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(54) **FLOOR-EMBEDDED DOOR LOCKING DEVICE**

BODENTÜRSCHLIESSER

DISPOSITIF DE VERROUILLAGE DE PORTE ENCASTRE DANS LE SOL

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Description

[0001] The present invention relates to a floor-embedded locking device for a door, in particular for an all-glass door, comprising a pivot pin device.

[0002] The pivot axis of a door such as an all-glass door may comprise a device wherein a pivot pin of a floor-embedded locking device is non-rotationally received so that said pivot pin is pivoted together with a pivotally supported receiving bush when the door is pivoted, with said receiving bush being surrounded by a cam plate which is engaged by a spring-mounted, longitudinally displaceable piston. Depending on the particular application, for example the respective thickness of the floor covering, the pivot pin is manufactured with such a length that a sufficiently long portion of it protrudes upwardly from the floor-embedded locking device, and is then installed in the floor-embedded locking device.

[0003] As disclosed in US 3 496 594 A, an adjustable coupler of a design is known that permits for adjustably coupling a floor embedded door closer to a pivot or butt hinge mounted door while permitting access to the door closer without unhinging the door. A closer arm is provided which is adapted for door mounting and also connection to the projecting pivot pin portion of the door closer. The closer arm has an enlarged head receiving the slotted projecting pivot pin portion which has a hexagonal cross-section and includes a tapered threaded bore receiving an expanding screw to expand the slotted pivot pin portion into tight frictional contact with the closer arm head.

[0004] Pivot pins of floor-embedded locking devices may comprise, for example, as known from DE 22 18 498 A1, showing the features according to the preamble portion of claim 1, adjacent to and below its annular collar a shank portion formed as a truncated pyramid which engages into a receiving bush having a matching internal shape. Although this design enables the pivot pin to be non-rotationally received in the receiving bush, the precise dimensions of the particular application need to be known beforehand, since the length of the pivot pin portion protruding from the floor-embedded locking device may not be adjusted at the assembly site. As a result, it is often necessary to provide a choice of pivot pins with different shank lengths at the assembly site. Furthermore, the pivot pin must be replaced by another one having a different length when the distance between the upper edge of the floor-embedded locking device and the lower edge of the door is changed lateron, for example due to the provision of another floor covering.

[0005] A pivot device for a floor-embedded locking device is known from DE 30 33 363 A1, with the pivot pin being axially fixed at a seat portion by means of screws and coupling members so that it is non-rotationally supported. The pivot pin comprises a plurality of notches extending transversely to its longitudinal direction, at which notches the pivot pin may be cut to the required

length. Thus, it is also necessary to provide pivot pins with sufficiently long shanks at the assembly site, which are then assembled at the required length. If there is a change lateron in the dimensions of the assembly site, for example an alteration of the floor height, a new pivot pin which has the required new length has to be provided.

[0006] It is an object of the present invention to provide a floor-embedded locking device with a pivot device that may be adapted to the particular dimensions of the respective assembly site.

[0007] The aforementioned problem is solved by a floor-embedded locking device comprising the features as claimed in claim 1. In accordance with the present invention, the floor-embedded door locking device is provided with a pivot device comprising a pivot pin with an annular collar and a non-circular shank formed adjacent to said collar, said shank having a uniform cross-section along its length, and a rotatably supported receiving bush whose shape matches that of the shank and wherein the pivot pin is received in a non-rotational and axially displaceable manner. The shank is formed as a sleeve comprising a slotted expansion portion which is engaged by a threaded bolt extending in an axial hole of the pivot pin, by means of which threaded bolt the expansion portion may be radially expanded so that it is clampingly locked in the receiving bush.

[0008] The present invention enables the shank of the pivot pin to be inserted into the receiving bush by a length required by the dimensional features of the particular application, i.e. so that the pivot pin protrudes from the floor-embedded locking device by such a length that the respective door may be received thereon as required. When the threaded bolt is threaded into the axial hole, the expansion portion of the shank, which is formed by slots provided in the shank, is radially expanded so that it is clamp-fitted in the receiving bush. A particular advantage of the device according to the present invention consists in the fact that the pivot pin may be axially displaced in the receiving bush by removing or unscrewing the threaded bolt from the axial hole in the shank. If there is a change in the dimensions of the door assembly, for example due to the installation of a floor covering of different thickness in the respective room, it is not necessary to install a new or different pivot pin in the floor-embedded locking device to accommodate the changed distance between the lower edge of the door and the upper edge of the floor-embedded locking device. Instead, the pivot pin merely has to be unlocked from its present clamping position, and clamp-fitted anew at the newly required position in the receiving bush.

