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(54) **SAFETY LOCK WITH HIGH FLEXIBILITY OF USE**

SICHERHEITSSCHLOSS MIT HOHER VERWENDUNGSFLEXIBILITÄT

VERROU DE SÛRETÉ À GRANDE SOUPLESSE D'UTILISATION

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Description

[0001] The present invention refers, to a safety lock with high flexibility of use, with use in general for doors, gates, safes etc.

[0002] Bitted locks are known comprising, inside a stiff box casing, a bolt with horizontal movement borne by a support plate, to which a plurality of retainer plates or gorges is associated, with movement orthogonal to the bolt or with oscillating movement.

[0003] The retainer plates have serrated windows defining notches of differentiated passage whose alignment opens a passage for a retainer element or Mentonnet fixed to the support plate.

[0004] Such locks are driven by a key with a suitable coding profile, which can be of single or double bit type: the rotation of the key collimates the notches of the retainer plates and opens the passage for the retainer element.

[0005] Notwithstanding the high level of safety of such locks, when they are installed in buildings still under construction, it may be necessary to provide a key to personnel employed in the working yard so to permit their access to the building.

[0006] To avoid a fraudulent use of the lock, temporary or building yard keys are foreseen which differ from the main or proprietor keys which will be used by the user after the building yard closes, due to the fact that the temporary keys can only partially operate the lock, for example only with only half-turn for the opening of the spring latch or with two turns in the case of four-turn locks.

[0007] In these situations, there remains the risk of fraudulent use of the lock each time the final user only partially closes it.

[0008] Safety locks have therefore been introduced on the market in which the coding operation foresees the substitution of the pack of retainer plates, which leads to the use of particular tools which are so complex that only specialised personnel can carry out the operation with the aid of a detailed instructions manual.

[0009] Other safety locks are known on the market which permit the recoding without the need to substitute parts of the mechanism inside the box casing of the lock itself.

[0010] In the latter locks, in general, it is not possible to reuse the disabled keys, or it is possible to reuse them only through the use of a specific restoration key.

[0011] A safety lock is known from document EP 0 943 761 A. The coding of this lock can be changed by a tool. An other safety lock is known from document WO 2007/072525 A (date of publication 28 June 2007).

[0012] The technical task proposed by the present invention is therefore that of making a safety lock with a high flexibility of use which permits eliminating the lamented technical drawbacks of the prior art.

[0013] In the scope of this technical task, one object of the invention is that of making a safety lock with high flexibility of use which is recodable in an automatic, ex-

tremely simple and quick manner.

[0014] Another object of the invention is that of making a safety lock with high flexibility of use which has more than one and preferably more than two distinct codes which can be attained in a completely automatic manner.

[0015] Not the least object of the invention is that of making a safety lock which is structurally simple and economical as well as functionally efficient.

[0016] The technical task, as well as these and other objects are achieved according to the present invention by making a safety lock in accordance with claim 1.

[0017] The safety lock of the present invention can be recoded in an entirely automatic manner on any one design coding, chosen as desired.

[0018] The receding is carried out directly by the key inserted for the first time in the lock, which is automatically self-enabled, automatically disabling every key which had been previously used for the execution of any function.

[0019] The recoding operation is extremely simple and quick and all keys of the lock can be directly tested by the builder.

[0020] Or, the lock can also be restored for the reuse of the previously disabled keys.

[0021] Other characteristics of the present invention are defined, moreover, in the subsequent claims.

[0022] Further characteristics and advantages of the invention will be more evident from the description of a preferred but not exclusive embodiment of the safety lock according to the finding, illustrated as indicative and non-limiting in the enclosed drawings, wherein:

Figure 1 shows a side elevation view of the safety lock in accordance with a preferred mode of achieving the invention, with the recoding element in its initial size and in unlocked position of the lock, with the bolt retracted;

Figure 2 shows a side elevation view of the safety lock of figure 1, with the recoding element in its intermediate size and in unlocked position of the lock, with the bolt retracted;

Figure 3 shows a side elevation view of the safety lock of figure 1, with the recoding element in its final size and in unlocked position of the lock, with the bolt retracted;

Figure 4 shows a side elevation view of the safety lock of figure 1, with the recoding element in its initial size and in locked position of the lock, with the bolt retracted;

Figure 5 shows a side elevation view of the safety lock of figure 1, with the recoding element in its initial size and in locked position of the lock, and with the bolt extracted with two turns;

Figure 6 shows a side elevation view of the safety lock of figure 1 with the recoding element in its initial size and in locked position of the lock, and with the bolt extracted with four turns;

Figure 7 shows a perspective view of the safety lock of figure 1 with the recoding element in its initial size and in unlocked position of the lock, and with the bolt retracted;

Figure 8 shows a side elevation view of the safety lock of figure 1 with the recoding element in its intermediate size and in locked position of the lock, and with the bolt retracted;

Figure 9 shows a perspective view of the safety lock of figure 1 with the recoding element in its intermediate size and in locked position of the lock, and with the bolt retracted;

Figure 10 shows a side elevation view of the safety lock of figure 1 with the recoding element in its final size and in locked position of the lock, and with the bolt retracted;

Figure 11 shows a perspective view of the safety lock of figure 1 with the recoding element in its final size and in locked position of the lock, with the bolt retracted;

Figure 12 shows an exploded perspective view of the safety lock of figure 1, from which the cover of the box casing has been removed;

Figure 13 is an exploded perspective view of the recoding element of the safety lock of figure 1; and

Figure 14 shows the three keys of the safety lock of figure 1.

[0023] With reference to the mentioned figures, a safety lock is indicated overall with the reference number 1.

[0024] The safety lock 1 is of four-turn type and has three driving keys 2a, 2b and 2c of double bitted type.

[0025] The lock 1 comprises a stiff box casing 3 at whose interior a latch 4 and a bolt 5 are kinematically associated.

[0026] The bolt 5 in particular is borne by a support plate 6 which is horizontally movable between a retraction position of the bolt 5 inside the box casing 3 for the opening of the lock, a partially extracted position corresponding to the closing of the lock with two turns, and a completely extracted position corresponding with the closing of the lock with four turns.

[0027] The support plate 6 is superimposed by a pack of retainer plates or gorges 7, of which, as shall be seen, one is special, indicated with 7'.

[0028] Every retaining plate 7 and 7', respectively, is

vertically movable and has a serrated windows 8 and 8' respectively defining passage notches 9 and 9', respectively, corresponding to the coding of the keys 2a, 2b and 2c.

[0029] The notches 9' of the special retaining plate 7' are in particular all equivalent.

[0030] A retaining element 10 or Mentonnet is fixed to the support plate 6 of the bolt 5, and is positioned inside the windows 8, 8'.

[0031] Each key 2a, 2b, 2c in use is capable of collimating the teeth of the windows 8, 8' so to open a passage corridor for the retaining element 10.

[0032] Every retaining plate 7, 7' has five notches which are subdivided into notches X for the driving of the second and fourth turn and the latch 4 and notches Y for the driving of the first and third turn of the bolt 5.

[0033] Every key 2a, 2b, 2c has two different bits, one corresponding to the notches X and one corresponding to the notches Y and each bit has six cuts, one for each retainer plate 7, 7', for a total of twelve notches cuts named with the letters A-L, as shown in figure 14.

[0034] The two bits are repeated, rotated 180° with respect to the centre of the key, since the retainer plates are positioned asymmetrically inside the box casing 3.

[0035] The central zone 50 of each key is not coded and serves for the horizontal drive of the support plate 6 of the bolt 5.

In particular, it must be noted that the bits of the keys 2a, 2b and 2c differ from each other only for the cut which drives the special retainer plate 7' and in particular for the cut B, which progressively increases its code radius from the key 2a to the key 2c, and for the cut K which progressively increases its code radius from the key 2a to the key 2c.

[0036] The lock 1 advantageously comprises a variable size recoding element 11 having a succession of sizes, in the current case three identified in the figures from the reference k0, k1 and k2 which is selectively aligned with the notch 100.

[0037] Each size of the recoding element 11 enables a corresponding key 2a, 2b, 2c and disables every key enabled by every other preceding size of the recoding element 11.

[0038] In the particular current case, the recoding element 11 in the initial size k0 enables the key 2a, in the intermediate size k1 enables the key 2b and disables the key 2a, and in the final size k2 enables the key 2c and disables both the key 2a and the key 2b.

[0039] The coding element 11 is supported by an additional plate 70 which is tightly bound to the stiff box casing 3 and has a slot 71 crossed by the retainer element 10.

[0040] Each key 2a, 2b, 2c has its own control means of the recoding element 11 adapted to automatically restore it into the size which enables it when the recoding element 11 is found in a size preceding that which enables it.

[0041] The control means present in each key 2a, 2b and 2c consist of corresponding cuts B and K which drive

the special retainer plate 7'.

[0042] The recoding element 11 has an additional retainer element 12 and is movable, in particular vertically movable, between a locking position in which the additional retainer element 12 locks the lock 1 and an unlocking position in which the additional retainer element unlocks the lock 1.

[0043] The recoding element 11 can be driven indirectly by the control means present in each key 2a, 2b, 2c, in the current case by means of a movement grip tab 13, projecting from the special retainer plate 7' and adapted to interfere with a foot 14 of the recoding element 11, or in a different embodiment by means of a movement transmission lever interposed between the recoding element 11 and the control means present in each key 2a, 2b, 2c.

[0044] Naturally, it is also conceivable, in a different embodiment of the present invention, that the recoding element 11 can be driven directly by the control means present in each key 2a, 2b, 2c.

[0045] The recoding element 11 comprises at least two components having a mechanical coupling of telescopic type, capable of varying the overall length of the recoding element 11, optionally permitting, as shall be seen, the possibility of restoring a size preceding the current size.

[0046] In a different embodiment of the present finding, the recoding element can be of friction type (with at least two components which are coupled with each other with a certain friction which permits them to keep their given size) or of plastic deformation type (a single plastically deformable component), the latter type leading to a structural simplification which however does not make possible the restoration of the recoding element into a preceding size thereof, the plastic deformation being irreversible.

[0047] In the particular case, the recoding element comprises a first longitudinal element 15 and a second longitudinal element 16 substantially parallel and slidably coupled along a sliding axis 18 parallel to their longitudinal axis.

[0048] The first and second longitudinal elements 15 and 16 have reciprocal setting means in a succession of positions along their sliding axis 18.

[0049] The setting means comprise a tooth 17 which can be selectively and elastically inserted in a seat of a plurality of seats of matching form to the tooth 17 and arranged in succession along the sliding axis 18.

[0050] The seats are indicated with the symbol k0, k1 and k2, every size of the recoding element 11 corresponding with the coupling of the tooth 17 in one of these.

[0051] The first longitudinal element 15 has a longitudinal hollow space 19 for guiding the sliding of the second longitudinal element 16 along the sliding axis 18.

[0052] The hollow space 19 is open at its side, through which the second longitudinal element 16 is inserted.

[0053] The recoding element 11 has at its apex a transverse extension 24 at whose end the additional retainer element 12 is positioned.

[0054] In particular, the transverse extension 24 is

made in a single piece with the first longitudinal element 15.

[0055] The grip foot 14 of the lifting force of the recoding element 11 is instead made of a single piece with the second longitudinal element 16.

