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(54) **A system of profile elements and an insertion guide element for use in such a system**

Ein System von Profilelementen und Einsatzsteuerelementen zur Verwendung in diesem System

Système d'éléments de profile et élément de guidage d'insertion à être utilisé dans un tel système

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## Description

**[0001]** The present invention relates to a system of profile elements for the construction of frame structures, said system comprising elongate hollow profile elements with at least one longitudinal channel and joining elements for providing angle joints between two such profile elements, said joining elements comprising a centring and load transferring insertion guide element having a substantially rod-shaped shank part for insertion with comparatively tight sliding adjustment into the mouth of said channel at a cut surface in one of said two profile elements and a head part formed integrally with the shank part.

**[0002]** Such systems are used inter alia in building structures, to which considerable requirements are made in respect of the tightness, the strength and the appearance of the joints between the profile elements. The mounting of such a system most often takes place on the building site and is normally carried out by means of screw connections, as in many cases it is impossible to weld the profile elements which may consist of plastics, steel or other types of metal materials. When assembling systems of this type it is a general problem that the profile elements are to be positioned accurately relative to each other before establishing the connection to ensure that the above-mentioned requirements are met. Particularly in connection with abutting joints between profile elements of the same cross-section outline and in particularly in case of the profile elements not forming right angles with each other, like for instance in bay extensions or in roof constructions, it is difficult to bring and maintain the profile elements into a correct mutual position.

**[0003]** From DE-A-30 35 361 a structure for the construction of picture frames is known, in which the profile elements designed as hollow profiles are connected in right-angled corner joints by means of likewise right-angled joining elements, and the construction is thus not suited for joining profile elements under other angles relative to each other.

**[0004]** In DE-A-33 22 699 a link connection for two tubular sections is disclosed, in which a transverse bolt arranged in one of the sections is engaged by an elongate slit in a connecting member secured in and forming a substantially right angle with the other section to allow the two tubular sections to be transferred from a position, in which they are parallel to each other, to a position in which they are arrestable with a right angle with respect to each other, without arrestability in any intermediate position between the two extreme positions.

**[0005]** On this background it is the object of the invention to provide a system, in which the mounting of the profile elements has been simplified, and where the joints between these elements possess the desired qualities in respect of providing a safe centering and load transfer between the interconnected profile elements in any angular position of the elements with respect to each other within a predetermined angular range.

**[0006]** The object is met by means of a system which is characteristic in that said shank part and said channel in said one profile has a substantially rectangular cross-section and that said head part has a first flat side wall portion intersecting one of two opposite parallel sides of the shank part under a prescribed maximum angle and a cylindrical wall section joining said first side wall portion and extending toward the other of said opposite sides of the shank part, said cylindrical wall section having its axis at the intersection of said first side wall portion and said one side of the shank part, the length of said first side wall portion and the radius of said cylindrical wall section corresponding to the width of a channel in the other of said two profile elements to provide stable connection between said profile elements for any angle therebetween within a prescribed angular range limited by said maximum angle by local surface engagement of part of said cylindrical wall section with an internal surface of said channel in said other profile element.

**[0007]** In this way, the desired centering and the simple mounting of such a system is obtained. Moreover, the load transferring function of the joints is improved.

**[0008]** In a system of profile elements for the construction of load-carrying frame structures comprising at least one column profile element which with an end surface forms an angle joint with a transverse girder profile element, a particularly suited alternative embodiment of the invention is characteristic in that the shank part of the insertion guide element is fastened in a channel in the column profile element, whereas the head part is inserted in a channel in the girder profile element either from its mouth at an end cut surface or through an opening in an outer wall of said channel, the head part being retained in the girder profile element by means of a locking engagement.

**[0009]** This locking engagement may preferably be provided by means of transversely flushing holes in the head part of the insertion guide element and opposite wall portions of said channel in the girder profile element.

