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Description

This invention is concerned with a locking device comprising a lock cylinder and a flat key wherein the cylinder has a housing in which a cylinder plug is rotatably accommodated together with a plurality of tumblers, the bug having a profiled keyway into which the tumblers project in the locked condition of the device, and wherein an additional tumbler is accommodated for sliding movement in a bore extending parallel to the longitudinal centre plane of the keyway, said additional tumbler projecting across the joint line between the plug and the housing when the device is in its locked condition.

One such locking device is described in GB Patent No 112,761 in the name of Eli Epstein. In this device, the cylinder lock has the usual spring-pressed tumbler pins carried by the casing and normally having interlocking engagement with the plug and is further provided with an annular tumbler element carried by the plus and acted on by a spring which tends to force it outwardly into interlocking engagement with the casing, said annular tumbler element being constructed to be moved by the key in a direction parallel but opposite to that of the tumbler pins whereby when the key is inserted said element will be withdrawn from engagement with the casing and the tumbler pins will be withdrawn from the plug. It is a disadvantage of this system that the annular tumbler element has a relatively complex shape and is relatively expensive to manufacture. It is a further disadvantage that a second bore is required in the cylinder core, to accommodate the annular tumbler element, which further increases the difficulty and hence the cost of manufacture.

Another such locking device is described in EP-A-202 949. This document was published on 26.11.86 and therefore falls within the meaning of Art. 54 (3) EPC. In this device not only does the additional tumbler comprise an additional plug pin and an additional housing pin, both of which have to be accommodated respectively in the plug and housing, and further the plug pin has a relatively complex shape by which it can be operated, but also a special construction of key is required which is relatively complex to manufacture. Thus, while said device affords a high degree of security, nevertheless it is expensive and time consuming to manufacture.

It is the object of the present invention to provide an improved locking device wherein the construction is considerably simplified without any significant loss in security.

The object is resolved, in accordance with the present invention, in a locking device comprising a pin tumbler cylinder for a lock and a flat key wherein the key has, on its narrow side opposite to the back edge, notches for the arrangement of tumblers, a longitudinally extending guide groove is formed in one wide surface of the key adjacent the back edge thereof and a longitudinally extending recess is formed in the wide surface of the key, the cylinder has a housing in which a cylinder plug is rotatably accommodated together with a plurality of pin tumblers the plug having a profiled keyway into which the plug tumblers project in the locked condition of the device, and wherein an additional tumbler which has a projection which projects into the keyway is accommodated for sliding movement in a bore extending parallel to the longitudinal centre plane of the keyway, said additional tumbler projecting across the joint line between the plug and the housing when the device is in its locked condition and the projection of the additional tumbler is received in the recess when the key is inserted in the keyway wherein the guide groove passes through and is deeper than the recess and one end of the recess opens into the key tip and the longitudinal side walls of the recess are at their key tip ends formed each with an outwardly inclined run-in surface portion, a first of the surface portions running into the key tip and the second being located rearwardly of the first and wherein the projection of the additional tumbler is engaged in turn by the two surface portions and is thus received in the recess formed in the key when the latter is inserted in the keyway, the distance of the second surface portion from the end remote from the key tip of the recess being greater than the dimension, measured longitudinally of the keyway, of the projection, and the distance between the side walls of the recess at said remote end thereof and the heightwise dimension of the projection being such as to provide a close fit between the projection and said end of the recess.

It will thus be appreciated that in the device in accordance with the present invention the only additional manufacturing step associated with the key construction is a machining operation to provide the recess and a relatively simple construction is required for the additional tumbler with its projection. Nevertheless, the additional security provided by the additional tumbler is not significantly diminished.

Various forms of recess may be provided in accordance with the present invention. For example, the side walls of the recess may run straight, or alternatively the side wall in which the first surface portion is formed may also have a re-entrant surface portion intermediate said first surface portion and the remote end of the recess. In this latter construction preferably the intermediate surface portion has a run-off slope and the second surface portion, formed in the other side wall, is

disposed opposite said run-off slope.

Again, the side wall in which the second surface portion is formed may have a re-entrant surface portion intermediate the second surface portion and the remote end of the recess, and further the other side wall may have a corresponding recessed portion disposed opposite thereto. With such an arrangement, furthermore, if desired a plurality of additional tumblers may be provided, arranged one behind the other in the direction of key insertion, and the heightwise disposition of each projection on its tumbler is determined according to the position of the tumbler in the direction of key insertion and thus its position in relation to the portion of the recess with which it cooperates in the opening condition of the device (viz. when the key is inserted).

In order to control the heightwise movement of the additional tumbler with reliability and certainty, preferably the two side walls provide a parallel-walled guide path for the projection.

Using the locking device in accordance with the invention, it will thus be appreciated that, when the key is inserted into the keyway of the cylinder, firstly the projection is engaged by the first run-in surface portion of the key and is lifted, together with the additional tumbler, during continued key insertion. As the key continues to be inserted, the second run-in surface portion then engages the projection, at the other side thereof, and ensures that it is cammed against the side wall in which the first surface portion is formed. At this stage the heightwise disposition of the tumbler is fully controlled, without the need for springs or other devices common in lock constructions. The projection is now held in the parallel-walled guide path and remains under control for the remainder of the key insertion, at the end of which the tumbler has freed the cylinder, which is thus now in its opening condition.

Conveniently the second surface runs into the back edge of the key. Furthermore, preferably the bore in which the additional tumbler is accommodated opens at both ends into the surface of the plug, the length of the additional tumbler corresponding to the length of the bore and the projection being spaced from one end of the additional tumbler such that, in the opening condition of the device, the addtional tumbler is accommodated wholly within the bore. In this way, it will be appreciated, it is not necessary to provide a separate plug pin and housing pin for the additional tumbler, but rather a single pin is sufficient.

In accordance with the present invention, furthermore, the guide groove passes through, but is deeper than, the recess. In this way, the guide groove still can serve its function without interfering in any way with the operation of the recess, and further without the recess and projection having any detrimental effect on the guidance of the key.

It will be appreciated that in the locking device in accordance with the invention rotation of the plug and insertion of an unauthorised key is advantageously prevented in the region of the guidance groove. Using such a device furthermore, the key firstly retains its unitary construction but on the other hand makes an extensive profile variation possible. The arrangement of grooves and ribs on the wide sides of the key remains unaffected, since the operation controlling the projection takes place exclusively in the generally most solid region of the flat key, namely the back. Also it is sufficient if a quite small part of the key length is used for the recess. On the other hand, however, further variations in respect of the depth of insertion can be achieved without detriment. In addition, the mode of construction is both simple and practical.

In use, the appropriately arranged inclined run-in surface portions are effective, when the key is inserted, forcibly to operate the projection. Thus there is no requirement for means, e.g. springs or the like, whereby a particular end position is determined. Nevertheless the function is highly certain. Compared with keys having the same overall construction from the point of view of the locking system used, the modification is scarcely noticeable. The offset of the first run-in surface portion from the tip of the key is quite small. Usual keys having the same locking function and profile would on the other hand collide with the projection, producing a barring effect, since their tip is relatively thicker in the direction of insertion. Modification of the key tip, however, e.g. to avoid operating the additional tumbler, would result not only in failure to release the latter, but also in prevention of the operation of the cylinder cam (or thrower), quite apart from difficulties in initial insertion of the key and in the normal operation of the tumbler pins.

By the feature of the second run-in surface portion running into the back edge of the key, furthermore, the control function of this second edge begins at a zero position, viz. in the plane of the joint line end of the cylinder plug, which is advantageous in terms of the control of the heightwise disposition of the additional tumbler.