[0056] The lock 1 then has a return spring 25 of the recoding element 11, towards the lowered position in which the additional retainer element 12 locks the support plate 6.

[0057] The return spring 25 has a spiral part positioned in a seat 26 made in the transverse extension 24, an arm 40 associated with a fixed part 41 of the lock 1 and an arm 27 adapted to elastically oppose the lifting of the recoding element 11.

[0058] The additional retainer element 12 is positioned in a slot 28 of the support plate 6.

[0059] The slot 28 has, on its lower profile, a plurality of coupling seats 29 of the additional retainer element 12 for locking the support plate 6, and on its upper profile, one or more cams 30 opposing the lifting of the additional retainer element 12.

[0060] In particular, there is a cam 30 for every position: initial (in the closing sense), intermediate (in the closing and opening sense) and final (in the opening sense). In this manner, one obtains the recoding in any possible position and/or drive direction.

[0061] In the solution illustrated for locking the lock 1, the additional retainer element 12 is capable of exerting a locking action of the support plate 6 of the bolt, but in a different embodiment in accordance with the present invention the additional retainer element 12 can be capable of directly or indirectly preventing the movement of other movable parts of the lock 1, for example one or more retainer plates or even the same drive keys.

[0062] Preferably, as illustrated, the lock 1 has restoration means of the recoding element 11 into any one of its preceding sizes.

[0063] The restoration means comprise at least one grip 31 for a reset tool (not shown), made on the surface of the recoding element 11 and accessible through a hole 32 of the box casing 3.

[0064] The access hole 32 is present on the side of the box casing 3 from which the bolt exits outward, so to permit the reset only if the lock is open.

[0065] The access hole 32 in a different embodiment in accordance with the present invention can be accessible from the side of the lock turned towards the internal side of the environment isolated by the door in which the lock is mounted.

[0066] The grip 31 has a standard form so to be driven by a standard tool, and is for example a rectilinear track for a flat head screwdriver 31, but it can likewise have a dedicated form, for being driven by a dedicated tool, or even have a coding so to be driven only by a coded tool.

[0067] The functioning of the lock according to the invention appears evident from that described and illustrated, and in particular is substantially the following.

[0068] Initially the recoding element 11 is in its size k0.

[0069] With the key disconnected, the retainer plates are aligned but the notches of the retainer plates 7, 7' are misaligned and the main retainer element 10 engages the teeth of the retainer plates 7, 7', preventing the movement of the bolt.

[0070] When a key is inserted and rotated in the lock, each cut of each of its bits is engaged with the corresponding retainer plate.

[0071] The lock 1 is initially driven through the enabled key 2a.

[0072] During the first turn, the cuts G, H, I, J, L of the key 2a move the retainer plates 7 so to collimate the notches 9 and open the passage of the main retainer element 10.

[0073] The cut K of the key 2a is engaged with the special retainer plate 7' which by means of the tab 13 is engaged with the foot 14 of the recoding element 11, lifting it. Consequently, the additional retainer element 12 integral with the recoding element 11 is released from the coupling seat 29 in which it is housed and frees the support plate 6. Since the passage corridor of the main retainer element 10 opens in a synchronized manner, and the support plate 6 is released from the additional retainer element 12, the bolt 5 can be moved.

[0074] During the second turn, the notches A, C, D, E, F of the key 2a move the retainer plates 7 to collimate the notches 9 and open the passage of the main retaining element 10.

[0075] The cut B of the key 2a is engaged with the special retainer plate 7' which by means of the tab 13 is engaged with the foot 14 of the recoding element 11, lifting it. Consequently, the additional retainer element 12 integral with the recoding element 11 is released from the coupling seat 29 in which it is housed and frees the support plate 6. Since the passage corridor of the main retainer element 10 opens in a synchronised manner, and the support plate 6 is released from the additional retainer element 12, the bolt 5 can be moved and the additional retainer element 12 is accommodated in the coupling seat 29 following that which was previously occupied.

[0076] The functioning is repeated for the subsequent turns.

[0077] The cuts B and K of the key 2a have the smallest code radius of the keys 2a, 2b and 2c. Such code radius is designed so to generate a lifting path of the recoding element 11 which is sufficient only to release the additional retainer element 12 from the coupling seat 29 but not sufficient to make it interfere with the cam 30, from which therefore no stress is transmitted to the recoding element 11.

[0078] When at the end of every turn, the bit of the key 2a is released from the retainer plates 7, 7', suitable helical return springs 42, interposed between the retainer plates 7 and the fixed part 41, bring the retainer plates 7 back in the lowered alignment position, while the return spring 25 brings the recoding element 11 back towards the lowered position in which the additional retainer ele-

ment 12, being engaged in the coupling seat 29, locks the support plate 6.

[0079] We will now assume, after the use of the key 2a, a first use of the key 2b in the lock 1.

5 **[0080]** The initial size of the recoding element is k0.

[0081] Since the bitting of the key 2b is identical to that of the key 2a, except for the notches B and K which control, however, the special retainer plate 7', and since the special retainer plate 7' is coded for all keys, the lock 1 permits an initial recognition of the key 2b which can begin its first turn. The cuts B and K of the key 2b have a code radius which is greater than the cuts B and K of the key 2a. In this situation, the cut K generates during the first turn a lifting course of the recoding element 11 which is sufficient not only to release the additional retainer element 12 from the coupling seat 29, but also to make it interfere with the opposing cam 30, from which therefore a downward thrust force is exerted which, being opposed to the lifting of the recoding element 11, generates a longitudinal compression stress which is sufficiently intense to overcome the force with which the first and the second longitudinal element 15 and 16 are coupled: the tooth 17 slides along the sliding axis 18 and is inserted in the subsequent seat k1. Already at the end of the first turn, therefore, the size of the recoding element 11 has been modified.

[0082] In the new size k1, the recoding element 11 is more contracted longitudinally than the size k0 and therefore, if one desires to use once again the key 2a, the lifting path of the special plate 7' generated by the cuts B and K of the key 2a is no longer sufficient to lift the recoding element 11, not even for releasing the additional retainer element 12 from the related coupling seat 29. Hence the key 2a is automatically disabled at the attainment of the size k1.

[0083] We now assume a first use of a key 2c in the lock 1 in which the dimension of the recoding element is k1.

[0084] Since the bitting of the key 2c is identical to that of the key 2b except for the cuts B and K, the lock 1 permits an initial recognition of the key 2c which begins its rotation. The cuts B and K of the key 2c have a code radius greater than the cuts B and K of the key 2b. In this situation, the cut K generates, during the first turn, a lifting path of the recoding element 11 which is sufficient not only to release the additional retainer element 12 from the coupling seat 29 but also make it interfere with the opposing cam 30 from which, therefore, a downward thrust force is exerted which, being opposed to the lifting of the recoding element 11 generates a longitudinal compression stress which is sufficiently intense to overcome the force with which the first and second longitudinal element 15 and 16 are coupled: the tooth 17 slides along the sliding axis 18 and is inserted in the subsequent seat k2.

[0085] In the new dimension k2, the recoding element 11 is more contracted longitudinally with respect to the dimension k1 (and is even more so with respect to the

dimension k0) and therefore, if one wishes to use the key 2b again, the lifting path of the special plate 7' generated by the cuts B and K of the key 2b is no longer sufficient to lift the recoding element 11, not even to release the additional retainer element 12 from the related coupling seat 29. Hence the key 2b is automatically disabled following the achievement of the dimension k2, and the key 2a remains even more so disabled.

[0086] At this point, in order to restore a disabled key, it is possible to insert a screwdriver into the hole 32, direct it into the grip 31 and lever the screwdriver itself or simply rotate it to make the first longitudinal element 15 slide with respect to the second longitudinal element 16 towards the dimension k1 or k0.

[0087] Naturally, it is possible to use the key 2c after the key 2a without passing to the key 2b: at the first use of the key 2c after the key 2a, the recoding element 11 carries out a double jump, from the dimension k0 directly to the dimension k2.

[0088] Likewise, it is possible to restore the dimension k0 beginning directly from the dimension k2.

[0089] The lock thus conceived is susceptible to numerous modifications and variations, all falling within the scope of the inventive concept; moreover, all details can be substituted by technically equivalent elements.

[0090] The minimum number of recoding sizes is two. The number of sizes of the recoding element is equal to the number of keys which in turn is equal to the number of distinct recoding radii of the cut which drives the special retainer plate.

[0091] The lock is of the type more generally having one or more superimposed or offset retainer plates with translational or oscillatory movement, and the special retainer plate can occupy any position in the set of the retainer plates, and consequently the cuts of the key which drive it can be in any position in the key bitting.

[0092] The key in turn can be of one or two bit type, with half-turn or two, four or additional turns, and the change of size can occur at the first half-turn of any one turn, either in opening or closing.

[0093] In practice, the materials used, as well as the sizes, can be of any type according to the needs and the state of the art.

Claims

1. Safety lock (1) of the type comprising one or more retainer plates (7,7') a variable size recoding element (II) having a succession of sizes, each which enables a corresponding key (2a,2b,2c) of the type with one or more bits and which disables every key (2a,2b,2c) enabled by every preceding sized said succession, each key (2a,2b,2c) having its own control means of said recoding element (II) adapted to automatically restore it to the enabling size when said recoding element (II) has a size preceding the enabling size, a main retainer element (10) present on

a support plate (6) of a bolt (5) which is horizontally movable in a box casing (3) of said lock (I), said one or more retainer plates (7,7') being movable to open a passage for said main retainer element (10) through their serrated window (8,8'), **characterised in that** said recoding element (II) bears an additional retainer element (12) associated with it, and **characterised in that** said recoding element (II) is borne movable inside said box casing (3) between a locking position in which said additional retainer element (12) locks said lock (I) and an unlocking position in which said additional retainer element (12) unlocks said lock (1)

2. Safety lock (I) according to claim 1, **characterised in that** said recoding element (II) can move orthogonally to said bolt (5).
3. Safety lock (1) according to any of the preceding claim 1 or 2, **characterised in that** said recoding element (11) is indirectly driven by said control means.
4. Safety lock (1) according to the preceding claim, **characterised in that** said recoding element (11) is driven by means of a special retainer plate (7') chosen from among said one or more retainer plates (7,7').
5. Safety lock (1) according to one or more preceding claims, **characterised in that** said recoding element (11) is driven by means of a movement transmission lever interposed between said recoding element (11) and said control means.
6. Safety lock (1) according to one of more of the preceding claims, **characterised in that** said recoding element (II) is driven directly by said control means.
7. Safety lock (1) according to one or more of the preceding claims, **characterised in that** said recoding element (11) comprises at least two components having a mechanical coupling of telescopic type.
8. Safety lock (1) according to one or more of the preceding claims, **characterised in that** said recoding element (II) is made of plastically deformable material.
9. Safety lock (1) according to one or more preceding claims, **characterised in that** for the locking of said lock (1) said additional retainer element (12) exerts a locking action of said support plate (6) of said bolt.
10. Safety lock (1) according to one or more preceding claims, **characterised in that** for the locking of said lock (1), said additional retainer element (12) exerts, directly or indirectly, a locking action of at least one

of said one or more retainer plate (7,7').

