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(71) Applicant: **Mauer Locking Systems Ltd**
BG-9009 Varna (BG)

(72) Inventor: **Kolev, Kolio Mitev**
BG-9009 Varna (BG)

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(74) Representative: **Radoslavov, Nikolay Radoslavov**
Varna Breeze Patent,
128, "8th Primorski Polk" Blvd., office 12
9002 Varna (BG)

(54) One motion lock

(57) The invention relates to one motion lock, which can be implemented for mounting into doors at homes, in the field of industry as a basic or supplemental lock, as well as for locking metal cases, electrical panels etc.

The lock consists of a cover (12), a case (1), in which a bolt (2) is sliding by means of ledges (6) in two parallel rectangular slots (11), made in the case (1) or by means of grooves (6a), sliding on ledges (11a), said

bolt (2) is connected to the lever (3) by means of a cylindrical pin (7), slidably received in a channel (8), made in the front side of the lever (3), whilst in the back side of the lever (3) is made a recess (22), in which a conveying element (4) is received, said element (4) being slidably moved by the cam (14) into the arc-shaped slots (13), (18), thus performing an arc-shaped movement in cooperation with the lever (3), the latter pushing the bolt (2) completely outwards.

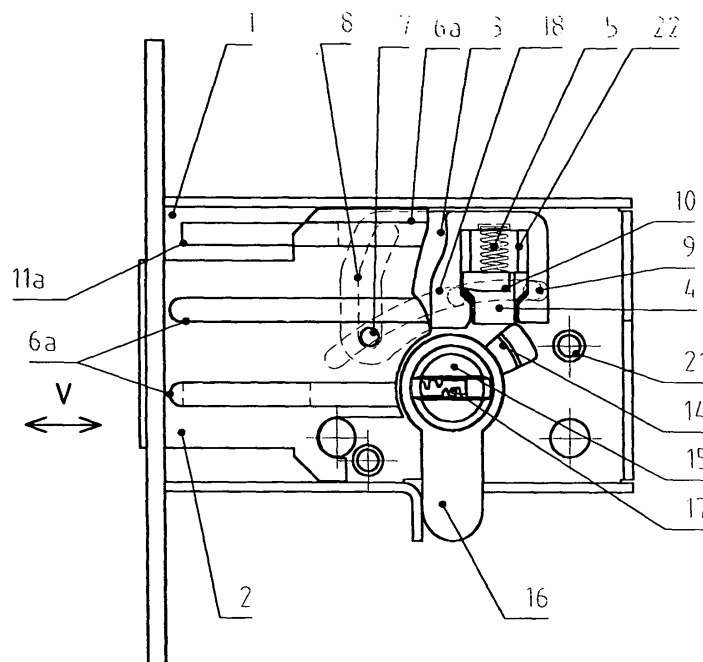


Fig. 6

Description

TECHNICAL FIELD

[0001] The invention relates to one motion lock, which can be implemented for mounting into doors at homes, in the field of industry as a basic or supplemental lock, as well as for locking metal cabinets, electrical panels etc.

BACKGROUND ART

[0002] A lock is known [1], consisting of a case, a cover, rigidly fixed to the case by means of rolled out bushes and columns, a bolt, comprising a conveying element, having T - shaped cross section, said conveying element being pressed by a spring. The bushes and the columns are forming threaded passage bores through the lock, said bores in cooperation with the threaded bore made in the bolt provide the possibility for mounting of an additional device for trilateral locking.

[0003] Said lock has the disadvantage of a short route of the bolt.

[0004] A lock is also known [2], comprising a cover, a case, in which a bolt is slidably received, driven by a conveying element, pressed by a spring, said conveying element being slidably received in a recess, made in a part rigidly connected to the bolt, said conveying element is provided with a guiding element, which is received in a bent slot, made in the case and said conveying element is sliding along with said bolt and as well transversely to its direction of movement, due to the impact of an actuating arm, connected to an inner cylinder, which is mounted within an outer cylinder, fixedly connected to the case, where the inner cylinder is rotatable by means of a key.

[0005] Said lock has the disadvantage that after the actuating arm is disengaged from the conveying element, the bolt has passed only $\frac{3}{4}$ of its route and for the rest $\frac{1}{4}$ of the route the bolt is moved by the impact of a compressed spring and the slope of the slot made in the case. Thus a premise is created the bolt to be pushed back into the case if an accidental inwardly directed force is exerted on the bolt.

SUMMARY OF THE INVENTION

[0006] The invention seeks to provide a lock having an extended route of the bolt, where its stable guidance is provided and to be avoided the possibility of pushing of the bolt back into the case with an accidental inwardly directed force exerted.

[0007] In accordance with the invention, this object is accomplished in an one motion lock, comprising a case, a cover, a lever, a bolt, a conveying element, a spring, a cam, connected to an inner cylinder, which is mounted to an outer cylinder, fixedly connected to the case. The lever is mounted to the case by means of two cylindrical

ledges, located on the one of the lateral sides of the lever, said ledges being slidably received in an arc-shaped slot. Said arc-shaped slot is made in the case or the cover so that its both ends are curved downwards in the direction of the bolt when being moved outwards the case. In the back side of the lever is made a recess, in which the conveying element is received, said element being pressed by a spring, from the upper side and by the cam from the lower side. Due to this the conveying element performs reciprocating movement combined with a movement describing an arc. On its part the conveying element is mounted by means of a tooth fixed thereto, to the cover or the case, said tooth being slidably received in another arc-shaped slot. Said arc-shaped slot is made in the cover or the case so that its both ends are curved downwards in the direction of the bolt when being moved outwards the case, whilst the both curved ends of the slot are confined by flat areas, on which the tooth of the conveying element falls in the both extreme positions of the bolt. Thus the bolt is blocked in completely locked and completely unlocked position. The lever on its part is hingedly connected at its front side to the bolt by means of a cylindrical pin, fixedly mounted on the bolt, said pin being slidably received in a channel, made in the front side of the lever. The bolt is mounted to the case or to the cover by means of ledges, said ledges being peripherally arranged alongside both sides of the bolt and slidably received in rectangular slots made in the case or in the cover and extending parallel to the direction of the movement of the bolt.