**[0010]** Moreover, the invention relates to an insertion guide element for use in an angle joint between two elongate profile elements with at least one longitudinal channel with substantially rectangular cross-section, said insertion guide element having the features stated in claim 8.

**[0011]** Through this insertion guide element, a standard part is provided which may be used in a number of joints between profile elements with mutually differing slope. The special design ensures an easy mounting and a stable fixation of the profile elements relative to each other over the entire angle range in question.

**[0012]** Advantageous embodiments of the insertion guide element are stated in subclaims 9-11.

**[0013]** The invention will be described in detail in the following by means of some examples of embodiments

and with reference to the schematic drawing, in which

Figs 1-4 show a system in a first embodiment of the invention, with differing angles between the profile elements of the system,

Fig. 5 a plane view at a larger scale of an insertion guide element in a first embodiment of the invention,

Fig. 6 a part of a system with an angle joint between a column profile element and a girder profile element, seen from the front and partially as a sectional view,

Fig. 7 the angle joint shown in Fig. 6, seen from the side and partially as a sectional view,

Fig. 8 a perspective view at a larger scale of an insertion guide element in an alternative embodiment of the invention for use in the system shown in Figs 6 and 7, and

Fig. 9 a system comprising an angle joint in connection with an assemblage point.

**[0014]** In the various figures the same reference numerals refer to parts having a similar or analogeous function.

**[0015]** In Figs 1-4 an example of a system of profile elements 1, 2, and 3 is shown, which as a whole constitutes part of a bigger frame structure, like for instance a building structure. The profile elements are connected with each other by corner joints, which at each point of assembly have one or more insertion guide elements 4.

**[0016]** The embodiment of the insertion guide element 4 is seen in detail in Fig. 5. The insertion guide element 4 has a substantially rod-shaped shank part 5 with a width b and a substantially circular-section-shaped head part 6 integral with the shank part 5. The head part 6 has a first side wall portion 7 which forms an angle v with a first side 8 of the shank part 5 and which extends into a cylindrical wall section 9. The wall section 9 extends in turn tangentially into a second wall portion 10 extending to a second side 11 of the shank part 5. The construction of the insertion guide element 4 is such that the first side wall portion 7 of the head part 6 has a length which is substantially equal to the width b of the shank part 5, and the cylindrical wall section 9 has a radius likewise corresponding to the width b. The centre axis of the wall section 9 is positioned in the intersection point between the first side 8 of the shank part and the first side wall portion 7, and the section 9 extends through a curved length of 90°, which has the effect that the first side wall portion 7 and the second wall portion 10 form two mutually parallel surfaces which are separated by a distance corresponding to the width b, and that the obtuse angle between the second wall portion 10 and the second side 11 of the shank part 5 is equal to the angle v. The angle v corresponds to a prescribed maximum value of the angle joint between the profile elements, and here amounts to a value of 135°.

**[0017]** The joining of for instance the profile elements 1 and 2 as shown in Figs 1-4 is carried out in the following way: the shank part 5 on the insertion guide element 4 is passed from the cut end surface of the profile 1 into a channel not shown in detail in one of the profile elements 1. The width b of the shank part 5 is chosen such that this insertion takes place with a comparatively tight sliding adjustment. If desired, one or more insertion guide elements 4 may be used at one point of joining, and in particular in connection with wide profile elements this will give an even better centring and load transfer. This naturally requires a corresponding number of channels in the profile elements. Following this the head part 6 of the insertion guide 4 is introduced into a corresponding channel in the second profile element 2. The profile elements 1 and 2 are now centred, their cut end surfaces covering each other completely, and may now be joined by means of for instance screws, bolts between exterior yokes or by gluing or welding.

**[0018]** As will be seen from Figs 1-4, the insertion guide element 4 brings about a safe centring and load transfer within a big angle range, in this case from 45° to 135°. These extreme positions are determined by the fact that the side wall portion 7 on the head part 6 is perpendicular to and abuts a side wall in the channel, in which the head part 6 is introduced.

