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(54) **Lock with replaceable bottom pins**

Schloss mit auswechselbaren, unteren Zuhaltungen

Serrure à paillettes inférieures remplaçables

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(56) References cited:
**EP-A1- 2 500 493 US-B1- 6 810 703
US-B1- 7 121 127**

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Description

[0001] The present invention relates to a lock, and more particularly, to a lock with replaceable bottom pins so as to obtain more sets of combinations without replacing the whole lock.

[0002] The conventional way to use a lock is to prepare suitable number of keys to families so as to unlock the lock, however, the lock is not safe when one of the keys is lost and most of the users will change for a new lock for safety reason. The replacement of the locks sometimes cost a lot of money and is not convenient for the users.

[0003] Figs. 1 to 3 show a conventional lock which generally comprises a housing 10 and a core 20, the housing 10 has multiple top pin holes 101 and the core has multiple bottom pin holes 201 which are in communication with the top pin holes 101. Multiple pin units 30 are installed in the top and bottom pin holes 101, 201. A cover 102 is mounted to the top pin holes 101 and the housing 10 has multiple grooves 103 so as to cooperate with the cover 102. The core 20 has a key hole 202 in one end thereof and the other end of the core 20 has a latch 203.

[0004] In normal condition, the key is inserted into the core 20 via the key hole 202 and the notches of the key accommodate the pin units 30 to align with the outer surface of the core 20 and with the ends of the top and bottom pin holes 101, 201, such that the latch 203 is operated by rotating the key. When the correct key is lost, the pins can be replaced, as shown in Fig. 2, by first removing the cover 102 from the grooves 103 and the pin units 30 are removed from the top and bottom pin holes 101, 201. The suitable pin units 30 are then installed to the top and bottom pin holes 101, 201 according to the arrangement of the notches of a new key. The cover 102 is again engaged with the grooves 103 to obtain a new lock.

[0005] Nevertheless, when replacing the pins, the pin units 30 are removed from the core 20 only when the top and bottom pin holes 101, 201 are in alignment with each other. If the diameters of the top and bottom pin holes 101, 201 are different, or the top and bottom pin holes 101, 201 are not in alignment with each other, the pin units 30 are stocked in the lock and the replacement cannot be successfully made. It is difficult for the users to check whether or not the top and bottom pin holes 101, 201 are in alignment with each other. The new pin units 30 are also not easily properly installed into the bottom pin holes 201 so that it is difficult for the users to replace the pins. Besides, the cover 102 is difficult to be removed from the grooves 103, even if only one set of the pin units 30 is to be replaced, the cover 102 is still required to be removed and other pin units 30 may drop out from the lock to further increase the time required to replace the pin units 30.

[0006] US7121127 (B1) discloses a lock set with a quick changeability which has a plug, a cylinder, a seat, a ring and a sliding cover. The plug is mounted in the

cylinder and has multiple first holes in rows wherein multiple lower pins are inserted. The cylinder has a chamber radially defined therein wherein the plug is inserted, and a lug formed in a top end thereof. Multiple second holes in rows are respectively defined in the lug and multiple upper pins and springs are inserted into the second holes. Multiple openings in rows are respectively defined in a lower inner wall of the cylinder wherein upper pins and springs are inserted into the second holes. The sliding cover abuts the lower inner wall of the chamber and has multiple orifices in rows defined therein.

[0007] The present invention intends to provide a lock with replaceable bottom pins, and the replacement is easy. In order to solve this problem the invention provides a lock according to claim 1. The dependent claims relate to advantageous embodiments.

[0008] The primary object of the present invention is to provide a lock in which it is easy to replace the bottom pin units so as to improve the shortcomings of the conventional locks.

[0009] When replacing the key, the core is rotated to align the bottom pin holes with the through holes, the housing and the core are released by releasing the positioning unit. The protrusion on the E-shaped clip is engaged with the recess so as to drive the core axially and to change the relationship between the bottom pin holes and the through holes from the alternative arrangement to the alignment arrangement. The bottom pin units are able to be replaced via the through holes. The top pin with the driving member is compressed to push the stop so as to replace the top pin units from the top pin holes.

[0010] Furthermore, by the side pin units and the position unit, when the lock is hit or picked from exterior, the side pin units are stocked in the bottom pin holes so that the core cannot be rotated or returned, and the positioning unit stops tool from entering the gap of the housing to provide two protections against unauthorized actions to the lock.

[0011] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

Fig. 1 is a perspective view to show the conventional bottom-pins replaceable lock;

Fig. 2 is an exploded view to show the conventional bottom-pins replaceable lock;

Fig. 3 is a cross sectional view, taken along line A-A in Fig. 1;

Fig. 4 is a perspective view to show the lock of the present invention;

Fig. 5 is an exploded view to show the lock of the present invention;

Fig. 6 is a cross sectional view to show that the first key is inserted into the lock of the present invention;

Fig. 7 is a cross sectional view to show that the first key is rotated to rotate the core of the lock of the

present invention;

Fig. 8 is a cross sectional view to show that the bottom pin holes and the through holes of the lock of the present invention are located alternatively to each other;

Fig. 9 is a cross sectional view to show that the positioning unit is pushed by the top pin units when the core is rotated;

Fig. 10 is a perspective view to show that the positioning unit is pushed by the top pin units, and the connection member and the connection portion are located alternatively to each other;

Fig. 11 is a cross sectional view to show that the positioning unit is pushed; Fig. 12 is a cross sectional view to show that the bottom pin holes are aligned with the through holes of the lock of the present invention;

Fig. 13 shows that the first key is removed and the bottom pin units are pulled out;

Fig. 14 shows that the second key is inserted into the key hole;

Fig. 15 shows that the second key is inserted into the key hole;

Fig. 16 is a cross sectional view, taken along line B-B in Fig. 15;

Fig. 17 shows that the third key is inserted into the key hole and different sets of the new bottom pin units are installed;

Fig. 18 is a perspective view to show that the third key is inserted into the key hole;

Fig. 19 is a cross sectional view to show that the third key is used and the stop is removed so as to install the top pin units;

Fig. 20 is a cross sectional view to show that the third key is used and the stop is installed to the lock;

Fig. 21 is a cross sectional view to show the side pin units, and

Fig. 22 is a cross sectional view to show that the side pin units form a locked mechanism.

[0012] Referring to Figs. 4 and 5, the lock of the present invention comprises a housing 1 having a space 11 defined axially therein and multiple top pin holes 12 are defined radially through the housing 1. The housing 1 has multiple through holes 13 which are located corresponding to the space 11. The housing 1 further has a groove 14 and a stop 15 is connected to the housing 1. The stop 15 has apertures 151 which are located corresponding to the top pin holes 12 and each of the apertures 151 has an inclined face 152 is gradually and outwardly narrowed. Multiple top pin units 16 are located in the top pin holes 12 and each top pin unit 16 has a top pin 161 and a resilient member 162. One of the top pin units 16' comprises a top pin 161' and a resilient member 162', the top pin 161' has a driving member 1611 on the top thereof and the driving member 1611 extends through the aperture 151.

[0013] A core 2 is located in the space 11 and has

multiple bottom pin holes 21 defined radially, the bottom pin holes 21 communicate with the top pin holes 12 respectively. The bottom pin units 22 are received in the bottom pin holes 21. The diameter of the through holes 13 allows the bottom pin units 22 to be inserted into the bottom pin holes 21. A key hole 23 is defined in the first end of the core 2 and a connection member 24 and a transmission unit 25 are connected to the second end of the core 2 as shown in Fig. 6. The connection member 24 has a protrusion 241 extending therefrom. The key hole 23 communicates with the bottom pin holes 21. The housing 1 has a connection portion 17 located corresponding to the connection member 24. The through holes 13 are located alternatively to the bottom pin holes 21. The diameters of the through holes 13 allow the bottom pin units 22 to be installed into the bottom pin holes 21 via the through holes 13. In this embodiment, the connection member 24 is an E-shaped clip and the connection portion 17 is a recess which is located corresponding to the protrusion 241.

[0014] A positioning unit 3 comprises a block 31, a resilient piece 32 and a positioning piece 33. The block 31 is connected to the outside of the core 2, and a room is defined between the core 2 and the block 31. The resilient piece 32 and the positioning piece 33 are located in the room. The block 31 has an elongate hole 311. The resilient piece 32 has its first end contacting the outside of the core 2 and the second end of the resilient piece 32 is connected to the positioning piece 33. The positioning piece 33 extends through the elongate hole 311 and is selectively engaged with the groove 14.

[0015] As shown in Fig. 6, the first key 4 is inserted into the key hole 23 and rotated to unlock the lock, the core 2 is driven by the first key 4 and the transmission unit 25 and the bottom pin holes 21 are co-rotated with the core 2 to let the lock be unlocked. When the bottom pin holes 21 are rotated to the through holes 13, as shown in Figs. 7 and 8, the bottom pin holes 21 and the through holes 13 are located alternatively to each other so that the bottom pin units 22 are kept located within the bottom pin holes 21, so that the core 2 is rotatable 360 degrees and the bottom pin units 22 do not drop from the bottom pin holes and the through holes 13.

[0016] During the rotation of the core 2 by the first key 4, as shown in Figs. 9 and 10, when the positioning unit 3 is co-rotated and aligned with the top pin holes 12, the positioning piece 33 is pushed by the top pin unit 16' and the resilient piece 32 is compressed. The positioning unit 3 is kept into the space 11 of the housing 1, the protrusion 241 of the E-shaped clip is alternative to the recess so that the connection member 24 cannot be engaged with the connection portion 17, so that the core 2 is not moved axially, and the positioning unit 3 contacts the top pin unit 16' to ensure that the core 2 can be rotated 360 degrees to unlock the lock.

[0017] The number of the through holes 13 is decided by the required number of sets of the top and bottom pin holes 12, 21. The number of the bottom pin units 22 can

be replaced with the same number of sets or different number sets. As shown in Figs. 11 to 16, when using the first key 4 to unlock the lock to rotate the bottom pin holes 21 to the through holes 13, in this embodiment, the core 2 is rotated 90 degrees, the connection member 24 is moved to the position corresponding to the connection portion 17. The user uses a tool with a tip (not shown) to push the positioning unit 3 to compress the resilient piece 32 and the positioning piece 33 is moved into the elongate hole 311 so that the core 2 is moved axially to let the connection member 24 be engaged with the connection portion 17. In other words, the core 2 is moved toward the key hole 23 and the protrusion 241 of the E-shaped clip is engaged with the recess, and the positioning unit 3 is moved axially into the space 11. The through holes 13 are in communication with the bottom pin holes 21, so that the bottom pin units 22 can be pulled out from the bottom pin holes 21 via the through holes 13, and the first key 4 is removed. The removal of the bottom pin units 22 and the first key 4 can be done without restriction of sequence. The user then inserts the second key 5 into the key hole 23 and the proper bottom pin units 22 that are matched with the notches of the second key 5 are installed into the bottom pin holes 21 and the through holes 13. The core 2 is then moved away from the key hole 23 to return the connection member 24 and the positioning unit 3. The through holes 13 and the bottom pin holes 21 are located alternative to each other. The bottom pin units 22 that match with the second key 5 cannot be removed from the through holes 13 and the bottom pin holes 21. The second key 5 is used to rotate the core 2 to a position where the key hole 23 is in alignment with the top pin holes 12 so that the second key 5 is the correct key for the lock.

[0018] After the bottom pin units 22 that are matched with the second key 5 are successfully replaced, even if the first key 4 is used again, because the notches of the first key 4 are not matched with the bottom pin units 22, the core 2 cannot be rotated.

[0019] When replaced with different number of sets of the bottom pin holes 22, the steps are the same as mentioned above, either the first or the second key 4, 5 is used, the through holes 13 are first rotated to be in alignment with the bottom pin holes 21 to remove the bottom pin units 22 from the lock. As shown in Figs. 17 to 20, the third key 6 is inserted into the key hole 23 and the bottom pin units 22 that match with the third key 6 are installed to the through holes 13 and the bottom pin holes 21. The original five sets of the bottom pin units 22 that are installed in the bottom pin holes 21 are replaced with six sets of the bottom pin units 22 to match the third key 6. By the reposition of the connection member 24 and of the positioning unit 3, the through holes 13 and the bottom pin holes 21 are located alternative to each other. The third key 6 is rotated to rotate the core 2 back to the position where the key hole 23 is located corresponding to the top pin holes 12. The lock has five sets of the top pin units 16, in order to let the third key 6 to unlock the

lock, the user uses a tool with a tip (not shown) to push the top pin unit 16' which has the driving member 1611 to compress the resilient member 162' and the driving member 1611 is moved into the aperture 151 so that the stop 15 is removed, and the sixth top pin unit 16 is installed into the top pin hole 12 and located corresponding to the sixth set of the bottom pin unit 22. The stop 15 is again to cover the top pin holes 12, the third key 6 is then able to lock and unlock the lock. The inclined face 152 of the aperture 151 helps the stop 15 to be back to its initial position. By replacing the same number or different number of the bottom pin units 22, and by cooperation with the change of top pin units 16, the lock can be co-operated with multiple keys.

[0020] The transmission unit 25 is manufactured integrally in the core 2 in this embodiment, nevertheless, the transmission unit 25 can also be secured by using a bolt and a nut, so that the transmission unit 25 can be used in different locks.

[0021] Furthermore, as shown in Figs. 21 and 22, the housing 1 may have at least one side pin hole 18 defined therethrough and the at least one side pin hole 18 is located between the top pin hole 12 and the through hole 13. The at least one side pin hole 18 receives a side pin unit 19. The side pin unit 19 comprises a side pin 191 and a spring member 192. The housing 1 has a filling hole 181 which is located diametrically in opposite to the at least one side pin hole 18. The side pin unit 19 is inserted into the at least one side pin hole 18 via the filling hole 181. The filling hole 181 is covered by a cover 182. When an unauthorized unlocking action by using a universal key or L-shaped wrench to unlock the lock occurs, the core 2 may be rotated, but the bottom pin units 22 cannot be pushed as using a correct key. Therefore, when the bottom pin units 22 are co-rotated and face the at least one side pin hole 18, there is a distance between the bottom pin units 22 and the at least one side pin hole 18, the side pin 191 of the at least one side pin hole 18 is not biased by the spring member 192 and engages with the bottom pin hole 21 so that the core 2 is not rotated by using the universal key or L-shaped wrench.