[0008] According to the invention a variant is given, where the bolt is mounted to both the case and the cover by means of parallel rectangular grooves bilaterally arranged on the bolt and slidably mounted on rectangular ledges made in both the case and the cover and extending parallel to the direction of the movement of the bolt.

[0009] According to the invention a possibility is provided for mounting of protective covers, made of a steel or plastics, by means of columns and screws passing through passage bores.

[0010] The lock, according to the invention has a number of advantages, as follows: due to the lever hingedly connected to the bolt an extended route of the bolt is achieved and on the other hand due to the joint arc-shaped movement of the lever and the conveying element, the lever remains engaged to the cam until to the final position, thus avoiding the possibility the bolt to be pushed back into the case due to accidental circumstances.

[0011] Further the lock can be protected by means of covers which results in a stable operation since the protective covers are preventing the lock of becoming polluted through the slots made both in the cover and the case and thus the lock to be blocked.

DESCRIPTION OF THE FIGURES IN THE DRAWINGS

[0012] The invention will now be described by way of examples and with reference to the accompanying in which:

Fig. 1 is a front view of the lock without a cover and the bolt completely received in the case;

Fig. 2 is a front view of lock with a cover and the first clasp of the conveying element effected;

Fig. 3 is a front view of the lock with a cover, the bolt completely outwards and the second (final) clasp of the conveying element effected;

Fig. 4 is a front view of the cover and illustrates the arrangement of the arc-shaped slot, bilaterally curved for fixing of the conveying element;

Fig. 5 is a back view of the lock and illustrates the arrangement of the arc-shaped slot for receiving of the lever;

Fig. 6 is a front view of the lock, according to a variant embodiment, without a cover and the bolt completely received in the case;

Fig. 7 is a front view of the lock, according to a variant embodiment, with a cover and the first clasp of the conveying element effected.

Fig. 8 is a front view of the lock, according to a variant embodiment, with a cover, the bolt completely outwards and the second (final) clasp of the conveying element effected;

Fig. 9 is a front view of the cover, according to a variant embodiment, and illustrates the arrangement of the arc-shaped slot, bilaterally curved for fixing of the conveying element;

Fig. 10 is a back view of the lock, according to a variant embodiment, and illustrates the arrangement of the arc-shaped slot for receiving of the lever;

Fig. 11 is a perspective view of the lock and illustrates the additionally mounted protective covers.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0013] In accordance with the examples given one embodiment of the lock is shown in Fig. 1, 2, 3, 4 and 5. The lock consists of a case 1, a cover 12, a bolt 2, a lever 3, a conveying element 4, a spring 5, a cam 14, an inner cylinder 15, an outer cylinder 16. The lever 3 is mounted to the case 1 by means of two cylindrical ledges 9, located on the one of the lateral sides of the lever 3, the said ledges 9 being slidably received in the arc-shaped slot 18, which is made in the case 1 so that its both ends are curved downwards in the direction of the bolt when being moved outwards the case. In the back side of the lever 3 is made a recess 22, in which the conveying element 4 is received, said element 4 being pressed by the spring 5, from the upper side and by the cam 14 from the lower side. Due to this the conveying element 4 performs reciprocating movement combined

with an arc-shaped movement. On its part the conveying element 4 by means of the tooth 10 fixed thereto is mounted to the cover 12, said tooth 10 being slidably received in the arc-shaped slot 13, the latter being made in the cover so that its both ends are curved downwards in the direction of the bolt when being moved outwards the case. The both curved ends of the slot 13 are confined by flat areas 13a and 13b, on which the tooth 10 of the conveying element 4 falls in the both extreme positions of the bolt 2. Thus the bolt 2 is blocked in completely locked and completely unlocked position. The lever 3 is connected hingedly at its front side to the bolt 2 by means of a cylindrical pin 7, fixedly mounted on the bolt 2, said pin 7 being slidably received in a channel 8, made in the front side of the lever 3. The bolt 2 is mounted to the case 1 by means of the ledges 6, said ledges being peripherally arranged on the bolt 2 and slidably received in the rectangular slots 11 made in the case 1 and extending parallel to the direction V of movement of the bolt 2.

[0014] The invention is realized also in variants (not shown in the figures). According to one of the variant embodiments the arc-shaped slot 18 is made in the cover 12 and the arc-shaped slot 13 is made in the case 1, whilst with another variant embodiment both the slot 18 and the slot 13 are made in the case 1 or in the cover 12. In further variant embodiment the slots 11 are made in the cover 12.

[0015] In Fig. 6, 7, 8, 9 and 10 is shown a variant embodiment of the lock, where the bolt 2 is mounted to both the case 1 and the cover 12 by means of the grooves 6a, said grooves being arranged bilaterally on the bolt 2 and slidably mounted to rectangular ledges 11a, which are made in both the case 1 and the cover 12 and arranged parallel to the direction V of movement of the bolt 2.

