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(54) **Mounting mechanism for sliding glass doors**

Montagevorrichtung für Glasschiebetüren

Mécanisme de montage pour portes vitrées coulissantes.

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(56) References cited:

DE-A- 3 238 204

GB-A- 531 950

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Description

[0001] The present invention refers to a mounting mechanism for sliding glass doors which does not require machining operations on the glass leaves and in addition allows an exact regulation of the height position.

[0002] More specifically, the mechanism of the invention is of the type which comprises an upper rail, a lower guide parallel to the upper rail and suspension heads which are attached to the upper edge of the door and have rolling elements which can move along the upper rail.

[0003] The Spanish patent application no. 9300632 already informs of a mechanism of the type described, in which the suspension heads are composed of two back-to-back plates which can be attached to each other in a matching position, which on their opposing faces and from the lower edge have matching indentations which make up a lower recess which can be attached to the upper edge of the door. One of the plates which make up the suspension head has one or more free wheels mounted on its outer face. The upper rail, on the other hand, is composed of an L-shaped bar with a horizontal branch which defines the track on which rest and may move the wheels of the suspension head.

[0004] With the arrangement described it is not possible to mount parallel leaves close to each other as they must be separated at least by the distance required to house the parallel rails of the different leaves.

[0005] For this same reason, mechanisms of the type described do not allow mounting glass doors between walls, when the wall separation is smaller than the width required to attach the bar which makes up the upper rail plus the space required for the door.

[0006] A further inconvenience of the mechanisms described is the difficulty of adjusting the door height, which is determined by the position of the rail.

[0007] For wooden sliding doors mechanisms are known in which the upper rail consists of a tubular bar above the door and open longitudinally on its lower side. Inside this rail carriages may move which are connected to the door leaves by vertical screws anchored on their lower side to a mounting element which is embedded and attached to the door, on its upper edge. In this sense the Spanish patent application no. 9501409 of the same applicants may be mentioned. Although this mechanism allows placing the parallel leaves very close to each other, it is not applicable to glass doors as it is not possible to embed and attach the mounting element to the upper edge of the leaves. DE-A-3 238 204 discloses a device for the suspended mounting of panes on a running rail according to the preamble of claim 1. GB-A-531 950 discloses a suspension device for sliding- and folding-doors and windows having a height-adjustment screw.

[0008] The object of the present invention is to eliminate the problems described by a mechanism of the type initially mentioned and which presents specific charac-

teristics allowing mounting of one or more leaves in a small space, enough to house the leaves with their corresponding suspension heads.

[0009] Another object of the invention is being able to adjust the height of the leave or leaves of the door, absorbing even certain tolerances or variations in the exact position of the upper rail and lower guide. These objects are achieved by means of the invention as defined in Claim 1 : preferred embodiment of the invention are defined in the dependant claims.

[0010] As mentioned above, the mechanism of the invention includes an upper rail and a lower guide between which are mounted the leave or leaves of the door and the suspension heads attachable to the upper edge of the door consisting of two back-to-back plates attachable to each other in a matching position.

[0011] According to the invention, the plates which make up the suspension heads have, on their inner face and after their upper edge, respective matching longitudinal indentations which make up an upper recess when the plates are placed together. These indentations which make up the recess have in their turn an equal number of identical grooves or channels along their bottom which face each other and define longitudinal guides in the recess, between which is mounted, so that it may move longitudinally, a baseplate with an hole through which a mounting screw passes to a carriage which is placed above the door and which may travel along the inside of the upper rail.

[0012] In the mechanism of the invention the upper rail is composed of a tubular bar which is open on its lower side. The carriage or carriages joined to the suspension heads by the aforementioned mounting screw can travel along the inside of this bar.

[0013] With this arrangement glass doors of two or more parallel leaves near each other may be mounted with sufficient room for the width of the suspension heads as the upper rail is above the leaves, as are the rolling elements.

[0014] The upper recess of the suspension heads described, as well as the baseplates have means to limit the displacement of the baseplate once it is mounted on the recess guides between a position of maximum extraction in which the orifice for the screw to the carriage is left beyond the suspension head and an inner position in which the baseplate is completely housed in the recess. The suspension heads also have means to block the baseplate in its inner limit position, remaining locked there with no danger of accidental displacement when the door leaves are moved.

[0015] The arrangement described also has the advantage of allowing adjusting the height of the leaves by acting on mounting screw connecting the baseplate to the carriage, an operation which will be executed when the baseplate is in the position of maximum extraction. Once the height is adjusted the baseplate is moved to its inner position and locked.

[0016] The upper recess of the suspension heads will

have a width matching the head of the carriage mounting screw so that when the baseplate is moved to the inner position where the head of the screw is inside the recess, the screw cannot turn and accidentally loosen.