[0022] The bottom pin units of the lock of the present invention can be easily replaced. The user simply rotates the core to align the bottom pin holes with the through holes, the positioning unit is released by using a tool with a tip so as to release the housing and the core. The protrusion on the E-shaped clip is engaged with the recess so as to drive the core axially and to align the bottom pin holes with the through holes again. The through holes are in communication with the bottom pin holes. The bottom pin units are able to be replaced via the through holes so that a new key can be used to lock and unlock the lock.

[0023] The same number or different number of sets of the bottom pin units can be replaced according to needs. The top pin with the driving member is compressed to push the stop so as to replace the top pin units from the top pin holes. The inclined face of the aperture helps the stop to be back to its initial position. By this

way, the lock can have different combinations of locking features.

[0024] By the side pin units and the position unit, when the lock is hit or picked from exterior, the side pin units are stocked in the bottom pin holes and the positioning unit stops tool from entering the gap of the housing so that the core cannot be rotated, and therefore provides two protections against unauthorized actions to the lock.

[0025] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention as defined by the appended claims.

Claims

1. A lock comprising:

a housing (1) having a space (11) defined axially therein, multiple top pin holes (12) defined radially through the housing (1), the housing (1) having multiple through holes (13) which communicate with the space (11), multiple top pin units (16) installed in the top pin holes (12),
 a core (2) located in the space (11) and having multiple bottom pin holes (21) defined radially, the bottom pin holes (21) communicating with the top pin holes (12) respectively,
 a key hole (23) defined in a first end of the core (2), the key hole (23) communicating with the bottom pin holes (21),
 multiple bottom pin units (22) installed in the bottom pin holes (21),
 a connection member (24) connected to a second end of the core (2),
 wherein the diameters of the through holes (13) allow the bottom pin units (22) to be inserted into the bottom pin holes (21) via the through holes (13),
 a connection portion (17) of the housing (1) located corresponding to the connection member (24), **characterized in that** when the bottom pin holes (21) are rotated to the through holes (13), the through holes (13) are located alternatively to the bottom pin holes (21), and when the connection member (24) is moved to the position corresponding to the connection portion (17), the core (2) can be moved axially so that the through holes (13) are aligned with the bottom pin holes (21).

2. The lock as claimed in claim 1, wherein the connection member (24) has a protrusion (241) and the connection portion (17) is a recess which is located corresponding the connection portion (17).

3. The lock as claimed in claim 1, wherein the housing (1) has a groove (14) and the core (2) has a positioning unit (3) on an outside thereof, the positioning unit (3) is selectively engaged with the groove (14).

4. The lock as claimed in claim 3, wherein the positioning unit (3) comprises a block (31), a resilient piece (32) and a positioning piece (33), the block (31) is connected to the outside of the core (2), a room is defined between the core (2) and the block (31), the resilient piece (32) and the positioning piece (33) are located in the room, the block (31) has an elongate hole (311), the resilient piece (32) has a first end contacting the outside of the core (2) and a second end of the resilient piece (32) is connected to the positioning piece (33), the positioning piece (33) extends through the elongate hole (311) and is selectively engaged with the groove (14).

5. The lock as claimed in claim 1, wherein the housing (1) has a stop (15) connected thereto and the stop (15) has at least one aperture (151) which is located corresponding to the top pin holes (12), multiple top pin units (16) are located in the top pin holes (12), and each top pin unit (16) has a top pin (161) and a resilient member (162), one of the top pin units comprises a top pin and a resilient member, this top pin and a driving member (1611) extend through the at least one aperture (151).

6. The lock as claimed in claim 5, wherein the at least one aperture (151) has an inclined face (152) which is gradually and outwardly narrowed.

7. The lock as claimed in claim 1, wherein a transmission unit (25) allowing to let the lock be unlocked when the core (2) is rotated is connected to the second end of the core (2).

8. The lock as claimed in claim 1, wherein the housing (1) has at least one side pin hole (18) defined there-through and the at least one side pin hole (18) is located between the top pin holes (12) and the through holes (13), the at least one side pin hole (18) receives a side pin unit (19).

9. The lock as claimed in claim 8, wherein the side pin unit (19) comprises a side pin and a spring member (192), the housing (1) has a filling hole (181) which is located diametrically opposite to the at least one side pin hole (18), the side pin unit (19) is inserted into the at least one side pin hole (18) via the filling hole (181), the filling hole (181) is covered by a cover (182).

Patentansprüche

1. Schloss, welches umfasst:

ein Gehäuse (1), welches einen darin axial definierten Raum (11) umfasst, mehrere obere Stiftöffnungen (12), welche radial im Gehäuse (1) definiert sind, wobei das Gehäuse (1) mehrere Durchgangsöffnungen (13) hat, welche mit dem Raum (11) in Verbindung stehen, und wobei mehrere obere Stifteinheiten (16) in den oberen Stiftöffnungen (12) montiert sind, ein Innenteil (2), welches in dem Raum (11) gelegen ist und mehrere untere Stiftöffnungen (21) radial festlegt, welche mit den jeweiligen oberen Stiftöffnungen (12) in Verbindung stehen, eine Schlüsselöffnung (23), welche in einem ersten Ende des Innenteils (2) liegt und in Verbindung mit den unteren Stiftöffnungen (21) steht, mehrere untere Stifteinheiten (22), welche in die unteren Stiftöffnungen (21) eingebracht sind, ein Verbindungselement (24), welches mit einem zweiten Ende des Innenteils (2) verbunden ist, wobei es die Durchmesser der Durchgangsöffnungen (13) den unteren Stifteinheiten (22) ermöglichen, in die unteren Stiftöffnungen (21) durch die Durchgangsöffnungen (13) eingefügt zu werden, einen Verbindungsbereich (17) des Gehäuses (1), welcher in Übereinstimmung mit dem Verbindungselement (24) gelegen ist, **dadurch gekennzeichnet, dass** wenn die unteren Stiftöffnungen (21) zu den Durchgangsöffnungen (13) gedreht sind, die Durchgangsöffnungen (13) den unteren Stiftöffnungen (21) gegenüber gelegen sind, und wenn das Verbindungselement (24) in eine Position bewegt wird, welche mit dem Verbindungsbereich (17) übereinstimmend ausgerichtet ist, kann das Innenteil (2) axial bewegt werden, so dass die Durchgangsöffnungen (13) mit den unteren Stiftöffnungen (21) übereinstimmend ausgerichtet sind.

2. Schloss nach Anspruch 1, wobei das Verbindungselement (24) einen Überstand (241) hat und der Verbindungsbereich (17) eine Aussparung ist, welche in Übereinstimmung mit dem Verbindungselement (24) gelegen ist.

3. Schloss nach Anspruch 1, wobei das Gehäuse (1) eine Nut (14) und das Innenteil (2) eine Positionierungseinheit (3) an seiner Außenseite hat und wobei die Positionierungseinheit (3) selektiv mit der Nut (14) verbunden ist.

4. Schloss nach Anspruch 3, wobei die Positionierungseinheit (3) einen Block (31), ein Federteil (32) und ein Positionierungsteil (33) beinhaltet, wobei der Block (31) mit der Außenseite des Innenteils (2) verbunden ist, wobei eine Kammer zwischen dem Innenteil (2) und dem Block (31) definiert ist, wobei das Federteil (32) und das Positionierungsteil (33) in der Kammer gelegen sind, wobei der Block (31) eine längliche Öffnung (311) hat, wobei das Federteil (32) ein erstes Ende hat, welches mit der Außenseite des Innenteils (2) in Verbindung steht, und ein zweites Ende des Federteils (32) mit dem Positionierungsteil (33) verbunden ist und wobei das Positionierungsteil (33) sich durch die längliche Öffnung (311) erstreckt und selektiv mit der Nut (14) verbunden ist.

5. Schloss nach Anspruch 1, wobei das Gehäuse (1) ein Halteelement (15) hat, welches damit verbunden ist und welches mindestens eine Apertur (151) hat, welche mit den oberen Stiftöffnungen (12) übereinstimmend ausgerichtet ist, wobei mehrere obere Stifteinheiten (16) in den oberen Stiftöffnungen (12) gelegen sind und jede obere Stifteinheit (16) einen oberen Stift (161) und ein Federelement (162) hat, wobei eine der oberen Stifteinheiten (16') einen oberen Stift (161') und ein Federelement (162') beinhaltet und wobei dieser obere Stift (161') und ein Antriebselement (1611) sich durch die mindestens eine Apertur (151) erstrecken.

6. Schloss nach Anspruch 5, wobei die mindestens eine Apertur (151) eine Neigungsfläche (152) hat und allmählich nach auswärts verengt ist.

7. Schloss nach Anspruch 1, wobei eine Übertragungseinheit (25), welche ermöglicht, dass das Schloss aufgeschlossen wird, wenn das Innenteil (2) gedreht ist, mit dem zweiten Ende des Innenteils (2) verbunden ist.

8. Schloss nach Anspruch 1, wobei das Gehäuse (1) mindestens eine Seitenstiftöffnung (18) hat, welche zwischen den oberen Stiftöffnungen (12) und den Durchgangsöffnungen (13) gelegen ist und wobei die mindestens eine Seitenstiftöffnung (18) eine Seitenstifteinheit (19) aufnimmt.

9. Schloss nach Anspruch 8, wobei die Seitenstifteinheit (19) einen Seitenstift (191) und ein Federelement (192) beinhaltet, wobei das Gehäuse (1) eine Füllöffnung (181) hat, welche der mindestens einen Seitenstiftöffnung (18) diametral gegenüber liegt, wobei die Seitenstifteinheit (19) in die mindestens eine Seitenstiftöffnung (18) durch die Füllöffnung (181) eingefügt ist und wobei die Füllöffnung (181) von einer Abdeckung (182) abgedeckt ist.

