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(54) **Flat key cylinder lock with anti-burglar features, particularly for use with master key locking systems.**

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Description

This invention relates to a flat key cylinder lock with anti-burglar features particularly for use with master key locking systems according to the preamble of Claim 1.

Known are flat key locks where. in addition to the usual bolt pins and counter-pins slided by the key dents, auxiliary side pins are provided which are slided by the key flanks and provide an added measure of burglar-proof ability.

Locks of this type are known, for example, from German Patent No. 2,003,059, and 1,260,340, in which the auxiliary pins are arranged to extend perpendicularly to the plane of the key. The pin action results from that, on the pins being slided sideways by the key being pushed in, they move out of the plug outer surface to engage in recesses formed in the cylindrical casing in which the plug is received rotatably. The proper key is formed with notches which, on the key being inserted into the lock, enable the auxiliary pins to retract by reaction effect as the plug is rotated. The pin retraction is facilitated by the crowned shape of the recesses.

When a bogus key is used, the notches and pins mismatch, and accordingly, the pins are held in a position of engagement with the recesses and prevent the plug from turning.

The burglar resisting ability of the known auxiliary pins is, in actual practice, rather unreliable because it can be easily overcome by effecting removal thereof lengthwise to the key profile at the areas abutting the auxiliary pins, that is by milling out the key flanks longitudinally, thereby the pins are allowed to slide freely in their seats. Such a deceptively machined key (referred to in the jargon as a "relieved" key) allow unrestricted sliding for the auxiliary pins which are, therefore, free to retract as the plug is rotated.

In fact, as is well known in the art of professional burglars, the relieved bogus key has on the same side thereof either a deceptive continuous longitudinal land formation or a deceptive continuous longitudinal groove formation on the appropriate height of the key determined after a deceptive external exploration of the key channel of the lock to be subjected to burglary.

The published German Patent Application No. 31 23 511 discloses a lock provided with holes for the auxiliary pins perpendicular to the usual pins and counter-pins and having the same or a larger diameter than the latter. With a "relieved" key, the counter-pins, after a 90° rotation, can fit into the holes for the auxiliary pins and make the lock fast. With a non-relieved key, the plug rotation would be hindered by the auxiliary pins being held engaged with the notches in the cylinder casing.

A lock according to the above disclosure has the disadvantage that when the lock is made fast in the rotated position, the bogus key cannot be removed and the lock is rendered unreusable.

The German Patent Application No. 3,014,183, discloses a lock having auxiliary pins cooperating with interference pins or balls that engage recesses in the outer casing to prevent the rotation of the plug.

The auxiliary and interference pins are shaped so as to enable rotation of the plug when the key is inserted but not when it is removed.

AT-B-371 833 generically hints that different types of auxiliary locking units may be used in a lock.

It is the technical aim of this invention to provide a cylinder lock having auxiliary pins which can obviate the drawbacks of the known ones, that is, can resist burglary efforts using deceptively "relieved" keys.

Within the above aim, it is an object of this invention to provide a lock which is suitable for use in locking systems with hierarchically different keys in conformity with a scale comprising multiple levels.

This aim and object are achieved by a cylinder lock as defined in Claim 1, in the preamble of which AT-B-371883 is considered.

Further features and advantages of the invention will become apparent from the following detailed description of some embodiments thereof, with reference to the accompanying illustrative drawing, in which:

Figure 1 is a fragmentary sectional view of a cylinder lock according to a first embodiment of this invention:

Figure 2 is a fragmentary sectional view of a cylinder lock according to a second embodiment of the invention;

Figure 3 is a fragmentary sectional view of a third embodiment of the invention; and

Figure 4 is a fragmentary sectional view of a fourth embodiment.

With reference to Figure 1, this lock comprises a cylindrical casing 1, on the interior of which a cylindrical plug 2 is set rotatably.

The cylindrical plug 2 is formed, in a known manner no further illustrated herein, with a lengthwise channel or flute 3 having a shaped profile to receive the operating key, as well as with a plurality of holes 4 aligned on a longitudinal plane coinciding with the lock centreplane and accommodating the usual pins or bolt pins which, in cooperation with the counter-pins, are driven by the lock actuating key.

The plug 2 has additional holes 5, 6 formed therein alongside the channel 3 and being oriented in a radial direction.

The hole 6 is part of a first type of auxiliary locking pin unit described below and the hole 5 is part of a second type of auxiliary locking pin unit.

The holes 5, 6 extend in plane containing an axis substantially, but do not necessarily coincide with the axis of the plug 2.

With the lock in the position shown, which is the position with the key disengaged, the holes 5, 6 are aligned with recesses 7, 8 in the form of longitudinal grooves having an arcuate cross-section and being formed on the inner walls of the casing 1.

The hole 5 is in communication with the channel 3 and accommodates a cylindrical pin 9 having each of its opposed ends configured as a spherical cap.

As visible in Fig. 1 pin 9 has an actuation surface portion 9a projecting into the channel 3 and a locking formation 9b normally out of engagement with the recess 7.

A hole 10 is also formed in the plug 2 which intersects the hole 6 orthogonally thereto and opens into the channel 3.

