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(54) LOCKING MECHANISM FOR A WINDOW OR DOOR

(57) Locking mechanism for a window or door (1) with a movable leaf (3) affixed in a fixed frame (2) and which is to be operated by a lock (2) with at least one operating arm (9) that slides in and out, whereby the locking mechanism (5) comprises a locking rod (13), that is axially movable with the operating arm (9), with a locking pin (10) at its end to be able to lock the movable leaf (3) with respect to the fixed frame (2) in the closed position of the window or door (1), wherein the locking rod (13) is composed of a metal locking pin (10) that is axially movably affixed in a hollow guide profile (17), and which is connected or can be connected to an aforementioned operating arm (9) of the lock (8) by means of a connecting element (11) that is elastically compressible in the axial direction (X-X') and which is intended to be able to move the locking pin (10) axially between a locked position and an unlocked position by operating the lock (8).

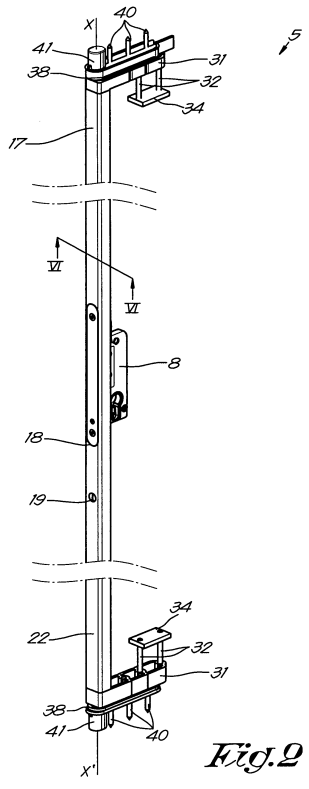

Fig.2

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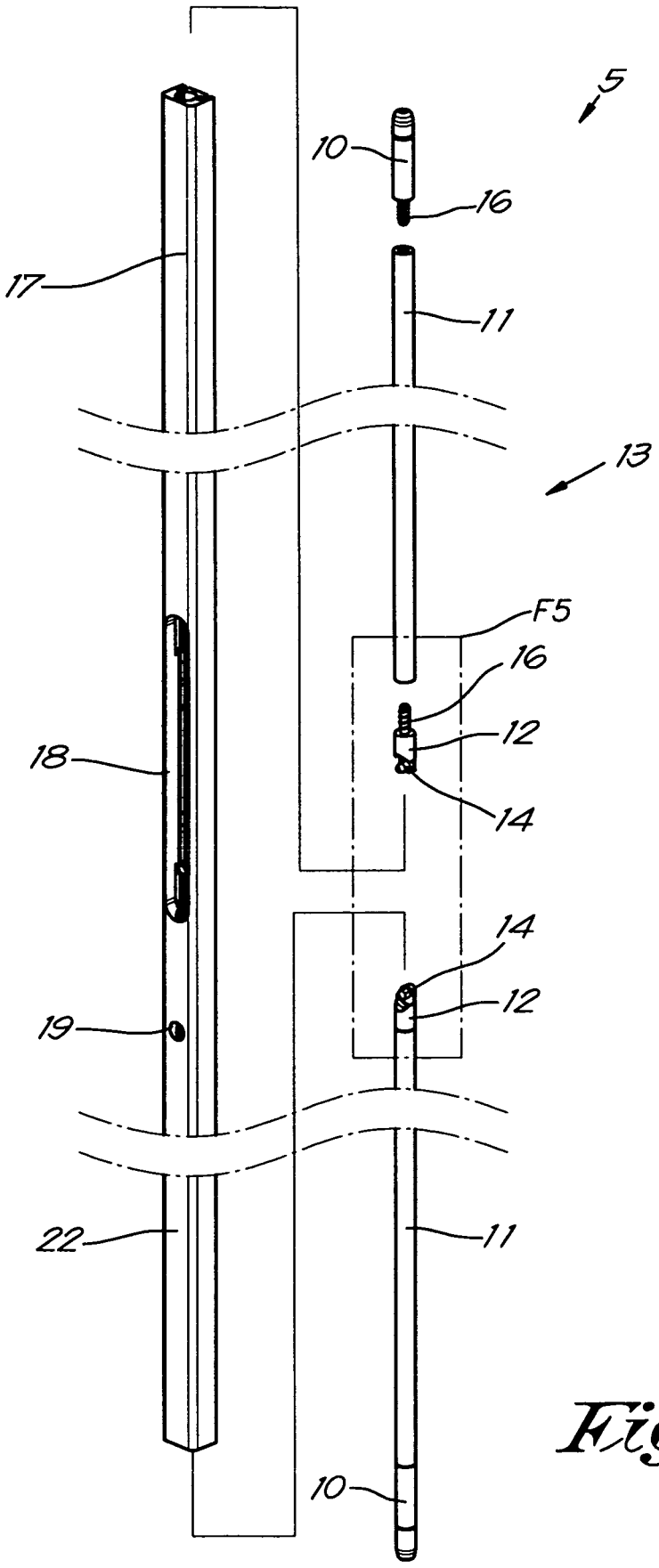

Fig.4

Description

[0001] The present invention relates to a locking mechanism for a window or door.

[0002] The invention is particularly aimed at a burglar-resistant locking mechanism for a sliding door, although the invention is not limited to this.

[0003] Burglar-resistant locking mechanisms are already known for locking the movable leaf of a window or door in the closed position with respect to the fixed frame of the window or door by means of a built-in lock.

[0004] With known locking mechanisms use is made of sliding slats fitted in grooves along the periphery of the movable leaf of the window or door that are movable by operating the aforementioned lock, whereby the sliding slats are provided at different points with mushroom-shaped locking pins which, due to the sliding movement of the sliding slats, can engage with corresponding locking plates, locking pieces or with a corresponding sliding slat affixed on the fixed frame of the window or door and which are provided with an undercut groove in which a locking pin can hook itself against undesired unlocking.

[0005] The locking pins in themselves are not strong enough to prevent a break-in, but through the use of a multiple of such locking pins a break-in can be seriously slowed down, such that burglars generally abandon their break-in attempt early so as not to give the emergency services the time to catch them in the act.

[0006] A first disadvantage is that such known locking mechanisms are generally made to measure and are composed of many components, such that they are relatively expensive and the mounting in a window or door takes a lot of time.

[0007] Another disadvantage is that with an open door the locking pins protrude towards the door opening, where they form a hazard for injuring people who pass by or for accidentally catching clothing or other items and which can thus be damaged. Moreover, these locking pins spoil the appearance of the window or door.

[0008] Another type of locking mechanism is known whereby two solid rods are built into a vertical post of the movable leaf, whereby the rods can be moved axially by means of a lock between a retracted position in the post and a locked position whereby an end of the rods is inserted in corresponding holes, respectively in the top and bottom horizontal profile of the fixed frame of the window or door. In this way an undesired opening of the window or door is obstructed.

[0009] The building in of such a locking mechanism requires a great deal of time and skill.

[0010] In order to break in the burglars try to reach the solid rods one by one and force them out of the hole in the frame and thereby bend or break the rods. As a result a lot of damage is caused to the door or window. Once it has succeeded for one rod, the next rod is dealt with.

[0011] Such a locking mechanism can be cracked relatively easily and quickly, such that such a type of locking mechanism generally does not satisfy the applicable anti-burglar standards, such that for example an RC2 break-in class according to the EN 1627 standard of 2011 is difficult to achieve.

[0012] Such locking mechanisms are known that can achieve an RC2 break-in class, but these locking mechanisms have the disadvantage that they can only be applied to doors or windows with profiles specially developed for this purpose. However, the door or window constructors must have extra specific profiles in stock for this purpose.

[0013] Another disadvantage of such locking mechanisms is that the rods can be dismantled with a lot of difficulty and dismantling work.

[0014] Another known problem with sliding doors and sliding windows in general is that extra anti-burglar arrangements must be made against the movable leaf being lifted out.

[0015] To increase the break-in security, generally an extra metal slat is also provided that is screwed onto the frame of the door or window with extra strong screws to reduce the distance between the movable leaf and the frame in order to reduce the risk of a lever or similar being squeezed in between. This of course means an extra cost in extra material and components.

[0016] The purpose of the present invention is to provide a solution to one or more of the aforementioned and other disadvantages with a cost-efficient design of a locking mechanism that is easy to install, highly burglar resistant and which is no more expensive than a conventional non-burglar-resistant locking mechanism, and which in its most preferred embodiment can satisfy the strict RC2 resistance class according to the EN 1627 standard of 2011 or 2-star class according to NEN 5089 of 2009.

[0017] To this end the invention concerns a locking mechanism for a window or door with a movable leaf, affixed in a fixed frame and which is to be operated by a lock with at least one operating arm that slides in and out, whereby the locking mechanism comprises a locking rod, that is axially movable with the operating arm, with a locking pin at its end to be able to lock the movable leaf with respect to the fixed frame in the closed position of the window or door, with the characteristic that the locking rod is composed of a metal locking pin that is axially movably affixed in a hollow guide profile, and which is connected or can be connected to an aforementioned operating arm of the lock by means of a connecting element that is elastically compressible in the axial direction and which is intended to be able to move the locking pin axially between a locked position and an unlocked position by operating the lock, whereby the connecting element is constructed as a flexible rod made of plastic or such.

[0018] An advantage of such a locking mechanism according to the invention is that it does not need to be built in, and that after adjusting the length of the guide profile and the locking rod, it is easily mounted against the movable leaf.

[0019] Furthermore, in principle it is sufficient to con-

nect the locking rod to the operating arm of the lock and to provide a hole in the fixed frame that, for a closed door or window, can act as a seat for the locking pin in its locked position.

[0020] Moreover, the length can easily be steplessly adapted to the dimensions of any door or window chosen at random. It can be done with one single saw cut when the locking rod is mounted in the guide profile, whereby they can then be sawn to size together.

[0021] Another advantage is that the mechanism is composed of few components, such that storage costs and logistical costs can be kept lower than with known locking mechanisms with many more components.

[0022] An advantage of an elastic connecting element constructed as a flexible plastic rod or another material with comparable features with respect to flexibility and elasticity is that the locking rods of a mounted window or a mounted door with a locking mechanism according to the invention can be replaced without much difficulty and dismantling work. Indeed, it is sufficient for the lock to be demounted to remove and put back the flexible rods via the aforementioned cutaway for the lock in the guide profile.