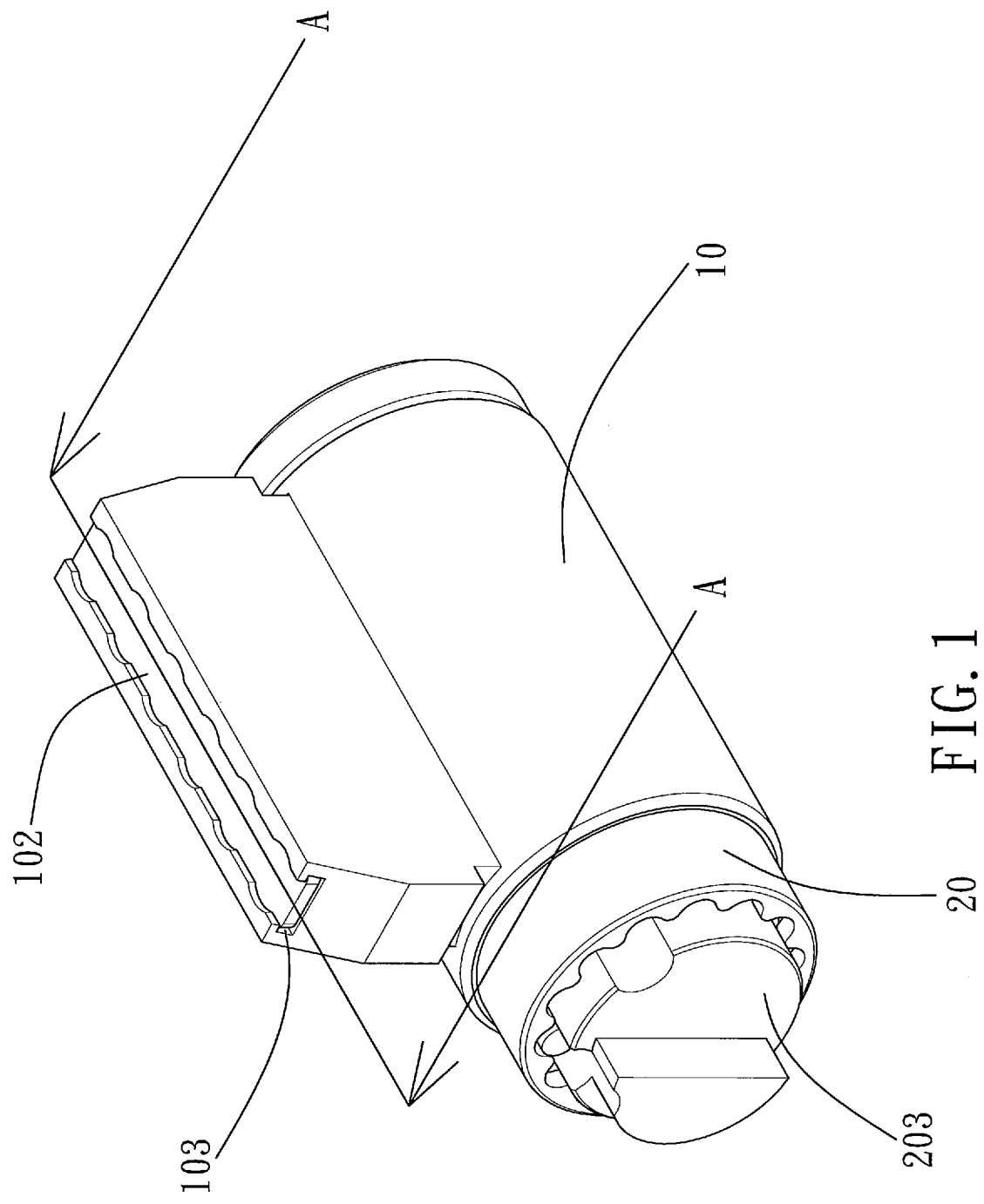
Revendications

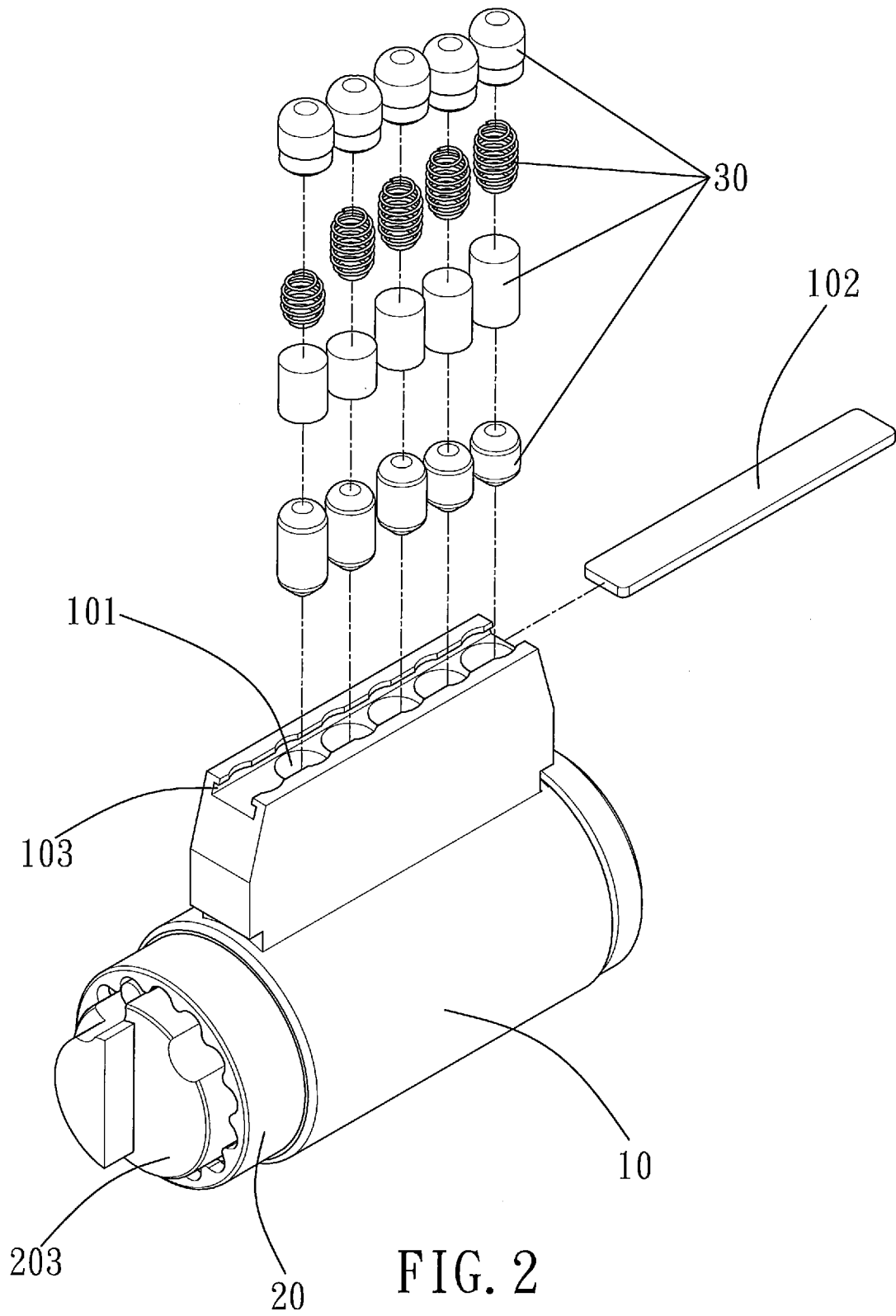
1. Serrure comprenant :

un boîtier (1) comportant un espace (11) défini axialement dans celui-ci, plusieurs trous de goupilles supérieurs (12) définis radialement à travers le boîtier (1), le boîtier (1) comportant plusieurs trous traversants (13) qui communiquent avec l'espace (11), plusieurs unités de goupilles supérieures (16) installées dans les trous de goupilles supérieurs (12),
un noyau (2) placé dans l'espace (11) et comportant plusieurs trous de goupilles inférieurs (21) définis radialement, les trous de goupilles inférieurs (21) communiquant respectivement avec les trous de goupilles supérieurs (12),
une entrée de clé (23) définie dans une première extrémité du noyau (2), l'entrée de clé (23) communiquant avec les trous de goupilles inférieurs (21),
plusieurs unités de goupilles inférieures (22) installées dans les trous de goupilles inférieurs (21),
un élément de connexion (24) connecté à une deuxième extrémité du noyau (2),
dans laquelle les diamètres des trous traversants (13) permettent aux unités de goupilles inférieures (22) d'être insérées dans les trous de goupilles inférieurs (21) via les trous traversants (13),
une partie de connexion (17) du boîtier (1) placée en correspondance avec l'élément de connexion (24),
caractérisée en ce que, lorsque l'on fait tourner les trous de goupilles inférieurs (21) jusqu'aux trous traversants (13), les trous traversants (13) sont positionnés alternativement par rapport aux trous de goupilles inférieurs (21), et lorsque l'on déplace l'élément de connexion (24) jusqu'à la position correspondant à la partie de connexion (17), le noyau (2) peut être déplacé axialement de telle façon que les trous traversants (13) sont alignés avec les trous de goupilles inférieurs (21).

2. Serrure selon la revendication 1, dans laquelle l'élément de connexion (24) comporte une protubérance (241) et la partie de connexion (17) est un évidement qui est situé en correspondance avec la partie de connexion (17).
3. Serrure selon la revendication 1, dans laquelle le boîtier (1) comporte une rainure (14) et le noyau (2) a une unité de positionnement (3) sur une partie extérieure de celui-ci, l'unité de positionnement (3) étant sélectivement mise en prise avec la rainure (14).

4. Serrure selon la revendication 3, dans laquelle l'unité de positionnement (3) comprend un bloc (31), une pièce élastique (32) et une pièce de positionnement (33), le bloc (31) est connecté à la partie extérieure du noyau (2), un interstice est défini entre le noyau (2) et le bloc (31), la pièce élastique (32) et la pièce de positionnement (33) sont situées dans l'interstice, le bloc (31) comporte un trou allongé (311), la pièce élastique (32) a une première extrémité en contact avec l'extérieur du noyau (2) et une deuxième extrémité de la pièce élastique (32) est connectée à la pièce de positionnement (33), la pièce de positionnement (33) s'étend à travers le trou allongé (311) et est sélectivement mise en prise avec la rainure (14).
5. Serrure selon la revendication 1, dans laquelle le boîtier (1) comporte une butée (15) connectée à celui-ci et la butée (15) comporte au moins une ouverture (151) qui est située en correspondance avec les trous de goupilles supérieurs (12), plusieurs unités de goupilles supérieures (16) sont situées dans les trous de goupilles supérieurs (12), et chaque unité de goupilles supérieure (16) comporte une goupille supérieure (161) et un élément élastique (162), une des unités de goupilles supérieures comprend une goupille supérieure et un élément élastique, cette goupille supérieure et un élément d'entraînement (1611) s'étendent à travers ladite au moins une ouverture (151).
6. Serrure selon la revendication 5, dans laquelle ladite au moins une ouverture (151) a une face inclinée (152) qui se rétrécit progressivement vers l'extérieur.
7. Serrure selon la revendication 1, dans laquelle une unité de transmission (25) permettant à la serrure d'être déverrouillée quand on fait tourner le noyau (2) est connectée à la deuxième extrémité du noyau (2).
8. Serrure selon la revendication 1, dans laquelle le boîtier (1) comporte au moins un trou de goupille latérale (18) défini à travers celui-ci et ledit au moins un trou de goupille latérale (18) est situé entre les trous de goupilles supérieurs (12) et les trous traversants (13), ledit au moins un trou de goupille latérale (18) recevant une unité de goupille latérale (19).
9. Serrure selon la revendication 8, dans laquelle l'unité de goupille latérale (19) comprend une goupille latérale et un élément formant ressort (192), le boîtier (1) comporte un trou de remplissage (181) qui se trouve diamétralement opposé audit au moins un trou de goupille latérale (18), l'unité de goupille latérale (19) est insérée dans ledit au moins un trou de goupille latérale (18) via le trou de remplissage (181), le trou de remplissage (181) est couvert par un cache (182).





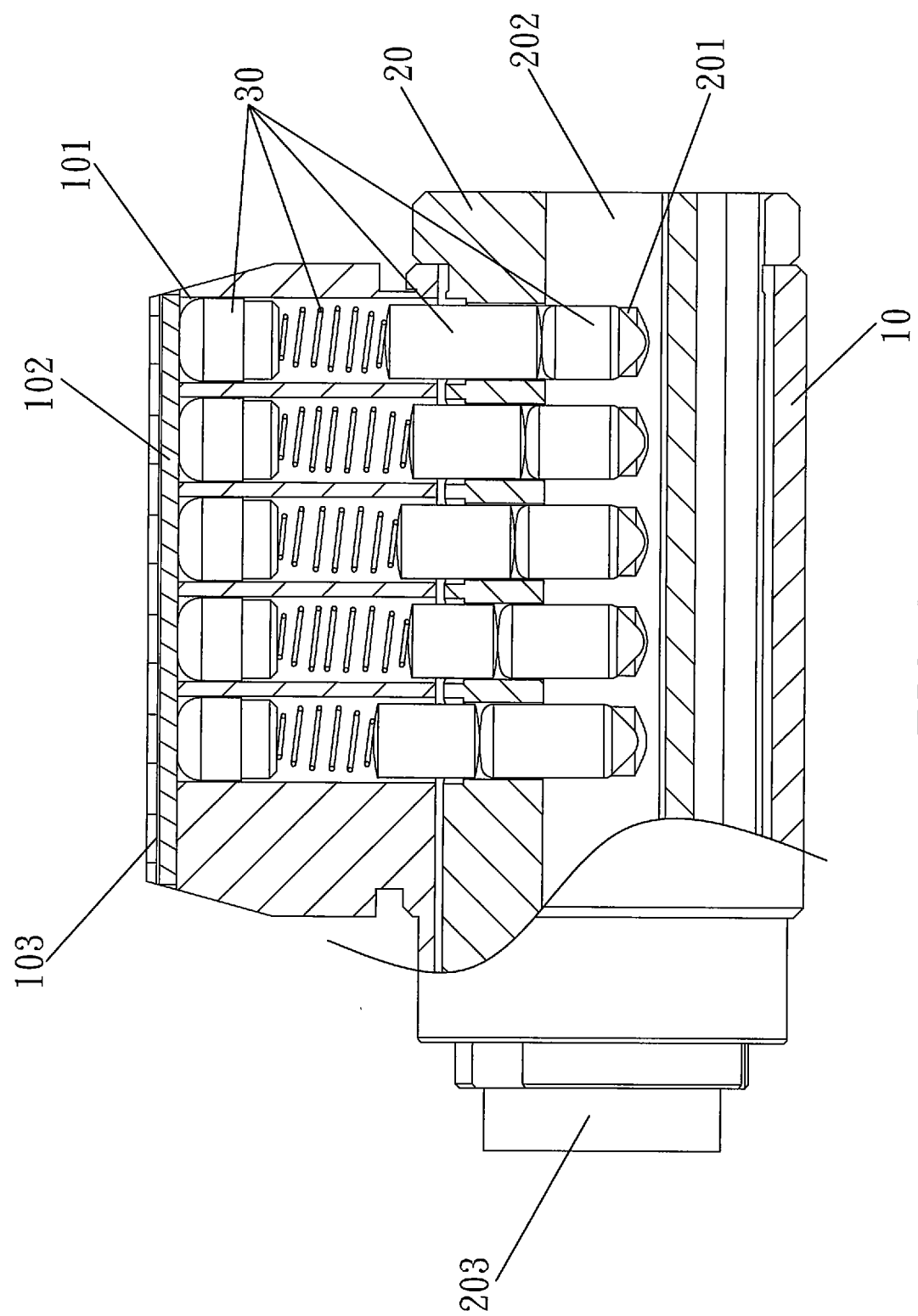
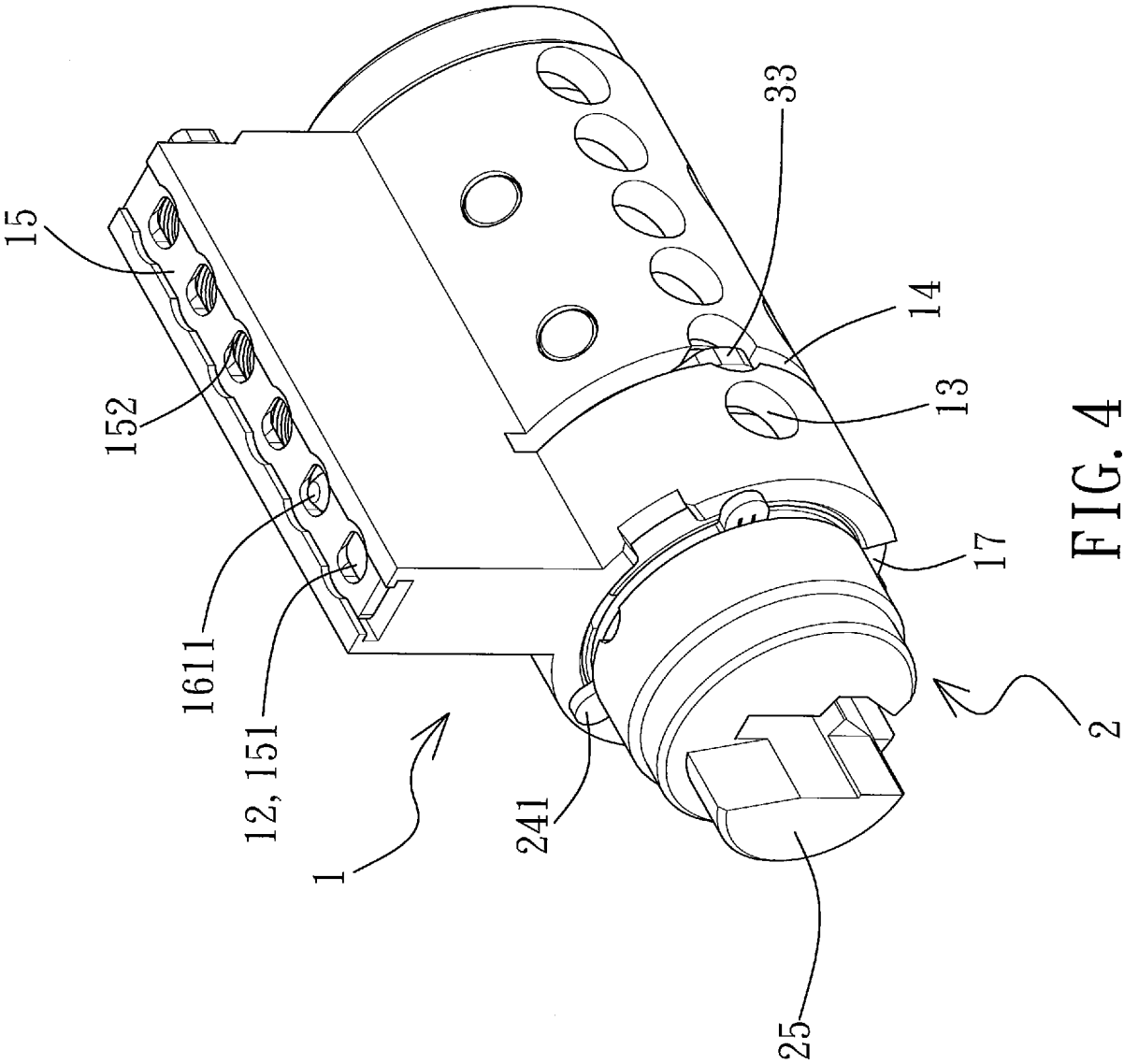


