(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 374 955 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
15.01.2014 Bulletin 2014/03

(51) Int Cl.:
E04B 9/12 *(2006.01)*

(21) Application number: **11160689.3**

(22) Date of filing: **31.03.2011**

(54) **Profiled bar for frames and corresponding frame**

Profilstange für Rahmen und entsprechender Rahmen

Barre profilée pour cadres et cadre correspondant

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **06.04.2010 IT PD20100109**

(43) Date of publication of application:
12.10.2011 Bulletin 2011/41

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Printed by Jouve, 75001 PARIS (FR)

Description

Field of application

[0001] The present invention relates to a profiled bar for frames, and a relative frame.

[0002] The profiled bar according to the invention is used in particular to make frames to support false ceilings. State of the art

[0003] It is known of in the art to make frames for false ceilings comprising a plurality of profiled bars mechanically coupled to each other.

[0004] The profiled bars of the prior art have a "T" profile comprising a central rib, a plate perpendicular to the central rib, and attachment elements positioned on the lateral ends of the rib. One or more shaped apertures are made on the central rib.

[0005] The frames are assembled by mechanically engaging the attachment elements of one profiled bar in the apertures made on the central rib of other profiled bars so as to form a reticular structure. Such reticular structure is generally suspended, for example by steel cables or tie-rods, to the ceiling. Panels, slats or other elements needed to form the false ceiling are laid on the wings defined by the plate of the "T" profiled bar, facing downwards.

[0006] Generally, the attachment elements comprise flexible tongues, which project from the longitudinal ends of the profiled bars to engage in the aforesaid apertures. Each tongue is provided with a central tooth, destined to engage the rib of the profiled bar for holding it once the attachment element has been inserted into the said aperture after elastic bending of the tongue.

[0007] Profiled bars with attachment elements of this type are described, for example, in the international patent applications WO 2004/042162 A1 e WO 2006/100068 A1.

[0008] The solutions of profiled bars for frames described above, despite being efficient, do not however permit an adequate mechanical distribution of the stresses in the points of reciprocal connection. The connection of the profiled bars is in fact entrusted substantially to a single retention tooth which, in addition, presses in the centreline area of the rib, that is the mechanically the weakest point of the profiled bar itself.

[0009] US2004/0159064 discloses a profiled bar having a flexible tongue for engaging a coupling aperture in the rib of another bar. The tongue has an end portion of reduced size in order to engage a seat made in the coupling aperture.

Presentation of the invention

[0010] Consequently, the purpose of the present invention is to overcome the drawbacks of the prior art mentioned above, by making available a profiled bar which offers a more resistant and safer mechanical connection.

[0011] A further purpose of the present invention is to make available a profiled bar which is simple and economical to produce.

Brief description of the drawings

[0012] The technical characteristics of the invention, according to the aforesaid purposes, are clearly evident from the claims below and the advantages of the same will be clearer from the following description made with reference to the appended drawings, showing one or more embodiments by way of non-limiting examples, wherein:

[0013] figure 1 shows a side view of a profiled bar according to one embodiment of the present invention;

[0014] figure 2 shows a side view of the profiled bar in figure 1, from the side of the arrow II in figure 1;

[0015] figure 3 shows a cross-section view of the profiled bar in figure 1, along the section plane III-III in figure 2;

[0016] figure 4 shows a view of a frame comprising profiled bars according to the present invention;

[0017] figure 5 shows a cross-section of the frame in figure 4, along the section plane V-V in figure 4;

[0018] figure 6 shows a cross-section view of the frame in figure 4, along the section plane VI-VI in figure 4;

[0019] figure 7 shows a perspective view of the profiled bar illustrated in figure 1;

[0020] figure 8 shows a perspective view of three profiled bars according to the invention in an assembly position. Detailed description

[0021] The elements or parts of elements common to the embodiments described below will be indicated using the same reference numerals.

[0022] With reference to the aforesaid figures, reference numeral 4,4',4" globally denotes a profiled bar, in particular for frames 8, having a main longitudinal extension X-X from a first to a second end 12,16.

[0023] The profiled bar 4 has, on at least one of said ends 12, 16, an attachment element 20 suitable for engaging with a further profiled bar 4' or 4".

[0024] The profiled bar 4 comprises a rib 24 and a plate 28 positioned perpendicular to the rib 24 so as to form together a "T" section.

[0025] Preferably the rib 24 comprises a longitudinal stiffening element 42 positioned on the side opposite the plate 28.

[0026] As illustrated in particular in Figure 1, the profiled bar 4 may be made from a single sheet by bending and shaping. The sheet defines the longitudinal stiffening element 42 as a box-like body and extends then in two distinct flat portions alongside each other to form the central rib 24. The two flat portions end with two orthogonal appendages, coplanar to each other and connected by a small connection plate, so as to define the plate 28.

[0027] The rib 24 comprises at least one coupling aperture 36, shaped to house said attachment element 20 in a holding relationship and positioned between said first

and second ends 12, 16.

[0028] The attachment element 20 comprises a fixing base 40 to the rib 24 which projects at least partially from the profiled bar 4 with a free end 44, and a tongue 48 flexibly elastic and coupled to the fixing base 40.

[0029] For example, the fixing base 40 is attached to the rib by riveting, welding, gluing and/or threaded coupling devices.

[0030] As may be seen in particular in Figures 1 and 2, the fixing base 40 is connected to the central rib 24 in a specially lowered area which acts as attachment seat. In particular, such lowered area may be obtained by removing a corresponding portion from one of the two flat neighbouring portions which define the rib of the profiled bar.

[0031] Alternatively, the fixing base may be made in one piece with the rib of the profiled bar.

[0032] The tongue 48 is bent towards the fixing base 40, at said free end 44 so as to form an angle of incidence with the fixing base 40.

[0033] The tongue 48 is provided with a pair of recesses 51, 52 which define an attachment head 50. The coupling aperture 36 in turn defines a first pair of projections 31, 32 suitable for engaging with the aforesaid recesses 51, 52 to hold the attachment head 50 to the rib 24. Such projections 31, 32 are positioned in opposite positions to a longitudinal centreline plane L-L of the rib 24.

[0034] In particular, as shown in Figure 6, the first pair of projections 31, 32 define inside the coupling aperture 36 a first groove 38 having a width substantially equivalent to the width of the necking defined on the flexible tongue 48 by the aforesaid two recesses 51, 52. Operatively, as will be described further below, when the attachment element is inserted into the coupling aperture, the tongue engages the coupling aperture with the necking positioned inside the aforesaid first groove 38.

