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(54) **CYLINDER LOCK WITH ANTI-BREAKING FUNCTION**

ZYLINDERSCHLOSS MIT ANTIBRUCHFUNKTION

SERRURE À CYLINDRE PRÉSENTANT FONCTION ANTI-RUPTURE

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Description

Technical field

[0001] The invention relates to a cylinder lock which can be implemented in the light industry, especially in the area of the locking devices with an increased security for living houses, public etc. buildings, as well for cabinets, safes and etc. where is required a high degree of burglary resistance.

Background art

[0002] The typical double cylinder lock comprises a housing with rotatable mounted therein an inner and outer cores by means of spring rings disposed in ring channels formed on the inner ends of the cores, as the housing is suitable to be mounted transversely through the lock case. Between both cores, in a channel formed in the housing, there is freely mounted a rotating cam to drive the lock elements. The said cam represents a solid ring with a tooth. The cam ring rotates with the rotation of the inner or outer core by means of a switch, consisting of two switching elements for the selectively connection of the cam with the outer or inner core by means of a correct key inserted in the respective core, as a result of which the cam tooth rotates coming out radially from the cylinder lock and drives the lock elements. It is known that by their using such cylinder locks can be put under attack in an attempt to manipulate the lock mechanism. Such attacks may cause forced removal of the outer core from the housing, thus providing an access for the cam rotation. Alternatively, an attempt can be tried to break the housing in the central part connecting its two halves. This part of the housing is usually the thinnest and therefore the weakest, because it is suited to accommodate the cam rotation into the respective channel, moreover, there is also a side bore formed therein for fixing to the lock. If this part of the housing can be broken, then the entire outer half of the cylinder lock can be removed, unless there were taken specific measures in the construction of the cylinder lock to resist this threat.

[0003] Cylinder lock is known [BG 1587U1], where the special construction of the cam makes difficult both breaking of the housing central section where the cam is disposed, and pulling of the outer core upon an axial force applied. The said cam with its external periphery covers the inner ends of both cores through respective ring channels. The cam consists of two identical parts which, in assembled state, are symmetrically mirrored to the cam axis. In the area of the cam ring, both cam parts are interlocked around a transmitting plate with a profile hole, to engage with a switch, and with at least two locking teeth engaged in respective radial holes in the cam parts. In the area of the cam tooth, both cam parts are connected each other by pin. The said switch consists of two switching elements axially movable by means of a correct key inserted in the inner or outer core to provide selec-

tively connection of the respective core with the cam.

[0004] Cylinder lock with an anti-breaking function [EP 2494129] is known, which comprises an inner and outer housing parts with rotatable mounted therein an inner and outer cores. Said housing parts are joined by means of a connecting element mounted in respective longitudinal bores formed therein. The connecting element represents a solid body that includes middle cylindrical part with opposite flat sides. In this middle part there is formed a side bore for fixing to the lock, there is also included a blocking element which extends in direction to the cam and which is provided to prevent the access to the cam tooth in case of burglary attack. Cylindrical end bodies extend axially from the middle part, in opposite directions. Said cylindrical end bodies are fixed to both housing parts by means of side pins passing through side bores formed therein and through side bores formed in both housing parts. Between the inner and outer housing parts, over the middle part of the connecting element, there is freely mounted a rotating cam implemented as a solid ring with a tooth, moreover there is mounted a switch in the cam. The said switch consists of axially movable first and second switching element for selectively connection of the inner or outer cores with the cam when the correct key is inserted in the respective core. Moreover, there is provided a security position for the first switching element, where, after forced removal of the outer core, the first switching element moves in a forward position under the action of a compression spring mounted behind it. In the said position of the first switching element, a blocking pin disposed in a radial bore into the body of the first switching element, moves under the spring action through a bore formed in the inner core to engage in respective bore in the ring body of the cam. Thus the first switching element, the inner core and the cam remain interconnected. In the said position of the first switching element, the cam movement towards the inner core is blocked, thus making more difficult the cam manipulation from outside after forced removal of the outer core.

