

(19)



(11)

**EP 3 482 023 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

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

**27.05.2020 Bulletin 2020/22**

(51) Int Cl.:

**E05B 27/00** <sup>(2006.01)</sup>

(86) International application number:

**PCT/IT2016/000173**

(21) Application number: **16770804.9**

(22) Date of filing: **11.07.2016**

(87) International publication number:

**WO 2018/011828 (18.01.2018 Gazette 2018/03)**

**(54) ANTI-INTRUSION CYLINDER FOR LOCKS**

**EINBRUCHVERHINDERNDER ZYLINDER FÜR SCHLÖSSER**

**BARILLET ANTI-INTRUSION POUR SERRURES**

(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**

(43) Date of publication of application:

**15.05.2019 Bulletin 2019/20**

(73) Proprietor: **Cisa S.p.a.**

**48018 Faenza (IT)**

(72) Inventor: **FABBRI, Matteo**

**I-47121 Forlì (IT)**

(74) Representative: **Modiano, Micaela Nadia**

**Modiano & Partners**

**Via Meravigli, 16**

**20123 Milano (IT)**

(56) References cited:

**EP-A1- 1 582 662 DE-B- 1 122 866**

**US-A- 2 111 515 US-A- 2 158 501**

**EP 3 482 023 B1**

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).

## Description

**[0001]** The present invention relates to an anti-intrusion cylinder for locks, in particular in order to prevent, using the lock alone, the key from being cloned by making a perfect impression of the internal components for coding the lock.

**[0002]** Currently locks exist that comprise a cylinder (within which the key must be inserted for opening) provided with a stator and with a rotor which are mutually coupled by way of a plurality of pins and counterpins that can slide within stator and rotor channels: each channel of the stator is facing and aligned with the respective channel of the rotor when the cylinder is in the locked configuration (key taken out, or inserted but not rotated with respect to the insertion configuration).

**[0003]** Between the bottom of the channel of the stator and the lower surface of the counterpin there is an elastic element that has an axial action designed to keep the counterpin away from the bottom, unless external actions entail lowering the counterpin (for example the insertion of the key in the cylinder).

**[0004]** The key, by way of its contoured (encoded) profile, acts on the upper surface of the pins, lowering them and bringing the discontinuity surface that separates the bottom of the pin from the apex of the counterpin into perfect alignment with the discontinuity surface present between rotor and stator, which can be substantially mutually disengaged (with the key inserted).

**[0005]** The rotor (with the key inserted, therefore with the pins lowered according to the coding) can be rotated by turning the head of the key which protrudes from the cylinder: in this manner the opening of the lock is permitted.

**[0006]** It is known that if an impression of the key is available, it is possible to obtain a perfect working copy thereof.

**[0007]** Methods are further known that make it possible to copy the key starting from the lock.

**[0008]** A non-encoded key is used, of the same type as that associated with a determined cylinder. Such key has previously been shaped by making a succession of grooves of depth equal to or deeper than the maximum depth present in the original key and filling such grooves with plastic elements (wax and plasticine) with a predefined degree of elasticity and ductility.

**[0009]** One then proceeds by alternately turning, clockwise (the direction for opening) and anticlockwise (the direction for locking), the rotor by way of such key, thus determining the oscillation of the pins of the cylinder.

**[0010]** Following a certain number of successive alternate rotations, clockwise and anticlockwise, of the key, the individual pins, under the thrust of the respective elastic elements, gouge the plastic filling element of the respective grooves, advancing until they bring the discontinuity surface that separates the bottom of the pin from the apex of the counterpin into perfect alignment with the discontinuity surface present between rotor and stator

(the position in which the rotor can be rotated by turning the head of the key which protrudes from the cylinder: in this manner the opening of the lock is permitted).

**[0011]** One can succeed therefore in acquiring, with only the lock available, a perfect impression of the internal encoding components of the lock and therefore in making, starting therefrom, a perfect copy of the original key.

**[0012]** Conventional construction solutions, although adapted to block any intrusion actions perpetrated on the cylinders, do not make it possible to guard against the possibility of cloning the key from the lock alone, with consequent intrinsic lack of security against tampering with conventional cylinders.

**[0013]** Document D1 discloses an anti-intrusion cylinder for locks according to the preamble of claim 1. Furthermore, in this document a single contoured annular body is fitted, with mechanical play, to the over the mushroom-shaped terminal of a pin shank.

**[0014]** The aim of the present invention is to solve the above mentioned drawbacks, by providing an anti-intrusion cylinder for locks which is highly secure against methods of cloning the key from the lock alone.

**[0015]** Within this aim, an object of the invention is to provide an anti-intrusion cylinder for locks which is low cost, easily and practically implemented and safely applied.

**[0016]** This aim and these and other objects which will become better apparent hereinafter are achieved by an anti-intrusion cylinder for locks of the type comprising a stator which is provided with a substantially cylindrical longitudinal cavity for accommodating a rotor with a longitudinal seat for the insertion of a key, said rotor and said stator comprising a plurality of channels, which are substantially aligned and facing when the cylinder is in the locked configuration, said channels accommodating respective pins, counterpins and optional elastic means which are adapted to prevent the rotation of the rotor in the stator in the absence of the key from said longitudinal seat, at least one of said pins comprising a shank, said shank being provided with a mushroom-shaped terminal with a diameter smaller than the diameter of said shank, said terminal being faced toward and proximate to the corresponding counterpin, characterized in that at least two contoured annular bodies with a substantially similar diameter to the diameter of said channel are mutually arranged in a column and are fitted, with mechanical play, over said mushroom-shaped terminal.

**[0017]** Further characteristics and advantages of the invention will become better apparent from the detailed description of a preferred, but not exclusive, embodiment of the anti-intrusion cylinder for locks according to the invention, which is illustrated by way of non-limiting example in the accompanying drawings, in which:

Figure 1 is a cross-sectional front elevation view of a conventional cylinder in the configuration of rest with the key inserted, the key being of the non-encoded type provided with plastic filling elements of

the respective encoding grooves;

Figures from 2 to 6 show, with reference to the conventional cylinder in Figure 1, the sequence of steps to fraudulently open the lock;

Figure 7 is a cross-sectional front elevation view of the cylinder according to the invention, which however lacks a second contoured annular body, in the configuration of rest with the key inserted, the key being of the non-encoded type provided with plastic filling elements of the respective encoding grooves; Figures from 8 to 10 show, with reference to the cylinder in Figure 7, the sequence of steps of an attempt to fraudulently open the lock;

Figure 11 is a cross-sectional front elevation view of the cylinder in Figure 7 in a locked configuration with the key partially rotated clockwise;

Figure 12 is a cross-sectional front elevation view of the cylinder in Figure 7 in a different locked configuration with the key partially rotated anticlockwise;

Figure 13 is an enlargement of Figure 7;

Figure 14 is a cross-sectional front elevation view of the cylinder with a single contoured annular body without the original key in configuration of rest;

Figure 15 is a cross-sectional front elevation view of the cylinder with the original key inserted in the configuration of rest;

Figure 16 is a cross-sectional front elevation view of the cylinder in Figure 15 in a first step of opening;

Figure 17 is a cross-sectional end view of the cylinder without key in the configuration of rest.