FIG. 3



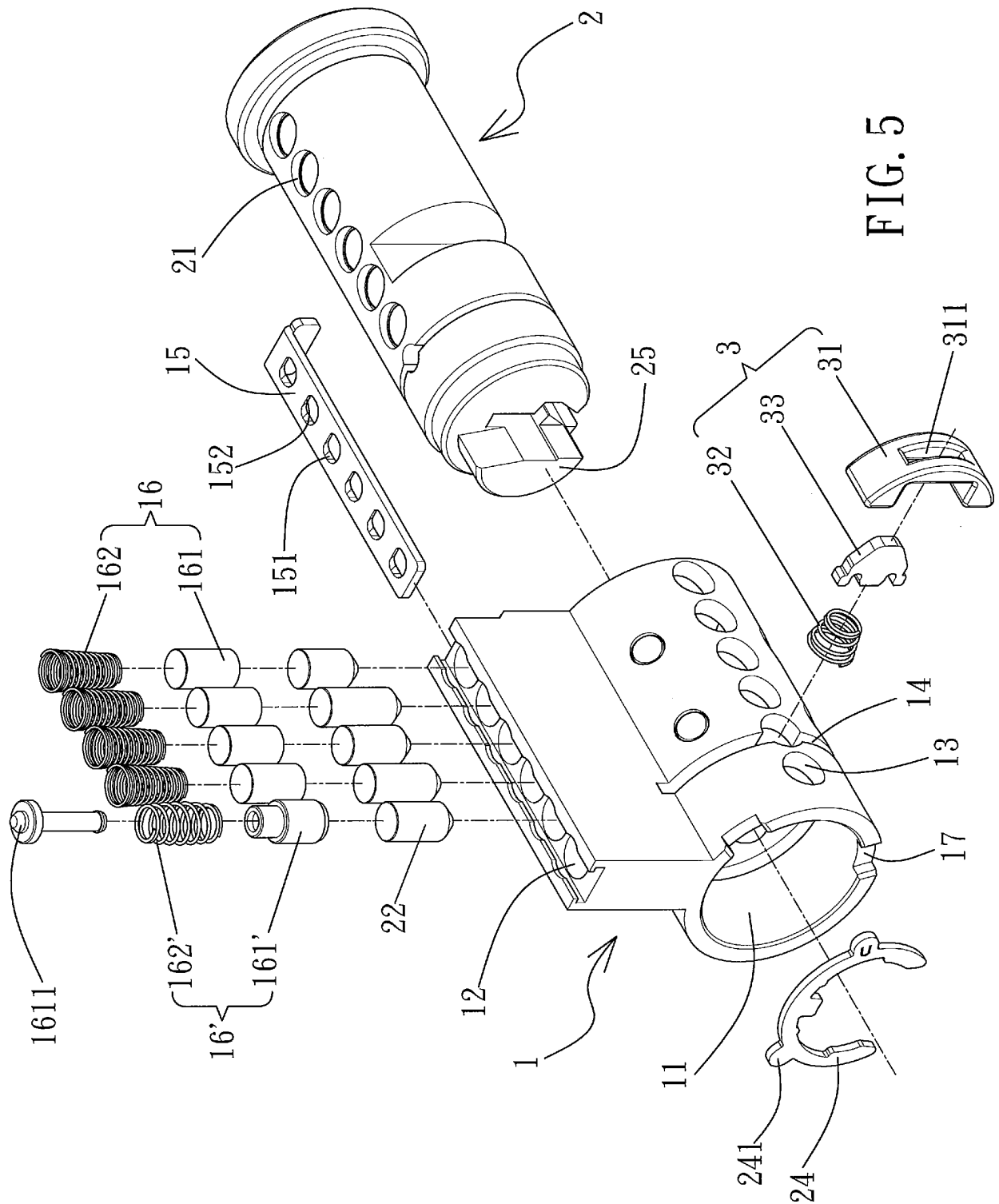


FIG. 5

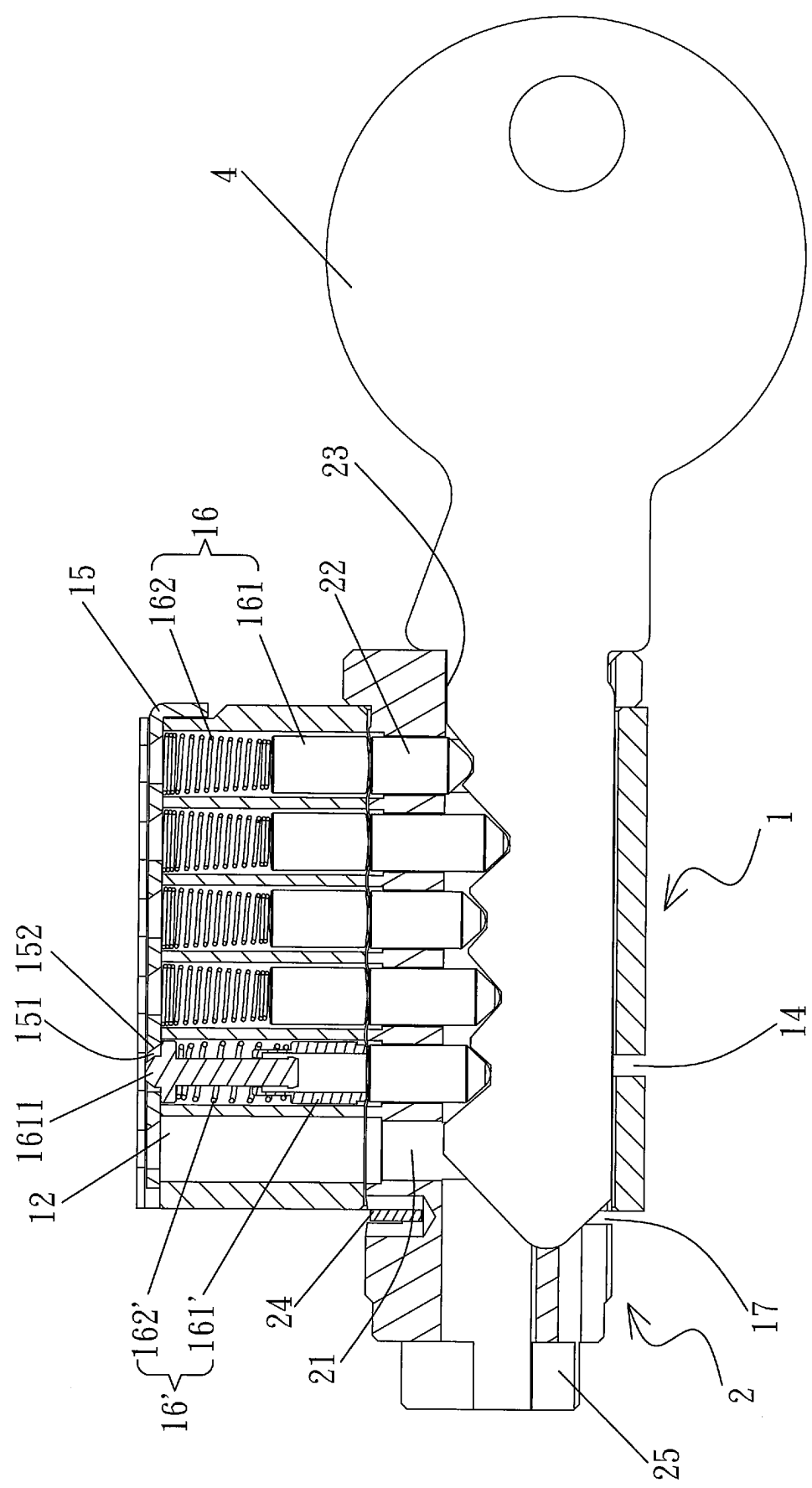
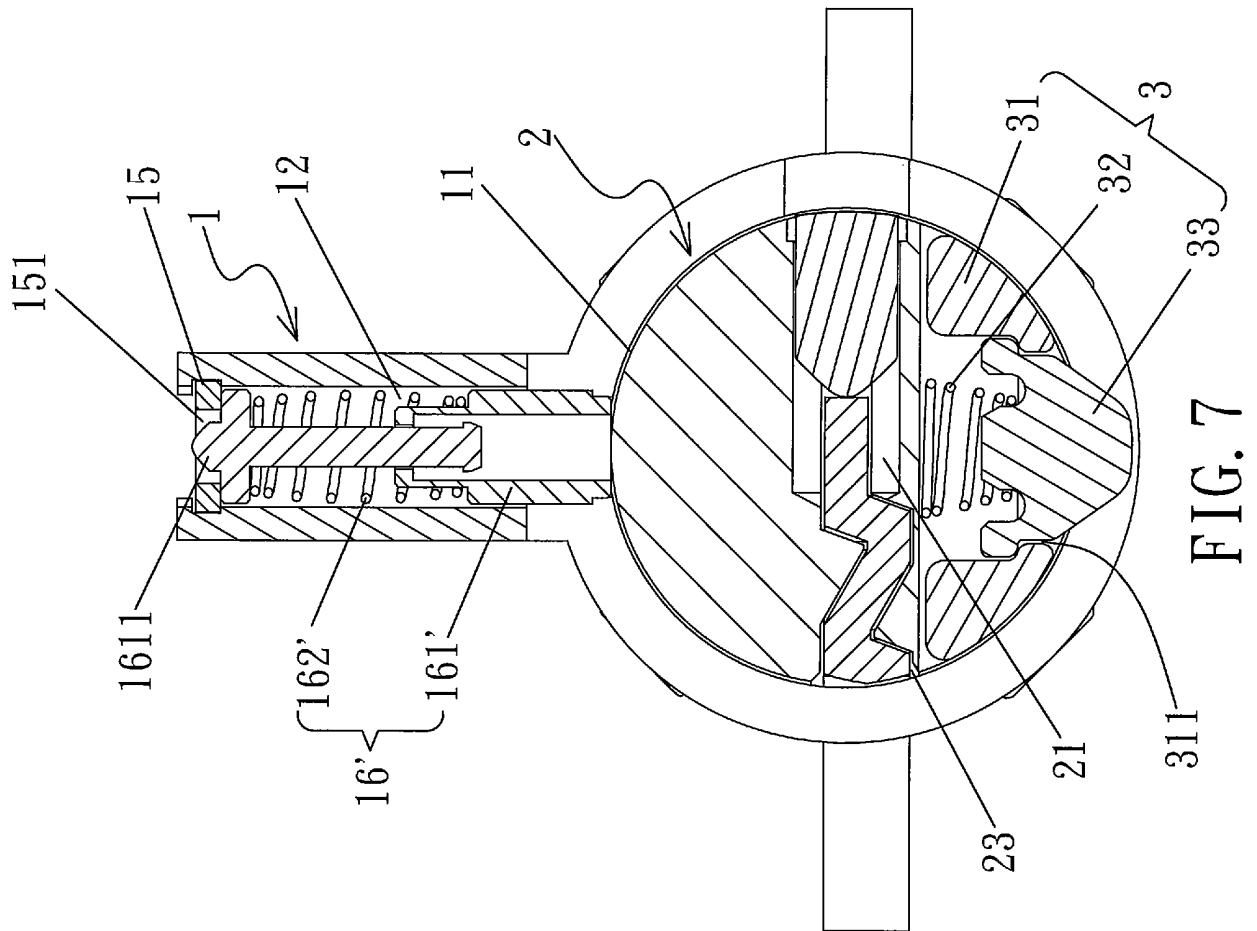