The hole 10 is closed on the side of the casing 1 by a pellet or plug nut 11 force fitted to provide support for a compression spring 12 which penetrates, with its opposed end, a recess formed in a pin 13 guided in the hole 10.

The pin 13 is provided at one end with a flange 14 which, owing to the bias force applied by the spring 12, is held at one end against a shoulder of the hole 10, and at the other end, with a hemispherical head 15 merging with the cylindrical body of the pin 13 through a conical collar 16.

The hemispherical head 15 provides an actuation surface portion normally protruding into the channel 3.

The abutment shoulder for the flange 14 in the hole 10 is positioned such that the hemispherical head 15 partially protrudes into the channel 3. Further, the depth of the hole 6, when combined with that of the recess 8, will equal the diameter of the hole 6, so that it can accommodate a ball 17 of the same diameter.

The ball 17 provides a locking formation normally in engagement with the recess 8 to exert a locking action between plug 2 and casing 1.

It should be noted that, with the flange 14 abutting against the shoulder in the hole 10, the ball 17 prevented from coming out of the hole 6 by the body of the pin 13 blocking access to the hole 10.

In the above description, reference has been made, for reasons of clarity in the drawings, to a single hole 5 formed on one side of the channel 3 and to a single pair of mutually intersecting holes 6, 10 formed on the other side of the same hole. Actually, it is envisaged that, according to the invention on the same side of the channel 3 and at an axial distance from each other, a set of holes comprising at least one hole 5 and respective pin 9 together with a pair of holes 6, 10 and respective pins 13 and ball 17,are provided.

It will be understood from the foregoing, that on the same side of the channel 3 two different types of auxiliary locking pin units are provided, i.e. a first type including the radial hole 6, the ball 17, the transverse hole 10 and the pin 13 and on the same side a second type of auxiliary locking pin unit including the radial hole 5 and the pin 9.

The lock just described is operated by means of a key having side notches arranged such that, with the key inserted into the channel 3, each notch faces one hole 5 to receive the pin 9. Furthermore, the key can act with its flanks directly on the pins 13 and push them back into the holes 10 against the bias of the spring 12.

As shown clearly in Figure 1, with the key removed, the plug 2 is inhibited from turning by, in addition to the actions of the pins and counter-pins housed in the holes 4, by the locking action of the ball 17 which cannot retract into the hole 6 owing to the pin 13 blocking it from moving.

On inserting the proper key into the channel 3, the pins 9 retain their freedom of movement due to the provision of corresponding notches on the key which enable the pins 9 to penetrate the channel 3. Simultaneously, the key flanks i.e. actuating land portions thereof push into the holes 10 the pins 13, thereby the ball can move down the conical region 16 and stop against the spherical head 15, thus disengaging from the recess 8. Owing to the pins in the holes 4 being positined by the key dents in the shear plane between the plug 2 and casing 1, the plug 2 may now be turned.

If a bogus "relieved" key is introduced into the channel 3 from either end, there will be at least one pin 13 which retains its position shutting off the ball 17 and, hence, the plug 2.

If the bogus key is not correctly relieved, the inhibiting function is assumed by at least one of the pins 9 being pushed back into the recess 7 to the plug blocking position.

As may be seen, the lock can provide a better safeguard than traditional ones, since the auxili- ary pins not only widen the range of key coding, but also compel any ill-intentioned person surreptitiously attempting to pick the lock to manipulate pins which are difficult to locate.

In practicing the invention, many modifications and variations are feasible especially in respect of the auxiliary pin fashioning.

In the embodiment of Figure 2, the pin 9 is replaced by a ball 18 and a pin 19. The ball 18 is accommodated in a radial hole 20 which intersects the hole 21 perpendicularly wherein the pin 19 is slidable.

Relatively to the lock centreplane in addition to the basic features of the invention the hole 21 is symmetrical to the hole 10 and opens into the channel 3 for the key at a position which need not necessarily be juxtaposed to the hole 10.

The pin 19 is provided with a flange 22 and an annular groove 23 defined by two flaring walls 24. The flange 22, similarly to the flange 14, is urged against a shoulder in the hole 21 by a spring 25 which rests

on a plug nut 26 in the hole 21.

With the proper key, the ball 18 will be facing the groove 23 and is free to move in the hole 20, disengaging from the recess 7 and allowing the plug 2 to be rotated.

By contrast, if the key has no notches, the ball 18 will remain in tangent contact with the periphery of the pin 19, while in engagement with the recess 7 and preventing the plug 2 from rotating. As visible from the drawing all actuation formations 9a, 15, 19, are substantially at the same height with respect to the channel 3.

In Figure 3, there is shown a solution wherein the hole 27 accommodating the auxiliary pins is formed through the channel 3 for the key. Thus no plug nuts are required. whilst to prevent the pins from leaving their seats, there are provided axial pins 28 which, by interfering with a side bevel 28a of the auxiliary pins, also prevent them from turning.

In Figure 4, lastly, there is shown an embodiment wherein the cylindrical springs 12 are replaced with leaf springs 29 each inserted into a respective slot 30 cut through the periphery of the plug 2 perpendicularly to its axis and intersects the hole 10 diametrically. The spring 29 has one end secured by a chamfer 31 of the slot and the other end acting on the pin 13 to bias it toward the position of engagement with the channel 3 for the key.