**[0018]** With reference to the figures, the reference numeral 1 generally indicates an anti-intrusion cylinder for locks.

**[0019]** The cylinder 1 comprises a stator 2 which is provided with a substantially cylindrical longitudinal cavity 3 for accommodating a rotor 4.

**[0020]** The rotor 4 in turn is affected by a longitudinal seat 5 which is intended to receive a key 6: the insertion of the respective key 6 into the seat 5 determines the ability to rotate the rotor 4 with respect to the stator 2, thus opening the lock with which the cylinder 1 is associated.

**[0021]** The rotor 4 and the stator 2 comprise a plurality of channels 7, which are substantially aligned and facing when the cylinder 1 is in the locked configuration.

**[0022]** The channels 7 accommodate respective pins 8, counterpins 9 and optional elastic means 7a which are adapted to prevent the rotation of the rotor 4 in the stator 2 in the absence of the key 6 in the longitudinal seat 5.

**[0023]** According to the invention, at least one of the pins 8 can positively comprise a shank 10, which is accommodated slideably in the stator portion 2 of a respective channel 7.

**[0024]** The shank 10 is provided, according to the invention, with a mushroom-shaped terminal 11 with a diameter smaller than the diameter of the shank 10.

**[0025]** The terminal 11 is faced toward and proximate

to the corresponding counterpin 9, in particular the end face 12 of the counterpin 9.

**[0026]** According to the invention, at least two contoured annular bodies 13, which has a substantially similar diameter to the diameter of the channel 7, is fitted, with mechanical play, over the mushroom-shaped terminal 11.

**[0027]** With reference to a specific embodiment of undoubted practical and applicative interest, the mushroom-shaped terminal 11 can positively comprise a stem 14, which has a first diameter of a value comprised between  $1/6$  and  $3/4$  of the diameter of the channel 7, surmounted by a plug 15, which has a second diameter of a value comprised between  $1/5$  and  $5/6$  of the diameter of the channel 7.

**[0028]** From observing the accompanying figures it can be seen that, with reference to the cylinder shown by way of example therein, the mushroom-shaped terminal 11 can be shaped like the head of a screw engaged axially on a respective pin 8, on an end face thereof.

**[0029]** The contoured annular body 13 comprises an inner through opening 16 which has a diameter larger than the first diameter of the stem 14 and than the second diameter of the plug 15.

**[0030]** Moreover, the maximum diameter of the plug 15 can also advantageously be smaller than the diameter of the through opening 16 of the contoured annular body 13, especially if the pin 8 is made in one piece that comprises its terminal 11. In this manner it will be possible to engage the contoured annular body 13 on the pin 8 (in particular on its terminal 11) easily.

**[0031]** The contoured annular body 13 can move with respect to the mushroom-shaped terminal 11 (while still remaining locked between the plug 15 and the lower end of the pin 8): in particular it can perform translational movements, arranging itself according to various possible misalignments with respect to the coaxial and aligned condition, and rotational movements, inclining itself with respect to the axis of the stem 14.

**[0032]** Obviously the combination of the translation and rotation movements will ensure a considerably higher level of security for the cylinder 1 because, as will be seen hereinafter, the annular body 13 can be locked between the rotor 4 and the stator 2 (in the event of attempts at tampering made using a non-encoded, previously-shaped key 6a provided with encoding grooves filled with plastic elements P) according to an unlimited number of different configurations, thus preventing the fraudulent opening of the cylinder 1.

**[0033]** It is useful to note that the contoured annular body 13 (fitted, with a predefined mechanical play, over the stem 14 of the mushroom-shaped terminal 11) is locked between the plug 15, below, and the end face of the shank 10, above.

**[0034]** The locking of the contoured annular body 13 in such position is due to the fact that it is compressed, by the action of the elastic element 7a, between the counterpin 9 and the pin 8 and fitted over the terminal 11.

**[0035]** In this manner, besides ensuring the necessary security against tampering, the mechanical stability of the entire cylinder 1 is also ensured, since it is not possible for the annular body 13 to accidentally disengage from the mushroom-shaped terminal 11.

**[0036]** With reference to an embodiment of undoubted practical and applicative interest, the inner through opening 16 of the contoured annular body 13 can conveniently comprise a first through hole 17 with a diameter that is complementary to the diameter of the plug 15 (in order to prevent the accidental disengagement of the annular body 13 from the mushroom-shaped terminal 11) and an external receptacle 18 with a diameter larger than the diameter of the plug 15; such receptacle 18 is adapted to temporarily accommodate the plug 15.

**[0037]** Saying that the first through hole 17 has a diameter that is complementary to the diameter of the plug 15 means that it will have a measurement proximate to that of the diameter of the plug; substantially it can be slightly smaller, the same, or slightly larger.

**[0038]** It is useful to point out further that the contoured annular body 13 can profitably have an outer shape structure that is preferably chosen from among cylindrical, toroidal, cask-shaped, frustum-shaped, prismatic, truncated pyramid shaped, teardrop portion shaped and a combination thereof.

**[0039]** According to the shape selected, the annular body 13 will perform a different locking action in the event of attempts at tampering.

**[0040]** In fact a shape structure that has a curved or roundish outer shape (for example toroidal, cask-shaped, teardrop portion shaped) will facilitate the annular body 13 in taking up inclined configurations (inclined with respect to the mushroom-shaped terminal 11) in that the absence of corner edges will enable easier rotation movements.

**[0041]** By contrast, a cylindrical shape structure, or one that is frustum-shaped, prismatic, truncated pyramid shaped and the like, will be more subject to translational misalignment movements of the axis of symmetry of the body 13 with respect to the axis of symmetry of the mushroom-shaped terminal 11.

**[0042]** Similarly, the pin 8 can also have an outer shape structure preferably chosen from among cylindrical, toroidal, cask-shaped, frustum-shaped, prismatic, truncated pyramid shaped, teardrop portion shaped and a combination thereof.

**[0043]** The possibility is not ruled out of adopting different shapes. For the pin 8 as well, according to the shape selected, the annular body 13 will perform a different locking action in the event of attempts at tampering.

**[0044]** In fact a shape structure that has a curved or roundish outer shape (for example toroidal, cask-shaped, teardrop portion shaped) will facilitate the annular body 13 in taking up inclined configurations (inclined with respect to the mushroom-shaped terminal 11) in that the absence of corner edges will enable easier rotation movements.

**[0045]** By contrast, a cylindrical shape structure, or one that is frustum-shaped, prismatic, truncated pyramid shaped and the like, will be more subject to translational misalignment movements of the axis of symmetry of the body 13 with respect to the axis of symmetry of the mushroom-shaped terminal 11.