[0023] Another advantage is that a locking rod with a section of plastic or other comparable material is generally cheaper than a completely metal rod of hardened metal and is also easier to make to size.

[0024] An advantage attached to the fact that the locking rod contains an elastically compressible section that is formed by the connecting element, is that in the event of break-in attempts whereby it is attempted to force the locking pin out of the frame, the burglar comes up against the problem that the locking pin springs back whenever he lets it go and that the forces that are exerted on the locking pin are entirely or partially absorbed by the connecting element. This makes it more difficult to force the locking rod and break in, such that the damage caused to the window or door is greatly reduced with respect to the known systems.

[0025] Preferably the locking mechanism is constructed such that the flexible rod of plastic or such has the freedom to bend or buckle elastically and/or upset elastically, at least locally, when compressed in the mounted situation in the guide profile, whereby in other words when upset due to compression the material of the rod has the possibility to expand sideways.

[0026] The elastic bending and/or upsetting thereby increases the elastic absorption capacity to absorb the forces exerted during a break-in, which further impedes a break-in.

[0027] Preferably two locking pins are used, one at the top and one at the bottom of the movable leaf, whereby the locking pins are each connected to the lock by means of an elastic connecting element in a guide profile.

[0028] Preferably the same guide profile is provided for both locking pins and guide profile is provided with a cutaway for the lock in the transverse direction, whereby the cutaway divides the guide profile into two branches, each with a locking pin and a connecting element.

[0029] An advantage of two locking pins, each with an elastic connecting element, is that after each attempt to force the locking pin out of the frame, the locking pin shoots back and pulls back into the frame. This provides the advantage that the burglar must concentrate on the two locking pins at the same time, which is in contrast to the known locking systems with two locking rods whereby the burglar can tackle the pins one by one separately. It goes without saying that this makes breaking in more difficult and takes more time, especially in the case of a door where the locking pins are located far apart.

[0030] In this way every conventional door or window that is composed of conventional profiles can be converted into a door or window that satisfies the RC2 break-in class.

[0031] The guide profile is preferably made of aluminium or another metal to protect the rod of plastic or such against break-in attempts.

[0032] Cutaways can be provided on the inside wall of the hollow guide profile that enable a slight bending of the connecting element during a break-in such that such bending can contribute to the absorption of the forces that are exerted on the locking pin by the burglar.

[0033] According to a particular aspect, the aforementioned rod of plastic or such is hollow, which as a result provides the advantage that an easy connection to the locking pin is possible, which can be provided with a screw to this end with which the locking pin can be screwed into the connecting element, and that moreover as a result space is also provided to at least partially elastically absorb the forces that occur during a break-in by the material of the hollow rod upsetting inwards.

[0034] In the same way a coupling piece can be provided to couple the connecting element to the lock, whereby the coupling piece can also be provided with a screw with which the coupling piece can be screwed into the hollow rod.

[0035] A small clearance is preferably left between the inside wall of the hollow guide profile and the outer periphery of the connecting element that is sufficient to enable a bending and/or expansion of the connecting element outwards to be able to elastically absorb the forces exerted on the connecting element during a break-in. This clearance can be all around or only local, for example in the form of cutaways that are provided along the periphery of the connecting element.

[0036] For the mounting of the guide profile against the post of the movable leaf of the window or door, screws can preferably be mounted that are screwed through passages in the guide profile into the post concerned, whereby the head of the screws is countersunk in a deepened seat that is concealed behind the locking rod. This provides the advantage that the screws are difficult to access by a burglar in the event of a break-in attempt.

[0037] According to another aspect of the invention the locking mechanism according to the invention is provided with spacers that are mounted between the guide profile

and the post of the movable leaf, whereby the spacers have a thickness that is adapted to the form and type of the post profile on which the locking mechanism must be mounted, so that the guide profile can be mounted on doors and windows of a number of suppliers, each with their own specific profiles.

[0038] With these spacers the position of the guide profile can also easily be adjusted to the built-in depth of a certain lock in the post.

[0039] Preferably these spacers are fastened to the profile in a clipable way so that they can be temporarily positioned easily and quickly and they thus do not have to be kept in place while screwing the guide profile on the leaf of the door or window and an extra pair of hands is thus not required for this purpose.

[0040] An extra metal slat between the leaf and the frame to provide locking points is superfluous in the case of the invention, as a locking mechanism according to the invention with only two locking pins is sufficient to be able to achieve an RC2 break-in class without extra locking points on the vertical posts of the door or window.

[0041] Preferably the locking mechanism is provided with a metal locking plate with a passage for an aforementioned locking pin and with means to fasten the locking plate to the fixed frame, so that the passage for the locking pin that is made directly in the fixed frame by drilling or similar, is finished more professionally and is also strengthened.

[0042] In addition, preferably an extra intermediate plate of elastically compressible material is provided that is intended to be mounted between the aforementioned locking plate and the frame, and which ensures that in the event of a break in, the locking system can be deformed but cannot break, such that it is difficult to get the locking pin out of the locking plate.

[0043] Such a locking plate with intermediate plate is preferably mounted in both the top and the bottom profile of the frame.

[0044] The invention also relates to fittings for a locking mechanism for a door or window as described above, that consists of a set of one or more of the following components or a combination:

- a lock;
- a guide profile to be made to size;
- one or two locking pins;
- a connecting element to be made to size between the locking pins and the lock;
- one or two coupling pieces for connecting the connecting element to the lock;
- an accessory to be able to temporarily fix the guide profile and connecting element with respect to one another in order to be able to make both elements to size together with one movement;
- spacers of adjustable thickness or a series of spacers of varying thickness;
- one or two holders of adjustable thickness for the locking pins or a series of holders of varying thickness;
- one or two locking plates;
- one or two intermediate plates;
- a number of screws.

[0045] Such fittings have the advantage that they are adaptable to many types of doors and windows with different profiles that make up these doors and windows.

[0046] The invention also relates to a door or window provided with a locking mechanism according to the invention.

[0047] With the intention of better showing the characteristics of the invention, a preferred embodiment of a locking mechanism according to the invention is described hereinafter, by way of an example without any limiting nature, with reference to the accompanying drawings, wherein:

figure 1 schematically shows a sliding door according to the invention;
figure 2 shows a practical embodiment of a locking mechanism according to the invention;
figure 3 shows an exploded view of the locking mechanism of figure 2 as intended for mounting in the door of figure 1, also shown in an exploded state;
figure 4 shows the section that is indicated by F4 in figure 3;
figure 5 shows the section that is indicated by the box F5 in figure 4;
figure 6 shows a cross-section according to line VI-VI in figure 2;
figure 7 shows the section that is indicated by F7 in figure 3, but from a different point of view;
figure 8 shows a front view of the element that is indicated by F8 in figure 7;
figure 9 shows a cross-section according to line IX-IX in figure 7, but in a mounted situation;
figure 10 shows a cross-section according to line X-X in figure 1;
figures 11 and 12 show a cross-section such as that of figure 10, but for variant embodiments of a door with different profiles;
figure 13 shows the section that is indicated by F13 in figure 3 on a larger scale;
figure 14 shows the components of figure 13 in a mounted situation;
figure 15 shows the section that is indicated by F15 in figure 3 on a larger scale;
figure 16 shows the components of figure 15 in a mounted situation and viewed from underneath;
figure 17 shows a cross-section of the bottom left corner of the sliding door of figure 1 according to line XVII-XVII in figure 10;
figure 18 shows a cross-section according to line XVIII-XVIII in figure 17;
figure 19 shows an accessory, used for the mounting of a locking mechanism according to the invention.

[0048] The sliding door 1, that is shown in figure 1 by way of an example, is made up of a fixed frame 2 and a movable leaf 3 therein, which in this case can be locked in the closed position as shown by operating a cylinder lock 4.

[0049] For the locking of the sliding door 1 use is made of a locking mechanism 5 according to the invention, as shown in figure 2, and which is built into the sliding door 1, as shown in figure 3, between a vertical post 6 of the fixed frame 2 and a vertical post 7 of the leaf 3, such that in the locked state of the sliding door the locking mechanism 5 cannot be accessed by a burglar or similar without force.

[0050] The locking mechanism is provided with a conventional lock 8, which, as is known and as shown in figure 5, is provided with two operating arms 9 that can be operated by means of the aforementioned cylinder lock to be able to be moved towards or away from one another in a vertical direction in order to lock or unlock the sliding door.

[0051] The locking mechanism is further provided with two locking pins 10, respectively a bottom and top locking pin of stainless steel or another hardened metal or similar, that are each connected to the aforementioned operating arms 9 of the lock 8 by means of a connecting element 11 and a coupling piece 12, with it all being composed as two locking rods 13, which in this case have a constant diameter over their entire length.

[0052] The coupling piece 12 is provided at the ends with a transverse pin 14 that fits in a transverse opening 15 of an operating arm 9 for coupling to this last-mentioned.

[0053] According to a characteristic of the invention, the connecting element 11 is elastically compressible in a certain sense in the axial direction of the locking rod 13, preferably over a distance of approximately 10 mm per running metre of the connecting element 11 upon the application of a force of 3000 N, and to this end is preferably made of plastic for example, for example PVC that has undergone a heat treatment to obtain a dimensional stability in the rest state within a temperature range from -20°C to 60°C.

[0054] According to a particular characteristic of the invention, use is made of a hollow flexible rod of the aforementioned material for the connecting element 11.

[0055] In that last case the locking pins 10 and the coupling pieces 12 can be provided with an axially extending screw 16 at an end with which it can be screwed into the hollow rod in line with the connecting element 11.

[0056] The locking mechanism 5 is further provided with a hollow tubular guide profile 17, as shown in figure 4, which is provided with a cutaway 18 in the transverse direction for the lock 8 with its operating arms 9, whereby the cutaway 18 divides the guide profile 17 into two branches that are each provided for guiding an aforementioned locking rod 13 in the axial direction X-X'.

[0057] Furthermore, means are provided to mount the guide profile 17 against the post 7 of the leaf 3, to which end passages 19 and 20 drilled in the guide profile in a transverse direction and at a distance from one another, through which, as shown in figures 7 and 9, screws 21 can be inserted that can be screwed into the post 7.