[0035] Preferably, the projections 31, 32 are positioned in symmetrical positions to the aforesaid longitudinal centreline plane L-L of the rib 24.

[0036] According to one embodiment, the coupling aperture 28 has a first pair of guides 60 positioned on opposite sides to the aforesaid longitudinal centre line plane L-L of the rib 24, and said attachment element 20 has a first pair of tabs 64 jutting out from the fixing base 40. The guides 60 cooperates slidaby in conjunction with the tabs 64 to guide the coupling of the attachment element 20 inside the coupling aperture 36.

[0037] Operatively, the free end 44 of the fixing base 40 is inserted inside the coupling aperture with the tabs 64 which engage the pair of guides 60 so as to slide. Gradually, as the free end 44 penetrates inside the aperture, the flexible tongue 48 is progressively pushed by the rib 24 against the fixing base, until the attachment head 50 has completely traversed the rib 24 and the two projections 31, 32 have engaged the two recesses 51, 52. At this point, the necking area engages in the first groove 58 with the tongue which snaps back into the uncompressed condition, keeping the attachment head 50 pressed onto the rib 24.

[0038] Thanks to the invention, unlike the solutions of the prior art considered, as may be observed in Figure 4 the connection between the profiled bars is not located in a single point but two separate and distanced holding points are provided, corresponding to the two projections, thereby enabling an improved distribution of the mechanical stresses.

[0039] Moreover, again thanks to the invention, the attachment element does not press in the centre line area of the rib (i.e. in the weakest point of the profiled bar), but rather presses on two portions of the rib distanced from the centreline area and therefore positioned respectively beside the plate 28 and the longitudinal stiffening element 42 (i.e. in the strongest and most rigid points of the profiled bar).

[0040] According to a further embodiment, illustrated in particular in Figure 6, the coupling aperture 36 defines at least a second pair of projections 33, 34, opposite the first pair of projections 31, 32 in relation to a centre line plane M-M of the aperture, orthogonal to the main longitudinal extension X-X of the profiled bar, to enable the contemporary holding of two attachment elements 20 of two separate profiled bars 4', 4".

[0041] Advantageously, the coupling aperture 36 has a second pair of guides 72 positioned on opposite sides in relation to the longitudinal centre line plane L-L of the rib 24, to permit the guided coupling of two attachment elements 20 of two separate profiled bars 4', 4".

[0042] Preferably, as illustrated in Figure 6, the centreline plane M-M is also a plane of symmetry for the coupling aperture 36.

[0043] According to a preferred embodiment, illustrated in detail in Figure 6, the coupling aperture 36 has a symmetrical profile to the centreline plane M-M and has a specular groove 58, which is made astride the longitudinal centreline plane L-L of the rib and is defined by two steps corresponding to the aforesaid two projections 31, 32 and 33, 34. Laterally to each projection a seat is made corresponding to one of the aforesaid guides 60, 72. Such seat is respectively defined by a first tooth 73, which extends perpendicular towards the centreline plane M-M and by a second tooth 74 aligned on such centreline plane M-M.

[0044] Preferably, the free end 44 of the fixing base 40 has a pair of shoulders 76 which define an end stop in the insertion of the attachment element 20 inside the coupling aperture 36.

[0045] Operatively, such shoulders 76 abut on the rib 24, once the attachment head 50 has engaged the rib 24 so as to hold it. This way lending further stability to the coupling.

[0046] The free end 44 may have a pair of draft bevels 80 to facilitate insertion of the attachment element 20 inside the coupling aperture 36.

[0047] The profiled bars 4, 4', 4" of the present invention may advantageously be assembled to each other to form a frame 8, in particular to support false ceilings. As

illustrated in Figures 4 and 6, the frame 8 comprises a plurality of profiled bars 4, 4', 4" mechanically coupled to each other so that the attachment element 20 of one profiled bar 4' engages in the coupling aperture 36 of a second profiled bar 4".

[0048] As may be appreciated from the description, the profiled bar according to the invention makes it possible to overcome the drawbacks presented in the prior art.

[0049] In particular, the profiled bar ensures more resistant and stable mechanical connection, characterised by an improved distribution of the stresses. This guarantees greater reliability and stability of the frame obtained by the interconnection of such profiled bars.

[0050] Lastly, the profiled bar is economical and simple to produce, inasmuch as obtainable by cutting and bending operations.

[0051] A person skilled in the art may make numerous modifications and variations to the sections described above so as to satisfy contingent and specific requirements, all contained within the sphere of the invention as defined by the appended claims.

Claims

1. Profiled bar (4, 4' , 4"), in particular for frames (8), having a main longitudinal extension (X-X) from a first and a second end (12,16), the profiled bar (4, 4', 4") having, on at least one of said ends (12,16), an attachment element (20) suitable for engaging with a further profiled bar (4"), and comprising a rib (24) and a plate (28) positioned perpendicular to the rib (24) so as to form together a 'T' section, the rib (24) comprising at least one coupling aperture (36) shaped to house said attachment element (20), the coupling aperture (36) being positioned between said first and second end (12, 16), whereby
the attachment element (20) comprises a base (40) for fixing to the rib (24), which base projects at least partially from the profiled bar (4, 4', 4") with one free end (44), and a tongue (48) flexibly elastic and coupled to the fixing base (40), **characterised by** the tongue (48) being bent towards the fixing base (40), at said free end(44), so as to form an angle of incidence with the fixing base(40), the tongue (48) being provided with a pair of recesses (51, 52) which define in the tongue an attachment head (50) and a necking, the coupling aperture (36) defining a first pair of projections (31, 32) suitable for engaging with the recesses (51, 52) to hold the attachment head (50) to the rib (24), said projections (31, 32) defining in the coupling aperture (36) a first groove (58) having a width substantially equivalent to the width of the necking and being positioned in opposite positions to a longitudinal centre line plane (L-L) of the rib (24), the tongue engaging the coupling aperture with the necking positioned inside said first groove (38), when the attachment element is inserted into the coupling aperture.

2. Profiled bar according to claim 1, wherein said projections (31, 32) are positioned symmetrically to the longitudinal centre line plane (L-L) of the rib (24).

3. Profiled bar (4) according to claim 1 or 2, wherein the coupling aperture (36) has a first pair of guides (60) positioned on opposite sides to the longitudinal centre line plane (L-L) of the rib (24) and said attachment element (20) has a first pair of tabs (64) jutting out from the fixing base (40), said first guides (60) sliding in conjunction with the first tabs (64) to guide the coupling of the attachment element (20).

