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

Einsteckschloss zur Befestigung in einer Tür oder dergleichen

Serrure encastrée pour montage dans une porte ou similaire

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Description

[0001] The invention relates to a mortise lock for mounting in a door or the like, as this is known by US-A-5 317 890.

[0002] In case of this known lock an actuation arm of a lock cylinder contacts the bolt in order to push it outwards, and a conveying element is used for pushing the bolt of the lock further outwards when this can no longer be done by an actuating arm. A bore is provided in the bolt, extending square to its direction of movement. A spring-biased pin is mounted in said bore. Said pin is provided with a second 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 be weakened by said slot and the other parts can only be of limited dimensions.

[0003] Now the object of the invention is to overcome this drawback by the provision of an alternative conveying element arrangement and so the invention provides 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, mounted in an outer cylinder which is fixedly connected to said case, said actuating arm being rotatable with the help of a key, a part of said bolt, connected to the part thereof which can be located entirely outside of said lock, being fittingly received in said case and is provided with a recess having two side walls extending square to the longitudinal direction of the bolt, a conveying element being present for cooperating with said actuating arm, said conveying element, having almost the same thickness as said bolt, is slidably received in said recess in said bolt and is slidable together with said bolt and also transversely to its direction of movement and is pushed into the direction of the actuating arm by means of a spring, said conveying element being provided with a cavity in which the actuating arm can be received when the key is rotated for moving said bolt, at least one pin being present in said conveying element either in the wall of said case, said pin being guided by a bent slot provided in the case either in said conveying element, the construction being such that after the actuating arm has moved the bolt outwardly by turning the key said actuating arm will be completely released from the conveying element by turning the key further, whereby the spring (11) then presses the conveying element (10) in the direction of the outer cylinder (17), such that by cooperation of said pin (13) and said bent slot (14) the conveying element (10) and the bolt (2) are moved further.

[0004] According to an embodiment said conveying element is provided with two pins being movable in two bent slots in said case for guiding said conveying element in relation to said case.

[0005] 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.

[0006] 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.

[0007] 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.

[0008] 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.

[0009] 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.

[0010] 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.

[0011] The bolt 2 comprises a part 7 which is fittingly and slidably 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 compression spring 11.

[0012] 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 of case 1, indicated in Figure 3. Holes 16 are present for fastening a possibly applicable metal work on the door.

[0013] 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.

[0014] 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 will move upward, also due to the pins 13 received in the slots 14. With that, the spring 11 will be compressed.

[0015] 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.

[0016] When turning the key 19 further, the actuating arm 20 will be completely released from the conveying element 10 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] It will be obvious, that only one possible embodiment 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.

10 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), mounted in an outer cylinder (17) which is fixedly connected to said case, said actuating arm (20) being rotatable with the help of a key (19), a part (7) of said bolt (2), connected to the part (8) thereof which can be located entirely outside of said lock, being fittingly received in said case (1) and is provided with a recess (9) having two side walls extending square to the longitudinal direction of the bolt (2), a conveying element (10) being present for cooperating with said actuating arm (20), said conveying element (10), having almost the same thickness as said bolt (2), is slidably received in said recess (9) in said bolt (2) and is slidable together with said bolt (2) and also transversely to its direction of movement (V) and is pushed into the direction of the actuating arm (20) by means of a spring (11), said conveying element being provided with a cavity (21) in which the actuating arm (20) can be received when the key is rotated for moving said bolt (2), at least one pin (13) being present in said conveying element (10) either in the wall of said case (1), said pin (13) being guided by a bent slot (14) provided in the case (1) either in said conveying element (10), the construction being such that after the actuating arm (20) has moved the bolt (2) outwardly by turning the key (19) said actuating arm (20) will be completely released from the conveying element (10) by turning the key further, whereby the spring (11) then presses the conveying element (10) in the direction of the outer cylinder (17), such that by cooperation of said pin (13) and said bent slot (14) the conveying element (10) and the bolt (2) are moved further.
2. Mortise lock for mounting in a door or the like, **characterized in that** said conveying element (10) is provided with two pins (13) being movable in two bent slots (14) in said case (1) for guiding said conveying element (10) in relation to said 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).