**[0046]** According to the invention and for undoubted security against attempts at tampering, the contoured annular bodies 13 are at least two in number, mutually arranged in a column and fitted, with mechanical play, over the mushroom-shaped terminal 11.

**[0047]** The presence of several superimposed annular bodies 13 ensures a considerable increase of the possible locking configurations that can occur in the event of attempts at tampering, with consequent increase of the intrinsic security of the cylinder 1.

**[0048]** It should be noted that the contoured annular bodies 13 mutually arranged in a column can be mutually identical or different.

**[0049]** In the second case, at least one first contoured annular body 13 could also comprise a recess for the partial accommodation of at least one portion of at least one second contoured annular body 13, so that they can also assume a configuration of mutual mating (and optional partial accommodation of the one in the other).

**[0050]** The presence of such recess in the first contoured body 13 and of the corresponding portion in the second contoured body 13 is in any case not necessary for the correct operation of the invention; the contoured bodies 13 could in fact have their mutual abutment faces flat or contoured completely independently of each other.

**[0051]** It should be noted that the cylinder 1 according to the invention can achieve extremely high standards of security if there is a plurality (in particular at least two) of pins 8 provided with the shank 10 with a mushroom-shaped terminal 11 (of diameter smaller than the diameter of the shank 10), and with at least one contoured annular body 13 which is fitted, with mechanical play, over the mushroom-shaped terminal 11: such pins 8 according to the invention can be effectively distributed in different channels 7.

**[0052]** Operation of the present invention is the following.

**[0053]** When using the specific key 6, as shown in the accompanying Figures 15 and 16, it will be easily possible to move the rotor 4 with respect to the stator 2 of the cylinder 1.

**[0054]** However, if an ill-intentioned individual attempts to tamper with the cylinder 1 according to the invention, through the use of a non-encoded, previously-shaped key 6a provided with encoding grooves filled with plastic elements P, the pin 8 provided with the mushroom-shaped terminal 11 will become locked.

**[0055]** In particular, the ill-intentioned individual will exert a mechanical moment in order to impose a rotation of the rotor 4 clockwise and, subsequently, anticlockwise, by way of such key 6a, in order to cause the oscillation of the pins 8 (as shown in the accompanying Figures 7,

8, 9).

**[0056]** The pin 8 under the action of the elastic element 7a will therefore compress the plastic filler element P, sliding, therefore, gradually upward inside the channel 7, until it brings the end face of the shank 10 into substantial alignment with the discontinuity surface between the stator 2 and the rotor 4 (as shown in the accompanying Figure 10).

**[0057]** In this configuration, the repeated action of rotating the rotor 4 will mean an offset of the annular body 13 with respect to the pin 8 over which it is fitted, with the impossibility of raising such pin 8 further (as shown in the accompanying Figures 11 and 12).

**[0058]** In fact, the annular body 13 will always abut with a surface thereof on the rotor 4, making a further lifting of the pin 8 inside the respective channel 7 impossible, and making it effectively impossible to make a perfect impression of the internal encoding components of the lock and therefore to make a perfect copy of the original key 6.

**[0059]** Advantageously the present invention solves the above mentioned problems, by providing an anti-intrusion cylinder 1 for locks which is highly secure against methods of cloning the key from the lock alone.

**[0060]** Positively the present invention makes it possible to provide an anti-intrusion cylinder 1 for locks relatively simply and at substantially low cost: such characteristics ensure a secure practical application of the present invention.

**[0061]** The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

**[0062]** In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

**[0063]** In practice, the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

**[0064]** Where the technical features mentioned in any claim are followed by reference numerals and/or signs, those reference numerals and/or signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference numerals and/or signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference numerals and/or signs.

## Claims

1. An anti-intrusion cylinder for locks of the type comprising a stator (2) which is provided with a substantially cylindrical longitudinal cavity (3) for accommodating a rotor (4) with a longitudinal seat (5) for the insertion of a key (6), said rotor (4) and said stator (2) comprising a plurality of channels (7), which are substantially aligned and facing when the cylinder

(1) is in the locked configuration, said channels (7) accommodating respective pins (8), counterpins (9) and optional elastic means (7a) which are adapted to prevent the rotation of the rotor (4) in the stator (2) in the absence of the key (6) from said longitudinal seat (5), at least one of said pins (8) comprising a shank (10), said shank (10) being provided with a mushroom-shaped terminal (11) with a diameter smaller than the diameter of said shank (10), said terminal (11) being faced toward and proximate to the corresponding counterpin (9), **characterized in that** at least two contoured annular bodies (13) with a substantially similar diameter to the diameter of said channel (7) are mutually arranged in a column and are fitted, with mechanical play, over said mushroom-shaped terminal (11).

2. The cylinder according to claim 1, **characterized in that** said mushroom-shaped terminal (11) comprises a stem (14), which has a first diameter of a value comprised between 1/6 and 3/4 of the diameter of said channel (7), surmounted by a plug (15), which has a second diameter of a value comprised between 1/5 and 5/6 of the diameter of said channel (7).

3. The cylinder according to claim 2, **characterized in that** said contoured annular bodies (13) comprise an inner through opening (16) which has a diameter larger than said first diameter of said stem (14) and substantially complementary to said second diameter of said plug (15).

4. The cylinder according to claim 3, **characterized in that** said contoured annular bodies (13) are fitted, with mechanical play, over said stem (14) of said mushroom-shaped terminal (11) and is interposed between said plug (15), below, and the end face of said shank (10), above.

5. The cylinder according to one or more of the preceding claims, **characterized in that** said inner through opening (16) of said contoured annular bodies (13) comprise a first through hole (17) with a diameter that is complementary to the diameter of said plug (15), and an external receptacle (18) with a diameter larger than the diameter of said plug (15) and adapted to temporarily accommodate said plug (15).

6. The cylinder according to one or more of the preceding claims, **characterized in that** either or both of said pin (8) and said contoured annular bodies (13) has an outer shape structure preferably chosen from among cylindrical, toroidal, cask-shaped, frustum-shaped, prismatic, truncated pyramid shaped, teardrop portion shaped and a combination thereof.

7. The cylinder according to one or more of the preceding claims, **characterized in that** said contoured an-

nular bodies (13) mutually arranged in a column are mutually identical.

8. The cylinder according to one or more of the preceding claims, **characterized in that** said contoured annular bodies (13) mutually arranged in a column are mutually different, at least one first contoured annular body (13) comprising a recess for partially accommodating at least one portion of at least one second contoured annular body (13).
9. The cylinder according to one or more of the preceding claims, **characterized in that** said pins (8), provided with said at least one shank (10) with a mushroom-shaped terminal (11) which has a diameter smaller than the diameter of said shank (10), and with at least two contoured annular bodies (13) which are fitted, with mechanical play, over said mushroom-shaped terminal (11), are at least two in number, distributed in different channels (7).