One of the basic features of the inventive locks is that they enable the fabrication of so-called master key systems, wherein the locks may be operated in conformity with hierarchically different levels, in the sense that keys of a hierarchically higher level can operate locks of lower levels, but not vice versa. Diversification may be achieved by intervention on the key flanks and respective side pins. Thus, the highest key in the hierarchy will have notches for receiving the pins 9 and lands for pushing back the pins 13 of all the locks. The lower level locks may have one or more auxiliary pins 9, 13 missing.

The presence of the spring-loaded pins 13 inhibits the fabrication of keys of a higher hierarchical level by "relieving".

The hierarchy to be obtained with the auxiliary pins may be combined with that to be obtained with the usual pins and counter-pins, thereby a much differentiated hierarchical scale can be provided.

Claims

1. A cylinder lock for preventing operation by a bogus key having deceptive continuous lateral longitudinal groove formations and deceptive continuous lateral longitudinal land formations, said cylinder lock comprising:

   a) a casing (1) having an axial cylindrical bore defining an inner wall, a cylinder plug (2) rotatably arranged in said bore, a channel (3) axially formed in said plug for receiving therein a proper key including lateral land formations and lateral notch formations, main tumbler pin means, at least one first auxiliary locking pin unit (13, 17) in said plug and said casing, wherein said first auxiliary unit is of the type including therein a locking member (17) cooperating with said plug (2) and said casing (1) and positionable between a locking position preventing rotation of said plug with respect to said casing and a releasing position allowing rotation of said plug with respect to said casing, said first auxiliary unit including further a controlling member (13) in said plug (2) for controlling the position of said locking member (17), said controlling member (13) having an actuation formation (15) to be actuated by land formations of the proper key, said actuation formation (15) normally protruding into said channel (3) at a predetermined height of said channel (3) when the proper key is removed from the channel and when said locking member (17) is positioned by said controlling member (13) to prevent rotation of said plug with respect to said casing, said controlling member (13) releasing said locking member (17) to reach said releasing position thereof when said actuation formation (15) of said controlling member (13) is engaged by a land formation of the proper key when the proper key is inserted in said channel (3) and

   b) wherein said cylinder lock further comprises at least a second auxiliary locking pin unit (9, 18, 19) of a type different from said first auxiliary locking pin unit (13, 17),

   characterized in that

   c) at least one of said first auxiliary locking pin unit (13, 17) and at least one of said second auxiliary locking pin unit (9, 18, 19) are both arranged on the same side of said channel (3) at an axial distance from each other,

   d) said second auxiliary locking pin unit (9, 18-19) including therein a locking member (9, 18) and an actuation formation (9a, 19), said locking member. (9, 18) being positionable between a releasing position allowing rotation of said plug (2) with respect to said casing (1) and a locking position preventing rotation of said plug (2) with respect to said casing (1),

   e) said actuation formation (9a, 19) protruding into said channel (3) substantially at said predetermined height of said channel (3) when said locking member (9, 18) is in said releasing position both when the proper key is removed from said channel and when the proper key is inserted in said channel (3) and

the notch formations on the same side thereof skip said actuation formation (9a, 19) of said second auxiliary pin unit (9, 18, 19),

f) thereby, when the proper key is inserted in said channel (3), a land formation provided on the same side of the proper key engages said actuation formation (15) of said first auxiliary locking unit (13, 17) arranged on the same side of the channel at an axial distance from said second auxiliary locking pin unit (9, 18, 19) thereby releasing said locking member (17), so that both the locking member (9) of the second auxiliary locking unit and the locking member (17) of said first auxiliary locking unit on the same side of the channel (3) are in their releasing positions, to allox rotation of said plug (2),

g) said locking member (9, 18) of said second auxiliary locking pin unit being positioned in said locking position thereof when a deceptive continuous longitudinal land formation of a first bogus key engages said actuation formation (9a, 19) of said second auxiliary locking unit when said first bogus key is inserted in said channel (3), and said locking member (17) of said first auxiliary locking pin unit (13, 17) arranged on the same side of said channel (3) being positioned in said released position thereof when said deceptive longitudinal lateral land formation of said first bogus key engages said actuation formation (15) of said locking member (17) on the same side of the channel (3),

h) thereby only said second auxiliary locking unit (9, 18-19) preventing rotation of said plug (2) when said first bogus key having deceptive continuous longitudinal land formations facing the same side of said channel (3) is inserted in said channel (3),

k) said locking member (9, 18) of said second auxiliary locking pin unit being positioned in said releasing position thereof when a deceptive continuous longitudinal lateral groove formation of a second bogus key skips said actuation formation (9a, 19) of said second auxiliary locking unit when said second bogus key is inserted in said channel (3) and said locking member (17) of said first auxiliary locking pin unit arranged on the same side of said channel (3) at an axial distance from said second auxiliary locking pin unit (9, 18-19) being positioned in said locking position thereof when said groove formation of said bogus key skips said actuation formation (15) of said locking member (17) arranged on the same side of the channel (3),

l) thereby only said first auxiliary locking pin unit (17, 13) preventing rotation of said plug (2) when said second bogus key having deceptive continuous longitudinal lateral groove formations facing the same side of the channel (3) is inserted in said channel.