[0058] The passages 19 in the side 22 that are turned away from the post 7 have a diameter A that approximately corresponds to the diameter of the head of the screws 21, while the passages 20 on the opposite side 23 present a smaller diameter B that approximately corresponds to the diameter of the shank of the screws 21.

[0059] The passages 20 are provided with a concealed seat 24 along the inside wall of the guide profile 17 for the head of the aforementioned screws 21, so that in the mounted state of the locking mechanism 5, the head of the screws 21 is concealed in an inaccessible manner behind the locking rod 13 in the guide profile 17, as shown in figure 9.

[0060] Between the guide profile 17 and the post 7 of the leaf 3, depending on the form and dimensions of the post 7 and the lock 8, spacers 25 can be provided with an adapted thickness C. The spacers 25 can either be made a suitable thickness upon assembly, or alternatively a choice can be made from a series of spacers of different thicknesses.

[0061] Figures 10, 11 and 12 illustrate different possible mountings of the guide profile 17 against posts of a different form or type, with a spacer 25 of a different thickness in the three cases, or in the case of figure 11, without a spacer 25.

[0062] In the example the spacers 25 are made as a ring or bush that determines the thickness C and which is equipped with two elastic bent arms 27 with which the spacers 27 can be fastened against the guide profile 17 by clipping the arms 27 in the grooves 28 provided to this end, in the side 23 of the guide profile 17.

[0063] Referring to figure 6, locking rods 13 are incorporated in the guide profile 17 with a certain clearance, whereby cutaways 30 are provided in the inside wall 29 of the hollow guide profile 17 that define a local clearance between the locking rods 13 and the guide profile 17 along the periphery of the locking rods 13 so that space is provided to the connecting element 11 to bend and expand somewhat.

[0064] The aforementioned cutaways 30 extend along the aforementioned periphery over two sectors that are turned with respect to one another by approximately a quarter circle, as shown in figure 6, although other configurations are not excluded, for example by cutaways in the connecting element 11 itself instead of in or in combination with cutaways in the guide profile 17 or without local cutaways but with a clearance over the entire periphery due to a difference between the inside diameter of the guide profile 17 and the outside diameter of the connecting element 11.

[0065] The locking pins 10 are further guided in the axial direction by holders 31 that are fastened perpendicularly to the guide profile 17 against the underside and top respectively of the leaf, for example as shown in fig-

ures 15 to 17 by means of bolts 32 that are screwed transversely through the horizontal profiles 33 of the frame of the leaf 3 into metal reinforcing plates 34 on the inside of the frame, or alternatively, by means of screws, which, if possible, can be screwed directly in the horizontal profiles 33 without the intervention of a reinforcing plate 34.

[0066] The holders 31 are provided with a passage 35 for the locking pin 10 that is mounted in line with the guide profile 17 so that the locking pins 10 are not only held in their place by the guide profile 17, but also by the holders, so that when a burglar succeeds in detaching the guide profile 17, the locking pins 10 are still kept in their place. This will substantially slow down the break-in attempt as he will now have to be able to force the holders 31 to achieve success.

[0067] The thickness D of the holders is chosen according to the dimensions and form of the profiles of the frame 2 and the leaf 3 and are adapted such that they limit the vertical freedom of movement of the leaf 3 in the fixed frame, so that it is impossible for a burglar to lift the leaf 3 out of the fixed frame 2 without extra arrangements having to be made for this. The thickness D of the holders is preferably such that there is little clearance in the vertical direction between the holder 31 and the frame 2.

[0068] The holders 31 are preferably easily made a suitable thickness. Alternatively a series of holders 31 with different thicknesses D can be provided from which a holder 31 with a suitable thickness D can be chosen.

[0069] Preferably the ends of the guide profile 17 fit closely against the holders 31 in order not to give a burglar any opportunity to squeeze a long screwdriver or other lever in between. To this end it is necessary to make the guide profile 17 a suitable length.

[0070] That can be done easily with a cut-off saw whereby it is possible to saw the guide profile 17 and the flexible connecting element 11 to size together with one movement. To this end an accessory 43 can be used, as illustrated in figure 19, that keeps the connecting element 11 in the guide profile 17 in place during sawing.

[0071] As illustrated with figure 15 the holders 31 can be provided with dowel pins 44 with which they can be correctly aligned in a transverse direction with respect to the guide profile 17, to which end this guide profile 17 is provided with corresponding slots 45, as best illustrated in figure 6.

[0072] In order to be able to lock the sliding door in its closed position, openings 36 are provided in the bottom and top horizontal profile 37 of the fixed frame 2 that are in line with the locking pins 10 when the leaf 3 is slid to its closed position in the frame 2.

[0073] In order to lock the leaf 3 in the closed position of the sliding door 1 with respect to the fixed frame 2, it is sufficient to operate the cylinder lock 4 to move the operating arms 9 and the locking rods 13 and locking pins 10 connected thereto away from one another, so that the locking pins 10 are locked at the top and the bottom in the openings 36 provided to this end.

[0074] To strengthen the aforementioned opening 36, as shown in figures 13, 14 and 17, a locking plate 38 can be used that is screwed by means of screws 40 against the frame 2, preferably with an interjacent intermediate plate 41 of elastically compressible material.

[0075] In order to unlock the sliding door it is sufficient to operate the lock to retract the locking pins 10 out of the locking plate 38 into the holders 31, such that the leaf 3 can be slid open unhindered.

[0076] When it is attempted to operate the lock 8 with the sliding door in the open position, upon the slightest turn of the lock 8 the locking pins 10 will immediately come up against the rail 42 of the top and bottom horizontal profile 37 of the frame 2, in view of the short distance between the locking pins 10 and these rails, such that the user immediately feels that he is making an incorrect operation, which is not the case with the known sliding doors.

[0077] It is clear that a locking mechanism with only one single locking rod belongs to the possibilities of the invention.

[0078] Instead of a hollow rod as a connecting element 11, other elastic means can be used that must ensure that the force needed to move the locking pins 10 is large enough to slow down a break-in attempt, but nevertheless is not too large either to prevent the components of the locking rods 13 or of the lock 8 breaking off. An elastic axial compressibility of 1% upon the application of a force of 3000N yields good results in practice.

[0079] A connecting element 11 must be such that it is only compressible in the axial direction X-X' to a limited extent, without excessive forces, over a distance that may not be greater than the length E of the locking pin with which it protrudes in the frame 2 in the locked state. For the rest this applies just as much to the construction of the connecting element 11 in the form of a plastic rod.

[0080] It goes without saying that the locking mechanism 5 in the form of fittings with separate components and in the mounted form in a door or window belong to the invention.

[0081] It goes without saying that a locking mechanism in the form of fittings does not necessarily contain all components described above, such as a lock 8, spacers 25, screws and bolts and similar.

[0082] The locking mechanism according to the invention is not limited to sliding doors but can also be used in other types of doors, for example double revolving doors or similar.

[0083] The present invention is by no means limited to the embodiment described as an example shown in the drawings, but a locking mechanism according to the invention can be realised in all kinds of forms and dimensions without departing from the scope of the invention.

Claims

1. Locking mechanism for a window or door (1) with a

movable leaf (3) affixed in a fixed frame (2) and which is to be operated by a lock (2) with at least one operating arm (9) that slides in and out, whereby the locking mechanism (5) comprises a locking rod (13), that is axially movable with the operating arm (9), with a locking pin (10) at its end to be able to lock the movable leaf (3) with respect to the fixed frame (2) in the closed position of the window or door (1), **characterised in that** the locking rod (13) is composed of a metal locking pin (10) that is axially movably affixed in a hollow guide profile (17), and which is connected or can be connected to an aforementioned operating arm (9) of the lock (8) by means of a connecting element (11) that is elastically compressible in the axial direction (X-X') and which is intended to be able to move the locking pin (10) axially between a locked position and an unlocked position by operating the lock (8), whereby the connecting element (11) is constructed as a flexible rod made of plastic or such.

2. Locking mechanism according to claim 1, **characterised in that** it is constructed such that the flexible rod of plastic or such has the freedom to bend elastically and/or upset elastically, at least locally, upon compression in the mounted situation in the guide profile.

3. Locking mechanism according to claim 1 or 2, **characterised in that** it is provided with a lock (8) with two operating arms (9) that are movable towards and away from one another and which are each connected or can be connected to an aforementioned locking pin (10) by means of an aforementioned connecting element (11).

4. Locking mechanism according to claim 2, **characterised in that** the guide profile (17) is provided with a cutaway (18) in the transverse direction for the lock (8) with its operating elements, whereby the cutaway (18) divides the guide profile (17) into two branches, each with a locking pin (10) and a connecting element (11).

5. Locking mechanism according to any one of the previous claims, **characterised in that** the connecting element (11) is made of PVC that has undergone a heat treatment to obtain a dimensional stability in the rest state within a temperature range from -20°C to 60°C.

6. Locking mechanism according to any one of the previous claims, **characterised in that** the connecting element (11) is constructed as a hollow flexible rod made of plastic or such.

7. Locking mechanism according to any one of the previous claims, **characterised in that** the locking pin (10) extends in line with the connecting element (11) and has the same cross-section as this connecting element (11).

8. Locking mechanism according to any one of the claims 5 to 7, **characterised in that** cutaways (30) are provided in the inside wall (29) of the hollow guide profile (17) that define a local clearance between the connecting element (11) and the guide profile (17) along the periphery of the connecting element (11).

9. Locking mechanism according to claim 8, **characterised in that** the aforementioned cutaways (30) extend along the aforementioned periphery over two sectors that are turned with respect to one another by approximately a quarter circle.

10. Locking mechanism according to any one of the previous claims, **characterised in that** the operating arms (9) are provided with a transverse opening (15) and that for the connection of an operating arm (9) to a connecting element (11) use is made of a coupling piece (12) that is provided at one end with a screw with which the coupling piece (12) can be screwed into the connecting element (11), and is provided at the other end with a transverse pin (14) that fits in an aforementioned transverse opening (15) for coupling to an operating arm (9) concerned of the lock (8).

11. Locking mechanism according to any one of the previous claims, **characterised in that** it is a surface-mounted mechanism able to be fastened against a post (7) of the movable leaf (3), whereby to this end this locking mechanism is provided with the necessary means to fasten the guide profile (17) against the post (7).