Patentansprüche

1. Einsteckschloss für die Montage in einer Tür oder dergleichen, mit einem Gehäuse (1), in welchem ein Bolzen (2) gleitbar aufgenommen ist, einem Betätigungsarm (20), der mit einem inneren Zylinder (18) verbunden ist, welcher in einem äußeren Zylinder (17) montiert ist, der mit dem Gehäuse fest verbunden ist, wobei der Betätigungsarm (20) mit Hilfe eines Schlüssels (19) drehbar ist, wobei ein Teil (7) des Bolzens (2), welcher mit demjenigen Teil (8) desselben verbunden ist, welcher vollständig außerhalb des Schlosses positioniert werden kann, passend in dem Gehäuse (1) aufgenommen und mit einer Aussparung (9) versehen ist, die zwei Seitenwände hat, welche sich senkrecht zur Längsrichtung des Bolzens (2) erstrecken, ein Übertragungselement (10) vorhanden ist für das Zusammenwirken mit dem Betätigungsarm (20), wobei das Übertragungselement (10), das nahezu dieselbe Dicke wie der Bolzen (2) hat, in der Aussparung (9) in dem Bolzen (2) gleitbar aufgenommen und zusammen mit dem Bolzen sowie auch quer zu dessen Bewegungsrichtung (V) gleitend bewegbar ist und mit Hilfe einer Feder (11) in Richtung des Betätigungsarmes (20) gedrückt wird, wobei das Übertragungselement mit einer Aussparung (21) versehen ist, in welcher der Betätigungsarm (20) aufgenommen werden kann, wenn der Schlüssel zum Bewegen des Bolzens (2) gedreht wird, wobei zumindest ein Zapfen (13) in dem Übertragungselement (10) oder in der Wand des Gehäuses (1) vorhanden ist und der Zapfen (13) durch einen gekrümmten Schlitz (14) geführt ist, welcher in dem Gehäuse (1) oder in dem Übertragungselement (10) vorgesehen ist, wobei der Aufbau von der Gestalt ist, dass, nachdem der Betätigungsarm (20) den Bolzen (2) durch Drehen des Schlüssels (19) nach außen bewegt hat, der Betätigungsarm (20) vollständig von dem Übertragungselement (10) freigegeben wird indem der Schlüssel noch weiter gedreht wird, wodurch die Feder (11) das Übertragungselement (10) dann in Richtung des äußeren Zylinders (17) drückt, so dass durch Zusammenwirken des Zapfens (13) und des gekrümmten Schlitzes (14) das Übertragungselement (10) und der Bolzen (2) weiter bewegt werden.

2. Einsteckschloss für die Montage in einer Tür oder

dergleichen, **dadurch gekennzeichnet, dass** das Übertragungselement (20) mit zwei Zapfen (13) versehen ist, die in zwei gekrümmten Schlitzten (14) in dem Gehäuse (1) zum Führen des Übertragungselementes (10) bezüglich des Gehäuses (1) bewegbar sind.

3. Einsteckschloss nach Anspruch 2, **dadurch gekennzeichnet, dass** jede der beiden Seitenflächen (12) des Übertragungselementes (10) mit einem Zapfen (13) versehen ist, wobei die Zapfen relativ zueinander versetzt sind und wobei jede der Seitenwände (3) des Gehäuses (1) die mit den Zapfen in Eingriff stehen, mit einem Schlitz (14) versehen ist.
4. Einsteckschloss nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** jeder Schlitz (14) einen entgegengesetzt gekrümmten Abschnitt (15) hat, in welchem ein Zapfen (13), der mit dem Übertragungselement (10) verbunden ist, aufgenommen werden kann, wenn der Bolzen (2) in das Gehäuse (1) zurückgedrückt wird, ohne den Schlüssel (19) zu verwenden.

