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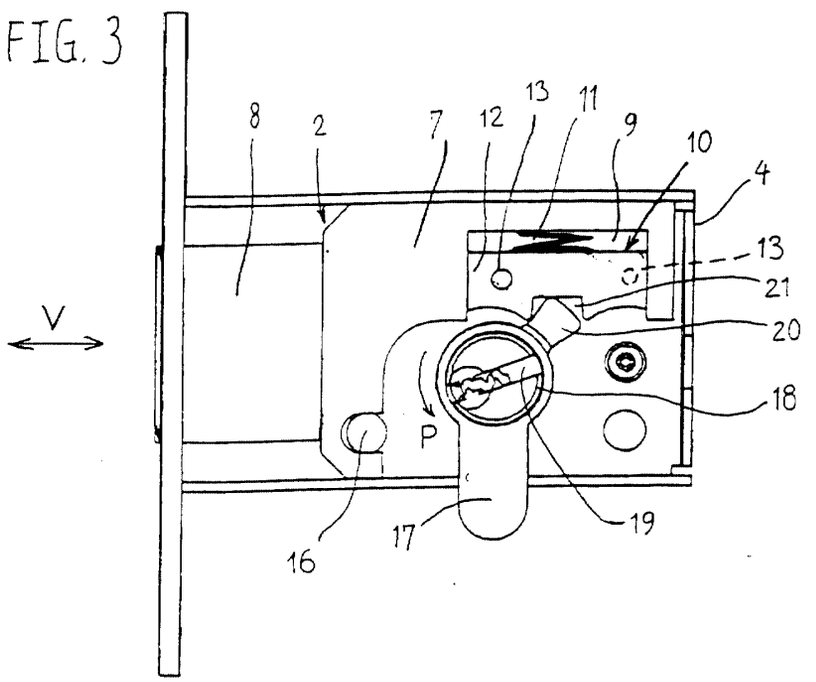
(54) Mortise lock for mounting in a door or the like

(57) Mortise lock for mounting in a door or the like, comprising a case (1) in which a bolt (2) is slidably received. A recess (9) in the bolt (2) holds a conveying element (10), which is slidable transverse to its direction of movement (V) and is under the action of a compression spring (11). Through the conveying element (10), the bolt can be moved by an actuating arm (20) being connected with an inner cylinder (18), which is mounted in an outer cylinder (17) and can be rotated with the help of a key (19). The conveying element (10) has pins (13) being guided by slots (14) mounted in the case (1). On sliding the bolt (2) outwards, the actuating arm (20) will be released from the conveying element (10) and the latter will then press the bolt (2) further outwards by means of the compressing spring (11).

FIG. 3



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Description

[0001] The invention relates to a mortise lock for mounting in a door or the like, comprising a case in which a bolt is slidably received, an actuating arm being connected to an inner cylinder which is mounted within an outer cylinder being fixedly connected to said case and being rotatable with the help of a key, a conveying element being present for cooperating with the actuating arm and said element being slidable together with said bolt and also transversely to its direction of movement and being pushed into the direction of the actuating arm by means of a spring, said conveying element being provided with a guide member cooperating with guiding means mounted within the case.

[0002] Such a lock is known from US 5 678 432. With this lock, the conveying element has a U-shaped cross-section and falls across a part of the bolt. The body of the U is provided with a laterally projecting portion, which can be contacted with obliquely extending guiding surfaces so that, after the conveying element has come out of engagement with the actuating arm, the conveying element can press the bolt further outwards.

[0003] The parts of such a lock are complex in construction, and due to the fact that the conveying element falls across a part of the bolt, the latter is weakened there, or it should be provided in a thicker state. When the bolt has been slid out completely, said weakening is directly behind the transverse plate of the lock, through which the bolt projects, thus in a very inconvenient location. Further, the edges of the body (rectangular in cross-section) of the U-shaped conveying element engage the walls of the guiding surfaces, as a result of which friction and thus wear may occur.