[0005] The disadvantage of this cylinder lock consists in the fact that the elements that block the cam movement towards the inner core are disposed in the ring body of the cam, which becomes accessible for manual manipulation and drilling after forced removal of the outer core. Moreover, the second switching element is not connected with the outer core and therefore it is not certain its falling therewith when the outer core is forcibly removed and its resting in the cam would obstruct the blocking elements passing in the security position which is another precondition for possible successful manipulation with suitable tool resulting in the cam rotation and lock opening. Furthermore, it is possible with an additional drilling to access the cam bore where is blocked the movable blocking pin and therefore to be manipulated by suitable tool until its unblocking, the cam rotation and lock opening.

Summary of the invention

[0006] The present invention seeks to provide an improved construction of a cylinder lock with an increased anti-breaking protection, resisting to the above mentioned attacks, with a security position of its elements, in which any cam movement towards the inner core after the outer core forcibly removal is limited, as the elements provided to block the cam movement, are possibly maximum remotely disposed from the critical area of the cam manipulation, and for this purpose the cam construction has to be improved as well.

[0007] There is thus provided a cylinder lock according to claim 1. The lock cylinder comprises an inner housing part with rotatable mounted therein an inner core and an outer housing part with rotatable mounted therein an outer core. The housing parts are joined by means of a connecting element mounted in respectively formed therein longitudinal bores. Between both cores there is a composite cam covering the inner end of the inner core trough a ring channel formed therein. The cam consists of two identical parts interlocked, in the area of the cam ring, around a first transmitting plate with a profile hole, to engage with first switching element of a switch, and with at least two locking teeth engaged in radial holes in the cam parts, which are connected each other, in the area of the cam tooth, by pin. The switch includes also a second switching element. Both switching elements provide selectively connection of the inner or outer core with the cam. Moreover, behind the first switching element, in the inner core, there is mounted a compression spring.

[0008] In accordance with the invention, the cam is mounted in a channel formed in the inner housing part, in the outer side of which there is mounted a stepped sleeve, the inner end of which is covered through a ring channel formed therein, by the cam. The cam includes also a second transmitting plate with a profile hole, to engage with the second switching element, and with at least two locking teeth engaged together with the locking teeth of the first transmitting plate in the radial holes of the cam parts. Between both transmitting plates of the cam there is a connecting plate with a central hole through which there is mounted a central pin passing through their profile holes. Moreover, additionally in a radial profile core hole formed in the inner core there is mounted a retaining element under spring and pin pressure. The retaining element is provided to take a security position on an extender axially disposed in the inner core behind the compression spring so that upon removal of the outer core the first switching element together with the central pin can be pushed out by the compression spring in a forward position in the profile hole of the first transmitting plate allowing the retaining element to get into the security position on the extender, behind the first switching element. Thus, in such position of the retaining element, all degrees of free movement of the first switching element, and respectively of the cam towards the inner core are blocked while in the same time the second

switching element is permanently connected to the outer core by spring ring covering it through a channel formed therein.

[0009] Moreover, in accordance with a preferred embodiment of the invention, the connecting plate is freely rotatable around the central pin and it is made of hardened steel like the central pin, the first and second transmitting plates and the stepped sleeve.

[0010] In accordance with a preferred embodiment of the invention, the retaining element should pass in a security position on the extender upon removal of the outer core while in a normal operation of the cylinder lock the retaining element is disposed in the radial profile core hole on the first switching element in a position, doesn't limiting its axial movement.

[0011] Furthermore, in accordance with a preferred embodiment of the invention, the connecting element is fixed to the inner and outer housing parts by means of respective transversal pins, passing through bores transversally formed therein and through the channel and transversal bores formed in the connecting element. Furthermore, on the connecting element, at the place where the housing parts are joined, there is provided a weakened section by means of formed second channel.

[0012] Moreover, in accordance with a preferred embodiment of the invention, the transversal pins fixing the connecting element to the inner housing part are made of hardened steel.

[0013] The advantage of the proposed cylinder lock, in accordance with the invention, consists of the improved anti-breaking function due to the fact that the elements that block the cam movement towards the inner core are disposed maximum far into the inner core, beyond the critical area of a possible cam manipulation after the inner core removal. Moreover, the provided permanent connection between the outer core and the second switching element ensures that this element will fall down upon forced removal of the outer core thus avoiding the risk for inactivation of the blocking elements. Moreover, any further drilling of the rest inner housing part is prevented by means of the hardened elements mounted therein - the stepped sleeve and connecting transversal pins, also by means of the hardened elements of the composite cam - the connecting and transmitting plates, as for this purpose the connecting plate is mounted freely rotatable and also by means of the hardened central pin passing through the said plates. Furthermore, the axially connection between the inner core and stepped sleeve, ensured by the composite cam, gives an additional strength of the inner housing part and makes more difficult the breaking in the cam area upon burglary attack.