[0009] According to a further embodiment of the present invention, one or more plain washers, rings or the like may be placed between the annular collar of the pivot pin and the receiving bush, which may also be easily removed if no longer required. In this embodiment, the pivot pin is not only held by means of a clamping fit,

but in addition its annular collar is positively supported on the washer placed on the receiving bush and under the annular collar.

[0010] According to a preferred embodiment of the present invention, the expansion portion of the shank extends from the free end of the shank to the centre thereof as seen in the longitudinal direction. However, the expansion portion may also extend to a position close to the annular collar of the pivot pin, or it may extend from the longitudinal centre of the shank in both directions towards the ends thereof, terminating at a distance from the two ends of the shank so that it is formed approximately in the central third of the length of the shank.

[0011] According to a further embodiment of the present invention, the axial hole of the pivot pin is provided with an internal thread as well as a conical countersinking that is formed in the expansion portion extending from the free end of the shank and tapers towards the annular collar. The external thread of the threaded bolt engages the internal thread of the axial hole, and the threaded bolt comprises a conical head portion at its free end which abuts against the inner peripheral wall of the conical countersinking. When the threaded bolt is accordingly rotated, it moves upwardly so that the conical head portion abutting against the peripheral wall of the countersinking in the expansion portion is moved towards the annular collar, and causes the expansion portion of the shank to expand.

[0012] According to another further embodiment of the present invention, the axial hole of the pivot pin is formed as a cylindrical counterbore within the pivot pin and has a shoulder formed adjacent to the bottom of the bore. The counterbore is adjoined by a portion of the hole which is smaller in diameter than the counterbore and which terminates, within the expansion portion extending from the free end of the shank, in a conical countersinking tapering towards the annular collar. The threaded bolt according to this embodiment is designed as a head screw which has its head supported on said shoulder at the bottom of the bore, and which has a conical locknut screwed onto its thread, said locknut abutting against the inner peripheral wall of the conical countersinking. When the threaded bolt is being rotated, the locknut abutting against the peripheral wall of the conical counterbore is moved upwardly towards the screw head so that it causes the expansion portion of the shank to expand. The conical surfaces of the locknut and the counterbore may be designed such that the locknut is prevented from rotating together with the threaded bolt when the latter is being rotated.

[0013] According to yet another embodiment of the present invention, the axial bore of the pivot pin comprises a threaded portion and, within the expansion portion, a conical portion which tapers towards the end of the shank. The threaded bolt is threaded into the threaded portion and abuts against the inner peripheral wall of the conical portion. The expansion portion, and thus the

conical portion tapering towards the end of the shank, may be provided such that they extend from the approximate centre in the longitudinal direction of the shank to the free end thereof. Alternatively, the expansion portion comprising the conical portion tapering towards the end of the shank may also be formed in the central third of the length of the shank so that the shank is not expanded at its free end but at its centre, resulting in a convex shape.

[0014] According to a further development of the above embodiment, the threaded portion is formed at least partially along the conical portion, with the threaded bolt being conical as well. When the conically formed threaded bolt is threaded into the at least partly threaded conical portion, it abuts against the inner peripheral wall of the conical portion and causes the latter to expand.

[0015] The threaded bolt comprises a tool engaging recess at its end facing the end of the pivot pin, which may be formed as a slot, a cross recess, a hexagon socket, a square socket, or an internal serration profile. As an alternative, the threaded bolt may, for example, be provided with a square journal at its free end facing the free end of the pivot pin, which may be engaged by a tool having a square socket so that the threaded bolt may be operated.

[0016] According to a preferred embodiment, the shank of the pivot pin has a hexagonal outer shape, and the receiving bush has a hexagonal inner shape. However, it is also possible to provide the outside of the shank and the inside of the receiving bush with a square or other polygonal shape.

[0017] The present invention will now be described in more detail and by way of example with reference to the accompanying drawing showing at least schematical views of embodiments of the present invention.