#### Patentansprüche

1. Ein einbruchverhindernder Zylinder für Schlösser, von der Art, die einen Stator (2) umfasst, der mit einem im Wesentlichen zylindrischen länglichen Hohlraum (3) für die Aufnahme eines Rotors (4) mit einem länglichen Sitz (5) zum Einführen eines Schlüssels (6) ausgestattet ist, wobei der Rotor (4) und der Stator (2) eine Vielzahl von Kanälen (7) umfassen, die im Wesentlichen ausgerichtet und einander zugewandt sind, wenn sich der Zylinder (1) in der geschlossenen Konfiguration befindet; wobei die Kanäle (7) entsprechende Stifte (8), Gegenstifte (9) und optionale elastische Mittel (7a) aufnehmen, die ausgebildet sind, um die Drehung des Rotors (4) im Stator (2) bei Abwesenheit des Schlüssels (6) in dem länglichen Sitz (5) zu verhindern; wobei mindestens einer der Stifte (8) einen Schaft (10) umfasst, wobei der Schaft (10) mit einem pilzförmigen Ende (11) mit einem Durchmesser versehen ist, der kleiner ist als der Durchmesser des Schafts (10), wobei das Ende (11) dem entsprechenden Gegenstift (9) zugewandt ist und an ihn angrenzt; **dadurch gekennzeichnet, dass** mindestens zwei konturierte ringförmige Körper (13) mit einem Durchmesser, der im Wesentlichen ähnlich dem Durchmesser des Kanals (7) ist, miteinander in einer Säule angeordnet und mit mechanischem Spiel über dem pilzförmigen Ende (11) aufgesetzt sind.
2. Der Zylinder gemäß Anspruch 1, **dadurch gekennzeichnet, dass** das pilzförmige Ende (11) einen Schaft (14) umfasst, der einen ersten Durchmesser mit einem Wert zwischen  $1/6$  und  $3/4$  des Durchmessers des Kanals (7) hat, überragt von einem Stopfen (15), der einen zweiten Durchmesser mit einem Wert

zwischen  $1/5$  und  $5/6$  des Durchmessers des Kanals (7) hat.

3. Der Zylinder gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die konturierten ringförmigen Körper (13) eine innere Durchgangsöffnung (16) umfassen, die einen Durchmesser hat, der größer ist als der erste Durchmesser des Schafts (14) und im Wesentlichen komplementär zu dem zweiten Durchmesser des Stopfens (15) ist.
4. Der Zylinder gemäß Anspruch 3, **dadurch gekennzeichnet, dass** die konturierten ringförmigen Körper (13) mit mechanischem Spiel über den Schaft (14) des pilzförmigen Endes (11) aufgesetzt sind und zwischen dem Stopfen (15), unten, und der Endfläche des Schafts (10), oben, angeordnet ist.
5. Der Zylinder gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die innere Durchgangsöffnung (16) der konturierten ringförmigen Körper (13) ein erstes Durchgangsloch (17) mit einem Durchmesser umfasst, der komplementär zum Durchmesser des Stopfens (15) ist, und einen äußeren Sitz (18) mit einem Durchmesser, der größer ist als der Durchmesser des Stopfens (15) und ausgebildet, um den Stopfen (15) vorübergehend aufzunehmen.
6. Der Zylinder gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** der Stift (8) und/oder die konturierten ringförmigen Körper (13) eine äußere Form haben, die vorzugsweise gewählt ist aus zylindrisch, ringförmig, tonnenförmig, kegelstumpfförmig, prismatisch, pyramidenstumpfförmig, tropfenteilförmig und einer Kombination davon.
7. Der Zylinder gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die konturierten ringförmigen Körper (13), die miteinander in einer Säule angeordnet sind, identisch miteinander sind.
8. Der Zylinder gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die konturierten ringförmigen Körper (13), die miteinander in einer Säule angeordnet sind, verschieden voneinander sind, wobei mindestens ein erster konturierter ringförmiger Körper (13) eine Vertiefung zur partiellen Aufnahme mindestens eines Abschnitts mindestens eines zweiten konturierten ringförmigen Körpers (13) umfasst.
9. Der Zylinder gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die Stifte (8), ausgestattet mit dem mindestens einen Schaft (10) mit pilzförmigem Ende (11), das einen

kleineren Durchmesser hat als der Schaft (10), und mit mindestens zwei konturierten ringförmigen Körpern (13), die mit mechanischem Spiel über das pilzförmige Ende (11) aufgesetzt sind, mindestens zwei an der Zahl sind, verteilt in verschiedenen Kanälen (7).

## Revendications

1. Barillet anti-intrusion pour des serrures du type comportant un stator (2) qui est pourvu d'une cavité longitudinale sensiblement cylindrique (3) pour recevoir un rotor (4) avec un siège longitudinal (5) pour l'insertion d'une clef (6), ledit rotor (4) et ledit stator (2) comportant une pluralité de canaux (7), qui sont sensiblement alignés et les uns en face des autres lorsque le barillet (1) est dans la configuration verrouillée, lesdits canaux (7) recevant des goupilles (8) respectives, des contre-goupilles (9) et des moyens élastiques facultatifs (7a) qui sont adaptés pour empêcher la rotation du rotor (4) dans le stator (2) en l'absence de la clef (6) dudit siège longitudinal (5), au moins une desdites goupilles (8) comportant une queue (10), ladite queue (10) étant pourvue d'une borne en forme de champignon (11) ayant un diamètre plus petit que le diamètre de ladite queue (10), ladite borne (11) étant dirigée vers la contre-goupille (9) correspondante et étant proche de celle-ci, **caractérisé en ce qu'**au moins deux corps annulaires profilés (13) ayant un diamètre sensiblement similaire au diamètre dudit canal (7) sont mutuellement agencés dans une colonne et sont montés, avec un jeu mécanique, sur ladite borne en forme de champignon (11).
2. Barillet selon la revendication 1, **caractérisé en ce que** ladite borne en forme de champignon (11) comporte une tige (14), qui a un premier diamètre avec une valeur comprise entre 1/6 et 3/4 du diamètre dudit canal (7), surmonté d'une tête (15), qui a un second diamètre d'une valeur comprise entre 1/5 et 5/6 du diamètre dudit canal (7).
3. Barillet selon la revendication 2, **caractérisé en ce que** lesdits corps annulaires profilés (13) comportent une ouverture traversante intérieure (16) qui a un diamètre plus grand que ledit premier diamètre de ladite tige (14) et sensiblement complémentaire dudit second diamètre de ladite tête (15).
4. Barillet selon la revendication 3, **caractérisé en ce que** lesdits corps annulaires profilés (13) sont montés, avec un jeu mécanique, sur ladite tige (14) de ladite borne en forme de champignon (11) et sont intercalés entre ladite tête (15), au-dessous, et la face d'extrémité de ladite queue (10), au-dessus.