It is also favourable that the depth of the recess is smaller than that of the guidance groove passing therethrough. In this way no grooving beyond the usual amount arises at the recessed wide face of the key because of the recess; the key blade thus retains its stability.

There now follows a detailed description, to be read with reference to the accompanying drawings, of three exemplary embodiments of the present invention. It will of course be understood that these three embodiments have been selected for de-

scription merely by way of non-limiting example.

In the accompanying drawings:-

Figs. 1 and 2 show in side view a locking cylinder and an associated flat key;

Figs. 3 and 4 are views in plan of the cylinder and key shown in Figs. 1 and 2;

Fig. 5 is a fragmentary view on an enlarged scale of the tip end of the key, in a first embodiment of the invention, showing also a projection of an additional tumbler of the cylinder;

Fig. 6 is a section taken along the line VI-VI of Fig.5;

Fig. 7 is a view in section taken along the line VII-VII of Fig. 1, showing the additional tumbler in a locking condition;

Fig. 8 is a view similar to Fig. 7, but with the key inserted and the cylinder in consequent opening condition;

Fig. 9 is a view similar to Figs. 7 and 8 but with the additional tumbler in an intermediate position;

Figs. 10 to 12 are respectively side, front and underneath plan views of the additional tumbler;

Fig. 13 is a view, similar to Fig. 5, but of a key in accordance with a second embodiment of the invention;

Fig. 14 is a view in section taken along the line XIV-XIV of Fig. 13;

Fig. 15 is a view, similar to Figs. 5 and 13, but of a key in accordance with a third embodiment of the invention; and

Fig. 16 is a view in section taken along line XVI-XVI of Fig. 15.

Referring to Figs. 1 to 4, the lock cylinder 1 shown is a double cylinder having a cylinder housing 2 which supports in a middle section 3 a cam (or thrower) 4. In each of the two opposed housing sections, of which one is only partially shown, a cylinder plug 5 is journalled and is connected to the cam upon insertion of a key 6. The intermediate connection element (not described in detail) is engaged by the insertion-end tip Sp of the key blade 7 to operate it. Each cylinder plug 5 (one only of which is hereinafter described) has a keyway 8 suited to the cross-sectional profile of the key. Radially disposed plug pins 9 project into the keyway, being aligned, when the flat key 6 is removed, with housing pins 10 which are urged by compression springs 11 in the direction of the cylinder plug 5. In the embodiments five such tumblers are provided for each cylinder plug.

The blade 7 of the flat key 6 has on both wide sides profiled variation grooves 12 extending in the direction of key insertion and profile variation ribs 13 adjacent thereto. Extending in opposed relation to the back edge 14 of the key blade 7, which is matched accurately to the cylindrical shape of the cylinder plug 5, are V-cuts 15 of different depths. The axial distance between the bottom of adjacent cuts is however the same in each case. All the V-cuts 15 end spaced from a guide section of the key blade 7 in the zone of which, near to the back, extends a continuous guide groove 16. A base 16' of the latter extends right into the region of a longitudinal central plane A-B of the flat key blade 7, which plane also corresponds to the like-designated plane of symmetry of the locking device.

The tip Sp of the key blade 7 is, as can be seen in the drawings, cut in a peak-shape such that two diverging end surfaces, including an angle of less than 90°, lie adjacent a slightly convex-shaped first zone forming the tip Sp, the upper of which end surfaces runs into the back edge 14 and the lower into the start of the first V-cut.

The tip end region of the guide groove 16 (see Fig. 5) has formed therein a widened portion or recess E which is open up to the tip Sp. For co-operating with said recess E a projection N is arranged on an additional tumbler 17 which faces the key blade 7, said projection projecting transversely into the keyway 8. The additional tumbler 17 is accommodated in a bore 18 of the cylinder plug 15, which bore runs parallel to the longitudinal centre plane A-B of the keyway 8. For operating the additional tumbler 17 the recess E has two outwardly inclined run-in surface portions, each leading into a side wall of the recess. More particularly, the key tip end of one side wall 19 of the recess E, lying at the V-cut side of the recess, has formed therein a first inclined run-in surface portion I, the angle of inclination of which is about 45°. The key tip end a of this surface portion I is in planar alignment with the underside 20 of the projection N, or lies slightly therebeneath. This basic orientation of the additional tumbler 17 is defined by supporting the underside 20 of the projection N on a bottom edge 21 of a cut-out 22 formed in the cylinder plug 5 (see Fig. 7), which cut-out intersects the keyway 8. In this position (corresponding to the locked condition of the device) both the conventional tumblers, formed from the plug pins 9 and housing pins 10, and also the additional tumbler 17, intersect the lock cylinder joint line F, the lower end 17' of the additional tumbler projecting into a locking recess 23 formed in the cylinder housing 2 and lying on the same axis as the bore 18. The locking recess 23 is machined through an aligned bore 24 provided in the cover of the cylinder housing 2, which bore can then be plugged.

Since said end a of the first run-in surface portion I extends rearwardly in relation to the arched peak b (see Fig. 5) forming the key tip Sp, a flat key of otherwise the same type would, without the recess E, collide with the corresponding vertical side surface 25 of the projection N; such a key would thus be barred.

The key tip end of the other side wall of the recess E has formed therein a second run-in surface portion II, disposed at a greater distance from the tip Sp than the first surface portion I. The distance y of said second surface portion II from the end 26, remote from the key tip, of the recess E is greater than the dimension, measured in the direction of key insertion, of the projection N. The end 26 of the recess E forms an end cut-out designated E', which is rounded off, e.g. to conform to a rounded projection shape (not shown in detail). In the first embodiment the projection N is generally rectangular in cross-section with bevels 27 formed at the edges, the bevel engaging the end a of the first surface portion I enabling the additional tumbler 17 to be operated smoothly.

In the third embodiment illustrated in Figs. 15 and 16 the two run-in surface portions I, II form a reception funnel which is closely adjacent to the tip and from which the recess E extends with straight parallel sides up to the end 26. The first embodiment shown in Fig. 5, on the other hand, has a more complex arrangement in that the side wall forms in combination with the first run-in surface portion I a guide path having a re-entrant portion 19 lying more closely to the back edge 14 of the key 6. The guide path thus runs into the end cut-out E' of the recess E, running parallel to the second run-in surface portion II, and indeed is arranged first descending and then extending straight. This shape therefore operates in altogether three planes. The first plane, which allows the key to move beneath the projection N by virtue of the end a of the first surface portion I, runs into a higher plane defined by the wall portion 19. In this position an upper end 17'' of the additional tumbler 17 enters the bore 24 of the cylinder housing cover. The guide path then has a descending portion defined by a run-off surface portion 28, which runs parallel with the second surface portion II, the guide path thus leading to the end cut-out E', which forms the third plane in which the additional tumbler 17 no longer projects beyond the lock cylinder joint line F (see Fig. 8). The lower end 17' of the additional tumbler 17 is cut back at the inner side 17''' (see Figs. 10 to 12) so that the pointed zone does not hook on the corresponding edge of the hole of the locking recess 23. The cylinder plug 5 is now rotatable. As can be seen in Fig. 8, the distance of the projection N from the upper end surface of the additional tumbler 17 is of the same dimension as the heightwise distance of the guide path from the back edge of the key.

