

(19)



(11)

EP 2 943 629 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

11.01.2017 Bulletin 2017/02

(51) Int Cl.:

E05B 17/20 ^(2006.01)

E05B 63/14 ^(2006.01)

(86) International application number:

PCT/IB2013/002853

(21) Application number: **13824342.3**

(22) Date of filing: **23.12.2013**

(87) International publication number:

WO 2014/108725 (17.07.2014 Gazette 2014/29)

(54) **SECURITY LOCK FOR ARMOURED DOORS AND FRONT DOORS**

SICHERHEITSSCHLOSS FÜR GEPANZERTE TÜREN UND HAUSTÜREN

SERRURE DE SÉCURITÉ POUR PORTES BLINDÉES ET PORTES D'ENTRÉE

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME

(72) Inventor: **CHIARO, Luigi**

I-80125 Napoli (IT)

(74) Representative: **Cirillo, Gennaro**

Brevetti Ing. Cirillo G. & C. SAS
Via Santa Lucia 15
80132 Napoli (IT)

(30) Priority: **10.01.2013 IT NA20130001**

(43) Date of publication of application:

18.11.2015 Bulletin 2015/47

(56) References cited:

EP-A1- 2 278 100 CH-A5- 677 517

FR-A1- 2 841 927

(73) Proprietor: **CHIARO, Luigi**

I-80125 Napoli (IT)

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 2 943 629 B1

Description

[0001] This invention concerns a security lock which can be used particularly on armoured doors and front doors.

[0002] The lock as per the invention is equipped with a special anti-burglary mechanism, in other words, it is able to resist even the most advanced break-in attempts using the insertion of counterfeit and appropriately modified universal keys.

[0003] More precisely, the lock as per the invention is equipped with a safety system which, in the event that it is forced with counterfeit and appropriately modified keys, intervenes with a series of auxiliary security cylinders, ejecting when the main cylinders are forced back.

[0004] In comparison to the traditional solutions, the lock as per the invention demonstrates the advantage of intervening with an auxiliary blocking device in cases where the main blocking device is forced open.

[0005] The object of this invention is inserted in the field of safety locks applicable to armoured doors, and more generally in the field of safety and anti-burglary devices.

[0006] As noted in the state of the art, armoured doors and front doors are usually equipped with safety locks that generally use keys to open, the shape of which changes based on the type of lock keyhole it is inserted in.

[0007] The locks of armoured doors must resist break-in attempts, and those equipped with a European profile cylinder lock particularly must have a protective defender on said cylinder, installed as close to the door as possible, better if cone-shaped, and the cylinder must also have anti-drill and anti-tear features.

[0008] The classic double-bit locks are among the most used in armoured front doors, and include a central deadbolt consisting of several sliding cylinders which fit into the slots created in the fixed part, allowing the blocking of the mobile part. To further increase the protection of the armoured door, vertical deadbolts are used.

[0009] The double-bit lock is also called a lever or wafer lock, with plates or gorges, or defined as "armoured" or "security lock".

[0010] The deadbolt or deadlock is moved by the key, the key is bound by the plates, bittings, levers or wafers. The height of the bittings of the key allows the grooves of the plates to align so the cam can go through said plates in order for the key to rotate and the bolt to retract.

[0011] Please note that double bit locks for armoured doors almost always have the same even and odd key turns. A "Key turn" means a 180° rotation of the key and the relative sliding of the carriage or deadlock.

[0012] Therefore with the way that locks have been conceived thus far, with the insertion of a specific key the deadbolt is pushed back allowing the door to open, since the key is a mechanical object that is inserted in the lock's mechanism thus completing it and initiating the sliding action of the deadlock by freeing the binds that were formed.

[0013] One of the most diffused techniques for forcing armoured locks is using a pry-bar or crowbar, with which you move the plates in order to insert the grooves of the plates in correspondence with the cam. This method leads to a remarkably easy implementation of the tools, using concepts and operations available to all, with the only disadvantage that the opening execution may be slow since you need to perform the entire opening manipulation for all 2 or 4 key turns; furthermore, the result of forcing it open is tied to the efficiency and speed of the execution, linked to dexterity and training.

[0014] Nevertheless, bad guys who want to force a traditional lock tend to use break-in tools that allow them to achieve the objective, and in any case a bad guy who has access to specific equipment and the time available can open any type of door with any type of lock and with any degree of security.

[0015] Some examples of well-known locks are those described in documents EP2278100, or FR2841927, or even CH677517, and they are traditional type locks which have the aforementioned drawbacks.

[0016] The purpose of this invention is to create a security lock that can withhold break-in attempts and even attempts where the main deadbolt is forced open.

[0017] In fact, in accordance with the invention, in the event that the bad guys manage to force open the main deadbolt an auxiliary safety deadbolt will intervene, which is activated by the same key that pushes back said main deadbolt.

