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(54) **Security device for double pattern locks**

Sicherheitsvorrichtung für Doppelbartschlösser

Dispositif de sécurité pour serrures à panneton double

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EP 0 778 382 B1

Description

[0001] The present invention relates to a security device that allows access to a double-pattern lock.

[0002] In conventional double-pattern locks the keyhole is relatively large and facilitates unauthorized actions on the tumblers with the purpose of moving them into the lock opening position.

[0003] The aim of the present invention is therefore to provide a device which prevents direct access to a double-pattern lock and constitutes a security against effraction attempts.

[0004] Within the scope of this aim, an object of the present invention is to provide a device which is structurally simple and can be applied to locks that have already been installed.

[0005] Another object of the present invention is to provide a device which is protected against forcing attempts.

[0006] A further object of the present invention is to provide a security device which can be applied to locks that have the same problems as double-pattern locks, such as plunger-type locks.

[0007] This aim and these objects are achieved with a security device adapted to allow access to a double-pattern lock, which is actuated by means of a double-pattern key, characterized in that it comprises a lock which has tumblers constituted by pins and is composed of a casing which forms a cylindrical cavity having a front opening for the insertion of the double-pattern key and a rear opening for the exit of said key which is orientated at an offset angle with respect to said front opening, said casing being associable in use with said double-pattern lock so that said rear opening is opposite, in a mirror-symmetrical fashion, with respect to the keyway of the double-pattern lock, a plug which is rotatable in said cavity and is crossed axially by a channel the cross-section whereof is such as to allow to guide the key inserted therein through said front opening, a set of holes which are formed on a radial plane of said plug and lead into said channel, a set of pins guided in said set of holes, two further sets of holes formed in said casing along radial planes which are angularly offset with respect to each other by an angle equal to said offset angle between said front and rear openings, a first and second sets of spring-loaded tumbler pins, which are guided in said additional sets of holes and cooperate with said pins to lock said plug in two angular positions, said channel being co-planar with respect to said front opening in one of said positions and being co-planar to said rear opening in the other position, said double-pattern key having an additional serration for actuating said pins and tumbler pins, such as to allow the rotation of the plug between said two angular positions so that, after the insertion of the key in the plug and the rotation of the plug through said offset angle, the key can engage the opening of the double-pattern lock.

[0008] Further characteristics and advantages of the invention will become apparent from the following description of some preferred embodiments thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a perspective view of a device according to the invention, illustrating its method of application to a double-pattern lock;
figure 2 is a sectional view of the device applied to a double-pattern lock;
figure 3 is a sectional view, taken along the plane III-III of figure 2;
figure 4 is a sectional view, taken along the plane IV-IV of figure 2;
figure 5 is a perspective view of the rear of the device;
figures 6, 7, and 8 are views of different embodiments of the device.

[0009] With reference to figures 1 to 5, the reference numeral 1 designates a conventional double-pattern lock composed of a box-like body 2 in which the opening 3, for the insertion of the double-pattern key that actuates the bolt 4, is formed.

[0010] The opening 3 has a shape which is complementary to the cross-section of the key at the patterns and is elongated on a horizontal plane.

[0011] The lock 1 is inserted in a seat 5 of a door 6 and is fixed by means of screws 7 which are driven through the front faceplate 8.

[0012] The lock is fixed not only by means of the screws 7 but also by means of screws driven through two holes 10 and 11, which are formed in the box-like body 2 below the opening 3 but outside the area required by the rotation of the double-pattern key.

[0013] In the illustrated example, the double-pattern key is designated by the reference numeral 12 and comprises, in addition to the shaft 13 and the two cut patterns 14 and 15, another serration 16, which is formed on the shaft 13 at the patterns and is composed of conical blind holes of varying depths. The serration 16 is preset for the actuation of the security device which, according to the invention, allows to access the double-pattern lock, enabling its actuation.

[0014] This device is generally designated by the reference numeral 17 and can be compared to a lock with pin tumblers. It comprises a cylindrical casing 18, inside which there is provided a cylindrical cavity 19 closed by a front wall 20 in which an opening 21 is formed, which is fully identical to the opening 3 of the double-pattern lock.

[0015] The cylindrical cavity 19 rotatably accommodates a plug 22 which is axially crossed by a channel 23 the cross-section whereof is identical to the cross-section of the opening 21.

[0016] The plug 22 is retained in the cavity 19 between the front wall 20 and a disk 24 which is fixed to the rear of the casing 18 by means of screws 25.

[0017] The disk 24 has an opening 26 which is identical to the opening 21 but is angularly offset with respect thereto by an angle of 90°.

[0018] Two sets of holes 27 and 28 are formed in the casing 18 and are arranged along two radial planes: the plane of the holes 27 is perpendicular to the plane of the opening 26 of the disk 24 and is therefore co-planar with respect to the plane of the front opening 21. Vice versa, the plane of the holes 28 is co-planar with respect to the plane of the rear opening 26 and is perpendicular to the plane of the front opening 21.