2. A cylinder lock according to Claim 1 characterized in that said second auxiliary locking unit comprises a cylindrical pin (9) slidingly arranged in a radial hole (5) of the plug (2) opening with one end into the key channel (3) and with the opposite end at the outer surface of the plug to face a longitudinal groove (7) formed in the inner wall of the casing (1), said pin having one end cooperating with the key to engage the notch formation thereof when the key is inserted to allow free rotation of the plug with respect to the casing and an opposite end engageable into said longitudinal groove when a bogus key is inserted, for locking said plug onto said casing.

3. A cylinder lock according to Claim 1 characterized in said second auxiliary locking unit comprises a radial hole (20) formed in said plug (2) and having one end opening at the outer surface of the plug to face a longitudinal groove (7) formed in the inner wall of the casing (1) and the opposite end opening into a transverse hole (21) intersecting said radial hole (20) and opening into the key channel (3), a ball (18) movably accommodated in said radial hole and a pin (19) slidingly guided in said transverse hole (21) and urged by means of a spring (25) in a normal position in which one end of the pin protrudes into the key channel, said pin having an annular groove (23) facing said radial hole for receiving said ball (18) when the pin is in said normal position to allow free rotation of the plug with respect to the casing, said pin, when a bogus key is inserted into the key channel, urging said ball to engage said longitudinal groove for locking said plug onto said casing.

Patentansprüche

1. Zylinderschloß, das von einem Nachschlüssel nicht schließbar ist, der mit durchgehenden seitlichen Längsnut- ausbildungen und durchgehenden seitlichen Längsbundausbildungen in täuschender Absicht versehen ist', wobei das Zylinderschloß aufweist:

   a) ein Gehäuse (1) mit einer axialen zylindrischen Bohrung zum Definieren einer Innenwand, einem drehbar in der Bohrung angeordneten Zylinderkern (2), einem axial in dem Kern ausgebildeten Kanal (3) zum Einführen eines passenden Schlüssels mit seitlichen Bundausbildungen und seitlichen Nutausbildungen, Hauptzuhalterstiftmittel, minde-

stens einer ersten Hilfsarretierstifteinheit (13, 17) in den Kern und in dem Gehäuse, wobei die erste Hilfseinheit von der Art ist, die ein mit dem Kern (2) und dem Gehäuse (1) zusammenwirkendes Arretierglied (17) aufweist, das zwischen einer eine Drehung des Kerns gegenüber dem Gehäuse verhindernden Arretierposition und einer die Drehung des Kerns gegenüber dem Gehäuse zulassenden Freigabeposition positionierbar ist, wobei die erste Hilfseinheit ferner ein Steuerglied (13) in dem Gehäuse (2) zum Steuern der Position des Arretiergliedes (17) aufweist, wobei das Steuerglied (13) ein Betätigungsteil (15) aufweist, das von Bundausbildungen des passenden Schlüssels betätigt wird, wobei das Betätigungsteil (15) normalerweise in den Kanal (3) in einer vorbestimmten Höhe des Kanals (3) hineinragt, wenn der passende Schlüssel aus dem Kanal entfernt ist und wenn das Arretierglied (13) von dem Steuerglied (13) so positioniert ist, daß eine Drehung des Kerns gegenüber dem Gehäuse verhindert ist, wobei das Steuerglied (13) das Arretierglied (17) freigibt, um in die Freigabeposition zu gelangen, wenn das Betätigungsteil (15) des Steuergliedes (13) mit einer Bundausbildung des passenden Schlüssels in Eingriff gerät, wenn der passende Schlüssel in den Kanal (3) eingeführt wird und

b) wobei das Zylinderschloß ferner mindestens eine zweite Hilfsarretierstifteinheit (18, 19) von einer Art aufweist, die sich von der ersten Hilfsarretierstifteinheit unterscheidet, dadurch gekennzeichnet, daß

c) mindestens eine der ersten Hilfsarretierstifteinheit (13, 17) und mindestens eine der zweiten Hilfsarre- tierstifteinheit (9, 18, 19) sind beide auf der gleichen Seite des Kanals (3) in einem gegenseitigen axialen Abstand angeordnet,

d) die zweite Hilfsarretierstifteinheit (9, 18-19) weist ein Arretierglied (9, 18) und ein Betätigungsteil (9a, 19) auf, wobei das Arretierglied (9, 18) zwischen einer Freigabeposition, die eine Drehung des Kerns (2) gegenüber dem Gehäuse (1) zuläßt, und einer Arretierposition, die eine Drehung des Kerns (2) gegenüber dem Gehäuse (1) verhindert, positionierbar ist,

e) das Betätigungsteil (9a, 19) ragt in den Kanal (3) im wesentlichen mit der gleichen Höhe des Kanals (3) hinein, wenn das Arretierglied (9, 18) in der Freigabeposition ist, sowohl wenn der passende Schlüssel aus dem Kanal entfernt, als auch wenn er in den Kanal (3) eingeführt wird, und wobei die Nutausbildungen auf dessen gleicher Seite an dem Betätigungsteil (9a, 19) der zweiten Hilfsstifteinheit (9, 18, 19) vorbei gehen,