11. Safety lock (1) according to one or more preceding claims, **characterised in that** for the locking of said lock (1) said additional retainer element (12) exerts, 5
directly or indirectly, a locking action of said key (2a, 2b, 2c).
12. Safety lock (1) according to one or more preceding claims, **characterised in that** said recoding element 10
(11) comprises a first longitudinal element (15) and a second longitudinal element (16) which are substantially parallel and slidably coupled along a sliding axis (18) parallel to their longitudinal axis, said first (15) and second (16) longitudinal element having reciprocal setting means in a succession of positions along said sliding axis (18). 15
13. Safety lock (1) according to the preceding claim, **characterised in that** said setting means comprises 20
a tooth (17) which is selectively insertable into a seat of a plurality of seats of matching form to said tooth (17) and arranged in succession along said sliding axis (18).
14. Safety lock (1) according to any of the preceding claim 12 or 13 **characterised in that** said first longitudinal element (15) has a longitudinal hollow 25
space (19) for guiding said second longitudinal element (16) along said sliding axis (18).
15. Safety lock (1) according to one or more preceding claims, **characterised in that** said recoding element 30
(11) has at the base a grip foot (14) of a lifting force from a tab of said special retainer plate (7') when this is lifted by said control means.
16. Safety lock (1) according to one or more preceding claims, **characterised in that** said special retainer plate (7') is coded in a manner so to permit the use 40
of any of said keys.
17. Safety lock (1) according to one or more preceding claims, **characterised in that** said recoding element 45
(11) has at its apex a transverse extension (24) at whose end said additional retainer element (12) is present.
18. Safety lock (1i) according to one or more preceding claims, **characterised in that** said additional retain- 50
er element (12) is positioned in a slot (28) of said support plate (6), said slot (28) defining a plurality of coupling seats (29) of said additional retainer element (12) for the locking of said support plate (6) and at least one cam (30) opposing the lifting of said additional retainer element (12). 55
19. Safety lock (1) according to one or more preceding

claims, **characterised in that** each key's said own control means consist of each cut of its biting which corresponds to the drive of said special retainer plate (7').

20. Safety lock (1) according to one or more of the preceding claims, **characterised in that** the biting of each key of said lock is identical except for the code radius of said each cut which corresponds to the drive of said special retainer plate (7').
21. Safety lock (1) according to one or more preceding claims, **characterised in that** it has restoration means of said recoding element (11) into any one of its preceding sizes.
22. Safety lock (1) according to one or more preceding claims, **characterised in that** said restoration means comprise at least one grip (31) for the end of a resetting tool positioned on the surface of said recoding element (11) and accessible through a hole (32) of said box casing.
23. Safety lock (1) according to any of the preceding claims 21 or 22, **characterised in that** said access hole (32) is present on the side of said box casing (3) from which said bolt (5) exits outward.
24. Safety lock (1) according to any of the preceding claims 21 to 23, **characterised in that** said grip (31) has a standard form so to be driven by a standard tool.
25. Safety lock (1i) according to any of the preceding claims 21 to 24, **characterised in that** said grip (31) has a dedicated form so to be driven by a dedicated tool.
26. Safety lock (1) according to any of the preceding claims 21 to 24, **characterised in that** said grip (31) has a coding so to be driven by a coded tool.

Patentansprüche

1. Sicherheitsschloss (1) des Typs umfassend eine oder mehrere Halteplatten (7, 7'), ein Umcodierungselement (11) variabler Größe mit einer Folge von Größen, von denen jede einen entsprechenden Schlüssel (2a, 2b, 2c) des Typs mit einer oder mehreren Bärten aktiviert und das jeden Schlüssel (2a, 2b, 2c), der durch jede vorherige Größe besagter Folge aktiviert wurde, deaktiviert, wobei jeder Schlüssel (2a, 2b, 2c) seine eigenen Kontrollmittel des besagten Umcodierungselements (11) besitzt, angepasst, um ihn automatisch zur Aktivierungsgröße wiederherzustellen, wenn besagtes Umcodierungselement (11) eine Größe vor der Aktivierungs-

- größe besitzt, ein Haupthalteelement (10) auf einer Trägerplatte (6) eines Bolzens (5), horizontal bewegbar in einem Kastengehäuse (3) des besagten Schlosses (1), wobei die besagte(n) eine oder mehreren Halteplatten (7, 7') bewegbar sind, um einen Durchgang für besagtes Halteelement (10) durch ihres gezackte Fenster (8, 8') zu öffnen, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) ein zusätzliches Halteelement (12) trägt, damit verbunden, und **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) bewegbar im besagten Kastengehäuse (3) zwischen einer Verriegelungsposition, in der das besagte Halteelement (12) besagtes Schloss (1) verriegelt, und einer Entriegelungsposition, in der besagtes zusätzliches Halteelement (12) besagtes Schloss (1) entriegelt, getragen wird.
2. Sicherheitsschloss (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) sich orthogonal zum besagten Bolzen (5) bewegen kann.
 3. Sicherheitsschloss (1) nach einem der vorhergehenden Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) indirekt durch die besagten Kontrollmittel angetrieben wird.
 4. Sicherheitsschloss (1) nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) mittels einer speziellen Halteplatte (7') angetrieben wird, ausgewählt aus der(den) besagten einen oder mehreren Halteplatten (7, 7').
 5. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) mittels eines Bewegungsübertragungshebels angetrieben wird, eingesetzt zwischen dem besagten Umcodierungselement (11) und den besagten Kontrollmitteln.
 6. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) direkt durch die besagten Kontrollmittel angetrieben wird.
 7. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) mindestens zwei Komponenten umfasst, die eine mechanische Kupplung des Teleskoptyps besitzen.
 8. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) aus einem plastisch verformbaren Material besteht.
 9. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte zusätzliche Halteelement (12) zum Verriegeln des besagten Schlosses (1) eine Verriegelungswirkung der besagten Halteplatte (6) des besagten Bolzens ausübt.
 10. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte zusätzliche Halteelement (12) zum Verriegeln des besagten Schlosses (1) direkt oder indirekt eine Verriegelungswirkung von mindestens einem des/der besagten einen oder mehreren Halteplatten (7, 7') ausübt.
 11. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte zusätzliche Halteelement (12) zum Verriegeln des besagten Schlosses (1) direkt oder indirekt eine Verriegelungswirkung des besagten Schlüssels (2a, 2b, 2c) ausübt.
 12. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) ein erstes Längselement (15) und ein zweites Längselement (16) umfasst, die im Wesentlichen parallel und verschiebbar entlang einer Verschiebeachse (18) parallel zu ihrer Längsachse angeordnet sind, wobei das besagte erste (15) und zweite (16) Längselement gegenseitige Einstellmittel in einer Folge von Positionen entlang der besagten Verschiebeachse (18) aufweisen.
 13. Sicherheitsschloss (1) nach dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** die besagten Einstellmittel einen Zahn (17) umfassen, der selektiv in einen Sitz mehrerer Sitze der zum besagten Zahn (17) passenden Form eingesetzt werden kann und angeordnet in Folge entlang der besagten Verschiebeachse (18).
 14. Sicherheitsschloss (1) nach einem der vorhergehenden Ansprüche 12 oder 13, **dadurch gekennzeichnet, dass** das besagte erste Längselement (15) einen länglichen Hohlraum (19) zum Führen des besagten zweiten Längselements (16) entlang der besagten Verschiebeachse (18) aufweist.
 15. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) an der Basis einen Greiffuß (14) einer Hebekraft

von einem Streifen der besagten speziellen Halteplatte (7') besitzt, wenn diese durch die besagten Kontrollmittel angehoben wird.

16. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die besagte spezielle Halteplatte (7') so codiert ist, dass sie den Einsatz aller besagten Schlüssel ermöglicht. 5
17. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte Umcodierungselement (11) an seinem Scheitel eine transversale Erweiterung (24) besitzt, an deren Ende sich das besagte zusätzliche Halteelement (12) befindet. 10
18. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das besagte zusätzliche Halteelement (12) in einer Aussparung (28) der besagten Trägerplatte (6) angeordnet ist, wobei die besagte Aussparung (28) mehrere Kupplungssitze (29) des besagten zusätzlichen Halteelements (12) definiert, um die besagte Trägerplatte (6) und mindestens einen Nocken (30), der dem Heben des besagten zusätzlichen Halteelements (12) entgegenwirkt, zu verriegeln. 25
19. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die besagten eigenen Kontrollmittel jedes Schlüssels aus jedem Schnitt seines Barts bestehen, der der Führung der besagten Halteplatte (7') entspricht. 30
20. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Bart jedes Schlüssels des genannten Schlosses identisch ist, mit Ausnahme des Codierungsradius jedes Schnitts, der der Führung der besagten speziellen Halteplatte (7') entspricht. 35
21. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es Wiederherstellungsmittel des besagten Umcodierungselements (11) in eine beliebige der vorherigen Größen besitzt. 40
22. Sicherheitsschloss (1) nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die besagten Wiederherstellungsmittel mindestens einen Griff (31) für das Ende eines Rücksetzungswerkzeugs umfassen, positioniert auf der Oberfläche des besagten Umcodierungselements (11) und zugänglich durch ein Loch (32) des besagten Kastengehäuses. 45

23. Sicherheitsschloss (1) nach einem der vorhergehenden Ansprüche 21 oder 22, **dadurch gekennzeichnet, dass** das besagte Zugangsloch (32) auf der Seite des besagten Kastengehäuses (3) ausgebildet ist, von der der besagte Bolzen (5) nach außen austritt. 5
24. Sicherheitsschloss (1) nach einem der vorhergehenden Ansprüche 21 bis 23, **dadurch gekennzeichnet, dass** der besagte Griff (31) eine Standardform besitzt, um von einem Standardwerkzeug betätigt zu werden. 10
25. Sicherheitsschloss (1) nach einem der vorhergehenden Ansprüche 21 bis 24, **dadurch gekennzeichnet, dass** der besagte Griff (31) eine spezielle Form besitzt, um von einem Spezialwerkzeug betätigt zu werden. 15
26. Sicherheitsschloss (1) nach einem der vorhergehenden Ansprüche 21 bis 24, **dadurch gekennzeichnet, dass** der besagte Griff (31) eine Codierung besitzt, um von einem codierten Werkzeug betätigt zu werden. 20