12. Locking mechanism according to claim 11, **characterised in that** the means for fastening the guide profile (17) against the post (7) are also formed by passages (19, 20) that are made at a distance from one another transversely through the guide profile (17) from one side (22) of the guide profile (17) to an opposite side (23), whereby the passage (19) on one side (22) is larger than the passage (20) on the other side (23), so that the guide profile can be fastened by means of screws with a head with a diameter that is smaller than that of the largest passage (20) but is larger than the diameter of the smallest passage (19).

13. Locking mechanism according to any one of the previous claims, **characterised in that** it is provided with a locking plate (38) with a passage (39) for an aforementioned locking pin (10) and with means to fasten the locking plate (38) to the fixed frame (2), and that it is also provided with an intermediate plate

(41) of elastically compressible material that is intended to be mounted between the aforementioned locking plate (38) and the fixed frame (2).

14. Locking mechanism according to any one of the previous claims, **characterised in that** it is provided with a holder (31) for the locking pin (10) with a passage (35) for the locking pin (10), whereby this holder (31) is intended to be fastened perpendicularly to the guide profile (17) below or above the movable leaf (3) and which at least partially encloses the end of the locking pin (10), whereby the thickness of the holder (31) or holders is adaptable to the profiles of the door or window (1) to ensure that the movable leaf (3) can only be lifted to a limited extent in the mounted situation.

15. Fittings for a locking mechanism of a window or door according to any one of the previous claims, **characterised in that** it consists of a set of one or more of the following components or a combination:

- a lock (8);
- a guide profile (17) to be made to size;
- one or two locking pins (10);
- a connecting element (11) to be made to size between the locking pins (10) and the lock (8);
- one or two coupling pieces (12) for connecting the connecting element (11) to the lock (8);
- an accessory to be able to temporarily fix the guide profile (17) and connecting element (11) with respect to one another in order to be able to make both elements to size together with one movement;
- spacers (25) of adjustable thickness or a series of spacers (25) of varying thickness;
- one or two holders (31) of adjustable thickness for the locking pins (10) or a series of holders (31) of varying thickness;
- one or two locking plates (38);
- one or two intermediate plates (41);
- a number of screws and/or bolts.