f) wodurch beim Einführen des passenden Schlüssels in den Kanal (3) eine Bundausbildung auf der gleichen Seite des passenden Schlüssels mit dem Betätigungsteil (15) der ersten Hilfsarretiereinheit (13, 17) in Eingriff gerät, die auf der gleichen Seite des Kanals in einem axialen Abstand von der zweiten Hilfsarretierstifteinheit (9, 18, 19) angeordnet ist, wodurch das Arretierglied (17) freigegeben wird, so daß sowohl das Arretierglied (9) der zweiten Hilfsarretierein- heit und das Arretierglied (17) der ersten Hilfsarretierein- heit auf der gleichen Seite des Kanals in ihren Freigabepositionen sind und eine Drehung des Kerns gestatten,

g) das Arretierglied (9, 18) der zweiten Hilfsarretierstifteinheit ist in seiner Arretierposition positio- niert, wenn eine täuschende kontinuierliche Längsbundausbildung eines ersten Nachschlüssels mit dem Betätigungsteil (9a, 19) der zweiten Hilfsarretiereinheit in Eingriff gerät, wenn der erste Nachschlüssel in den Kanal (3) eingeführt wird und das Arretierglied (17) der ersten Hilfsarretierstifteinheit (13, 17), die auf der gleichen Seite des Kanals (3) angeordnet ist, in ihrer Freigabeposition positioniert wird, wenn die täuschende seitliche Längsbundausbildung des ersten Nachschlüssels mit dem Betätigungsteil (15) des Arretiergliedes (17) auf der gleichen Seite des Kanals (3) in Eingriff gerät,

h) wodurch nur die zweite Hilfsarretiereinheit (9, 18-19) die Drehung des Kerns (2) verhindert, wenn der erste Nachschlüssel mit täuschenden kontinuierlichen Längsbundausbildungen der gleichen Seite des Kanals (3) zugekehrt in den Kanal (3) eingeführt wird,

k) das Arretierglied (9, 18) der zweiten Arretierstifteinheit in seiner Freigabeposition positioniert wird, wenn eine täuschende kontinuierliche seitliche Längsnutausbildung eines zweiten Nachschlüssels an dem Betätigungsteil (9a, 19) der zweiten Hilfsarretiereinheit vorbeigeht, wenn der zweite Nachschlüssel in den Kanal (3) eingeführt wird und das Arretierglied (17) der ersten Hilfs- arretierstifteinheit, die auf der gleichen Seite des Kanals (3) in einem axialen Abstand von der zweiten Hilfsarretierstifteinheit (9, 18-19) angeordnet ist, in seiner Arretierposition positioniert wird, wenn die Nutausbildung dieses Nachschlüssels an dem Betätigungsteil (15) des auf der gleichen Seite des Kanals (3) angeordneten Arretiergliedes (17) vorbeigeht,

l) wodurch nur die erste Hilfsarretierstifteinheit (17, 13) die Drehung des Kerns (2) ver-

hindert, wenn der zweite Nachschlüssel mit täuschenden kontinuierlichen seitlichen Längsnutausbildungen, die der gleichen Seite des Kanals (3) zugekehrt sind, in den Kanal eingeführt wird.

2. Zylinderschloß nach Anspruch 1, dadurch gekennzeichnet, daß die zweite Hilfsarretiergruppe einen zylindrischen Stift (9) aufweist, der verschiebbar in einer radialen Bohrung (5) des Kernes (2) angeordnet ist, welche mit einem Ende in den Schlüsselkanal (3) und mit dem entgegengesetzten Ende an der Außenfläche des Kernes, um einer in der Innenwand des Gehäuses (1) ausgebildeten Längsnut (7) gegenüberzuliegen, mündet, wobei ein Ende des Stiftes mit dem Schlüssel zusammewirkt, um bei eingestecktem Schlüssel in die Einkerbungen desselben einzugreifen und eine freie Drehung des Kernes in bezug auf das Gehäuse zu gestatten, und das entegegengesetzte Ende in die Längsnut eingreift, wenn ein Nachschlüssel eingestekt wird, um den Kern am Gehäuse zu verriegeln.

3. Zylinderschloß nach Anspruch 1, dadurch gekennzeichnet, daß die zweite Hilfsarretiergruppe eine radiale Bohrung (20) aufweist, die im Kern (2) ausgebildet ist und von der ein Ende an der Außenfläche des Kernes mündet, um einer in der Innenwand des Gehäuses (1) ausgebildeten Längsnut (7) gegenüberzuliegen, und das entgegengesetzte Ende in eine Querbohrung (21) mündet, welche die radiale Bohrung (20) schneidet und in den Schlüsselkanal (3) ausmündet, wobei eine Kugel (18) beweglich in der radialen Bohrung angeordnet ist und ein Stift (19) verschiebbar in der Querbohrung (21) geführt ist und mittels einer Feder (25) in eine Normalstellung, in welcher ein Ende des Stiftes in den Schlüsselkanal hineinragt, gedrückt wird, wobei der Stift eine Ringnut (23) besitzt, welche der radialen Bohrung gegenüberliegt, um die Kugel (18) aufzunehmen, wenn sich der Stift in der genannten Normalstellung befindet, um eine freie Bewegung des Kernes in bezug auf das Gehäuse zu gestatten, welcher Stift, wenn ein Nachschlüssel in den Schlüsselkanal eingestekt wird, die Kugel in den Eingriff mit der Längsnut drückt, um den Kern am Gehäuse zu verriegeln.

