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(54) False ceiling structure

Abgehängte Deckestruktur
Structure de faux plafond

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(56) References cited:
EP-A2- 1 617 004 GB-A- 682 550
US-A- 4 463 537 US-A1- 2006 064 939

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Description

[0001] The present invention relates to a false ceiling structure having a high structural simplicity, which allows for a simple installation and removal and high-quality aesthetics, since the supporting profiles remain completely hidden. It also relates to a false ceiling structure, convenient to install and in which the supporting flanges remain hidden, without resorting to specific profiles.

Background of the invention

[0002] Different systems are known for hanging false ceilings composed of plates or trays suspended with hidden, visible and semi hidden profiles. Different forms of profiles support each of the three systems.

[0003] In the system with semi hidden or hidden profiles, plates or trays are supported on the posterior or front profile and are inserted into the opposite one thus completely or partially covering the profile. For the extraction of the plate, the supported part is raised until it can be disengaged from the opposite profile, at which time the plate invades the interior zone between the profile and the ceiling, in case of meeting any obstacle like the tensioners of the hanging system of the profiles or the passage of supply or service facilities, it is necessary to remove the plate or plates adjacent to displace it (them) laterally and remove the plate in this new position.

[0004] The use of standard systems limits the size of the plates in the direction perpendicular to the profiles to the same distance between said support profiles of the plates.

[0005] There are complex mechanisms, provided with cam systems, latches, screws or magnets, to allow disengage the plate without raising it.

[0006] Ceiling structures of the type comprising a false ceiling plates, profiles provided with a bottom flange and a web so as to define two tabs for the support of two adjacent plates, the plates being provided with a supporting and positioning tabs on the sides of support plates being disengageable by a rotation which implies the vertical displacement of one side followed by a translational displacement of the plate to the disengaged from the side on which the rotation has been made, are also known.

[0007] These structures are for example disclosed in the document US5311719.

[0008] However, this solution has the drawback that the support structure must have a special configuration or its supporting length has to be limited to half the width of the beam flange wing, thus originating stability limitations.

[0009] In US5024034 a similar structure is disclosed too, but whose attachment is based on a retractable part to be manipulated by a tool, to proceed to disengage the plate. This solution fits standard profiles, but has the disadvantage that the manipulation of the retractable part is quite complicated and requires an added tool.

[0010] US 2006/06439 A1 discloses a false ceiling

structure according to the preamble of claim 1.

Description of the invention

[0011] To overcome the abovementioned limitations, the invention provides for a false ceiling structure according to claim 1.

[0012] Preferably, these parts are small plates provided with five portions perpendicular with each other and in a stepped form, the first of these portions corresponding to the supporting flange, the second to an abutting and positioning portion that leans against a portion of the profile with a vertical section, two third and fourth portions which define a space between the part and the plate and a fixation portion of the part to the plate, the height of the fourth portion being greater than the height of the vertical portion of the profile arranged under the opening and the height of the opening being greater than the height of the second portion, such that it is possible to move the plate between two positions, one wherein the supporting flange leans on the opening and the second portion abuts with the profile thereby positioning the plate and another one wherein the plate is raised until said space lies in front of the vertical portion of the profile arranged under the opening and the second portion in front of the opening in which it is possible to move laterally the plate.

[0013] More preferably, the distance between the projection of the second portion of the part over the plate and the edge of the plate corresponds to half the horizontal width of the supporting profile.

[0014] Advantageously, the supporting profiles are U-inverted profiles.

[0015] More advantageously, the structure comprises bridles for hanging it on the supporting profiles.

[0016] Finally, the fixation portion is attached to the plate by a staple or an equivalent fixation element.

Brief description of the drawings

[0017] For a better understanding of what has been disclosed some drawings are attached in which, schematically and solely by way of non-limiting example, practical cases of embodiment are shown. Figures 1 to 6 show embodiments according to the invention, while Figure 7 to 19 show embodiments not forming part of the claimed invention.

Figure 1 is a schematic section showing the process of dismounting a plate of a structure according to the invention.

Figure 2 is a perspective view in which the main components of the structure are shown.

Figure 3 is a detail of the supporting plate according to a preferred embodiment provided with a sixth fixation portion on the edge of the plate.

Figure 4 is a perspective view illustrating a detail of the supporting part, illustrating its attachment to the plate by a staple and the profile provided with open-

ings for the part.

Figure 5 shows schematically an alternative supporting part 3 in which the positioning element comprises two protrusions between which the bottom edge of the profile opening is fitted.

Figure 6 is a section showing an embodiment in which the plate has a width greater than the distance between two supporting profiles, and which is provided with supporting parts on the intermediate profiles.

Figure 7 shows an embodiment which employs a square profile and on top of which the supporting parts rests.

Figure 8 is a schematic section which shows the main components of the invention according to another embodiment, in which the plate is placed.

Figure 9 is a schematic section similar to figure 8 in which the plate has been disengaged.

Figure 10 is a detail of the supporting part of the plate in the retractable flange side.

Figure 11 is similar to Figure 10 but in which the flange is retracted.

Figures 12 to 14 show three steps of placement of a metal plate provided with internal rods.

Figure 15 shows the arrangement of the rods in the metal plate.

Figures 16 to 18 show three steps of placing a plaster plate provided with inner rods.

Figure 19 shows the arrangement of the rods in the plaster plate.

Description of preferred embodiments

[0018] The invention relates to a false ceiling structure, comprising false ceiling plates 1, profiles 2 for supporting said plates 1 for supporting two adjacent plates 1, parts 3 for supporting the plates 1 joined thereto and provided with a supporting flange 31.

[0019] The invention is characterised in that said parts 3 comprise at least a positioning element of the supporting flange 31 in respect to the profile 2, and the part 3 being configured to allow the simultaneous displacement:

- of said flange 31 over the bearing region on the profile 2 and;
- of the plate 1 in the space V lying between the adjacent plate 1' and the supporting profile 2;

when the part 3 and the plate 1 are moved upwards, such that it is possible to disengage the supporting part 3' of the supporting profile 2' in the side opposite of the plate 1 and then rotate the plate 1 for removing it.

[0020] The supporting profile 2 is provided with at least two portions 11, 12 with a vertical section provided with openings 13 over which said supporting flanges 31 are supported.

[0021] A structure as described can be done in many

ways, although an embodiment in which these parts 3 are plates provided with five portions 31, 32, 33, 34, 35 perpendicular with each other and in a stepped form, as shown in figures 3 and 4, is preferred.