Description of the figures in the drawings

[0014] The present invention is explained in details using the following enclosed drawings:

Fig. 1 represents an exploded view of the cylinder

lock

Fig. 2 represents a side view of the assembled cylinder lock

Detailed description of the embodiments

[0015] In accordance with the invention, one preferred embodiment of the cylinder lock is shown on Figs. 1 and 2. The cylinder lock consists of an inner housing part 1 with an inner core 3 rotatable mounted therein and an outer housing part 2 with an outer core 4 rotatable mounted therein. The housing parts 1 and 2 are joined by means of a connecting element 5 mounted in respectively formed therein longitudinal bores 1b and 2b. Between both cores 3 and 4 there is a composite cam 7 covering the inner end of the inner core 3 through the ring channel 14 formed therein. The cam 7 consists of two identical parts 7a interlocked, in the area of the cam 7 ring, around a first transmitting plate 9 with a profile hole 9a, provided to engage with first switching element 10a of a switch 10, and with two locking teeth 9b engaged in radial bores 8 in the cam parts 7a. In the area of the cam 7 tooth, the cam parts 7a are connected each other by pin 11. The switch 10 includes also a second switching element 10b. Both switching elements 10a and 10b provide selectively connection of the inner core 3 or outer core 4 with the cam 7 by a correct key inserted in the respective core. Moreover, behind the first switching element 10a, in the inner core 3, there is mounted a compression spring 12.

[0016] In accordance with the invention, the composite cam 7 is mounted in a channel 13 formed in the inner housing part 1, in the outer side 1a of which there is mounted a stepped sleeve 16, the inner end of which is covered through a ring channel 15 formed therein by the cam 7. The cam 7 includes also a second transmitting plate 17 with a profile hole 17a, to engage with the second switching element 10b, and with two locking teeth 17b engaged together with the locking teeth 9b of the first transmitting plate 9 in the radial holes 8 of the cam parts 7a. Moreover, between both transmitting plates 9 and 17 of the cam 7 there is disposed a connecting plate 18 with a central hole 18a through which there is mounted a central pin 19 passing through their profile holes 9a and 17a. Moreover, additionally in a radial profile core hole 20 formed in the inner core 3 there is mounted a retaining element 21 under the spring 25 and pin 26 pressure. The retaining element 21 is provided to take a security position on an extender 22 axially disposed in the inner core 3 behind the compression spring 12, so that the first switching element 10a together with the central pin 19 can be pushed out by the compression spring 12 and engaged in a forward position in the profile hole 9a of the first transmitting plate 9. Therefore, in this position of the retaining element 21, all degrees of free movement of the cam 7 towards the inner core 3 are blocked. In the same time, the second switching element 10b is permanently connected to the outer core 4 by spring ring 23 covering it through a channel 24 formed therein.

[0017] In accordance with a preferred embodiment of the invention, the connecting plate 18 is freely rotatable around the central pin 19 and it is made of hardened steel like the central pin 19, the first and second transmitting plates 9 and 17, and the stepped sleeve 16, that makes the construction of the inner housing part 1 resistant to burglary drilling.

[0018] In accordance with a preferred embodiment of the invention, the retaining element 21 should pass in a security position on the extender 22 upon removal of the outer core 4 while in normal operation of the cylinder lock the retaining element 21 is disposed in the radial profile core hole 20 on the first switching element 10a in a position, doesn't limiting its axial movement.

[0019] In accordance with a preferred embodiment of the invention, the connecting element 5 is fixed to the inner housing part 1 and the outer housing part 2 by means of respective transversal pins 6a and 6b passing through bores 1c and 2c transversally formed therein, and through the channel 5a and transversal bores 5c respectively formed in the connecting element 5. Furthermore, on the connecting element 5, at the place where the inner and outer housing parts 1 and 2 are joined, there is provided a weakened section by means of formed second channel 5b, thus predetermining the breaking place in case of any burglary attempt.

[0020] Moreover, the transversal pins 6a fixing the connecting element 5 to the inner housing part 1 are made of hardened steel, thus realizing an additional protection against possible drilling of the rest inner housing part 1 after the burglary attack.