[0018] This way the lock becomes absolutely ironclad, guaranteeing the utmost endurance of the components even against the most advanced break-in attempts.

[0019] Therefore, the lock according to the invention uses a pair of independent deadbolts, one of which consists of the main deadbolt and is used for the regular opening and closing of the door, while the other consists of an emergency auxiliary deadbolt that intervenes in cases where the main deadbolt is forcefully pushed back by a non-original key.

[0020] Further features and details of the invention may be better understood by the description below, given by way of example and not of limitation, as well as by the attached table of drawings, in which:

- figure 1 represents the overall axonometric schematic view of the lock according to the invention with the main deadbolt in the outward position;
- figure 2 is the overall schematic view of the lock according to the invention with the auxiliary deadbolt in the outward position;
- figure 3 illustrates the schematic view of the security lock according to the invention with both deadbolts pulled back and in the open door position;
- figure 4 shows the exploded schematic and axonometric view of the inner part of the key activating device;
- figure 5 represents the overall schematic frontal point of view of the lock according to the invention.

[0021] With reference to the figures attached, 10 indicates the overall lock according to the invention, which substantially consists of an armoured housing box 11, where there are mechanical parts that engage the slots created in the fixed part and that allow the blocking of the mobile part.

[0022] More precisely, inside the armoured housing box 11, there is the first horizontal sliding carriage 12 with the locking cylinders 13 fixed on its exterior, and a second carriage 14 also sliding horizontally with the auxiliary locking cylinders 15 fixed on its exterior.

[0023] The upper carriage 12 and the lower carriage 14 are arranged respectively above and below the central control cylinder 16 which includes the parts determining the horizontal movement of the two carriages.

[0024] In fact, both the upper carriage 12 and the lower carriage 14 have serrated edges, indicated respectively with 17 and 18, on which the serrated gears 19 and 20 operate, forming part of the central control unit 16.

[0025] The upper carriage 12 has a counter-force spring 21 that keeps it in an outward pushed position.

[0026] As seen in figure 4, the control unit 16 substantially consists of a central plug 22 which includes said first serrated gear 19, and on this central plug 22 there is a second coaxial plug 23 attached that bears a second serrated gear 24, which faces gear 19.

[0027] The central plug 22 is inserted in a blocking unit 25 attached to a bracket 26, upon which the carriages 12 and 14 slide horizontally.

[0028] The central plug 22 along with the respective gear 19 operates on the main carriage 12, while the coaxial plug 23 along with the respective gear 24 operates on the auxiliary security carriage 14.

[0029] As seen in figure 2, the main carriage 12 and the auxiliary security carriage 14 are kept in pre-established positions with the use of screws 28 and 29 which, using the thrust of the springs 30, push the respective ball bearings 31 in one of the holes 32 created on each of the carriages.

[0030] Figure 2 also illustrates the use of a sensor 33 which determines the control of any electronic blocking accessories supplied.

[0031] According to the invention, as seen in figure 4, the keys for opening and closing the lock are different; more precisely there is a key 33 with a certain bitting that opens from the outside of the residence and another key 34 with a different bitting than the previously described which opens from the inside of the residence.

[0032] Please note that in order to obtain the release of the carriage 12 in order to close the door, both from the outside as well as from the inside, you must insert one of the two keys 33 and 34 in the lock unit.

[0033] From an operational point of view the lock device described allows, through the regular insertion of a key, for the central plug 22 to determine the rotation of the gear 19 thus sliding the carriage 12, which determines the insertion or extraction of the cylinders 13 in the holes of the fixed structure.

[0034] In the event of an attempt to force the lock, for example through the use of counterfeit keys, plug 22 binds to plug 23 and it is in this situation that the upper carriage 12 is pushed back while the lower carriage 14 moves forward thus blocking itself in the hole of the fixed part, preventing the door from opening.

[0035] The invention was previously described with reference to one of its preferential embodiments, but it is clearly susceptible to numerous variations which fall within its scope in the framework of technical equivalents.