[0019] The holes 27 and 28 slidingly accommodate two respective sets of tumbler pins 29 and 30 which are moved towards the plug 22 by springs 31 and 32, which rest on a bush 33 that surrounds the casing 18. The bush 33 is axially retained between an external collar 34 of the casing 18 and the disk 24.

[0020] The pins 29 and 30 are meant to cooperate with a set of pins 35 guided in respective holes 36 which are formed along a radial plane in the plug 22 and lead into the channel 23 at right angles to the plane of said channel.

[0021] The pins 35 are mushroom-shaped, with a portion which has a larger diameter and is adapted to stop against internal shoulders of the holes 36 and a thinner portion that ends with a rounded tip which protrudes into the channel 23 of the plug.

[0022] As will become apparent hereinafter, during the actuation of the device, the plug 22 can rotate between two angular positions which are rotated through 90° with respect to each other and are defined by a pin 37 which is radially screwed through the casing 18 and abuts against a flat portion 38 of the plug 22. In one of these positions (the one shown in figure 3), the pins 35 are aligned with the tumbler pins 30, whilst the channel 23 is co-planar with respect to the front opening 21.

[0023] In this position, the tumbler pins 30 engage the holes 36 of the plug 22, preventing its rotation.

[0024] In the other position of the plug, the pins 35 are aligned with respect to the tumbler pins 29, whilst the channel 23 is co-planar with respect to the rear opening 26.

[0025] Coupling of the described device 17 to the double-pattern lock is provided by means of two pins with threaded tips 39 and 40, which are fixed axially to the disk 24. The mutual distance of the pins 39 and 40 is such that said pins can pass through the holes 10 and 11 of the box 2, and their radial distance from the rotation axis of the plug 12 is such that the rear opening 26 faces, in a mirror-symmetrical manner, the opening 3 of the double-pattern lock.

[0026] The device is fixed by means of two nuts 41 and 42 which are screwed to the tips of the pins 39 and 40, which protrude from the opposite side of the box 2.

[0027] Operation of the described device is as follows.

[0028] When the key 12 is not inserted, the device is in the condition shown in figures 2 and 3, which is determined by the abutment of the pin 37 against one side of the flat portion 38, whereat the channel 23 of the plug 22 is co-planar to the front opening 21 and the tumbler pins 30 engage the holes 36 of the plug 22 and prevent its rotation. Since in this situation the channel 23 is perpendicular to the opening 26, the opening 3 of the lock 1 remains closed, except for the small region of intersection between the opening 26 and the channel 23, which corresponds to the cross-section of the shaft 13 of the key 12.

[0029] By inserting the double pattern 14 and 15 of the key 12 in the plug 22, the serration 16 determines the mutual positioning of the pins 35 with respect to the tumbler pins 30 which allows, by turning the key, the 90° rotation of the plug 22 to the subsequent stop position, which is determined by locator 37, against the other side of the flat portion 38, whereat the pins 35 are aligned with the tumbler pins 29.

[0030] In this situation, the channel 23 is co-planar with respect to the rear opening 26 and therefore to the opening 3, so that it is possible to cause the further advancement of the key through the openings 26 and 3 to insert it in the double-pattern lock and actuate it.

[0031] It should be noted that during this step, the pins 35 and the tumbler pins 29 can slide within the holes 36 and 27, and when the key 12 is fully inserted in the double-pattern lock, the pins 35 rest on the cylindrical part of the shaft 13. The key is removed by first returning the double pattern of the key into the channel 23 and then rotating the key in reverse with respect to the previous direction, until the channel 23 is co-planar with respect to the front opening 21.

[0032] It is evident that the device perfectly achieves the intended aim and objects. In particular, it avoids making the pins of the double-pattern lock accessible to unlawful means, such as picklock or the like, inserted through the opening 3.

[0033] The described device is susceptible of numerous modifications and variations, all of which are within the scope of the same inventive concept.

[0034] Figure 6 is a view of an embodiment which, as in the previously described case, illustrates the installation of the device directly against a double-pattern security lock 1a, in which the bolt is composed of a plurality of parallel pins and the partially threaded pins 39 and 40 engage threaded holes of the rear disk 24. Instead of the nuts 41 and 42, there are provided threaded bushes 42a which allow the engagement of screws 42b for fixing a covering plate 42c.

[0035] Figure 7 illustrates a solution for armored doors which comprise a metallic central plate 43 covered by an external paneling 44. The lock with pin-shaped bolt 1a is fixed to the plate 43 and the device is retained by the screws 39 and 40 inside a seat of the paneling 44 so that a peripheral flange 45 abuts against said paneling.

[0036] In armored doors (see figure 8) the double-pattern lock 1a is often protected by a so-called drill-proof plate 45, which is interposed between the lock 1a and

the plate 43 and is retained by fixing screws 46 and 47 driven through the lock. In this case, the device can be effectively accommodated in a protective cup 48 which has a front opening 49 identical to the opening 21 and an annular lip 50 which is co-planar with respect to the disk 24 and engages an annular seat 51 which is formed in the drill-proof plate 45 and lies between the plate 43 and the double-pattern lock, so that the lip 50 prevents the extraction of the cup 48 from the seat 52 in the door.