FIG. 6



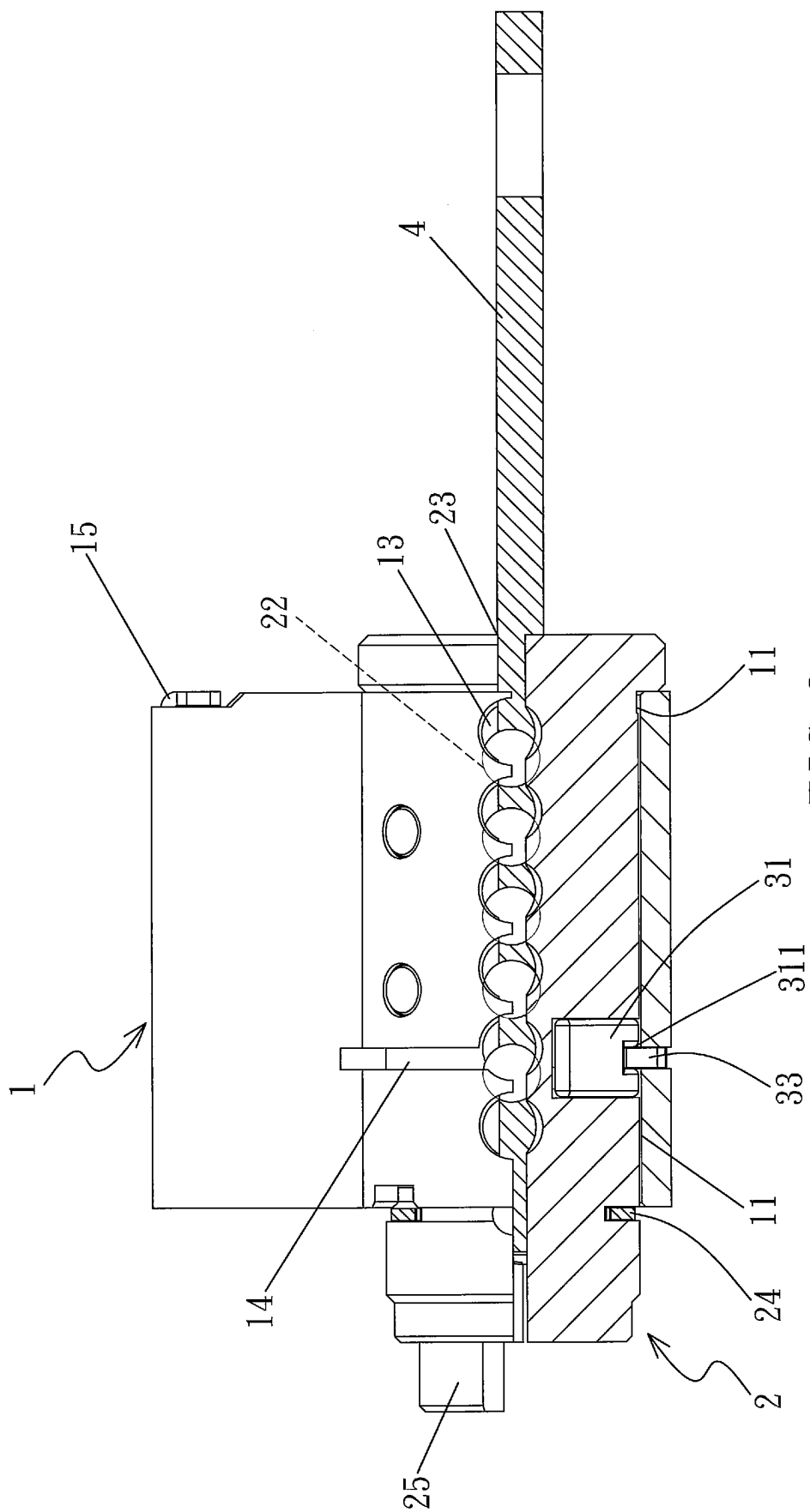


FIG. 8

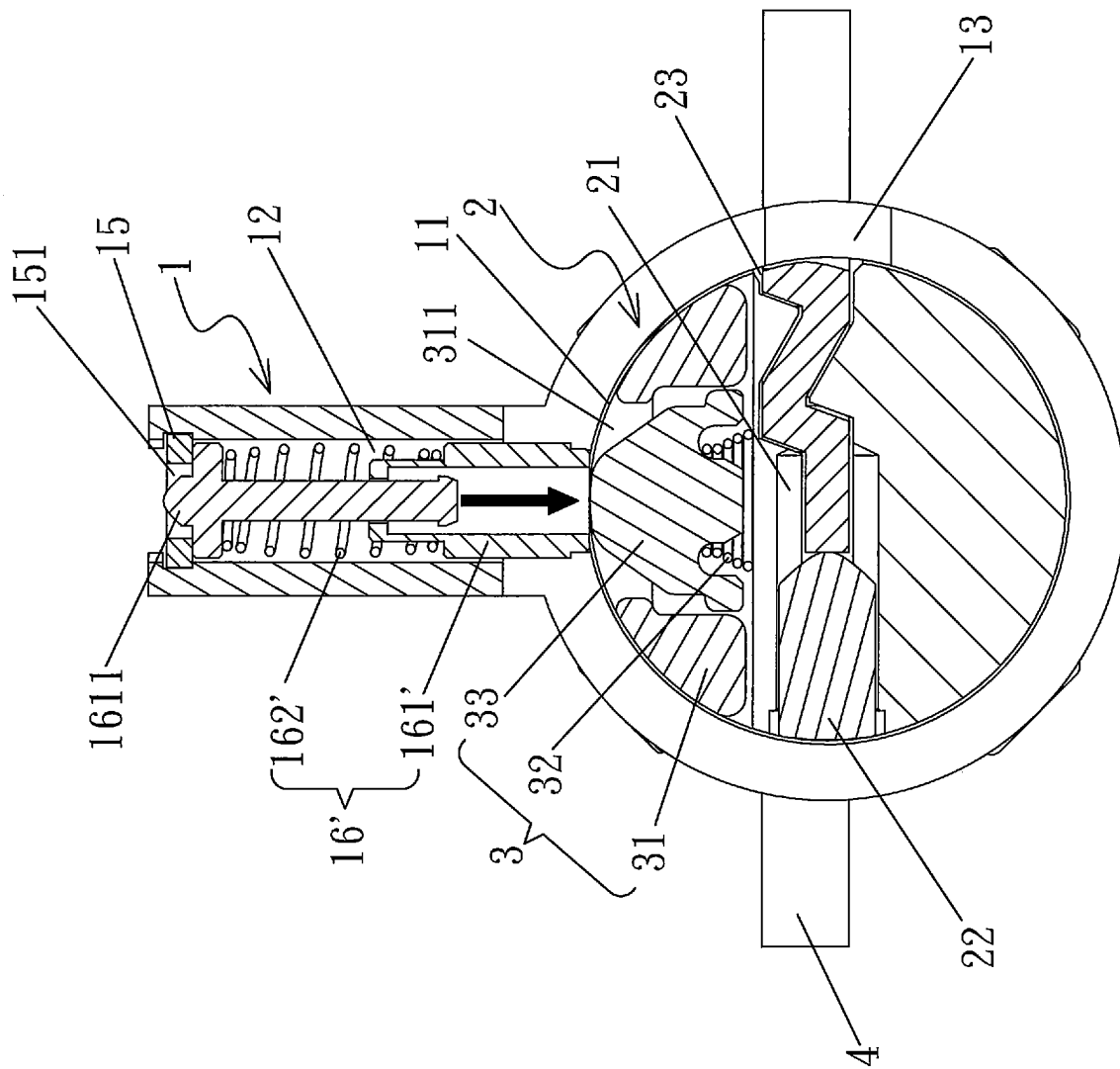


FIG. 9

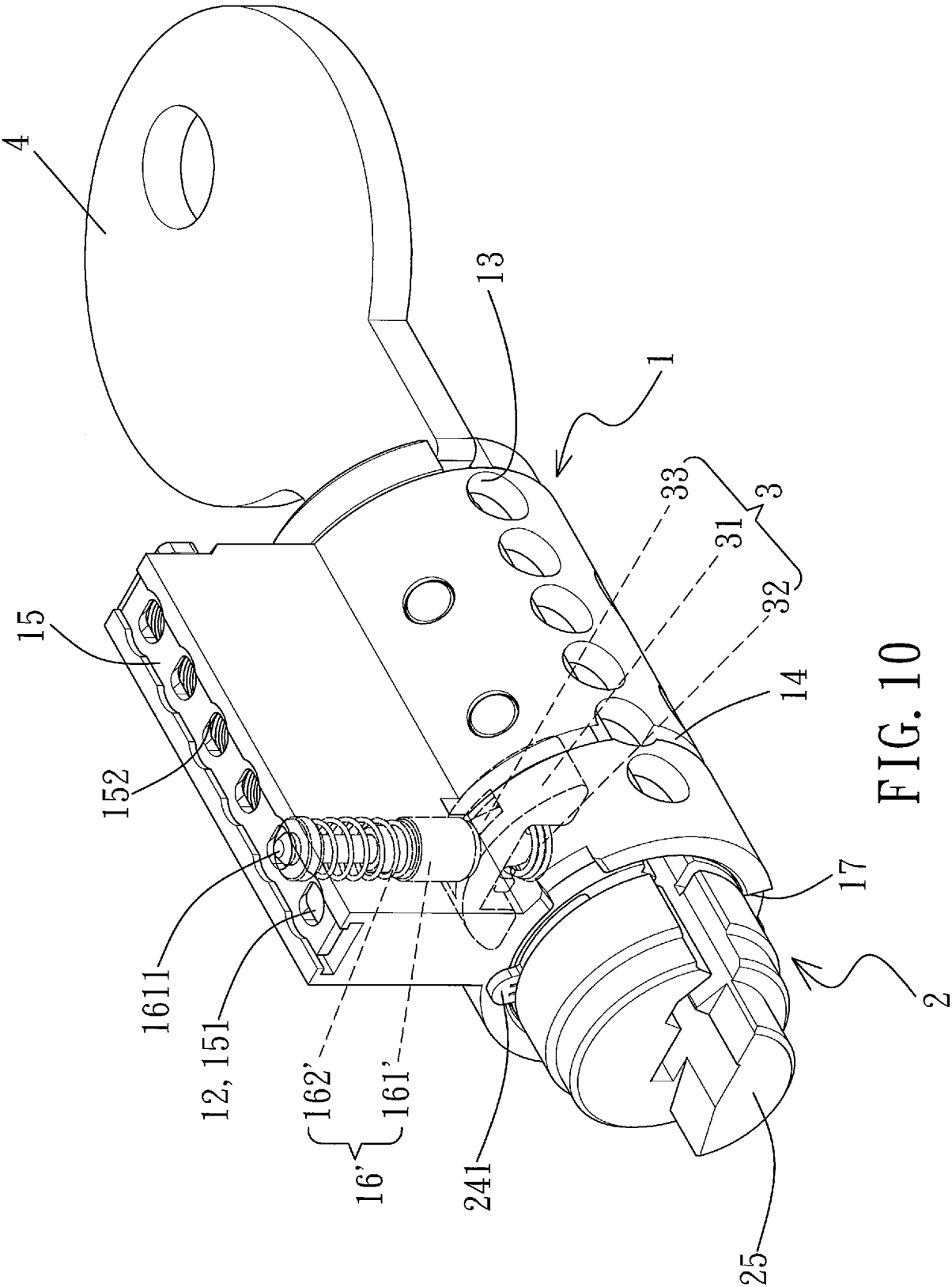


FIG. 10

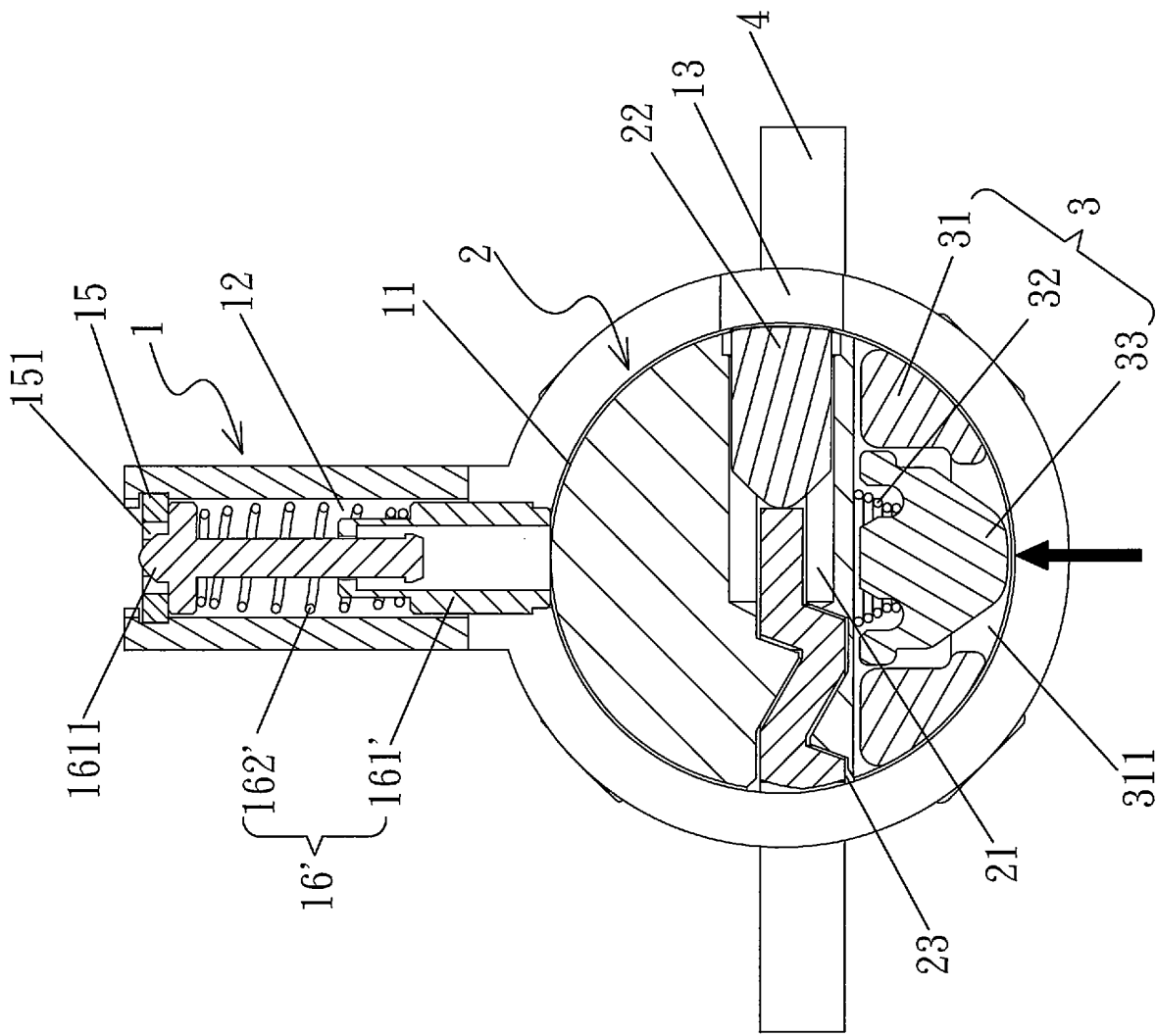