5. Barillet selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite ouverture traversante intérieure (16) desdits corps annulaires profilés (13) comporte un premier trou traversant (17) ayant un diamètre qui est complémentaire du diamètre de ladite tête (15), et un logement externe (18) ayant un diamètre plus grand que le diamètre de ladite tête (15) et adapté pour recevoir temporairement ladite tête (15).
6. Barillet selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** l'un ou l'autre parmi ladite goupille (8) et lesdits corps annulaires profilés (13), ou les deux, ont une structure de forme extérieure de préférence choisie parmi cylindrique, toroïdale, en forme de fût, tronconique, prismatique, en forme de pyramide tronquée, en forme de portion de goutte et une combinaison de celles-ci.
7. Barillet selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** lesdits corps annulaires profilés (13) mutuellement agencés dans une colonne sont mutuellement identiques.
8. Barillet selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** lesdits corps annulaires profilés (13) mutuellement agencés dans une colonne sont mutuellement différents, au moins un premier corps annulaire profilé (13) comportant un évidement pour recevoir partiellement au moins une partie d'au moins un second corps annulaire profilé (13).
9. Barillet selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** lesdites goupilles (8), pourvues de ladite au moins une queue (10) avec la borne en forme de champignon (11) qui a un diamètre plus petit que le diamètre de ladite queue (10), et ayant au moins deux corps annulaires profilés (13) qui sont montés, avec un jeu mécanique, sur ladite borne en forme de champignon (11), sont au moins au nombre de deux, réparties dans différents canaux (7).