Revendications

1. Serrure à cylindre pour empêcher le fonctionnement à l'aide d'une fausse clé, possédant des encoches longitudinales latérales continues déceptives et des parties surélevées longitudinales latérales, continues déceptives, ladite serrure à cylindre comprenant :

a) un boîtier (1) possédant un alésage cylindrique axial délimitant une paroi latérale, un barillet cylindrique (2) disposé à rotation dans ledit alésage, un canal (3) pratiqué axialement dans ledit barillet pour recevoir à l'intérieur une clé appropriée possédant des parties surélevées latérales et des encoches latérales, des broches de gorge principales, au moins une première unité de broche de verrouillage auxiliaire (13, 17) dans ledit barillet et ledit boîtier, ladite première unité auxiliaire étant du type comportant un élément de verrouillage (17) coopérant avec ledit barillet (2) et ledit boîtier (1) et étant apte à être positionnée entre une position de verrouillage empêchant la rotation dudit barillet par rapport audit boîtier et une position de libération permettant une rotation dudit barillet par rapport audit boîtier, ladite première unité auxiliaire comportant en outre un élément de commande (13) dans ledit barillet (2) pour commander la position dudit élément de verrouillage (17), ledit élément de commande (13) possédant une partie d'actionnement (15) destinée à être actionnée par des parties surélevées de la clé appropriée, ladite partie d'actionnement (15) faisant normalement saillie dans ledit canal (3) à une hauteur prédéterminée dudit canal (3) lorsque la clé appropriée est retirée du canal et lorsque ledit élément de verrouillage (17) est positionné par ledit élément de commande (13) pour empêcher la rotation dudit cylindre par rapport audit boîtier, ledit élément de commande (13) libérant ledit élément de verrouillage (17) pour que ce dernier atteigne sa position de libération lorsque ladite partie d'actionnement (15) dudit élément de commande (13) est en engagement avec une partie surélevée de la clé appropriée lorsque la clé appropriée est insérée dans ledit canal (3) et

b) ladite serrure à cylindre comprenant en outre au moins une seconde unité de broche de verrouillage auxiliaire (9, 18, 19) d'un type différent de ladite première unité de broche de verrouillage auxiliaire (13, 17),

caractérisée en ce que

c) l'une au moins desdites premières unités de broche de verrouillage auxiliaire (13, 17) et l'une au moins desdites secondes unités de broche de verrouillage auxiliaire (9, 18, 19) sont toutes deux disposées sur le même côté dudit canal (3) à une distance axiale l'une de l'autre,

d) ladite seconde unité de broche de verrouillage auxiliaire (9, 18-19) comprenant un élément de verrouillage (9, 18) et une partie

d'actionnement (9a, 19), ledit élément de verrouillage (9, 18) étant apte à être positionné entre une position de libération permettant la rotation dudit barillet (2) par rapport audit boîtier (1) et une position de verrouillage empêchant la rotation dudit barillet (2) par rapport audit boîtier (1),

e) ladite partie d'actionnement (9a, 19) faisant saillie dans ledit canal (3) sensiblement à ladite hauteur prédéterminée dudit canal (3) lorsque ledit élément de verrouillage (9, 18) est dans ladite position de libération à la fois lorsque la clé appropriée est retirée dudit canal et lorsque la clé appropriée est insérée dans ledit canal (3) et les encoches sur le même côté de celle-ci sautent ladite partie d'actionnement (9a, 19) de ladite seconde unité de broche auxiliaire (9, 18, 19)

f) ce par quoi, lorsque la clé appropriée est insérée dans ledit canal (3), une partie surélevée prévue sur le même côté de la clé appropriée vient en engagement avec ladite partie d'actionnement (15) de ladite première unité de verrouillage auxiliaire (13, 17) disposée sur le même côté du canal à une distance axiale de ladite seconde unité de broche de verrouillage auxiliaire (9, 18, 19), libérant ainsi ledit élément de verrouillage (17) de telle sorte que à la fois l'élément de verrouillage (9) de la seconde unité de verrouillage auxiliaire et l'élément de verrouillage (17) de ladite première unité de verrouillage auxiliaire sur le même côté du canal (3) sont dans leur position de libération pour permettre la rotation dudit barillet (2)