FIG. 11

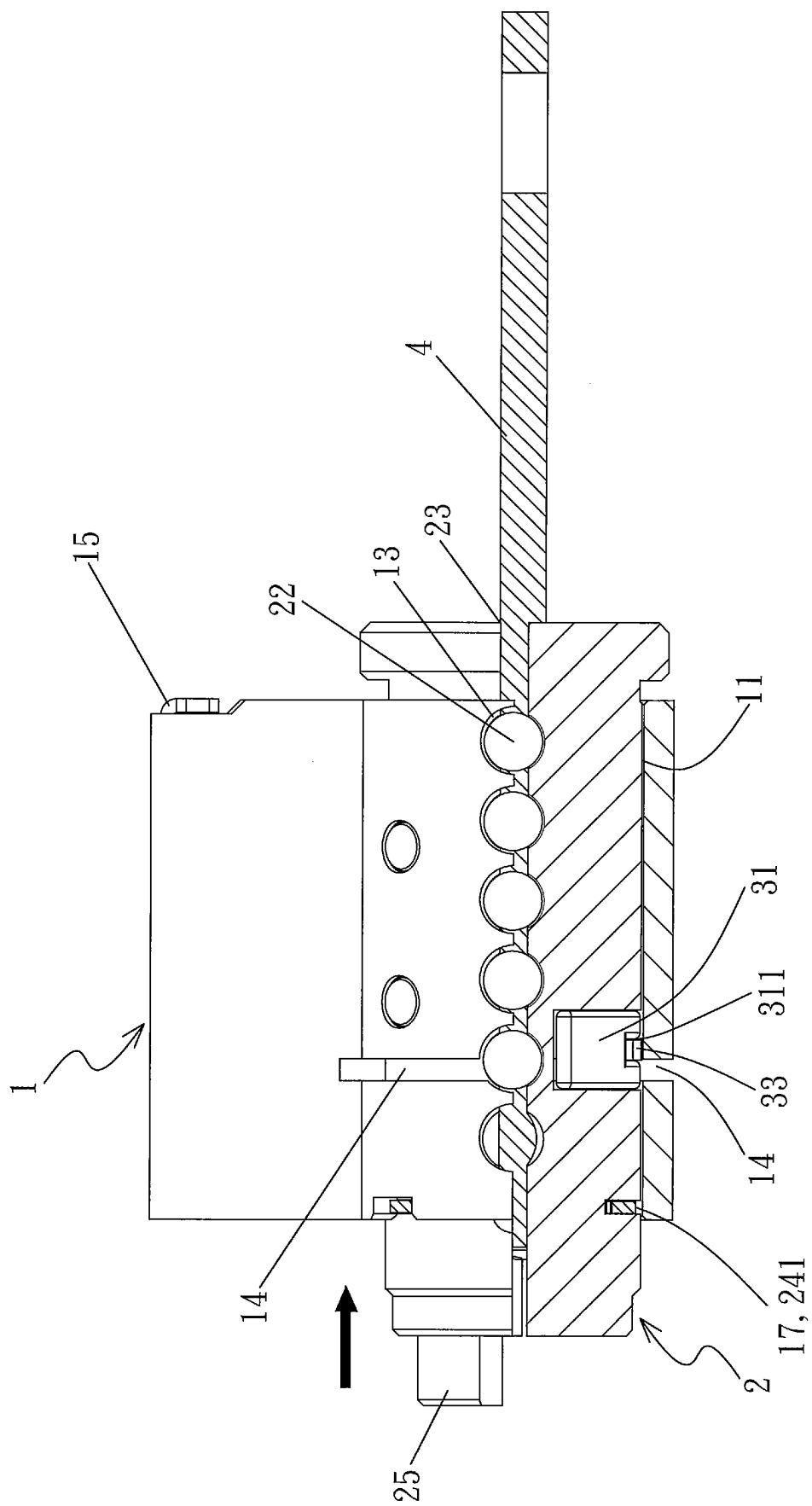
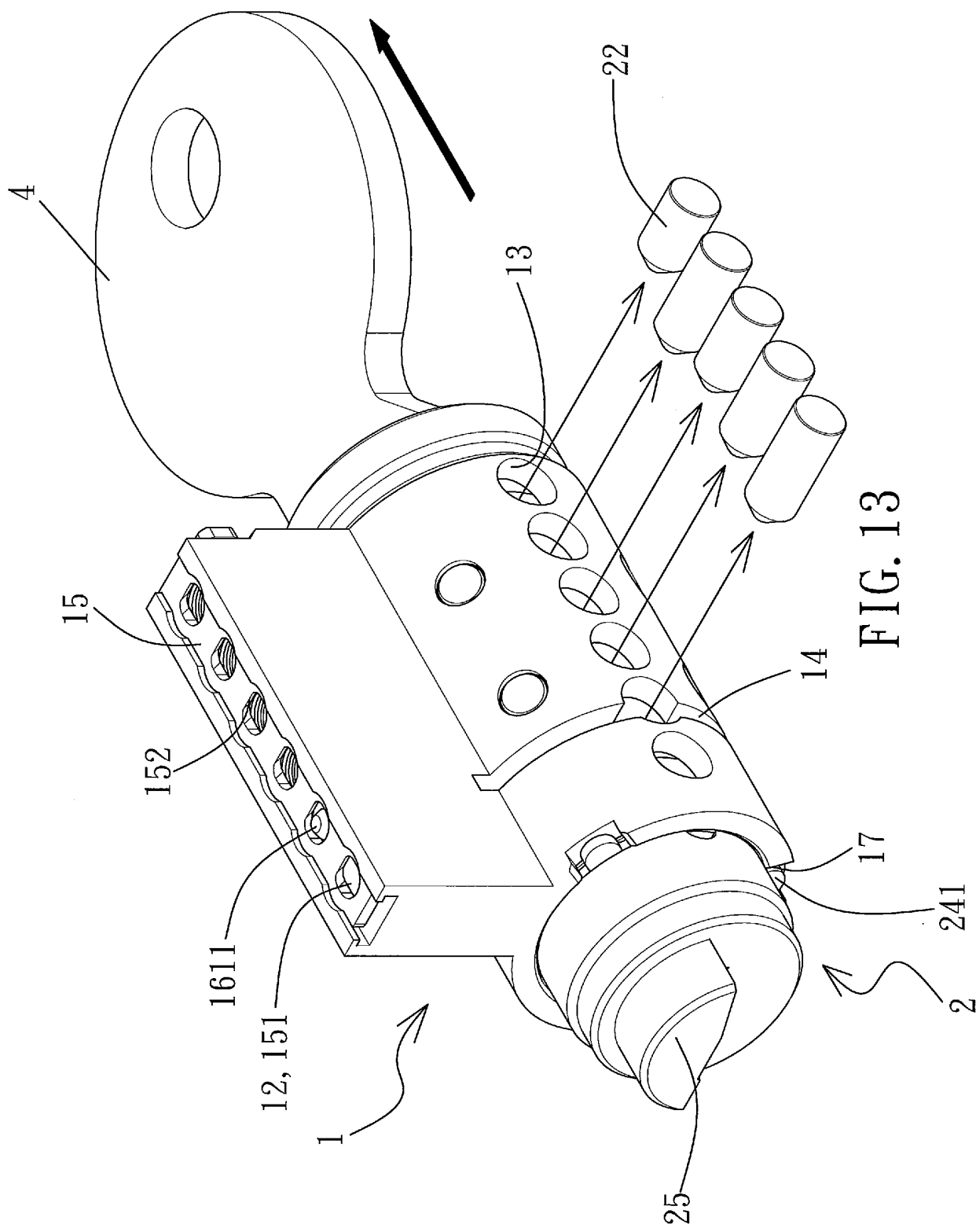
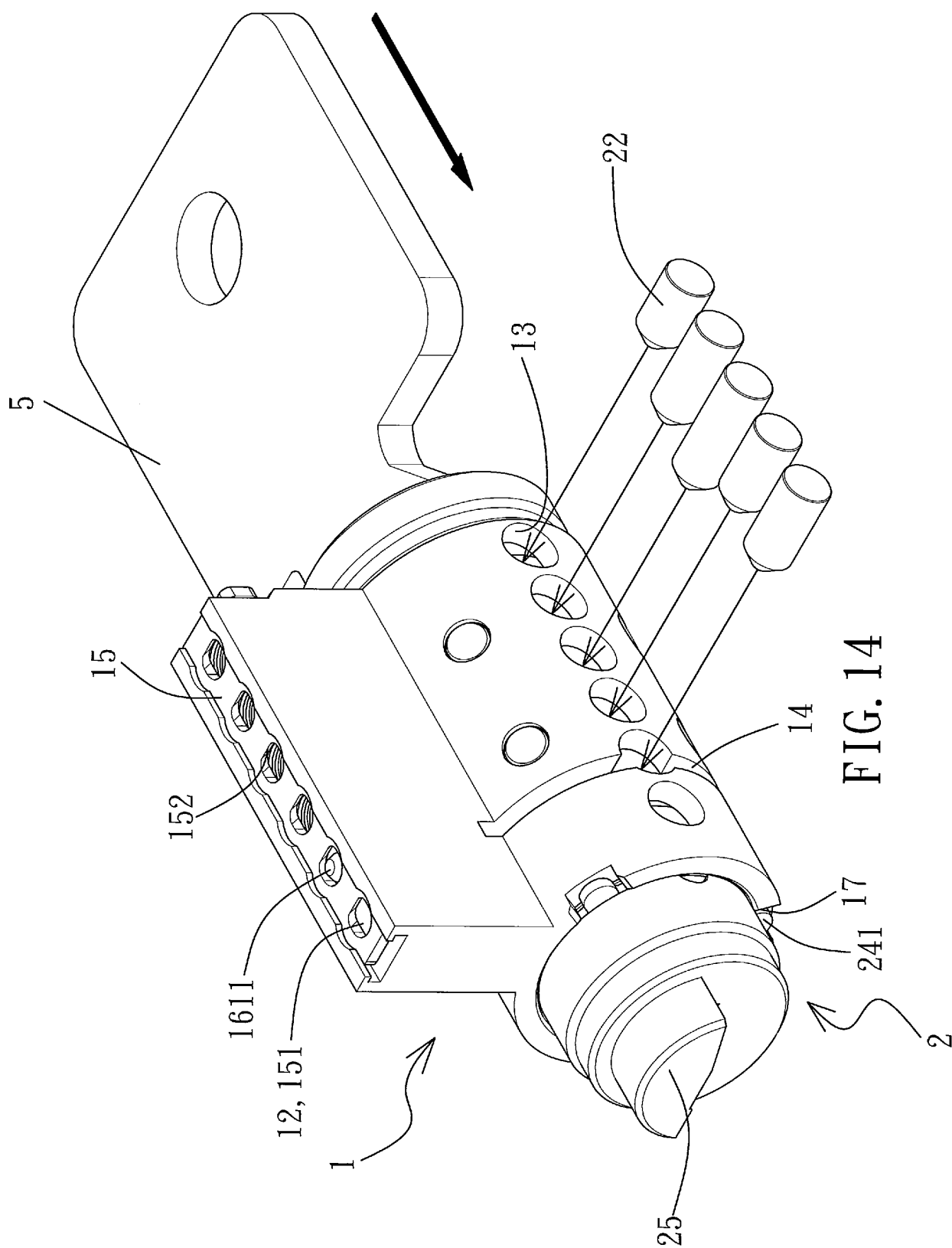
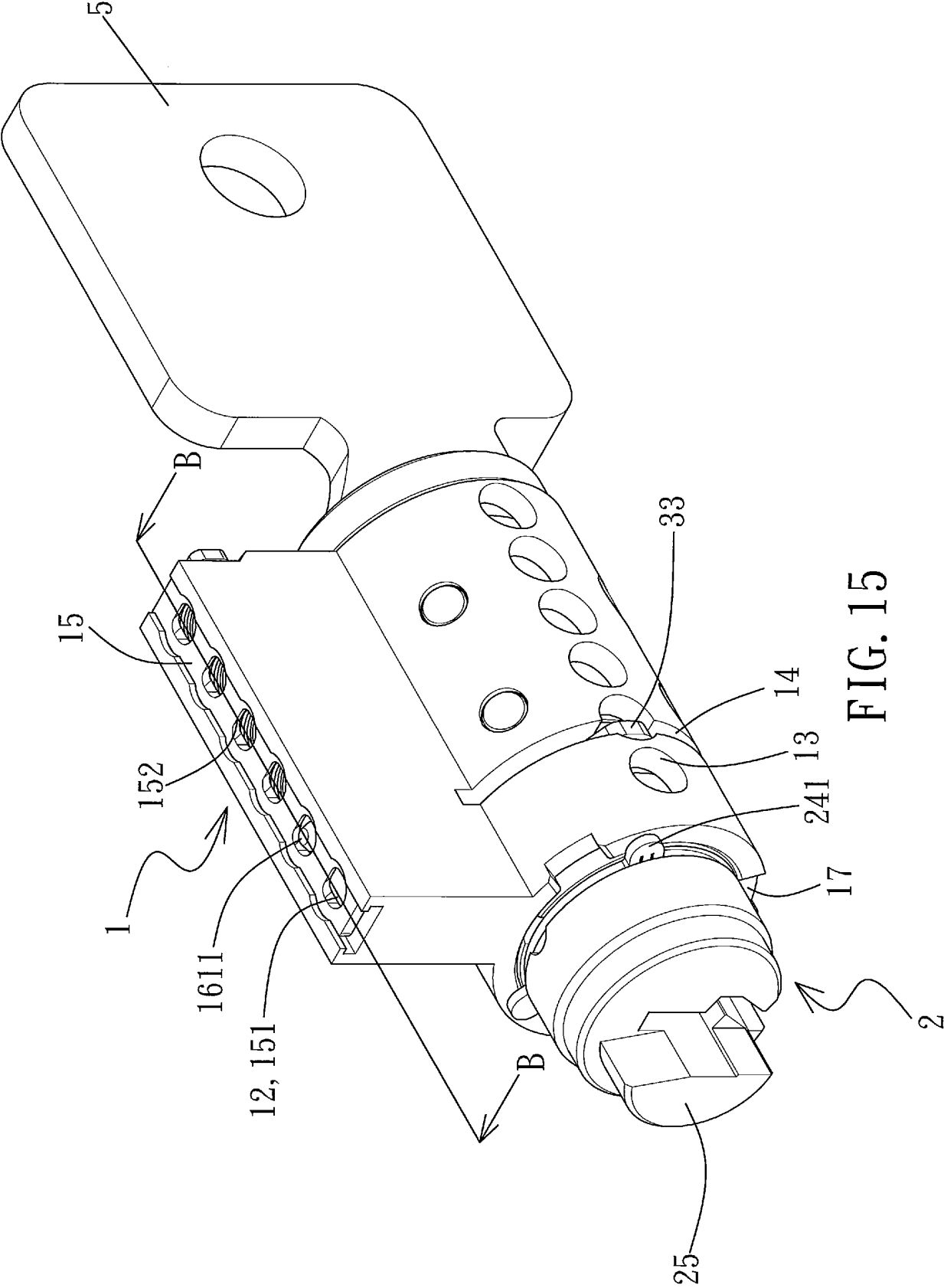
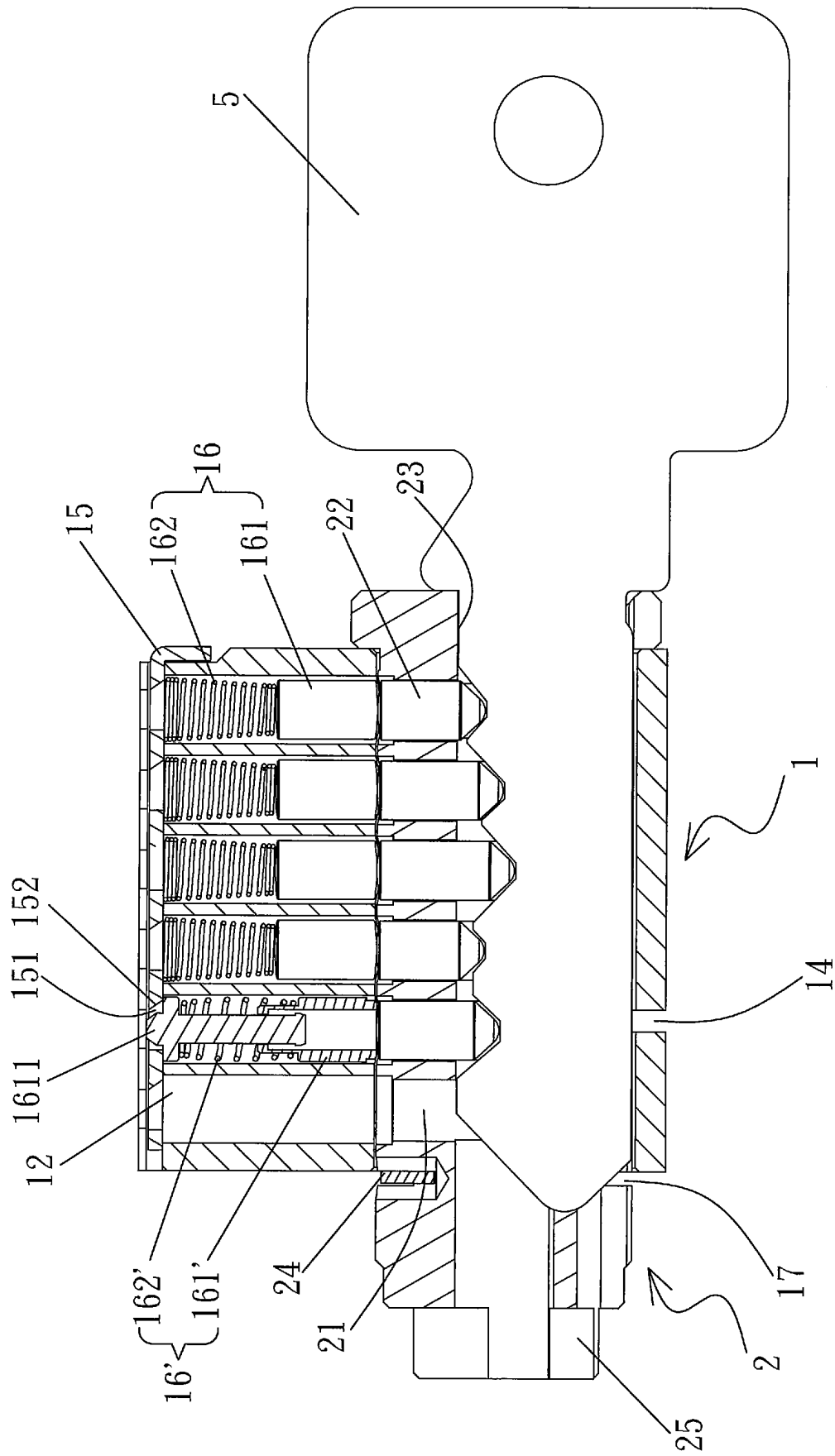