The second embodiment (Figs. 13 and 14) differs from the aforedescribed merely in that the end cut-out E' of the recess E rises again in the region of the end 26; the guide path is thus wave-shaped in this case. As can be seen the recess E extends over a region of two V-cuts 15. In this case, therefore, two or even more additional tumblers 17 may be provided, lying one behind the other in the direction of insertion of the key 6, and each having a projection N; the distance by which, in the opening condition, each projection lies from the back edge 14 is thus determined by its position along the keyway. The planes associated with said tumblers are designated C-D and G-H and are disposed on lands between the conventional tumblers 10/11. The lower section of the guide path lying between the see wall portion 19 and the end cut-out E' is embraced by a trapezoidal bridge 29, thus proving the wave contour. In this way moreover the amount of material remaining is substantial, so that practically no weakening of the end region of the flat key arises, since the recess E does not in any event extend up to the base 16' of the guide groove 16. In this way also visually the key retains an appearance corresponding to that of similar keys, because the guide rib structure is partially continued.

In using any one of the keys described above, upon insertion thereof the projection N of the additional tumbler 17 is raised and, when the key is fully inserted, is held by closed-fitted guidance in opening condition. When the key is withdrawn, on the other hand, the gravity-dependent additional tumbler 17 moves into a locking condition, thus barring rotation by projecting beyond the lock cylinder joint line F. The introduction of a generally similar key which does not have the recess E is barred since the tip Sp collides with the side 25 of the projection N so that insertion of the key is prevented and the additional tumbler 17 cannot be lifted.

Claims

1. A locking device comprising a pin tumbler cylinder (1) for a lock and a flat key (6) wherein the key (6) has, on its narrow side opposite to the back edge (14), notches (15) for the arrangement of tumblers, a longitudinally extending guide groove (16) is formed in one wide surface of the key (6) adjacent the back edge (14) thereof and a longitudinally extending recess (E) is formed in the wide surface of the key (6), the cylinder (1) has a housing (2) in which a cylinder plug (5) is rotatably accommodated together with a plurality of pin tumblers (9,10) the plug (5) having a profiled keyway (8) into which the plug tumblers (9) project in the locked condition of the device, and wherein an additional tumbler (17) which has a projection (N) which projects into the keyway (8) is accommodated for sliding movement in a bore (23) extending parallel to

the longitudinal centre plane A-B of the keyway (8), said additional tumbler (17) projecting across the joint line between the plug (5) and the housing (2) when the device is in its locked condition and the projection (N) of the additional tumbler (17) is received in the recess (E) when the key (6) is inserted in the keyway (8) wherein the guide groove (16) passes through and is deeper than the recess (E) and one end of the recess (E) opens into the key tip (Sp) and the longitudinal side walls of the recess (E) are at their key tip ends formed each with an outwardly inclined run-in surface portion (I,II), a first (I) of the surface portions running into the key tip (Sp) and the second (II) being located rearwardly of the first (I) and wherein the projection (N) of the additional tumbler (17) is engaged in turn by the two surface portions (I,II) and is thus received in the recess (E) formed in the key (6) when the latter is inserted in the keyway (8), the distance (y) of the second surface portion (II) from the end (E') remote from the key tip (Sp) of the recess (E) being greater than the dimension, measured longitudinally of the keyway (8), of the projection (N), and the distance (x) between the side walls of the recess (E) at said remote end (E') thereof and the heightwise dimension of the projection (N) being such as to provide a close fit between the projection (N) and said end (E') of the recess (E).

2. Device according to Claim 1 characterised in that that the side walls of the recess (E) run straight.

3. Device according to Claim 1 characterised in that the side wall in which the first surface portion (I) is formed also has a re-entrant surface portion (19) intermediate said first surface portion (I) and the remote end (E') of the recess (E).

4. Device according to Claim 3 characterised in that the intermediate surface portion (19) has a run-off slope (28) and in that the second surface portion (II), formed in the other side wall, is disposed opposite said run-off slope (28).

5. Device according to Claim 1 characterised in that the side wall in which the second surface portion (II) is formed has a re-entrant surface portion (29) intermediate said second surface portion (II) and the remote end (E') of the recess (E) and in that the other side wall has a corresponding recessed portion disposed opposite thereto.

6. Device according to Claim 5 characterised by a plurality of additional tumblers (17) arranged one behind the other in the direction of key insertion, and in that the heightwise disposition of each projection (N) on its tumbler (17) is determined according to the position of the tumbler (17) in the direction of key insertion and thus its position in relation to the portion of the recess (E) with which it co-operates in the opening condition of the device.

7. Deuce according to any one of the preceding Claims characterised in that the two side walls provide a parallel-walled guide path for the projection (N).

8. Device according to any one of the preceding Claims characterised in that said second surface portion (II) runs into the back edge (14) of the key (6).

9. Device according to any one of the preceding Claims characterised in that the bore (23) in which the additional tumbler (17) is accommodated opens at both ends into the surface of the plug (5), in that the length of the additional tumbler (17) corresponds to the length of the bore (23), and in that the projection (N) is spaced from the one end of the additional tumbler (17) such that, in the opening condition of the device (viz. when the key (6) is inserted), the additional tumbler (17) is accommodated wholly within the bore (23).

Patentansprüche

1. Schließvorrichtung mit einem Stiftzuhaltungszylinder (1) für ein Schloß und einem Flachschlüssel (6), wobei der Schlüssel (6) an seiner schmalen Seite gegenüber dem rückwärtigen Rand (14) Kerben (15) für die Anordnung von Zuhaltungen aufweist, eine längs sich erstrekkende Führungsnut (16) in einer breiten Oberfläche des Schlüssels (6) benachbart zu dessen rückwärtigem Rand (14) ausgebildet ist und eine längs sich erstreckende Ausnehmung (E) in der breiten Oberfläche des Schlüssels (6) ausgebildet ist, der Zylinder (1) ein Gehäuse (2) aufweist, in welchem ein Zylinderzapfen (5) drehbar zusammen mit einer Vielzahl von Stiftzuhaltungen (9, 10) aufgenommen ist, wobei der Zapfen (5) einen profilierten Schlüsselschlitz (8) aufweist, in welchen die Zapfenzuhaltungen (9) im verriegelten Zustand der Vorrichtung ragen, wobei eine zusätzliche Zuhaltung (17), welche einen Vorsprung (N) aufweist, welcher in den Schlüsselschlitz (8) ragt, zwecks Gleitbewegung in einer Bohrung (23)

aufgenommen ist, die sich parallel zu der Längsmittelebene A-B des Schlüsselschlitzes (8) erstreckt, wobei die zusätzliche Zuhaltung (17) über die Verbindungslinie zwischen dem Zapfen (5) und dem Gehäuse (2) ragt, wenn die Vorrichtung in ihrem verriegelten Zustand ist, und der Vorsprung (N) der zusätzlichen Zuhaltung (17) in der Ausnehmung (E) aufgenommen ist, wenn der Schlüssel (6) in den Schlüsselschlitz (8) eingeführt ist, wobei die Führungsnut (16) durch die Ausnehmung (E) läuft und tiefer als diese ist und ein Ende der Ausnehmung (E) in die Schlüsselspitze (Sp) öffnet und die Längsseitenwände der Ausnehmung (E) an ihren Schlüsselspitzenenden jeweils mit einem auswärts geneigten Einlaufoberflächenabschnitt (I, II) ausgebildet sind, wobei der erste (I) der Oberflächenabschnitte in die Schlüsselspitze (Sp) läuft und der zweite (II) hinter von dem ersten (I) angeordnet ist und wobei der Vorsprung (N) der zusätzlichen Zuhaltung (17) seinerseits durch die zwei Oberflächenabschnitte (I, II) im Eingriff und somit in der Ausnehmung (E) aufgenommen ist, welche in dem Schlüssel (6) ausgebildet ist, wenn letzterer in den Schlüsselschlitz (8) eingeführt ist, wobei der Abstand (y) des zweiten Oberflächenabschnittes (II) von dem Ende (E') entfernt von der Schlüsselspitze (Sp) der Ausnehmung (E) größer ist als die Abmessung des Vorsprunges (N), gemessen längs des Schlüsselschlitzes (8), und der Abstand (x) zwischen den Seitenwänden der Ausnehmung (E) an deren entferntem Ende (E') und die Höhenabmessung des Vorsprunges (N) derart sind, daß eine Feinpassung zwischen dem Vorsprung (N) und dem Ende (E') der Ausnehmung (E) geschaffen ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Seitenwände der Ausnehmung (E) gerade verlaufen.

3. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Seitenwand, in welcher der erste Oberflächenabschnitt (I) ausgebildet ist, ebenfalls einen Wiedereintritts-Oberflächenabschnitt (19) zwischen dem ersten Oberflächenabschnitt (I) und dem entfernt liegenden Ende (E') der Ausnehmung (E) aufweist.

4. Vorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß der Zwischenoberflächenabschnitt (19) eine Ablaufschräge (28) aufweist und daß der zweite Oberflächenabschnitt (II), welcher in der anderen Seitenwand vorgesehen ist, der Ablaufschräge (28) gegenüberliegend angeordnet ist.

5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Seitenwand, in welcher der zweite Oberflächenabschnitt (II) ausgebildet ist einen Wiedereintritts-Oberflächenabschnitt (29) zwischen dem zweiten Oberflächenabschnitt (II) und dem entfernt liegenden Ende (E') der Ausnehmung (E) aufweist, und daß die andere Seitenwand einen entsprechenden ihm gegenüberliegenden mit einer Ausnehmung versehenen Abschnitt aufweist.

6. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß eine Vielzahl von zusätzlichen Zuhaltungen (17) hintereinander in der Richtung des Einführens des Schlüssels angeordnet ist und daß die Hochlage eines jeden Vorsprungs (N) an seiner Zuhaltung (17) entsprechend der Lage der Zuhaltung (17) in Richtung des Einsetzens des Schlüssels und somit entsprechend ihrer Lage bezüglich des Abschnittes der Ausnehmung (E) bestimmt ist, mit welchem er im Öffnungszustand der Vorrichtung zusammenwirkt.

7. Vorrichtung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die beiden Seitenwände für den Vorsprung (N) einen parallelwandigen Führungsweg schaffen.

8. Vorrichtung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der zweite Oberflächenabschnitt (II) in den rückwärtigen Rand (14) des Schlüssels (6) läuft.

9. Vorrichtung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Bohrung (23), in welcher die zusätzliche Zuhaltung (17) aufgenommen ist, sich an beiden Enden in die Oberfläche des Zapfens (5) öffnet, daß die Länge der zusätzlichen Zuhaltung (17) der Länge der Bohrung (23) entspricht und daß der Vorsprung (N) von dem einen Ende der zusätzlichen Zuhaltung (17) derart beabstandet ist, daß im Öffnungszustand der Vorrichtung (nämlich wenn der Schlüssel (6) eingeführt ist) die zusätzliche Zuhaltung (17) vollständig innerhalb der Bohrung (23) aufgenommen ist.

Revendications

1. Dispositif de fermeture comprenant un barillet (1) à goupille pour une serrure et une clé plate (6) dans lequel la clé (6) possède sur son côté étroit opposé à l'arête de dos (14), des encoches (15) destinées à loger des goupilles, une rainure de guidage (16) s'étendant longitudinalement est réalisée sur une surface large de la

clé (6) voisine de son arête de dos (14) et un évidement (E) s'étendant longitudinalement est réalisé sur la surface large de la clé (6), le barillet (1) comprend un stator (2) dans lequel un rotor de barillet (5) est logé mobile en rotation, avec une pluralité de goupilles (9, 10), et possède une entrée de clé profilée (8) dans laquelle les goupilles (9) sont engagées, dans l'état fermé du dispositif, et dans lequel une goupille additionnelle (17) posséde un mentonnet (N) qui s'étend dans l'entrée de clé (8), est logé pour décrire un mouvement de coulissement dans un perçage (23) qui s'étend parallèlement au plan médian (A-B) longitudinal de l'entrée de clé (8), cette goupille additionnelle (17) s'étendant en travers de la ligne de joint entre le rotor (5) et le stator (2) lorsque le dispositif est dans son état fermé, et le mentonnet (N) de la goupille additionnelle (17) est reçu dans l'évidement (E) lorsque la clé (6) est insérée dans l'entrée de clé (8), dans lequel, la rainure de guidage (16) s'étend à travers l'évidement (E) et est plus profonde que celui-ci, et une extrémité de l'évidement (E) s'ouvre dans la pointe de la clé (Sp) et chacune des parois latérales longitudinales de l'évidement (E) est munie, à son extrémité côté pointe de clé, d'une portion de surface d'entrée inclinée vers l'extérieur (I, II), une première (I) des portions de surface aboutissant dans la pointe (Sp) et la deuxième (II) étant placée en arrière de la première (I), et dans lequel le mentonnet (N) de la goupille additionnelle (17) est attaqué tour à tour par les deux portions de surface d'entrée (I, II), et se loge ainsi dans l'évidement (E) formé dans la clé (6), lorsque cette dernière est insérée dans l'entrée de clé (8), la distance (y) de la deuxième portion (II) de surface à l'extrémité (E') de l'évidement (E) qui est éloigné de la pointe de clé (Sp) étant plus grande que la dimension du mentonnet, mesuré dans la direction de la longueur de l'entrée de clé (8), cependant que la distance (x) entre les parois latérales de l'évidement (E), mesurée à ladite extrémité éloignée, et la dimension en hauteur du mentonnet (N) étant propre à établir un ajustement serré entre le mentonnet (N) et cette extrémité (E') de l'évidement (E).

2. Dispositif selon la revendication 1, caractérisé en ce que les parois latérales de l'évidement (E) s'étendent en ligne droite.

3. Dispositif selon la revendication 1, caractérisé en ce que la paroi latérale dans laquelle la première portion de surface (I) est formée possède en outre une portion de surface rentrante (19) qui est intermédiaire entre ladite première portion de surface (I) et l'extrémité éloignée (E') de l'évidement (E).

4. Dispositif selon la revendication 3, caractérisé en ce que la portion de surface intermédiaire (19) présente une pente de sortie (28) et en ce que la deuxième portion de surface (II) formée dans l'autre paroi latérale est disposée en face de cette pente de sortie (28).

5. Dispositif selon la revendication 1, caractérisé en ce que la paroi latérale dans laquelle la deuxième portion de surface (II) est formée possède une portion de surface rentrante (19) entre cette deuxième portion de surface (II) et l'extrémité éloignée (E') de l'évidement (E) et en ce que l'autre paroi latérale présente une portion creusée correspondante disposée en face de cette portion rentrante.

6. Dispositif selon la revendication 5, caractérisé par une série de goupilles additionnelles (17) disposées l'une derrière l'autre dans le sens de l'insertion de la clé et en ce que la disposition en hauteur de chaque mentonnet (N) sur sa goupille (17) est déterminée en fonction de la position de la goupille (17) dans le sens de l'insertion de la clé et, par conséquent, en fonction de sa position par rapport à la portion de l'évidement (E) avec laquelle elle coopère dans l'état ouvert du dispositif.