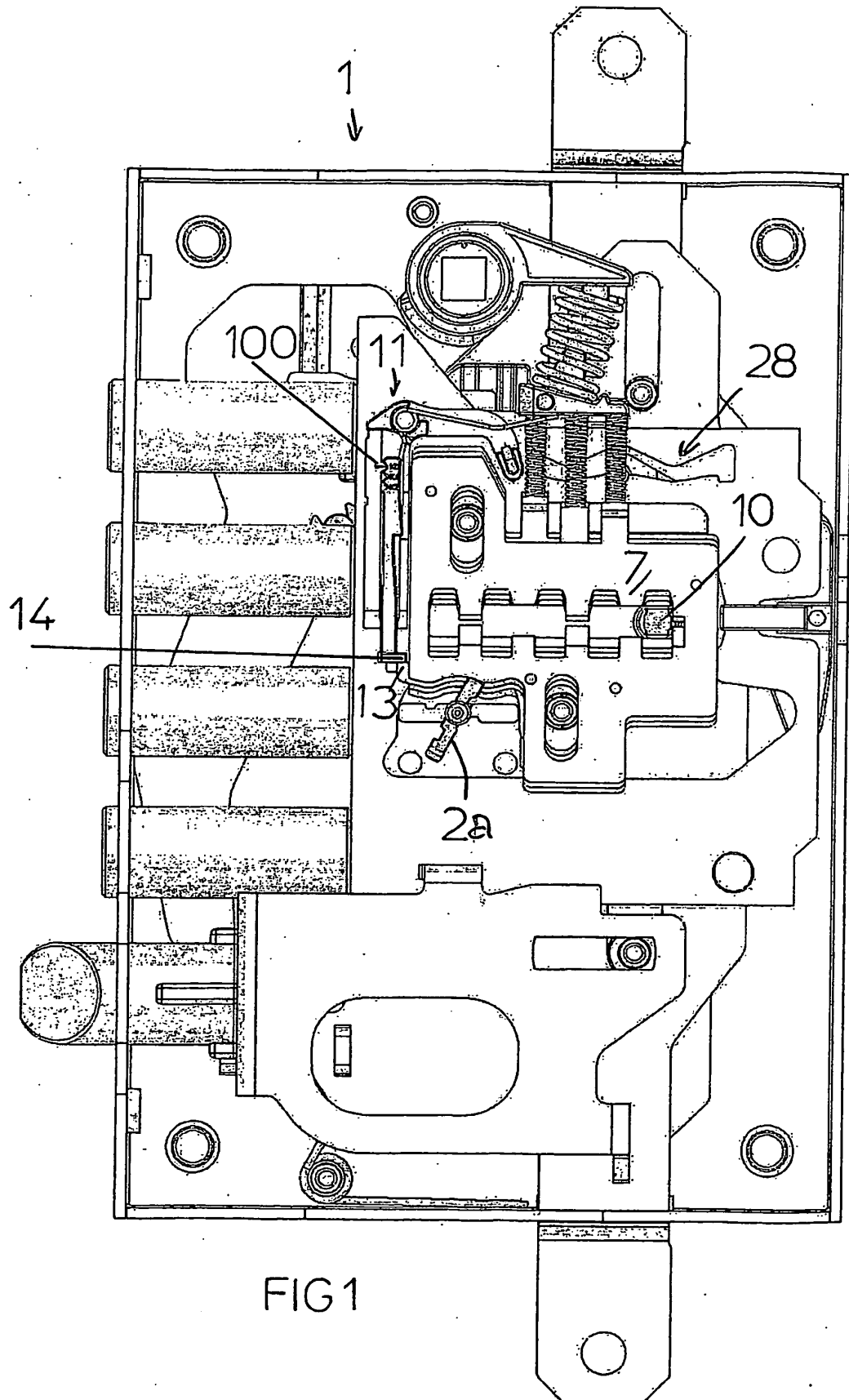
Revendications

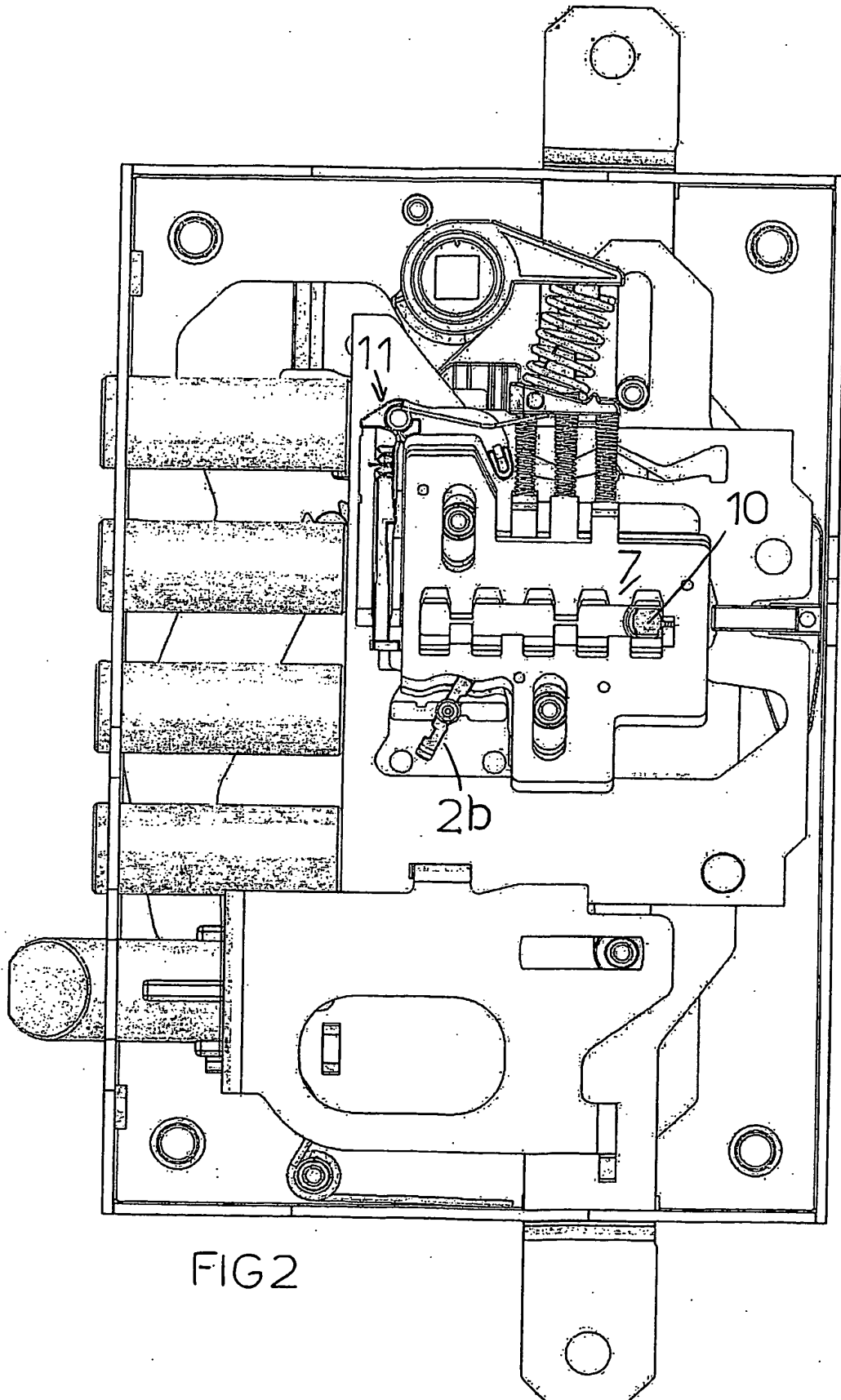
1. Serrure de sûreté (1) du type comprenant une ou plusieurs plaques de retenue (7, 7'), un élément de reprogrammation au format variable (11) comportant une succession de formats, chacun activant une clé correspondante (2a, 2b, 2c) du type composé d'un ou plusieurs pannetons et qui désactive toutes les clés (2a, 2b, 2c) activées par tous les formats précédents de ladite succession, chaque clé (2a, 2b, 2c) ayant ses propres moyens de commande dudit élément de reprogrammation (11) aptes à rétablir automatiquement son format d'activation lorsque ledit élément de reprogrammation (11) possède un format précédent par rapport à celui d'activation, un élément principal de retenue (10) présent sur une plaque-support (6) d'un pêne (5) mobile horizontalement dans un coffre (3) de ladite serrure (1) ladite une ou plusieurs plaques de retenue (7, 7') étant mobile(s) pour ouvrir un passage pour ledit élément de retenue (10) principal à travers leur fenêtre crantée (8, 8') **caractérisée en ce que** ledit élément de reprogrammation (11) supporte un élément de retenue supplémentaire (12) associé à celui-ci, et **caractérisée en ce que** ledit élément de reprogrammation (11) est supporté de façon mobile à l'intérieur du coffre (3) entre une position de verrouillage dans laquelle ledit élément de retenue supplémentaire (12) verrouille ladite serrure (1) et une position de déverrouillage dans laquelle ledit élément de retenue supplémentaire (12) déverrouille ladite serrure (1). 50