FIG. 12









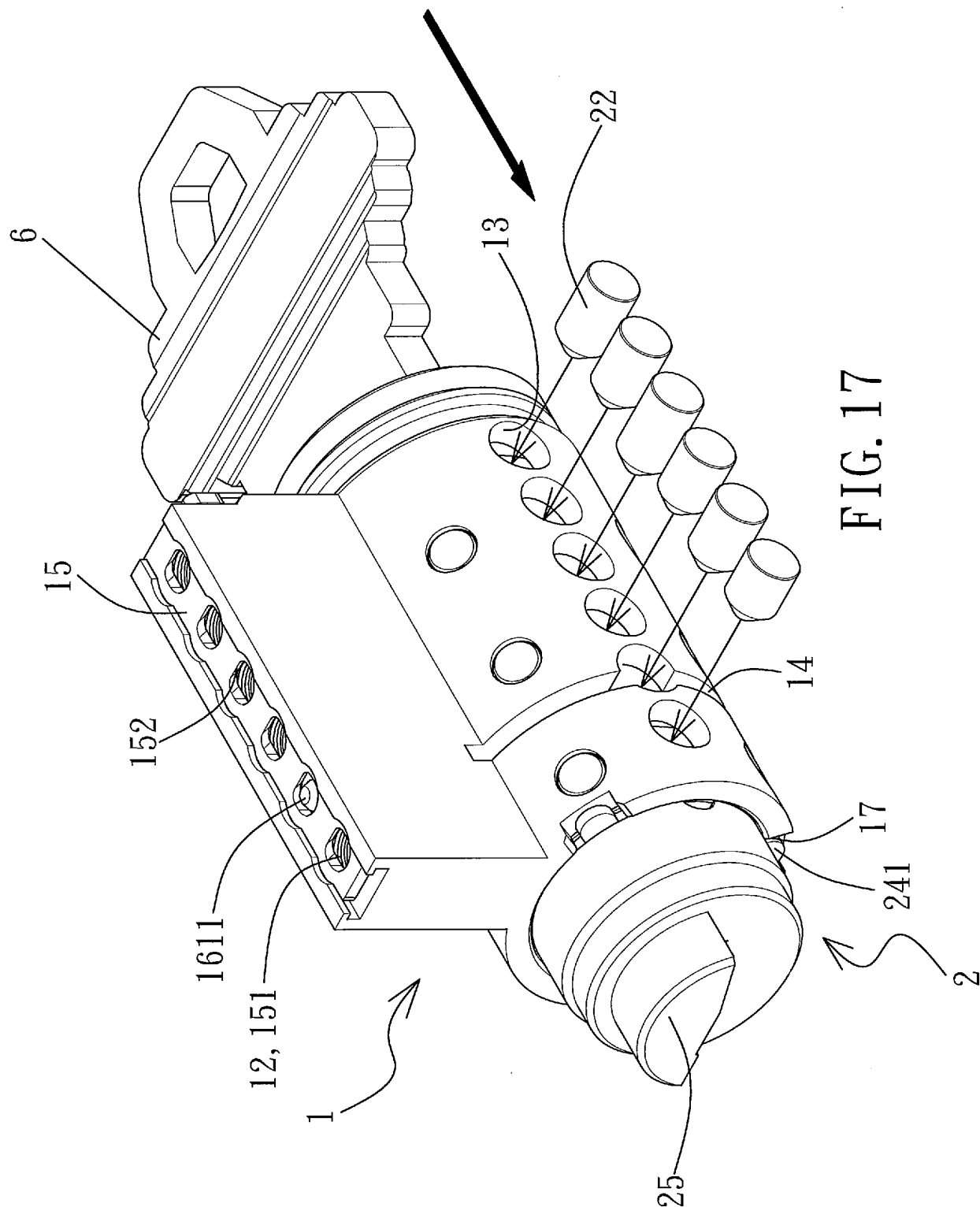
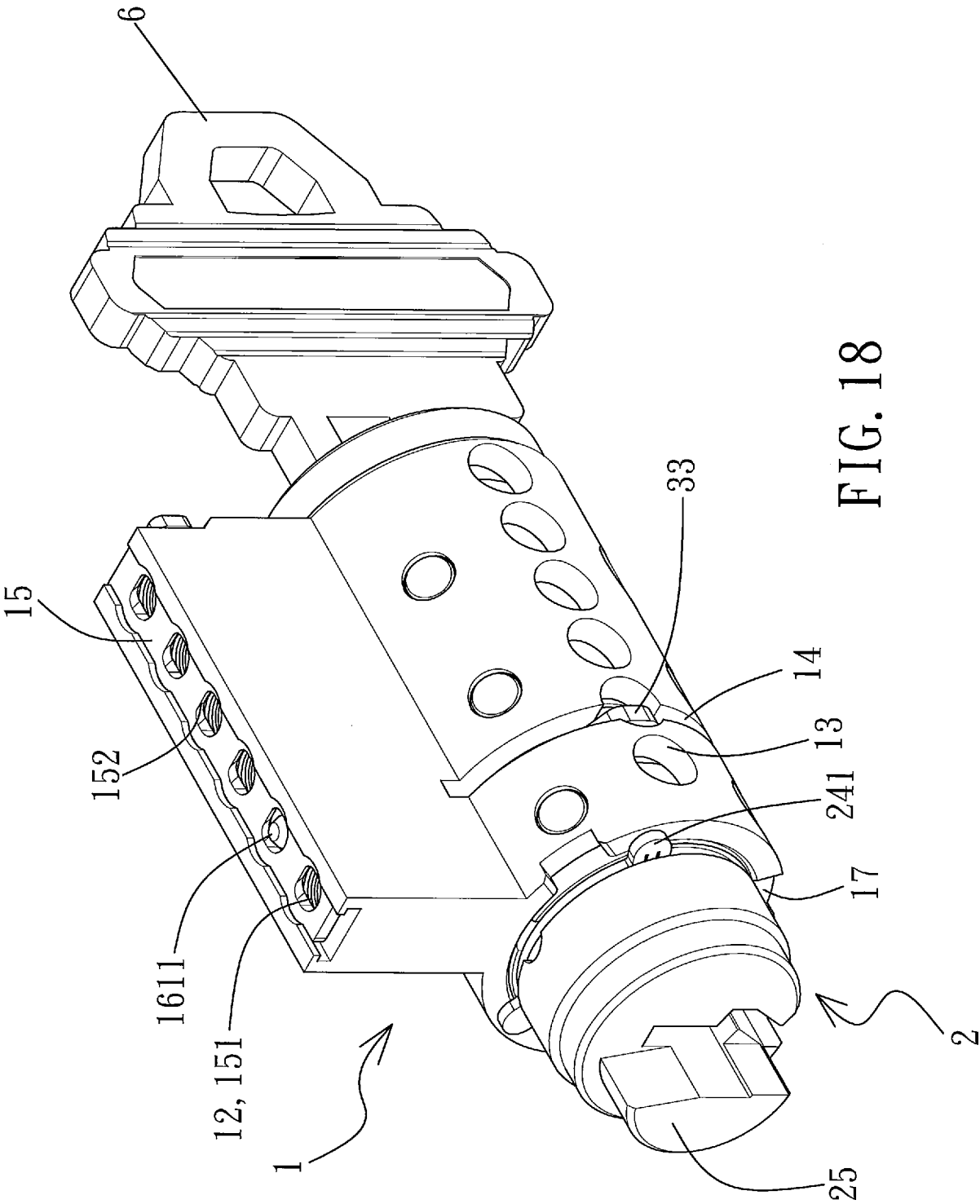