[0037] The cup, by virtue of keying means or the like, which are not shown but easily imaginable, is rotationally rigidly coupled to the casing 18 and to the drill-proof plate 45 so that the openings 49 and 26 are co-planar with the openings 21 and 3 respectively. The gap between the cup 48 and the seat 52 is closed by a ring 53 which is superimposed on the cup.

[0038] In the practical embodiment of the invention, the pins 36 and the tumbler pins 29 and 30 can be arranged at any mutual angle, maintaining the possibility of aligning the channel 23 of the plug 22 with respect to the front opening 21 and the rear opening 26 to allow to insert the key in the plug and then in the double-pattern lock.

[0039] The additional serration 16 may furthermore be formed on one of the patterns instead of on the shaft of the key, in which case the pins 36 and the tumbler pins 29 and 30 have an orientation which is appropriately offset in an angular direction. Likewise, it is possible to provide, in the plug 22, two sets of pins which cooperate with two double sets of tumbler pins in the casing 18.

[0040] The inventive concept of the device can also be applied by equivalence to locks of the so-called plunger type which, by having front serrations, require a rather large keyway which is accordingly subject to the same dangers of effraction as double-pattern locks. Likewise, by equivalence, instead of providing a device 17 having tumblers constituted by pins, it is possible to provide a device with wafer tumblers.

[0041] 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 interpretation of each element identified by way of example by such reference signs.

Claims

1. Security device adapted to allow access to a double-pattern lock (1), which is actuated by means of a double-pattern key (12), characterized in that it comprises a lock (17) which has tumblers constituted by pins and is composed of a casing (18) which forms a cylindrical cavity (19) having a front opening (21) for the insertion of the double-pattern key and a rear opening (26) for the exit of said key which is orientated at an offset angle with respect to said front opening, said casing (18) being associable in use with said double-pattern lock (1) so that said rear opening (26) is opposite, in a mirror-symmetrical fashion, with respect to the keyway (3) of the double-pattern lock, a plug (22) which is rotatable in said cavity (19) and is crossed axially by a channel (23) the cross-section whereof is such as to allow to guide the key (12) inserted therein through said front opening (21), a set of holes (36) which are formed on a radial plane of said plug (22) and lead into said channel (23), a set of pins (35) guided in said set of holes (36), two further sets of holes (27, 28) formed in said casing (18) along radial planes which are angularly offset with respect to each other by an angle equal to said offset angle between said front and rear openings (21, 26), a first and second sets of spring-loaded tumbler pins (29, 30), which are guided in said additional sets of holes (27, 28) and cooperate with said pins (35) to lock said plug (22) in two angular positions, said channel (23) being co-planar with respect to said front opening (21) in one of said positions and being co-planar to said rear opening (26) in the other position, said double-pattern key (12) having an additional serration (16) for actuating said pins (35) and tumbler pins (29, 30), such as to allow the rotation of the plug (22) between said two angular positions so that, after the insertion of the key (12) in the plug (22) and the rotation of the plug (22) through said offset angle, the key (12) can engage the opening (3) of the double-pattern lock (1).

2. Device according to claim 1, characterized in that said casing (18) is constituted by a sort of cup which is closed by a disk (24) which is associated therewith and is provided with said rear opening (26).

3. Device according to claim 1, characterized in that said serration (16) is formed in at least one of the patterns (14, 15) of the key (12).

4. Device according to one of the preceding claims, characterized in that said lock with pins (17) is coupled to said double-pattern lock (1) by means of two screws (39, 40) which are fixed coaxially to said casing (18) and pass through said double-pattern lock (1).

5. Device according to one of the preceding claims, characterized in that said casing (18) is accommodated in a protective cup (48) having means (50) for anchoring to the door.

6. Device according to claim 5, characterized in that said means comprise an annular lip (50) which is adapted to be anchored in said door.

7. Device according to one of claims 1 to 6, characterized in that it can be applied to a plunger-type lock.

8. Device according to one of claims 1 to 7, characterized in that a lock with tumblers constituted by laminae is used instead of said pin lock (17).