[0004] The object of the invention is to overcome these drawbacks and to that end provides for, that a part of the bolt, connecting to the part which can be located entirely outside of the lock, is fittingly received in the case of the lock and is provided with a recess having two side walls extending square to the longitudinal direction of the bolt, with the conveying element, having almost the same thickness as the bolt, being slidably received in said recess, in which at least one pin for guiding the conveying element is connected to the conveying element or the wall of the case and is guided in a bent slot which has been made in the case or in the conveying element. In this way, a robust structure is obtained, while the friction between the parts is limited as much as possible.

[0005] In order to achieve an optimal guiding of the conveying element in relation to the case, in particular two spaced apart pins and two slots will be applied, seen in the direction of movement of the bolt.

[0006] According to an embodiment, both lateral surfaces of the conveying element can be provided with one pin, said pins being offset in relation to one another, and each of the lateral walls of the case engaging them can be provided with a slot.

[0007] Due to this, the distance between the pins can remain small in that the slots are not situated in one single wall and might overlap. Providing slots in the conveying element would create the risk that said element might get weakened.

[0008] It can be provided for, that each slot has an oppositely bent portion into which a pin connected to the conveying element can be received when the bolt is pushed back into the case without using the key.

[0009] Thus, when the key is not used, the bolt can not be pushed into the case, since then the conveying element will provide a blocking of the bolt.

[0010] Further, US 5 317 890 is referred to, which discloses a lock likewise using a conveying element for pushing the bolt of the lock further outwards when this can no longer be done by the actuating arm. Here, a bore is made in the bolt, extending square to its direction of movement, in which bore a spring-biased pin is mounted. The pin is provided with a further pin being transverse to the plane of the bolt, said second pin being guided by a slot made in a wall of the case. The bolt will get weakened by the slot and the other parts can only be of limited dimensions.

[0011] The invention is further explained by way of an embodiment, illustrated in the drawing, in which:

Fig. 1 shows a perspective view of a mortise lock according to the invention, with the outer and inner cylinders omitted and the bolt slid completely outwards;

Fig. 2 shows a perspective view of the lock of Fig. 1, on a reduced scale, in which a lateral wall of the case has been omitted and the bolt is received in the house completely;

Fig. 3 shows diagrammatically a lateral view of the lock when the key is turned thus far that the actuating arm starts cooperating with the conveying element;

Figs. 4, 5 and 6 show lateral views according to Fig. 3, yet in successive positions of the parts when the key is turned ever further.

[0012] The drawing shows a mortise lock comprising a case 1 in which a bolt 2 is slidably received. The case 1 is defined by the lateral walls 3, in which one of said walls can be connected to the transverse walls 4, so that a housing 5 is formed, to which the other lateral wall 3 can be fixed by means of screws. At its front side, the housing 5 is provided with a cross-plate 6, with which the lock can be fastened to a door or the like by means of screws.

[0013] The bolt 2 comprises a part 7 which is fittingly and slidingly received in the case 1, and a part 8 which can project outwards through the cross-plate 6. A recess 9 in the part 7 of the bolt 2 holds a conveying element 10, which is slidable in the plane of the bolt 2 and transverse to its direction of movement V, see fig. 3. The conveying element 10 is spring-loaded by means of a com-

pression spring 11.

[0014] A pin 13 is mounted on each lateral wall 12 of the conveying element 10 and each pin 13 is received in a slot 14 in one of the lateral walls 3 of the case 1. As indicated in Figure 3, the pins 13 are offset in relation to each other and obviously this also applies to the slots 14 in which they are located. As appears from Fig. 1 in particular, a slot 14 is provided with an oppositely bent part 15, in which the accompanying pin 13 will fall when an inwardly directed force is exerted on part 8 of the bolt 2 in particular. With normal operation of the lock, as will be described further, the inward movement of the bolt 2 is limited by the slots 14, possibly in combination with the transverse wall 4 the of case 1, indicated in Figure 3. Holes 16 are present for fastening a possibly applicable metal work on the door.

[0015] An outer cylinder 17 is fixedly mounted in the case 1 and the inner cylinder 18 is rotatable within said outer cylinder 17. Rotation of the inner cylinder 18 takes place in a known way with the help of a key 19 providing for deblocking of the inner cylinder 18.

