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(54) Strut with stripping mechanism

(57) Strut with stripping mechanism which comprises an outer telescopic tube (1) and an inner telescopic tube (2), the outer tube (1) having a threaded portion (3) which has two diametrically opposing slides (10) to house a pin (12) which is, in turn, housed in two diametrically opposing orifices (11) which the inner tube (2) has, having a nut (8) which is screwed in the threaded portion (3), and which holds an anchoring piece (13) which comprises an upper notch (15) and a lower notch (16), positioned at different levels, allowing said anchoring piece (13) to move in a direction perpendicular to the outer tube (1) and be placed in a locked position, wherein the pin (12) is in contact with the upper notch (15), and an unlocked position wherein the pin (12) is in contact with the lower notch (16).

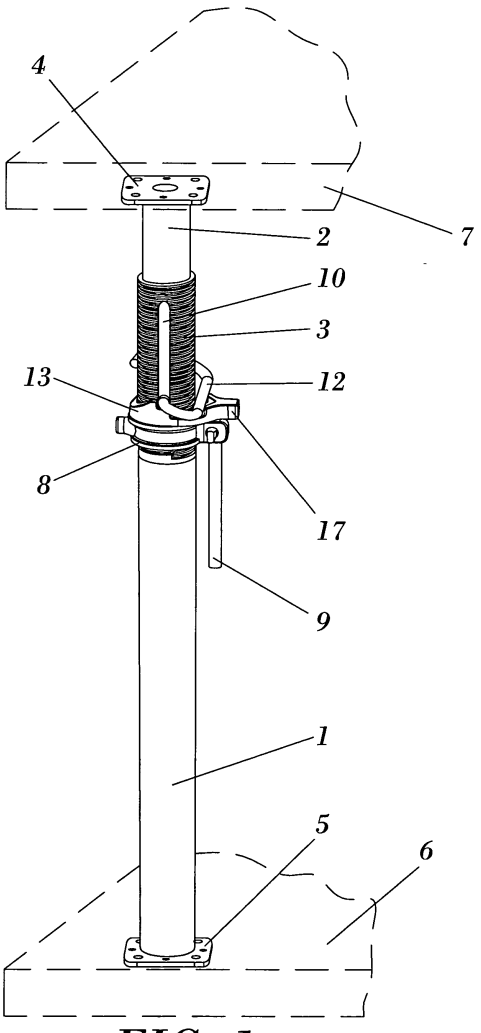

FIG. 1

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a strut with stripping mechanism which is applicable within the field of construction, enabling a quick removal of the strut which allows the time said operation requires to be reduced, with the subsequent reduction in execution costs of a work, all with elements which are simple to manufacture, robust and versatile, which allows already existing struts to be used.

BACKGROUND OF THE INVENTION

[0002] At present, the use of struts are known in the field of construction in order to support the shuttering structure of the floor slabs during the execution thereof, for which purpose the shuttering contains the fresh concrete during its pouring until the stipulated time has passed; after its setting, the shuttering is removed, which allows undertaking the execution of another floor slab or any other task in the work.

[0003] These struts consist of a telescopic tube which extends until its length is equal to the distance between floor slabs, so that the lower end rests on an already executed foot plate or floor slab and the upper end supports the floor slab shuttering which is executed on an upper level.

[0004] Once the strut has been extended until its working length, its telescopic ends are fixed or anchored, which is performed by the disposal of pins or elements which serve as limit for the relative position of both ends, which rest on a nut which is found in one of the tubes and which, by screwing, allows the relative position of both tubes to be defined.

[0005] When the concrete of the floor slab or flagstone being executed has set, it is necessary to remove the strut, which is in a loaded position as it receives the corresponding weight of said floor slab, for which purpose a considerable torque must be applied to the nut to lower the upper portion of the strut, which is usually performed on site by a hammer blow, which produces a premature deterioration of the strut.

[0006] On some occasions it is not possible to loosen said nut, often as a consequence of its jamming due to the dirt of the work of by effect of thermal dilatations, for which reason it becomes necessary to hit the lower end of the strut, in an area close to its support point, in order to produce its inclination and its removal, which causes unnecessary damage in the strut, which, on some occasions, disables it for future use.

[0007] One of the aforementioned struts is described in Spanish patent with publication number ES 2140280, which discloses a device for the unloading of struts which comprises a bushing with the possibility of sliding with respect to one of the portions of the strut and which rests on the setscrew of the strut and which has diametrically opposing grooves wherein a pin is located, being configured to house two protuberances in a form similar to another sliding piece on the exterior of the strut shank.

[0008] This mechanism is complex, both in its manufacturing and in uncomfortable use, having little robustness as a consequence of the breakage or spoilage of the strut when any blows occur, especially in said protuberances, something which is frequent in the field of construction work, which means that the contact between the mechanism elements is defective, the part losing its entire functionality.

[0009] Likewise, Spanish utility model with publication number ES 1045613 U relates to a strut for shuttering which comprises a pin which enables the position of two telescopic portions of the strut to be blocked. Said pin locks and unlocks in a certain position using a rotational part which has projections at different levels, whereon the pin rests and determines the position of the upper body of the strut.

[0010] The main drawback of this strut is that the rotational part fits around the upper body or tube, for which reason it must be rotated by sharp blows, due to its loaded position with the weight of the shuttering, both to be positioned in the locked position and to be positioned in the unlocked or release position, causing premature wear and deterioration of the upper tube of the strut. Furthermore, to move the rotational piece it is necessary to apply a torque of considerable force, which means that on hitting one end thereof, it is necessary for this blow to be transmitted to the strut in order to achieve the torque necessary to cause the part to rotate, which again leads to premature wear of the strut, in which section there finally appears a groove of wear and the marks of the hammer blows.