7. Dispositif selon une quelconque des revendications précédentes, caractérisé en ce que les deux parois latérales forment une piste de guidage à parois parallèles pour le mentonnet (N).

8. Dispositif selon une quelconque des revendications précédentes, caractérisé en ce que cette deuxième portion de surface (II) aboutit dans l'arête de dos (14) de la clé (6).

9. Dispositif selon une quelconque des revendications précédentes, caractérisé en ce que le perçage (23) dans lequel la goupille additionnelle (17) est logée s'ouvre à ses deux extrémités dans la surface du rotor (5), en ce que la longueur do la goupille additionnelle (17) correspond à la longueur du perçage (23) et en ce que le mentonnet (N) est espacé d'une première extrémité de la goupille additionnelle (17) d'une distance telle que, dans l'état ouvert du dispositif (c'est-à-dire lorsque la clé (6) est insérée, la goupille additionnelle (17) soit entièrement contenue dans le perçage (23).

FIG.1

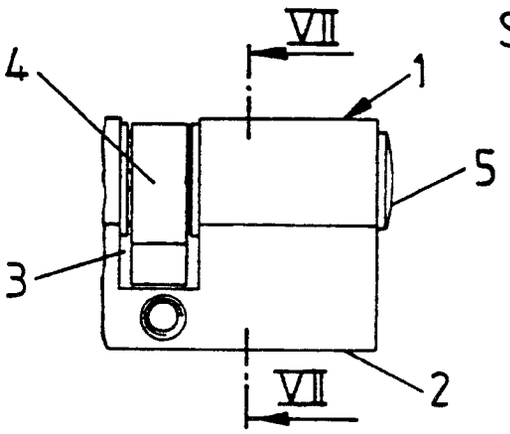
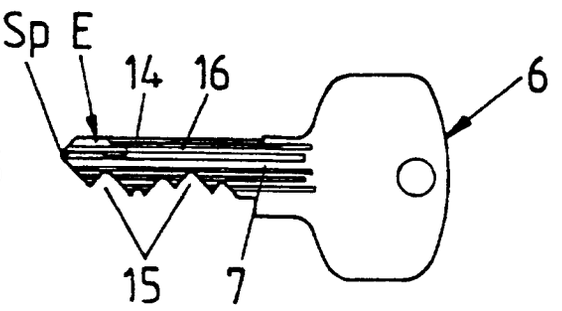