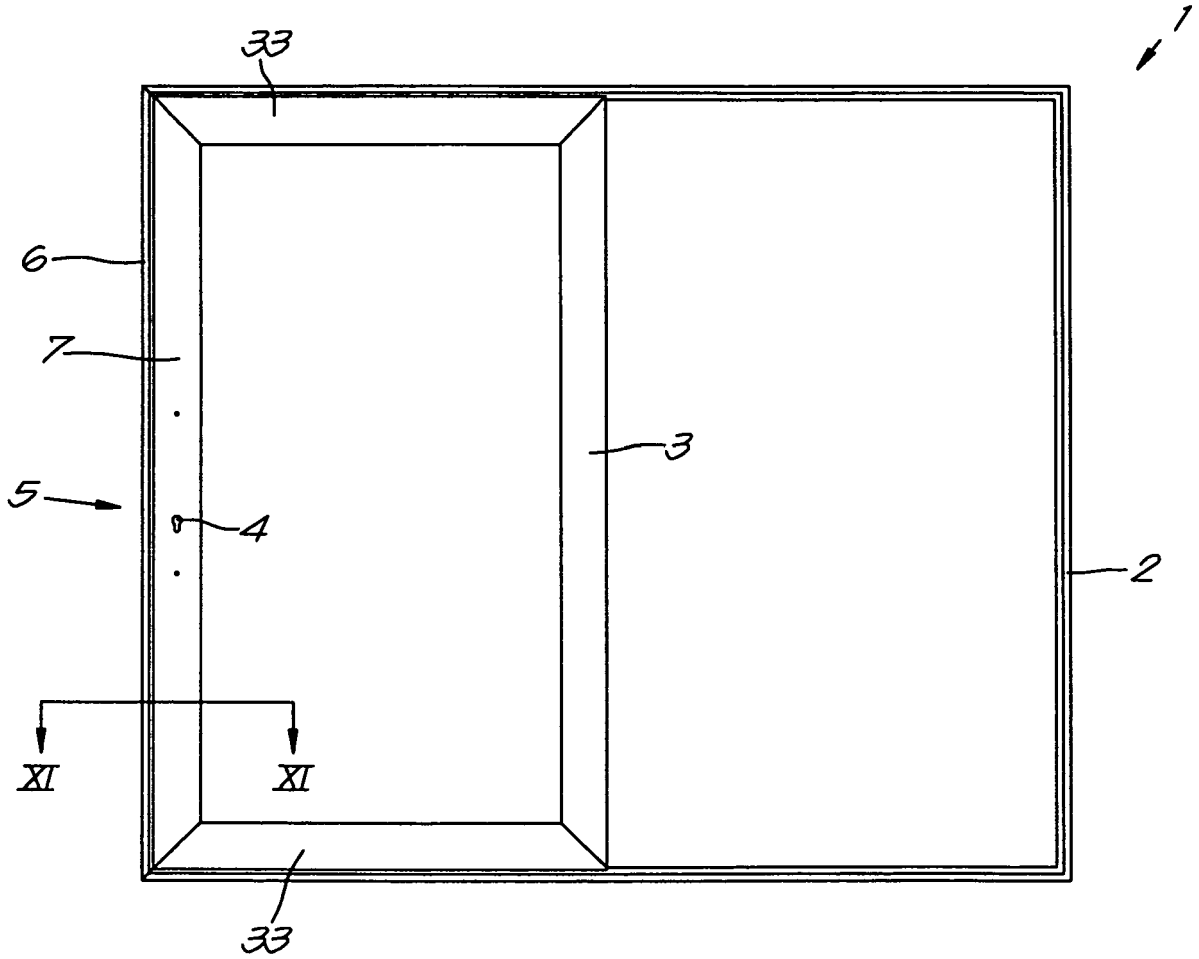

Fig. 1

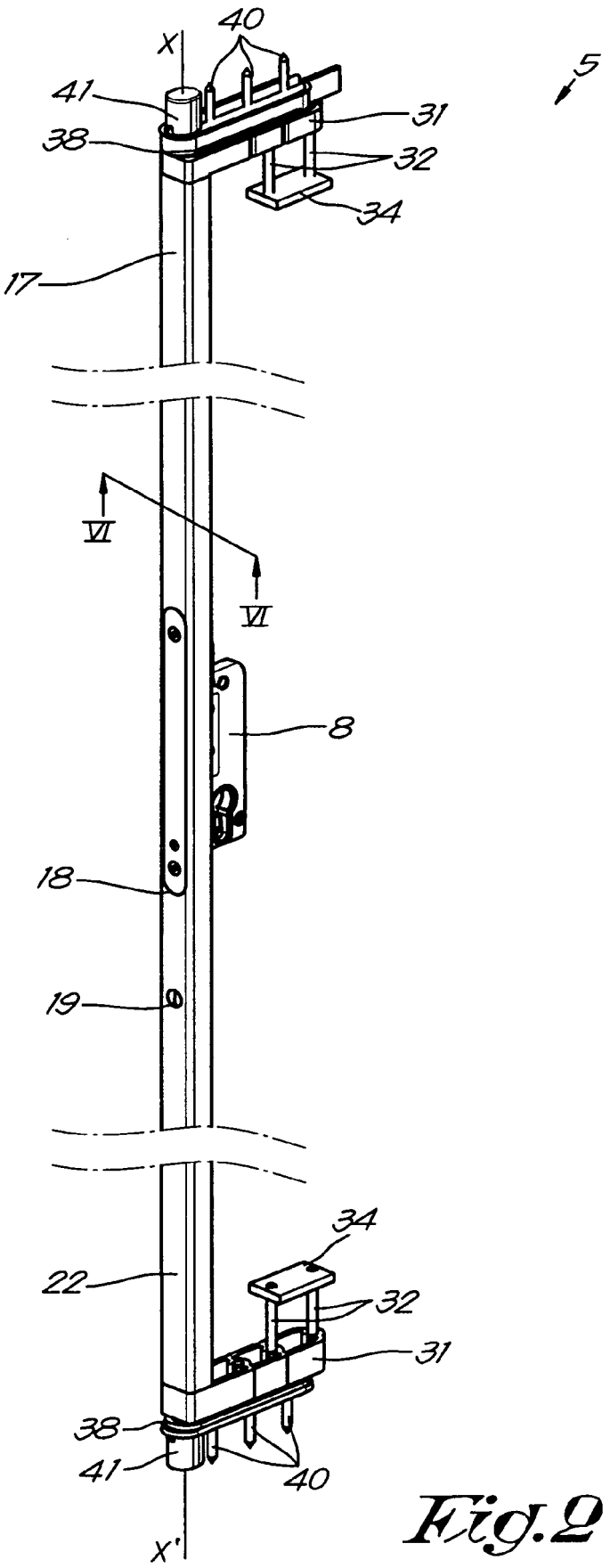

Fig.2

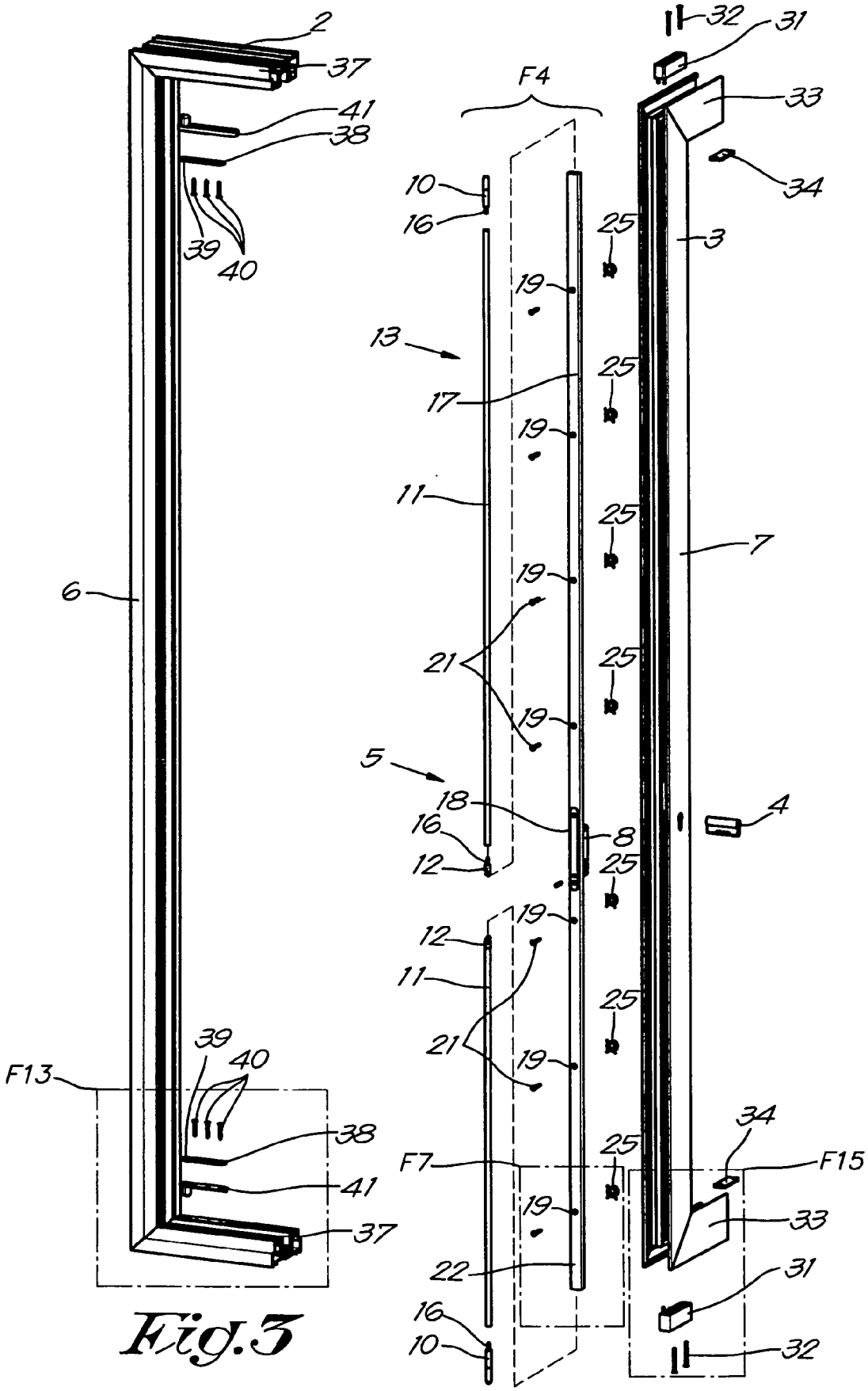
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Fig.3