4. Profiled bar (4) according to claim 1, 2 or 3, wherein the coupling aperture defines at least a second pair of projections (33, 34), opposite the first pair of projections (31, 32) in relation to a centre line plane (M-M) of the aperture, orthogonal to the main longitudinal extension (X-X), to enable the contemporary holding of two attachment elements (20) of two separate profiled bars (4', 4").

5. Profiled bar (4) according to claim 4, wherein said centre line plane (M-M) is also a plane of symmetry for the coupling aperture (36).

6. Profiled bar (4) according to claim 3, 4 or 5, wherein the coupling aperture (36) has a second pair of guides (72) positioned on opposite sides in relation to the longitudinal centre line plane (L-L) of the rib (24), to permit the guided coupling of two attachment elements (20) of two separate profiled bars (4', 4").

7. Profiled bar (4) according to any of the previous claims, wherein the fixing base (40) is attached to the rib (24) by rivets, welding, gluing and/or threaded coupling devices.

8. Profiled bar (4) according to any of the previous claims, wherein the free end (44) of the fixing base (40) has a pair of shoulders (76) which define an end stop in the insertion of the attachment element (20) inside the coupling aperture (36), said shoulders (76) abutting on the rib (24) of the further profiled bar (4") in the installed condition.

9. Profiled bar (4) according to any of the previous claims, wherein the free end (44) has a pair of draft bevels (80) to facilitate the insertion of the attachment element (20) inside the coupling aperture (36).

10. Profiled bar (4) according to any of the previous claims, wherein said rib (24), on the side opposite the plate (28), comprises a longitudinal stiffening element (42).

11. Frame (8), in particular for the support of suspended ceilings, comprising a plurality of profiled bars (4, 4', 4") according to one or more of the previous claims, wherein said profiled bars (4, 4', 4") are mechanically coupled to each other so that the attachment element (20) of a first profiled bar (4') couples into the coupling aperture (36) of a second profiled bar (4").

Patentansprüche

1. Profilstange (4, 4', 4"), insbesondere für Rahmen (8), die eine längsseitige Hauptverlängerung (X-X) von einem ersten und einem zweiten Ende (12, 16) aufweist, wobei die Profilstange (4, 4', 4") an mindestens einem der Enden (12, 16) ein Anschlusselement (20) aufweist, das geeignet ist, in eine weitere Profilstange (4 ") einzugreifen, und das eine Rippe (24) und eine Platte (28), die senkrecht zur Rippe (24) positioniert ist, umfasst, so dass sie zusammen einen T-Abschnitt bilden, wobei die Rippe (24) mindestens eine Kopplungsöffnung (36) umfasst, die geformt ist, das Anschlusselement (20) aufzunehmen, wobei die Kopplungsöffnung (36) zwischen dem ersten und zweiten Ende (12, 16) positioniert ist, wobei das Anschlusselement (20) eine Basis (40) zum Befestigen an die Rippe (24) umfasst, wobei die Basis mindestens teilweise mit einem freien Ende (44) von der Profilstange (4, 4', 4") hervorsteht, und eine Zunge (48), die biegsam elastisch und an die Befestigungsbasis (40) gekoppelt ist, **dadurch gekennzeichnet, dass** die Zunge (48) zur Befestigungsbasis (40) hin gebogen ist, an dem freien Ende (44), so dass ein Auftreffwinkel mit der Befestigungsbasis (40) gebildet wird, wobei die Zunge (48) mit einem Paar Aussparungen (51, 52) versehen ist, die in der Zunge einen Anschlusskopf (50) und eine Einschnürung bestimmen, wobei die Kopplungsöffnung (36) ein erstes Paar Vorsprünge (31, 32) bestimmt, die geeignet sind, in die Aussparungen (51, 52) einzugreifen, um den Anschlusskopf (50) an der Rippe (24) zu halten, wobei die Vorsprünge (31, 32) in der Kopplungsöffnung (36) eine erste Nut (58) bestimmen, die eine Breite aufweist, die im Wesentlichen mit der Breite der Einschnürung übereinstimmt, und die in gegenüberliegenden Positionen zu einer längsseitigen Mittellinienebene (L-L) der Rippe (24) positioniert ist, wobei die Zunge in die Kopplungsöffnung eingreift, während die Einschnürung innerhalb der ersten Nut (38) positioniert ist, wenn das Anschlusselement in die Kopplungsöffnung eingeführt ist.

2. Profilstange nach Anspruch 1, wobei die Vorsprünge (31, 32) symmetrisch zur längsseitigen Mittellinienebene (L-L) der Rippe (24) positioniert sind.

3. Profilstange (4) nach Anspruch 1 oder 2, wobei die Kopplungsöffnung (36) ein erstes Paar Führungen (60) aufweist, die auf gegenüberliegenden Seiten zur längsseitigen Mittellinienebene (L-L) der Rippe (24) positioniert sind und das Anschlusselement (20) ein erstes Paar Laschen (64) aufweist, die von der Befestigungsbasis (40) hervorstehen, wobei die ersten Führungen (60) in Verbindung mit den ersten Laschen (64) gleiten, um die Kopplung des Anschlusselements (20) zu führen.

4. Profilstange (4) nach Anspruch 1, 2 oder 3, wobei die Kopplungsöffnung mindestens ein zweites Paar Vorsprünge (33, 34) bestimmt, die dem ersten Paar Vorsprünge (31, 32) in Bezug auf eine Mittellinienebene (M-M) der Öffnung gegenüberliegen, orthogonal zur längsseitigen Hauptverlängerung (X-X), um das gleichzeitige Halten von zwei Anschlusselementen (20) von zwei separaten Profilstangen (4', 4") zu ermöglichen.

5. Profilstange (4) nach Anspruch 4, wobei die Mittellinienebene (M-M) auch eine Symmetrieebene für die Kopplungsöffnung (36) ist.

6. Profilstange (4) nach Anspruch 3, 4 oder 5, wobei die Kopplungsöffnung (36) ein zweites Paar Führungen (72) aufweist, die auf gegenüberliegenden Seiten in Bezug auf die längsseitige Mittellinienebene (L-L) der Rippe (24) positioniert sind, um die geführte Kopplung von zwei Anschlusselementen (20) von zwei separaten Profilstangen (4', 4") zu erlauben.

7. Profilstange (4) nach einem der vorherigen Ansprüche, wobei die Befestigungsbasis (40) an der Rippe (24) durch Nieten, Schweißen, Kleben und/oder Schraubkopplungsvorrichtungen angebracht ist.

8. Profilstange (4) nach einem der vorherigen Ansprüche, wobei das freie Ende (44) der Befestigungsbasis ein Paar Schultern (76) aufweist, die einen Anschlag bei der Einführung des Anschlusselementes (20) im Inneren der Kopplungsöffnung (36) bestimmen, wobei die Schultern (76) an der Rippe (24) der weiteren Profilstange (4 ") im installierten Zustand anliegen.