[0017] The characteristics set forth as well as others characteristic of the invention are presently described in greater detail with the aid of the attached drawings where an example is shown of an embodiment of a non-limiting nature.

[0018] In the drawings:

[0019] Figure 1 is a front elevation of a mechanism in agreement with the invention for mounting two glass sliding doors with a cross section of the upper rail to show the movable carriages.

[0020] Figure 2 shows enlargement A of figure 1, at a greater scale and in cross section.

[0021] Figure 3a is a cross section of the suspension head along the III-III line of figure 2.

[0022] Figure 3b is a view similar to figure 3a with a variation of execution.

[0023] Figure 4 is a view similar to figure 2 with the baseplate to which is attached the mounting screw out of the suspension head.

[0024] Figure 5a is a longitudinal cross section of the suspension head along the line V-V of figure.

[0025] Figure 5b is a view similar to figure 5a showing a variation of execution.

[0026] Figure 6 shows a cross section of the suspension heads, upper rail and lower guide corresponding to the two leaves of the glass door.

[0027] The door shown in figure 1 includes two glass leaves labeled 1 and 2, which are mounted by a mechanism which includes an upper rail for each door, labeled by numbers 3 and 4, and lower guides 5 and 6. Each of the doors has suspension heads mounted on top labeled 7 and 8. Upper rails 3 and 4 as seen in figure 6, are tubular in section and are open along the bottom side. Inside each rail carriages 9 and 10 are housed, connected to suspension heads 7 and 8 as described below.

[0028] On the ends of rails 3 and 4 are extreme stops 11 which limit the displacement of carriages 9 and 10 and define their position when the doors 1 and 2 are closed.

[0029] As can be seen in figures 2 and 6, each of suspension heads 7 and 8 is composed of two rectangular plates 12, back-to-back and joined by screws 13. These plates have, on their inner face and from the lower edge, longitudinal indentations which define as the plates are joined a recess 15 which is connected to the upper edge of glass leaves 1 and 2. The inner surface of indentations 14 can be covered in a shock-absorbing and anti-skid material

[0030] Plates 12 also have on their inner surface and from the upper edge corresponding longitudinal indentations 17 which define as the plates are set, a longitudinal recess 18. Indentations 17 have identical grooves or channels 19 on the bottom, which are left facing each

other and define in recesses 18 longitudinal guides between which is mounted a baseplate 20 which can move horizontally.

[0031] This baseplate, as seen in figures 3 and 5, has an orifice 21 through which screw 22 passes attaching it to the corresponding suspension carriage.

[0032] Suspension heads have means in order to limit the displacement of baseplate 20. These means can consist of pins or bolts 23 mounted across plates 12, which are tangent to recess 18 and slightly project out from the bottom. These means complement screws 24 which are attached to baseplate 20 and which project from the bottom and act as limiting stops for the displacement of the baseplate as they collide with pins 23.

In the position shown in figure 2, baseplate 20 is housed completely inside recess 18 defined by plates 12, with screw 24 resting on one pin 23. In the position shown in figure 4, plate 20 is in the position of maximum extraction, screw 24 colliding with the other pin 23. In the position of figure 4 hole 21 of baseplate 20 is outside recess 18 allowing the introduction of mounting screw 22 to the carriage 10, at which position the head of screw 22 can be acted upon to adjust the height of baseplate 20 and thus that of suspension heads 7 and 8, and therefore that of glass leaves 1 and 2, figure 1.

[0033] In the inner position of baseplate 20, shown in figures 2 and 3a, this position is locked by locking elements consisting of a pressure screw 25 inserted through a threaded orifice in one of plates 12 level with channel 19. Baseplate 20 has notches 26 in its longitudinal edges which lie opposite screw 25 in its inner position, as shown in figure 3. By tightening screw 25 it partially enters notches 26, stopping baseplate 20 from moving and perhaps projecting out from the suspension head accidentally, for example due to the displacement of the door leaves.

[0034] According to a variation of execution shown in figures 3b and 5b, baseplate 20 has a striation or groove 28, for example in its upper surface, which creates sufficient friction with channels 19 to prevent its accidental displacement.

[0035] As shown in figure 6, upper recess 18 of the suspension heads 7 and 8 is of the same width as the head of screw 22, at least in the segment located under channels 19. In this way screw 22 cannot turn once baseplate 20 is in its inner position of figures 2 and 3. Above channels 19 upper recess 18 can be of lesser width, enough to allow the pin of screw 22 to pass.

[0036] Plates 12 which make up the suspension head have, along their upper and outer edges, grooves or channels 27 meant for attaching brushes which close against tubes 3 and 4 which make up the upper rails.

[0037] In figure 6 heads 7 and 8 are shown in different cross sections in order to show in one case screw 13 for mounting of the two head plates and in the other case screw 22 for attaching the head to the corresponding carriage.