FIG. 17



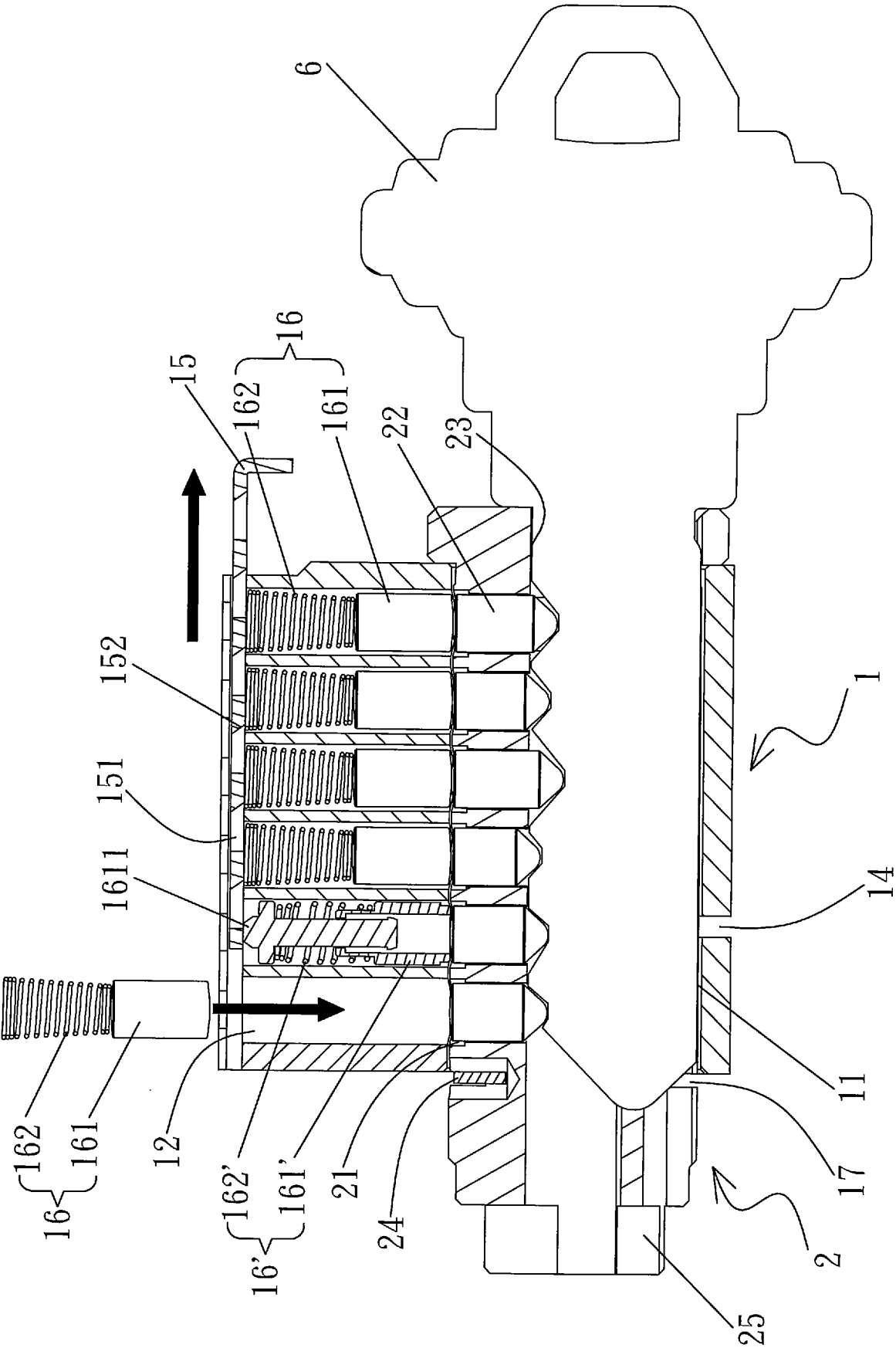
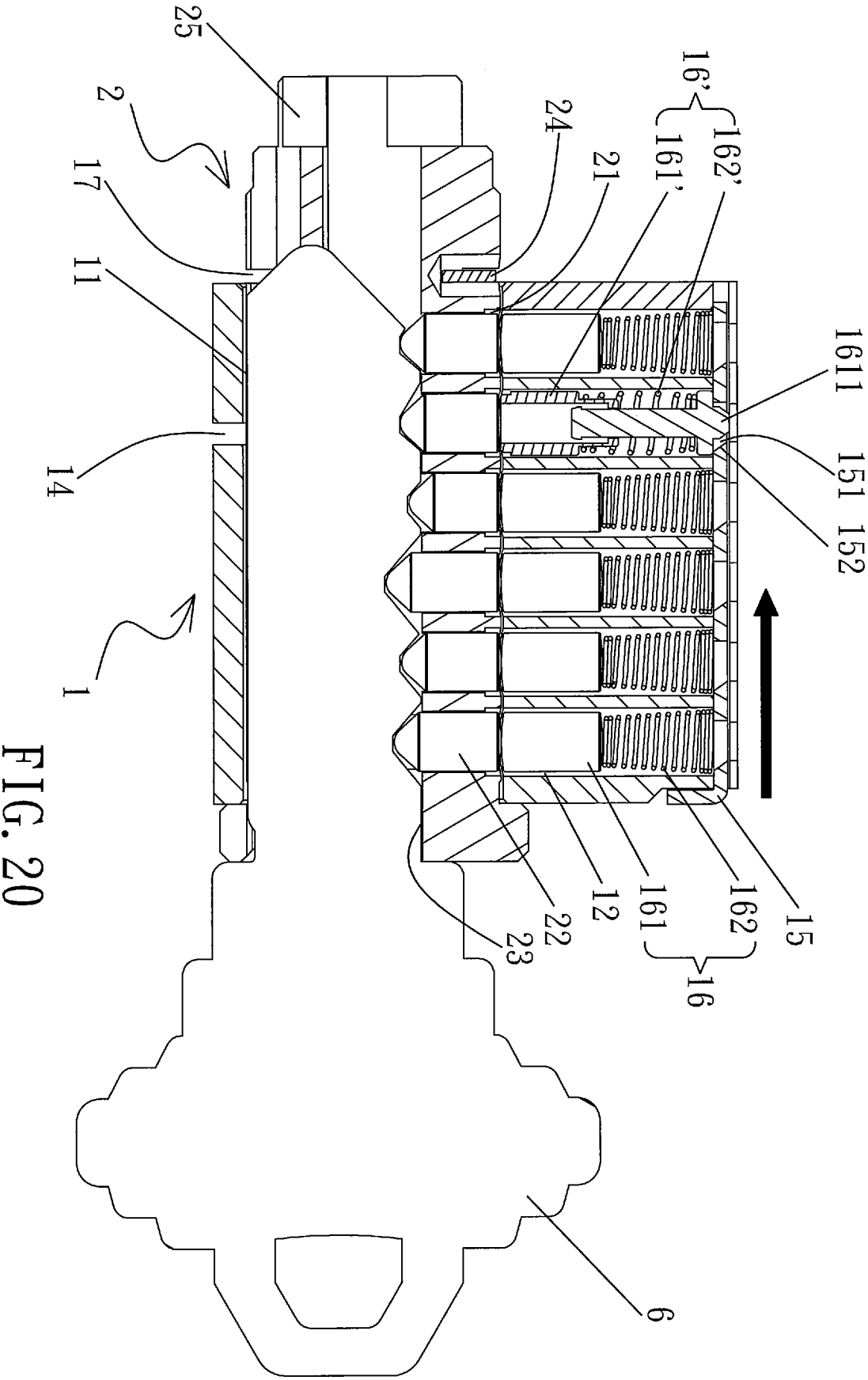
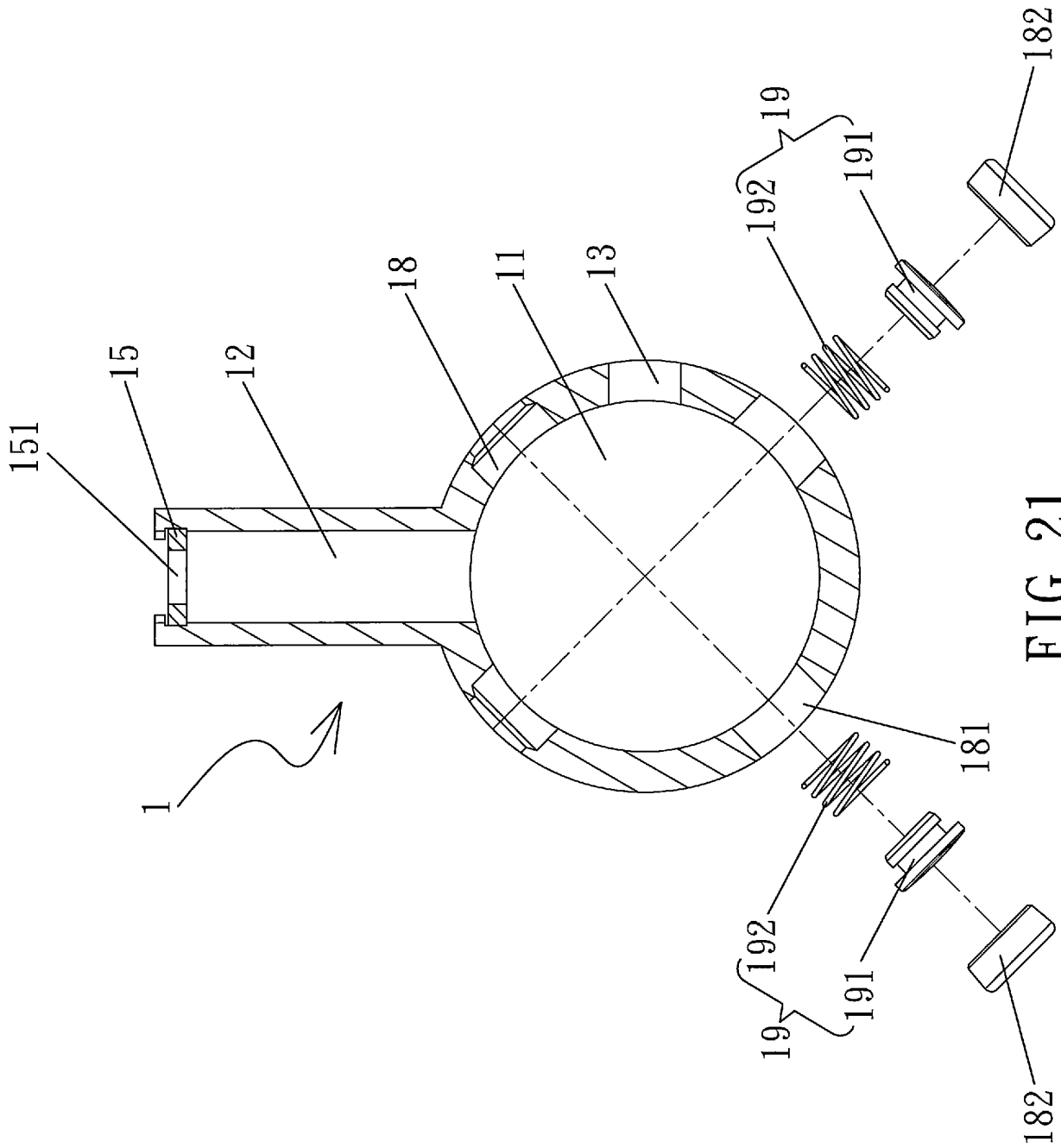


FIG. 19





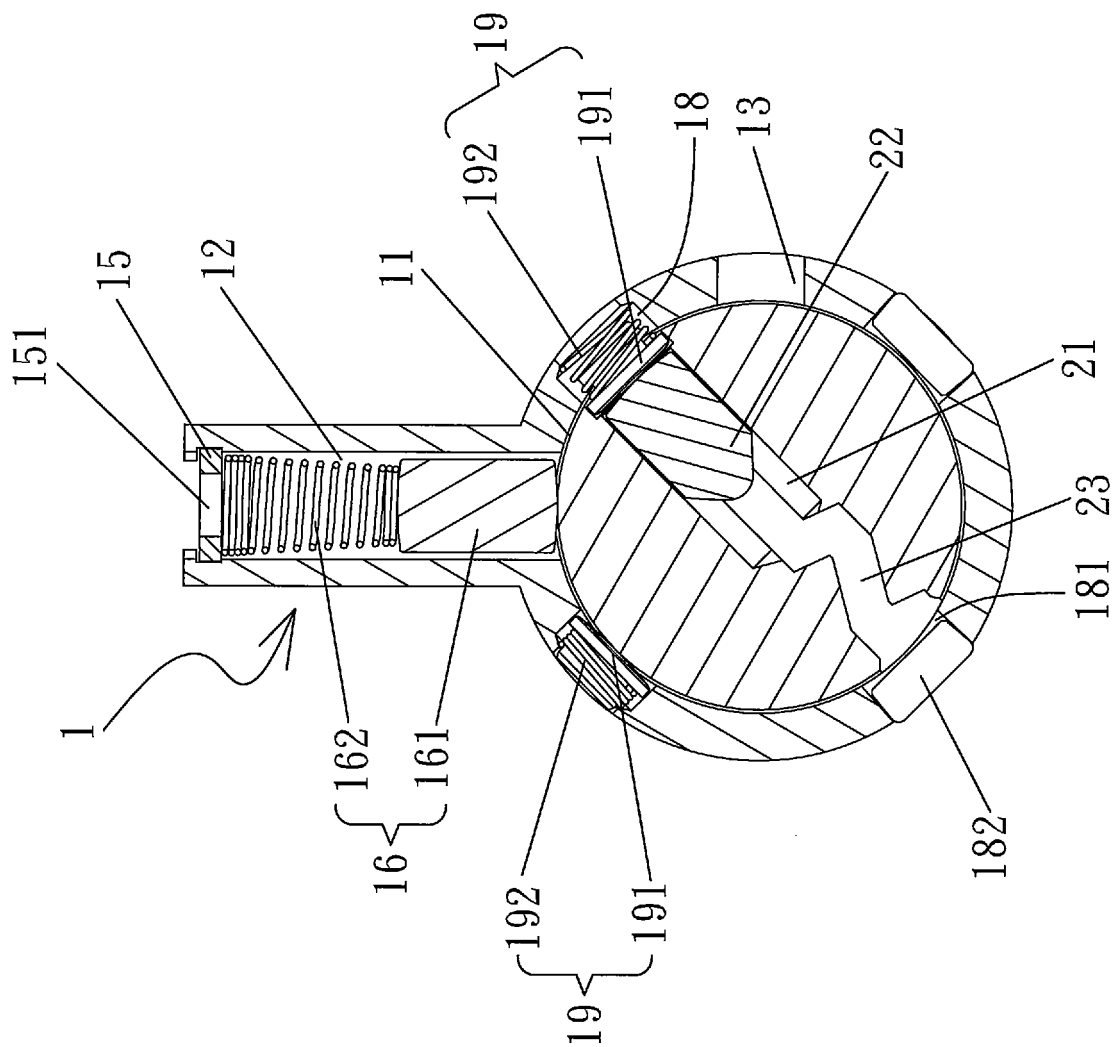


FIG. 22

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 7121127 B1 [0006]