9. Profilstange (4) nach einem der vorherigen Ansprüche, wobei das freie Ende (44) ein Paar sich verjüngende Abfasungen (80) aufweist, um die Einführung des Anschlusselements (20) in die Kopplungsöffnung (36) zu erleichtern.

10. Profilstange (4) nach einem der vorhergehenden Ansprüche, wobei die Rippe (24) auf der Seite gegenüberliegend der Platte (28) ein längsseitiges Versteifungselement (42) umfasst.

11. Rahmen (8), insbesondere für das Stützen von ab-

gehängten Decken, umfassend eine Vielzahl Profilstangen (4, 4', 4") nach einem oder mehreren der vorhergehenden Ansprüche, wobei die Profilstangen (4, 4', 4") mechanisch miteinander verkoppelt sind, so dass das Anschlusselement (20) einer ersten Profilstange (4') mit der Kopplungsöffnung (36) einer zweiten Profilstange (4") verkoppelt ist.

Revendications

1. Barre profilée (4, 4', 4"), destinée en particulier à des ossatures (8), qui présente une extension longitudinale principale (X - X) à partir d'une première et d'une seconde extrémités (12, 16), la barre profilée (4, 4', 4") présentant, sur l'une au moins desdites extrémités (12, 16), un élément de fixation (20) approprié à une mise en prise avec une autre barre profilée (4"), et comprenant une nervure (24) et une plaque (28) positionnée perpendiculaire à la nervure (24) de façon à former ensemble une section en « T », la nervure (24) comprenant au moins une ouverture d'accouplement (36) dont la forme permet de loger ledit élément de fixation (20), l'ouverture d'accouplement (36) étant positionnée entre lesdites première et seconde extrémités (12, 16), grâce à quoi l'élément de fixation (20) comprend une base (40) pour une fixation sur la nervure (24), laquelle base fait saillie en partie au moins à partir de la barre profilée (4, 4', 4") avec une extrémité libre (44), et une languette (48) élastique de manière flexible et accouplée avec la base de fixation (40), **caractérisée en ce que** la languette (48) est fléchie vers la base de fixation (40), au niveau de ladite extrémité libre (44), de façon à former un angle d'incidence avec la base de fixation (40), la languette (48) étant dotée d'une paire de renfoncements (51, 52) qui définissent dans la languette une tête de fixation (50) et un étranglement, l'ouverture d'accouplement (36) définissant une première paire de saillies (31, 32) appropriées à une mise en prise avec les renfoncements (51, 52) de façon à tenir la tête de fixation (50) sur la nervure (24), lesdites saillies (31, 32) définissant dans l'ouverture d'accouplement (36) une première rainure (58) qui présente une largeur sensiblement équivalente à la largeur de l'étranglement, et étant positionnées dans des positions opposées par rapport à un plan axial longitudinal (L - L) de la nervure (24), la languette mettant en prise l'ouverture d'accouplement avec l'étranglement positionné à l'intérieur de ladite première rainure (38), lorsque l'élément de fixation est inséré dans l'ouverture d'accouplement.

2. Barre profilée selon la revendication 1, dans laquelle lesdites saillies (31, 32) sont positionnées de manière symétrique par rapport au plan axial longitudinal (L - L) de la nervure (24).

3. Barre profilée (4) selon la revendication 1 ou la revendication 2, dans laquelle l'ouverture d'accouplement (36) présente une première paire de guides (60) positionnés sur des côtés opposés par rapport au plan axial longitudinal (L - L) de la nervure (24) et ledit élément de fixation (20) présente une première paire de pattes (64) qui font saillie à partir de la base de fixation (40), lesdits premiers guides (60) coulissant en même temps que les premières pattes (64) de façon à guider l'accouplement de l'élément de fixation (20).

4. Barre profilée (4) selon l'une quelconque des revendications 1 à 3, dans laquelle l'ouverture d'accouplement définit au moins une deuxième paire de saillies (33, 34), opposée à la première paires de saillies (31, 32) par rapport à un plan axial (M - M) de l'ouverture, orthogonal à l'extension longitudinale principale (X - X), de façon à permettre un maintien simultané de deux éléments de fixation (20) de deux barres profilées séparées (4', 4").

5. Barre profilée (4) selon la revendication 4, dans laquelle ledit plan axial (M - M) est également un plan de symétrie de l'ouverture d'accouplement (36).

6. Barre profilée (4) selon l'une quelconque des revendications 3 à 5, dans laquelle l'ouverture d'accouplement (36) présente une seconde paire de guides (72) positionnés sur des côtés opposés par rapport au plan axial longitudinal (L - L) de la nervure (24), de façon à permettre un accouplement guidé de deux éléments de fixation (20) de deux barres profilées séparées (4', 4").

7. Barre profilée (4) selon l'une quelconque des revendications précédentes, dans laquelle la base de fixation (40) est fixée sur la nervure (24) par des rivets, par soudage, par collage et / ou par des dispositifs d'accouplement filetés.

8. Barre profilée (4) selon l'une quelconque des revendications précédentes, dans laquelle l'extrémité libre (44) de la base de fixation (40) présente une paire d'épaulements (76) qui définissent un arrêt d'extrémité lors de l'insertion de l'élément de fixation (20) à l'intérieur de l'ouverture d'accouplement (36), lesdits épaulements (76) venant en butée contre la nervure (24) de l'autre barre profilée (4") dans l'état installé.

9. Barre profilée (4) selon l'une quelconque des revendications précédentes, dans laquelle l'extrémité libre (44) présente une paire de biseaux de dépouille (80) destinés à faciliter l'insertion de l'élément de fixation (20) à l'intérieur de l'ouverture d'accouplement (36).

10. Barre profilée (4) selon l'une quelconque des reven-

dications précédentes, dans laquelle ladite nervure (24), sur le côté opposé à la plaque (28), comprend un élément de renforcement longitudinal (42).

11. Ossature (8), destiné en particulier à supporter des plafonds suspendus, comprenant une pluralité de barres profilées (4, 4', 4") selon l'une quelconque des revendications précédentes, dans lequel lesdites barres profilées (4, 4', 4") sont accouplées de manière mécanique les unes aux autres de telle sorte que l'élément de fixation (20) d'une première barre profilée (4') s'accouple dans l'ouverture d'accouplement (36) d'une deuxième barre profilée (4").