[0038] With the arrangement described and as seen

in figure 6, parallel leaves of a glass door may be placed near each other, as corresponding suspension rails 3 and 4 are left above these leaves, back-to-back and it is enough that space remains between consecutive leaves to house suspension heads 7 and 8.

[0039] For this same reason a single-leaf door could be mounted between two walls which are near each other as long as upper rail 3 and the door suspension head can be housed.

[0040] In addition, as mentioned above screw 22 allows to adjust the height of the suspension head and with it that of the corresponding glass leaf

[0041] Between plates 12 which make up the suspension heads are placed spacers 29, figures 2, 4 and 6, the length of which is adjusted for different thicknesses of glass leaf 1 or 2, for example for two different widths. In this case there are also two baseplates 20 of different width for mounting between channels 19.

[0042] The heads of screws for attaching plates 12 of each suspension head can be hidden by decorative strips 30, figure 6, or coupled to a slight groove of said plates on their outside face, level with the passage orifices of these screws.

[0043] Although in the example described each glass leaf 1 or 2 has two suspension heads 7 - 8, a single head of length equal to the width of the leaf could be used, with the above described components on its ends.

Claims

1. Mechanism for mounting sliding glass doors, comprising an upper rail (3, 4), a lower guide (5, 6) parallel to the upper rail (3, 4) and suspension heads (7, 8) which may be attached to the upper edge of the door (1, 2), and having rolling elements which can move along the upper rail, with suspension heads (7, 8) composed of two back-to-back plates (12) which can be attached to each other so that they match and have on their matching faces and on the lower edge, corresponding matching indentations (14) which define a lower recess which can be mounted on the upper edge of the door, wherein the plates which make up the suspension heads (7, 8) have on their inner face on the upper edge corresponding matching longitudinal indentations (17) which define, as said plates (12) are placed next to each other, an upper recess (18); said indentations (17) having an equal number of identical longitudinal channels (19) along their bottom, which are left opposite each other and form in the recess longitudinal guides between which is mounted, so that it may slide, a baseplate (20), **characterised in that** said baseplate is provided with an hole (21) through which passes a screw (22) for attachment to a carriage placed above the door (1, 2) and which may move on the upper rail (3, 4); whereby said screw is arranged so that the distance between the car-

riage and the baseplate can be modified by turning the screw; said upper recess (18) and baseplate (20) having means to limit the displacement of the baseplate (20) between a position of maximum extraction, in which the hole (21) for the screw (22) is left outside the recess (18), allowing for adjustment of the distance between carriage and baseplate by acting on the screw (22), and an inner position in which the baseplate (20) is completely housed in the recess (18), also having means (25) to lock the baseplate in its inner position.

2. Mechanism as in claim 1, **characterised in that** the upper recess (18) is of an equal width to the head of the screw (22), at least in the segment placed below the aforementioned longitudinal channels while above these channels it is preferably of lesser width, enough to allow passage of the pin of suspension screw (22).
3. Mechanism as in claim 1, **characterised in that** the means to limit the displacement of the baseplate (20) consist of two pins or bolts (23) which cross the suspension head (7, 8) placed at its side edges and in a position secant to the upper recess (18), and of a lower stop (24) of the baseplate (20) which touches said bolts (23) when the baseplate (20) reaches its limit positions.
4. Mechanism as in claim 1, **characterised in that** the means for locking baseplate (20) in its inner position consist of at least one pressure screw (25) screwed into one of the plates (12) which make up the suspension heads (7, 8) in a position matching the internal groove or channel, and of an indentation (26) which the baseplate (20) has in its longitudinal edges in a position even with the pressure screw (25) as said baseplate (20) reaches its inner position.
5. Mechanism as in claim 1, **characterised in that** the means for blocking the baseplate in its inner position consist of a striation or groove (28) formed on one of the surfaces of said baseplate (20) along the areas which rest on and rub on the channels or grooves of plates (12) of the suspension heads.

Patentansprüche

1. Vorrichtung zum Montieren von Schiebetüren aus Glas mit einer oberen Schiene (3, 4), einer zu der oberen Schiene (3, 4) parallelen unteren Führung (5, 6) und Aufhängeköpfen (7, 8), die an dem oberen Rand der Tür (1, 2) befestigbar sind und Roll-elemente aufweisen, die entlang der oberen Schiene bewegbar sind, mit Aufhängeköpfen (7, 8), die zwei rückseitig zueinander angeordnete Platten (12) aufweisen, die so miteinander verbindbar sind,