Revendications

1. Verrou encastré pour montage dans une porte ou analogue, comprenant un boîtier (1) dans lequel un pêne (2) est reçu de manière coulissante, un bras d'actionnement (20) étant relié à un cylindre intérieur (18), monté dans un cylindre extérieur (17) qui est fixement relié audit boîtier, ledit bras d'actionnement (20) pouvant être mis en rotation à l'aide d'une clef (19), une partie (7) dudit pêne (2), reliée à la partie (8) de celui-ci qui peut être positionnée entièrement à l'extérieur de ladite serrure, étant reçue de manière ajustée dans ledit boîtier (1) et est munie d'un évidement (9) ayant deux parois latérales s'étendant orthogonalement à la direction longitudinale du pêne (2), un élément de transfert (10) étant présent pour coopérer avec ledit bras d'actionnement (20), ledit élément de transfert (10), ayant pratiquement la même épaisseur que ledit pêne (2), est reçu de manière coulissante dans ledit évidement (9) dans ledit pêne (2) et peut coulisser en association avec ledit pêne (2) et également transversalement à sa direction de déplacement (V) et est poussé dans la direction du bras d'actionnement (20) au moyen d'un ressort (11), ledit élément de transfert étant muni d'une cavité (21) dans laquelle le bras d'actionnement (20) peut être reçu lorsque la clef est pivotée pour déplacer ledit pêne (2), au moins un tourillon (13) étant présent dans ledit élément de transfert (10) soit dans la paroi dudit boîtier (1), ledit tourillon (13) étant guidé par une fente courbe (14) prévue dans le boîtier (1), soit dans ledit élément de transfert (10), la construction étant telle qu'après que le bras d'actionnement

(20) a déplacé le pêne (2) vers l'extérieur en tournant la clef (19), ledit bras d'actionnement (20) sera entièrement libéré de l'élément de transfert (10) en tournant davantage la clef, de sorte que le ressort (11) presse alors l'élément de transfert (10) dans la direction du cylindre extérieur (17), de sorte que par coopération dudit tourillon (13) et de ladite fente courbe (14), l'élément de transfert (10) et le pêne (2) sont davantage déplacés.

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2. verrou encastré pour un montage dans une porte ou analogue, **caractérisée en ce que** ledit élément de transfert (10) est muni de deux tourillons (13) mobiles dans deux fentes courbes (14) dans ledit boîtier (1) pour guider ledit élément de transfert (10) par rapport audit boîtier (1). 15
3. Verrou encastré selon la revendication 2, **caractérisée en ce que** chacune des deux surfaces latérales (12) de l'élément de transfert (10) est munie d'un tourillon (13), lesdits tourillons étant décalés l'un par rapport à l'autre, et chacune des parois latérales (3) du boîtier (1) en contact avec ceux-ci étant munie d'une fente (14). 20
4. Verrou encastré selon la revendication 2 ou 3, **caractérisée en ce que** chaque fente (14) a une partie courbée de manière opposée (15) dans laquelle un tourillon (13) relié à l'élément de transfert (10) peut être reçu lorsque le pêne (2) est repoussé dans le boîtier (1) sans utiliser la clef (19). 30