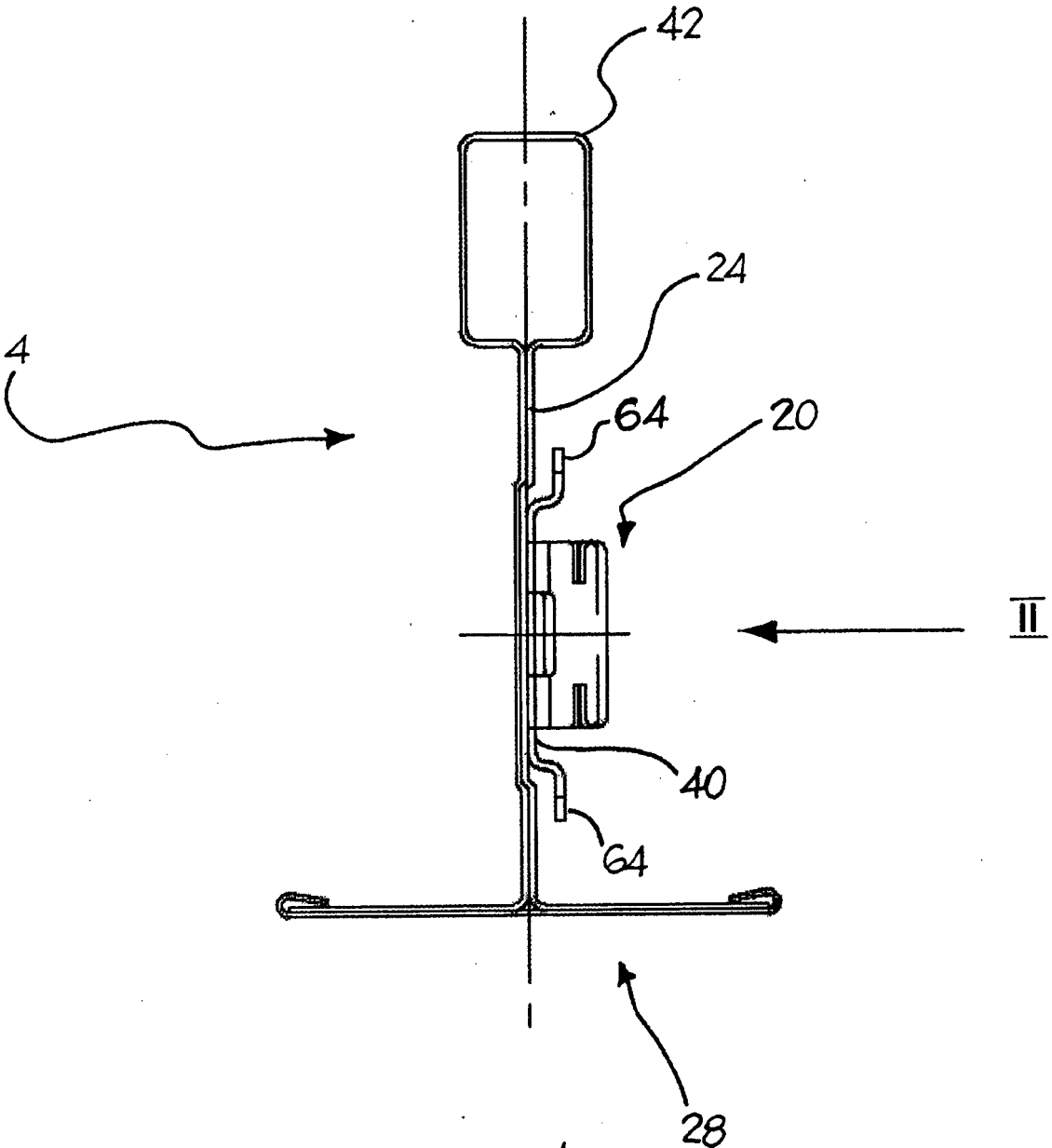

Fig.1

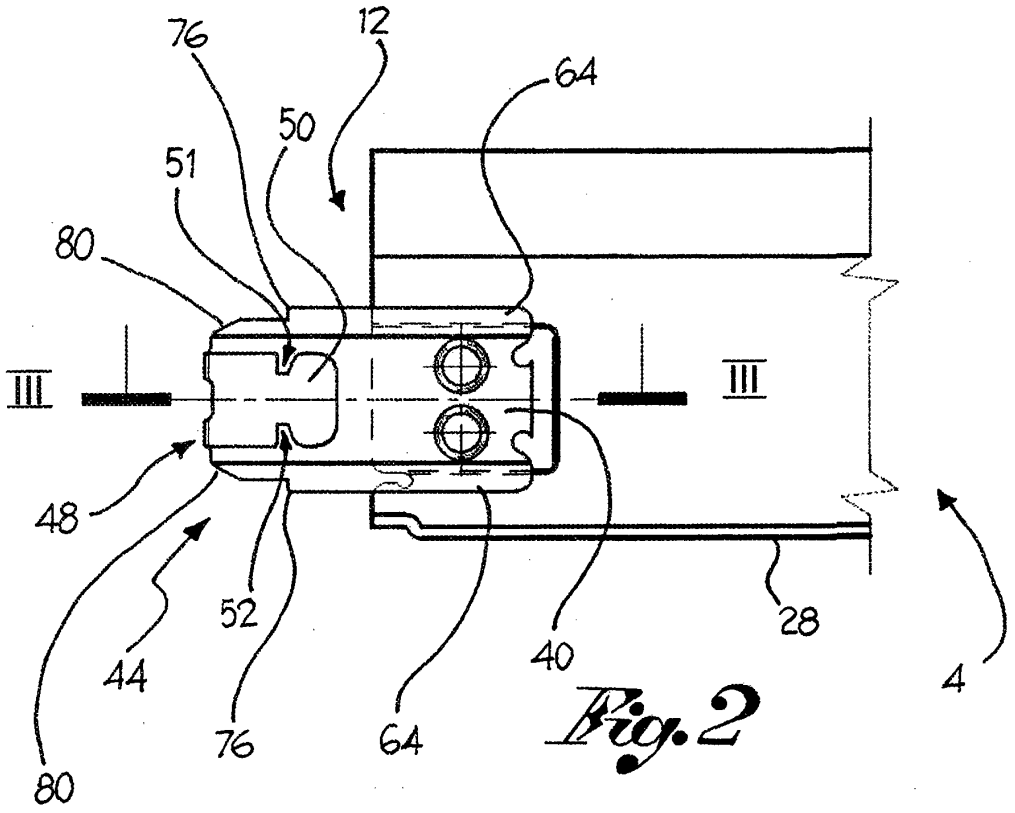
76
12
64
50
51
80
III
III
48
52
44
76
64
40
28
4
80