Fig. 1 is an exploded view of a pivot device;

Fig. 2 is a cross-sectional view of the embodiment according to claim 4 of the present invention;

Fig. 3 is a cross-sectional view of the embodiment according to claim 5 of the present invention;

Fig. 4 is a cross-sectional view of the embodiment according to claim 6 of the present invention; and

Fig. 5 is a cross-sectional view of another embodiment according to claim 6 of the present invention.

[0018] Fig. 1 shows an exploded view of a pivot device 1 of a floor-embedded locking device for a door, with body 17 of floor-embedded locking device being shown as a fragment only. The pivot device 1 comprises a pivot pin 2 having a pivot pin portion 4 which is formed by two opposing plane surfaces and designed to engage into the door device. Pivot pin portion 4 is adjoined by an annular collar 5 which is adjoined by a hexagonal shank

6. An expansion portion, which in this embodiment comprises six slots 7 that are each formed in one of the six peripheral surfaces of the hexagon, extends from the free end of the shank 6 to approximately the centre thereof as seen in the longitudinal direction. The receiving bush 3 which is pivotally supported (not shown) in the floor-embedded locking device 17 also comprises a hexagonal inner shape. An axial hole 8 extends through the pivot pin 2 and is engaged by the threaded bolt (not shown) by means of which the expansion portion may be expanded. Two plain washers 9 are placed between the pivot pin 2 and the receiving bush 3 so that they rest on the end face of the receiving bush 3. The annular collar 5 of the pivot pin 2 is supported on the upper washer 9. The height of protrusion of the pivot pin 2 from the floor-embedded locking device 17 may be adjusted by means of the washers 9. Shank 6, which is axially displaceable in the receiving bush 3, is inserted into the receiving bush 3 with the washers 9 placed therebetween so that the mounting height of the pivot pin 2 is adjusted in accordance with the dimensional characteristics of the particular application. Then the threaded bolt is threaded into the axial hole 8 so that the expansion portion is expanded, causing the pivot pin 2 to be clamp-fitted in the receiving bush 3.

[0019] Fig. 2 shows the cross-sectional view of a pivot device 1 of a floor-embedded door locking device, comprising a receiving bush 3 wherein a pivot pin 2 is non-rotationally received. The upper portion 4 of the pivot pin, which is to be received by a door device, is adjoined by an annular collar 5 which is in turn adjoined by a shank 6 of the pivot pin 2. The axial hole 8 of this embodiment comprises a thread which extends through the pivot pin 2. A conical countersinking 10 which tapers towards the annular collar 5 is provided in the expansion portion formed by slots 7 and extending from the free end of shank 6 to approximately the longitudinal centre thereof. A threaded bolt 11 is threaded into said axial hole 8, with the conical head portion of the threaded bolt 11 abutting against the inner peripheral wall of the conical countersinking 10. The end of the threaded bolt 11 which is remote from the conical head portion is formed with a tool engaging recess in the shape of a hexagon socket. The pivot pin 2 may be clamp-fitted in the receiving bush 3 by threading the threaded bolt 11 into the axial hole 8 so that the conical head of the threaded bolt 11 is moved upwardly within the conical countersinking 10 and thus causes the free end of the shank 6 to expand.

[0020] In Fig. 3, the axial hole 8 comprises a cylindrical counterbore 12 in the upper portion of the pivot pin, with a shoulder being formed at the bottom 13 of the bore. The counterbore 12 is adjoined by a hole portion which is smaller in diameter than the counterbore 12 and, in this embodiment, extends to the conical countersinking 10. The threaded bolt 11 is formed as a hexagon socket screw whose head is supported on the shoulder at the bottom 13 of the bore, and has a conical

locknut 14 threaded onto its free end which abuts against the inner peripheral wall of the countersinking 10. When the threaded bolt 11 is screwed into the hole, the locknut 14, which abuts against the peripheral wall, is moved upwardly so that it expands the free end of the shaft 6. The locknut 14 comprises a protruding pin 16 at its lateral surface which engages into one of the slots 7 so that the locknut 14 is fixed against rotation at the conical surface of the countersinking 10.