Claims

1. A security lock substantially consisting of an armoured housing box (11) where there are mechanical parts engaging the slots created in the fixed part allowing the mobile part to be blocked, **characterized in that** inside the armoured housing box (11) there is the first horizontal sliding carriage (12), with the locking cylinders (13) fixed on its exterior, and a second carriage (14), also sliding horizontally, with the auxiliary locking cylinders (15) fixed on its exterior; and **in that** said first and second carriages (12, 14) are activated by a central unit (16) that includes independent plugs (22, 23), each of which bears independent serrated gears (19, 24) that operate on the teeth (17, 18) of these same carriages wherein in the event of an attempt to force the lock through the use of counterfeit keys, the two plugs (22, 23) bind and the upper carriage (12) is pushed back while the lower carriage (14) moves forward.
2. The security lock according to the foregoing claim, **characterised in that** the upper carriage (12) and the lower carriage (14) are arranged respectively above and below the central control cylinder (16) which includes the parts that determine the horizontal movement of the two carriages.
3. The security lock according to either of the foregoing claims, **characterised in that** both the upper carriage (12) and the lower carriage (14) are equipped with serrated edges, indicated respectively with (17, 18), on which the serrated gears (19, 20) that are part of the central control unit (16) operate.
4. The security lock according to either of the foregoing claims, **characterised in that** the upper carriage (12) is equipped with a counter-force spring (21) that keeps it in the outward pushed position.
5. The security lock according to either of the foregoing claims, **characterised in that** the control unit (16) substantially consists of a central plug (22) which includes said first serrated gear (19), and on this central plug (22) there is a second coaxial plug (23) attached that bears a second serrated gear (24), which

faces gear (19).

6. The security lock according to either of the foregoing claims, **characterised in that** the central plug (22) is inserted in a blocking unit (25) attached to a bracket (26), upon which the carriages (12, 14) slide horizontally.
7. The security lock according to either of the foregoing claims, **characterised in that** the central plug (22) along with the respective gear (19) operates on the main carriage (12), while the coaxial plug (23) along with the respective gear (24) operates on the auxiliary security carriage (14).
8. The security lock according to either of the foregoing claims, **characterised in that** the main carriage (12) and the auxiliary security carriage (14) are kept in pre-established positions with the use of screws (28, 29) which, using the thrust of the springs (30), push the respective ball bearings (31) in one of the holes (32) created on each of the carriages.
9. The security lock according to either of the foregoing claims, **characterised in that** the keys for opening and closing the lock are different; more precisely there is a key (33) with a certain bitting that opens from the outside of the residence and another key (34) with a different bitting than the previously described which opens from the inside of the residence, and by the fact that in order to obtain the release of the carriage (12) in order to close the door, both from the outside as well as from the inside, you must insert one of the two keys (33, 34) in the lock unit.
10. The security lock according to either of the foregoing claims, **characterised by** the use of a sensor (33) which determines the control of any electronic blocking accessories supplied.

Patentansprüche

1. Sicherheitsschloss, im wesentlichen aus einem gepanzerten Aufnahmekasten (11) bestehend, bei dem mechanische Teile vorhanden sind, die mit Schlitten im Eingriff stehen, die im feststehenden Teil derart ausgebildet sind, dass das bewegliche Teil verriegelt werden kann, **dadurch gekennzeichnet, dass** innerhalb des gepanzerten Aufnahmekastens (11) der erste horizontale Schlitten (12) angeordnet ist, mit am äußeren Teil befestigten Schließzylindern, und ein zweiter Schlitten (14), der auch horizontal verschiebbar ist, mit den Hilfschließzylindern (15) verbunden ist, die an seinem Außenteil befestigt sind, und dass die besagten ersten und zweiten Schlitten (12, 14) von einer Zentraleinheit (16) betätigt werden, die unabhängige Zap-

fen (22, 23) umfasst, von denen jede unabhängige gezahnte Zahnräder (19, 24) trägt, die auf den Zähnen (17, 18) derselben Schlitten wirken, wobei im Falle eines Versuchs, das Schloss mit der Verwendung von gefälschten Schlüsseln aufzubrechen, vereinigen sich die beiden Zapfen (22, 23) und der obere Schlitten (12) zurückgeschoben wird, während der untere Schlitten (14) nach vorne bewegt wird.

2. Sicherheitsschloss nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** der obere Schlitten (12) und der untere Schlitten (14) jeweils oberhalb und unterhalb des zentralen Steuerzylinders (16) angeordnet sind, der die Teile umfasst, die die horizontale Bewegung der beiden Schlitten bestimmen.
3. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** sowohl der obere Schlitten (12) als der untere Schlitten (14) mit gezackten Kanten versehen sind, die jeweils mit (17, 18) bezeichnet sind und auf denen die gezackten Zahnräder (19, 20) wirken, die Bestandteile der zentralen Steuereinheit (16) sind.
4. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** der obere Schlitten (12) mit einer Feder (21) versehen ist, die eine Rückstellkraft übt, die sie in der Position nach außen gedrückt hält.
5. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** die Steuereinheit (16) im wesentlichen aus einem zentralen Zapfen (22) besteht, der das besagte erste gezackte Zahnrad (19) aufweist, und auf diesem zentralen Zapfen (22) ein zweiter zentraler Zapfen vorhanden ist, der ein zweites gezacktes Zahnrad (24) stützt, das dem Zahnrad (19) zugewandt ist.
6. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** der zentrale Zapfen (22) in eine Verriegelungseinheit (25) eingeführt wird, die mit einem Bügel (26) befestigt ist, auf dem die Schlitten (12, 14) in einer horizontalen Richtung gleiten.
7. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** der zentrale Zapfen (22) zusammen mit dem jeweiligen Zahnrad (19) auf dem Hauptschlitten (12) wirkt, während der koaxiale Zapfen (23) zusammen mit dem jeweiligen Zahnrad (24) auf dem Sicherheitsschlitten (14) wirkt.
8. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** der Hauptschlitten (12) und der Sicherheitshilfsschlitten