[0016] In Fig. 11 is shown a variant embodiment of the invention, where to the case 1 and the cover 12 are mounted protective covers 19 made of steel or plastics, said protective covers being mounted by means of columns 21 and screws 20 passing through bores 20a.

IMPLEMENTATION OF THE INVENTION

[0017] One motion lock according to the invention operates as follows. The key 17 is inserted into the inner cylinder and as illustrated in Fig. 1, 2, 3, 4, 5 the key is turned counter clockwise in order to perform the locking operation. As a result the cam 14 moves the conveying element 4 upwards, whilst at the same time the conveying element 4 being exposed to the impact of the rotating cam 14 moves slidably by means of the tooth 10 in the arc-shaped slot 13, made in the cover 12 or the case 1. The conveying element 4 performs arc-shaped movement, thus pulling the lever 3 so that said lever 3 to perform reciprocating and arc-shaped movement by means of the cylindrical ledges 9 sliding into the arc-shaped slot 18, made in the case 1 or the cover 12. As being moved

the lever 3 pushes the bolt 2, which slides outwards in the direction V by means of the ledges 6 sliding into the parallel slots 11, made in the case 1 or the cover 12. With the variant embodiment, as shown in Fig. 6, 7, 8, 9 and 10 the bolt 2 is moved by means of grooves 6a, sliding on the parallel rectangular ledges 11, made both in the case 1 and the cover 12. As being further moved outwards the front side of the lever 3 falls downwards due to the fact that the cylindrical pin 7 is hingedly connected to the channel 8, made in the front side of the lever 3. Due to this movement the lever 3 remains engaged to the cam 14 until the bolt 2 is moved completely outwards. With the end of the locking operation the tooth 10 of the conveying element 4 falls into the curved part of the slot 13 and is located on the flat area 13a, thus the bolt 2 being blocked until the commencement of the unlocking operation. With the unlocking operation the key 17, respectively the cam 14 is turned in the reverse direction (clockwise) and the described movements of the lever 3 and the conveying element 4 are performed in a reverse sequence. With this operation the cam 14 is disengaged from the lever 3 after the bolt 2 is completely received in the case 1.

Claims

1. One motion lock, consisting of a case, a cover, a conveying element, a spring, a cam, connected to an inner cylinder, mounted in an outer cylinder, fixed to the case, **characterised in that** a lever (3) is unilaterally mounted by means of cylindrical ledges (9) being slidably received in an arc-shaped slot (18), made in the case (1) or in the cover (12), whilst in the back side of the lever (3) is made a recess (22), in which is received the conveying element (4), pressed from its upper side by the spring (5) and from the lower side by the cam (14), said conveying element (4) being mounted by means of a tooth (10) slidably received in an arc-shaped slot (13), made in the cover (12) or in the case (1), said lever (3) on its part being hingedly connected to the bolt (2) by means of a cylindrical pin (7), fixedly connected to the bolt (2), said pin (7) being slidably received in a channel (8), made in the front side of the lever (3), said bolt (2) being mounted by means of ledges (6) slidably received in rectangular slots (11), made in the case (1) or the cover (12) and extending parallel to the direction V of movement of the bolt (2) or by means of grooves (6a), made in the both sides of the bolt (2), said grooves (6a) being slidably mounted on rectangular ledges (11a), made both in the case (1) and the cover (12) and extending parallel to the direction V of movement of the bolt (2).
2. A lock according to claim 1, **characterised in that** the arc-shaped slot (18) is made in the case (1) or in the cover (12) so that said slot (18) is curved

downwards in the direction of the bolt (2) when being moved outwards the case (1).

3. A lock according to claim 1, **characterised in that** the arc-shaped slot (13) is made in the cover (12) or in the case (1) so that said slot (13) is curved downwards in the direction of the bolt (2) when being moved outwards the case (1).
4. A lock according to claims 1 and 3, **characterised in that** the curved ends of the slot (13) are confined by flat areas (13a) and (13b).
5. A lock according to claim 1, **characterised in that** the conveying element (4) has a T-shaped cross section.
6. A lock according to claims 1 and 5, **characterised in that** the lower front side of the conveying element (4) is flat.
7. A lock according to claims 1 and 3, **characterised in that** the slot (13) is made in the cover (12), whilst slots (18), (11) are made in the case (1).
8. A lock according to claims 1 and 3, **characterised in that** the slot (13) is made in the case (1), whilst slots (18), (11) are made in the cover (12).
9. A lock according to claims 1, 2 and 3, **characterised in that** the slot (13) as well as slots (18), (11) are made in the cover (12) or in the case (1).
10. A lock according to claim 1, **characterised in that** both to the case (1) and to the cover (12) are mounted protective covers (19) made of steel or plastics, said protective covers (19) being mounted by means of columns (21) and screws (20) passing through passage bores (20a).