[0022] The first portion 31 corresponds to the supporting flange. The second one 32 corresponds to an abutting and positioning portion that leans against a portion 11 with a vertical section of the profile 2. The two portions third and fourth 33, 34 define a space between the part 3 and the plate 1. Finally the fifth one 35 is a fixation portion of the part 3 to the plate 1.

[0023] In this embodiment, for the invention to have an effect it is necessary that the height of the fourth portion 34 is greater than the height of the vertical portion of the profile arranged under the opening 13 and the height of the opening greater than the height of the second portion, such that it is possible to move the plate between two positions, one wherein the supporting flange leans on the opening and the second portion abuts with the profile thereby positioning the plate and another one wherein the plate is raised until said space lies in front of the vertical portion of the profile arranged under the opening 13 and the second portion in front of the opening 13 in which it is possible to move laterally the plate 1, displacement shown by the arrow B of figure 1.

[0024] The distance between the projection of the second portion 32 of the part 3 over the plate 1 and the edge of the plate 1 corresponds to half the horizontal width of the supporting profile 2, such that by the opposite side of the profile a plate identical will lie adjacent to the first plate.

[0025] For this purpose, the supporting profiles 2 are preferably U-inverted profiles.

[0026] As in other known structures, bridles 4 are provided for hanging it on the supporting profiles 2. If necessary, it is possible to directly fix the supporting profiles 2 to the ceiling as shown in figure 1.

[0027] There are several ways of attaching the parts to the plate, two of which are illustrated in Figures 3 y 4. In the first case the attachment is carried out in the edge of the plate 1 and in the second by means of a staple 5. It is possible to use screws, rivets, nuts recessed, welding, adhesives etc, as well.

[0028] In the embodiment described with reference to the drawings a supporting part 3 provided with five or six bent portions is described. This is an economical and reliable solution.

[0029] However, it will be apparent to one skilled in the art that other solutions are possible without departing from the scope of the first appended claim.

[0030] Specifically, the supporting portion in the profile 2 could be provided with a central engagement portion in the edge of the opening of the profile, for example by means of an inlaying. In this case the supporting part 3 could require to be made of only three portions, though with dimensions selected to allow the claimed displacement abilities, for example as schematically shown in figure 5.

[0031] Another solution, not forming part of the claimed invention, might be, as seen in Figure 7, to use a square profile on which the supporting part rests, solution also encompassed by the present invention.

[0032] On the other hand, the skilled person will appreciate that in this preferred embodiment it is required that the supporting profiles are disposed with the openings for supporting the flanges facing each other, and therefore positioning profiles are provided for fixing with each other adjacent supporting profiles 2, which can be arranged diagonally as struts.

[0033] Figure 6 shows an embodiment in which the plate has dimensions greater than the distance between two adjacent supporting profiles 2, but in which supporting parts in the intermediate profiles are provided. In this case, it is also possible to remove the plate according to the present invention.

[0034] As can be seen in Figures 8 to 10, the embodiment relates to a false ceiling structure, comprising plates 1' of a false ceiling, profiles 2' provided with a lower flange 3' and a web 4' such that two flanges are defined 41', 42' for supporting two adjacent plates 1', the plates being 1' provided with supporting and positioning flanges 5', 6' in the supporting sides, the plates being 1' disengageable by a rotation involving the vertical displacement of one of the sides then followed by a translation displacement of the plate 1' for disengagement of the side on which the rotation has been done.

[0035] These features being known, the embodiment is characterized in that the supporting and positioning flanges 5' of one of the sides are fixed in respect to the plate, and the flanges 6' of the opposite side are retractable, retracting the retractable flanges 6' in the movement of translation displacement.

[0036] Therefore, as can be seen in any of the two variants illustrated in the figures, for example in Figures 12 to 14, it is possible to disengage the plates without having to access the flange, simply by a means of a vertical movement of the left side of the plate, a permitted translation, since the flange is retractable, this translation allowing to release the engaged right end, after which the plate may be removed. The mounting would be to perform these actions in reverse order. Figures 16 to 18 describe the same process, but in the case of a plaster plate.

[0037] As illustrated in Figures 8 to 11, a first alternative would be that the supporting retractable flanges 6' comprise a resilient plastic member 7', such that these flanges 6' are retracted when pressing the web of the profile 4'.

[0038] According to another embodiment, the plates 1' comprise a retractable element 8' in the engagement region in the side opposite the plate 1', the retractable member being mechanically linked 8' of the engagement region with the retractable flange 6' such that the sliding of the retractable member end 8' in the plate 1' causes a sliding of the same length of the retractable flange 6'. Therefore, this embodiment omits the use of a spring, but uses a mechanical link between both sides of the

plate.

[0039] In this second variant, the retractable element 8' is a rod 9' attached to the retractable flange 6', as illustrated in the plan views of the 8' and 12'.

[0040] Finally, as illustrated for example in Figures 14 and 18, the inferior portion of the plates 1' has a width in the separation direction of the supporting profiles which is the same to the distance between consecutive profiles. As illustrated in Figures 1' and 2', it is also possible that said width is a multiple of the distance between the profiles, so that a single plate 1' can cover large areas.

[0041] Although reference has been made to specific embodiments of the invention, it is apparent to one skilled in the art that the false ceiling structure as described is susceptible to numerous variations and modifications, and that all the details mentioned can be replaced by other technically equivalent, without departing from the scope of protection defined by the appended claims.

[0042] Therefore the inventive structure solutions overcomes the prior art because it eliminates mechanisms, facilitates the extraction of the plates from the profiles, and in this system, all the plates are accessible in all the assemblies, which in turn, allows the mounting of plates which distance is greater than the distance between the profiles in any direction.

Claims

30 1. False ceiling structure, comprising false ceiling plates (1), profiles (2) for supporting said plates (1) for supporting two adjacent plates (1), parts (3) for supporting the plates (1) joined thereto and provided with a supporting flange (31), wherein said parts (3) comprise at least a positioning element of the supporting flange (31) in respect to the profile (2), and the part (3) being configured to allow the simultaneous displacement:

40 - of said flange (31) over the bearing region on the profile (2) and;
- of the plate (1) in the space (V) lying between the adjacent plate (1') and the supporting profile (2);

45 when the part (3) and the plate (1) are moved upwards, such that it is possible to disengage the supporting part (3') of the supporting profile (2') in the side opposite the plate (1) and then rotate the plate (1) for removing it.

50 **characterized in that** the supporting profile (2) is provided with at least two portions (11, 12) with a vertical section provided with openings (13) over which said supporting flanges (31) are supported.