(14) in vorbestimmten Positionen mit der Verwendung von Schrauben (28, 29) gehalten sind, die durch den Schub der Federn (30), die jeweiligen Kugellager (31) in eine der auf jedem Schlitten erzeugten Bohrungen (32), drücken.

9. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **dadurch gekennzeichnet, dass** die zum Öffnen und Schließen des Schlosses verwendeten Schlüssel unterschiedlich sind; genauer gesagt, ist ein Schlüssel (33) mit einer gewissen Verzahnung vorhanden, der von der Außenseite des Wohnsitzes und hat ein anderer Schlüssel (34) eine verschiedene Verzahnung als die zuvor beschriebene, die aus dem Inneren des Wohnsitzes öffnet, und dass um die Freigabe des Schlittens (12) zum Schließen der Tür zu erhalten, sowohl von außen als auch von innen, einer der beiden Schlüssel (33, 34) in die Schlosseinheit eingeführt werden soll.
10. Sicherheitsschloss nach einem der vorhergehenden Ansprüchen, **gekennzeichnet durch** die Verwendung eines Sensors (33), der die Steuerung von jedem gelieferten elektronischen Schließzubehörs bestimmt.

Revendications

1. Verrouillage de sécurité constitué essentiellement d'un boîtier de logement blindé (11), dans lequel des pièces mécaniques sont couplées aux fentes formées dans la partie fixe, permettant à la partie mobile d'être verrouillée, **caractérisé en ce que**, dans l'intérieur du boîtier de logement blindé (11) le premier chariot coulissant horizontal (12) est logé, avec les cylindres de verrouillage (13) fixés sur sa partie extérieure, et un second chariot (14) est également coulissant en horizontal, avec les cylindres de verrouillage auxiliaires (15) fixés sur sa partie extérieure, et **en ce que** lesdits premier et second chariot (12, 14) sont activés par une unité centrale (16) qui comprend des bouchons indépendants (22, 23), dont chacun porte des engrenages avec des dents de scie (19, 24) indépendants qui agissent sur les dents (17, 18) de ces mêmes chariots, dans lequel dans le cas d'une tentative de forcer le verrouillage avec l'utilisation de clés de contrefaçon, les deux bouchons (22, 23) se réunissent et le chariot supérieur (12) est repoussé tandis que le chariot inférieur (14) se déplace vers l'avant.
2. Verrouillage de sécurité selon la revendication précédente, **caractérisé en ce que** le chariot supérieur (12) et le chariot inférieur (14) sont disposés respectivement au-dessus et au-dessous du cylindre de commande centrale (16) qui comprend les parties qui déterminent le mouvement horizontal des deux

chariots.

3. Verrouillage de sécurité selon l'une quelconque des revendications précédentes, **caractérisé en ce que** soit le chariot supérieur (12) que le chariot inférieur (14) sont pourvus de bords en forme de dents de scie, respectivement indiqués par (17, 18), sur lesquels les engrenages en forme de dents de scie (19, 20) agissent, faisant partie de l'unité centrale de commande (16).
4. Verrouillage de sécurité selon l'une quelconque des précédentes revendications **caractérisé en ce que** le chariot supérieur (12) est muni d'un ressort (21) avec une force de rappel antagoniste, qui le maintient dans la position poussée vers l'extérieur.
5. Verrouillage de sécurité selon l'une quelconque des précédentes revendications, **caractérisé en ce que** l'unité de commande (16) est constituée essentiellement d'un bouchon central (22) qui comprend ledit premier engrenage en forme de dents de scie (19), et sur ce bouchon central (22) se trouve un second bouchon coaxial (23) fixé, qui supporte un second engrenage en forme de dents de scie (24), qui est tourné vers l'engrenage (19).
6. Verrouillage de sécurité selon l'une quelconque des précédentes revendications, caractérisé en ce que le bouchon central (22) est inséré dans une unité de verrouillage (25) fixée à un support (26) sur lequel les chariots (12, 14) sont coulissants dans une direction horizontale.
7. Verrouillage de sécurité selon l'une quelconque des précédentes revendications, **caractérisé en ce que** le bouchon central (22) agit le long de l'engrenage respectif (19) sur le chariot principal (12), tandis que le bouchon coaxial (23) agit le long de l'engrenage respectif (24) sur le chariot de sécurité (14) auxiliaire.
8. Verrouillage de sécurité selon l'une quelconque des précédentes revendications, **caractérisé en ce que** le chariot principal (12) et le chariot de sécurité (14) auxiliaire sont tenus dans des positions prédéterminées par l'utilisation de vis (28, 29), qui en utilisant la poussée des ressorts (30) poussent les roulements à billes respectifs (31) dans l'un des trous (32) formés sur chacun des chariots.
9. Verrouillage de sécurité selon l'une quelconque des précédentes revendications, caractérisé en ce que les clés pour ouvrir et fermer le verrouillage sont différentes; plus précisément, il y a une clé (33) avec une denture déterminée qui débouche à l'extérieur de la résidence et une autre clé (34) avec une denture différente de celle décrite précédemment, qui débouche de l'intérieur de la résidence, et en ce que