dass sie flächig aufeinander passen und auf ihren aufeinander angepassten Seiten und an dem unteren Rand aufeinander angepasste Vertiefungen (14) aufweisen, die eine untere Ausnehmung ausbilden, die an dem oberen Rand der Tür befestigbar ist, wobei die Platten, die die Aufhängeköpfe (7, 8) ausbilden, auf ihrer Innenseite an dem unteren Rand über entsprechend aufeinander angepasste, in Längsrichtung verlaufende Vertiefungen (17) verfügen, die wie die benachbart angeordneten Platten (12) eine obere Ausnehmung (18) ausbilden, wobei die Vertiefungen (17) auf ihrer Unterseite eine einander entsprechende Anzahl von identischen, in Längsrichtung verlaufenden Kanälen (19) aufweisen, die einander gegenüberliegend angeordnet sind und in der Ausnehmung in Längsrichtung verlaufende Führungen ausbilden, zwischen denen so, dass sie verschiebbar ist, eine Grundplatte (20) befestigt ist, **dadurch gekennzeichnet, dass** die Grundplatte mit einem Loch (21) ausgebildet ist, durch das zum Befestigen an einem oberhalb der Tür (1, 2) angeordneten und entlang der oberen Schiene (3, 4) bewegbaren Schlitten eine Schraube (22) durchläuft, wobei die Schraube so ausgebildet ist, dass der Abstand zwischen dem Schlitten und der Grundplatte durch Drehen der Schraube veränderbar ist, wobei die obere Ausnehmung (18) und die Grundplatte (20) Mittel aufweisen, um die Bewegung der Grundplatte (20) zwischen einer Stellung mit maximalen Überstand, in der das Loch (21) für die Schraube (22) außerhalb der Ausnehmung (18) verbleibt und dadurch das Einstellen des Abstandes zwischen dem Schlitten und der Grundplatte durch Einwirken auf die Schraube (22) gestattet, und einer innenseitigen Stellung zu begrenzen, in der die Grundplatte (20) vollständig von der Ausnehmung (18) aufgenommen ist, und weiterhin über Mittel (25) verfügt, um die Grundplatte in ihrer innenseitigen Stellung festzulegen.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die obere Ausnehmung (18) wenigstens in dem unterhalb der vorgenannten, in Längsrichtung verlaufenden Kanäle liegenden Bereich die gleiche Breite wie der Kopf der Schraube (22) aufweist, während sie oberhalb von diesen Kanälen Vorzugsweise von geringerer, jedenfalls ausreichender Breite zum Durchtritt des Schaftes der Aufhängeschraube (22) ist.

3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Mittel zum Begrenzen der Bewegung der Grundplatte (20) zwei Schäfte oder Bolzen (23) aufweisen, die den an den seitlichen Rändern angeordneten Aufhängekopf (7, 8) in einer zu der oberen Ausnehmung (18) schneidenden Ausrichtung queren, und über einen unteren Anschlag (24) der Grundplatte (20) verfügen, der die

Bolzen (23) berührt, wenn die Grundplatte (20) ihre Randstellungen erreicht.

4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Mittel zum Festlegen der Grundplatte (20) in ihrer innenseitigen Stellung aus wenigstens einer in eine der Platten (12), die die Aufhängeköpfe (7, 8) ausbilden, in einer Position, die an die innenseitige Nut oder den innenseitigen Kanal angepasst ist, eingeschraubten Druckschraube (25) und einer Vertiefung (26) bestehen, die die Grundplatte (20) an ihren Längsrändern in einer der Druckschraube (25) entsprechenden Lage aufweist, wenn die Grundplatte (20) ihre innenseitige Stellung erreicht.
5. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Mittel zum Blockieren der Grundplatte in ihrer innenseitigen Stellung aus einer Riefe oder Nut (28) bestehen, die an einer der Oberflächen der Grundplatte (20) in den Bereichen ausgebildet ist, die auf den Kanälen oder Nuten der Platten (12) der Aufhängeköpfe aufliegen und an diesen reiben.

Revendications

1. Mécanisme pour monter des portes vitrées coulissantes, comprenant un rail supérieur (3, 4), un guide inférieur (5, 6) parallèle au rail supérieur (3, 4) et des têtes de suspension (7, 8) qui peuvent être fixées au bord supérieur de la porte (1, 2), et ayant des éléments de roulement qui peuvent se déplacer le long du rail supérieur, avec des têtes de suspension (7, 8) composées de deux plaques dos à dos (12) qui peuvent être fixées l'une à l'autre de sorte qu'elles correspondent et aient, sur leurs faces qui correspondent et sur le bord inférieur, des empreintes relatives correspondantes (14) qui définissent un évidement inférieur qui peut être monté sur le bord supérieur de la porte, dans lequel les plaques qui forment les têtes de suspension (7, 8) ont sur leur face intérieure du bord supérieur des empreintes longitudinales relatives correspondantes (17) qui définissent, à mesure que lesdites plaques (12) sont placées côte à côte, un évidement supérieur (18) ; lesdites empreintes (17) ayant un nombre égal de canaux longitudinaux identiques (19) le long de leur fond, qui sont maintenus opposés l'un de l'autre et forment dans l'évidement des guides longitudinaux entre lesquels est montée, de sorte qu'elle puisse glisser, une plaque de base (20), **caractérisé en ce que** ladite plaque de base est pourvue d'un orifice (21) à travers lequel une vis (22) passe pour la fixer à un chariot placé au-dessus de la porte (1, 2) et qui peut se déplacer sur le rail supérieur (3, 4) ; moyennant quoi ladite vis est agen-