[0021] As may be seen from Fig. 4, the axial bore 8 of the pivot pin 2 comprises a threaded portion which substantially extends from the pivot pin to the expansion portion in the shank 6. The threaded portion is adjoined by a hole portion 17 which is smaller in diameter than the threaded portion and extends approximately across the two upper thirds of the length of shank 6. It is adjoined by a conical portion 15 which tapers towards the free end of the shank 6. The threaded bolt 11 comprises a cylindrical extension in the form of a journal 18 whose free end abuts against the inner peripheral wall of the conical portion 15, with the diameter of the journal 18 being smaller than that of the threaded bolt 11.

[0022] A further embodiment of the present invention is shown in Fig. 5, wherein the expansion portion with the slots 7 is provided approximately in the central third of the length of the shank rather than at the free end of the shank 6. The axial hole 8 comprises a cylindrical counterbore which extends to the expansion portion and is adjoined by the conically tapering portion 15 formed in the expansion portion. In this embodiment, the conical portion is at least partially formed with a thread, and the threaded bolt 11 also has a conical shape. When the threaded bolt 11 is screwed into the hole, its threads abut against the peripheral wall of the conical portion 15 so that the expansion portion of the shank 6 is convexly expanded.

Claims

1. A floor-embedded locking device for a door, and in particular for an all-glass door, comprising a receiving bush (3) which is rotatably received within the floor-embedded body (17) of the locking device, and a pivot pin (2) which includes a projecting pivot pin portion (4) at its free end which upwardly projects from the floor-embedded body (17) of the locking device for cooperation with the door, an annular collar (5) adjacent to and below the pivot pin portion (4) and a non-circular shank (6) adjacent to and below said collar (5) which shank (6) is received in the receiving bush (3) in a non-rotational manner and is fixed in the receiving bush (3) by means of a threaded bolt (11) extending in an axial hole (8) of the pivot pin (2), the axial hole (8) extending through said projecting pivot pin portion (4) and into the shank (6) of the pivot pin, **characterized in that** the shank (6) of the pivot pin (2) is axially displaceable

in said receiving bush (3) and is formed as a sleeve comprising a slotted expansion portion to be radially expandable by an adjustment of the threaded bolt (11) thereby clampingly fixing the shank of the pivot pin (2) in its displacement positions in the receiving bush (3) so that the projecting pivot pin portion (4) is adjustable in its height above the floor-embedded body (17) of the locking device by said displacement of the shank in the receiving bush (3).

2. A floor-embedded locking device according to Claim 1, with at least one plain washer (9) being placed between the annular collar (5) and the receiving bush (3).

3. A floor-embedded locking device according to Claim 1 or Claim 2, with the expansion portion of the shank (6) extending from the free end thereof.

4. A floor-embedded locking device according to any one of the Claims 1 to 3, with the axial hole (8) of the pivot pin (2) comprising an internal thread and, in the expansion portion, a conical countersinking (10) which tapers towards the annular collar (5), with the external thread of the threaded bolt (11) engaging the internal thread of the axial hole (8), and the free end of the threaded bolt (11) comprising a conical head portion which abuts against the inner peripheral wall of the conical countersinking (10).

5. A floor-embedded locking device according to any one of the Claims 1 to 3, with the axial hole (8) of the pivot pin (2) being formed as a cylindrical counterbore (12) within the pivot pin (2), said counterbore (12) having a shoulder formed at a bottom (13) of the bore and being adjoined by a portion of the hole which is smaller in diameter than the counterbore (12) and which, within the expansion portion, terminates at a conical countersinking (10) which tapers towards the annular collar (5), with the threaded bolt (11) being formed as a head screw whose head is supported on said shoulder and onto whose thread a conical locknut (14) is threaded which abuts against the inner peripheral wall of the conical countersinking (10).

6. A floor-embedded locking device according to any one of the Claims 1 to 3, with the axial hole (8) of the pivot pin (2) comprising a threaded portion and, within the expansion portion, a conical portion (15) conically tapering towards the end of the shank, with the threaded bolt (11) being threaded into the threaded portion and abutting against the inner peripheral wall of the conical portion (15).

7. A floor-embedded locking device according to Claim 6, with the threaded portion being formed at least partially along the conical portion (15), and the

threaded bolt (11) having a conical shape.

8. A floor-embedded locking device according to any one of the Claims 1 to 7, with the threaded bolt (11) comprising a tool engaging recess formed as a slot, a cross recess, a hexagon socket, a square socket, or an internal serration profile.

9. A floor-embedded locking device according to any one of the Claims 1 to 8, with the shank (6) of the pivot pin (2) having a hexagonal outer shape, and the receiving bush (3) having a matching hexagonal inner shape.