55 2. Structure according to the previous claim, wherein said parts (3) are plates provided with five portions (31, 32, 33, 34, 35) perpendicular with each other

- and in a stepped form, the first of these portions (31) corresponding to the supporting flange, the second (32) to an abutting and positioning portion that leans against a portion (11) with a vertical section of the profile (2), two portions third and fourth (33, 34) which define a space between the part (3) and the plate (1) and a fixation portion (35) of the part (3) to the plate (1), the height of the fourth portion being (34) greater than the height of the vertical portion of the profile arranged under the opening (13) and the height of the opening greater than the height of the second portion, such that it is possible to move the plate between two positions, one wherein the supporting flange leans on the opening and the second portion abuts with the profile thereby positioning the plate and another one wherein the plate is raised until said space lies in front of the vertical portion of the profile arranged under the opening (13) and the second portion in front of the opening (13) in which it is possible to move laterally the plate (1). 5
3. Structure according to the previous claim, wherein the distance between the projection of the second portion (32) of the part (3) over the plate (1) and the edge of the plate (1) corresponds to half the horizontal width of the supporting profile (2). 10
4. Structure according to any of the previous claims, in which the supporting profiles (2) are U-inverted profiles. 15
5. Structure according to any of the previous claims, comprising bridles (4) for hanging it on the supporting profiles (2). 20
6. Structure according to any of the previous claims, wherein the fixation portion is attached to the plate by a staple (5). 25
7. Structure according to any of the previous claims, wherein the length of the plate is a multiple of the distance between adjacent supporting profiles, the plate being provided with intermediate supporting parts. 30
8. - dem Flansch (31) über die Lagerregion auf dem Profil (2) und;
- der Platte (1) in dem Zwischenraum (V), der zwischen der benachbarten Platte (1') und dem Trageprofil (2) liegt;
- wenn das Teil (3) und die Platte (1) nach oben bewegt werden, so dass es möglich ist, das Trageteil (3') des Trageprofils (2') in der Seite gegenüber der Platte (1) außer Eingriff zu bringen und dann die Platte (1) zu drehen, um dieselbe zu entfernen; **dadurch gekennzeichnet, dass** das Trageprofil (2) mit zumindest zwei Abschnitten (11, 12) versehen ist, mit einem vertikalen Bereich, der mit Öffnungen (13) versehen ist, über denen die Trageflansche (31) getragen werden.
2. Struktur gemäß dem vorhergehenden Anspruch, bei der die Teile (3) Platten sind, die mit fünf Abschnitten (31, 32, 33, 34, 35) senkrecht zueinander und in einer gestuften Form versehen sind, wobei der erste dieser Abschnitte (31) dem Trageflansch entspricht, der zweite (32) einem Anstoß- und Positionierungsabschnitt, der gegen einen Abschnitt (11) mit einem vertikalen Bereich des Profils (2) lehnt, zwei Abschnitten, dritter und vierter (33, 34), die einen Zwischenraum zwischen dem Teil (3) und der Platte (1) definieren, und einem Befestigungsabschnitt (35) des Teils (3) an der Platte (1), wobei die Höhe des vierten Abschnitts (34) größer ist als die Höhe des vertikalen Abschnitts des Profils, der unter der Öffnung (13) angeordnet ist, und die Höhe der Öffnung größer ist als die Höhe des zweiten Abschnitts, so dass es möglich ist, die Platte zwischen zwei Positionen zu bewegen, einer, bei der sich der Trageflansch auf die Öffnung stützt und der zweite Abschnitt mit dem Profil anstößt, wodurch die Platte positioniert wird, und einer anderen, bei der die Platte angehoben wird bis der Zwischenraum vor dem vertikalen Abschnitt des Profils liegt, der unter der Öffnung (13) angeordnet ist, und der zweite Abschnitt vor der Öffnung (13), in der es möglich ist, die Platte (1) seitlich zu bewegen. 35
- 45 3. Struktur gemäß dem vorhergehenden Anspruch, bei der der Abstand zwischen dem Vorsprung des zweiten Abschnitts (32) des Teils (3) über der Platte (1) und der Kante der Platte (1) der Hälfte der horizontalen Breite des Trageprofils (2) entspricht.
4. Struktur gemäß einem der vorhergehenden Ansprüche, bei der die Trageprofile (2) U-invertierte Profile sind. 50
- 55 5. Struktur gemäß einem der vorhergehenden Ansprüche, die Verbindungsstangen (4) zum Hängen derselben an die Trageprofile (2) aufweist.

Patentansprüche

1. Zwischendeckenstruktur, die folgende Merkmale umfasst: Zwischendeckenplatten (1), Profile (2) zum Tragen der Platten (1) zum Tragen zweier benachbarter Platten (1), Teile (3) zum Tragen der Platten (1), die mit denselben verbunden sind und mit einem Trageflansch (31) versehen sind, wobei die Teile (3) zumindest ein Positionierungselement des Trageflansches (31) bezüglich des Profils (2) aufweisen, und das Teile (3) konfiguriert ist, um die gleichzeitige Verschiebung zu ermöglichen von:

6. Struktur gemäß einem der vorhergehenden Ansprüche, bei der der Befestigungsabschnitt durch eine Klammer (5) an der Platte angebracht ist.
7. Struktur gemäß einem der vorhergehenden Ansprüche, bei der die Länge der Platte ein Mehrfaches des Abstands zwischen benachbarten Trageprofilen ist, wobei die Platte mit Zwischenträgerseilen versehen ist.
- 5
- 10

Revendications

1. Structure de faux plafond, comprenant des plaques de faux plafond (1), des profilés (2) pour supporter lesdites plaques (1) pour supporter deux plaques adjacentes (1), des pièces (3) pour supporter les plaques (1) jointes à ceux-ci et pourvues d'une bride de support (31), dans laquelle lesdites pièces (3) comprennent au moins un élément de positionnement de la bride de support (31) par rapport au profilé (2), et la pièce (3) étant configurée de manière à permettre le déplacement simultané:

- de ladite bride (31) sur la région d'appui sur le profilé (2); et
- de la plaque (1) dans l'espace (V) s'étendant entre la plaque adjacente (1') et le profilé de support (2),

lorsque la pièce (3) et la plaque (1) sont déplacées vers le haut, de telle sorte qu'il soit possible de désengager la pièce de support (3') du profilé de support (2') dans le côté opposé à la plaque (1) et de faire tourner ensuite la plaque (1) afin d'enlever celle-ci,

caractérisée en ce que le profilé de support (2) est pourvu d'au moins deux portions (11, 12) avec une section verticale comportant des ouvertures (13) au-dessus desquelles lesdites brides de support (31) sont supportées.