pour obtenir la libération du chariot (12) à fin de fermer la porte, à la fois de l'extérieur et également de l'intérieur, il faut insérer une des deux clés (22, 24) dans le verrouillage.

5

10. Verrouillage de sécurité selon l'une quelconque des revendications précédentes, **caractérisé par** l'utilisation d'un capteur (33) qui détermine la commande de chaque accessoire de verrouillage électronique fourni.

10

15

20

25

30

35

40

45

50

55

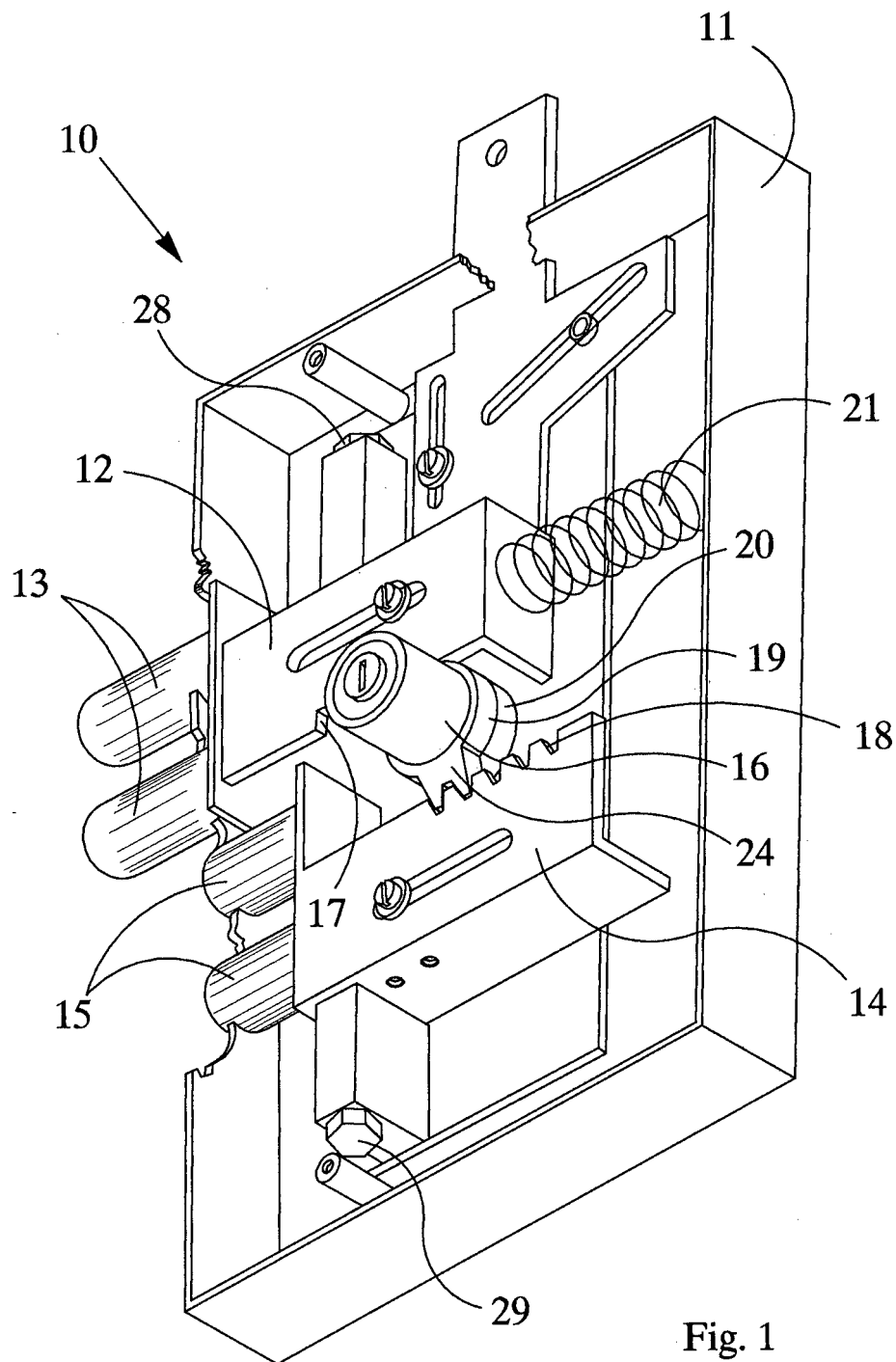


Fig. 1

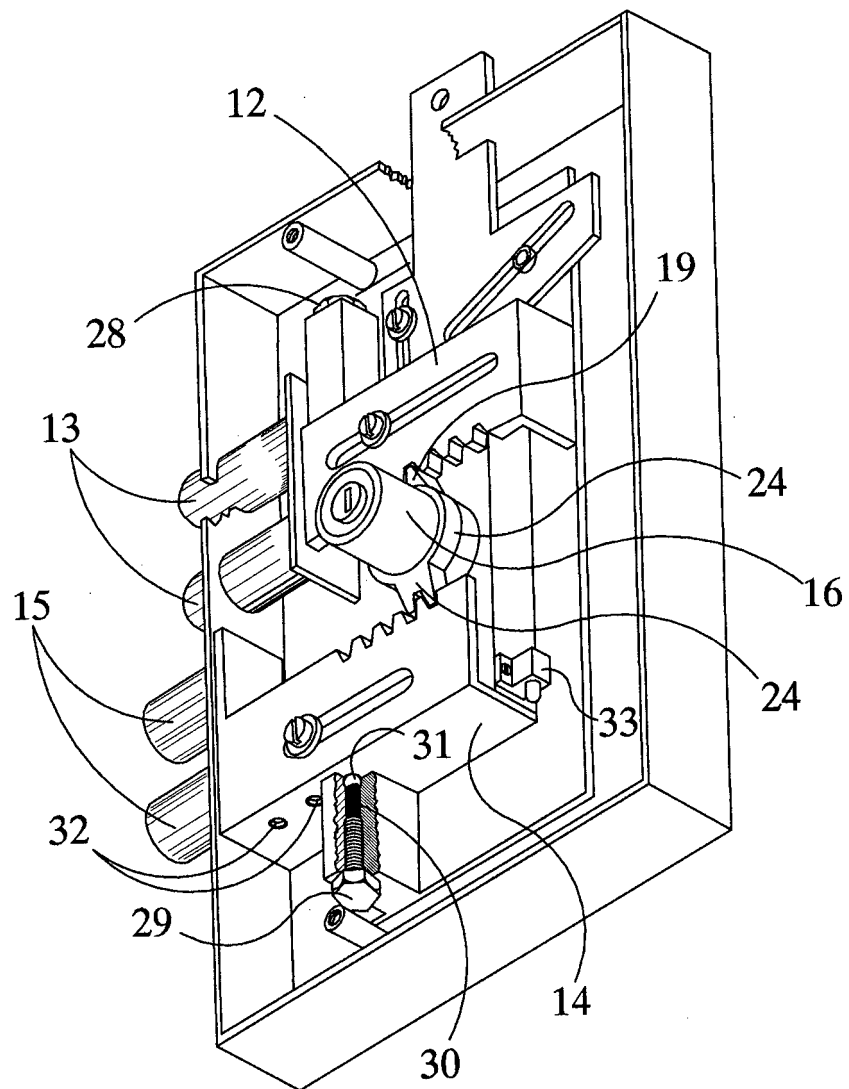


Fig. 2

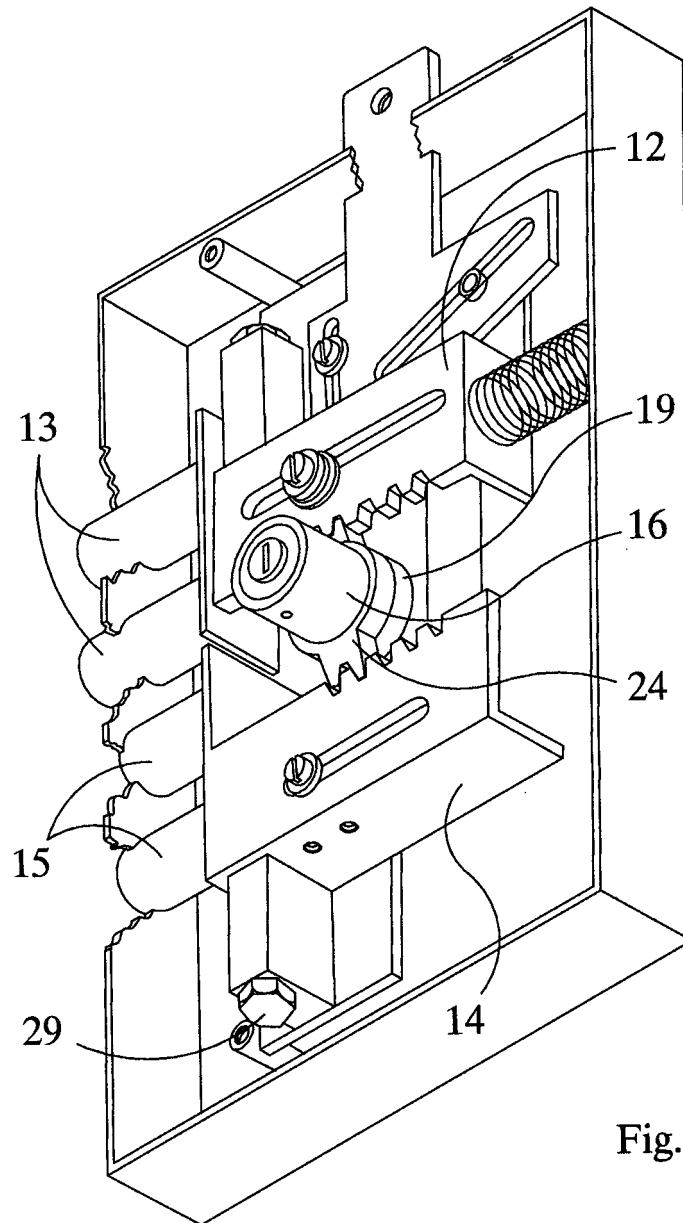


Fig. 3