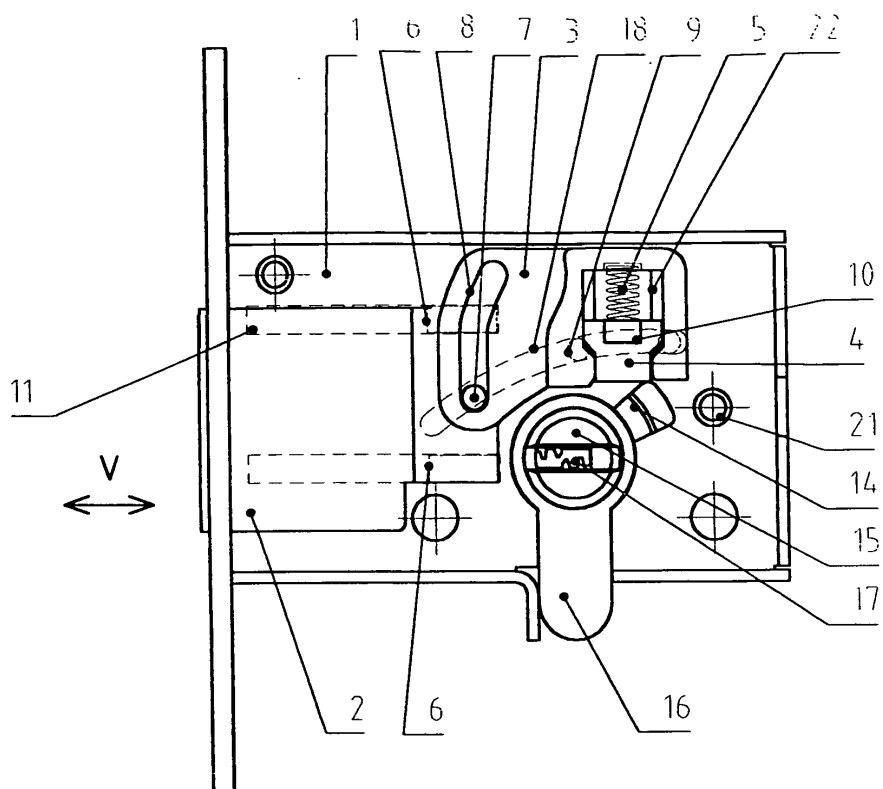


Fig.1

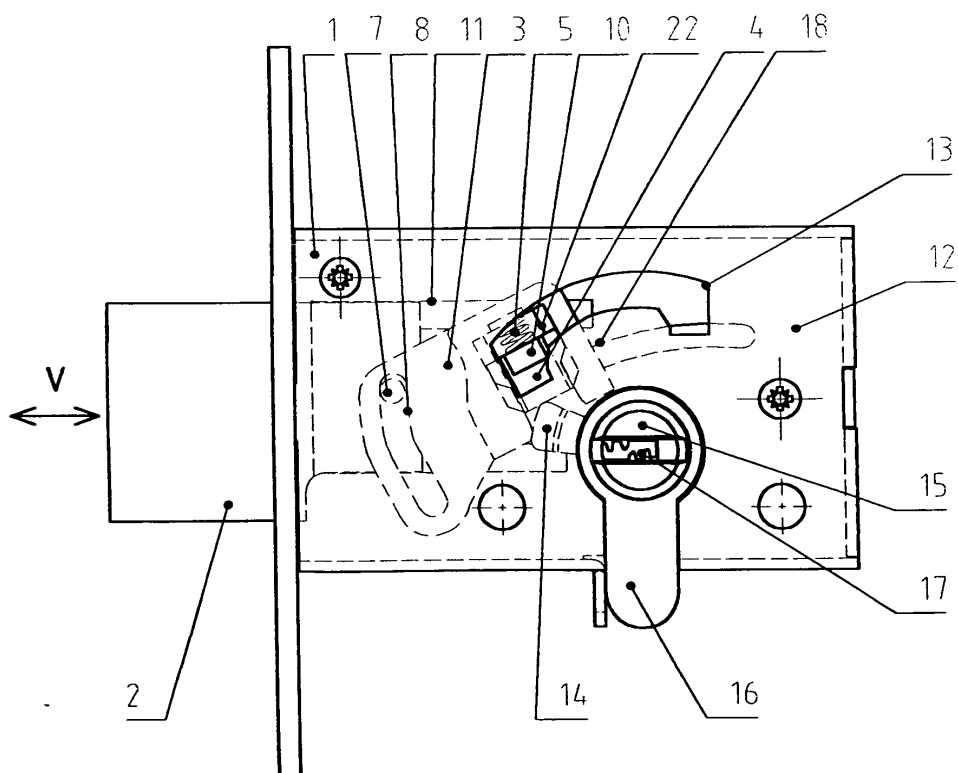


Fig. 2