2. Structure selon la revendication précédente, dans laquelle lesdites pièces (3) sont des plaques pourvues de cinq parties (31, 32, 33, 34, 35) perpendiculaires les unes aux autres et sous une forme échelonnée, la première de ces parties (31) correspondant à la bride de support, la deuxième (32) à une partie de butée et de positionnement qui s'appuie contre une partie (11) avec une section verticale du profilé (2), deux parties, les troisième et quatrième (33, 34) qui définissent un espace entre la pièce (3) et la plaque (1), et une partie de fixation (35) de la pièce (3) à la plaque (1), la hauteur de la quatrième partie (34) étant plus grande que la hauteur de la partie verticale du profilé agencée en dessous de l'ouverture (13), et la hauteur de l'ouverture étant plus grande que la hauteur de la deuxième partie,

de telle sorte qu'il soit possible de déplacer la plaque entre deux positions, une dans laquelle la bride de support s'appuie sur l'ouverture et où la deuxième partie bute contre le profilé, positionnant de ce fait la plaque, et une autre dans laquelle la plaque est élevée jusqu'à ce que ledit espace se trouve en face de la partie verticale du profilé agencée en dessous de l'ouverture (13) et que la deuxième partie se trouve en face de l'ouverture (13), dans laquelle il est possible de déplacer la plaque (1) latéralement.

3. Structure selon la revendication précédente, dans laquelle la distance entre la projection de la deuxième partie (32) de la pièce (3) sur la plaque (1) et le bord de la plaque (1) correspond à la moitié de la largeur horizontale du profilé de support (2).
4. Structure selon l'une quelconque des revendications précédentes, dans laquelle les profilés de support (2) sont des profilés en forme de U inversé.
5. Structure selon l'une quelconque des revendications précédentes, comprenant des suspentes (4) afin de suspendre celle-ci aux profilés de support (2).
6. Structure selon l'une quelconque des revendications précédentes, dans laquelle la partie de fixation est attachée à la plaque par une agrafe (5).
7. Structure selon l'une quelconque des revendications précédentes, dans laquelle la longueur de la plaque est un multiple de la distance entre des profilés de support adjacents, la plaque étant pourvue de pièces de support intermédiaires.