[0016] Like with the known cylinder locks, the key 19 can only be inserted in the inner cylinder 18 when the latter is in the position shown in Figure 2. On rotation of the inner cylinder 18 in the direction of the arrow P, the actuating arm 20 connected to it will at a given moment be received in a cavity 21 of the conveying element 10, as illustrated in Figure 3. The actuating arm 20 now starts acting on the conveying element 10, causing it to be pushed to the left, as seen in Figure 3. Further, the conveying element 10 wil move upward, also due to the pins 13 received in the slots 14. With that, the spring 11 will be compressed.

[0017] After the position of the actuating arm 20 shown in Figure 4, the position as shown in Figure 5 is achieved. Now, the actuating arm 20 comes to lie below a point of the conveying element 10 and will not be able to push this element further to the left.

[0018] When turning the key 19 further, the actuating arm 20 will be completely released from the conveying element 1C as shown in Figure 6. The spring 11 then presses the conveying element 10 downward in the direction of the outer cylinder 17. By the cooperation of the pins 13 connected to the conveying element 10 and the slots 14 mounted in the lateral walls 3 of the case 1, the conveying element 10 will move further to the left, as seen in Figure 6. This will also cause the bolt 2 to move further to the left and achieve the position illustrated in Figure 6, in which it protrudes beyond the case 1 across the maximum distance, beyond its plate 6 in particular.

[0019] The key 19 can be turned further, so that it will have been rotated across 360 degrees in total, and can then be taken out of the lock. As appears from Figure 6, after inserting the key 19 into the lock, the actuating arm 20 can be rotated in the direction of the arrow R so that the arm will again be received in the cavity 21 of the conveying element 10. Conveying element 10 can then be moved upwards and to the right in order to pull the bolt 2 back into the case 1.

[0020] Although a mortise lock has been discussed in the above, the invention is not limited to this lock. It can also be used with other types of locks when it is important to slide the bolt outward from the case as far as possible.

[0021] As stated earlier, application of two pins 13 and two slots 14 will be preferred in order to guide the conveying element 10 in the recess 9 in the bolt 2 in the best possible way. It is possible to apply one single pin 13 and a slot 14, but this will require a more accurate guiding of the conveying element 10 within the recess 9.

[0022] Further, it is possible to make the slots 14 in separate plates which can be secured on the lateral walls 3 of the case. Then, the lateral walls can be closed, so that the penetration of dirt into the case is prevented.

[0023] Like with known locks, the lock can be designed in such a way, that the actuating arm can be rotated from both sides of the lock.

[0024] It will be obvious, that only one possible emodiment of a mortise lock according to the invention has been illustrated in the drawings and described above, and that many changes can be made without leaving the inventive idea, as it is indicated in the appended claims.