Patentansprüche

1. Sicherheitsvorrichtung, die den Zugang zu einem Doppelbartschloß (1) ermöglicht, das mittels eines Doppelbartschlüssels (12) betätigt wird, dadurch **gekennzeichnet**, daß sie eine Schließvorrichtung (17) enthält, die aus Stiften gebildete Zuhalter hat und aus einem Gehäuse (18) besteht, das einen zylindrischen Hohlraum (19) bildet, der eine vorderseitige Öffnung (21) zum Einsetzen des Doppelbartschlüssels und eine rückseitige Öffnung (26), die um einen Versatzwinkel gegenüber der vorderseitigen Öffnung orientiert ist, zum Austreten des Schlüssels hat, daß das Gehäuse (18) dem Doppelbartschloß (1) beim Gebrauch so zugeordnet werden kann, daß die rückseitige Öffnung (26) spiegelsymmetrisch dem Schlüsselweg (3) des Doppelbartschlosses gegenüberliegt, daß sie einen Zapfen (22) enthält, der in dem Hohlraum (19) drehbar ist und der axial von einem Kanal (23) gekreuzt ist, dessen Querschnitt es erlaubt, den Schlüssel (12) zu führen, der durch die vordere Öffnung (21) eingeführt ist, daß sie einen Satz Löcher (36) enthält, die auf einer radialen Ebene des Zapfens (22) gebildet sind und die in den Kanal (23) münden, daß sie einen Satz Stifte (35) enthält, die in dem Satz Löcher (36) geführt sind, daß sie zwei weitere Sätze Löcher (27, 28) enthält, die in dem Gehäuse (18) entlang radialer Ebenen mit einem Winkelversatz zueinander angeordnet sind, wobei der Winkel gleich dem Versatzwinkel zwischen der vorderseitigen und der rückseitigen Öffnung (21, 26) ist, daß sie einen ersten und einen zweiten Satz federgelagerter Zuhaltestifte (29, 30) enthält, die von den zusätzlichen Sätzen Löcher (27, 28) geführt sind und die mit den Stiften (35) zusammenwirken, um den Zapfen (22) in zwei Winkelpositionen zu verriegeln, so daß der Kanal (23) koplanar mit der vorderseitigen Öffnung (21) in einer der Positionen ist und koplanar mit der rückseitigen Öffnung (26) in der anderen Position ist, und daß der Doppelbartschlüssel (12) eine zusätzliche Zahnung (16) zum Betätigen der Stifte (35) und der Zuhaltestifte (29, 30) derart hat, daß das Drehen des Zapfens (22) zwischen den zwei Winkelpositionen möglich ist, so daß nach dem Einsetzen des Schlüssels (12) in den Zapfen (22) und nach dem Drehen des Zapfens (22) um den Winkelversatz der Schlüssel (12) in die Öffnung des Doppelbartschlosses (1) eingreifen kann.

2. Vorrichtung nach Anspruch 1, dadurch **gekennzeichnet**, daß das Gehäuse (18) aus einer Art Schale zusammengesetzt ist, die durch eine Scheibe (24) geschlossen ist, die mit der Schale verbunden ist und in der die rückseitige Öffnung (26) vorgesehen ist.

3. Vorrichtung nach Anspruch 1, dadurch **gekennzeichnet**, daß die Verzahnung (16) in mindestens einem Muster (14, 15) des Schlüssels (12) ausgebildet ist.

4. Vorrichtung nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß die Schließvorrichtung (17) mit Stiften mit dem Doppelbartschloß (1) mittels zweier Schrauben (39, 40) verbunden ist, die achsengleich an dem Gehäuse (18) befestigt sind und die durch das Doppelbartschloß (1) hindurchgeführt sind.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, dadurch **gekennzeichnet**, daß das Gehäuse (18) in einer schützenden Schale (48) angeordnet ist, die Mittel (50) zum Verankern mit der Tür hat.

6. Vorrichtung nach Anspruch 5, dadurch **gekennzeichnet**, daß die Mittel einen ringförmigen Rand (50) haben, der in der Tür verankert werden kann.

7. Vorrichtung nach einem der Ansprüche 1 bis 6, dadurch **gekennzeichnet**, daß die Vorrichtung bei einem Zylinderschloß eingesetzt sein kann.

8. Vorrichtung nach einem der Ansprüche 1 bis 7, dadurch **gekennzeichnet**, daß eine Schließvorrichtung mit Zuhaltern, die aus Lamellen zusammengesetzt sind, an Stelle der Schließvorrichtung (17) mit Stiften eingesetzt ist.

Revendications

1. Dispositif de sécurité adapté pour permettre l'accès à une serrure (1) à entrée de clé double, qui est actionnée au moyen d'une clé à panneton double (12), caractérisée en ce qu'il comprend une serrure (17) qui a des fichets constitués par des goupilles et est composé d'un boîtier (18) qui forme une cavité cylindrique (19) ayant une ouverture frontale (21) pour l'insertion de la clé à panneton double et une ouverture arrière (26) pour la sortie de ladite clé qui est orientée de manière angulairement décalée par rapport à ladite ouverture frontale, ledit boîtier (18) pouvant être associé, en utilisation, avec ladite serrure (1) à entrée de clé double de telle manière que l'ouverture arrière (26) soit en regard, d'une manière à symétrie de miroir de l'entrée de clé (3) de la