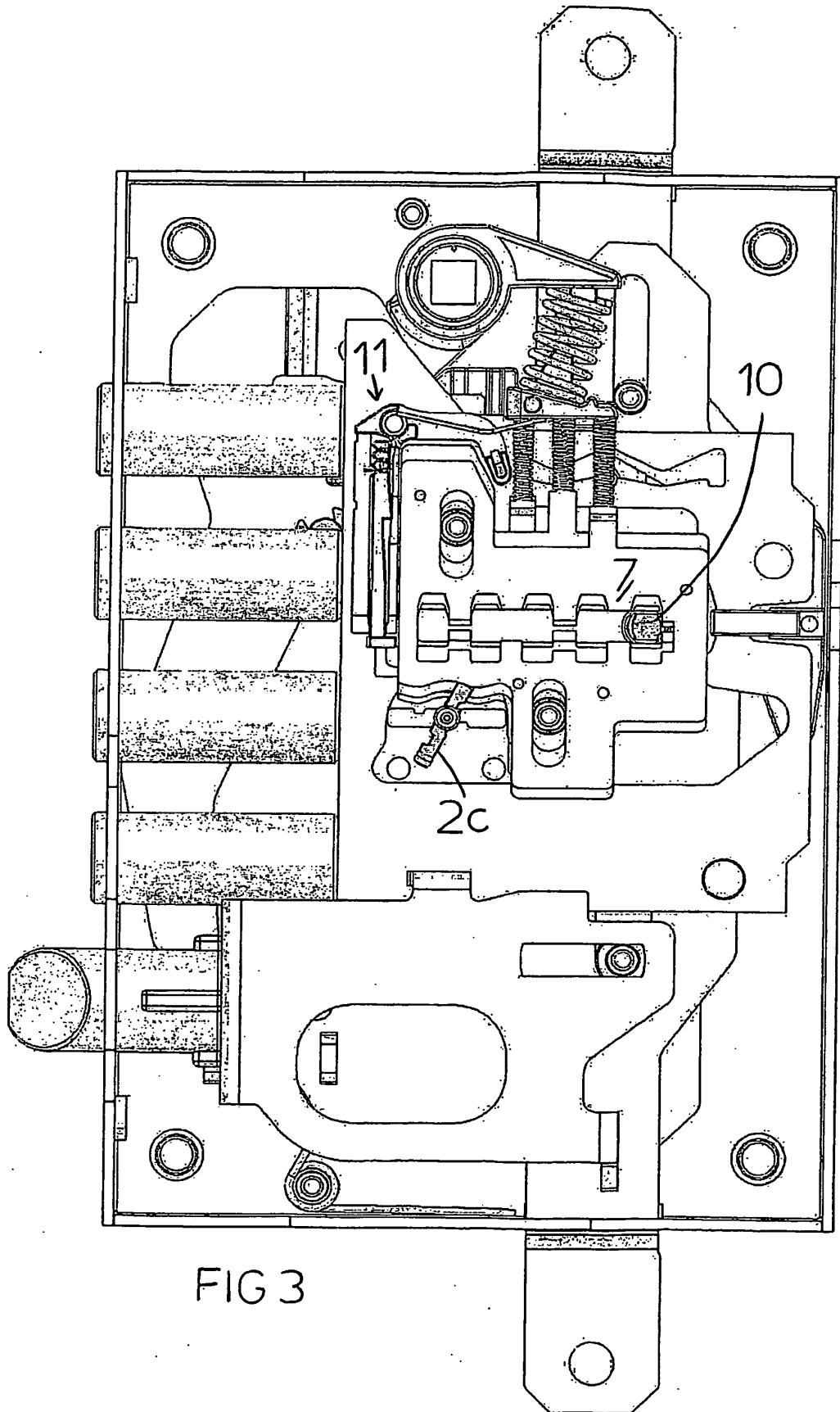
2. Serrure de sûreté (1) selon la revendication 1, **caractérisée en ce que** le dit élément de reprogrammation (11) peut se déplacer orthogonalement au dit pêne (5). 5
3. Serrure de sûreté (1) selon l'une quelconque des revendications précédentes 1 ou 2, **caractérisée en ce que** ledit élément de reprogrammation (11) est indirectement entraîné par lesdits moyens de commande. 10
4. Serrure de sûreté (1) selon la revendication précédente, **caractérisée en ce que** ledit élément de reprogrammation (11) est entraîné par les moyens d'une plaque de retenue particulière (7') choisie parmi lesdites une ou plusieurs plaques de retenue (7, 7'). 15
5. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de reprogrammation (11) est entraîné via un levier de transmission de mouvement interposé entre ledit élément de reprogrammation (11) et lesdits moyens de commande. 20
6. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de reprogrammation (11) est directement entraîné par lesdits moyens de commande. 25
7. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de reprogrammation (11) comprend au moins deux composants ayant un raccord mécanique de type télescopique. 30
8. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de reprogrammation (11) est fabriqué en matière plastique déformable. 35
9. Serrure de sécurité (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** pour le verrouillage de ladite serrure (1) ledit élément de retenue supplémentaire (12) exerce une action de verrouillage de ladite plaque-support (6) dudit pêne. 40
10. Serrure de sécurité (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** pour le verrouillage de ladite serrure (1) ledit élément de retenue supplémentaire (12) exerce, directement ou indirectement, une action de verrouillage d'au moins une de ladite une ou plusieurs plaques de retenue (7, 7'). 45
11. Serrure de sécurité (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** pour le verrouillage de ladite serrure (1) ledit élément de retenue supplémentaire (12) exerce, directement ou indirectement une action de verrouillage de ladite clé (2a, 2b, 2c). 50
12. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de reprogrammation (11) comprend un premier élément longitudinal (15) et un second élément longitudinal (16) étant substantiellement parallèles et accouplés de manière coulissante le long d'un axe de coulissement (18) parallèle à leur axe longitudinal, ledit premier (15) et second élément longitudinal (16) comportant des moyens de réglage réciproques dans une succession de positions le long dudit axe de coulissement (18). 55
13. Serrure de sûreté (1) selon la revendication précédente, **caractérisée en ce que** lesdits moyens de réglage comprennent une dent (17) étant insérable, de façon sélective, dans un logement d'une pluralité de logements de forme correspondant à ladite dent (17) et disposés à la suite le long dudit axe de coulissement (18).
14. Serrure de sûreté (1) selon l'une quelconque des revendications précédentes 12 ou 13, **caractérisée en ce que** ledit premier élément longitudinal (15) comporte un espace longitudinal creux (19) pour guider ledit second élément longitudinal (16) le long dudit axe de coulissement (18).
15. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de reprogrammation (11) comporte à la base un pied de préhension (14) exerçant une force de levage à partir d'une languette de ladite plaque de retenue (7') spéciale lorsqu'elle est levée par les moyens de commande .
16. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ladite plaque de retenue particulière (7') est codée de façon à permettre l'utilisation de l'une quelconque desdites clés.
17. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de reprogrammation (11) comporte à son sommet un développement transversal (24) à l'extrémité duquel ledit élément de retenue supplémentaire (12) est présent.
18. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit élément de retenue supplémentaire (12) est placé dans une fente (28) de ladite plaque-sup-

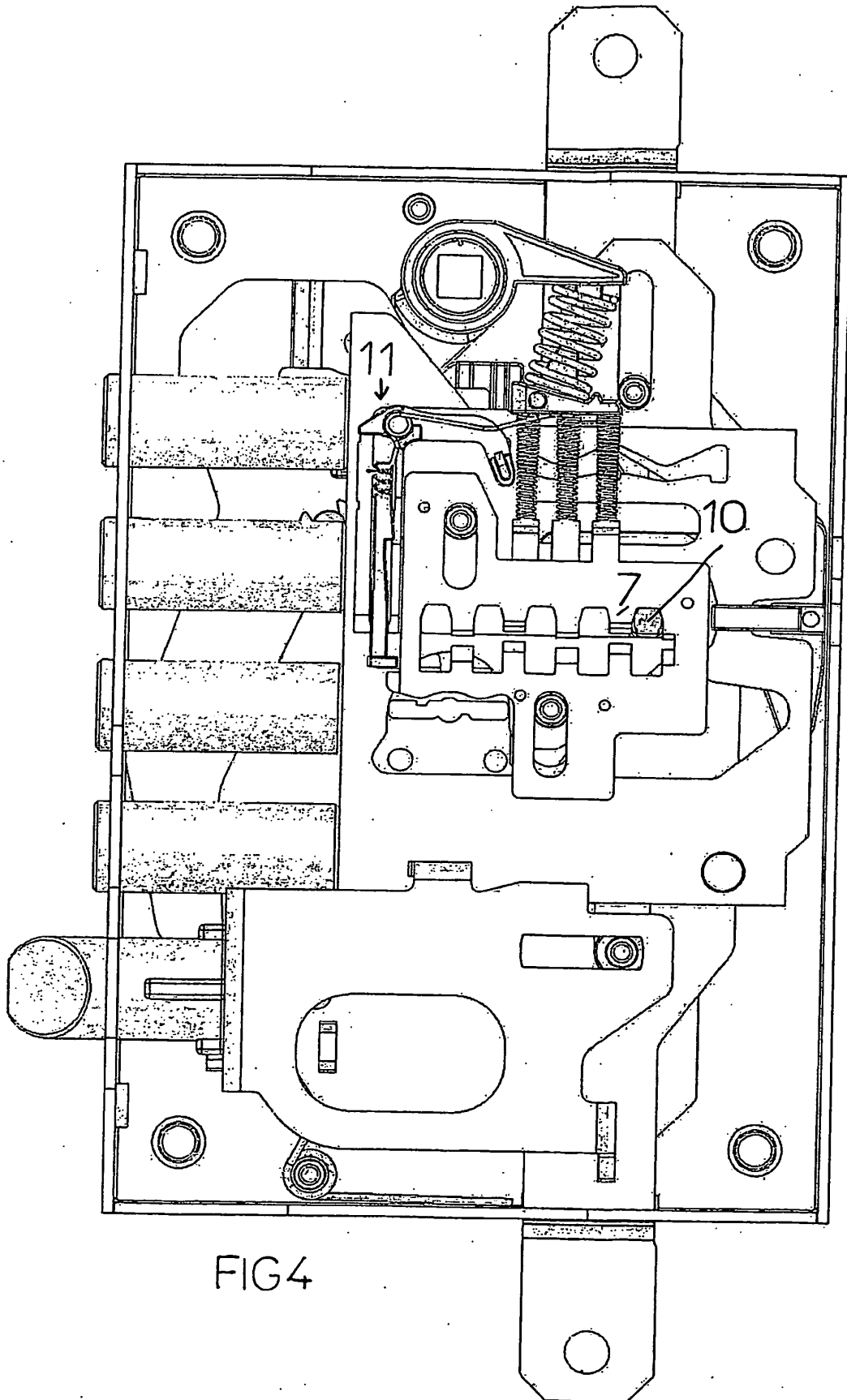
port (6), ladite fente (28) définissant une pluralité de logements d'accouplement (29) dudit élément de retenue supplémentaire (12) pour le verrouillage de ladite plaque-support (6) et au moins une came (30) s'opposant au levage dudit élément de retenue supplémentaire (12). 5

19. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** lesdits moyens de commande propre à chaque clé consistent en chaque découpe de son panneton correspondant à l'entraînement de ladite plaque de retenue spéciale (7'). 10
20. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** le panneton de chaque clé de ladite serrure est identique sauf pour le rayon du code de chacune desdites découpes correspondant à l'entraînement de ladite plaque de retenue spéciale (7'). 15
20
21. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce qu'elle** possède des moyens de rétablissement dudit élément de reprogrammation (11) dans n'importe lequel de ses formats précédents. 25
22. Serrure de sûreté (1) selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** lesdits moyens de rétablissement comprennent au moins un sillon (31) à l'extrémité d'un outil de réinitialisation positionné sur la surface dudit élément de reprogrammation (11) et accessible par un orifice (32) dudit coffre. 30
35
23. Serrure de sûreté (1) selon l'une quelconque des revendications précédentes 21 ou 22 **caractérisée en ce que** ledit orifice d'accès (32) se trouve sur le côté dudit coffre (3) à partir duquel ledit pêne (5) sort vers l'extérieur. 40
24. Serrure de sûreté (1) selon l'une quelconque des revendications précédentes de 21 à 23, **caractérisée en ce que** ledit sillon (31) possède une forme standard de sorte à être entraîné par un outil standard. 45
25. Serrure de sûreté (1) selon l'une quelconque des revendications précédentes de 21 à 24, **caractérisée en ce que** ledit sillon (31) possède une forme spécifique de sorte à être entraîné par un outil spécifique. 50
26. Serrure de sûreté (1) selon l'une quelconque des revendications précédentes de 21 à 24, **caractérisée en ce que** ledit sillon (31) possède un codage de sorte à être entraîné par un outil codé. 55