Patentansprüche

1. Bodenschließvorrichtung für eine Tür, insbesondere für eine Ganzglastür, aufweisend eine Aufnahmebuchse (3), welche innerhalb des Bodenschließkastens (17) der Bodenschließvorrichtung drehbar aufgenommen ist, und einen Drehzapfen (2), welcher an seinem freien Ende einen vorstehenden Drehzapfenbereich (4) aufweist, welcher zum Zusammenwirken mit der Tür nach oben aus dem Bodenschließkasten (17) vorsteht, sowie einem dem Drehzapfenbereich (4) benachbarten und unterhalb diesem angeordneten Ringbund (5), und einem dem Ringbund (5) benachbart und unterhalb diesem angeordneten unrunder Schaft (6), welcher in der Aufnahmebuchse (3) mittels eines sich in eine Axialbohrung (8) des Drehzapfens (2) erstreckenden Gewindebolzens (11) drehfest befestigt ist, wobei sich die Axialbohrung (8) durch den vorstehenden Drehzapfenbereich (4) hindurch und in den Schaft (6) des Drehzapfens erstreckt, **dadurch gekennzeichnet, dass** der Schaft (6) des Drehzapfens (2) in der Aufnahmebuchse (3) axial verschiebbar ist und als Hülse ausgebildet ist und die Hülse einen geschlitzten Spreizabschnitt aufweist, welcher durch Verstellen des Gewindebolzens (11) radial aufspreizbar ist, wodurch der Schaft des Drehzapfens (2) in der Aufnahmebuchse (3) in seinen Verschiebepositionen verklemmbar ist, so dass der vorstehende Drehzapfenbereich (4) durch Verschieben des Schaftes in der Aufnahmebuchse (3) in seiner Höhe oberhalb des Bodenschließkastens (17) der Bodenschließvorrichtung einstellbar ist.

2. Bodenschließvorrichtung nach Anspruch 1, wobei zwischen den Ringbund (5) und die Aufnahmebuchse (3) wenigstens eine Unterlegscheibe (9) eingesetzt ist.

3. Bodenschließvorrichtung nach Anspruch 1 oder 2, wobei der Spreizabschnitt des Schaftes (6) sich von dessen freien Ende aus erstreckt.

4. Bodenschließvorrichtung nach einem der Ansprüche 1 bis 3, wobei die Axialbohrung (8) des Drehzapfens (2) ein Innengewinde und in dem Spreizabschnitt eine sich zum Ringbund (5) verjüngende konische Senkbohrung (10) aufweist, und daß der Gewindebolzen (11) mit seinem Außengewinde in das Innengewinde der Axialbohrung (8) eingreift und am freien Ende einen konischen Kopfteil aufweist, der in der konischen Senkbohrung (10) an deren Umfangswandung angreift. 10
5. Bodenschließvorrichtung nach einem der Ansprüche 1 bis 3, wobei die Axialbohrung (8) des Drehzapfens (2) innerhalb des Drehzapfens (2) als zylindrisches Senkloch (12) mit einer am Lochgrund (13) ausgebildeten Schulter ausgebildet ist, an das sich ein Bohrungsabschnitt mit einem Durchmesser anschließt, der kleiner als der Durchmesser des Senkloches (12) ist, und innerhalb des Spreizabschnittes in eine sich zum Ringbund (5) hin verjüngende, konische Senkbohrung (10) übergeht, wobei der Gewindebolzen (11) als Kopfschraube ausgebildet ist, die mit ihrem Kopf auf der Schulter abgestützt ist und auf deren Gewinde eine konische Kontermutter (14) aufgeschraubt ist, die in der konischen Senkbohrung (10) an deren Umfangswandung angreift. 20 25
6. Bodenschließvorrichtung nach einem der Ansprüche 1 bis 3, wobei die Axialbohrung (8) des Drehzapfens (2) einen Gewindeabschnitt und innerhalb des Spreizabschnittes einen sich zum Schaftende hin konisch verjüngenden konischen Abschnitt (15) aufweist, und daß der Gewindebolzen (11) in den Gewindeabschnitt eingeschraubt ist und in dem konischen Abschnitt (15) an dessen Umfangswandung angreift. 30 35
7. Bodenschließvorrichtung nach Anspruch 6, wobei der Gewindeabschnitt wenigstens teilweise entlang des konischen Abschnitts (15) ausgebildet ist und daß der Gewindebolzen (11) konisch ausgebildet ist. 40
8. Bodenschließvorrichtung nach einem der Ansprüche 1 bis 7, wobei der Gewindebolzen (11) eine Werkzeugeingriffsausnehmung in Form eines Schlitzes, eines Kreuzschlitzes, eines Innensechskants, eines Innenvierkants oder eines Innenvielzahnprofils aufweist. 45 50
9. Bodenschließvorrichtung nach einem der Ansprüche 1 bis 8, wobei der Schaft (6) des Drehzapfens (2) an seiner Außenseite und die Aufnahmebuchse (3) an ihrer Innenseite sechskantig ausgebildet sind. 55