g) ledit élément de verrouillage (9, 18) de ladite seconde unité de broche de verrouillage auxiliaire étant positionné dans sa position de verrouillage lorsqu'une partie surélevée longitudinale continue déceptive d'une première fausse clé vient en engagement avec ladite partie d'actionnement (9a, 19) de ladite seconde unité de verrouillage auxiliaire lorsque ladite première fausse clé est insérée dans ledit canal (3), et ledit élément de verrouillage (17) de ladite première unité de broche de verrouillage auxiliaire (13, 17), disposé du même côté dudit canal (3), étant positionné dans sa position libérée lorsque ladite partie surélevée latérale longitudinale déceptive de ladite première fausse clé vient en engagement avec ladite partie d'actionnement (15) dudit élément de verrouillage (17) sur le même côté du canal (3),

h) ce par quoi, seule ladite seconde unité de verrouillage auxiliaire (9, 18-19) empêchant la rotation dudit barillet lorsque ladite première fausse clé ayant des parties surélevées longitudinales continues déceptives en regard du même côté dudit canal (3) est insérée dans ledit canal (3),

k) ledit élément de verrouillage (9, 18) de ladite seconde unité de broche de verrouillage auxiliaire étant positionné dans sa position de libération lorsqu'une encoche latérale longitudinale continue déceptive d'une seconde fausse clé saute ladite partie d'actionnement (9a, 19) de ladite seconde unité de verrouillage auxiliaire, lorsque ladite seconde fausse clé est insérée dans ledit canal (3), et ledit élément de verrouillage (17) de ladite première unité de broche de verrouillage auxiliaire disposé sur le même côté dudit canal (3) à une distance axiale de ladite seconde unité de broche de verrouillage auxiliaire (9, 18-19) étant positionné dans sa position de verrouillage lorsque ladite encoche de ladite fausse clé saute ladite partie d'actionnement (15) dudit élément de verrouillage (17) disposée sur le même côté du canal (3),

l) ce par quoi, seule ladite première unité de broche de verrouillage auxiliaire (17, 13) empêchant la rotation dudit barillet (2) lorsque ladite seconde fausse clé possédant des encoches latérales longitudinales continues déceptives en regard du même côté du canal (3) est insérée dans ledit canal.

2. Serrure à cylindre selon la revendication 1, caractérisé en ce que ladite seconde unité de verrouillage auxiliaire comporte une broche cylindrique (9) disposée à coulissement dans un trou radial (5) du barillet (2) débouchant à une extrémité dans le canal de clé (3) et à l'extrémité opposée à la surface extérieure du barillet pour faire face à une gorge longitudinale (7) pratiquée dans la paroi intérieure du boîtier (1), ladite broche possédant une extrémité coopérant avec la clé pour venir en contact de l'encoche de celle-ci lorsque la clé est introduite pour permettre une rotation libre du barillet par rapport au boîtier et une extrémité opposée pouvant s'engager dans ladite gorge longitudinale lorsqu'une fausse clé est introduite, pour bloquer ledit barillet sur ledit boîtier.

3. Serrure à cylindre selon la revendication 1, caractérisée en ce que ladite seconde unité de verrouillage auxiliaire comporte un trou radial (20) pratiqué dans ledit barillet (2) et possédant une extrémité débouchant à la surface extérieure du barillet pour faire face à une gorge longitudinale (7) ménagée dans la paroi intérieure du boîtier (1) et l'extrémité opposée débouchant dans un trou transversal (21) coupant ledit trou radial (20) et débouchant dans le canal de clé (3), une

bille (18) logée de façon déplaçable dans ledit trou radial et une broche (19) guidée à coulissement dans ledit trou transversal (21) et poussée au moyen d'un ressort (25) dans une position normale dans laquelle une extrémité de la broche fait saillie dans le canal de clé, ladite broche possédant une gorge annulaire (23) tournée vers ledit trou radial pour recevoir ladite bille (18) lorsque la broche se trouve dans la disposition normale pour permettre une rotation libre du barillet par rapport au boîtier, ladite broche, lorsqu'une fausse clé est introduite dans le canal de clé poussant ladite bille pour l'engager dans ladite gorge longitudinale en vue de bloquer ledit barillet sur ledit boîtier.