[0011] On the other hand, Spanish utility model with publication number ES 1054199 U relates to a quick decentering which comprises two telescopic tubes and a pin configured to quickly withdraw the strut when its use is no longer necessary. Said pin transversally passes through an inner tube whose end is in contact with the shuttering, said pin having lower notches which constitute a difference in level and which cause a slight drop in height of the inner tube when it moves horizontally therein, by effect of a dry blow, enabling the quick removal of the strut.

[0012] United States patent with publication number US 4,752,057 defines a strut which has a functioning principle similar to that of the strut described in the previous paragraph, with differences in the configuration of the pin element, having the drawback of the wear that usually occurs in the notches of the pin, as a consequence of the contact with the walls of the tube, which rest on said notches, and particularly as a consequence of the difference in level of the tube, which is achieved by blows which bring about the horizontal movement of the pin.

DESCRIPTION OF THE INVENTION

[0013] The present invention relates to a strut with stripping mechanism which permits its quick and simple removal by an operation which does not damage or deteriorate any elements of the strut, which manages to reduce the times that said operation requires, or reduce the manpower necessary to collect the struts for a same collection time, either to execute the next floor slab or to store the struts, said time reduction being greater the larger the surface strutted, which leads to a reduction in the execution costs of the work.

[0014] On the other hand, the strut of the invention comprises elements which are simple and cheap to manufacture, which are highly robust, which lead to an extension of its useful life, being extremely versatile, making it possible to use the struts which are already existing or available on site, by the incorporation of their elements.

[0015] The strut with stripping mechanism that the invention proposes comprises an outer tube configured to telescopically house an inner tube, both tubes preferably having a circular section and the outer tube being configured to rest on a support surface, which typically is an already executed foot plate or floor slab, by a first end which has fixed, for example by welding, a lower support plate that can consist of a plate with orifices for its securing to the support surface, at one end having a threaded portion, or having fixed a bushing which is externally threaded.

[0016] On the other side, the inner tube is configured to play telescopically in the interior of the outer tube, said inner tube having fixed at one free end, for example, by welding, an upper support plate which may consist of a plate with orifices for its securing to a surface to be strutted, which may be a lower surface of a floor slab shuttering, or an already executed structural element which needs to be strutted, for example in renovation work.

[0017] As has been previously stated, the outer tube comprises a threaded portion which has two diametrically opposing slides with longitudinal orientation, i.e. oriented towards a central shaft of the outer tube, said slides being configured to house and guide a pin, preferably with circular section which is tightly housed in the slides.

[0018] The pin is configured to be housed in two diametrically opposing orifices of the inner tube, which means that the play of the pin in the orifices and in the slides permits and defines a stroke for the relative position between the outer tube and the inner tube, whose position is defined by a nut configured to screw in the threaded portion, which defines its height position, and to support an anchoring piece, or locking piece, which is configured to make contact with the pin, so that the positioning of the nut and its contact with the pin defines the height and position of the inner tube, typically raising said nut until contact is made with the inner tube, specifically of the upper support plate with the surface to be strutted.

[0019] Therefore, the anchoring piece, which preferably tightly contains the outer tube, comprises an upper notch and a lower notch positioned at a lower level, i.e. underneath that of the upper notch when the anchoring piece is in working position resting on the nut.

[0020] The anchoring piece is configured to move in a direction perpendicular to the outer tube and be placed in a locked position, wherein the pin is in contact with the upper notch, specifically resting on said upper notch, and an unlocked position wherein the pin is in contact with or resting on the lower notch.

[0021] The anchoring piece fits on the outer tube having a clearance in a direction perpendicular thereto which permits its movement, tightly being in contact with the outer tube in a direction perpendicular to the previously defined direction of movement of the anchoring piece, although it can freely rotate with respect to the outer tube with no other restriction than contact with the pin.

[0022] In this way, the movement from the locked position to the unlocked position achieves that contact of the anchoring piece with the pin is performed at a lower level, which means that the inner tube descends enabling a release of the strut and its recovery quickly by a simple movement of a single piece.

[0023] Furthermore, in the case of struts which comprise a threaded portion or a bushing and a setscrew, as in the case of the struts belonging to the state of the art, by the incorporation of the anchoring piece and the pin, said strut can be used for its conversion in the strut of the invention, with the consequent savings.

[0024] It covers the possibility that the anchoring piece comprises at least one anchoring stop, preferably two, configured to make contact with the pin, specifically with a bent portion of said pin, when said anchoring piece is in the locked position, therefore the pin has a configuration similar to that of a clip. In accordance with a preferred embodiment, said, at least one, anchoring stop is located at the same level as the lower notch.

[0025] On the other hand, it covers the possibility that the anchoring piece comprises a button, preferably a thickened area in the area of the anchoring stop of similar section to that of a hammer for hitting with this tool, said button being configured to receive an impact when said anchoring piece is in the locked position which moves said anchoring piece to the unlocked position, for which reason the lower notch is positioned between the upper notch and the anchoring stop.

[0026] Likewise, it covers the possibility that the anchoring piece comprises a tab positioned in the upper notch, said tab being configured to contain one end of the pin limiting its position in the orifices of the inner tube.

[0027] It covers the possibility that the nut comprises an actuating lever configured to screw said nut in the threaded portion by its actuation by a user.

[0028] It finally covers the possibility that the inner tube comprises means indicative of a total length of the strut, for example, by recording the height, being visible through the slides so that the user has information on the height between floor slabs during the placement of the

strut.

[0029] Thus, in accordance with the described invention, the strut that the invention proposes constitutes an advance in the struts used to date, and resolves the aforementioned problems in a fully satisfactorily manner, in the line to permit reducing the times necessary for their removal, which is performed in a simple way, with the subsequent reduction in costs to execute the works, all with simple elements of manufacturing, that are robust and versatile, which permits its incorporation in already existing struts.