Revendications

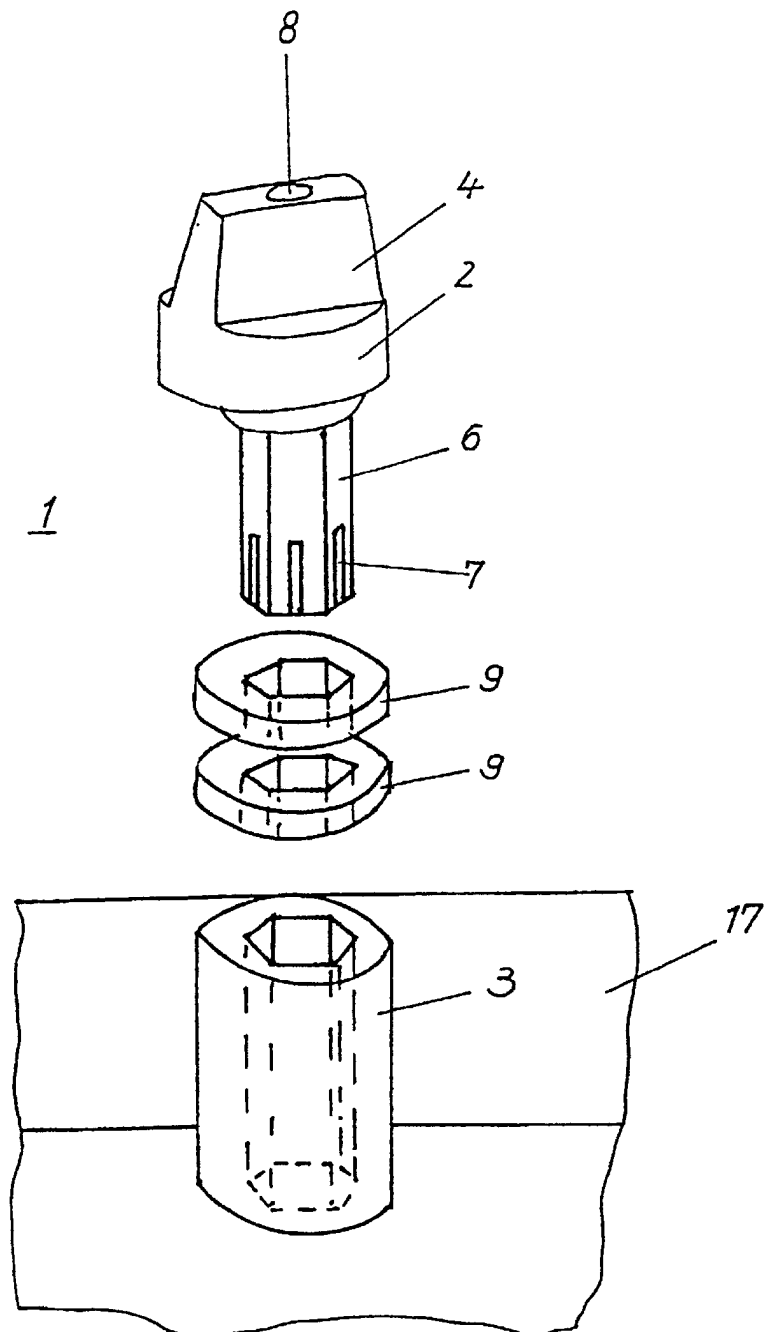
1. Dispositif de blocage, encastré dans le sol, pour une porte et en particulier pour une porte tout en verre, comprenant une douille de réception (3), qui est logée de manière à pouvoir tourner à l'intérieur du corps (17), encastré dans le sol, du dispositif de blocage, et une broche formant pivot (2), qui inclut au niveau de son extrémité libre, une partie saillante (4), de broche formant pivot qui fait saillie vers le haut à partir du corps (17), encastré dans le sol, du dispositif de blocage, de manière à coopérer avec la porte, un collet annulaire (5) situé en position adjacente à et au-dessous de la partie (4) de broche formant pivot, et une tige non circulaire (6) située en position adjacente à et au-dessous dudit collet (5), laquelle tige (6) est logée dans la douille de réception (3) sans possibilité de rotation et est fixée dans la douille de réception (3) au moyen d'un boulon (11) qui s'étend dans un trou axial (8) de la broche formant pivot (2), le trou axial (8) traversant ladite partie saillante (4) de ladite broche formant pivot et pénétrant dans la tige (6) de la broche formant pivot, **caractérisé en ce que** la tige (6) de la broche formant pivot (2) est déplaçable axialement dans ladite douille de réception (3) et est agencée sous la forme d'un manchon comprenant une partie d'expansion fendue pouvant être dilatée radialement au moyen d'un ajustement du boulon (11), ce qui permet de fixer par serrage la tige de la broche formant pivot (2) dans ses positions de déplacement dans la douille de réception (3) de sorte que la hauteur de la partie saillante (4) de broche formant pivot au-dessus du corps (17), encastré dans le sol, du dispositif de blocage est réglée au moyen dudit déplacement de la tige dans la douille de réception (3).
2. Dispositif de blocage encastré dans le sol selon la revendication 1, comportant au moins une rondelle plate (9), disposée entre le collet annulaire (5) et la douille de réception (3).
3. Dispositif de blocage encastré dans le sol selon la revendication 1 ou la revendication 2, dans lequel la partie d'expansion de la tige (6) s'étend à partir de l'extrémité libre de cette dernière.
4. Dispositif de blocage encastré dans le sol selon l'une quelconque des revendications 1 à 3, dans lequel le trou axial (8) de la broche formant pivot (2) comprend un taraudage et, dans la partie d'expansion, il est prévu un logement conique (10), qui se rétrécit en direction du collet annulaire (5), le filetage extérieur du boulon (11) engrenant avec le taraudage du trou axial (8), et l'extrémité libre du boulon (11) comprenant une partie de tête conique qui est en butée contre la paroi périphérique intérieure du logement conique (10).