Fig. 2

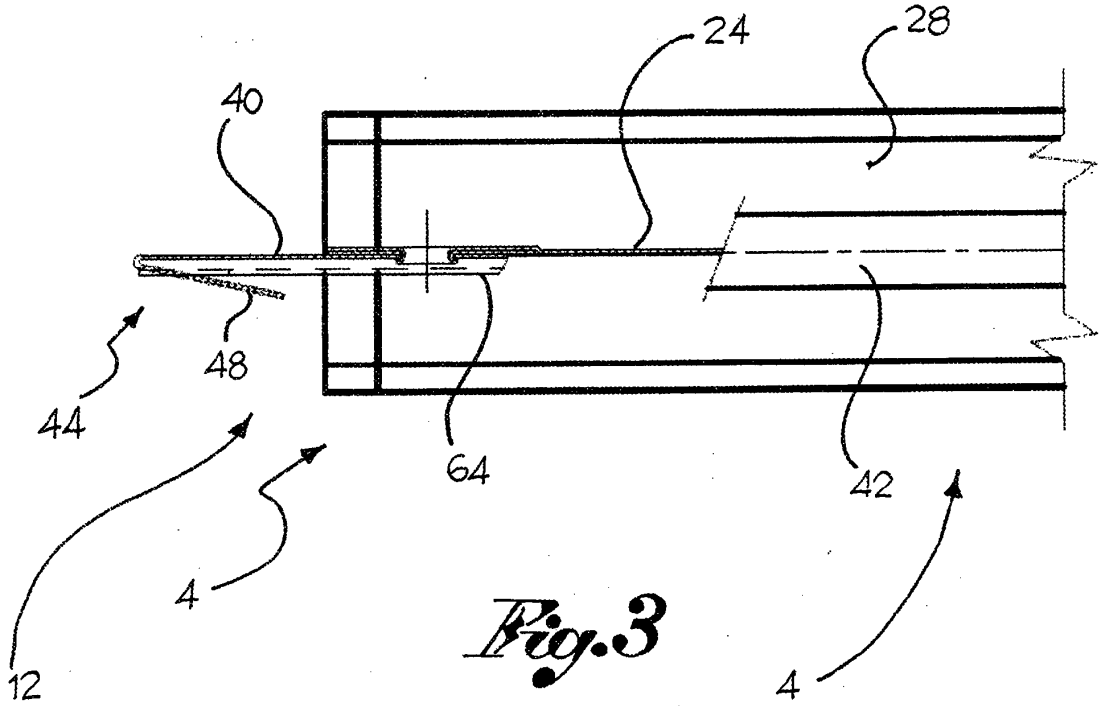
24
28
40
48
44
64
42
4
12
4

Fig. 3

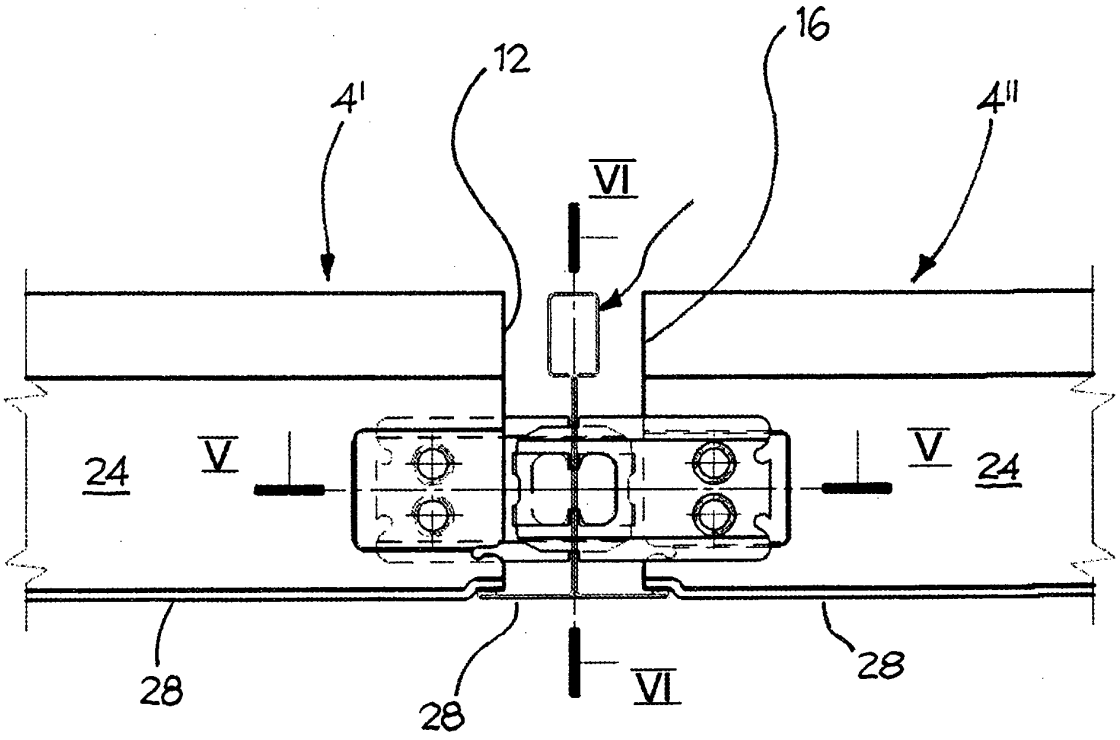

Fig. 4