DESCRIPTION OF THE DRAWINGS

[0030] To complement the description being made and with the object of helping towards a better understanding of the characteristics of the invention, in accordance with a preferred example of practical embodiment thereof, a set of figures is attached as an integral part of the description, wherein the following has been represented with an illustrative non-limitative character:

Figure 1. Shows a schematic perspective view of a strut in a working position located between a support surface and a surface to strut.

Figure 2. Shows a perspective view of the anchoring piece.

Figure 3. Shows a perspective view of the anchoring piece from a different point of view to that shown in figure 2.

Figure 4. Shows a perspective view of the nut which comprises the strut to define the relative position of the telescopic tubes.

Figure 5. Shows a detail according to a perspective view of the nut and the anchoring piece in a locked position.

Figure 6. Shows a detail according to a perspective view, as in the previous figure, wherein the pin has been released from its contact with the anchoring stops.

Figure 7. Shows a detail according to a perspective view of the nut and the anchoring piece in an unlocked position.

Figure 8. Shows a detail according to a perspective view of the tab which comprises the anchoring piece to house the end of the pin.

PREFERRED EMBODIMENT THE INVENTION

[0031] In light of the described figures, it can be observed in one of the possible embodiments of the invention that the strut with stripping mechanism comprises an outer tube (1) configured to telescopically house an inner tube (2), the outer tube (1) being configured to rest on a support surface (6) by a first end which has a support plate (5) welded, having a threaded portion (3) at the opposite end.

[0032] The inner tube (2) is configured to play telescopically in the interior of the outer tube (1), said inner tube (2) having an upper support plate (4) welded at a free end to secure it to a surface to be strutted (7), as can be seen in figure 1.

[0033] The outer tube (1) comprises a threaded portion (3) which has two diametrically opposing slides (10) with longitudinal orientation, said slides (10) being configured to house and guide a pin (12) with circular section which is tightly housed in said slides (10).

[0034] The pin (12) is configured to be housed in two diametrically opposing orifices (11) of the inner tube (2), which means that the play of the pin in the orifices (11) and in the slides (10) defines a stroke for the relative position between the outer tube (1) and the inner tube (2), whose position is defined by a nut (8) configured to screw in the threaded portion (3) and support an anchoring piece (13) which is configured to make contact with the pin (12).

[0035] The anchoring piece (13), which tightly contains the outer tube (1), comprises an upper notch (15) and a lower notch (16) positioned at a level below that of the upper notch (15) when the anchoring piece (13) is in working position resting on the nut (8), as can be seen in the figures.

[0036] The anchoring piece (13) is configured to move in a direction perpendicular to the outer tube (1) and be placed in a locked position, shown in figures 1, 5 and 6, wherein the pin (12) is in contact with the upper notch (15), specifically resting on said upper notch (15), and an unlocked position wherein the pin (12) is in contact with or resting on the lower notch (16), as is shown in figure 7.

[0037] On the other hand, the anchoring piece (13) comprises two anchoring stops (14) configured to make contact with the pin (12), specifically with a bent portion of said pin (12), when said anchoring piece (13) is in the locked position, for which reason the pin (12) has a configuration similar to that of a clip. The anchoring stops (14) are located at the same level as the lower notch (16).

[0038] The anchoring piece (13) comprises a button (17), in the area of the anchoring stop (14), configured to receive an impact with a hammer when said anchoring piece (13) is in the locked position so that it moves said anchoring piece (13) to the unlocked position, for which reason the lower notch (16) is positioned between the upper notch (15) and the anchoring stop (14).

[0039] As can be seen in figure 8, the anchoring piece (13) comprises a tab (15') positioned in the upper notch (15), said tab (15') being configured to contain one end of the pin (12), limiting its position in the orifices (11) of the inner tube (2).

[0040] On the other hand, the nut (8) comprises an actuating lever (9) configured to screw said nut (8) in the threaded portion (3) by its actuation by a user.

[0041] Furthermore, the inner tube (2) comprises means indicative of a total length of the strut, which consists of recording the height, it being visible through the slides (10) so that the user has information on the height

between floor slabs during the placement of the strut.

[0042] In light of this description and set of figures, persons skilled in the art can understand that the embodiments of the invention described may be combined in multiple forms within the scope of the invention. The invention has been described according to preferred embodiments thereof, but for persons skilled in the art it will be evident that multiple variations may be introduced in said preferred embodiments without going outside the scope of the invention claimed.

Claims

1. Strut with stripping mechanism, which comprises an outer tube (1) configured to telescopically house an inner tube (2), said outer tube (1) comprising a threaded portion (3) which has two diametrically opposing slides (10) with longitudinal orientation configured to house a pin (12) which is also configured to be housed in two diametrically opposing orifices (11) that the inner tube (2) has, comprising a nut (8) configured to screw in the threaded portion (3), **characterized in that** said nut (8) is configured to hold an anchoring piece (13) which comprises an upper notch (15) and a lower notch (16), positioned at different levels, said anchoring piece (13) being configured to be moved in a direction perpendicular to the outer tube (1) and be placed in a locked position, wherein the pin (12) is in contact with the upper notch (15), and an unlocked position wherein the pin (12) is in contact with the lower notch (16).

2. Strut with stripping mechanism, according to claim 1, **characterized in that** the anchoring piece (13) comprises at least one anchoring stop (14) configured to make contact with the pin (12) when said anchoring piece (13) is in the locked position.

3. Strut with stripping mechanism, according to claim 2, **characterized in that** said, at least one, anchoring stop (14) is located at the same level as the lower notch (16).