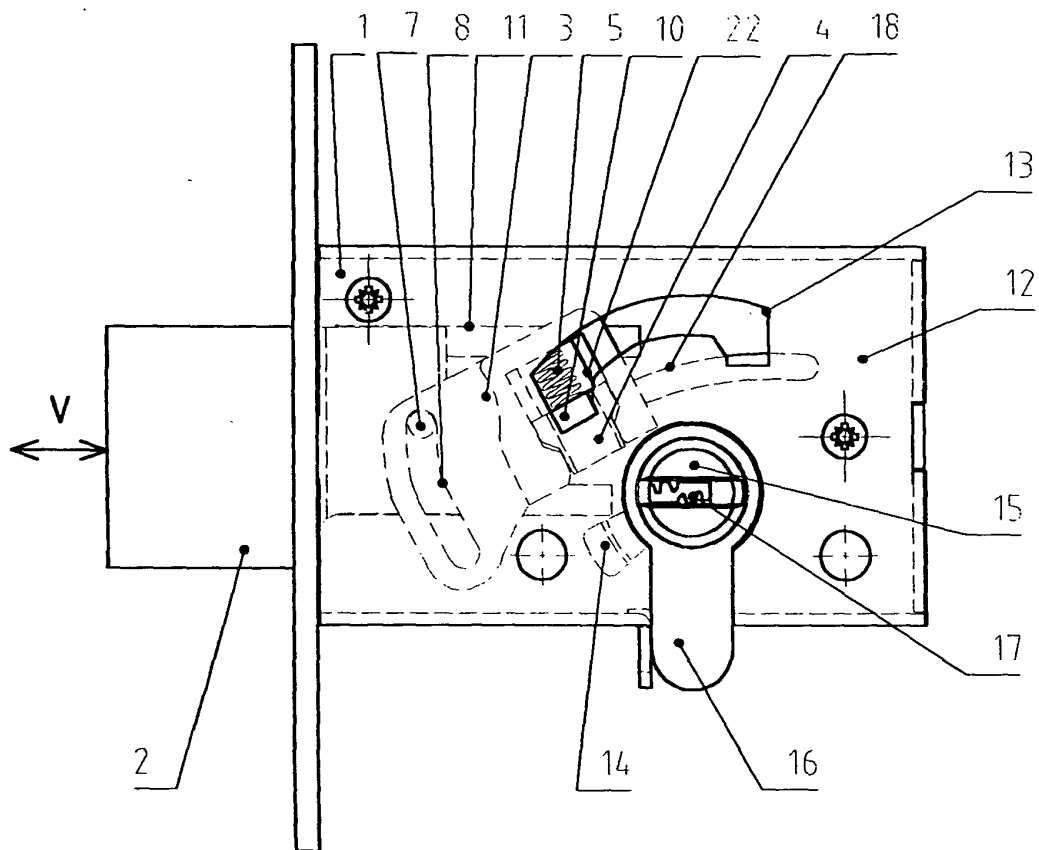


Fig. 3

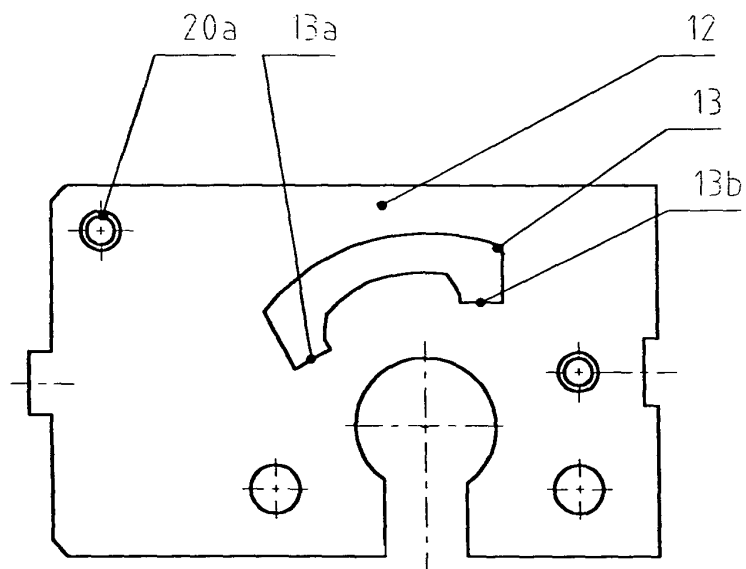


Fig. 4

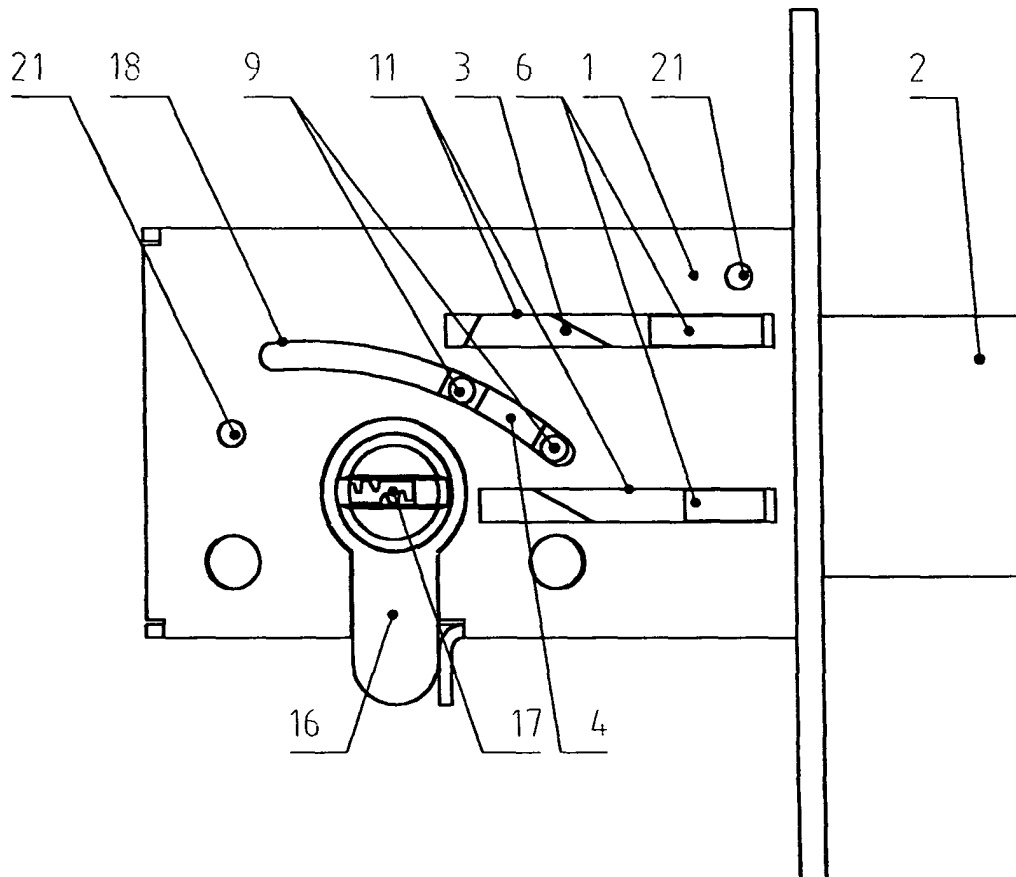