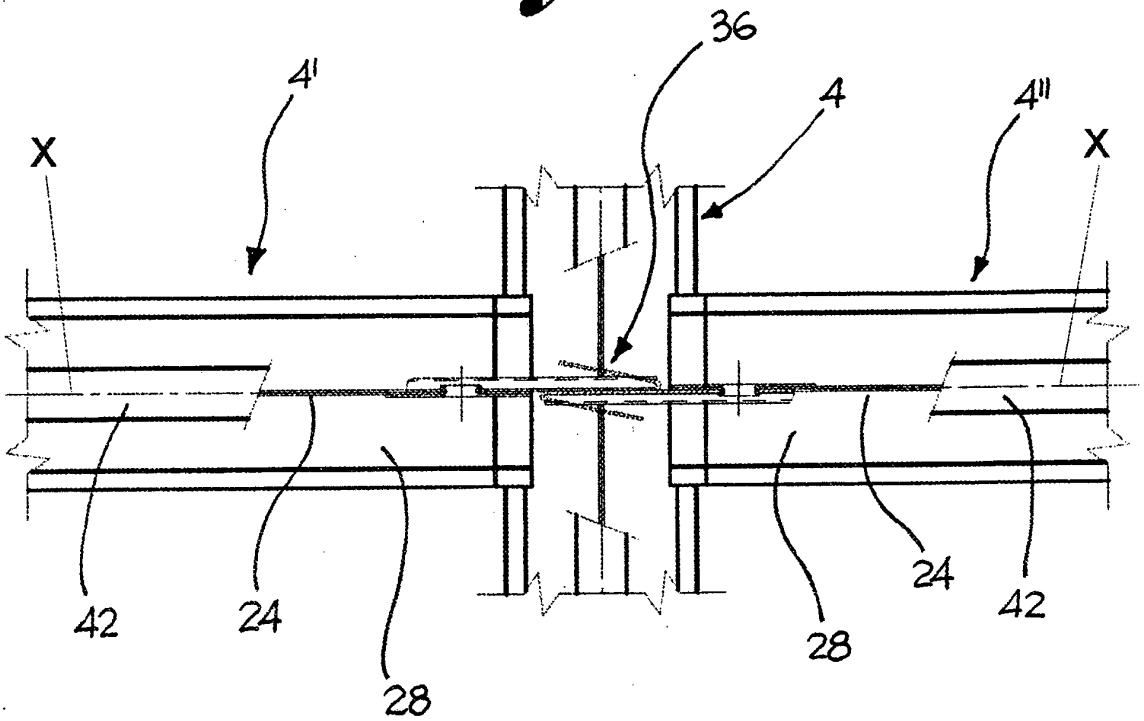

Fig. 5

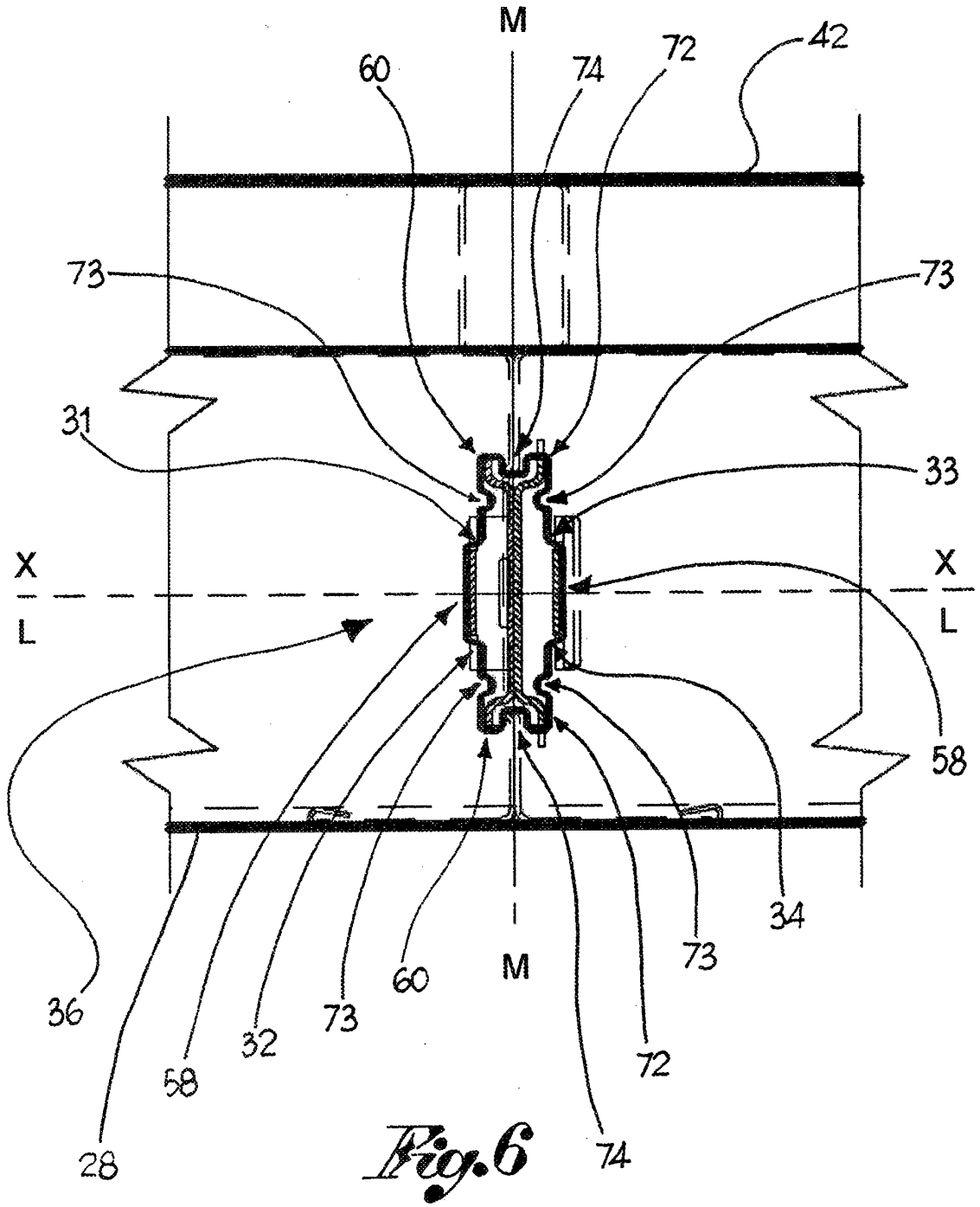

Fig.6

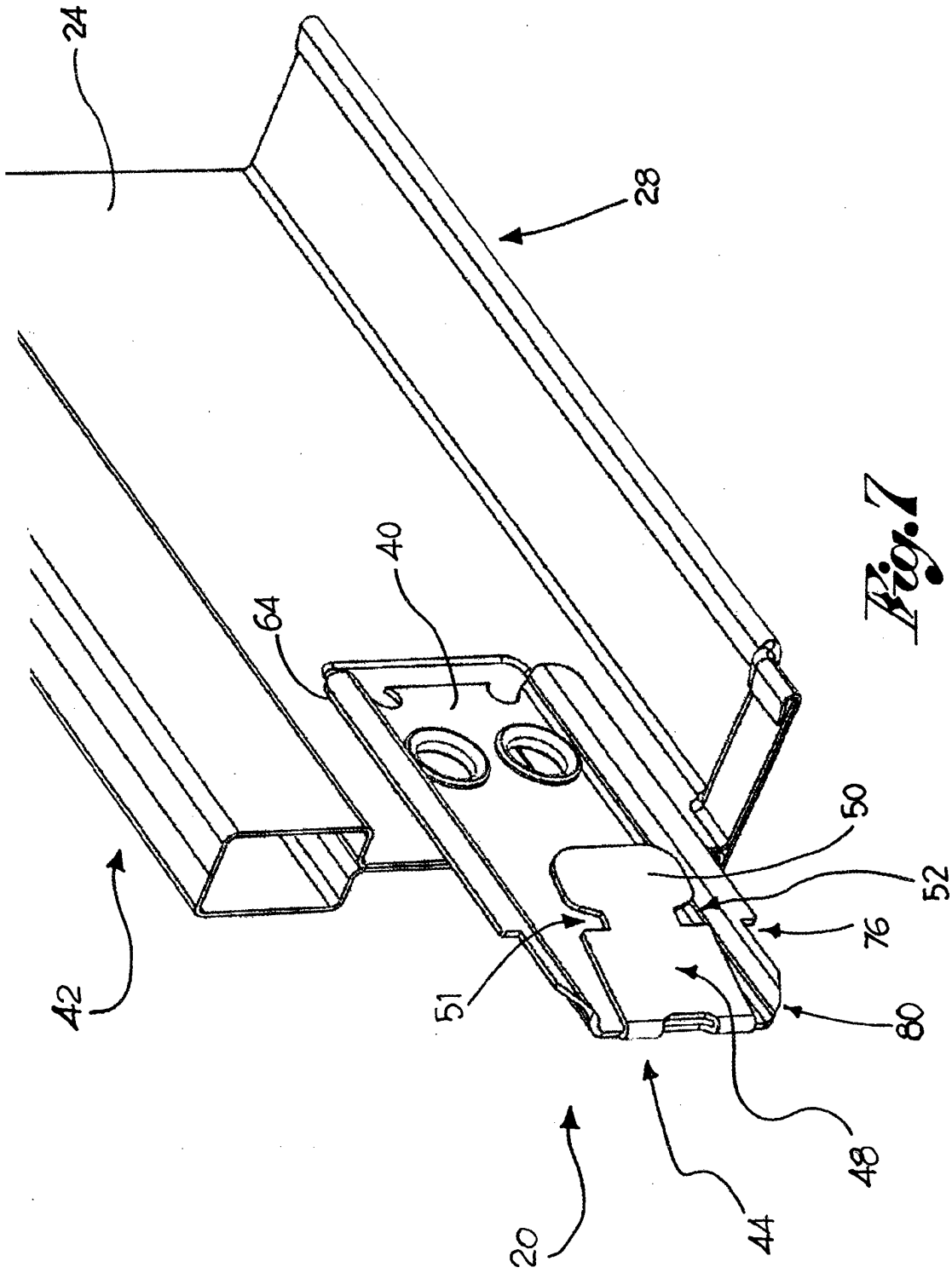

