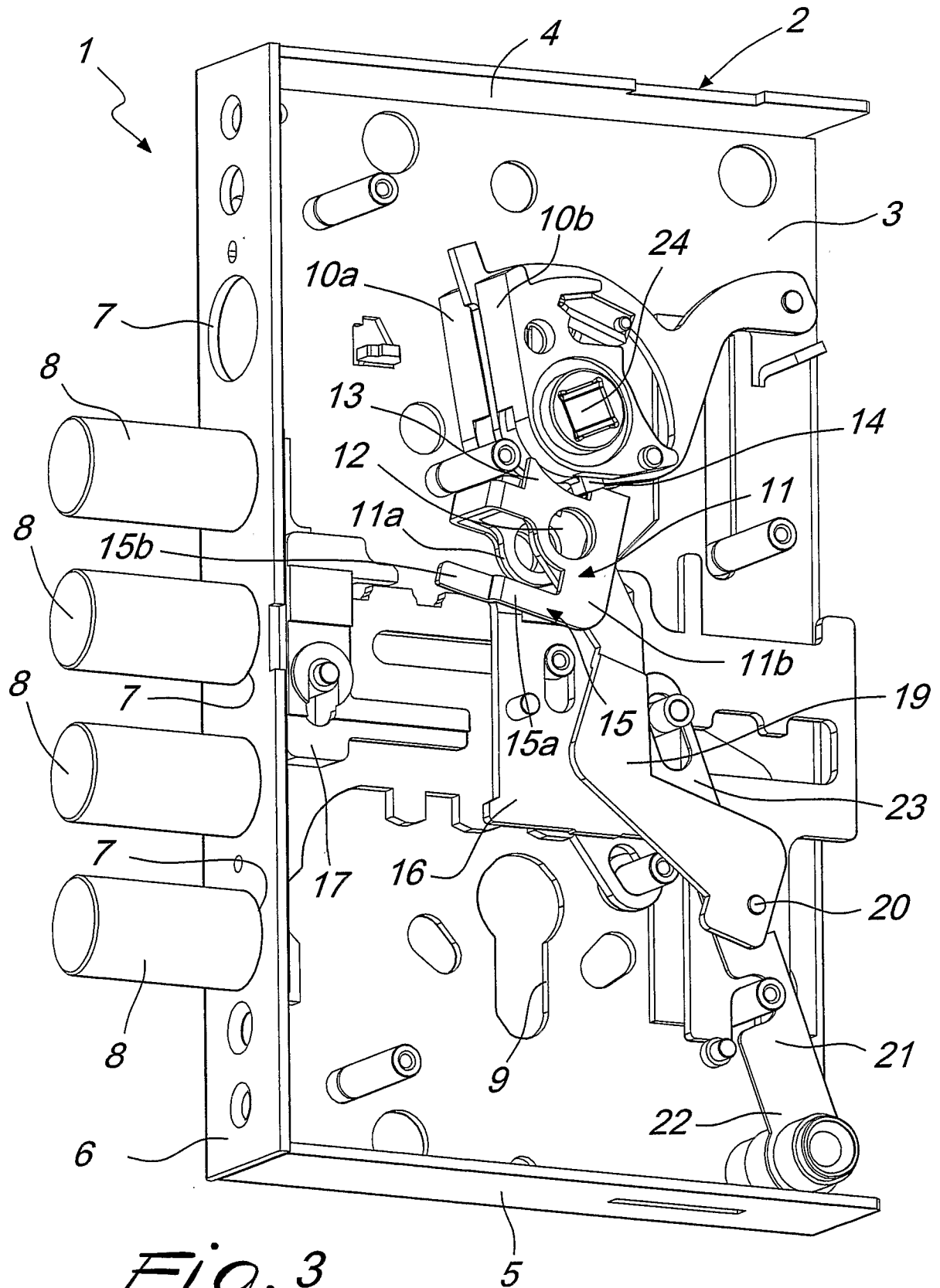


Fig. 3

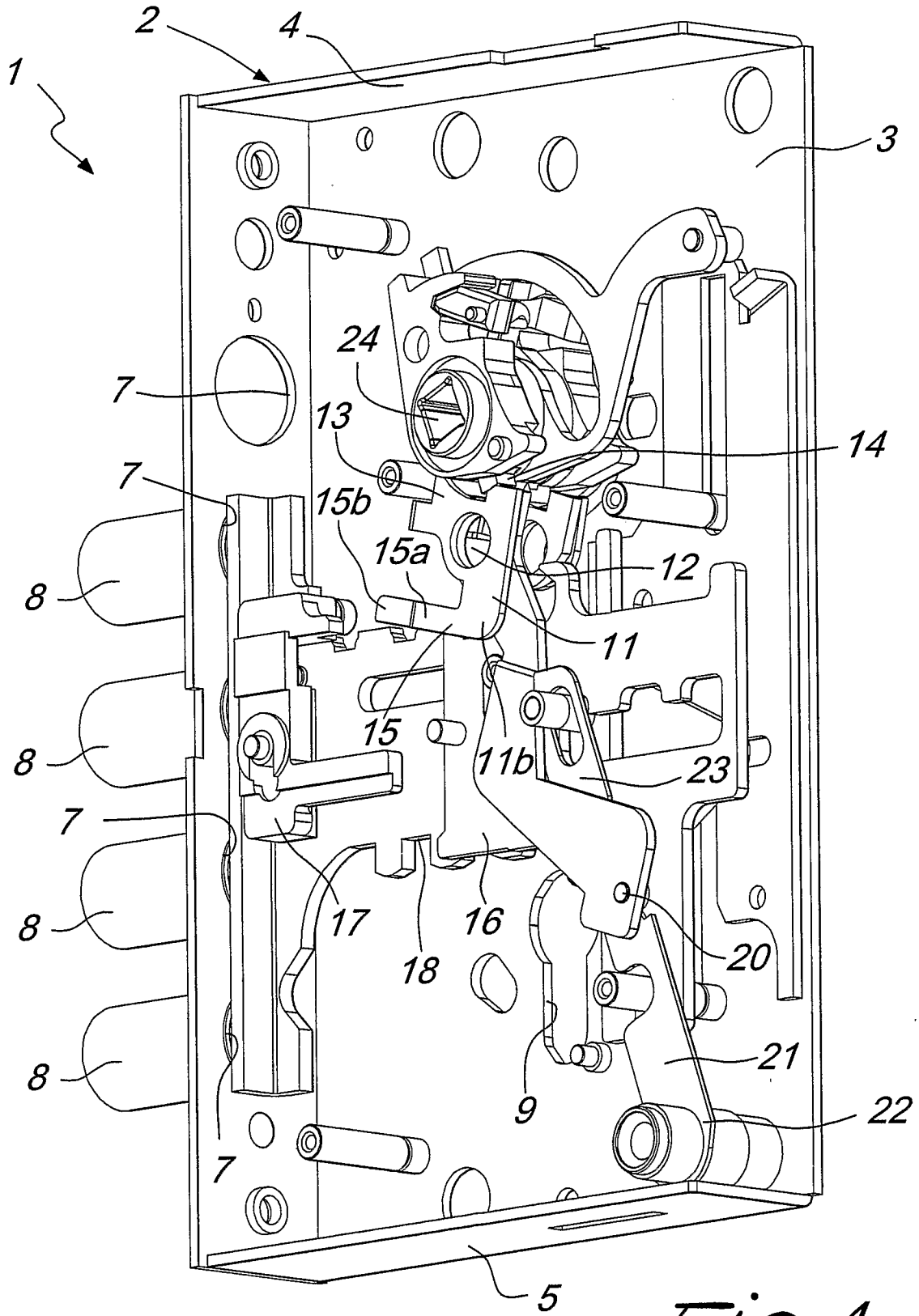


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2007/000497

A. CLASSIFICATION OF SUBJECT MATTER
INV. E05B59/00 E05B15/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 260 660 A (TALLERES ESCORIAZA SA) 27 November 2002 (2002-11-27) paragraphs [0025], [0026]; figures 5,6	1,3
A	EP 0 708 216 A (JPM CHAUVAT SA) 24 April 1996 (1996-04-24) column 2, line 33 - column 3, line 49; figures 1-4	1
A	EP 0 688 930 A (FERCO INTERNATIONAL USINE FERRURES) 27 December 1995 (1995-12-27) column 3, line 19 - line 48; figures 1-3	1
A	EP 1 156 180 A (FLIETHER KARL GMBH & CO) 21 November 2001 (2001-11-21) paragraph [0012]; figures 1-4	1

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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