Fig. 1

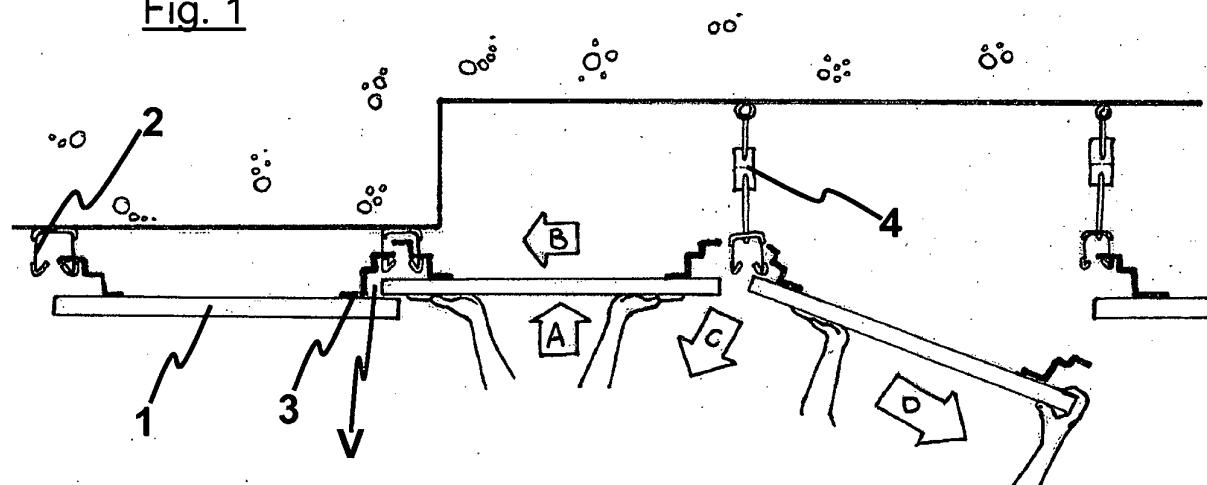


Fig. 2

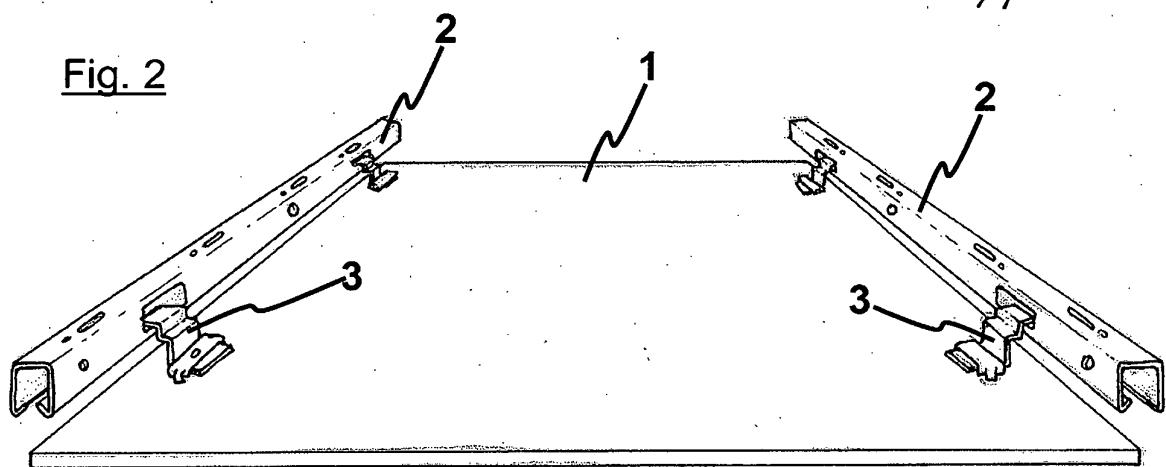


Fig. 6

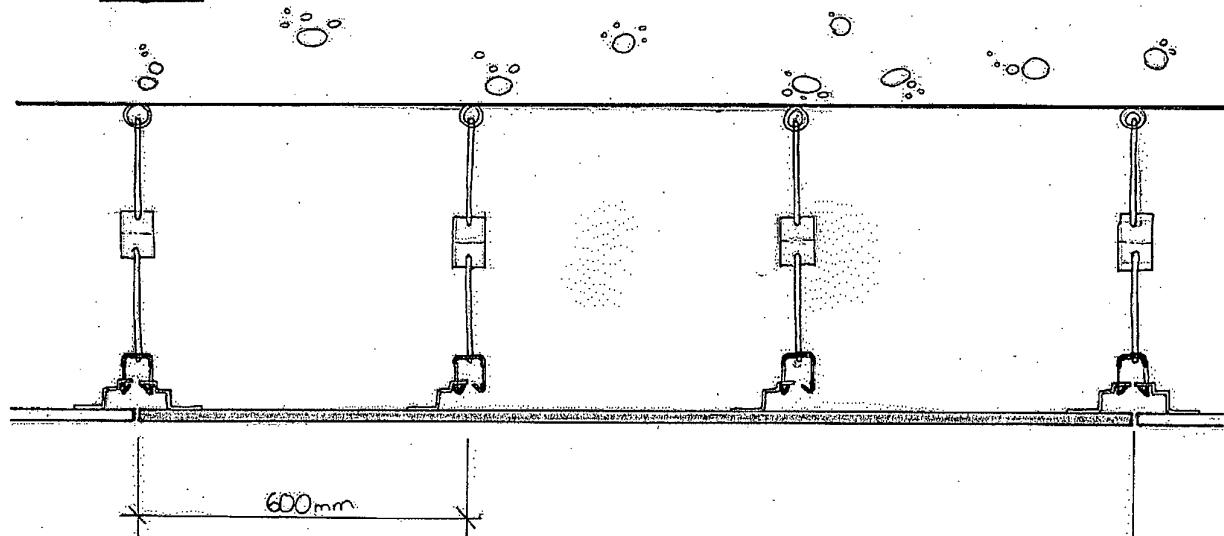


Fig. 3

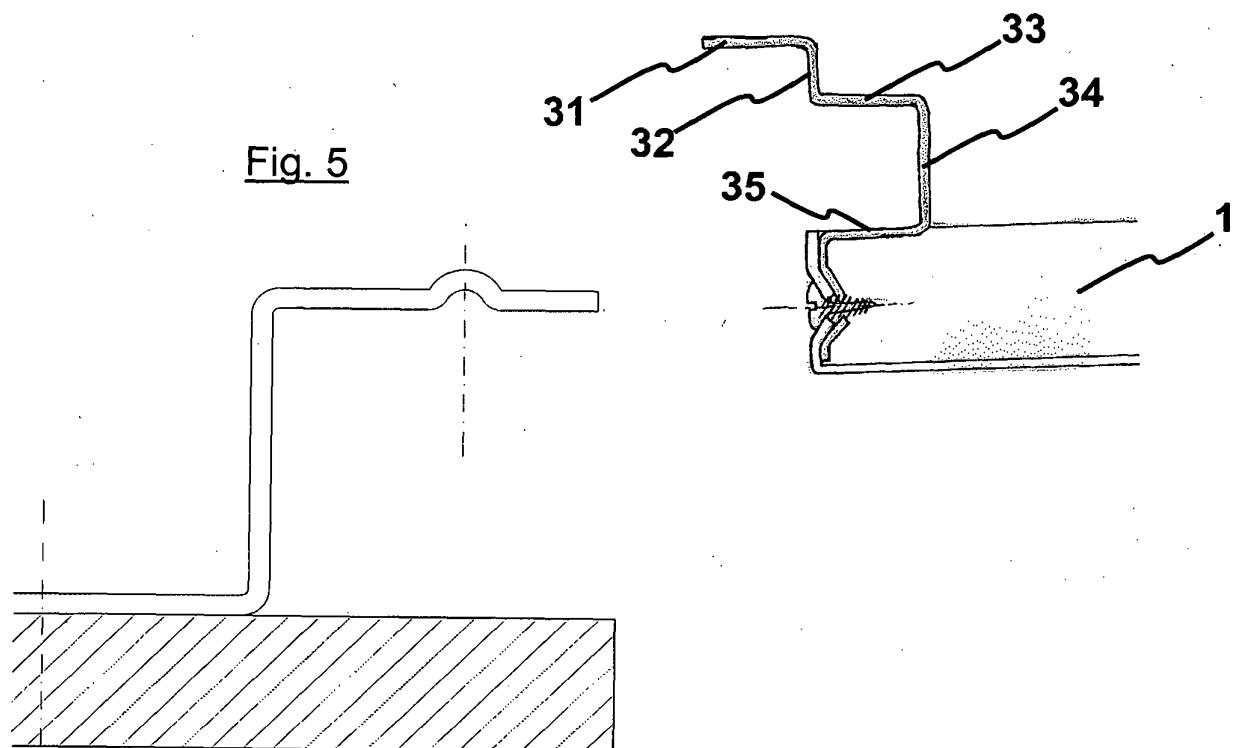


Fig. 5