Fig.7

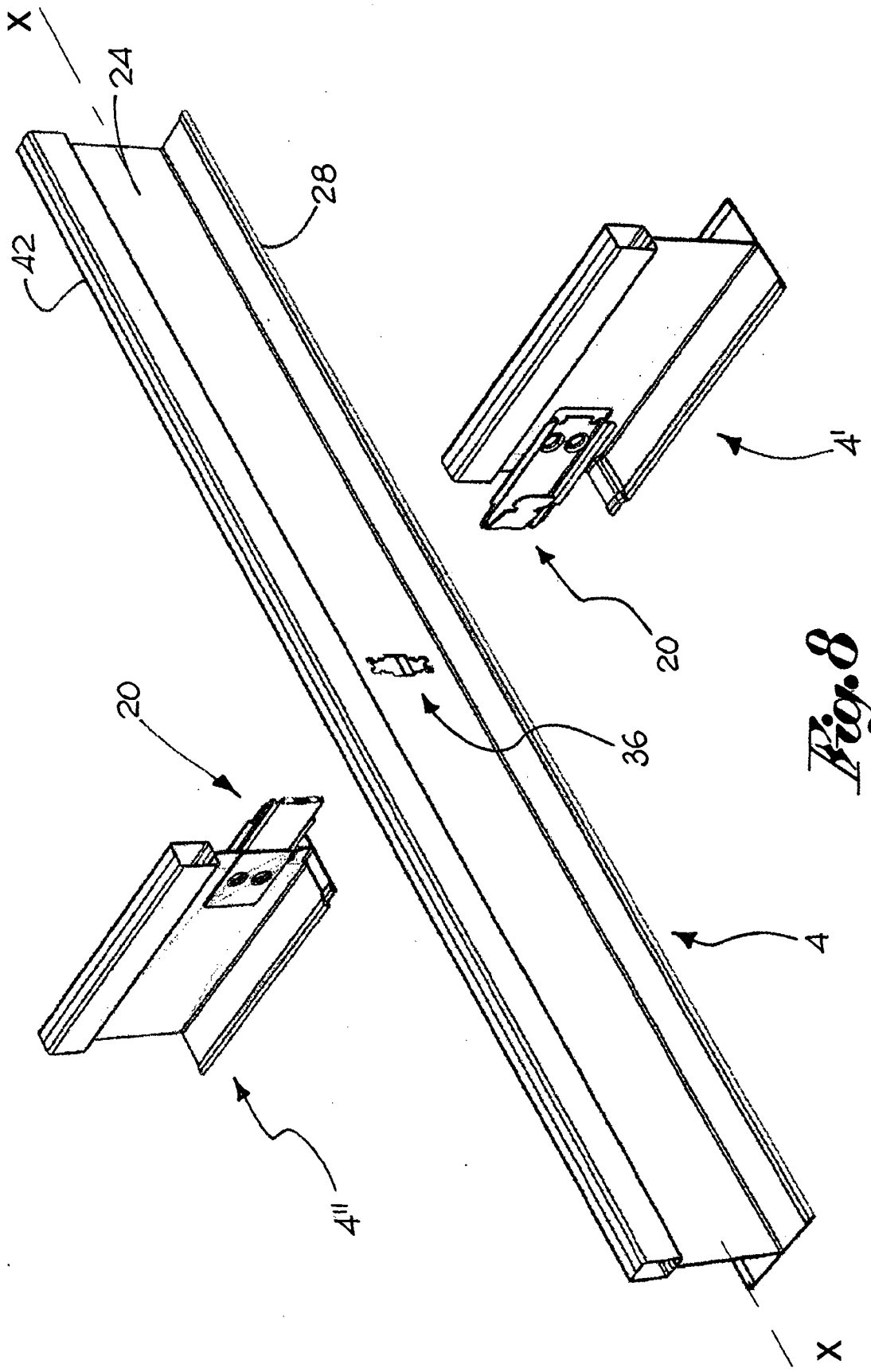

Fig.8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- US 20040159064 A **[0009]**