FIG.2



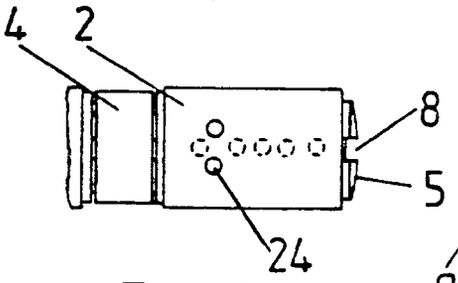


FIG.3

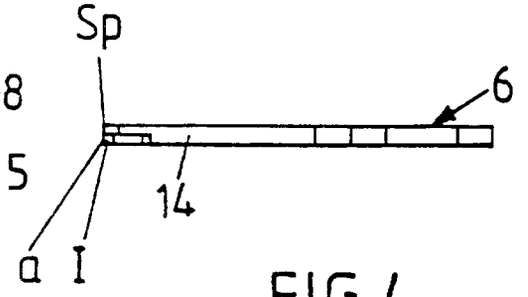


FIG.4

FIG.6

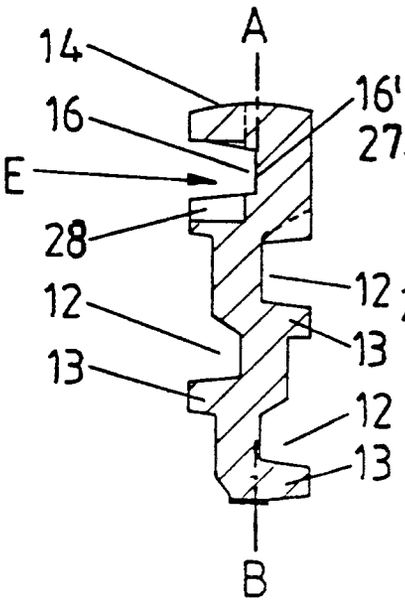


FIG.5

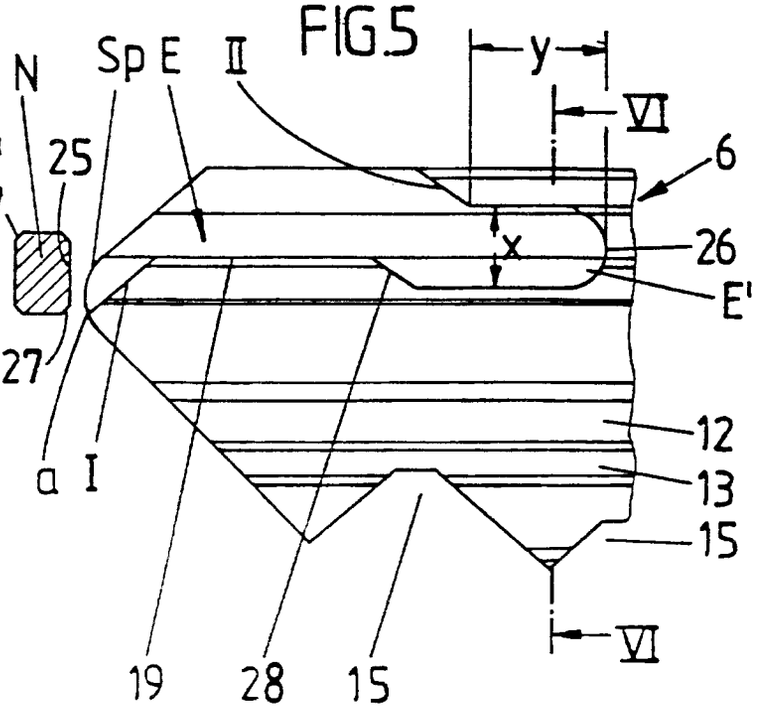


FIG.7

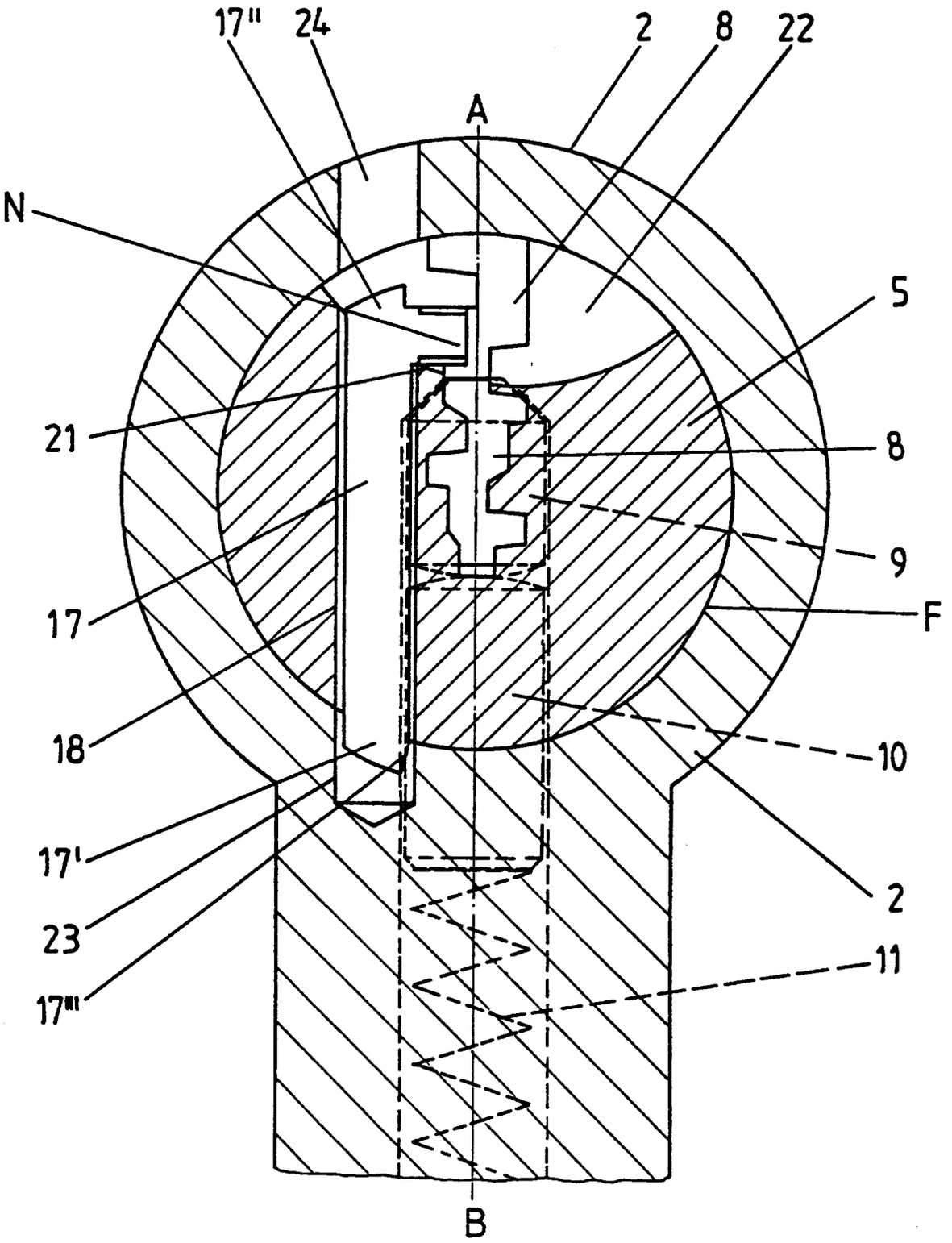


FIG.8

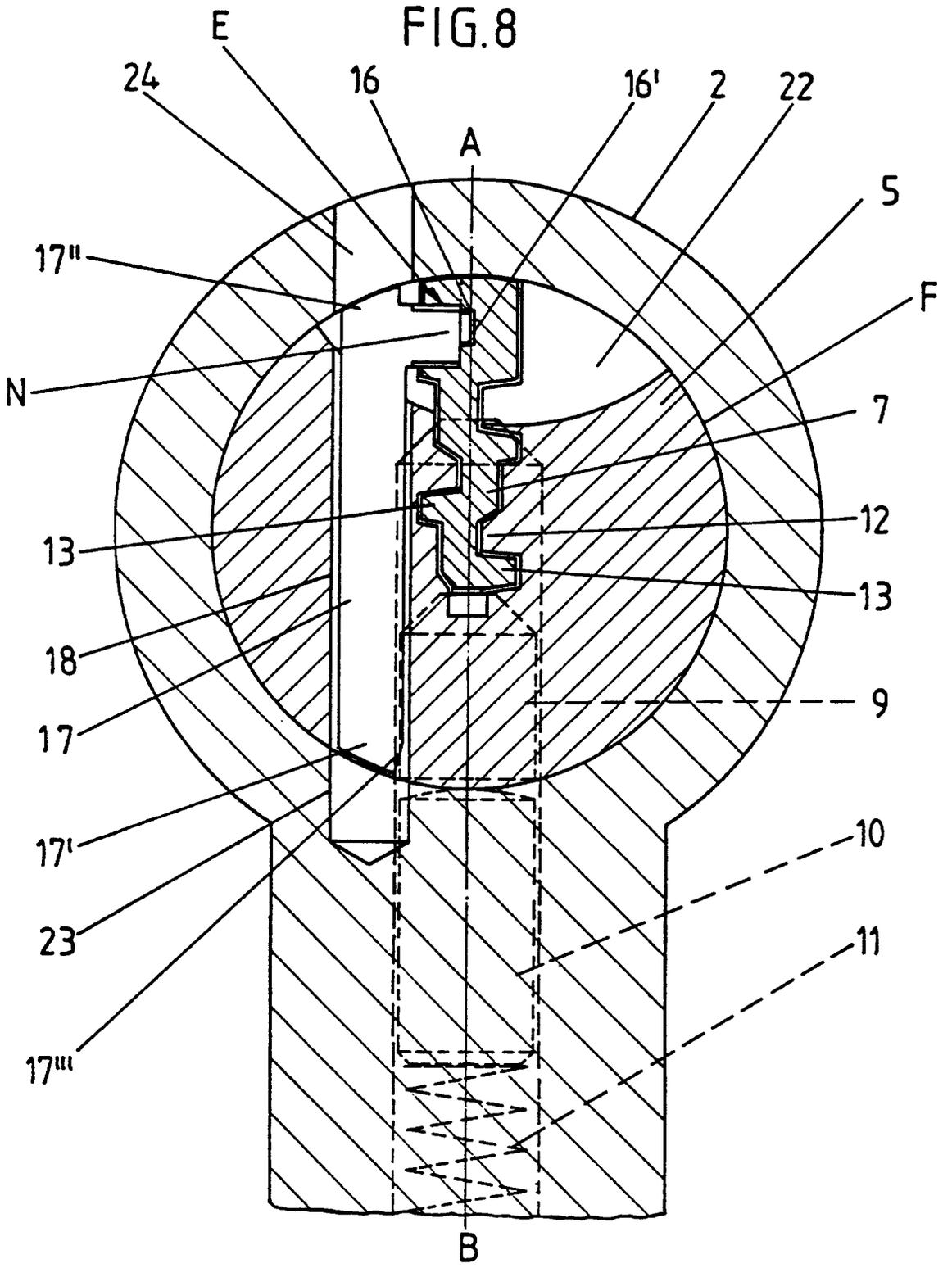


FIG.9

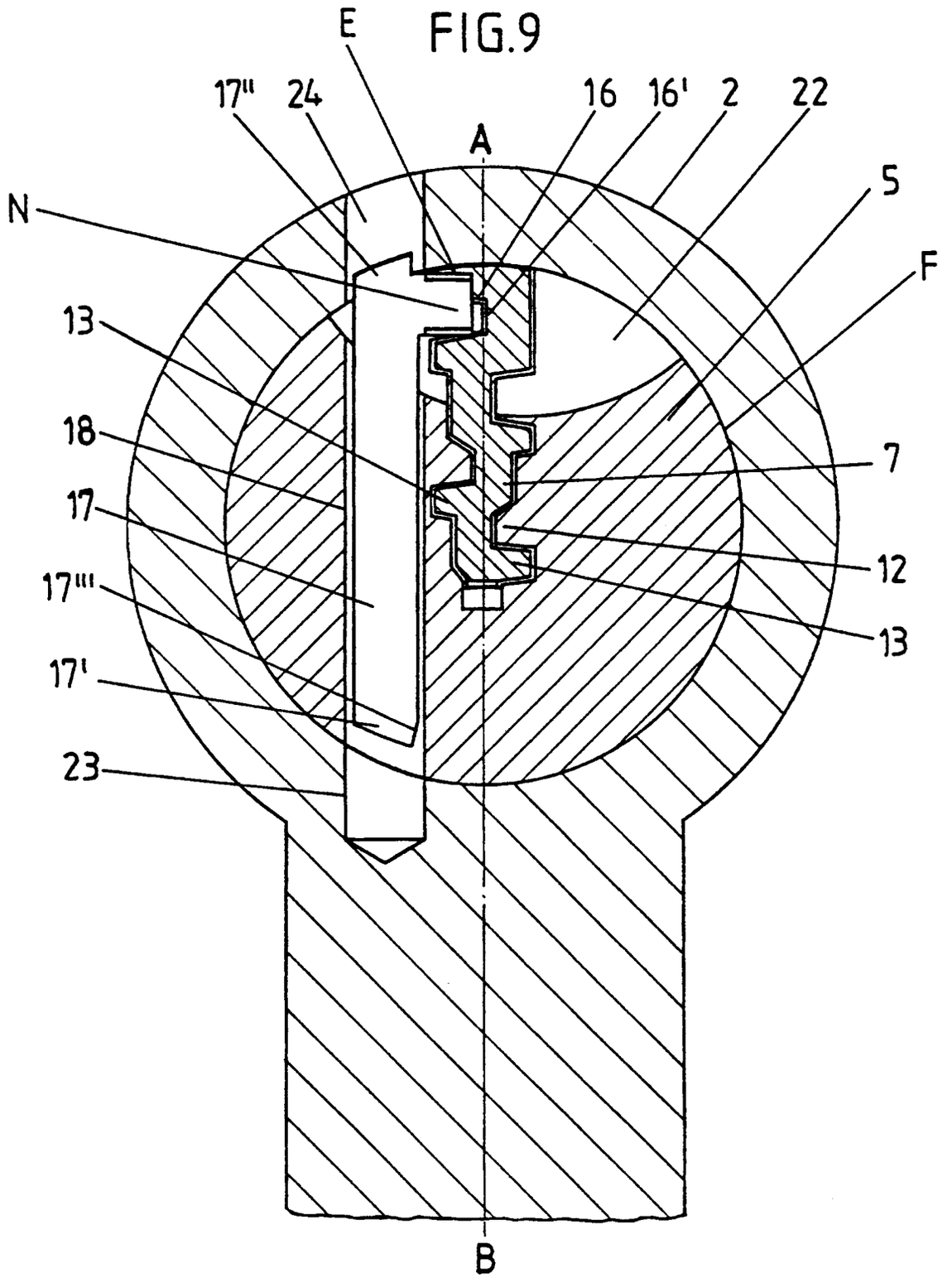


FIG.12