Claims

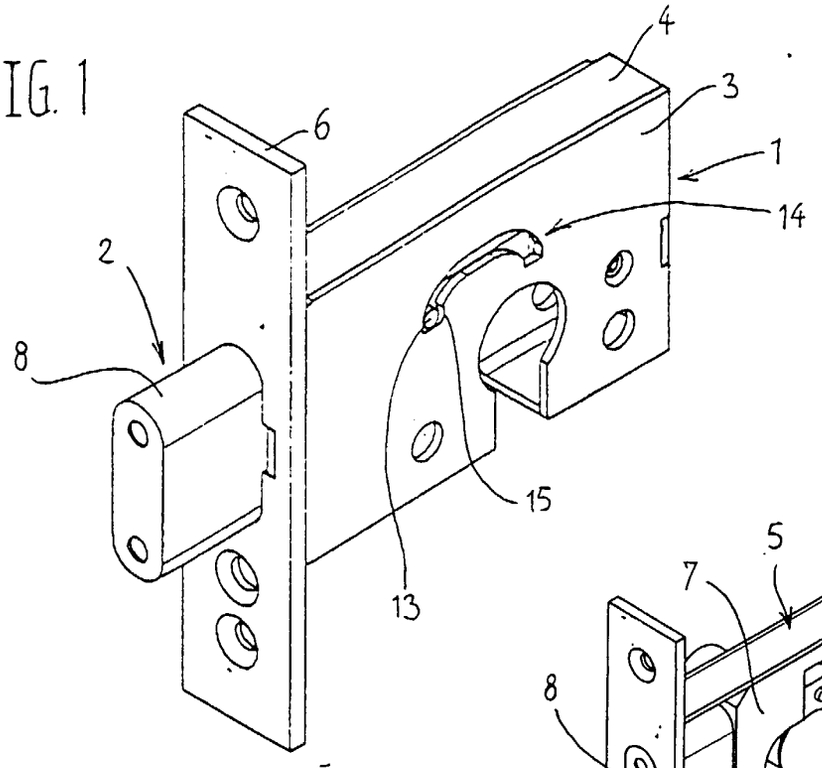
1. Mortise lock for mounting in a door or the like, comprising a case (1) in which a bolt (2) is slidably received, an actuating arm (20) being connected to an inner cylinder (18), which is mounted within an outer cylinder (17) being fixedly connected to said case and being rotatable with the help of a key (19), a conveying element (10) being present for cooperating with the actuating arm (20) and said element being slidable together with said bolt (2) and also transversely to its direction of movement (V) and being pushed into the direction of the actuating arm (20) by means of a spring (11), said conveying element being provided with a guide member (13) cooperating with guiding means (14) mounted within the case (1), characterized in that a part (7) of the bolt (2), connecting to the part (8) thereof which can be located entirely outside of the lock, is fittingly received in the case (1) of the lock and is provided with a recess (9) having two side walls extending square to the longitudinal direction of the bolt, with the conveying element (10), having almost the same thickness as the bolt (2), being slidably received in said recess, in which at least one pin (13) for guiding the conveying element, is connected to the conveying element or the wall of the case and is guided in a bent slot (14) which has been made in the case or in the conveying element (10).

2. Mortise lock according to claim 1, characterized in that two spaced apart pins (13) and two slots (14), seen in the direction of movement (V) of the bolt (2), are present for guiding the conveying element (10) in relation to the case (1).

3. Mortise lock according to claim 2, characterized in that each of both lateral surfaces (12) of the conveying element (10) is provided with one pin (13), said pins being offset in relation to one another, and each of the lateral walls (3) of the case (1) engaging them being provided with a slot (14).

4. Mortise lock according to claim 2 or 3, characterized in that each slot (14) has an oppositely bent portion (15) into which a pin (13) connected to the conveying element (10) can be received when the bolt (2) is pushed back into the case (1) without using the key (19).