[0021] In the so assembled cylinder lock, in the housing parts 1 and 2 and in their respective cores 3 and 4, there are disposed also parts of pin reversing mechanism decoding the code combination of a correct key inserted into the channel of the respective core, which are not subject of the invention and are not described herein.

[0022] The invention can be used for protection against burglary attacks both in double cylinder locks and cylinder locks with special functions - their implementations are equally included within the scope of the invention without size limitations and with any kind of pin reversing mechanisms for the key decoding mounted in the cylinder lock.

Implementation of the invention

[0023] In accordance with the invention, the cylinder lock operates, as follows.

[0024] When the correct key is inserted outside the cylinder lock, into the outer core 4, the key pushes the second switching element 10b which engages into the profile hole 17a of the second transmitting plate 17. In the same time by the central pin 19, the key pushes and disengages the first switching element 10a from the profile hole 9a of the first transmitting plate 9, thus providing a connection of the cam 7 with the outer core 4, which rotates together with the key, thus causing the second switching

element 10b rotation together with the cam 7, which in turn unlocks the lock elements.

[0025] When the key is removed from the outer core 4, the first switching element 10a moves under the compression spring 12 action and engages into the profile hole 9a of the first transmitting plate 9, as in the same time it pushes and disengages the second switching element 10b from the profile hole 17a of the second transmitting plate 17.

[0026] When the correct key is inserted inside the cylinder lock, into the inner core 3, the key does not need to push the first switching element 10a, because it already had been moved under the compression spring 12 action and had been engaged into the profile hole 9a of the first transmitting plate 9, thus providing a connection of the cam 7 with the inner core 3 which rotates together with the key, thus causing the rotation of the first switching element 10a together with the cam 7 which accordingly unlocks the lock elements. Moreover, the described axial movable elements are sized, so that in normal operation of the cylinder lock the retaining element 21 remains in the radial profile core hole 20, in position on the first switching element 10a, doesn't limiting its axial movement.

[0027] In case of burglary attack, upon removal of the outer core 4, with or without the outer housing part 2, the dimensional build-up between the axial movable elements changes, so that the first switching element 10a moves in a forward position under the compression spring 12 action allowing the retaining element 21 to move under the action of the spring 25 and pin 26, and to get out of the radial profile core hole 20 and to get into a security position on the extender 22, behind the first switching element 10a, thus limiting all degrees of free movement of the first switching element 10a and respectively, of the cam 7 towards the inner core 3. Moreover, at the same time, the second switching element 10b remains permanently connected with the outer core 4 owing to the provided for this purpose spring ring 23 connecting the second switching element 10b with the outer core 4 through a channel 24 formed therein, thus preventing the possibility for inactivation of the retaining element 21 upon forced removal of the outer core 4.

Claims

1. Cylinder lock comprising

- an inner housing part (1) with rotatable mounted therein an inner core (3),
- an outer housing part (2) with rotatable mounted therein an outer core (4),
- a connecting element (5), joining the housing parts (1) and (2), the connecting element (5) is mounted in longitudinal bores (1b) and (2b), respectively formed in the housing parts (1) and (2),

- a composite cam (7), mounted between both cores (3) and (4), covering the inner end of the inner core (3) through a ring channel (14) formed therein,

- a switch (10) including a first and second switching elements (10a) and (10b) to provide selectively connection of the inner core (3) or outer core (4) with the cam (7),

- the cam (7) consists of two identical parts (7a) interlocked, in the area of the cam (7) ring, around a first transmitting plate (9) with a profile hole (9a), to engage with the first switching element (10a), and with at least two locking teeth (9b), engaged in radial holes (8) in the cam parts (7a) which are connected each other in the area of the cam (7) tooth, by pin (11),