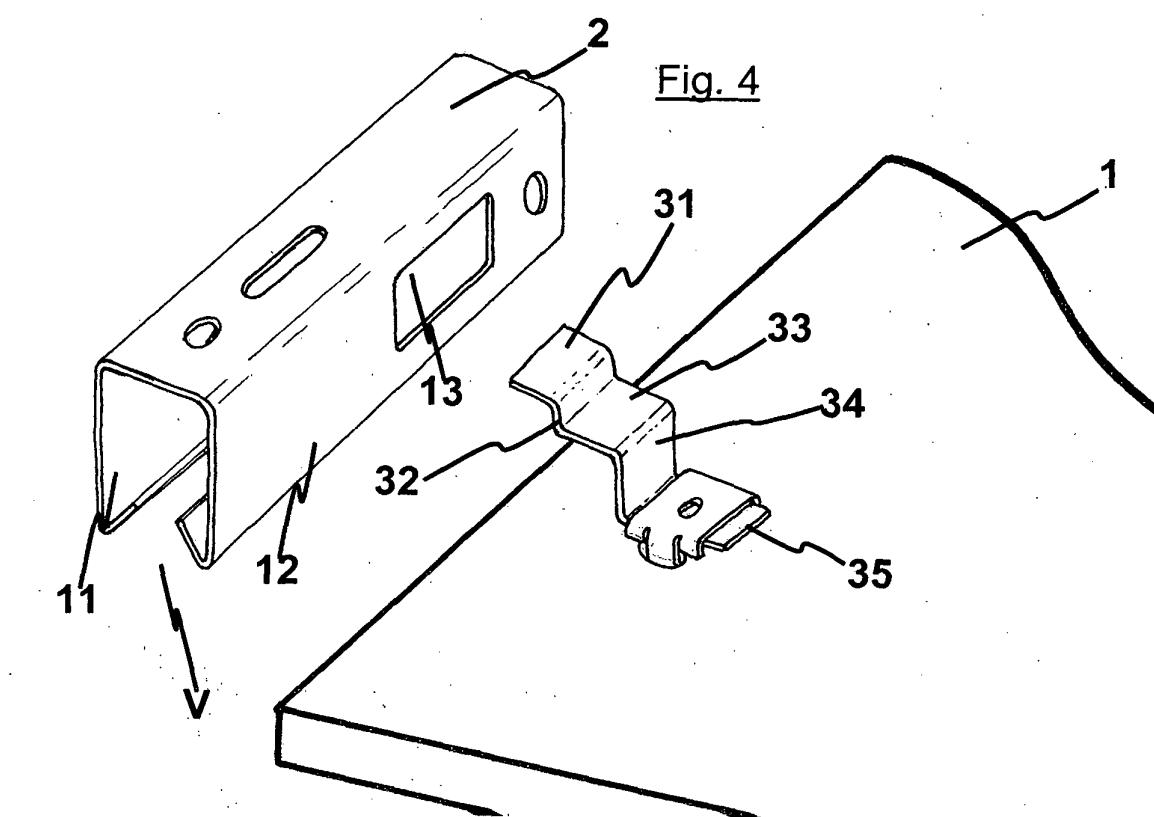
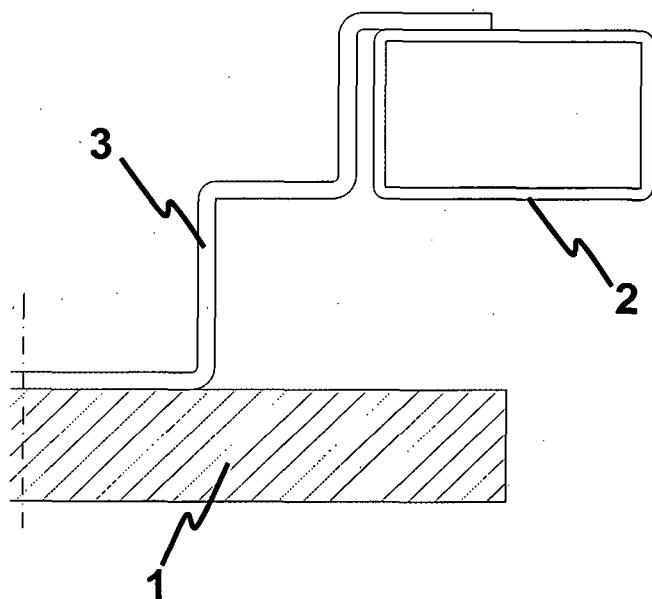
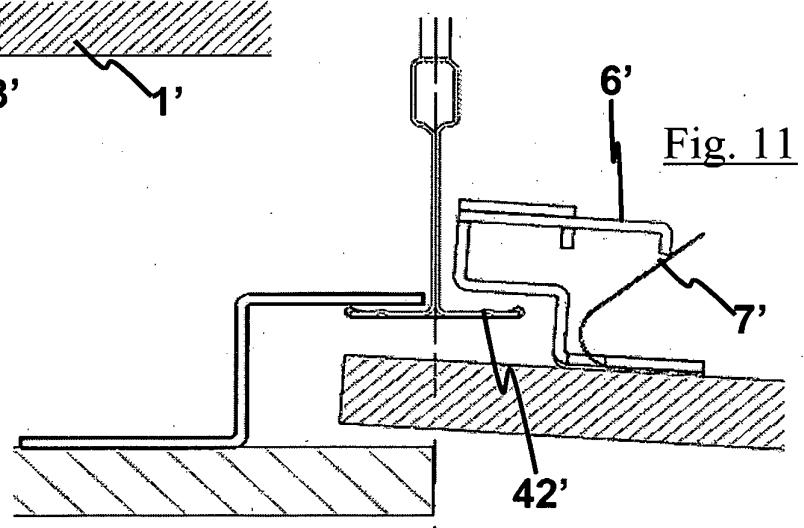
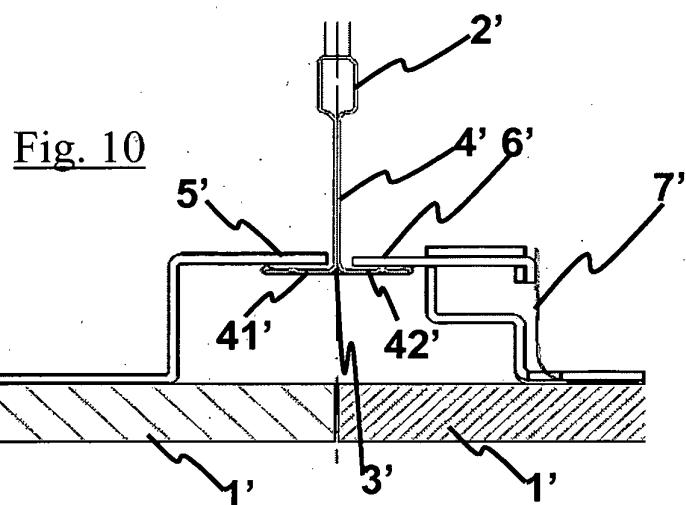
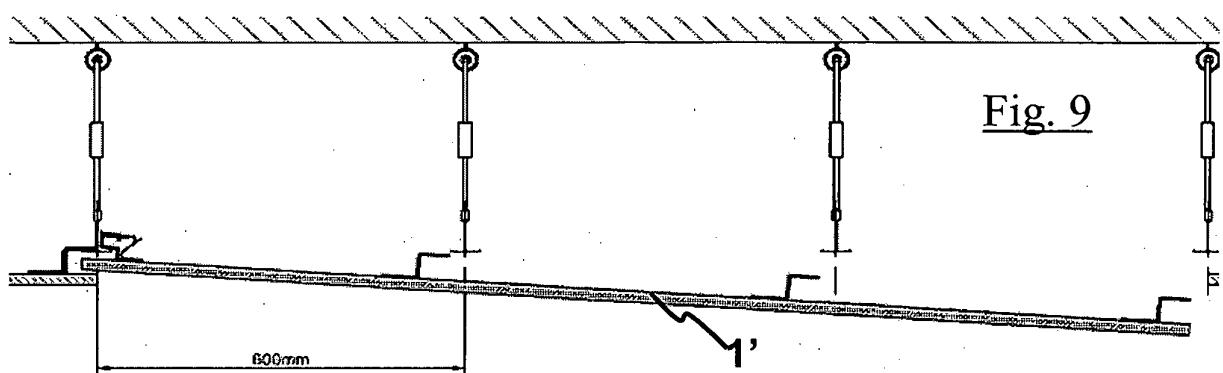
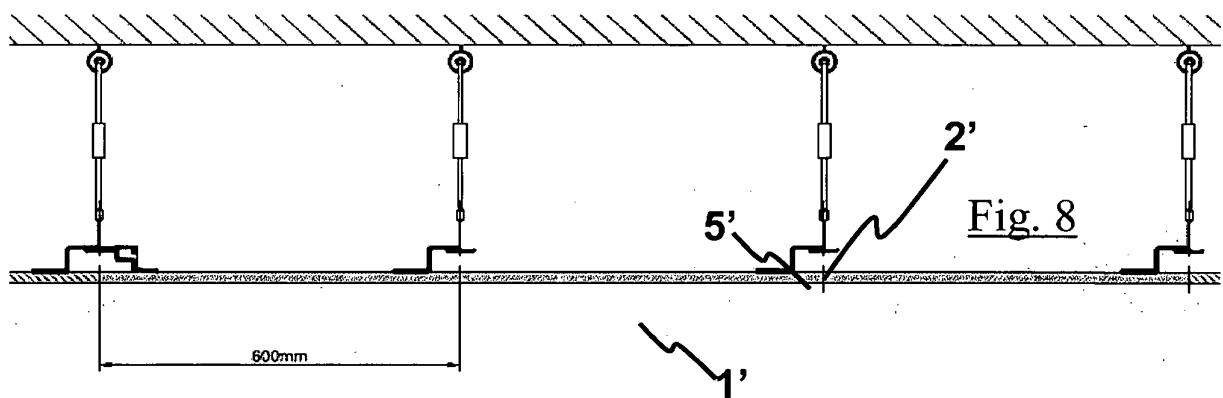