serrure à entrée de clé double, d'un insert (22) qui peut tourner dans ladite cavité (19) et est traversé axialement par un canal (23) dont la section transversale est adaptée pour permettre le guidage de la clé (12) insérée à l'intérieur à travers ladite ouverture frontale (21), d'un ensemble de trous (36) qui sont formés dans un plan radial dudit insert (22) et débouche dans ledit canal (23), d'un ensemble de goupilles (35) guidées dans ledit ensemble de trous (36), de deux autres ensembles de trous (27, 28), formés dans ledit boîtier (18) le long de plans radiaux qui sont décalés angulairement les uns par rapport aux autres d'un angle égal audit angle de décalage entre lesdites ouvertures frontale et arrière (21, 26), d'un premier et un second ensembles de goupilles formant fichets, chargées par ressort, (29, 30), qui sont guidées dans lesdits ensembles additionnels de trous (27) et (28) et coopèrent avec lesdites goupilles (35) pour verrouiller ledit insert (22) dans deux positions angulaires, ledit canal (23) étant coplanaire par rapport à ladite ouverture frontale (21) dans une desdites positions et étant coplanaire avec ladite ouverture arrière (26) dans l'autre position, ladite clé à panneton double (12) ayant une dentelure additionnelle (16) pour actionner lesdites goupilles (35) et lesdites goupilles formant fichets (29, 30), de manière à permettre la rotation dudit insert (22) entre lesdites deux positions angulaires de telle manière qu'après l'insertion de la clé (12) dans l'insert (22) et la rotation de l'insert (22) selon ledit angle de décalage, la clé (12) peut s'engager dans l'ouverture (3) de la serrure à entrée de clé double (1).

2. Dispositif selon la revendication 1, caractérisé en ce que ledit boîtier (18) est constitué par une sorte de coupe qui est fermée par un disque (24) associé à elle et comportant ladite ouverture arrière (26).

3. Dispositif selon la revendication 1, caractérisé en ce que ladite dentelure (16) est formée dans au moins un des pannetons (14,15) de la clé (12).

4. Dispositif selon l'une des revendications précédentes, caractérisé en ce que ladite serrure à goupilles (17) est accouplée à ladite serrure (1) à entrée de clé double au moyen de deux vis (39,40) qui sont fixées coaxialement audit boîtier (18) et traversent ladite serrure (1) à entrée de clé double.

5. Dispositif selon l'une des revendications précédentes, caractérisé en ce que ledit boîtier (18) est reçu dans une coupe protectrice (48) ayant des moyens (50) pour un ancrage à la porte.

6. Dispositif selon la revendication 5, caractérisé en ce que lesdits moyens comprennent une lèvre annulaire (50) qui est adaptée pour être ancrée dans ladite porte.

7. Dispositif selon l'une des revendications 1 à 6, caractérisé en ce qu'elle peut être appliquée à une serrure de type à plongeur.

8. Dispositif selon l'une des revendications 1 à 7, caractérisé en ce qu'une serrure avec des fichets constitués par des rondelles empilées est utilisée à la place de ladite serrure à goupilles (17).