5. Dispositif de blocage encastré dans le sol selon l'une quelconque des revendications 1 à 3, dans lequel le trou axial (8) de la broche formant pivot (2) est agencé sous la forme d'un contre-perçage cylindrique (12) à l'intérieur de la broche formant pivot (2), ledit contre-perçage (12) possédant un épaulement formé dans un fond (13) du trou et étant réuni par une partie du trou, qui a un diamètre inférieur au contre-perçage (12) et qui, dans la partie d'expansion, se termine au niveau d'un logement conique (10) qui se rétrécit en direction du collet annulaire (5), le boulon (11) étant agencé sous la forme d'une vis à tête, dont la tête est supportée par ledit épaulement et sur le filetage de laquelle est vissé un écrou de blocage conique (14) qui est en butée contre la paroi périphérique intérieure du logement conique (10). 5 10 15
6. Dispositif de blocage encastré dans le sol selon l'une quelconque des revendications 1 à 3, dans lequel le trou axial (3) de la broche formant pivot (2) comprend une partie filetée et, dans la partie d'expansion, une partie conique (15) qui se rétrécit avec une forme conique en direction de l'extrémité de la tige, le boulon (11) étant vissé dans la partie filetée et étant en butée contre la paroi périphérique intérieure de la partie conique (15). 20 25
7. Dispositif de blocage encastré dans le sol selon la revendication 6, dans lequel la partie filetée est formée au moins en partie le long de la partie conique (15) et le boulon (11) possède une forme conique. 30
8. Dispositif de blocage encastré dans le sol selon l'une quelconque des revendications 1 à 7, dans lequel le boulon (11) comprend un renforcement d'engagement d'un outil, agencé en forme de fente, de renforcement en croix, de douille hexagonale, de douille carrée ou de profil à dentelure intérieure. 35 40
9. Dispositif de blocage encastré dans le sol selon l'une quelconque des revendications 1 à 8, dans lequel la tige (5) de la broche formant pivot (2) possède une forme extérieure hexagonale, et la douille de réception (3) possède une forme intérieure hexagonale adaptée. 45