Fig. 5

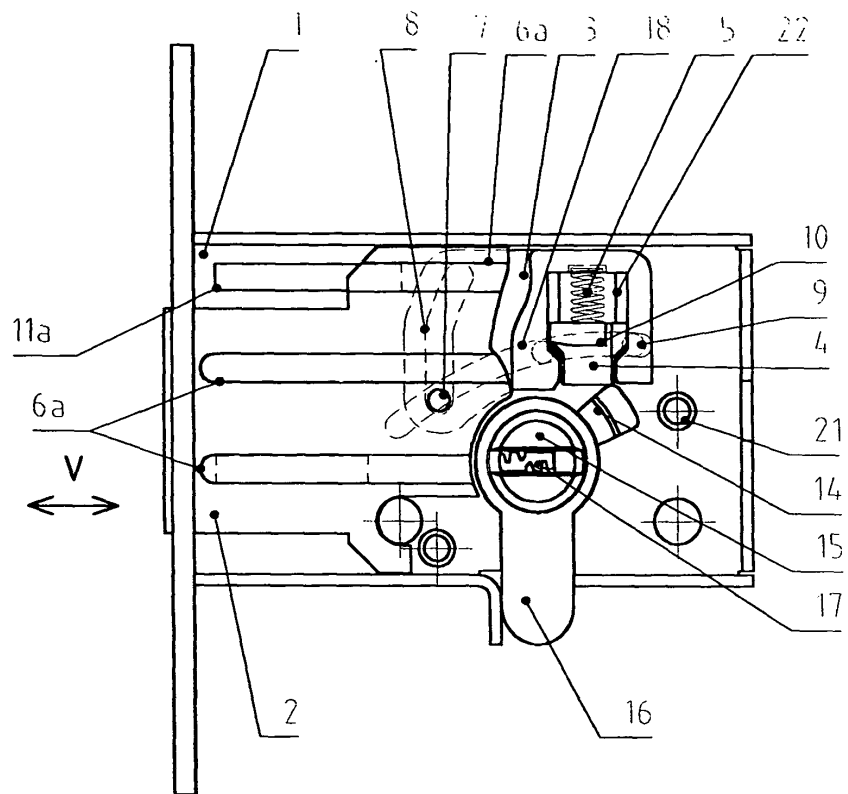


Fig. 6

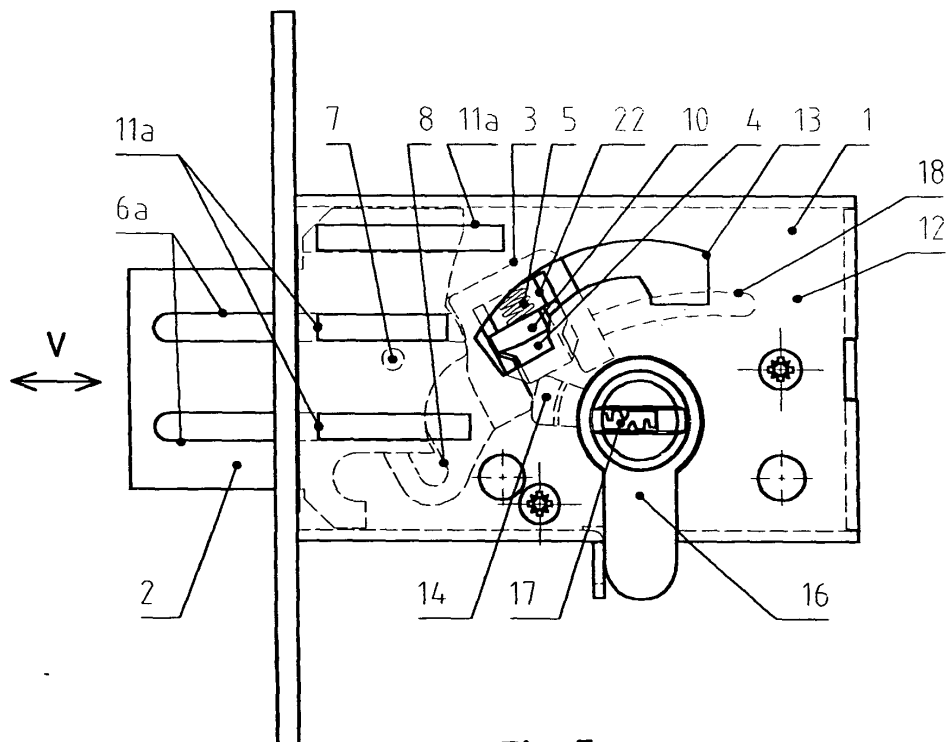