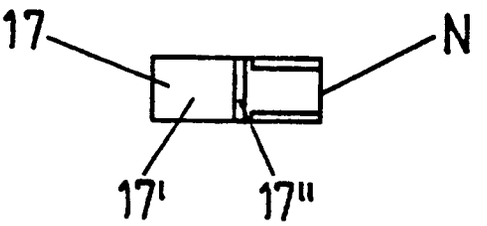


FIG.11

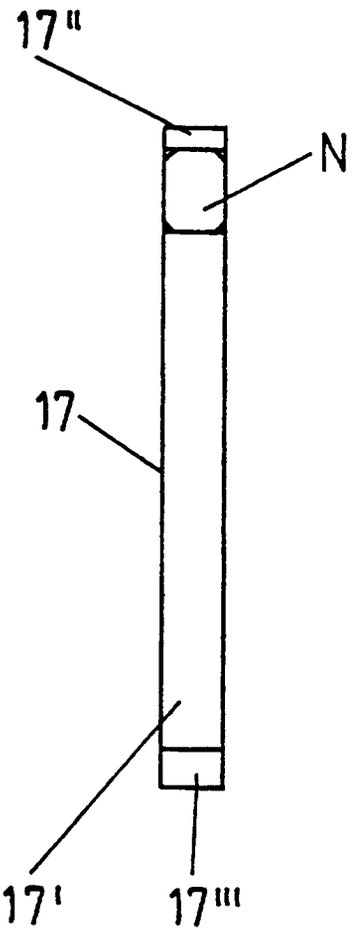


FIG.10

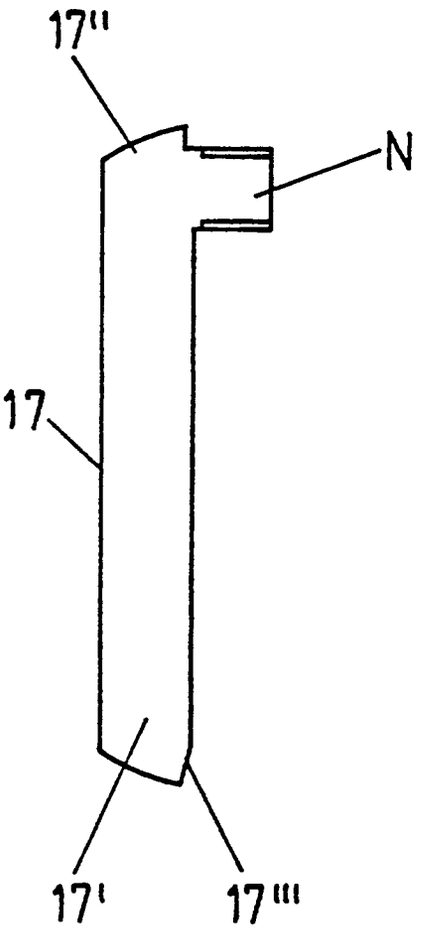


FIG.13

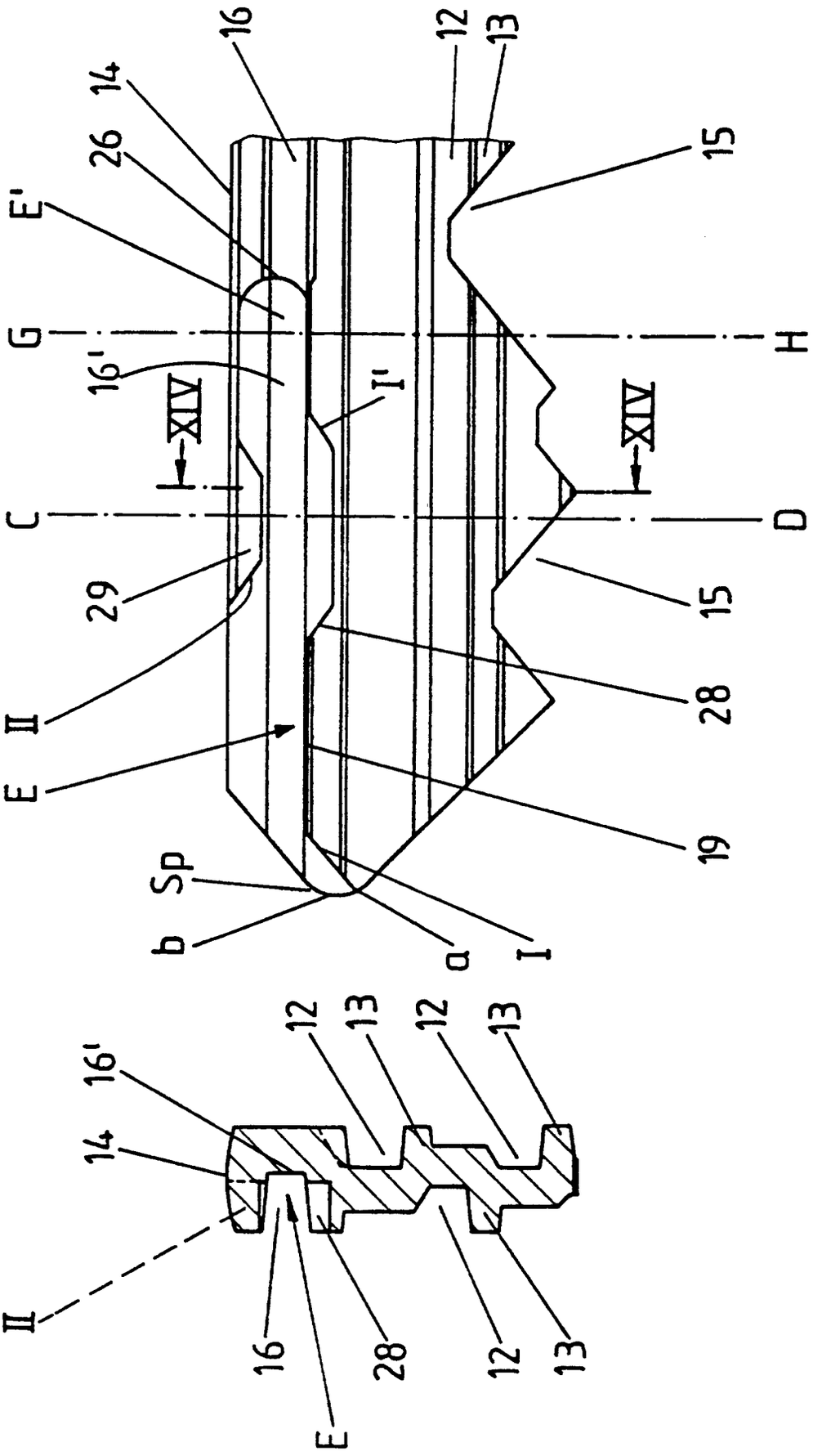

16
12
13
14
26
E'
15
G
H
16'
XIV
I'
XIV
C
D
29
15
II
28
E
19
Sp
b
a'
I

FIG.14

16'
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II