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Fig. 1



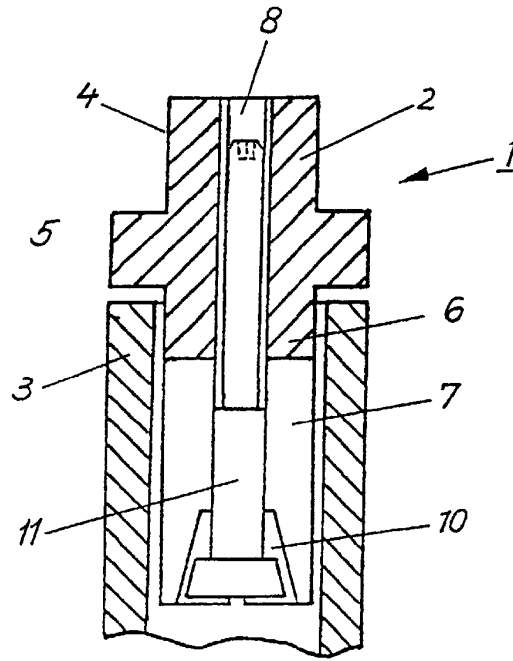


Fig. 2

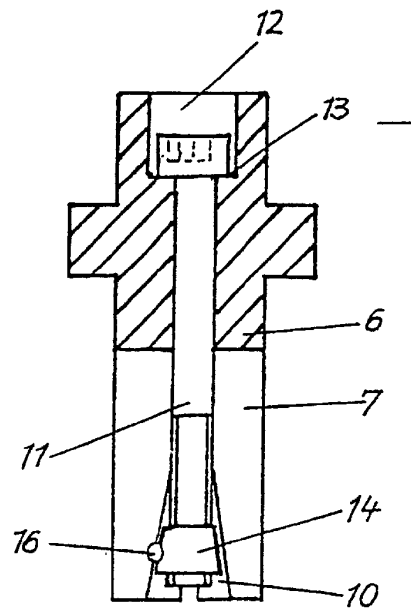


Fig. 3

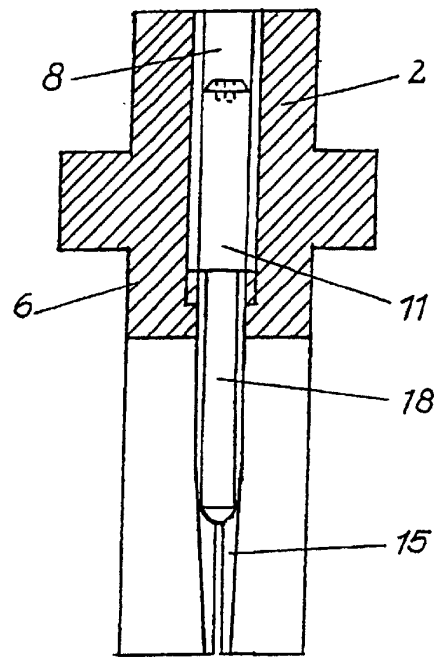


Fig. 4

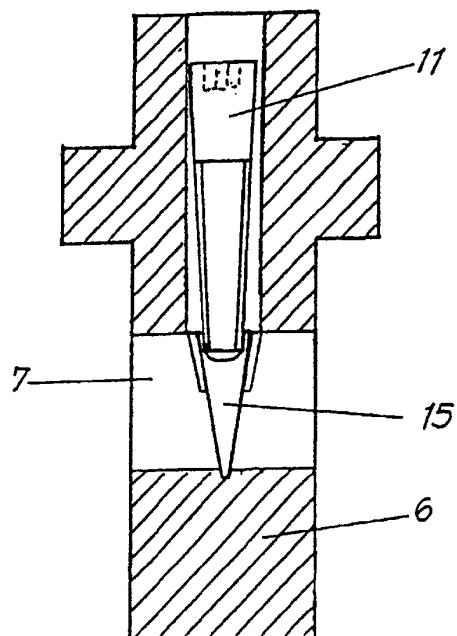


Fig. 5