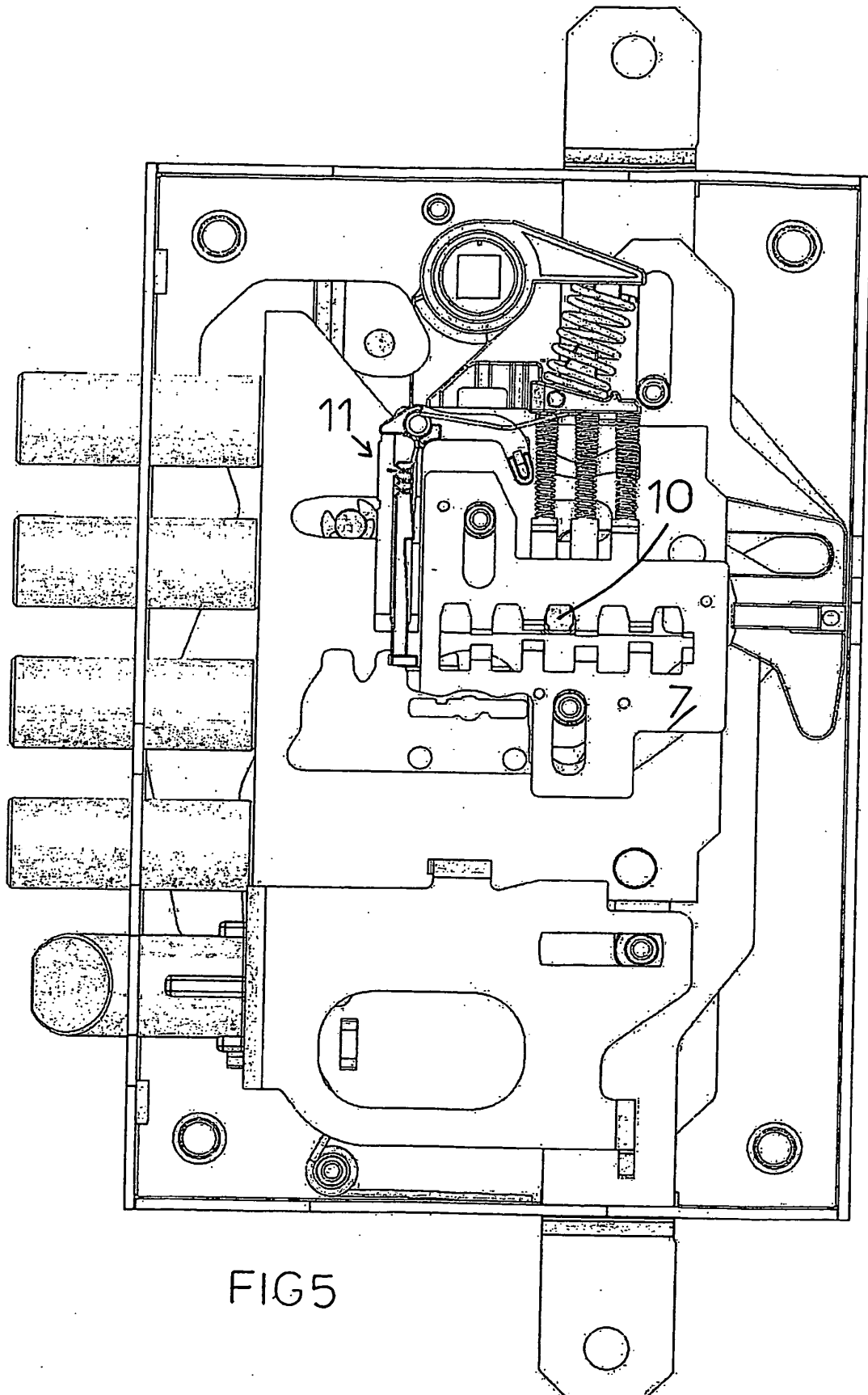
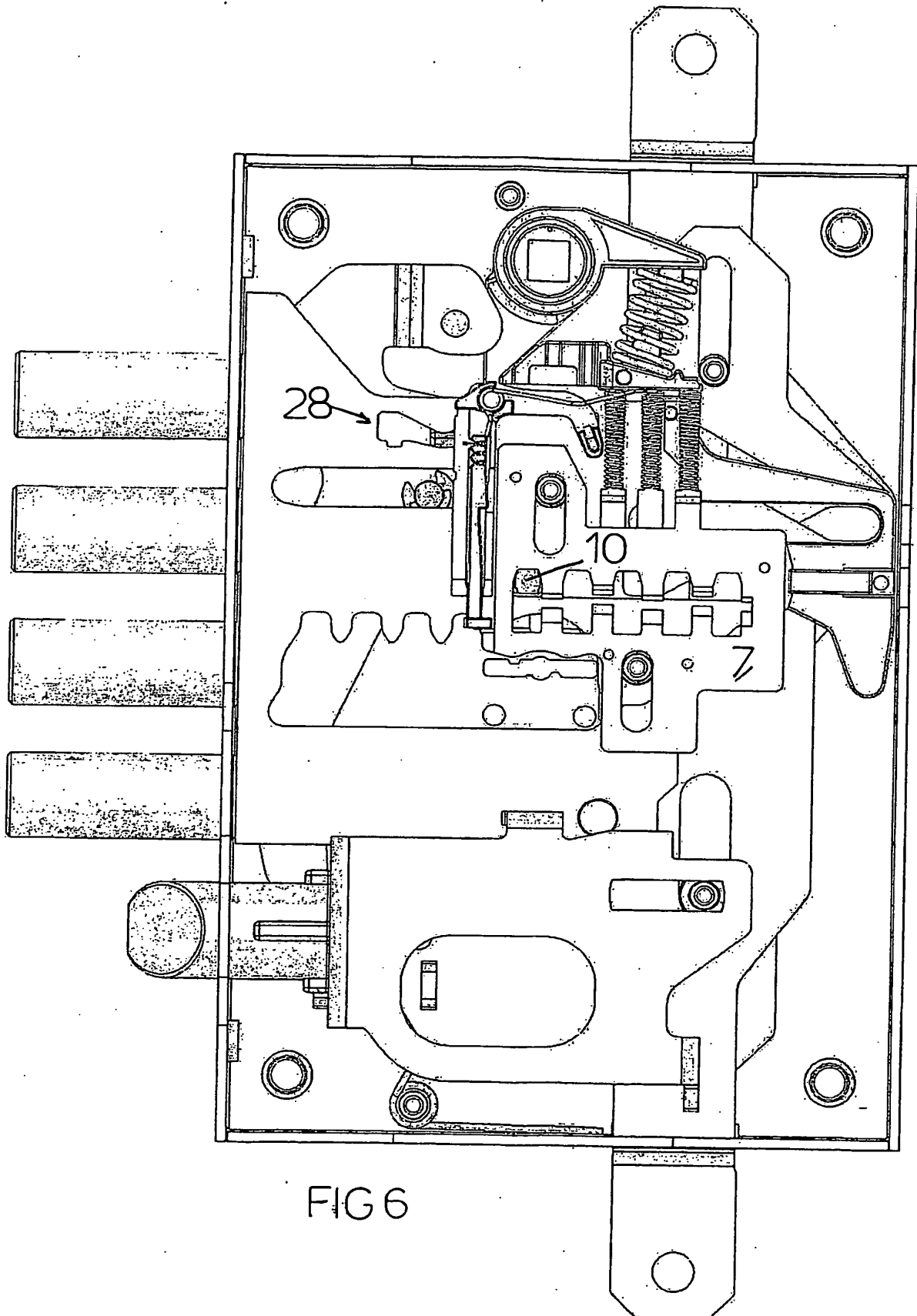
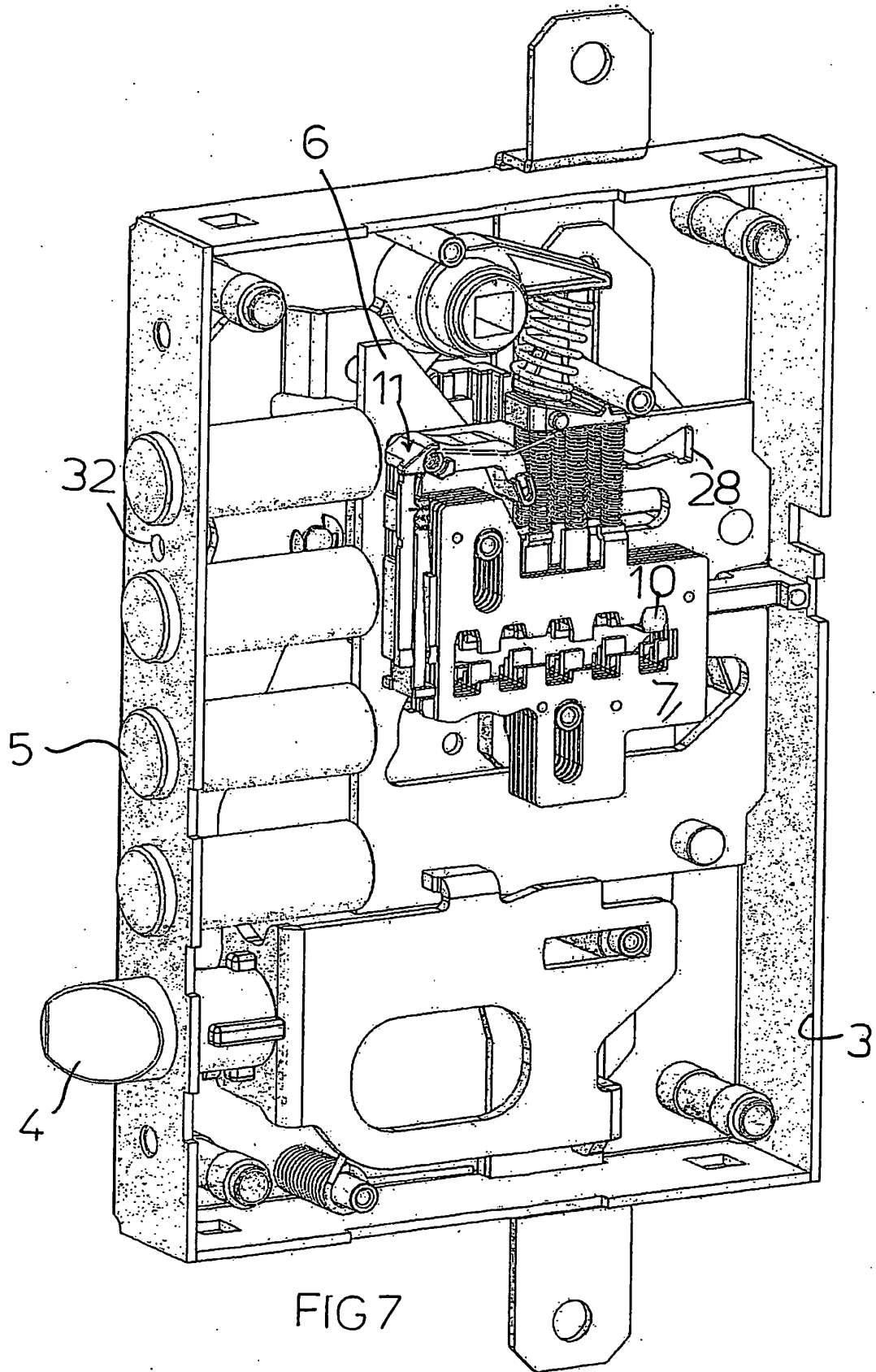