FIG. 1



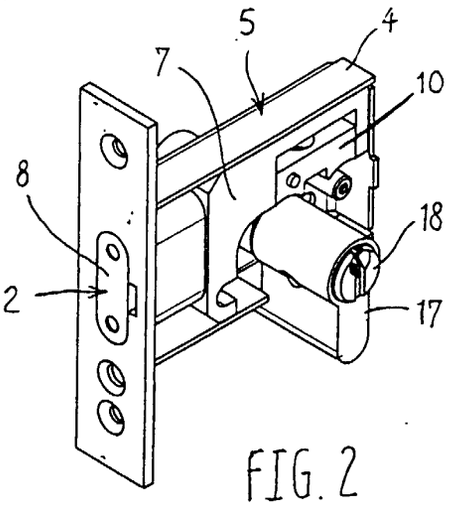


FIG. 2

FIG. 3

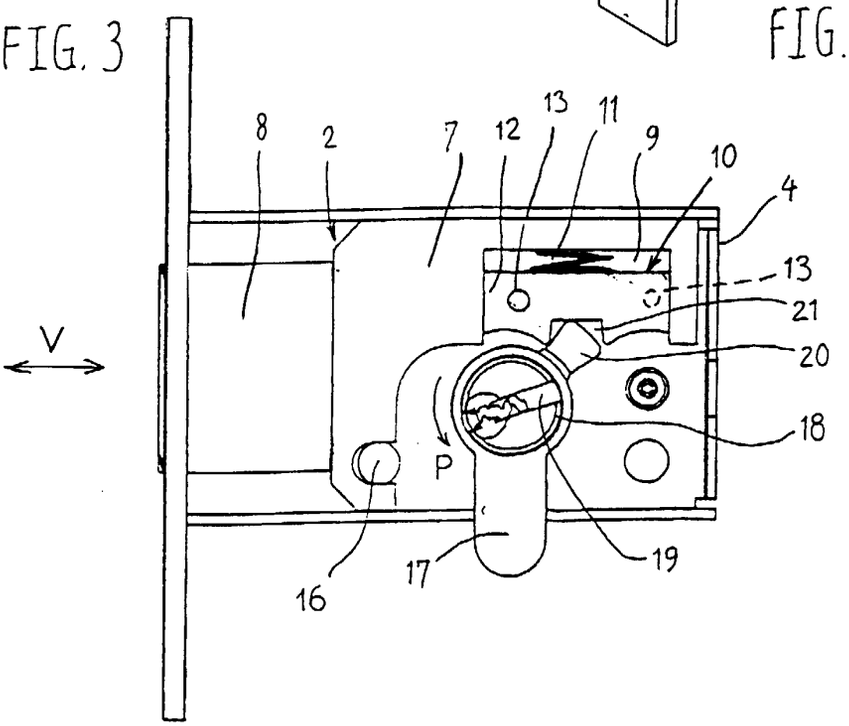


FIG. 4

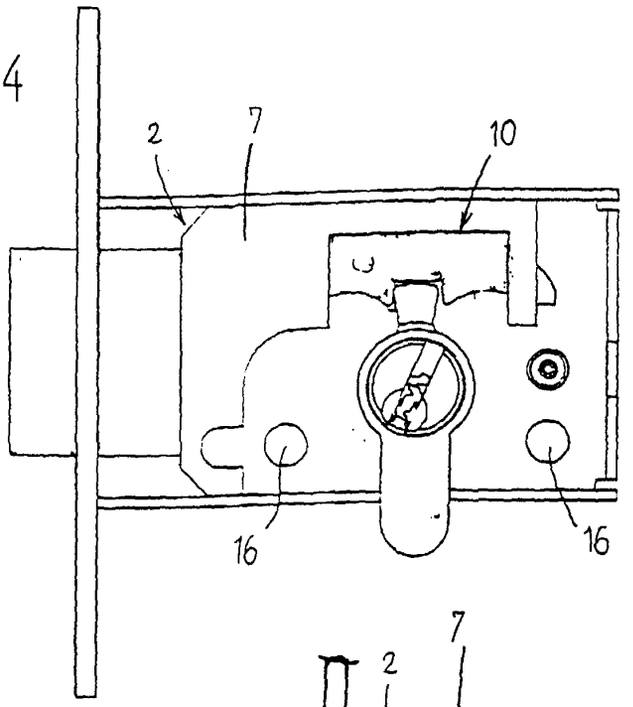


FIG. 5

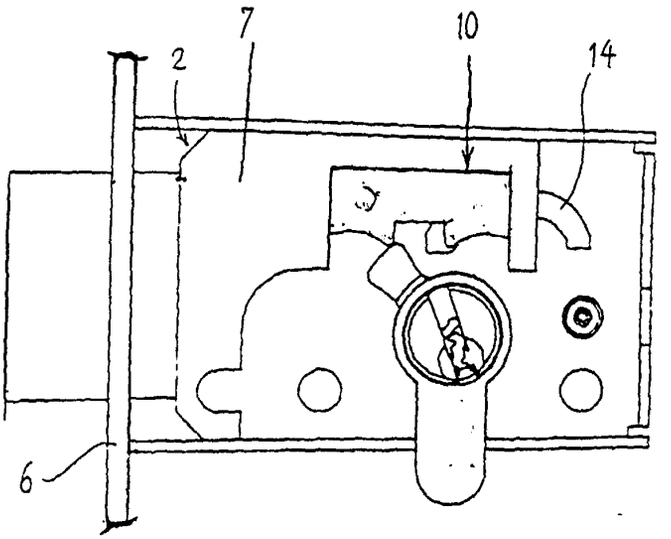


FIG. 6