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FIG. 1

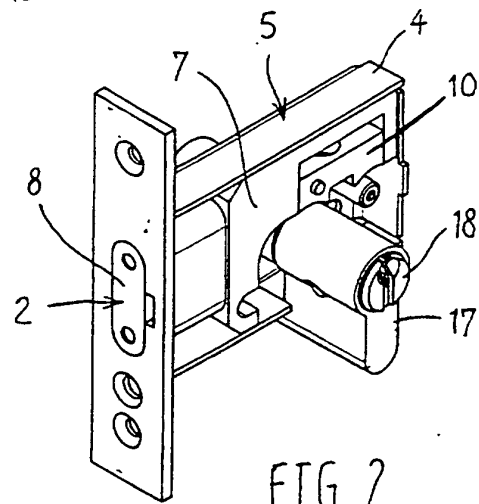
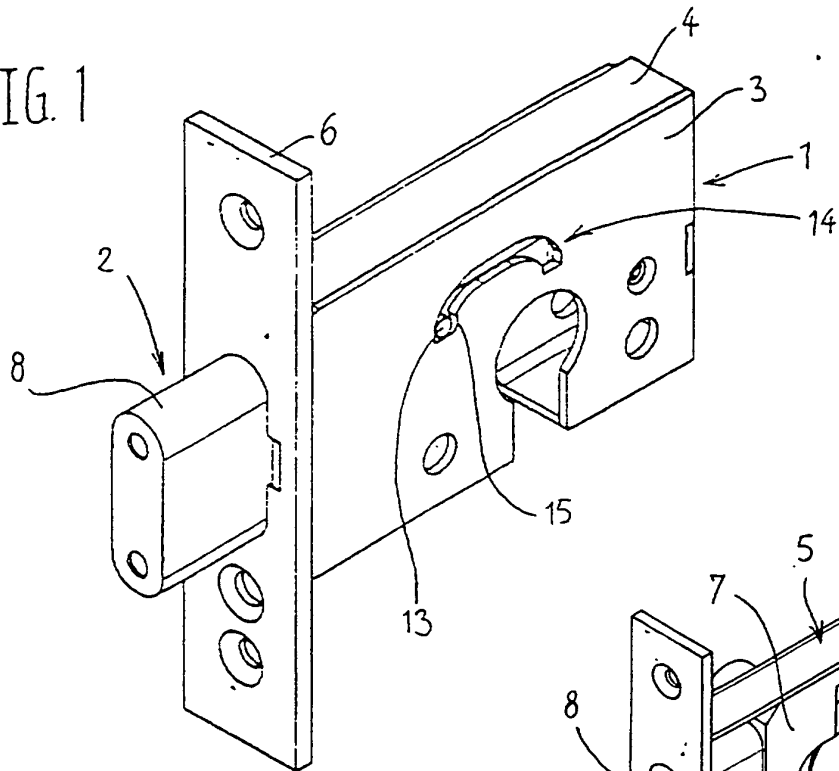