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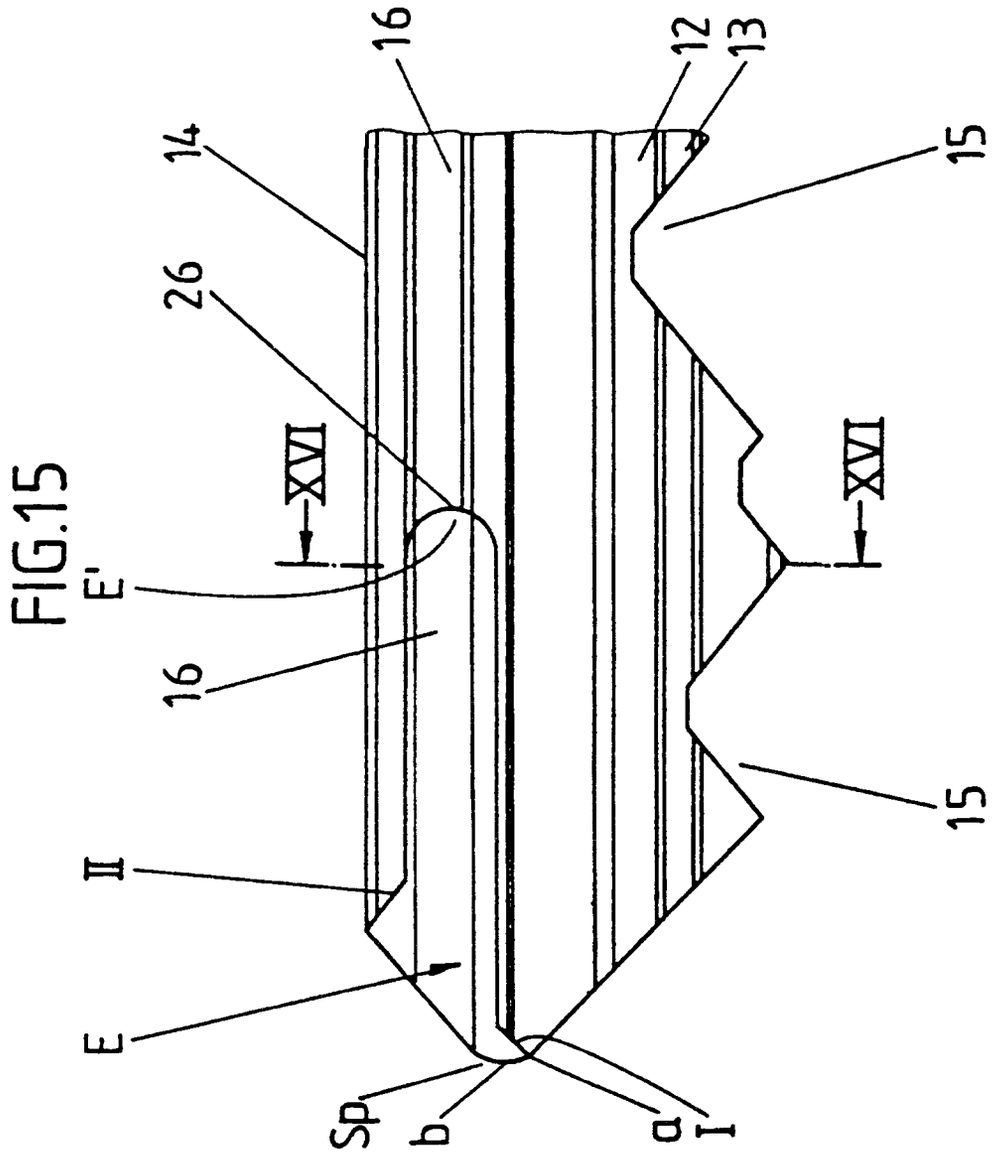
13
E

FIG.15


16
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XVI
E'
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II
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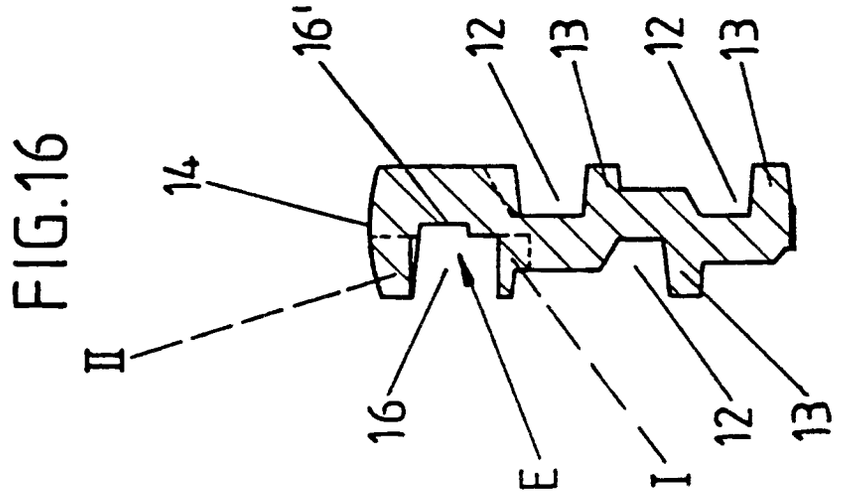
Sp
b
a
I
15

FIG.16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