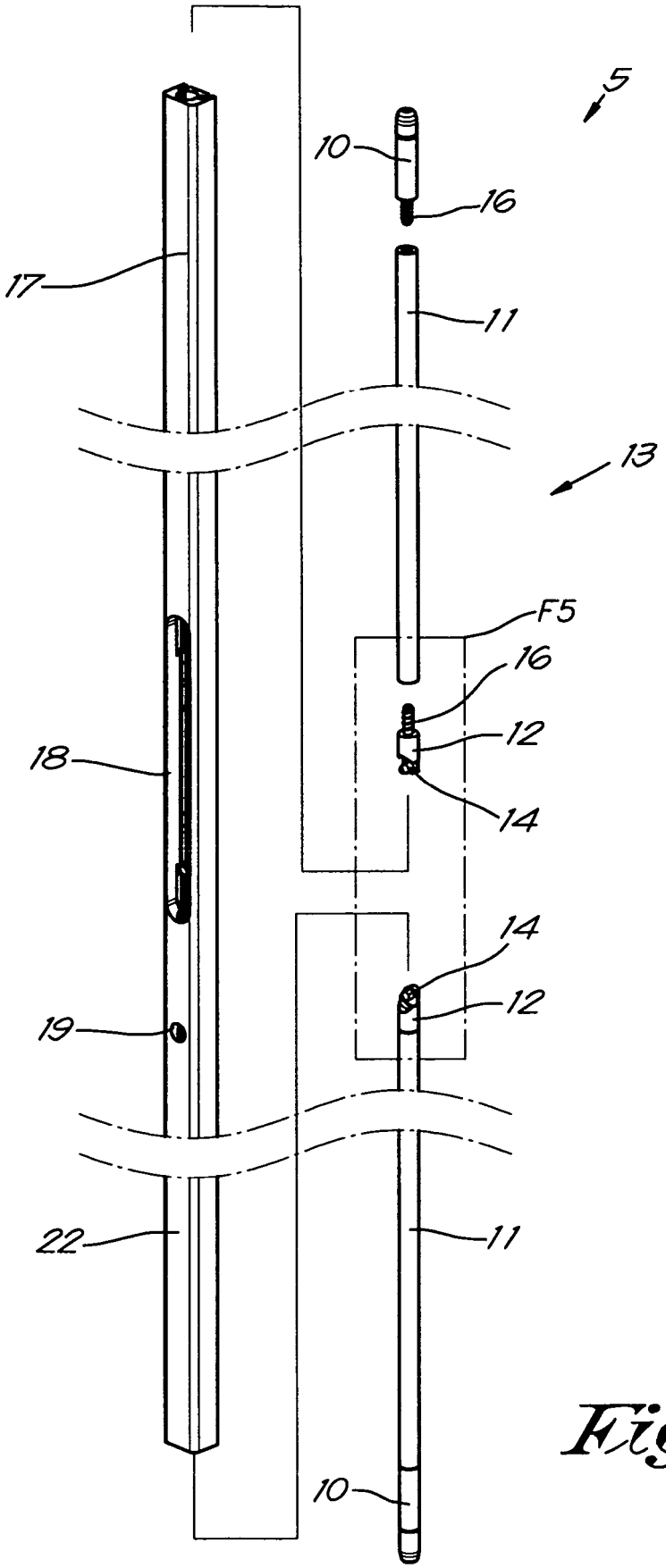

Fig.4

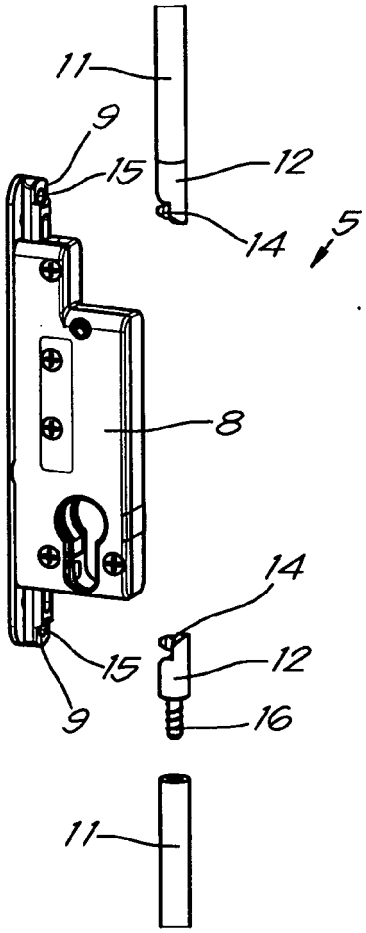

Fig.5

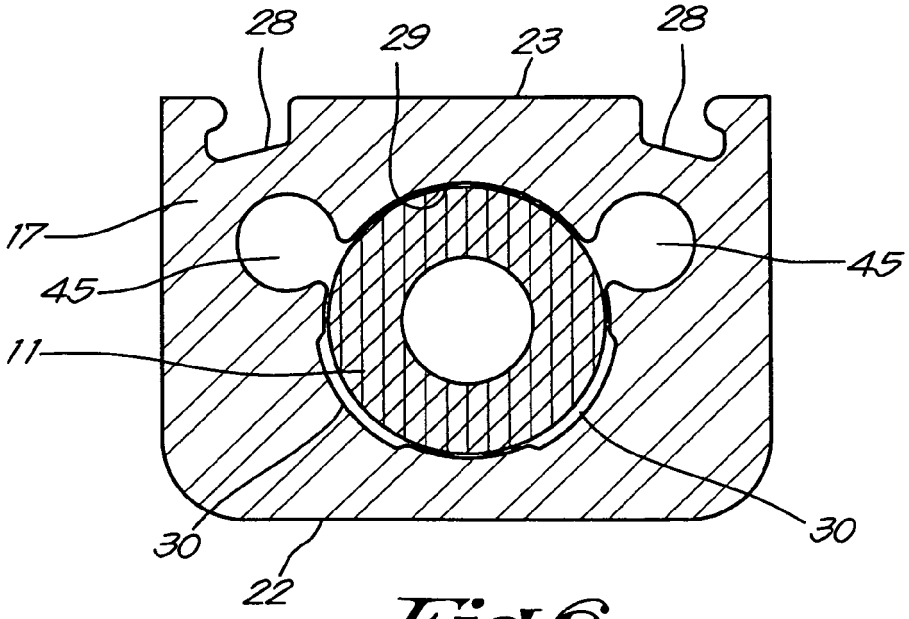

Fig.6

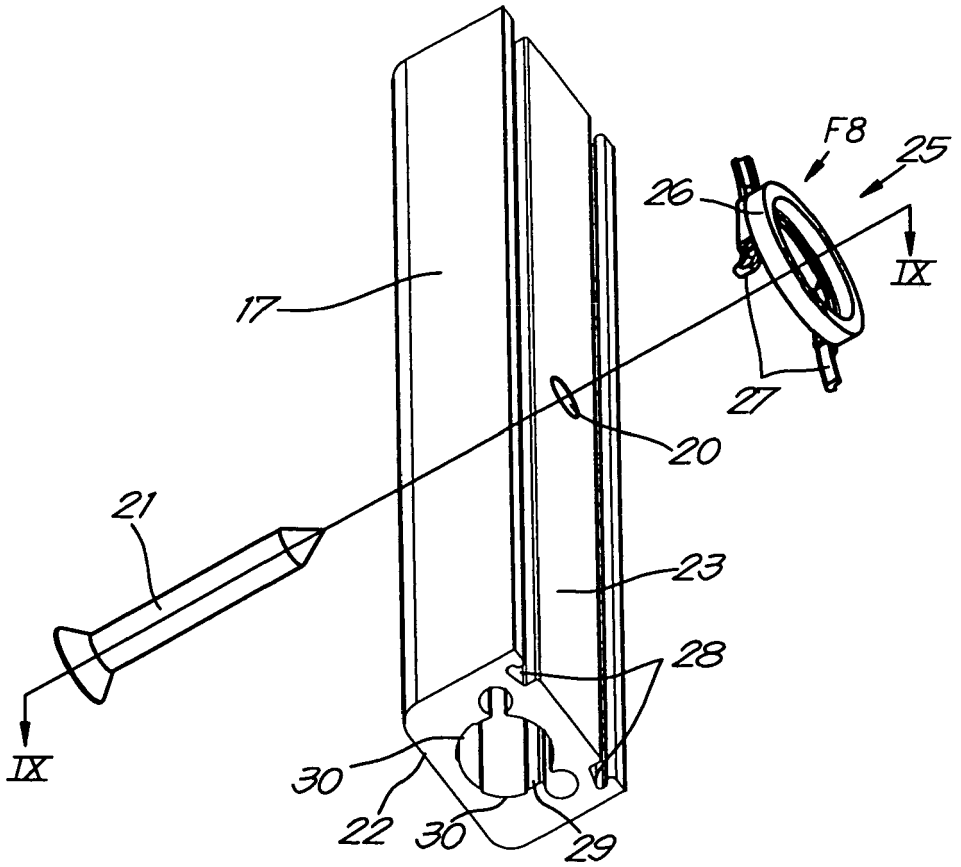

Fig.7

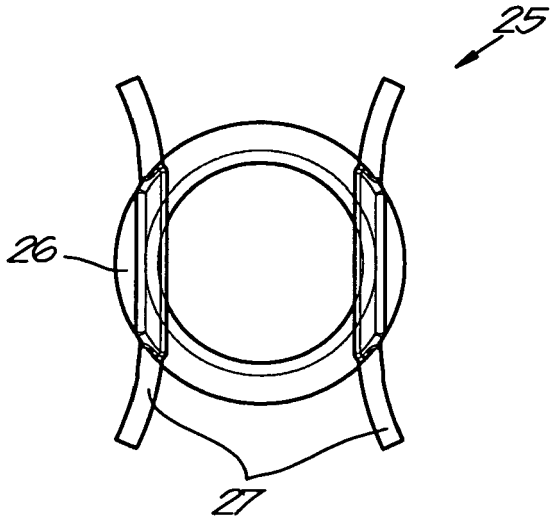

Fig.8

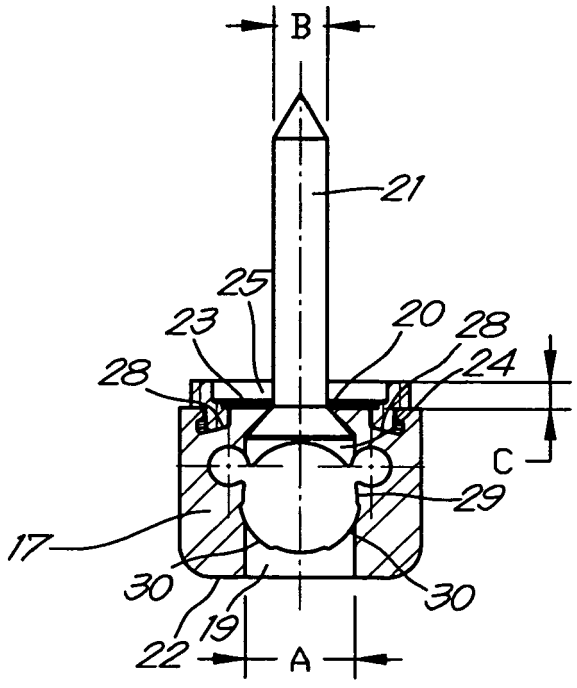

Fig.9

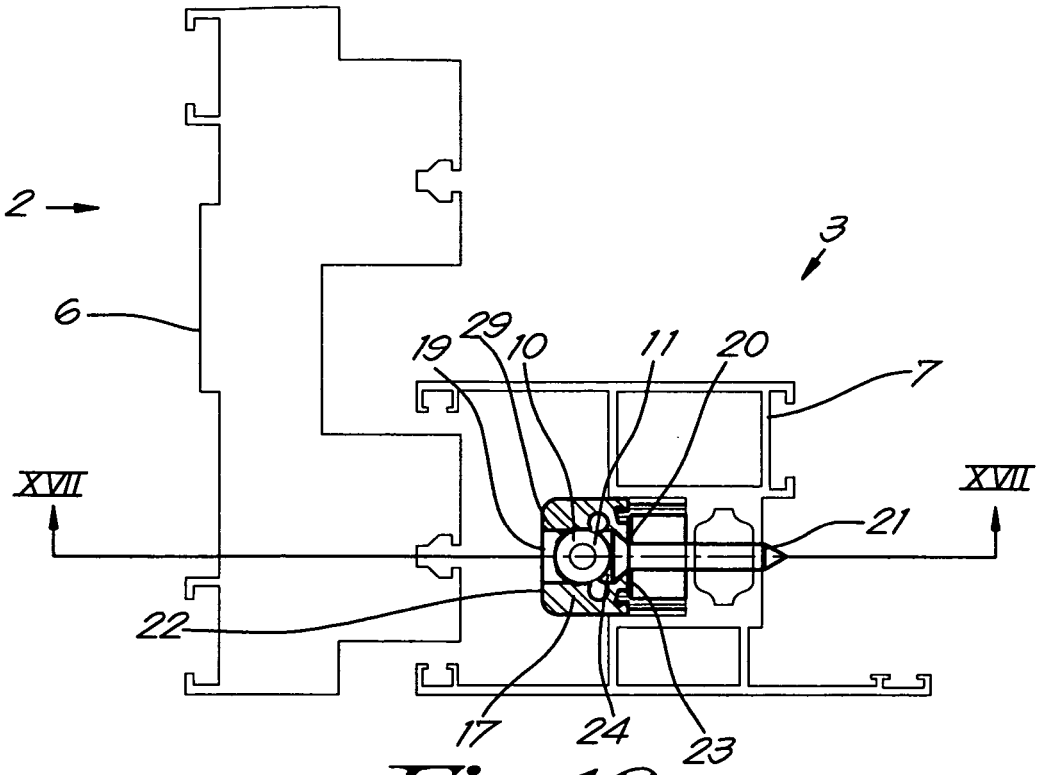
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Fig.10

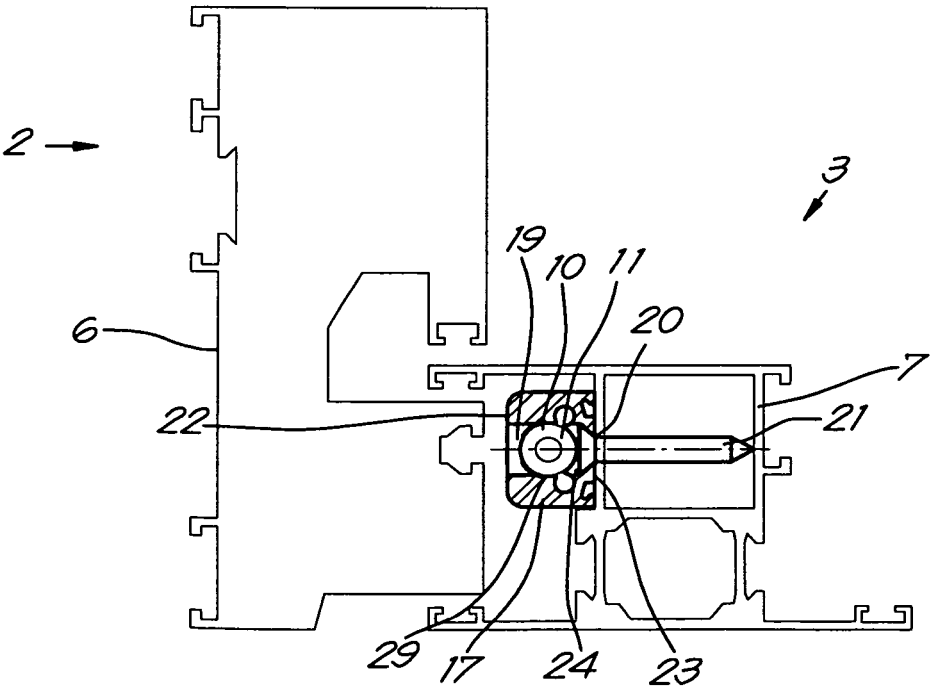
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Fig.11