- a compression spring (12), mounted in the inner core (3), behind the first switching element (10a),

wherein the cam (7) is mounted in a channel (13) formed in the inner housing part (1), in the outer side (1a) of which there is mounted a stepped sleeve (16), the inner end of which is covered through a ring channel (15) formed therein by the cam (7), which includes also a second transmitting plate (17) with a profile hole (17a), to engage with the second switching element (10b), and with at least two locking teeth (17b) engaged together with the locking teeth (9b) of the first transmitting plate (9) in the radial holes (8) of the cam parts (7a), moreover between both transmitting plates (9) and (17) of the cam (7) there is a connecting plate (18) with a central hole (18a), through which there is mounted a central pin (19) passed through their profile holes (9a) and (17a), moreover, additionally in a radial profile core hole (20) formed in the inner core (3), there is mounted under spring (25) and pin (26) pressure, a retaining element (21) provided to take a security position on an extender (22), axially disposed in the inner core (3) behind the compression spring (12), so that upon removal of the outer core (4) the first switching element (10a) together with the central pin (19) can be pushed out by the compression spring (12) in a forward position in the profile hole (9a) of the first transmitting plate (9) allowing the retaining element (21) to get into the security position on the extender (22), behind the first switching element (10a), thus blocking all degrees of free movement of the first switching element (10a), and respectively of the cam (7), towards the inner core (3), while in the same time the second switching element (10b) is permanently connected to the outer core (4) by means of a spring ring (23) covering it through a channel (24) formed therein.

2. Cylinder lock, according to claim 1, **characterized in that** the connecting plate (18) is freely rotatable

around the central pin (19) and it is made of hardened steel like the central pin (19), the first and second transmitting plates (9 and 17) and the stepped sleeve (16).

3. Cylinder lock, according to claim 1 and 2, **characterized in that** the retaining element (21) should pass in a security position on the extender (22) upon removal of the outer core (4), while in normal operation of the cylinder lock the retaining element (21) is disposed in the radial profile core hole (20) on the first switching element (10a) in a position, doesn't limiting its axial movement.
4. Cylinder lock, according to claim 1, 2 and 3, **characterized in that** the connecting element (5) is fixed to the housing parts (1) and (2) by means of respective transversal pins (6a) and (6b), passing through bores (1c) and (2c) transversally formed therein, and through the channel (5a) and transversal bores (5c) respectively formed in the connecting element (5), furthermore on the connecting element (5), at the place where the housing parts (1) and (2) are joined, there is provided a weakened section, by means of formed second channel (5b).
5. Cylinder lock, according to claim 4, **characterized in that** the transversal pins (6a) are made of hardened steel.

Patentansprüche

1. Ein Schließzylinder, bestehend aus:

- einem inneren Gehäuseteil (1) mit einem rotierend montierten Innenrotor (3),
- einem äußeren Gehäuseteil (2) mit einem rotierend montierten Außenrotor (4),
- einem verbindenden Bauteil (5), das die Gehäuseteile (1) und (2) verbindet, das verbindende Bauteil (5) ist in längliche Öffnungen (1b) und (2b) montiert, geformt entsprechend in Gehäuseteile (1) und (2),
- einem zusammengesetzten Schlüsselbart (7), montiert zwischen beiden Rotoren (3) und (4), umfassend das Innenende von dem Innenrotor (3) durch einen in ihm geformten ringförmigen Kanal (14),
- Umschalter (10), einschließen das erste und das zweite Umschaltelement (10a) und (10b) für die wahlweise Verbindung des Innenrotors (3) oder des Außenrotors (4) mit dem Schlüsselbart (7),
- der Schlüsselbart (7) besteht aus zwei gleichen Teilen (7a), in dem ringförmigen Bereich des Schlüsselbart (7) um die erste übertragende Platte befestigt (9) mit Profilöffnung (9a), zur

Aufsteckung mit dem ersten Umschaltelement (10a) und mit mindestens zwei abriegelnden Zähnen (9b), aufgesteckt in Radialöffnungen (8) in den Teilen (7a), die im Bereich des Zahnes von dem Schlüsselbart (7) mittels einem Stift verbunden sind (11),
- verstellende Feder (12), montiert in dem Innenrotor (3), hinter dem ersten Umschaltelement (10a),