cée de sorte que la distance entre le chariot et la plaque de base puisse être modifiée en tournant la vis ; ledit évidement supérieur (18) et la plaque de base (20) ayant des moyens pour limiter le déplacement de la plaque de base (20) entre une position d'extraction maximum, dans laquelle l'orifice (21) pour la vis (22) est maintenu à l'extérieur de l'évidement (18), permettant d'ajuster la distance entre le chariot et la plaque de base en agissant sur la vis (22), et une position intérieure dans laquelle la plaque de base (20) est complètement accueillie dans l'évidement (18), ayant également des moyens (25) pour bloquer la plaque de base dans sa position intérieure.

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2. Mécanisme selon la revendication 1, **caractérisé en ce que** l'évidement supérieur (18) est d'une largeur égale à la tête de la vis (22), au moins dans le segment placé en dessous des canaux longitudinaux susmentionnés alors qu'au-dessus de ces canaux, il est de préférence de largeur inférieure, suffisamment pour permettre le passage de la tige de la vis de suspension (22).

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3. Mécanisme selon la revendication 1, **caractérisé en ce que** les moyens pour limiter le déplacement de la plaque de base (20) comprennent deux chevilles ou boulons (23) qui croisent la tête de suspension (7, 8) placés au niveau de ses bords latéraux et dans une position sécante à l'évidement supérieur (18), et d'un dispositif d'arrêt inférieur (24) de la plaque de base (20) qui touche lesdits boulons (23) lorsque la plaque de base (20) atteint ses positions limites.

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4. Mécanisme selon la revendication 1, **caractérisé en ce que** les moyens pour bloquer la plaque de base (20) dans sa position intérieure comprennent au moins une vis de pression (25) vissée dans une des plaques (12) qui forment les têtes de suspension (7,8) dans une position correspondant à la rainure ou canal interne, et d'une empreinte (26) dont la plaque de base (20) dispose dans ses bords longitudinaux dans une position même avec la vis de pression (25) à mesure que ladite plaque de base (20) atteint sa position intérieure.

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5. Mécanisme selon la revendication 1, **caractérisé en ce que** les moyens pour bloquer la plaque de base dans sa position intérieure comprennent une strie ou rainure (28) formée sur une des surfaces de ladite plaque de base (20) le long des zones qui reposent et passent sur les canaux ou rainures de plaques (12) des têtes de suspension.

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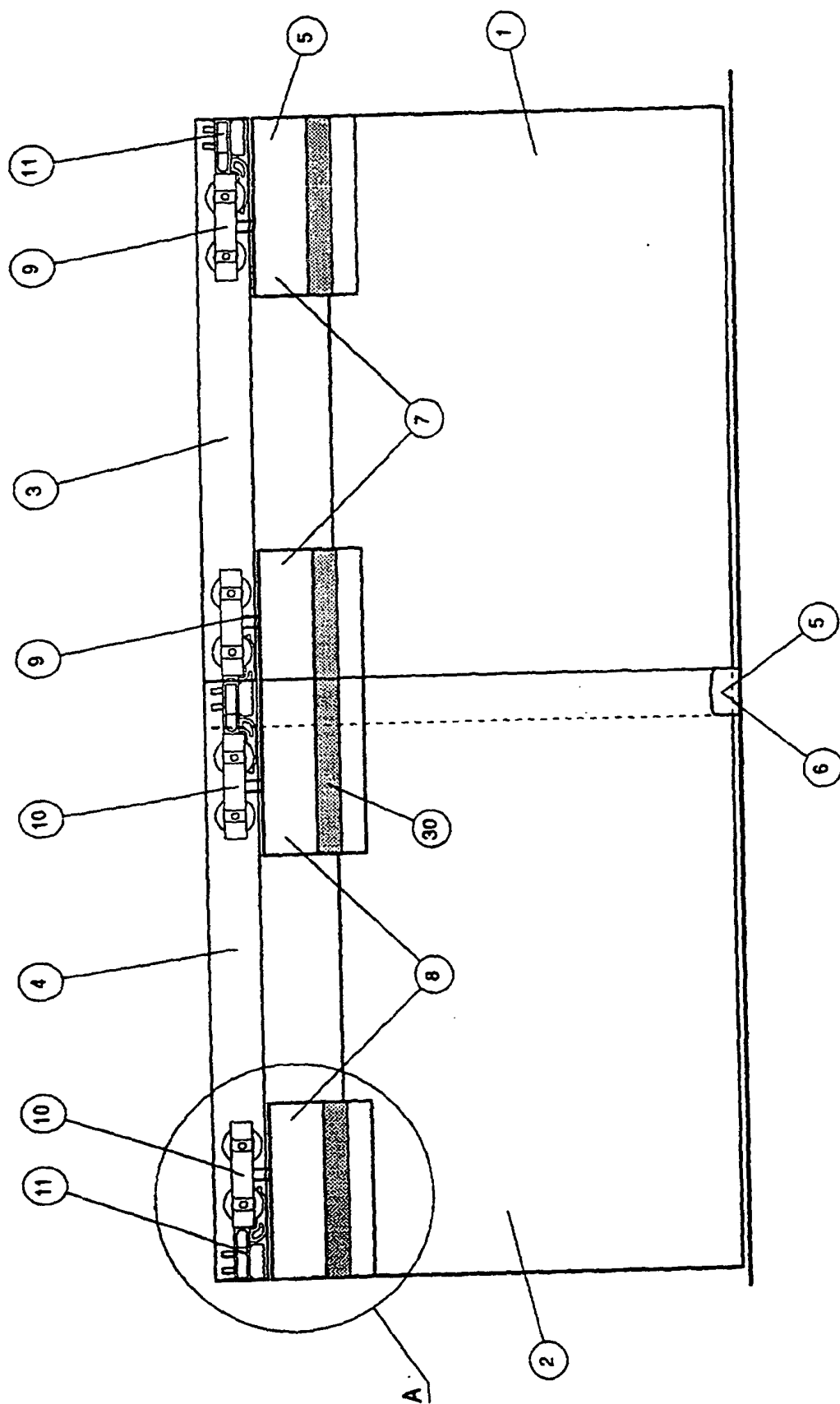