FIG.1

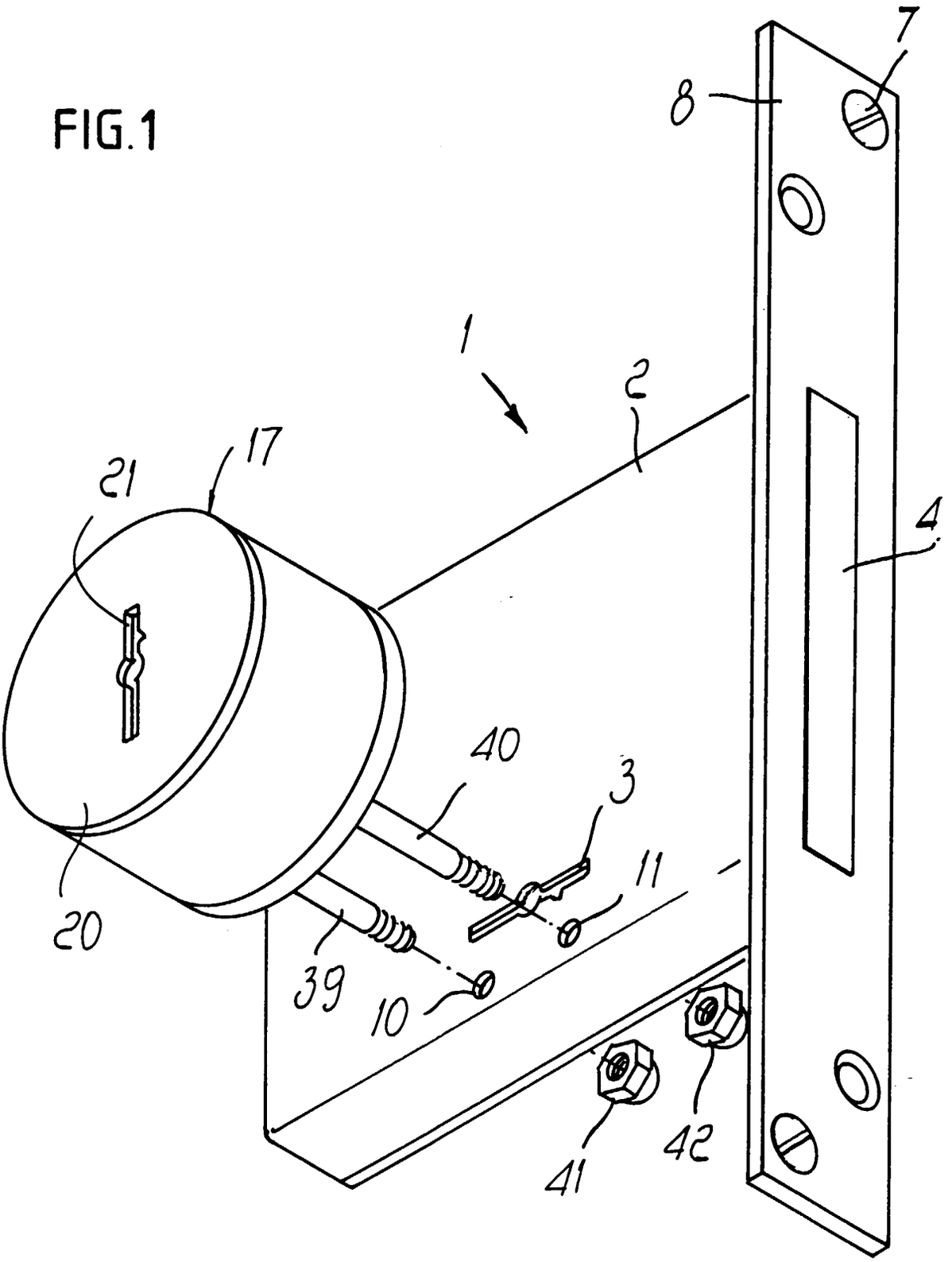


FIG.2