wobei der Schlüsselbart (7) in dem Kanal montiert ist (13), geformt in dem Innenbereich des Gehäuseteils (1), in dessen Außenrand (1a) eine Stufenhülse montiert ist (16), deren äußeres Ende durch einen in ihr geformten ringförmigen Kanal eingefasst ist (15), von dem Schlüsselbart (7), der noch eine zweite übertragende Platte (17) mit Profilöffnung (17a), zur Aufsteckung mit dem zweiten Umschaltelement einschließt (10b), und mit noch mindestens zwei abriegelnden Zähnen (17b), aufgesteckt zusammen mit den abriegelnden Zähnen (9b) an der ersten übertragenden Platte (9) in den Radialöffnungen (8) der Teile (7a), wobei zwischen beiden übertragenden Platten (9) und (17) am Schlüsselbart (7) eine verbindende Platte (18) mit einer Zentralöffnung angebracht worden ist (18a), durch welche ein Zentralstift montiert ist (19), der durch ihre Profilöffnungen hindurchläuft (9a) und (17a), außerdem ist zusätzlich in dem Innenrotor (3), in einer radialen Profilöffnung des Rotors (20) unter dem Druck einer Feder (25) und einem Stift (26), ein Verriegelungselement montiert (21), das dazu vorgesehen wurde, eine sichere Position auf einem Verlängerungsstück einzunehmen (22), das in dem Innenrotor axial (3) hinter der verstellenden Feder aufgestellt ist (12), ein solches, dass bei einer Beseitigung von dem Außenrotor (4), das erste Umschaltelement (10a) zusammen mit dem Zentralstift (19), von der verstellenden Feder sich als verschoben herausstellt (12) und in einer weiter vorn liegenden Position in der Profilöffnung (9a) der ersten übertragenden Platte aufgesteckt wird (9) und das Verriegelungselement befähigt (21), die sichere Position auf dem Verlängerungsstück (22), hinter dem ersten Umschaltelement (10a) einzunehmen, auf diese Weise alle Stufen der Bewegungsfreiheit des ersten Umschaltelements (10a) und entsprechend den Schlüsselbart (7) gegenüber dem Innenrotor abriegelnd (3), wobei zum gleichen Zeitpunkt das zweite Umschaltelement (10b) feststehend zum Außenrotor (4) durch einen Federring verbunden ist (23), der es durch einen in ihm geformten Kanal einfasst (24).

2. Schließzylinder, gemäß Anspruch 1, **sich kennzeichnend dadurch, dass** die verbindende Platte (18) frei um den Zentralstift rotiert (19), wobei sie sowie der Zentralstift (19), die erste und die zweite

übertragenden Platten (9 **■** 17), und die Stufenhülse (16) aus gehärtetem Stahl gefertigt sind.

3. Schließzylinder, gemäß Anspruch 1 und 2, **sich kennzeichnend dadurch, dass** das Verriegelungselement (21) dazu vorgesehen ist, in eine sichere Position auf dem Verlängerungsstück zu wechseln (22), bei Beseitigung des Außenrotors (4), wobei bei normalem Betrieb des Schließzylinders sich das Verriegelungselement (21) in der radialen Profilöffnung des Rotors (20) auf dem ersten Umschaltelement befindet (10a), in einer Position, die seine axiale Verschiebung nicht beschränkt.
4. Schließzylinder, gemäß Anspruch 1, 2 und 3, **sich kennzeichnend dadurch**, dass das verbindende Bauteil (5) fest an die Gehäuseteile (1) und (2) mittels entsprechender Querstifte (6a) und (6b) angebracht ist, die durch Öffnungen verlaufen, die quer in ihnen geformt sind (1c) und (2c) und durch entsprechend in dem verbindenden Bauteil (5) geformten Kanal (5a) und Queröffnungen (5c), wobei auf dem verbindenden Bauteil (5), in der Verbindungsstelle der Gehäuseteile (1) und (2), eine schwache Schnittstelle durch einen auf diese geformten zweite Kanal (5b) vorgesehen ist.
5. Schließzylinder, gemäß Anspruch 4, **sich kennzeichnend dadurch, dass** die Querstifte (6a) aus gehärtetem Stahl gefertigt worden sind.

Revendications

1. Serrure à cylindre, constituée de
 - partie de boîtier intérieure (1) avec un rotor interne monté de manière rotative (3),
 - partie de boîtier extérieure (2) avec un rotor externe monté de manière rotative (4),
 - élément de couplage (5), qui connecte les parties de boîtier (1) et (2), l'élément de couplage (5) est monté dans les ouvertures longitudinales (1b) et (2b), formées dans les parties de boîtier (1) et (2),
 - pouce composé (7), monté entre les deux rotors (3) et (4), englobant l'extrémité intérieure du rotor interne (3) à travers un canal annulaire formé à l'intérieur (14),
 - commutateur (10), comprenant un premier et un deuxième élément de commutation (10a) et (10b) pour la connexion sélective du rotor interne (3) ou du rotor externe (4) avec le pouce (7),
 - le pouce (7) se compose de deux parties identiques (7a), serré dans la région annulaire du pouce (7) autour d'une première plaque de transmission (9) avec ouverture profilée (9a),