4. Strut with stripping mechanism, according to any of the preceding claims, **characterized in that** the anchoring piece (13) comprises a button (17) configured to receive an impact when said anchoring piece (13) is in the locked position which moves said anchoring piece (13) to the unlocked position.

5. Strut with stripping mechanism, according to any of the preceding claims, **characterized in that** the anchoring piece (13) comprises a tab (15') positioned in the upper notch (15), said tab (15') being configured to contain one end of the pin (12) limiting its position in the orifices (11) of the inner tube (2).

6. Strut with stripping mechanism, according to any of the preceding claims, **characterized in that** the nut (8) comprises a lever (9) configured to screw said nut (8) in the threaded portion (3) by its actuation by a user.

7. Strut with stripping mechanism, according to any of the preceding claims, **characterized in that** the inner tube (2) comprises means indicative of a total length of the strut.

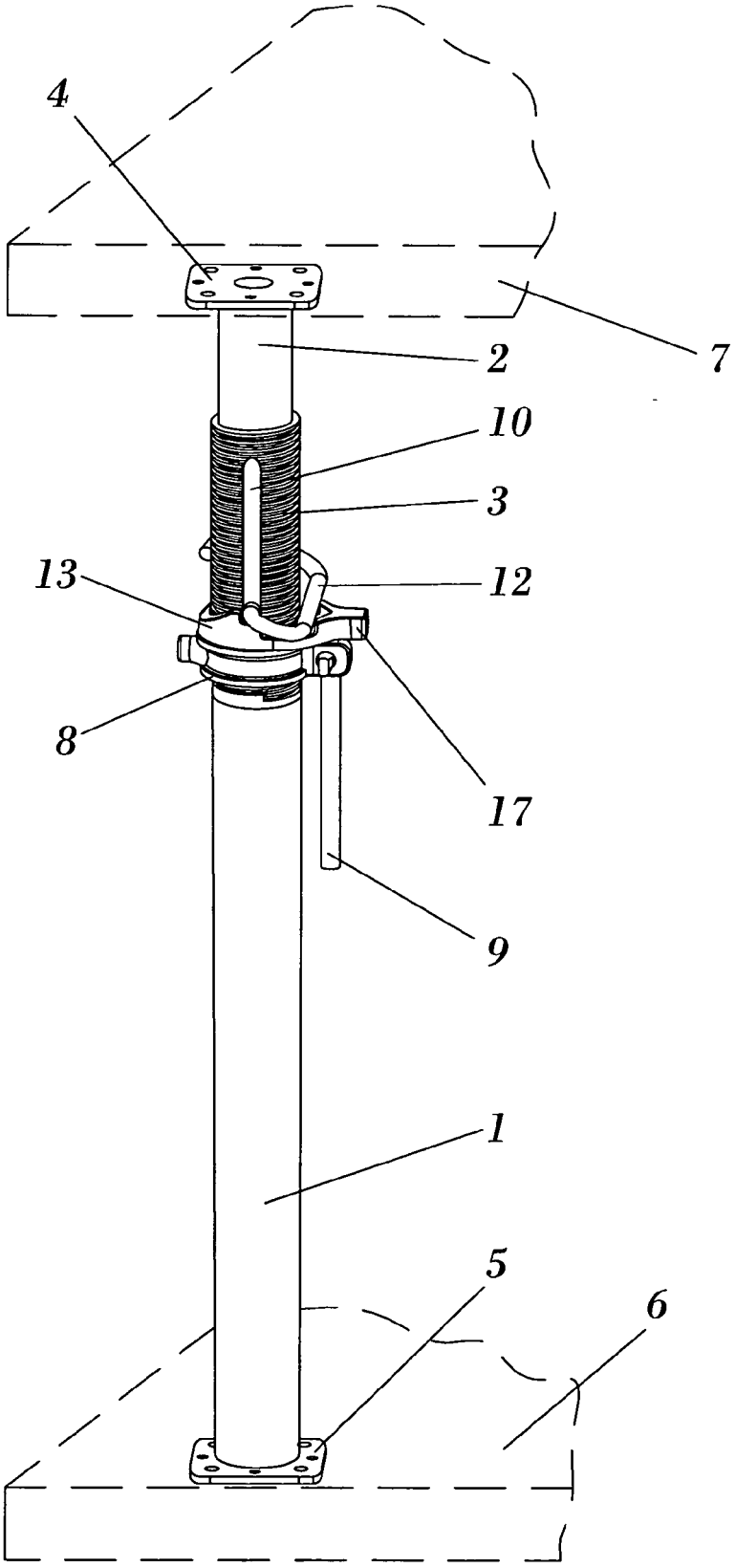

FIG. 1

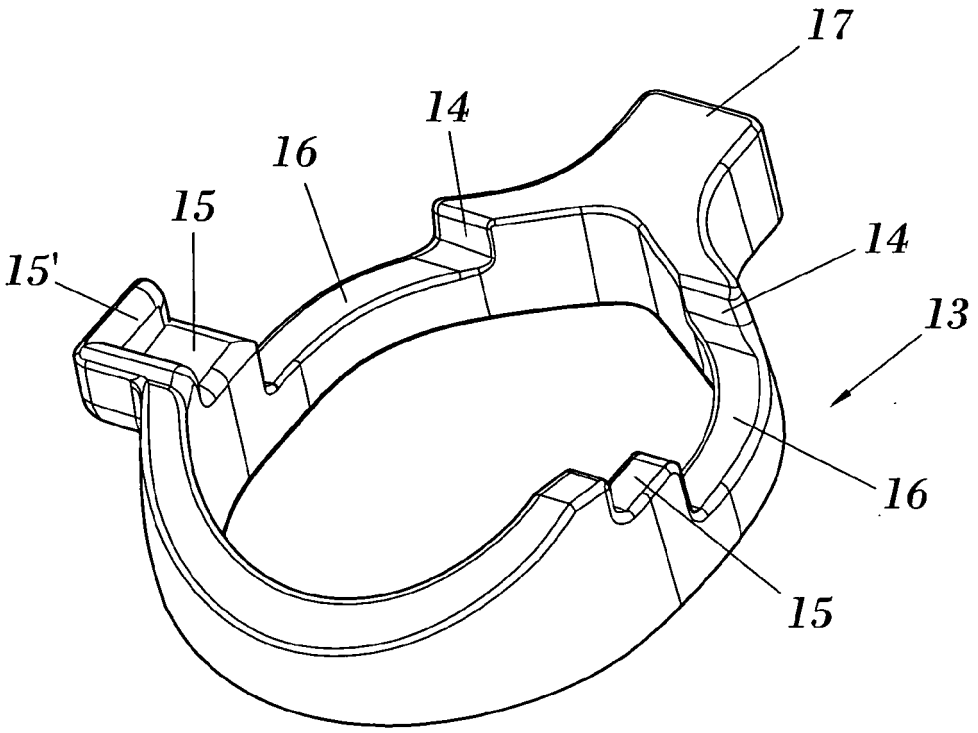

FIG. 2

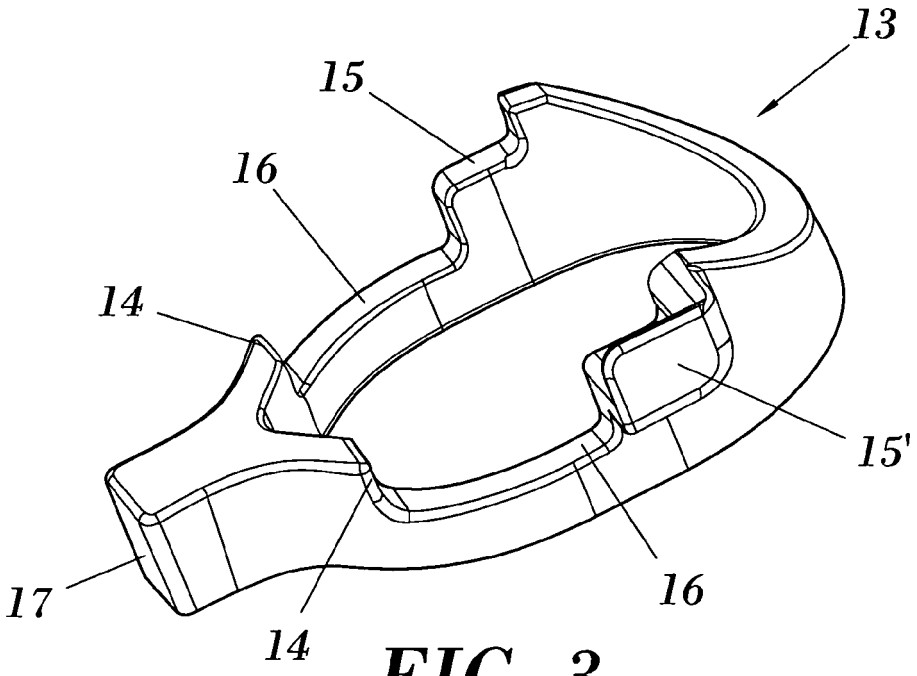

FIG. 3

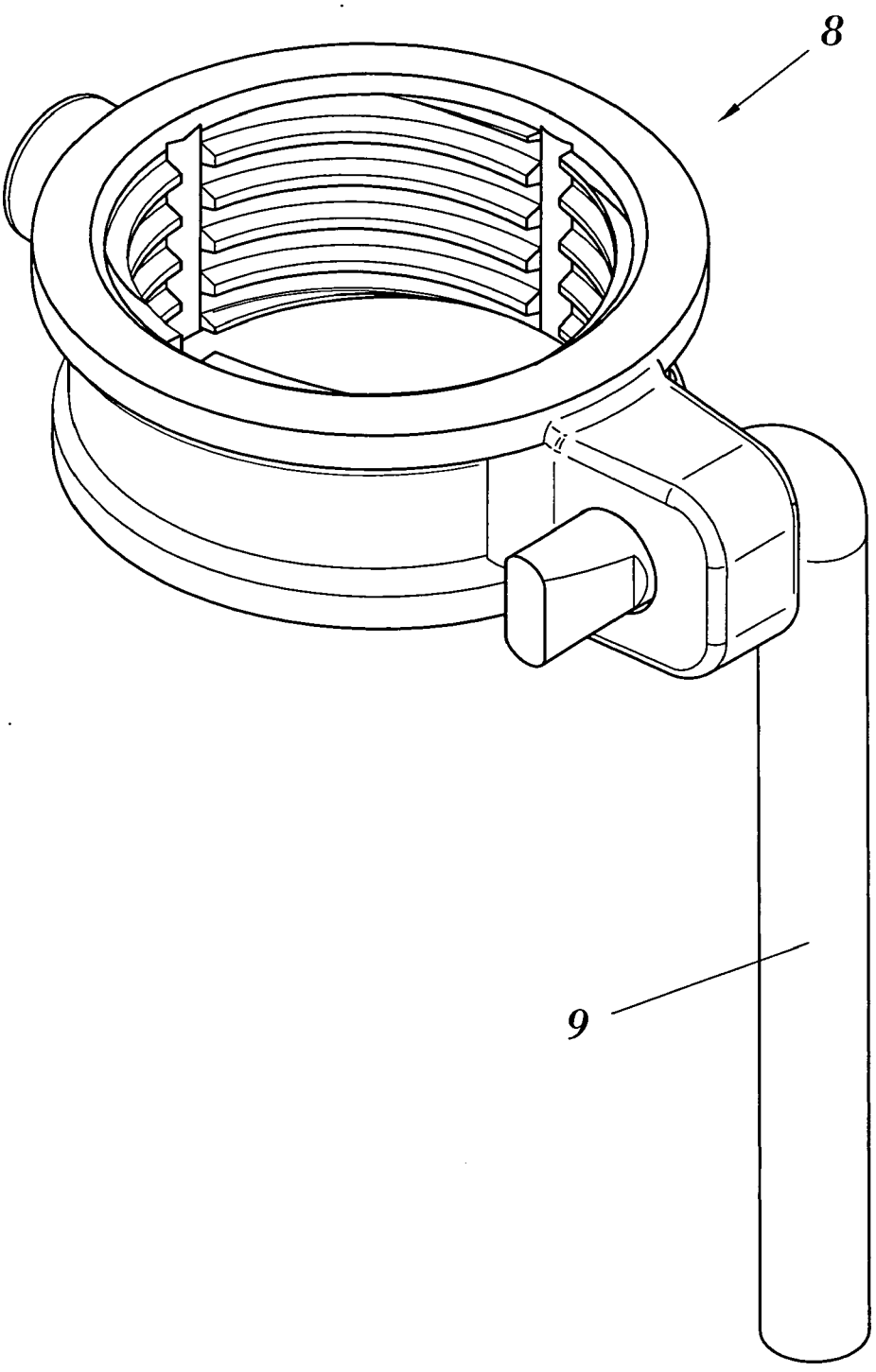

FIG. 4

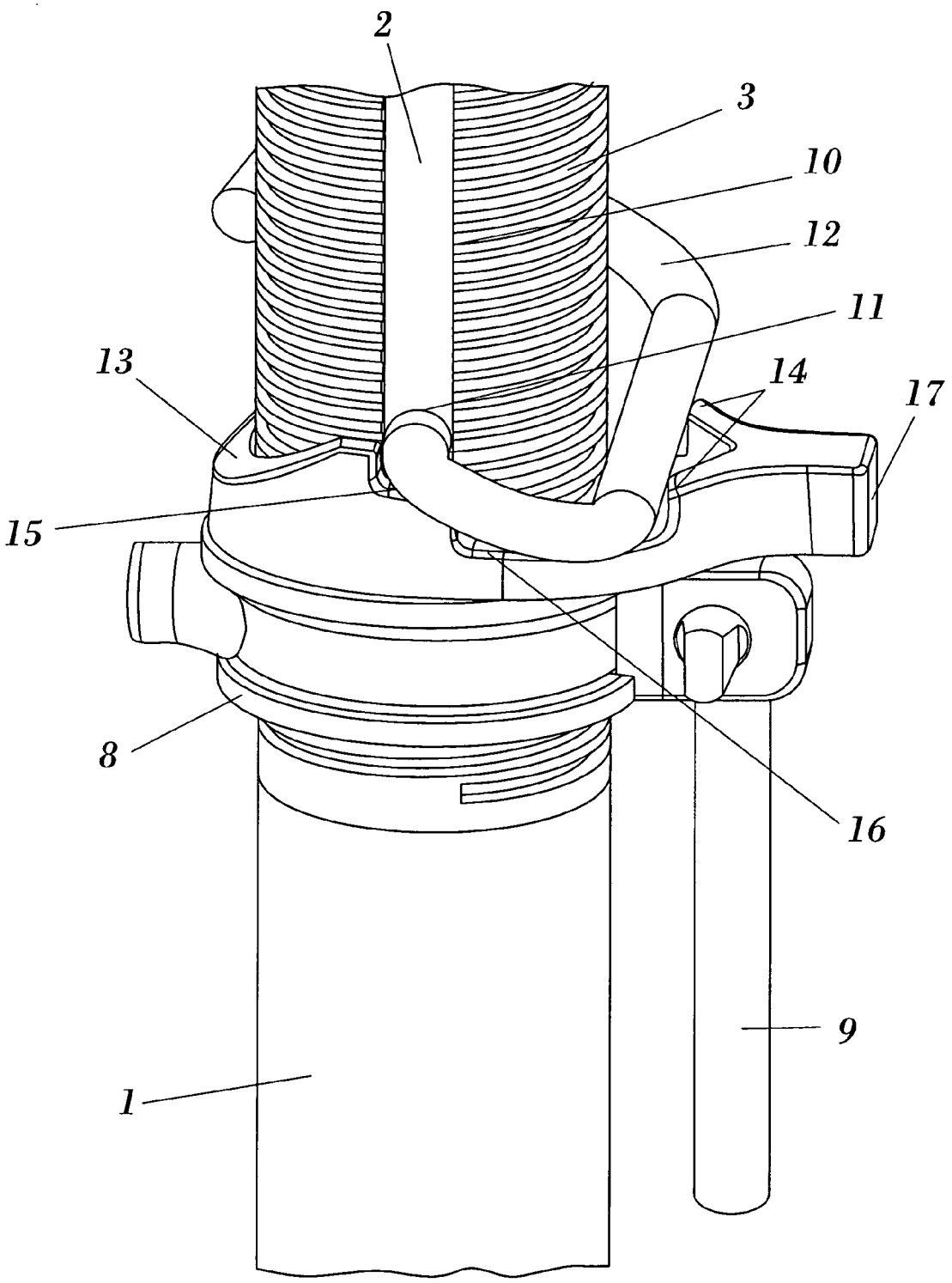

FIG. 5

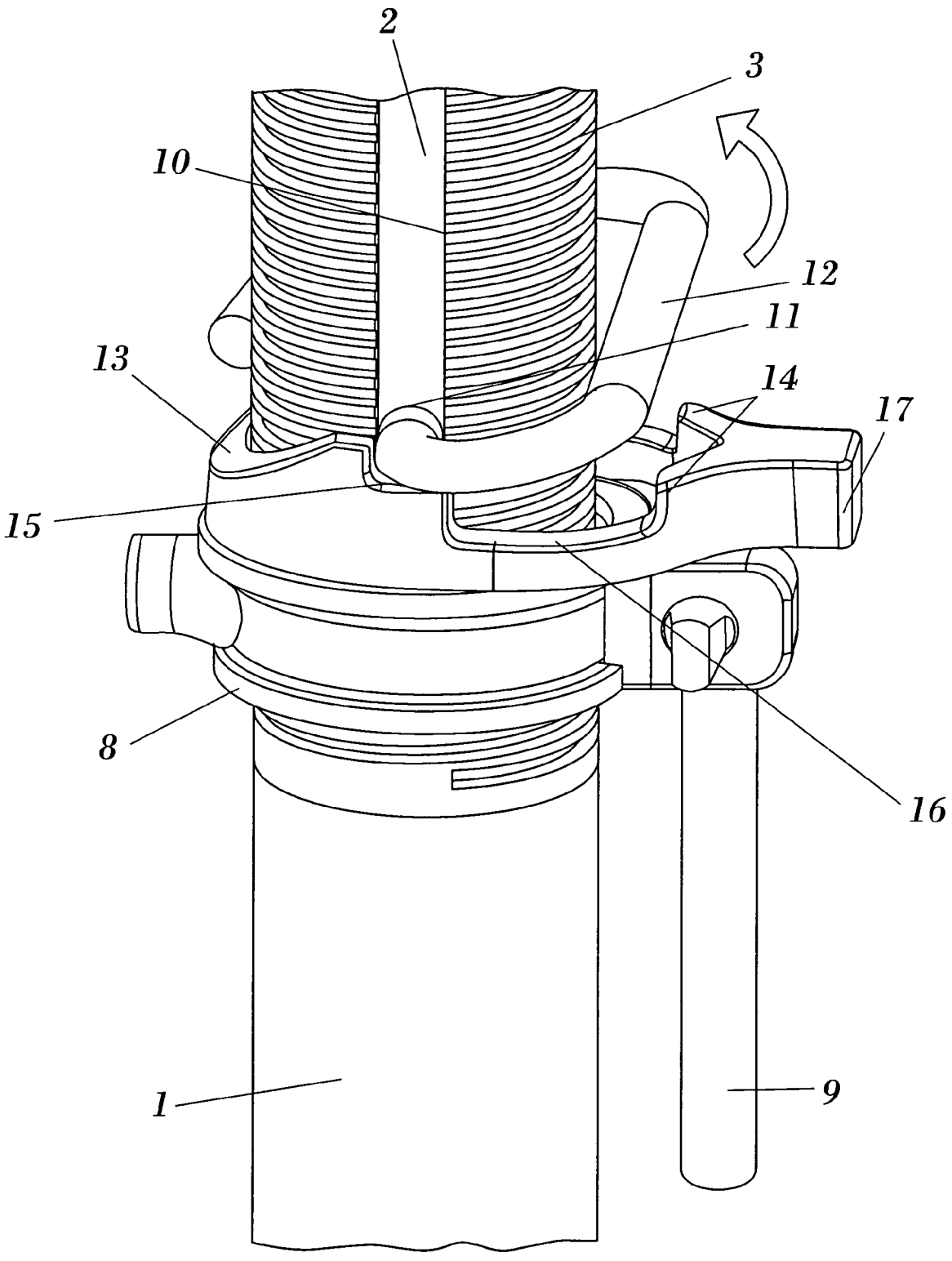

FIG. 6