Fig. 4

Fig. 7





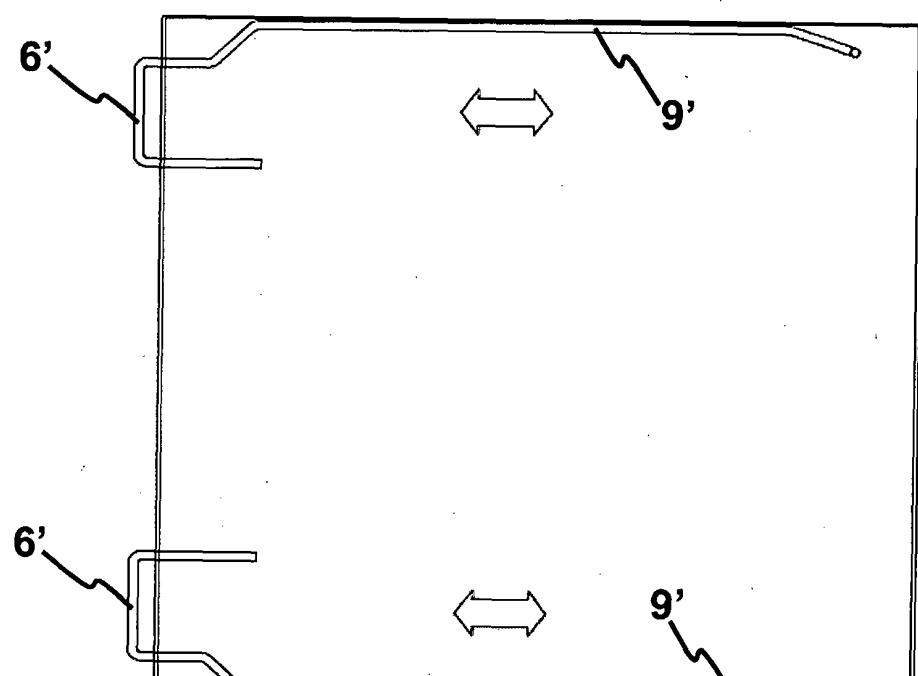
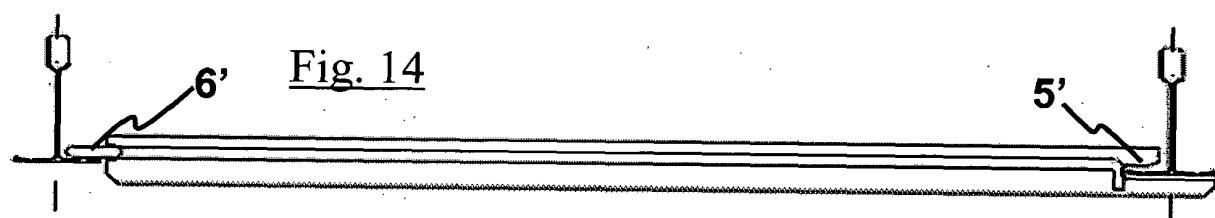
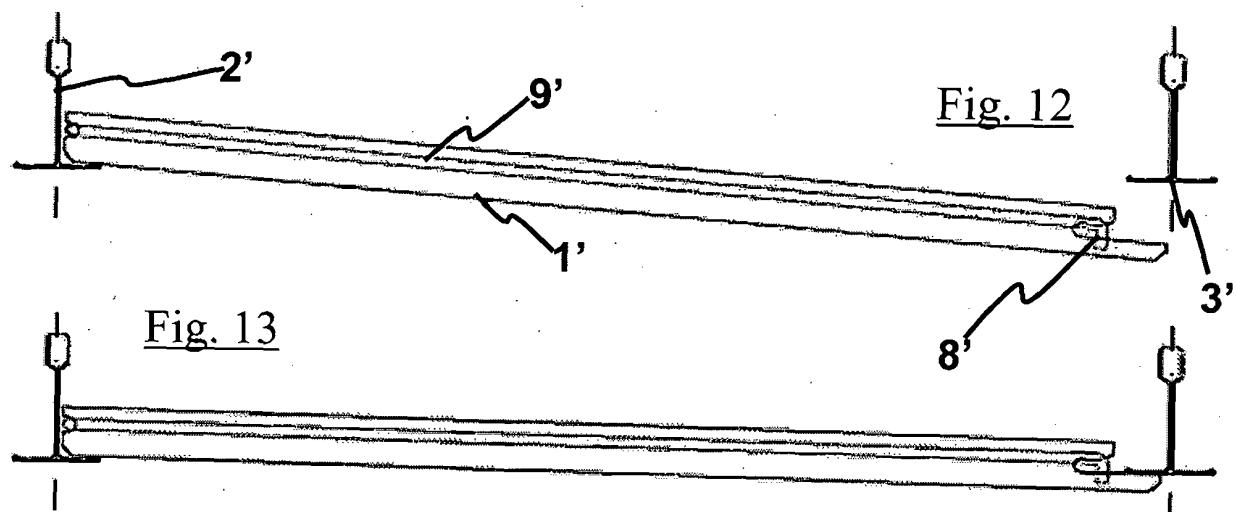