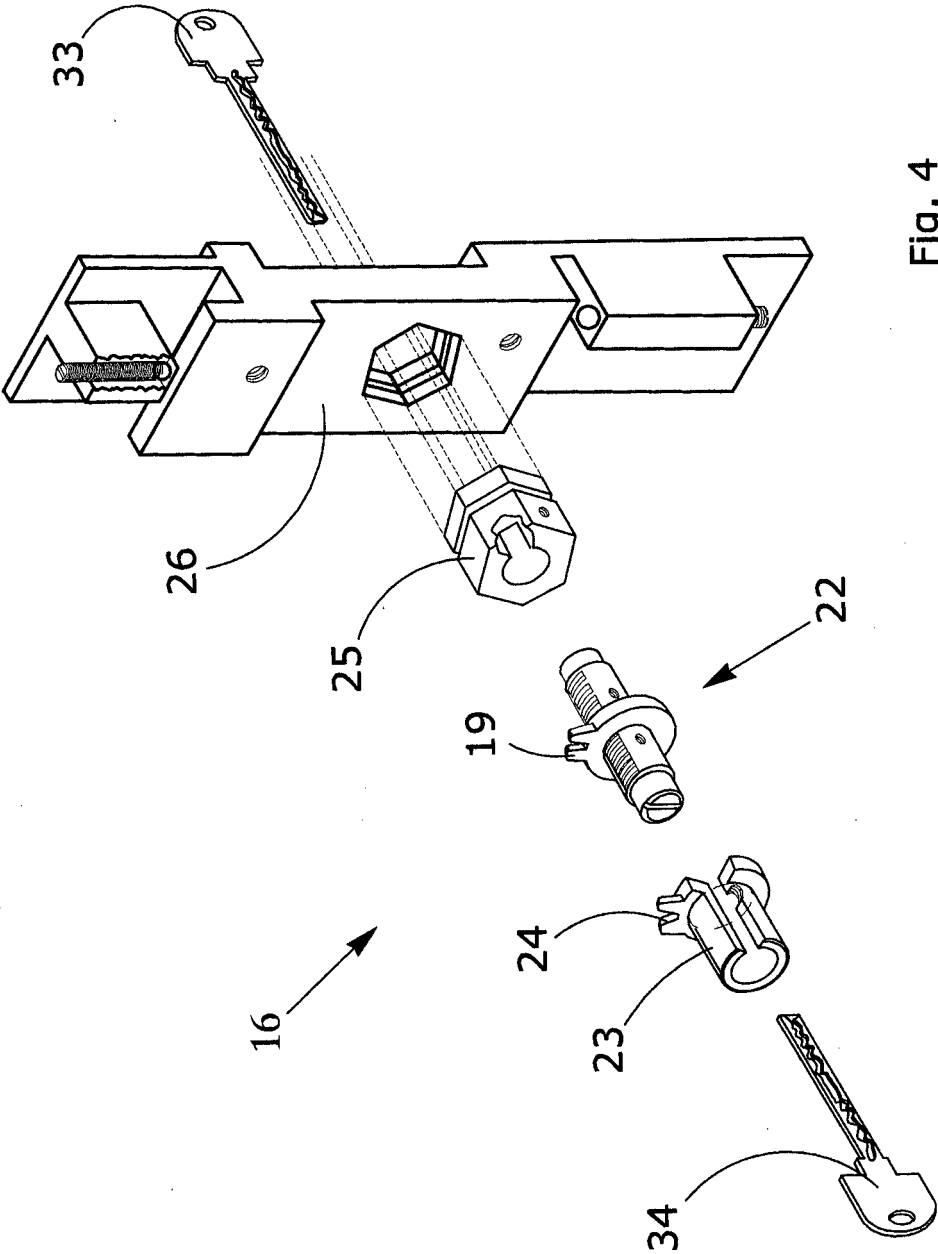


Fig. 4

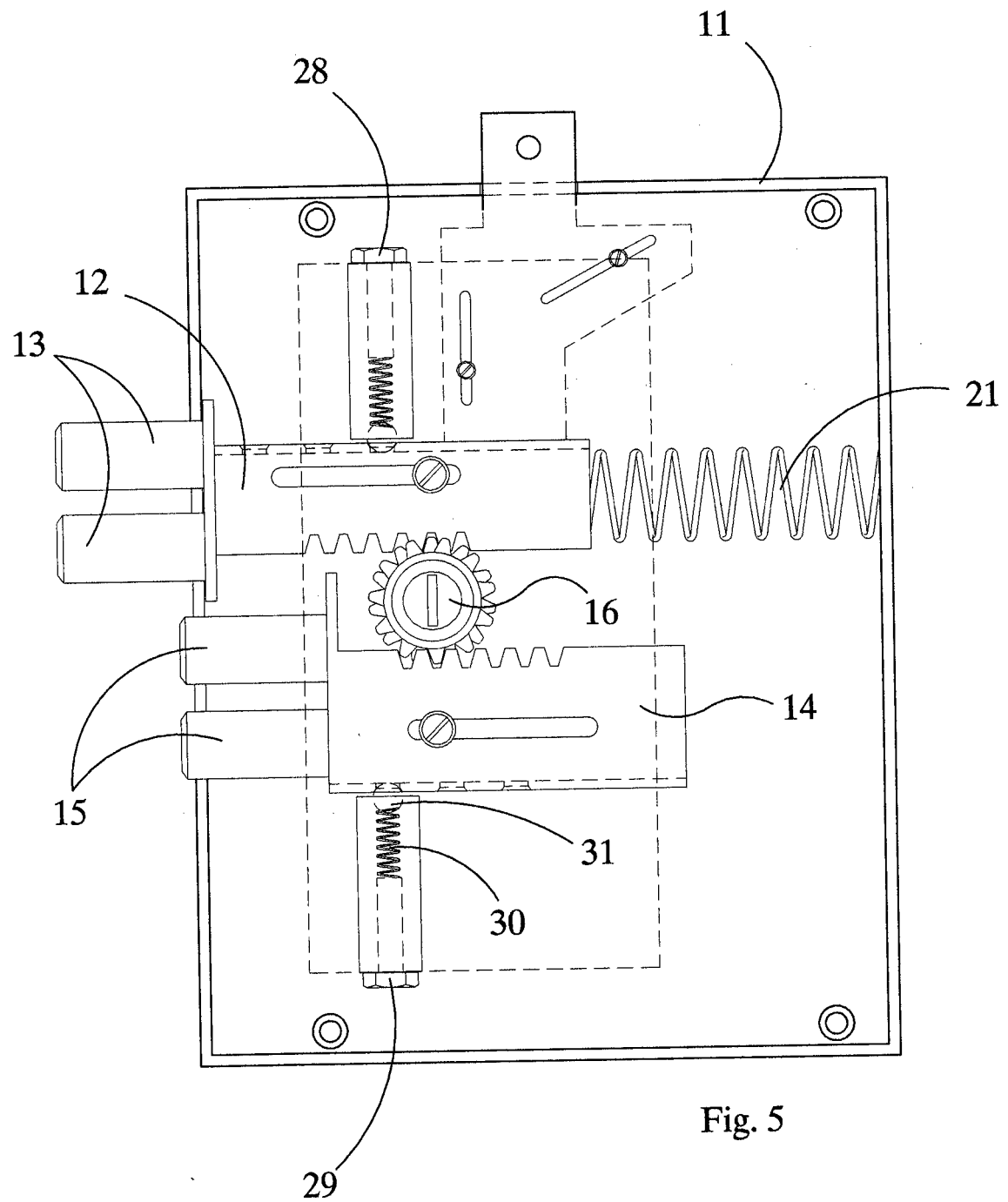


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 2278100 A [0015]
- FR 2841927 [0015]
- CH 677517 [0015]