pour engagement avec le premier élément de commutation (10a), et avec au moins deux dents de verrouillage (9b), engagées dans des ouvertures radiales (8) dans les parties (7a), qui, dans la zone de la dent du pouce (7), sont reliés au moyen d'une broche (11),
 - ressort de déplacement (12), monté dans le rotor interne (3), en arrière du premier élément de commutation (10a),

où le pouce (7) est monté dans un canal (13), formé dans la partie de boîtier intérieure (1), dont dans la partie externe (1a) est montée un manchon de vitesse (16), dont l'extrémité intérieure est recouverte, à travers un canal annulaire formée à l'intérieur (15) du pouce (7), qui comprend en outre une seconde plaque de transmission (17) avec une ouverture de profil (17a), pour l'engagement avec le second élément de commutation (10b), et avec au moins deux dents de verrouillage (17b), engagées avec les dents de verrouillage (9b) de la première plaque de transmission (9) dans les ouvertures radiales (8) des parties (7a), entre les deux plaques de transmission (9) et (17) le pouce (7) se trouve une plaque de couplage (18) avec une ouverture centrale (18a), à travers laquelle une broche centrale est montée (19), passant à travers leurs ouvertures profilées (9a) et (17a), de plus, en supplément dans le rotor interne (3), dans une ouverture radial profilée de rotor (20) est monté, sous la pression d'un ressort (25) et d'une broche (26), un élément de verrouillage (21), destiné à être solidement positionné sur une extension (22), situé axialement dans le rotor interne (3) derrière le ressort de déplacement (12), de sorte que lors de l'enlèvement du rotor externe (4), le premier élément de commutation (10a) avec la broche centrale (19), pour être poussé par le ressort de déplacement (12) et engagé dans une position avant dans l'ouverture de profilée (9a) de la première plaque de transmission (9), permettant à l'élément de verrouillage (21) de prendre une position sécurisée sur l'extension (22), derrière le premier élément de commutation (10a), bloquant ainsi tous les degrés de liberté de mouvement du premier élément de commutation (10a) et, respectivement, du pouce (7) par rapport au rotor interne (3), tandis qu'au même moment le second élément de commutation (10b) est relié en permanence au rotor externe (4) au moyen d'un anneau de ressort (23), qui l'entoure à travers un canal formé à l'intérieur (24).

2. Serrure à cylindre, selon la revendication 1, **caractérisée en ce que** la plaque de couplage (18) peut tourner librement autour de la broche centrale (19), et elle est fabriquée en acier trempé comme la broche centrale (19), la première et la deuxième plaques de transmission (9 et 17), et le manchon de vitesse (16).

3. Serrure à cylindre, selon la revendication 1 et 2, **caractérisée en ce que** l'élément de verrouillage (21) est destiné à passer à une position sécurisée sur l'extension (22), lors de l'enlèvement du rotor externe (4), tandis que pendant le fonctionnement normal de la serrure, l'élément de verrouillage (21) est situé le profil radial de l'ouverture du rotor (20) sur le premier élément de commutation (10a), dans une position qui ne limite pas son déplacement axial.
4. Serrure à cylindre, selon la revendication 1, 2, et 3, **caractérisée en ce que** l'élément de couplage (5) est fixé sur les parties de boîtier (1) et (2) au moyen de broches transversales respectives (6a) et (6b), traversant des ouvertures transversales (1c) et (2c), et respectivement formées dans l'élément de couplage (5), canal (5a) et les ouvertures transversales (5c), et sur l'élément de couplage (5), à la jonction des parties de boîtier (1) et (2), est prévue une section transversale affaiblie à travers un second canal formé sur celle-ci (5b).
5. Serrure à cylindre, selon la revendication 4, **caractérisée en ce que** les broches transversales (6a) sont fabriquées en acier trempé.