Fig. 7

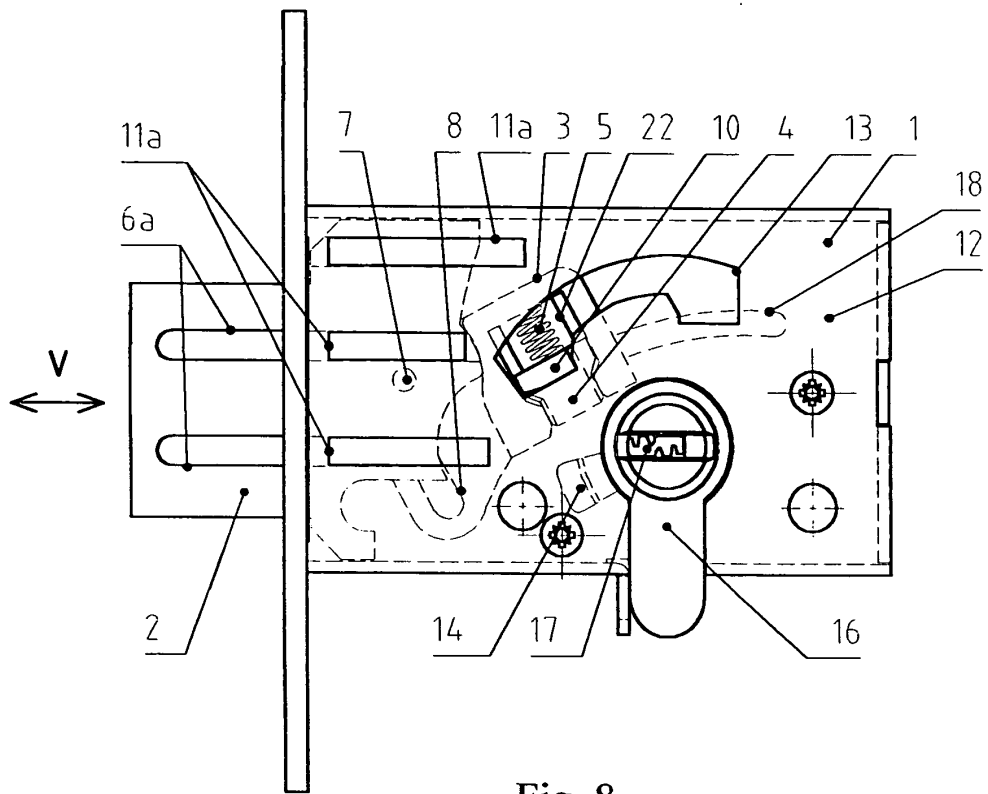


Fig. 8

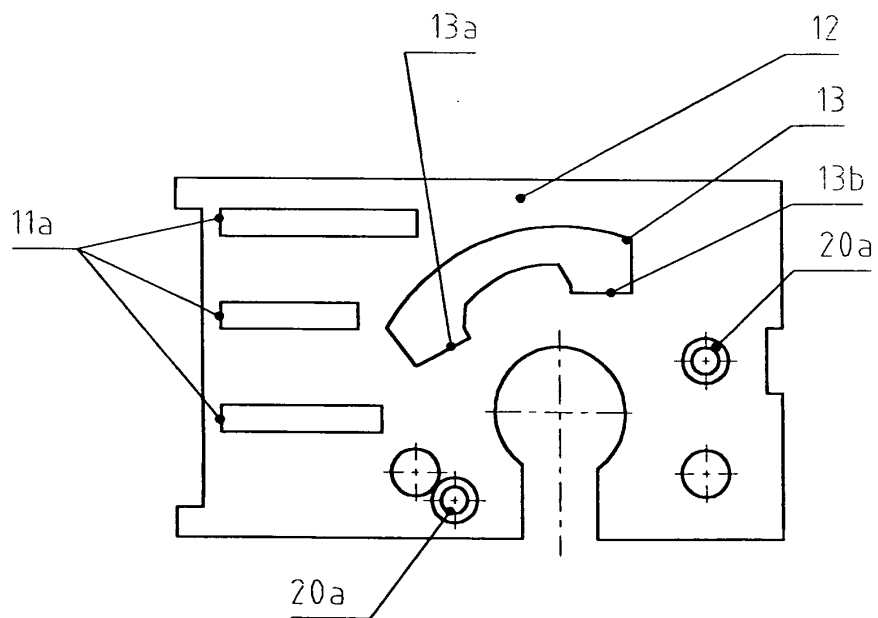