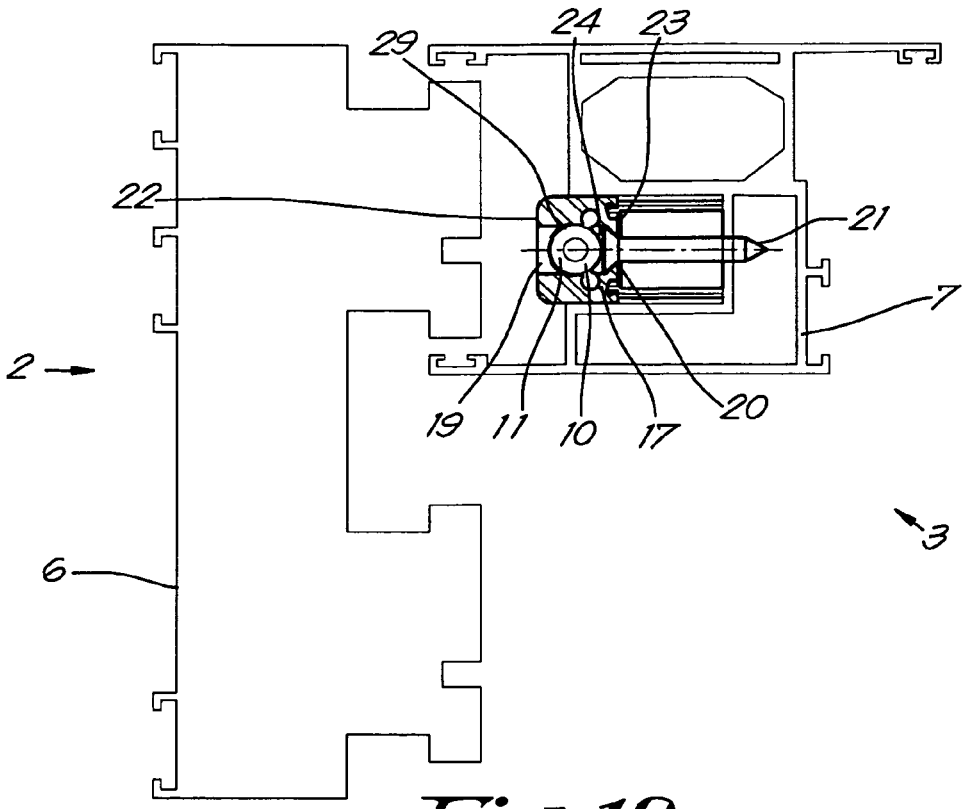

Fig. 12

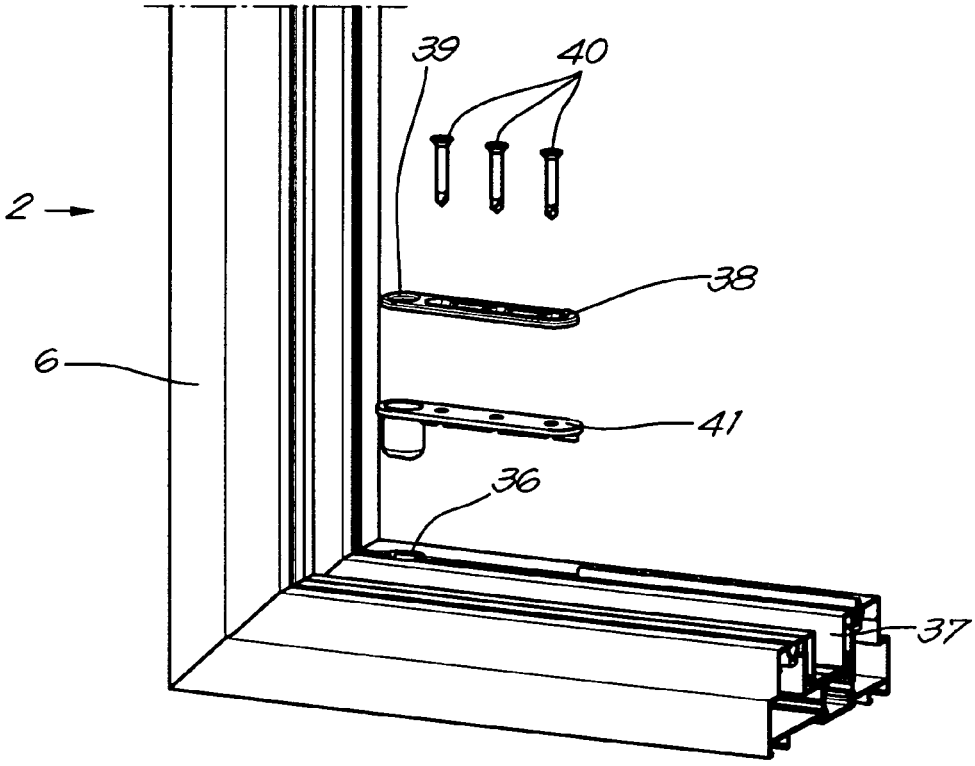

Fig. 13

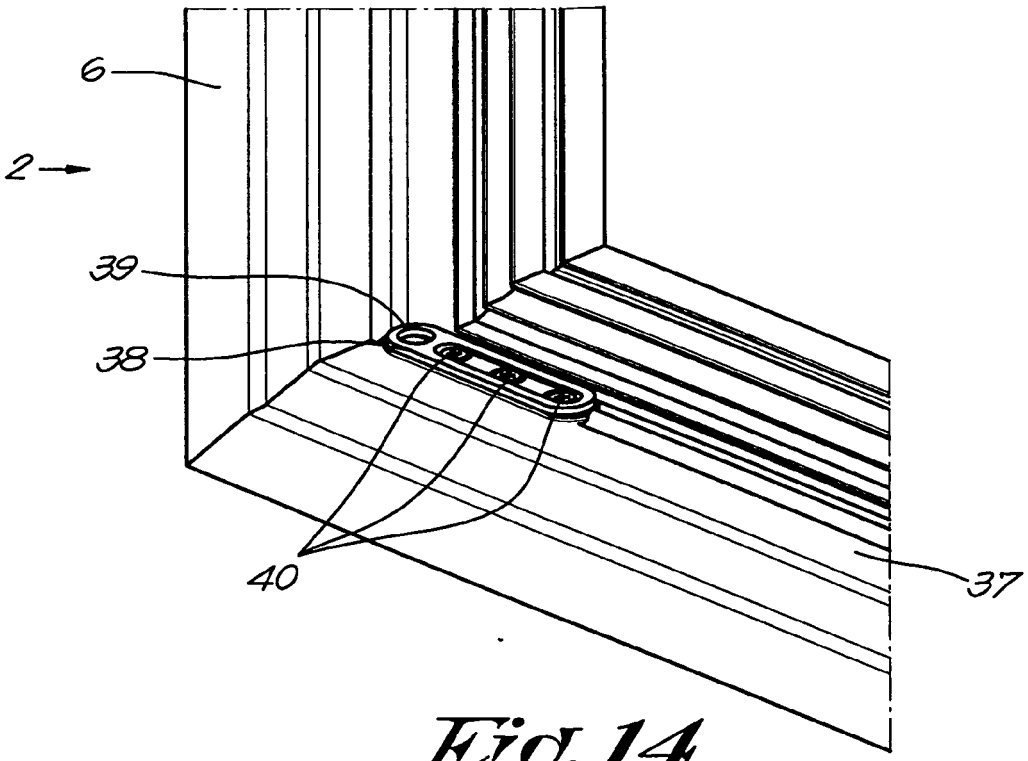

Fig. 14

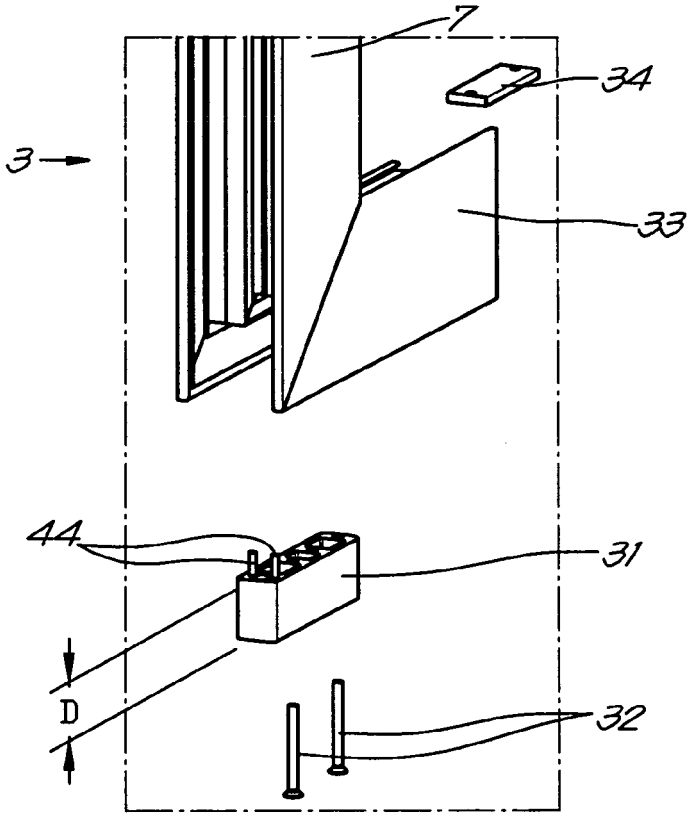

Fig. 15

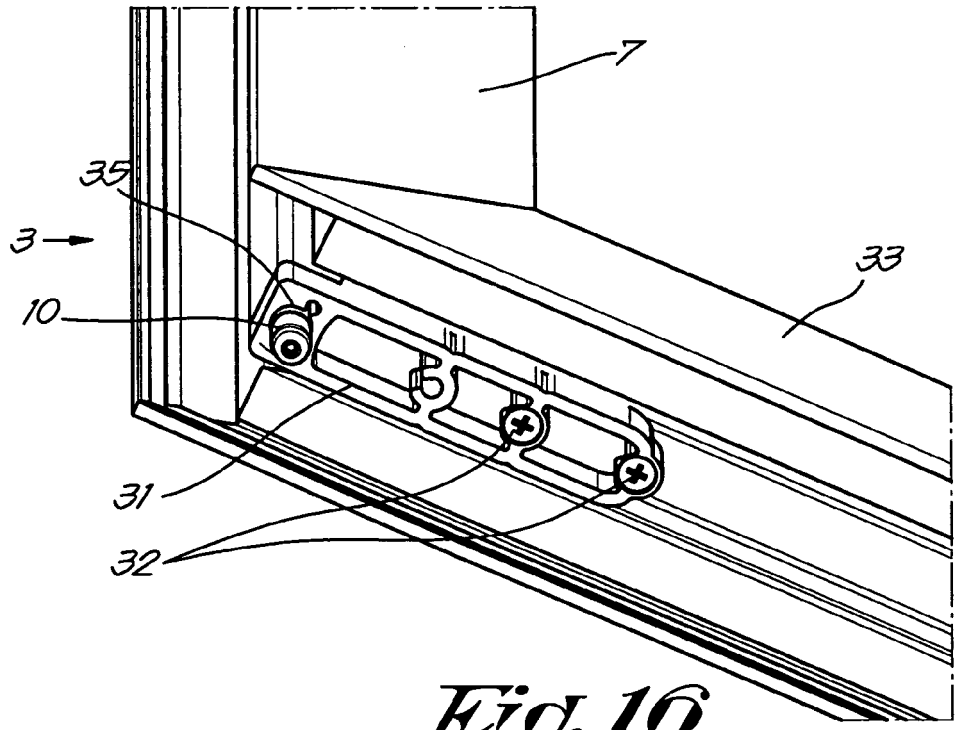

Fig. 16

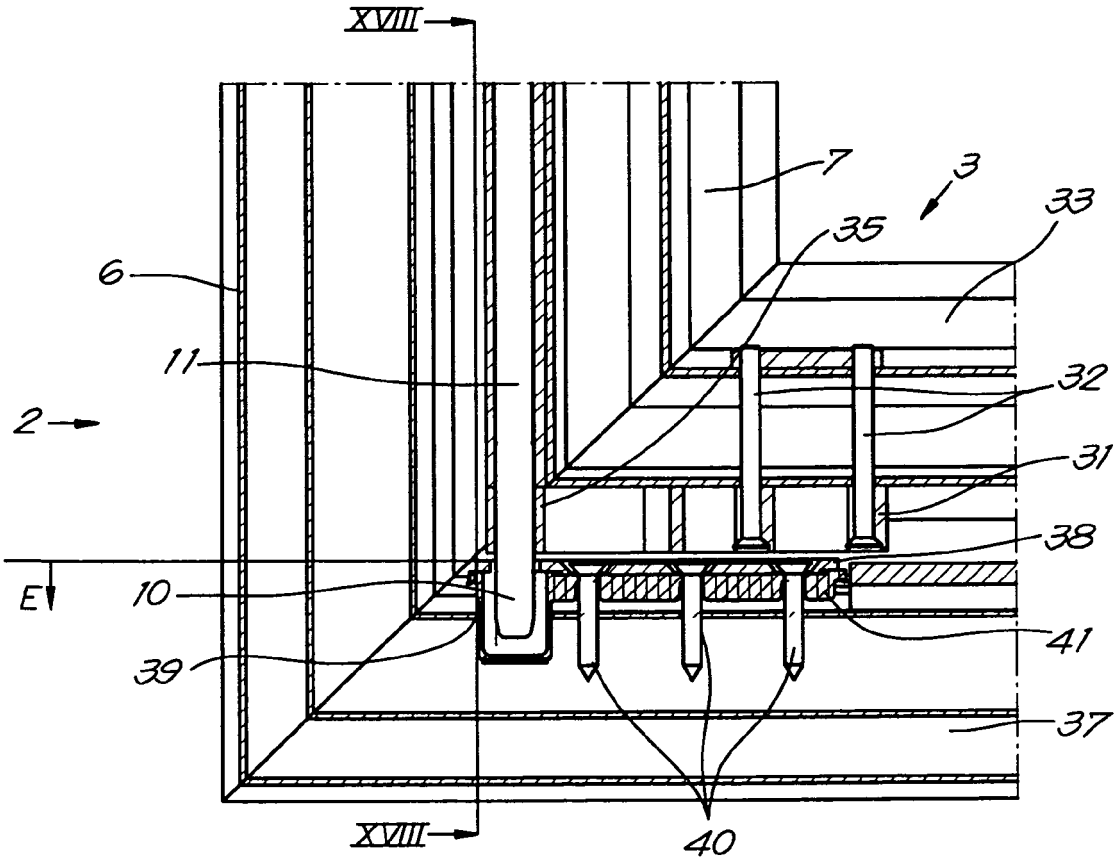

Fig. 17

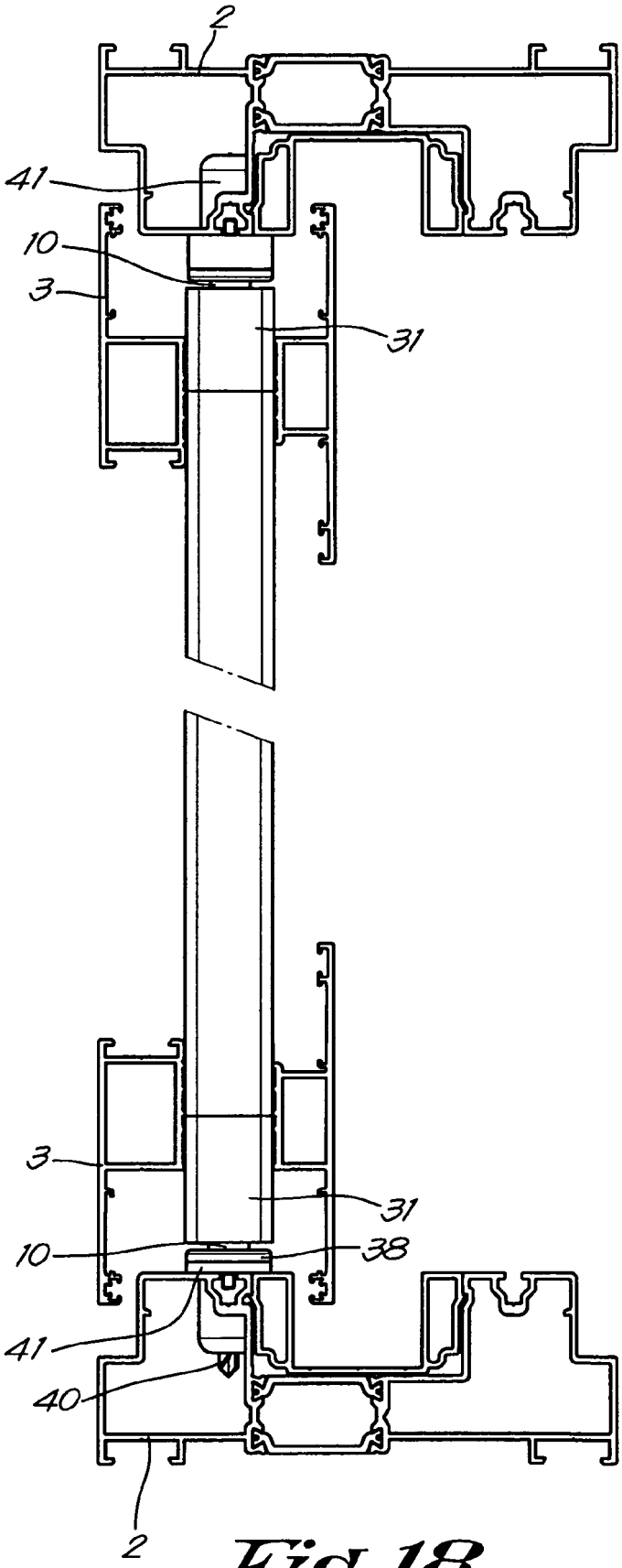

Fig. 18

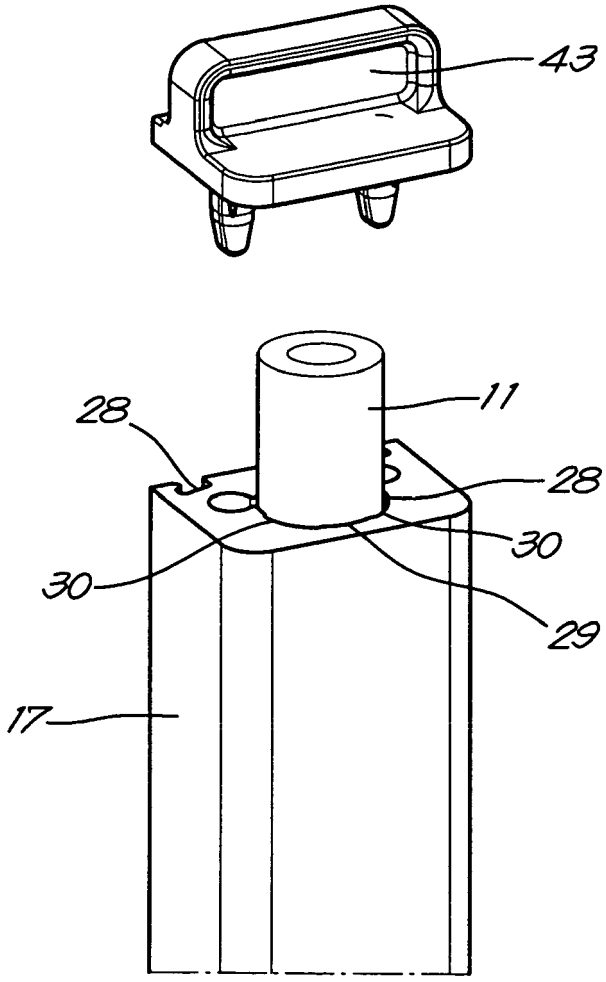

Fig. 19

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EUROPEAN SEARCH REPORT

Application Number
EP 16 00 2232

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 955 432 A2 (SURELOCK MCGILL LIMITED [GB]) 10 November 1999 (1999-11-10) * paragraph [0034] - paragraph [0037] * * paragraph [0051] - paragraph [0056] * * figures 1-5 *	1-15	INV. E05C9/00 E05C9/18 E05C9/04 E05C9/20 E05C9/22
A	EP 0 457 014 A2 (ZARGES LEICHTBAU GMBH [DE]) 21 November 1991 (1991-11-21) * column 4, line 20 - column 8, line 13 * * figures 1-5 *	1-15	E05B15/16
A	WO 2012/003104 A1 (ADAMS RITE MFG [US]) 5 January 2012 (2012-01-05) * page 4, line 4 - line 10 * * page 8, line 2 - page 9, line 7 * * figures 1-20 *	1-15	
A	US 5 709 111 A (HENAO JOSE GABRIEL [US]) 20 January 1998 (1998-01-20) * column 3, line 19 - column 7, line 24 * * figures 1-9 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
A	WO 95/27115 A1 (VOLVO AB [SE]; BERGGREN TONY J [SE]) 12 October 1995 (1995-10-12) * page 3, line 20 - line 37 * * page 4, line 14 - line 23 * * figures 2-4 *	1-15	E05C E05B