Fig. 1

Fig. 2

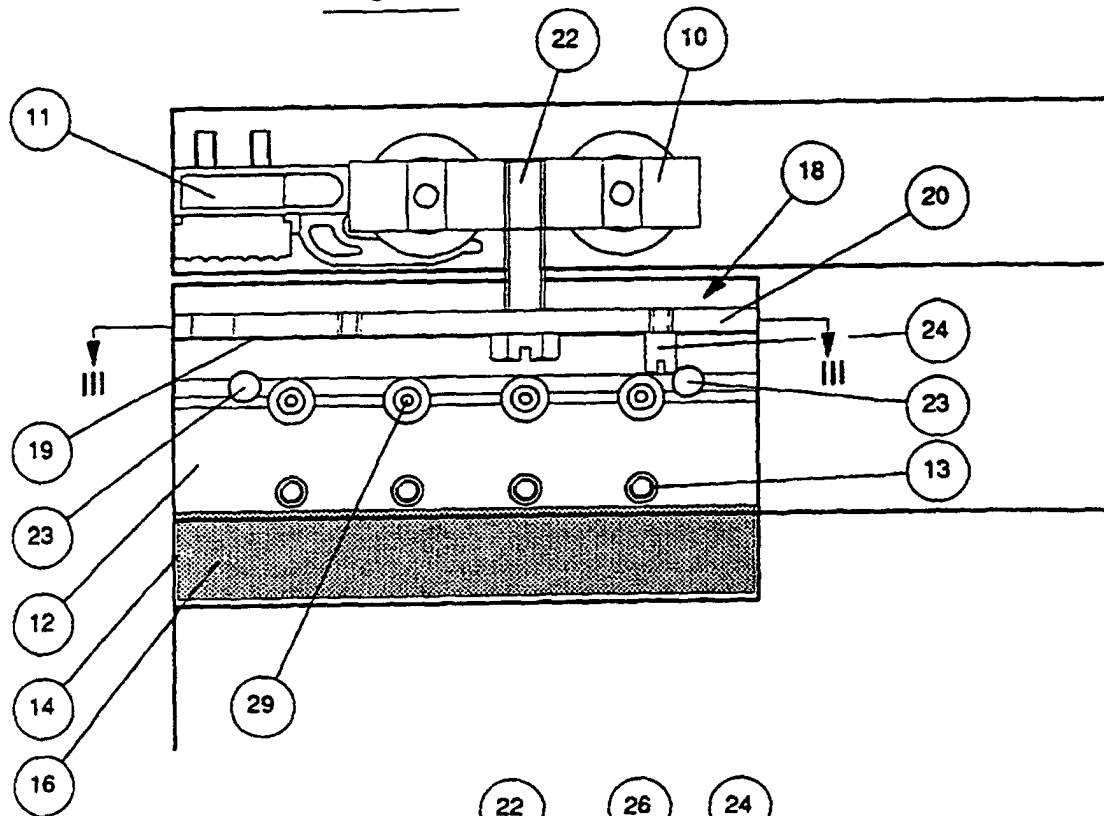


Fig. 3a

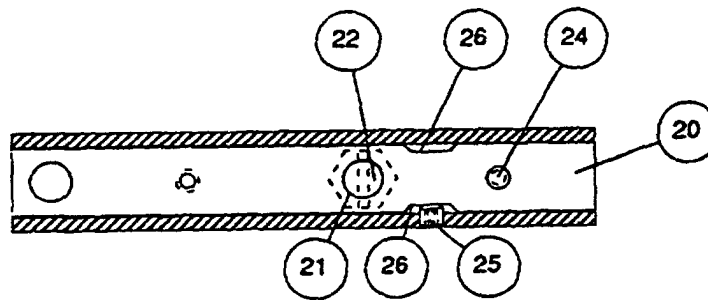


Fig. 3b