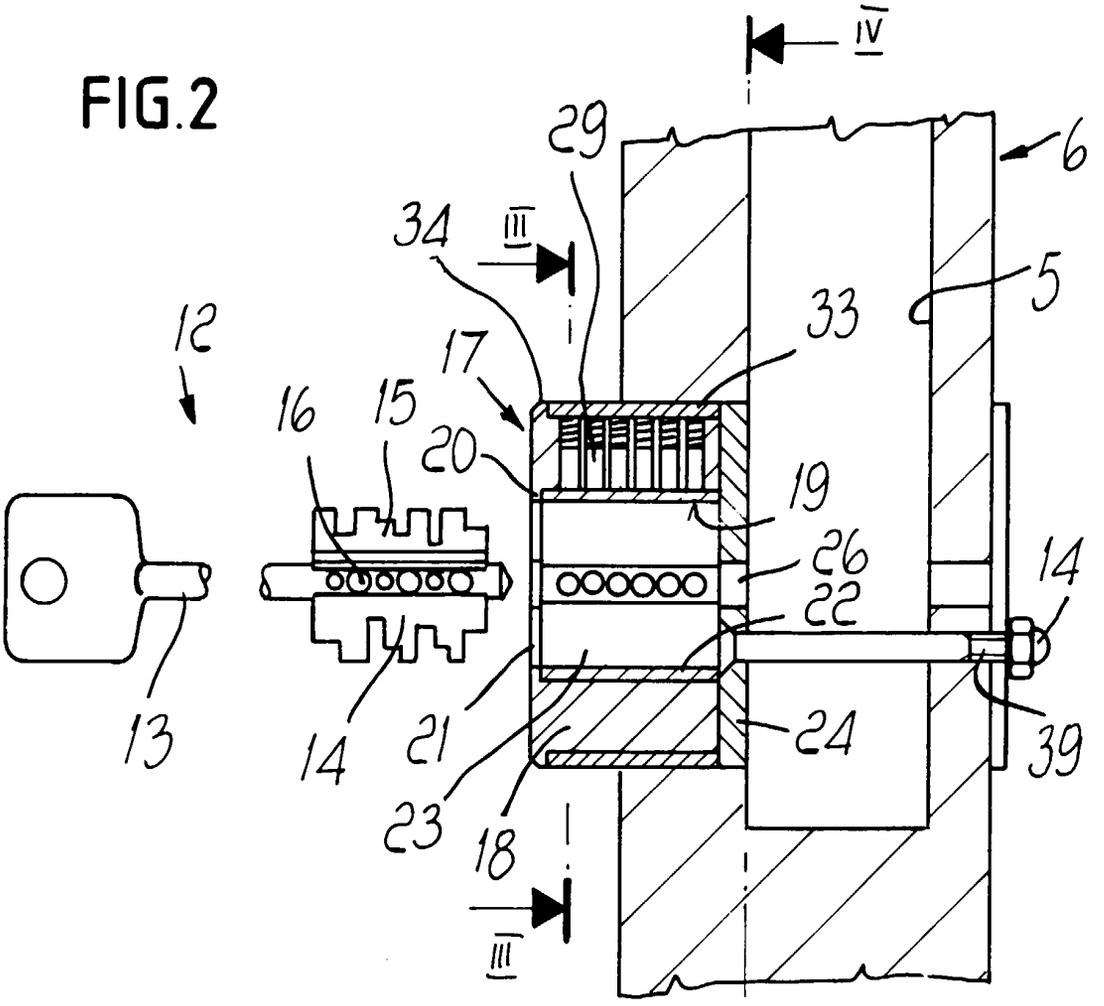
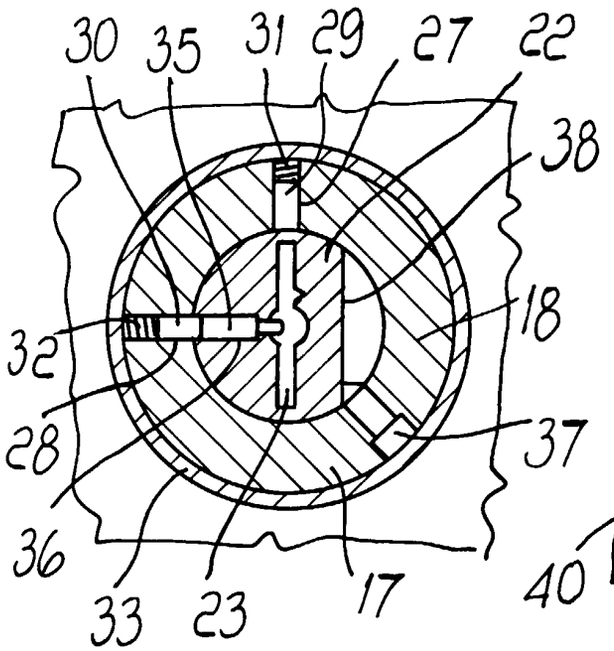