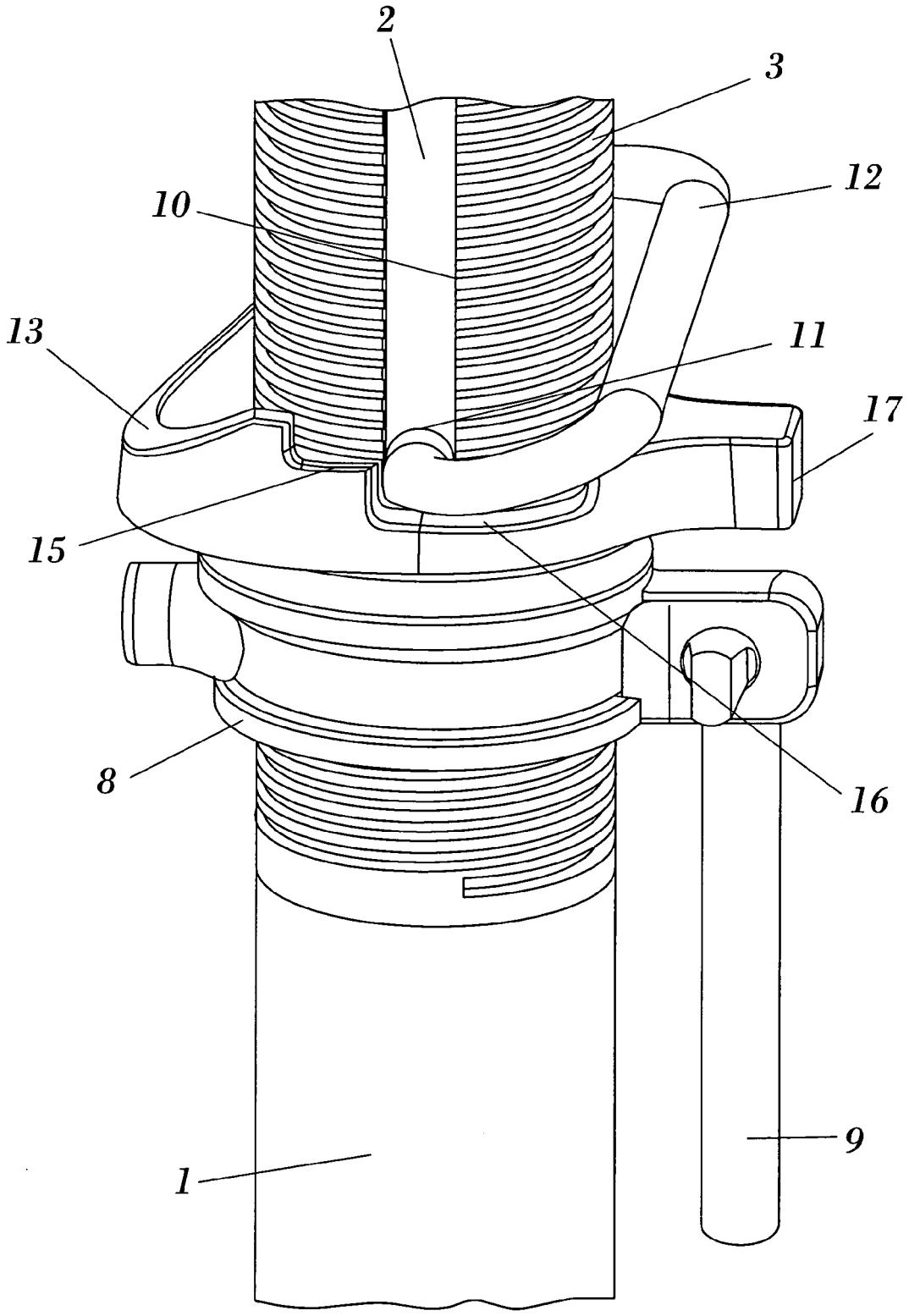

FIG. 7

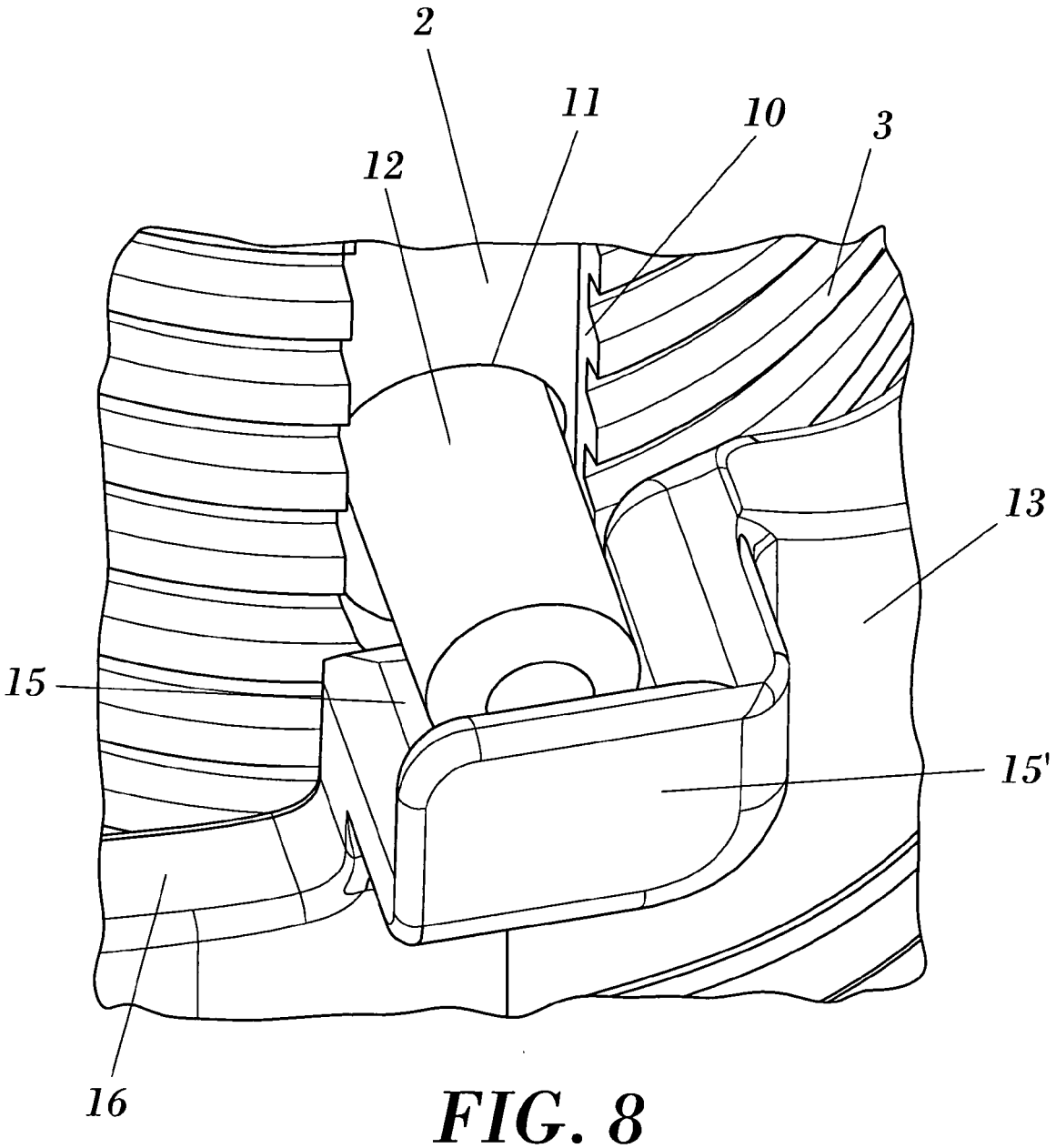

FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 07 38 0084

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	30 August 2007	Scharl, Willibald

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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