A	EP 1 521 893 A1 (HUF HUELSBECK & FUERST GMBH [DE]) 13 April 2005 (2005-04-13) * paragraph [0022] * * figures 1-3 *	1-15	
A	JP 2006 103525 A (PIOLAX INC) 20 April 2006 (2006-04-20) * figures 1-4 *	1-15	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	3 March 2017	Antonov, Ventseslav

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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L : document cited for other reasons

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03-03-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0955432 A2	10-11-1999	EP 0955432 A2	10-11-1999
		US 6283516 B1	04-09-2001
EP 0457014 A2	21-11-1991	DE 9005487 U1	06-09-1990
		EP 0457014 A2	21-11-1991
WO 2012003104 A1	05-01-2012	CA 2804211 A1	05-01-2012
		CN 102985629 A	20-03-2013
		GB 2495450 A	10-04-2013
		TW 201207211 A	16-02-2012
		US 2012000257 A1	05-01-2012
		WO 2012003104 A1	05-01-2012
US 5709111 A	20-01-1998	NONE	
WO 9527115 A1	12-10-1995	NONE	
EP 1521893 A1	13-04-2005	AU 2003250868 A1	02-02-2004
		CN 1668823 A	14-09-2005
		DE 10231329 A1	29-01-2004
		EP 1521893 A1	13-04-2005
		KR 20050025344 A	14-03-2005
		US 2005225095 A1	13-10-2005
		WO 2004007878 A1	22-01-2004
JP 2006103525 A	20-04-2006	JP 4542865 B2	15-09-2010
		JP 2006103525 A	20-04-2006

EPO FORM P0459

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