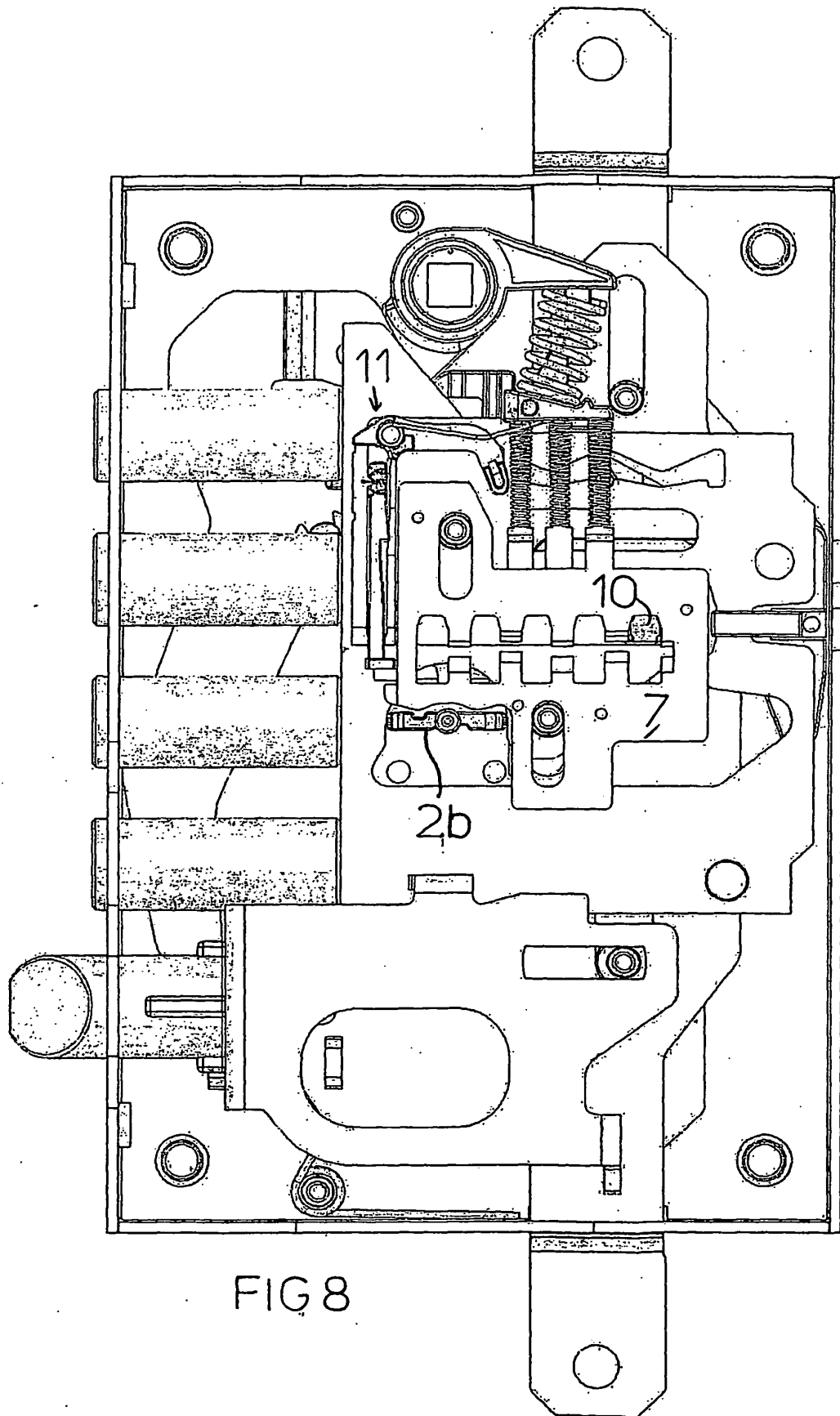
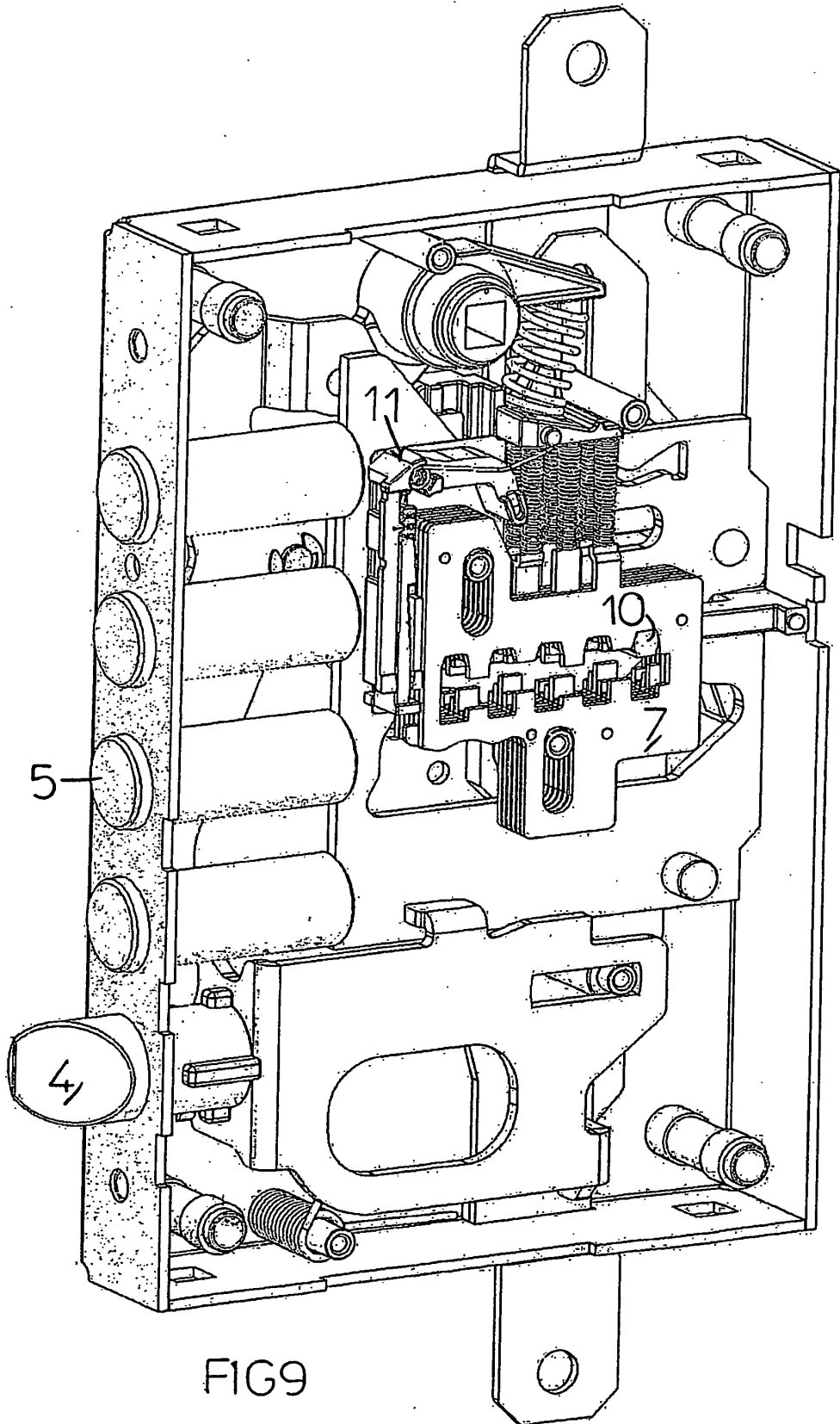