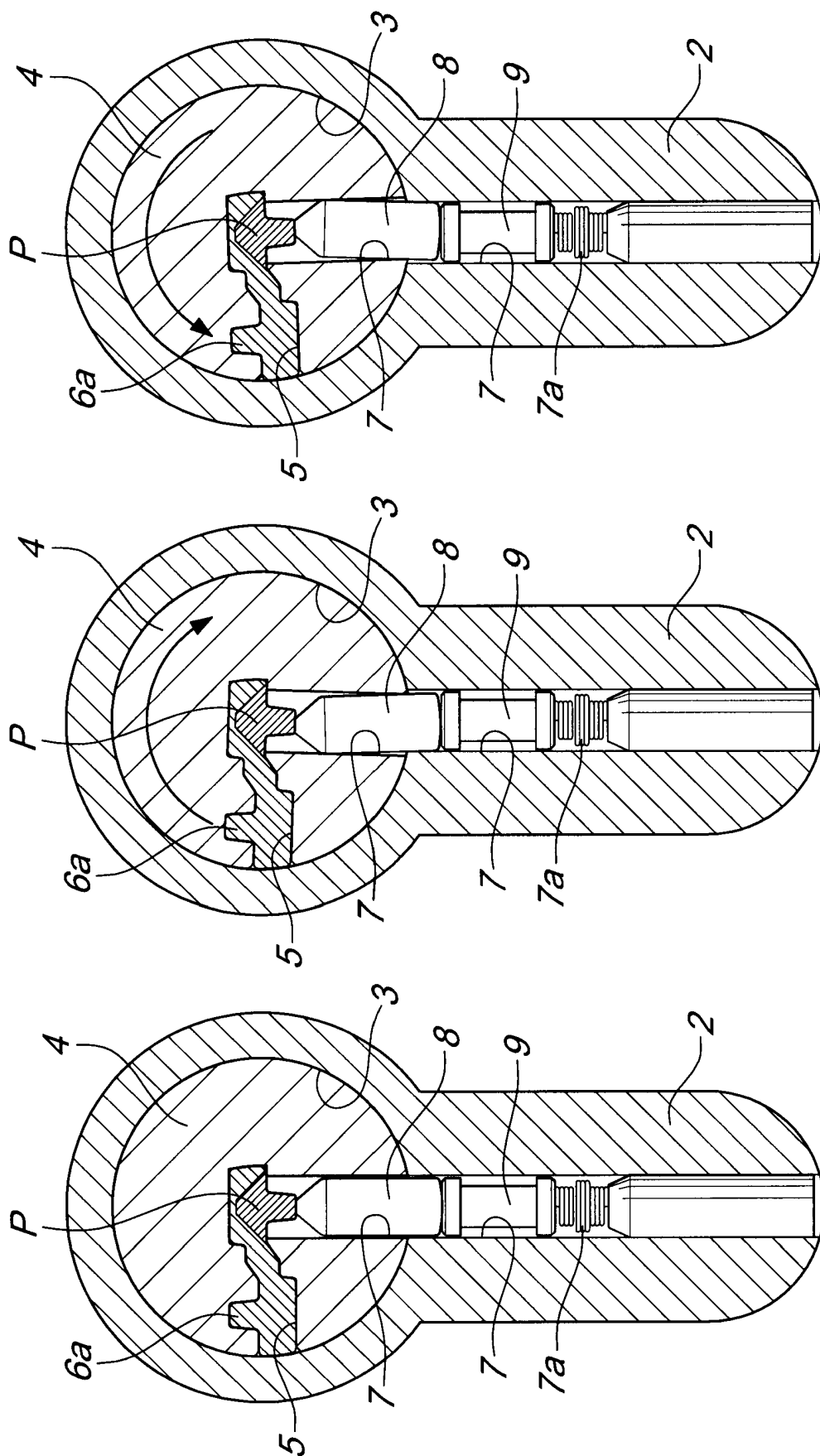


Fig. 3

Fig. 2

Fig. 1



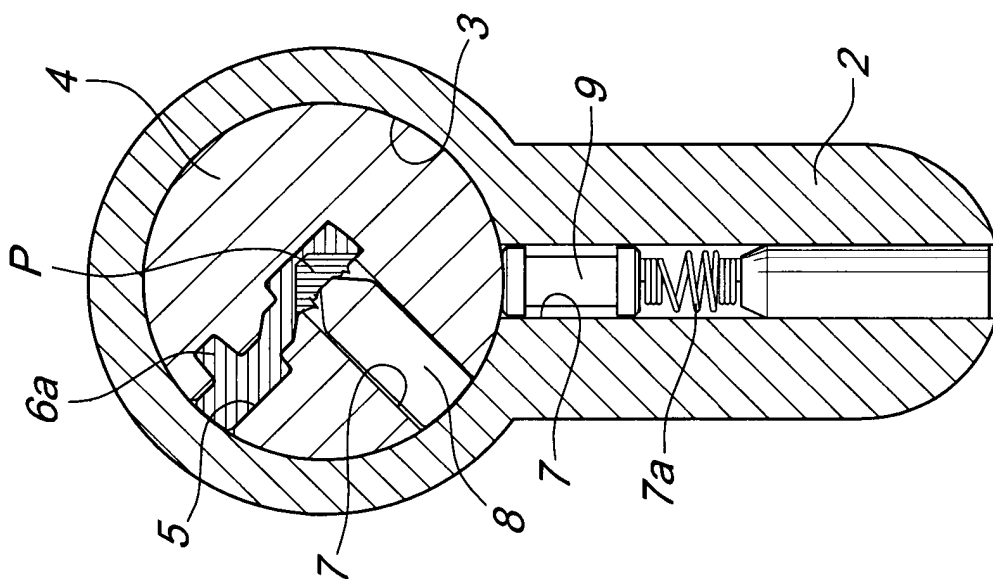


Fig. 4

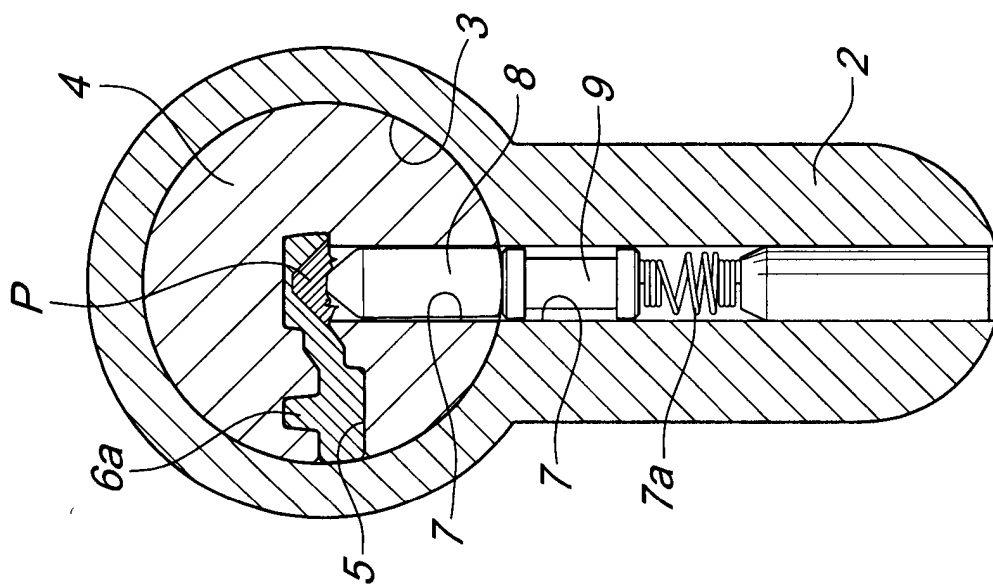