FIG.3



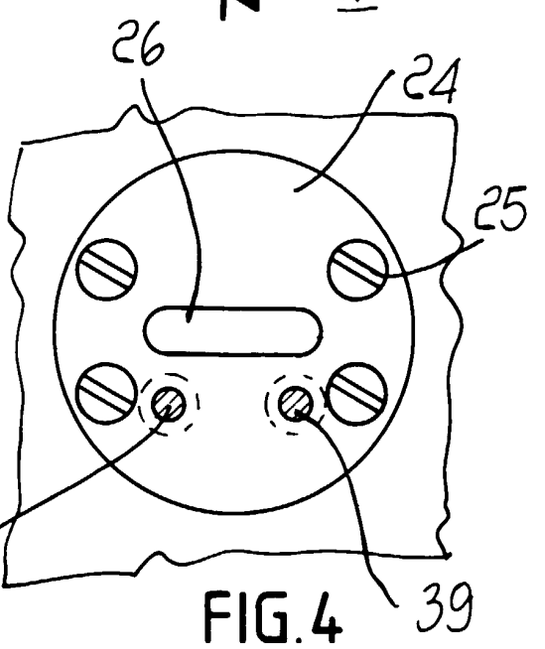


FIG.4

FIG.5

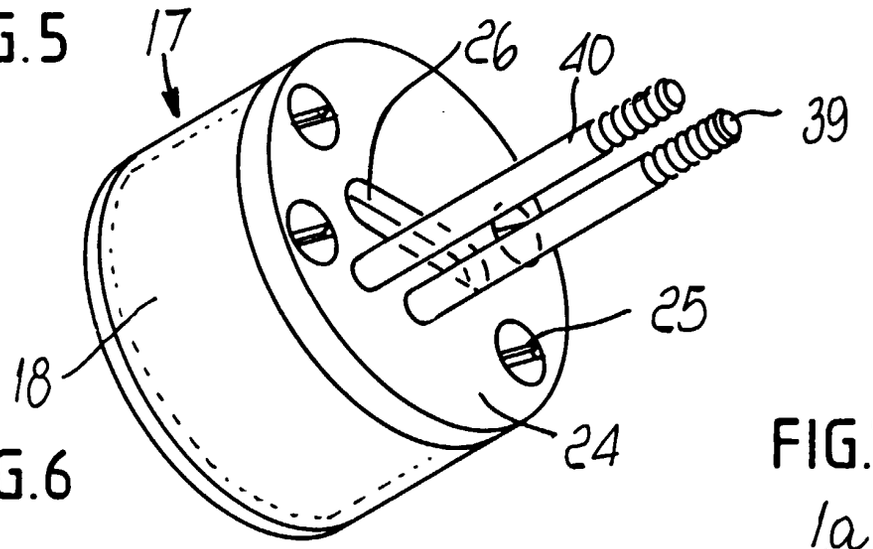


FIG.6

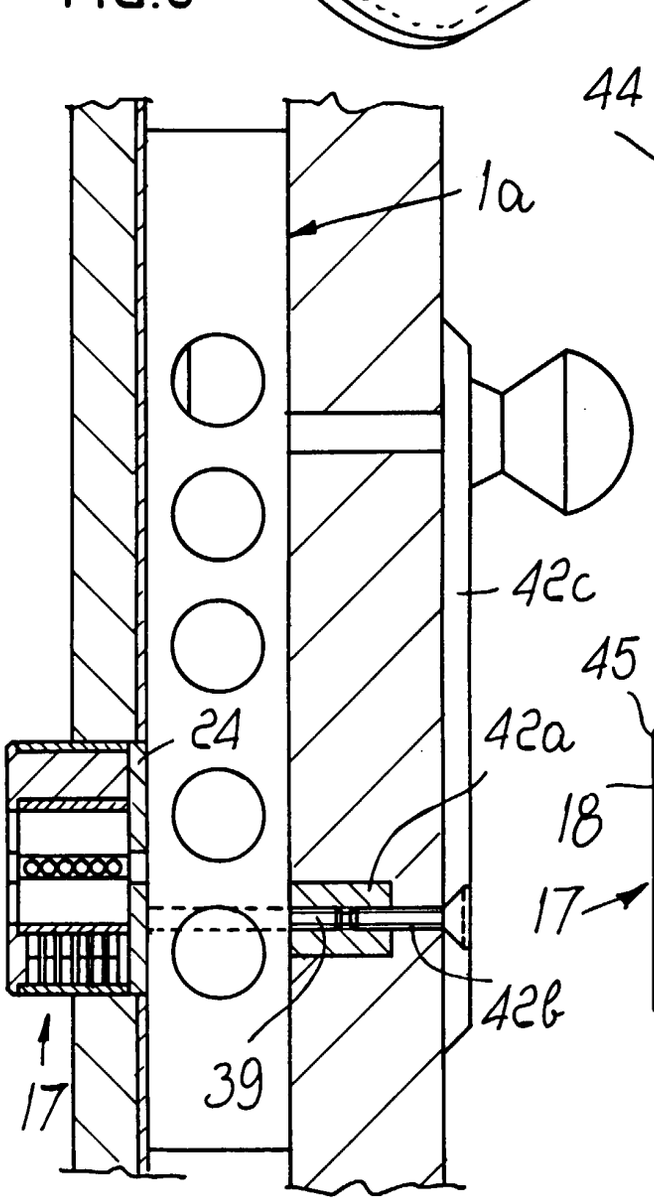


FIG.7

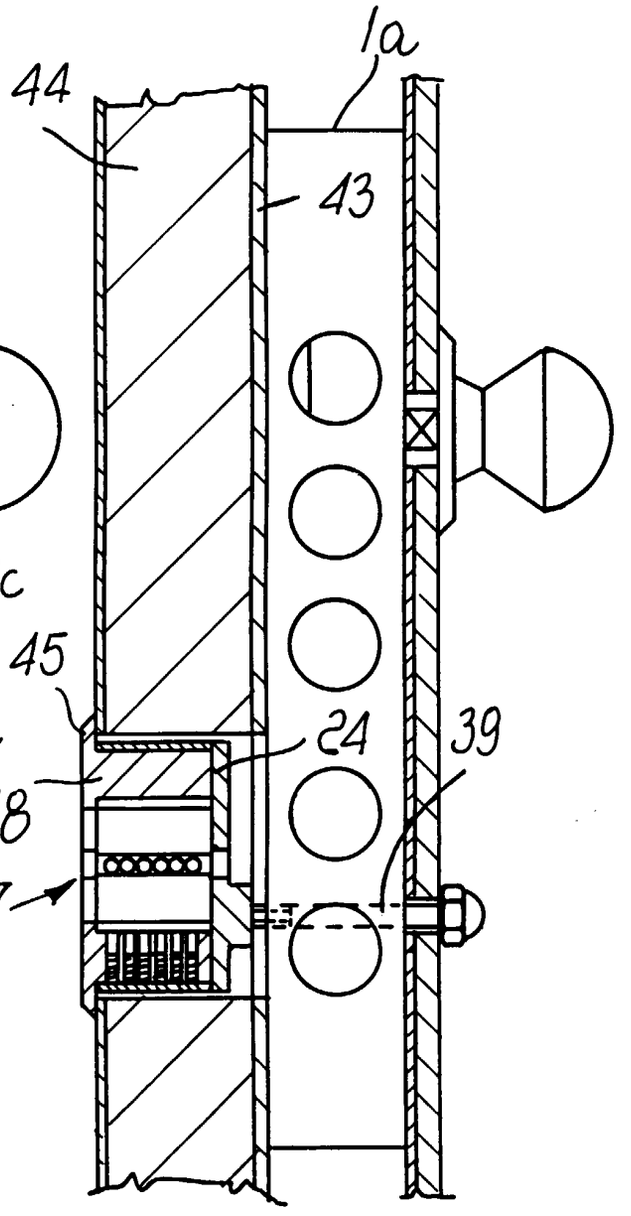


FIG.8