Fig. 15

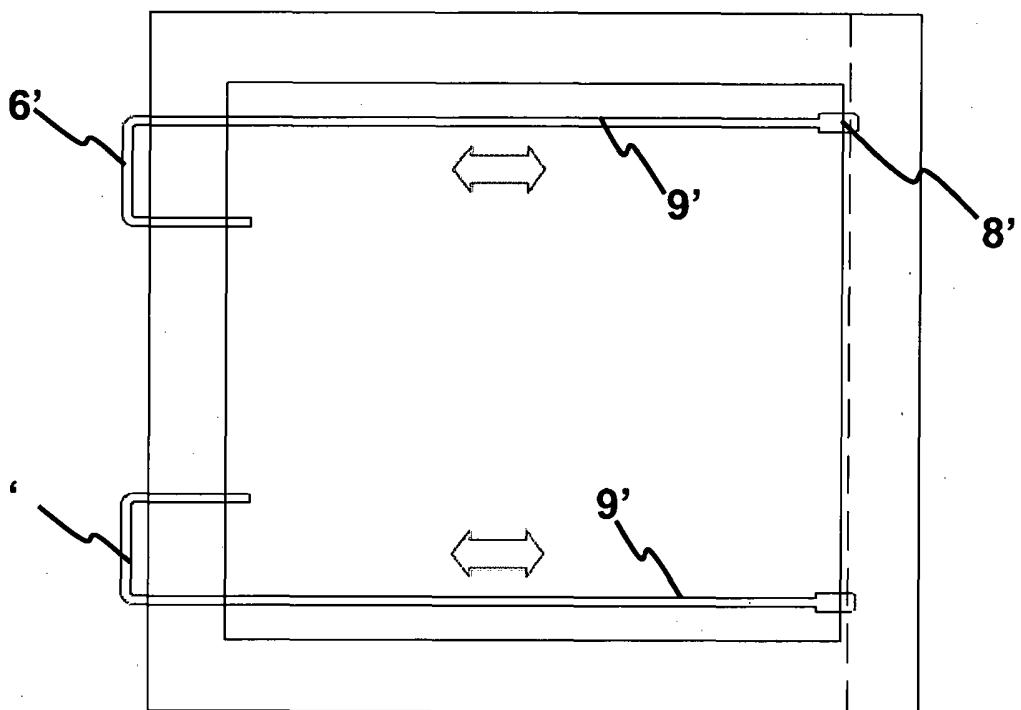
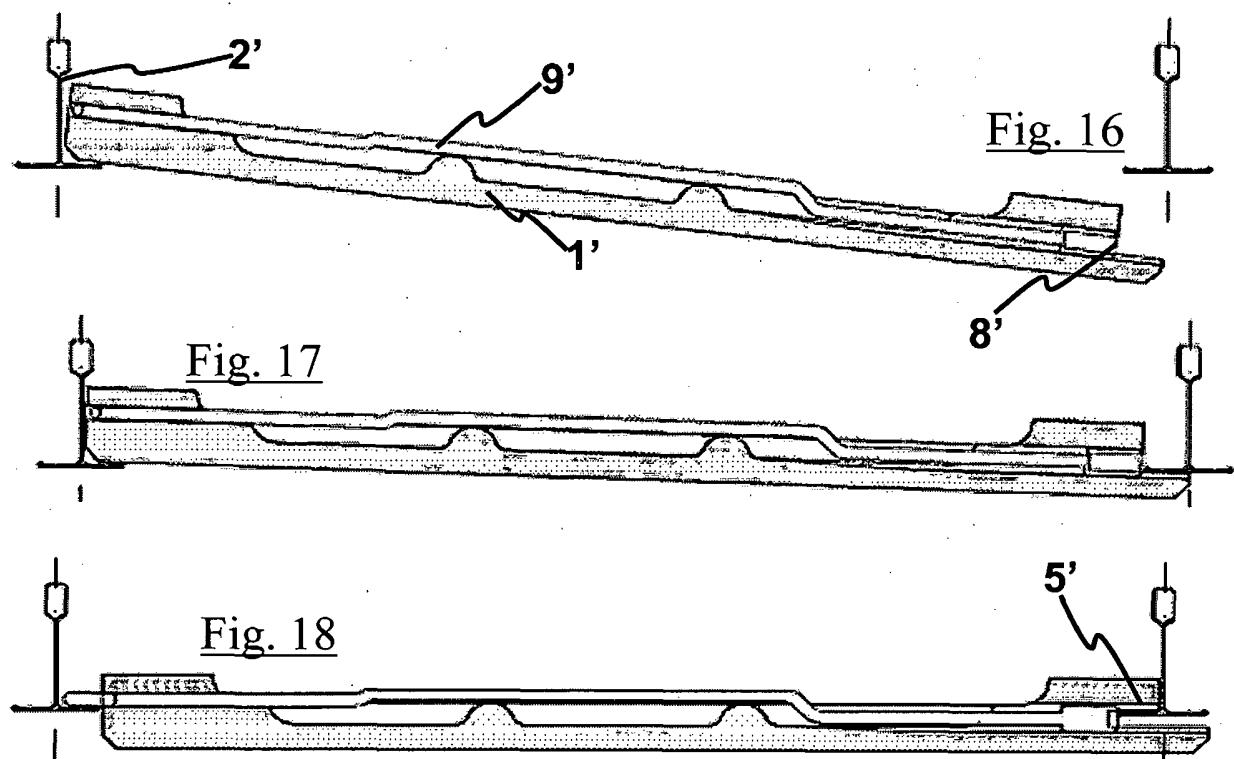


Fig. 19

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5311719 A [0007]
- US 5024034 A [0009]
- US 200606439 A1 [0010]