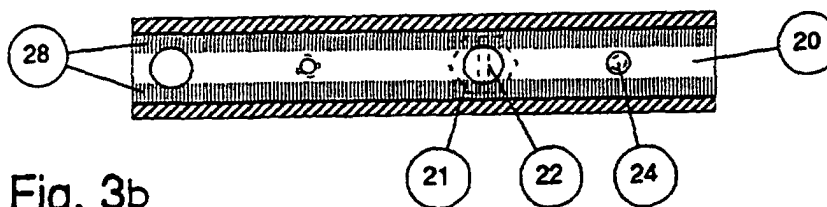


Fig. 4

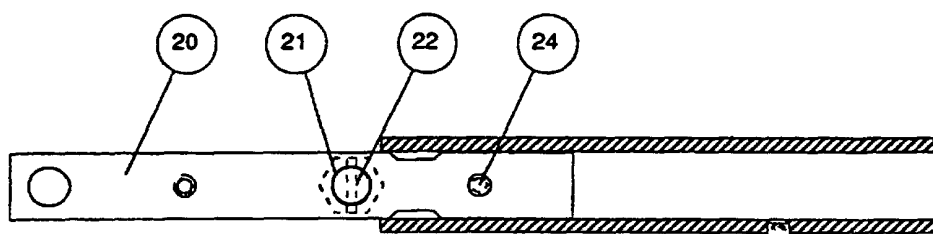
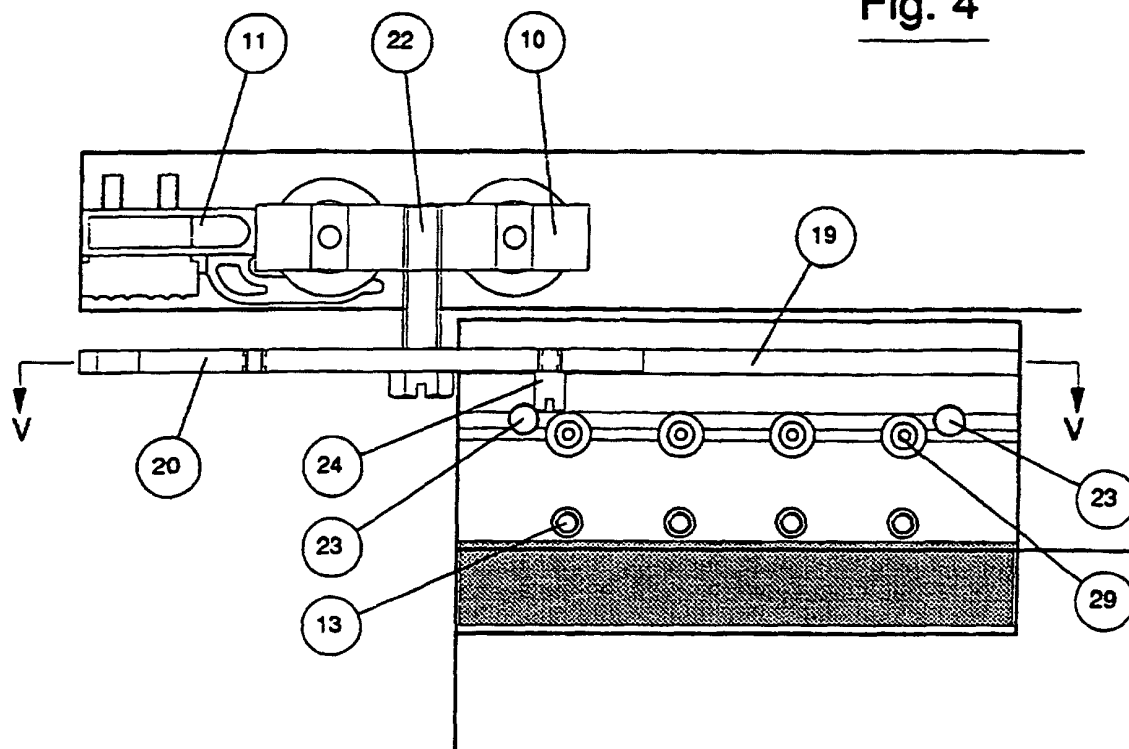