Fig. 5

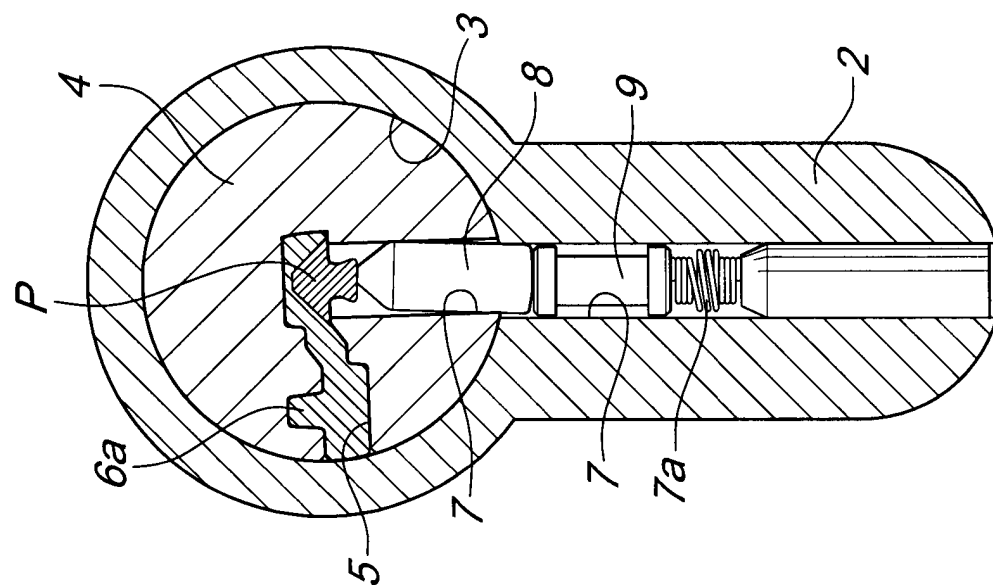


Fig. 6

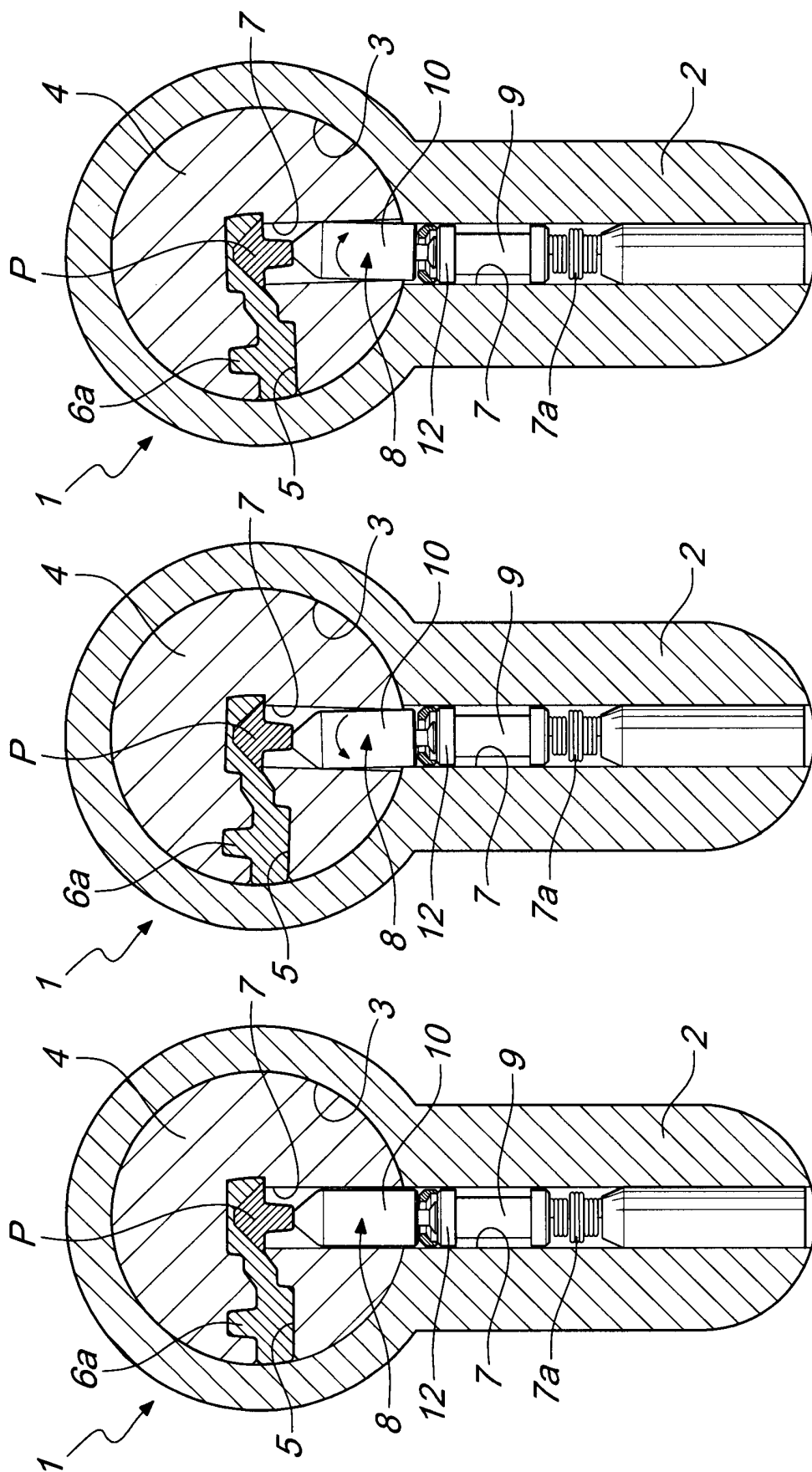
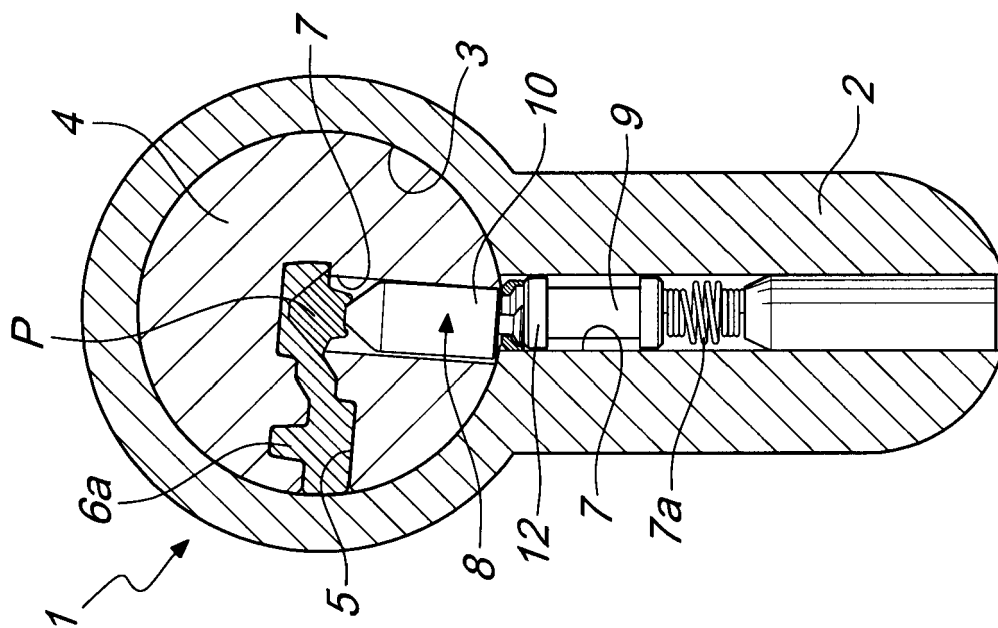