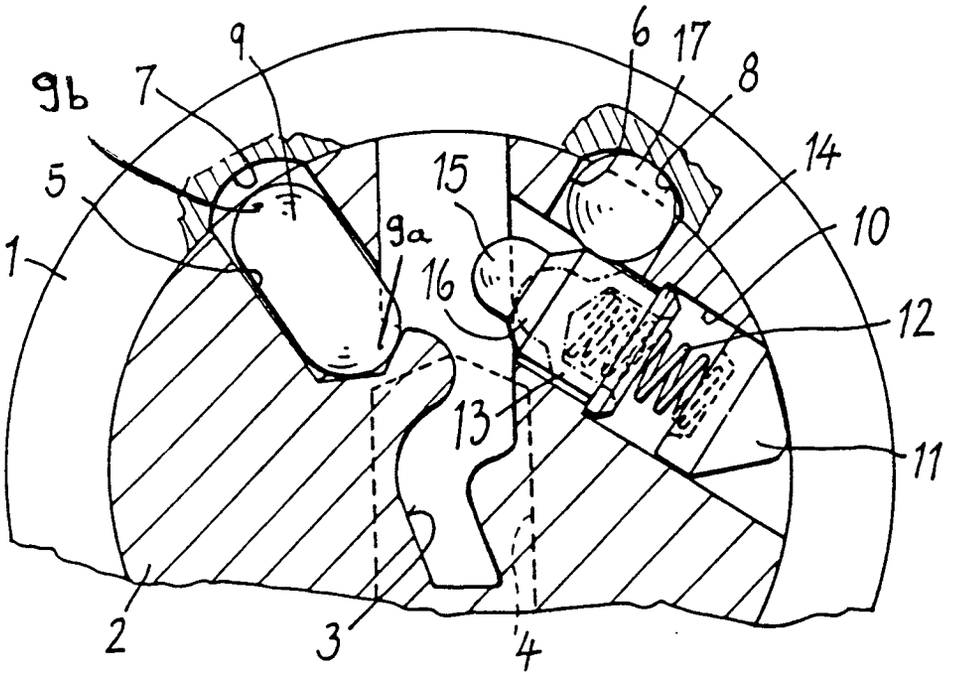
9b
7
9
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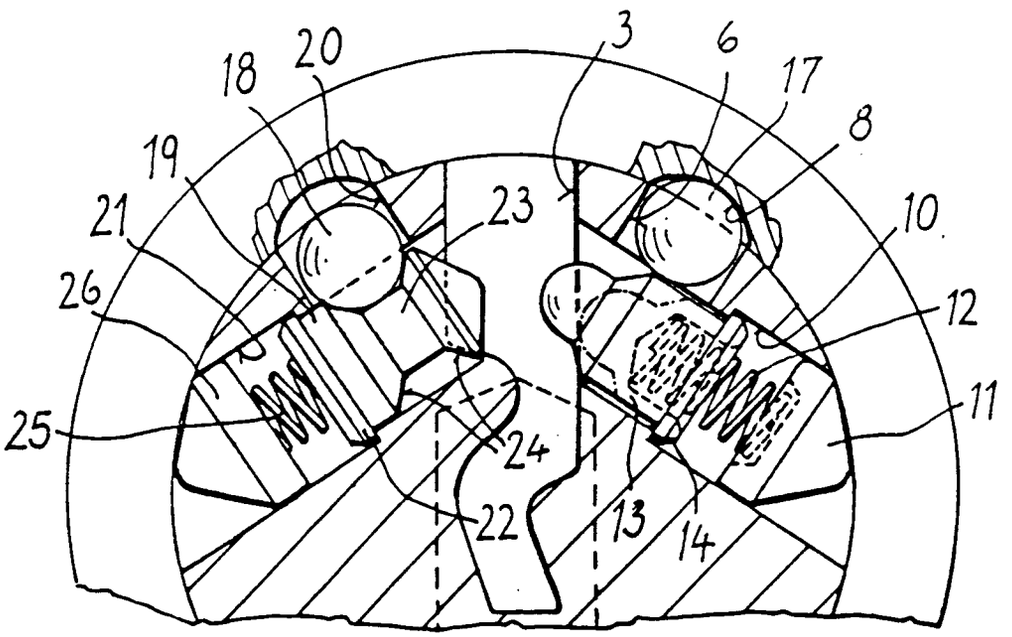
Fig. 1

Fig. 2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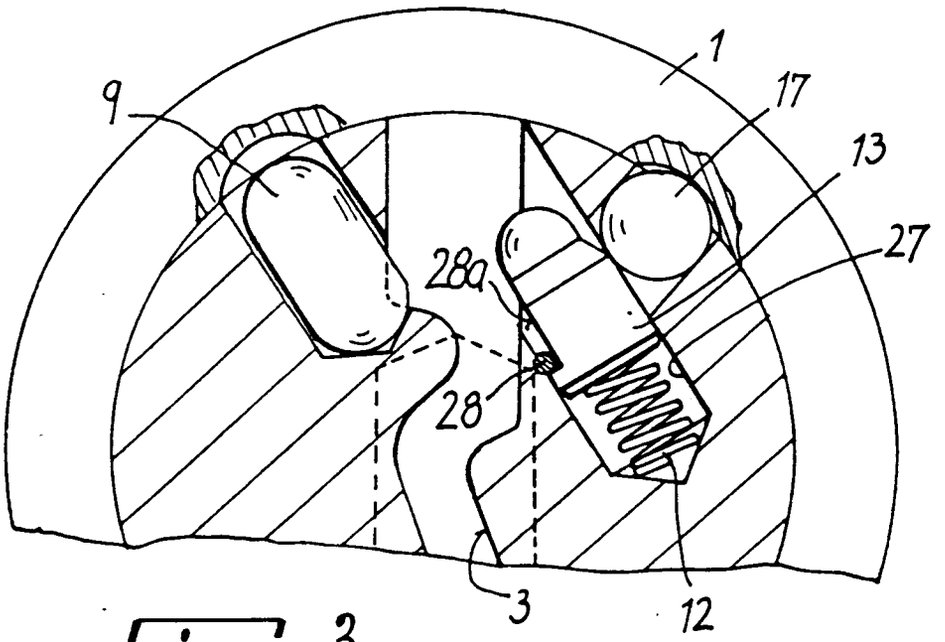

Fig. 3

Fig. 4