Fig. 5a

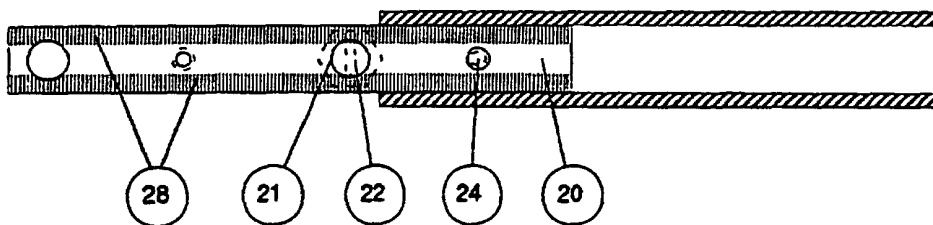


Fig. 5b

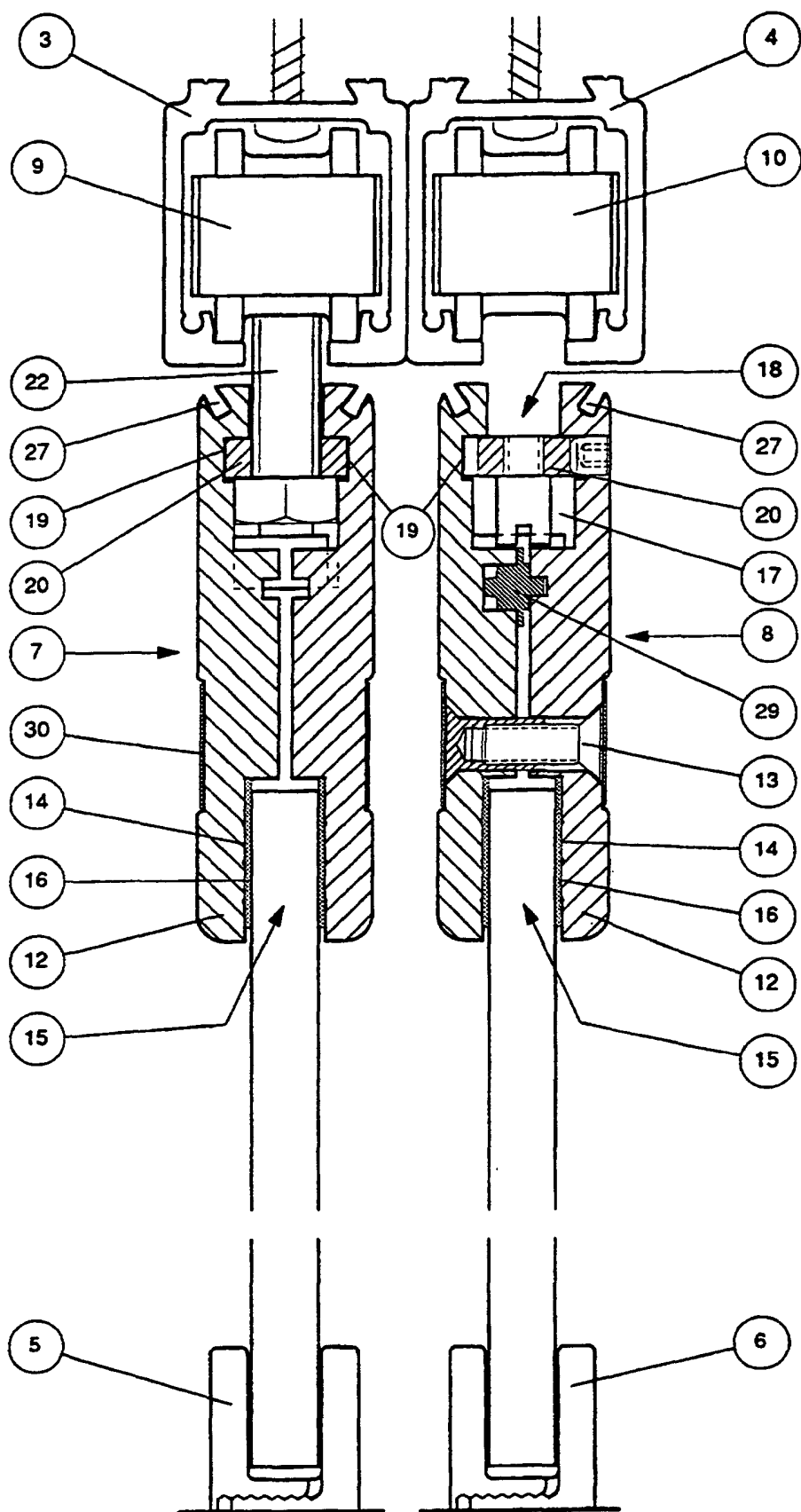


Fig. 6