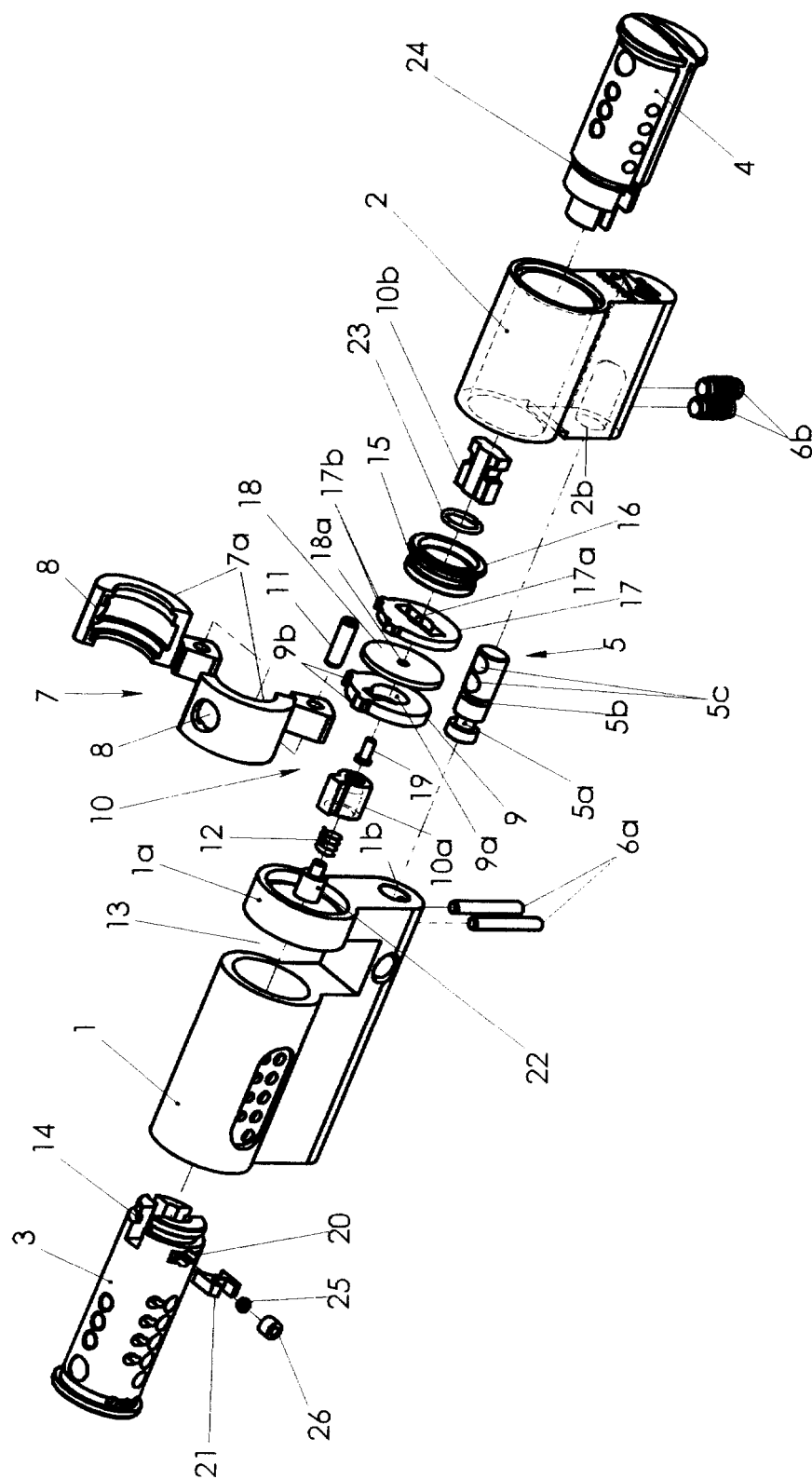


Fig. 1

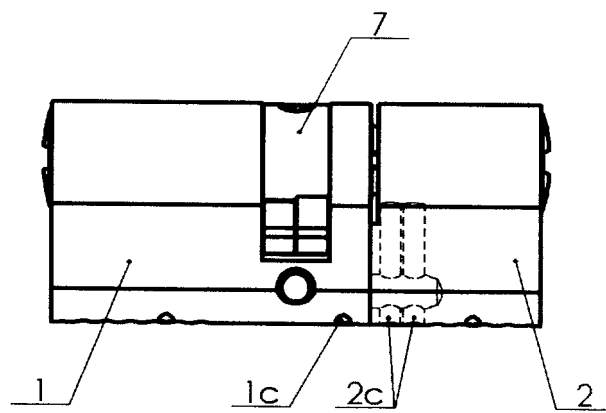


Fig. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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