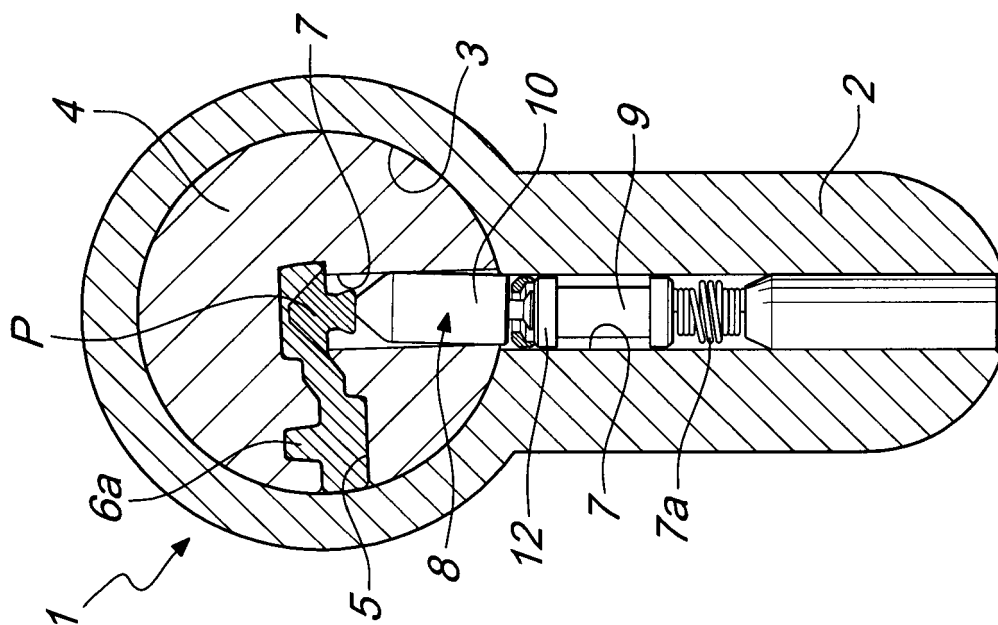
Fig. 9

Fig. 8

Fig. 7



*Fig. 11*



*Fig. 10*

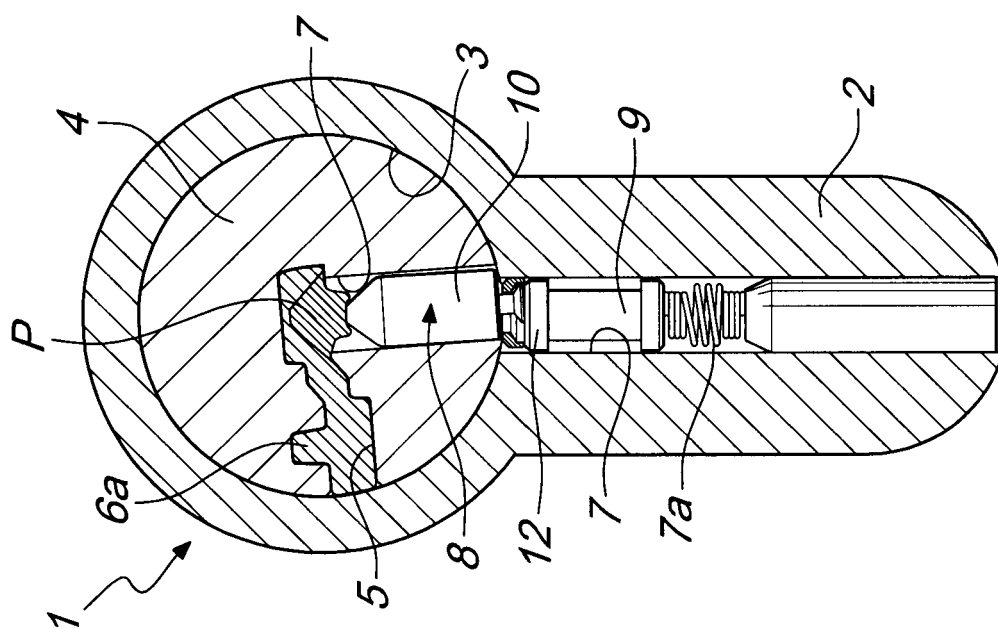


Fig. 12

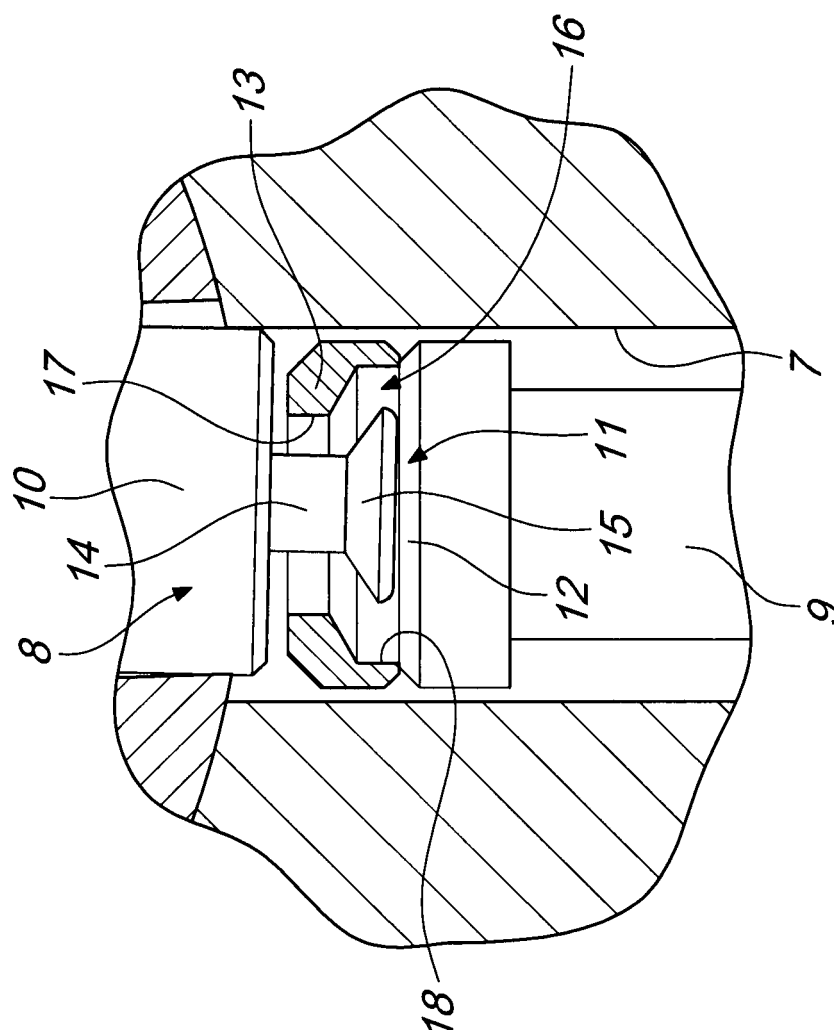


Fig. 13

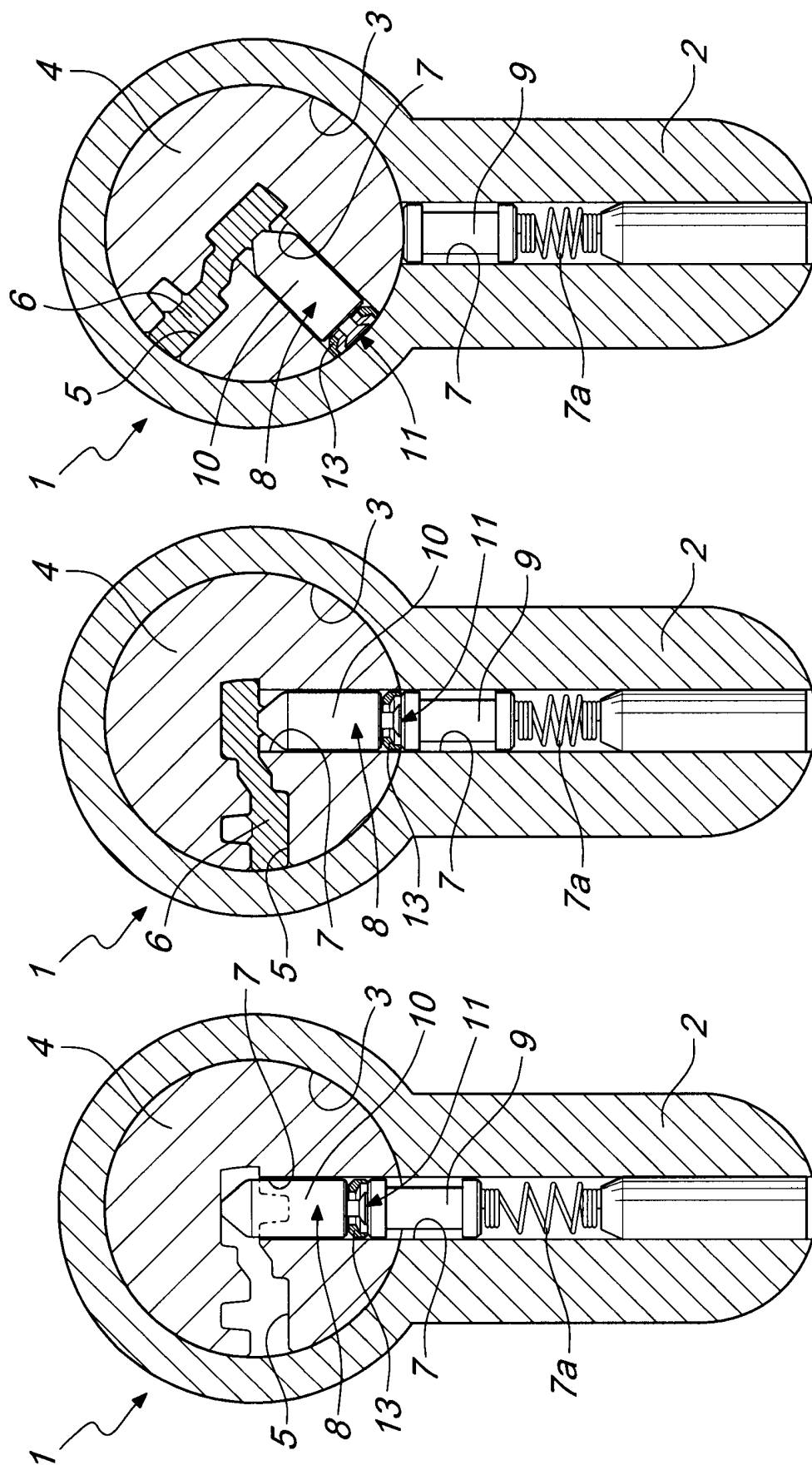


Fig. 16

Fig. 15

Fig. 14