FIG. 2

FIG. 3

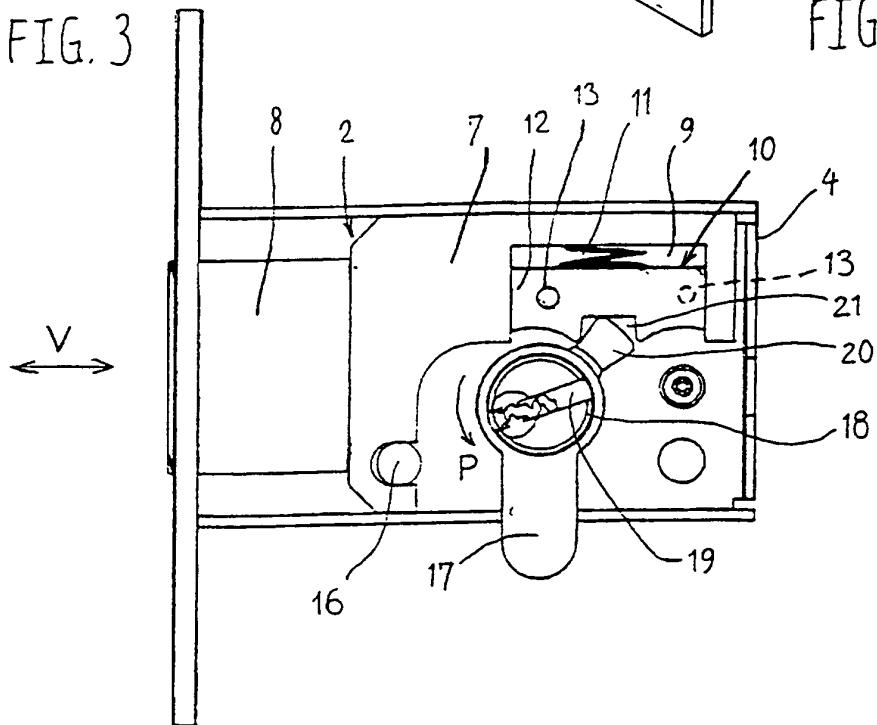


FIG. 4

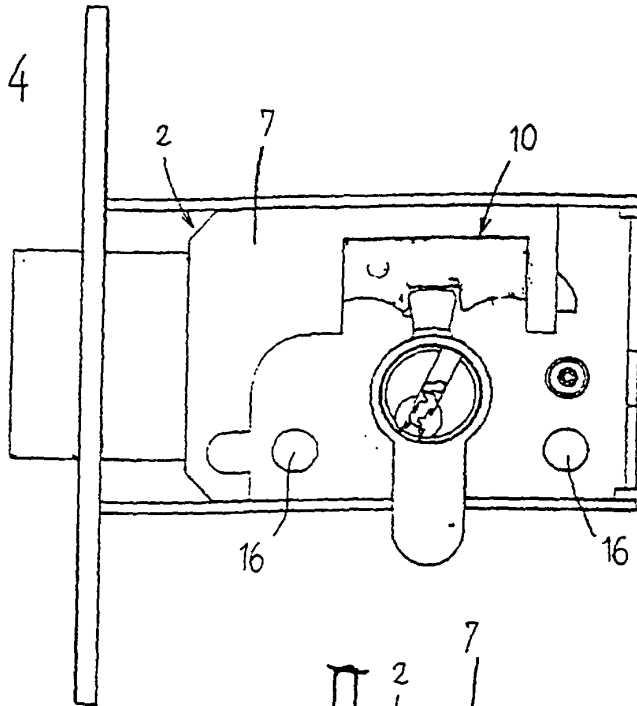


FIG. 5

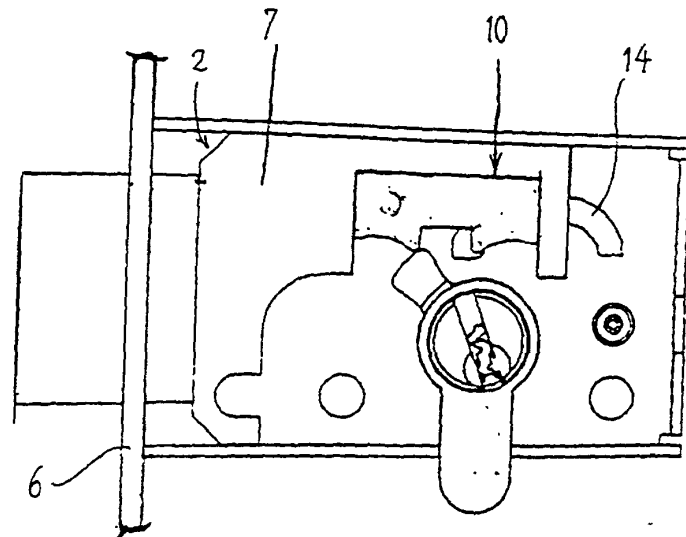
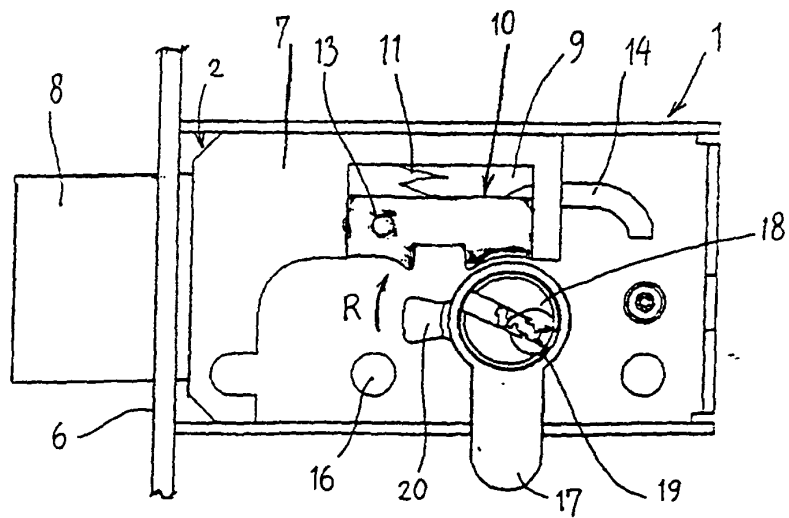


FIG. 6



REFERENCES CITED IN THE DESCRIPTION

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