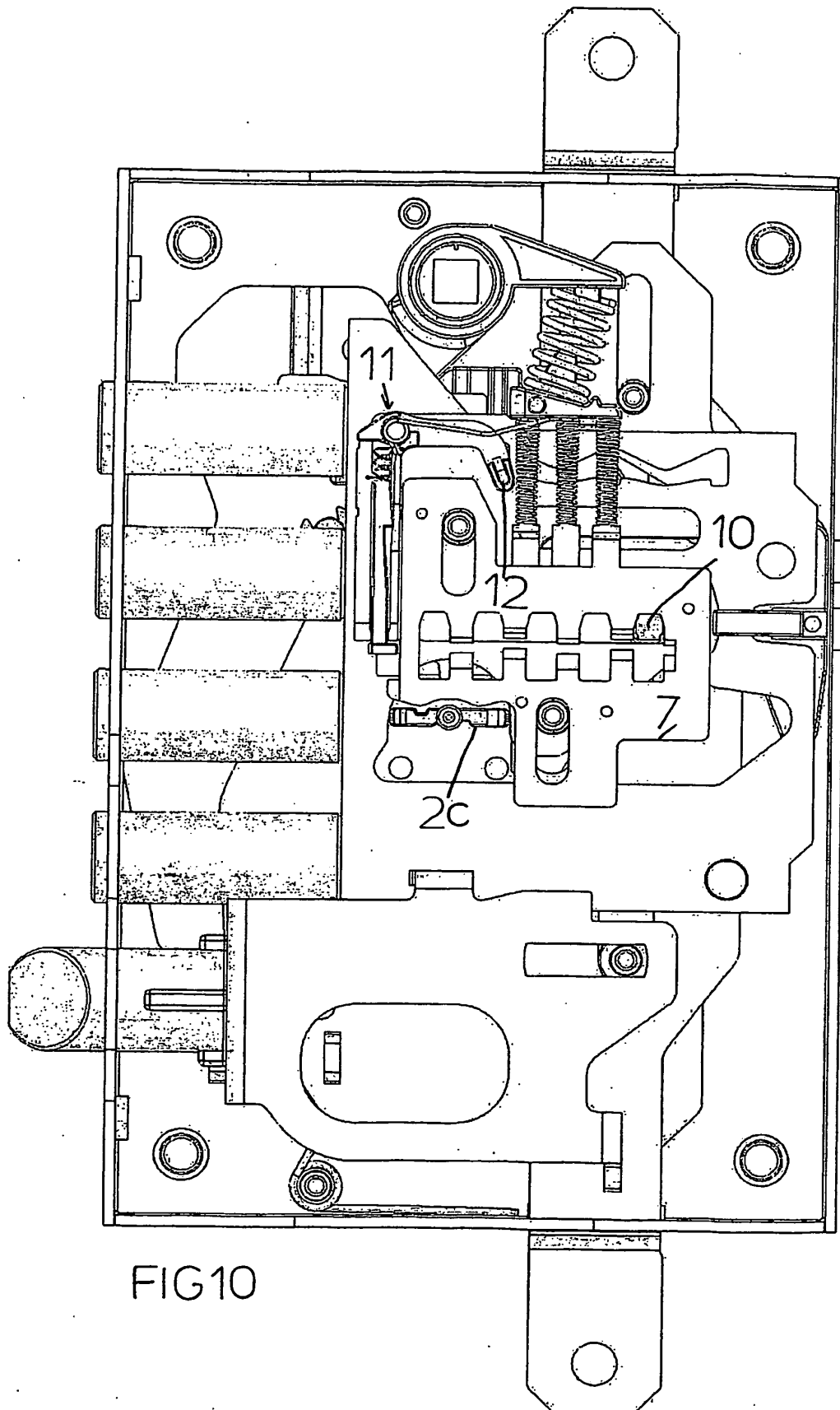
FIG5

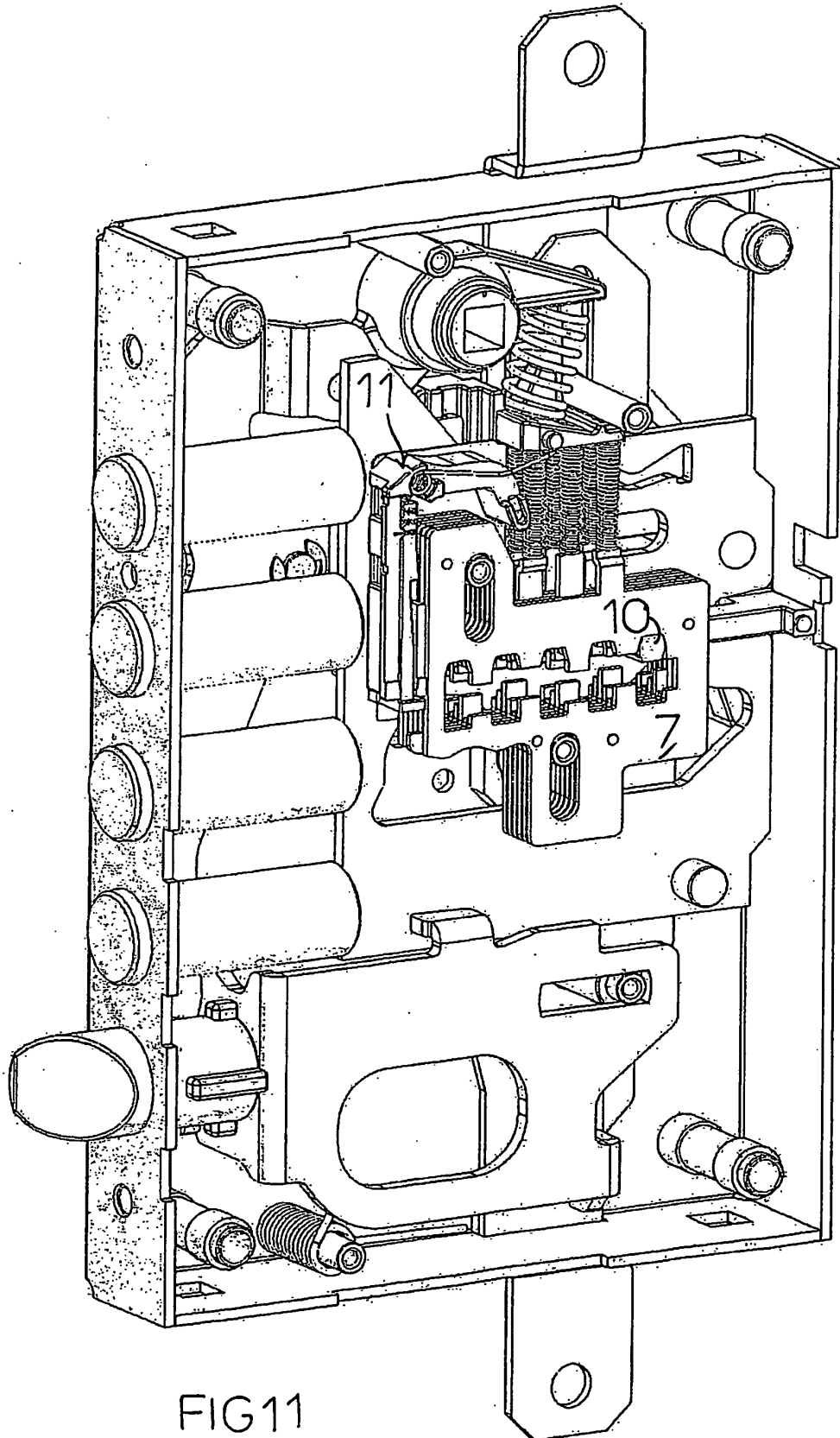


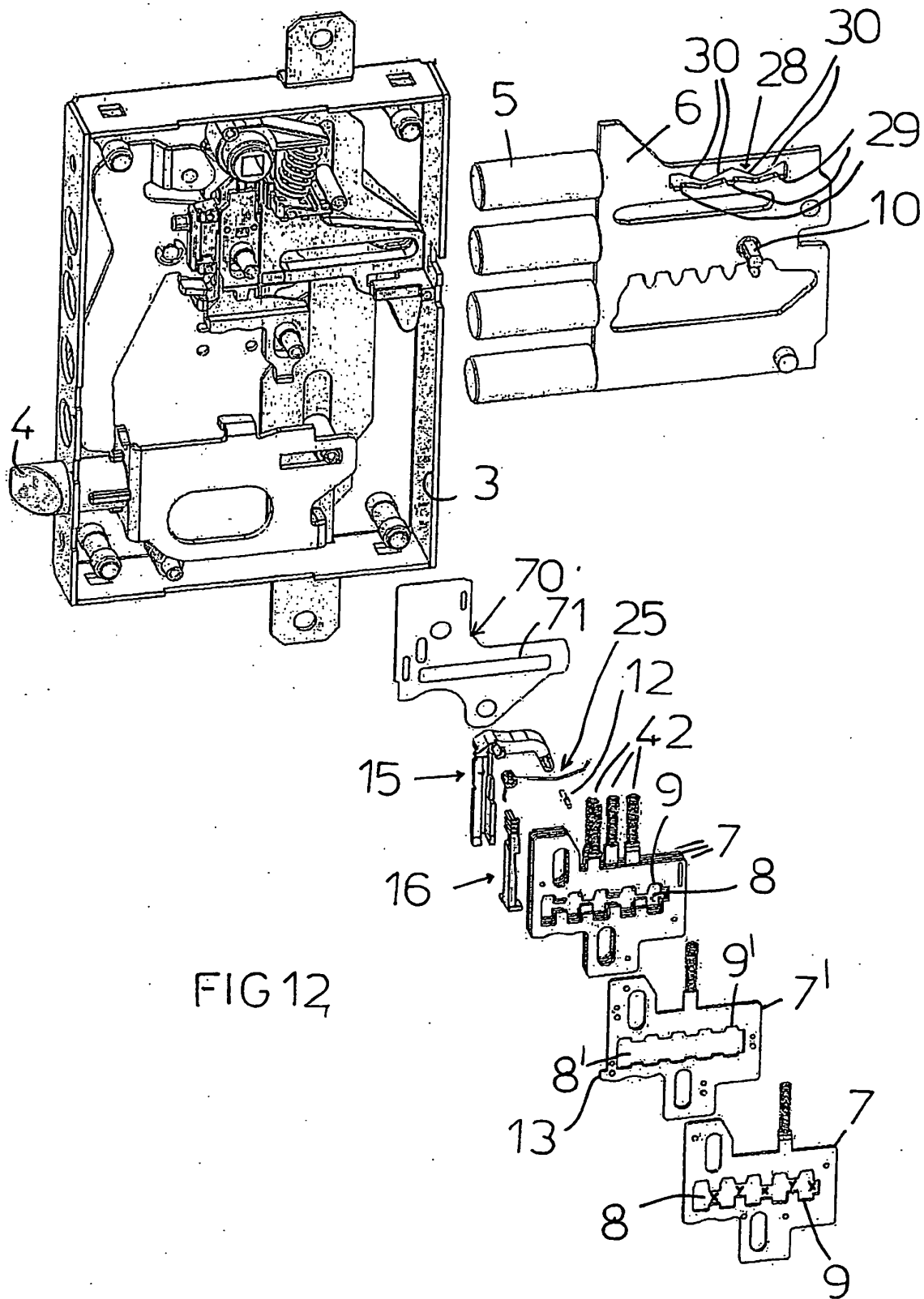












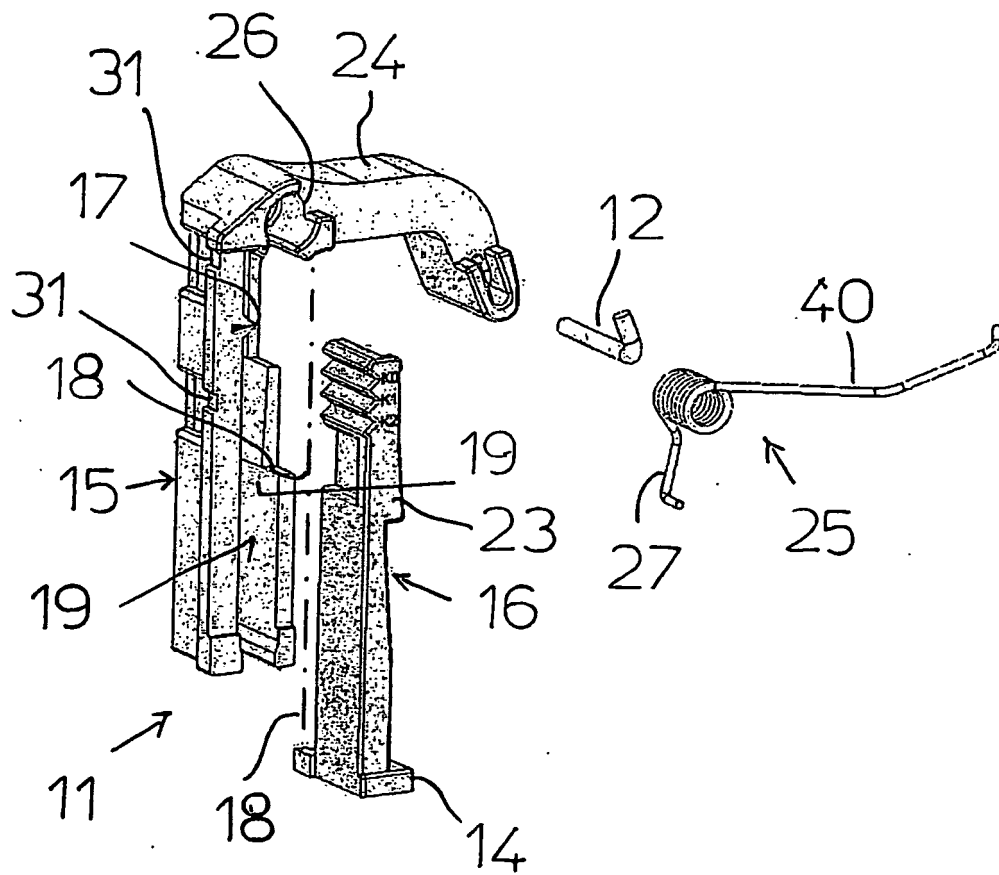


FIG13

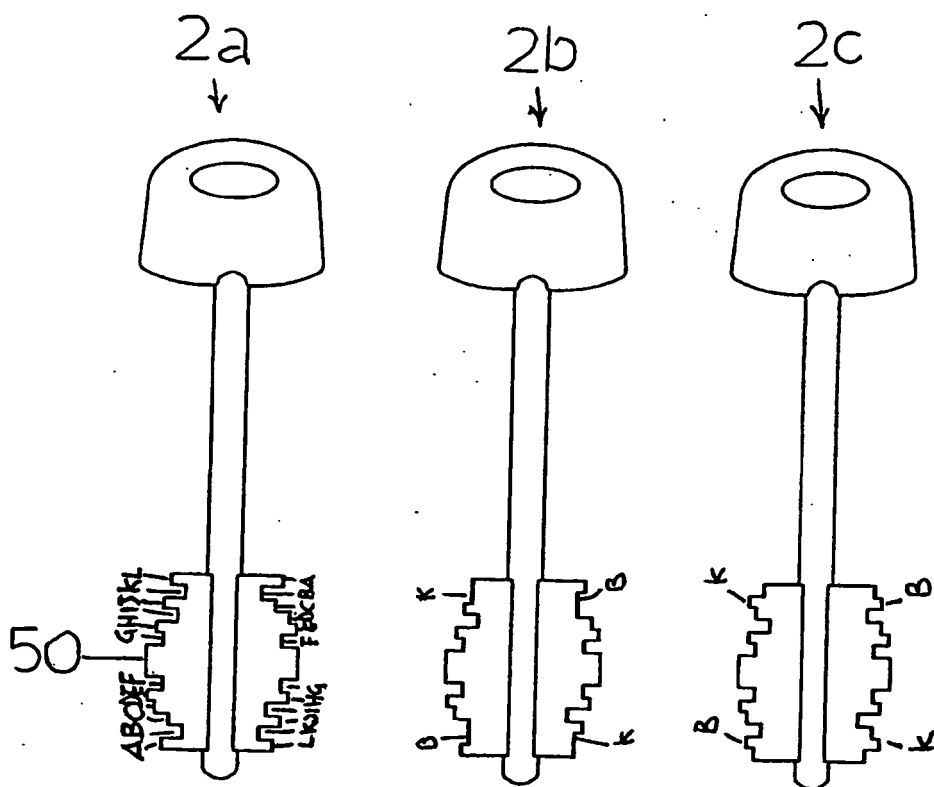


FIG 14

REFERENCES CITED IN THE DESCRIPTION

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