Fig. 9

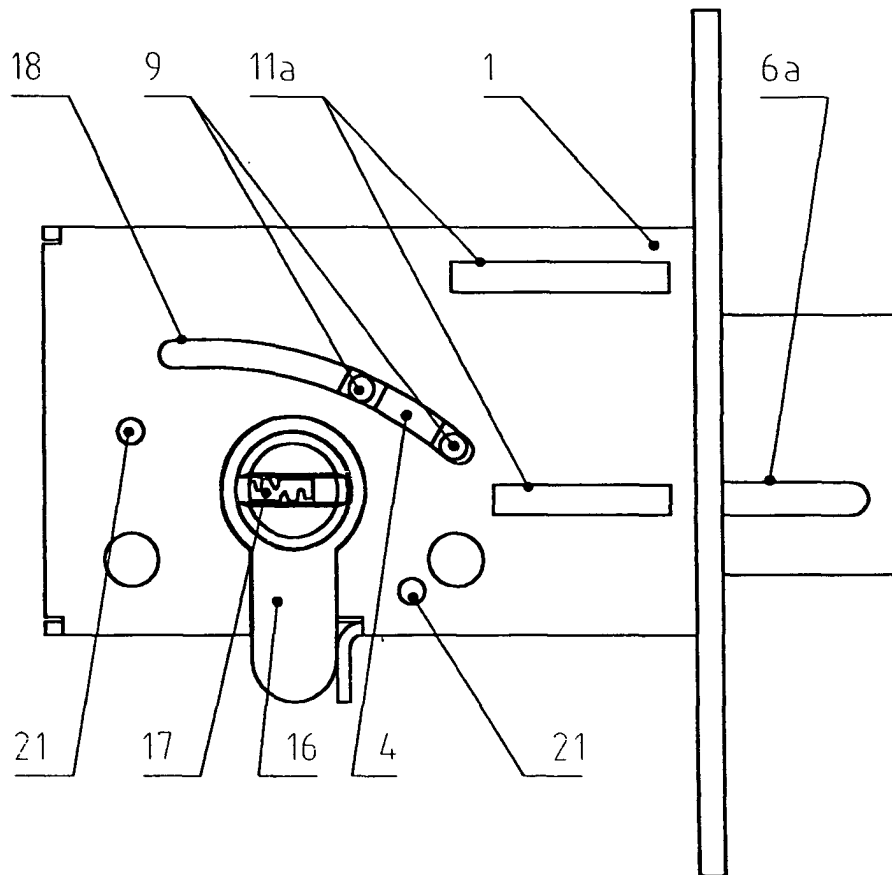


Fig. 10

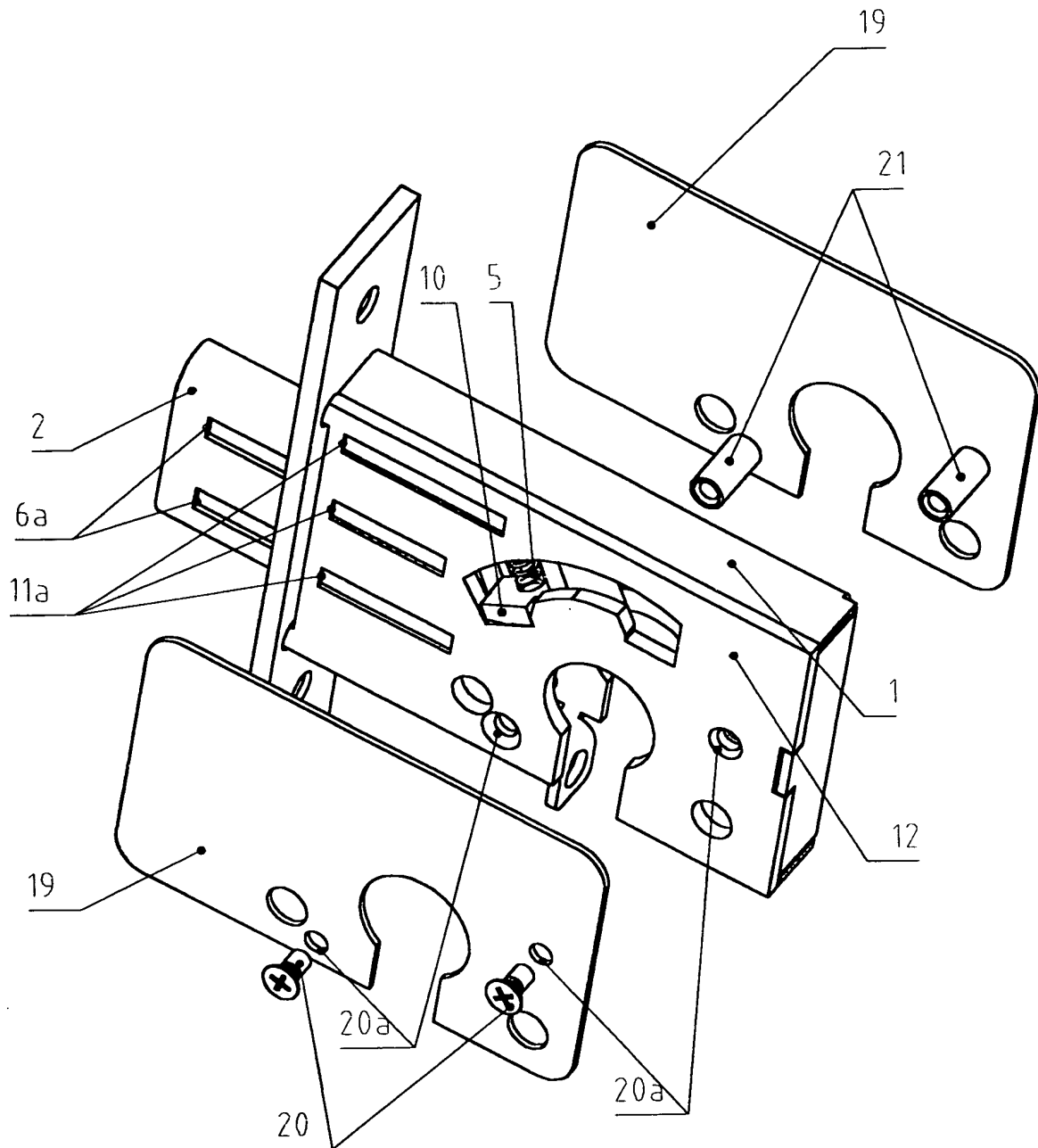


Fig. 11