**[0019]** Figs 6 and 7 show a part of a system, in which a column profile element 20 forms an angle joint with a transverse girder profile element 21 by means of an insertion guide element 22 with a shank part 23 which is introduced into and fastened for instance by means of rivets in a channel 24 in the column profile element 20. The insertion guide element 22 is with a head part 25 inserted in a channel 26 in the girder profile element 21 through an opening 27 in an outer wall of this channel. The head part 25 is retained in the girder profile element 21 by means of a locking engagement which in the embodiment shown is established thereby that in the head part 25 a transverse hole 28 is provided which flushes with holes 29, 30 in the opposite walls of the channel 26 in the girder profile element 21, as well as a by a pin (not shown) which is introduced into the holes 28, 29, and 30, whereby the column profile element 20 and the girder profile element 21 become mutually locked.

**[0020]** Fig. 8 shows the construction of the insertion guide element 22. As will appear, a ledge 31 with a shoulder 32 is formed between the shank part 23 and the head part 25, said shoulder extending between opposite sides 33, 34 of the shank part 23 in an angle which will be explained in the following. The object of the shoulder 32 is to put a bottom limit to the angle range of the angle joint between the profile elements, here the column profile element 20 and the girder profile element 21, and amounts in the embodiment shown here to approx. 30°. In addition thereto the insertion guide element 22 is, like the element 4 shown in Fig. 5, provided with a first side wall portion 35 and a cylindrical wall section 36.

**[0021]** Finally, Fig. 9 shows a system, in which a cor-

ner joint of the same type as shown in Figs 1-4 and guided by means of one or more insertion guide elements 4, as shown in fig. 5, is connected with a column profile element 20 by means of an insertion guide element 22 as described with reference to Figs. 6 and 7.

## Claims

1. A system of profile elements for the construction of frame structures, said system comprising elongate hollow profile elements (1,2,3;20,21) with at least one longitudinal channel and joining elements for providing angle joints between two such profile elements, said joining elements comprising a centring and load transferring insertion guide element (4;22) having a substantially rod-shaped shank part (5;23) for insertion with comparatively tight sliding adjustment into the mouth of said channel at a cut surface in one (1,3;20) of said two profile elements and a head part (6;25) formed integrally with the shank part, **characterized** in that said shank part (5;23) and said channel in said one profile has a substantially rectangular cross-section and that said head part (6;25) has a first flat side wall portion (7;35) intersecting one (8;33) of two opposite parallel sides of the shank part under a prescribed maximum angle (v) and a cylindrical wall section (9;36) joining said first side wall portion (7;35) and extending toward the other (11;34) of said opposite sides of the shank part, said cylindrical wall section (9;36) having its axis at the intersection of said first side wall portion (7;35) and said one side (8;33) of the shank part (5;23), the length of said first side wall portion (7;35) and the radius of said cylindrical wall section (9;35) corresponding to the width of a channel in the other (2;21) of said two profile elements to provide stable connection between said profile elements for any angle therebetween within a prescribed angular range limited by said maximum angle (v) by local surface engagement of part of said cylindrical wall section (9;36) with an internal surface of said channel in said other profile element.

2. A system of profile elements according to claim 1, **characterized** in that the length of said first side wall portion (7) of the head part (6) and the radius of said cylindrical wall section (9) correspond to the width (b) of the shank part (5) between said opposite parallel sides (8,11), the cylindrical wall section extending through a curved length of 90° and joining the other of said opposite parallel sides of the shank part through a second flat wall portion (10) of the head part (6) parallel with said first wall portion (7).

3. A system of profile elements according to claim 2, **characterized** in that said maximum angle (v) amounts to 135°.

4. A system of profile elements according to claim 1, 2 or 3, in which said tow profile elements have identical cross-section profiles and have been made with bevelled end cut surfaces for the provision of a corner joint, **characterized** in that the head part (6) of the insertion guide element (4) is inserted in said channel in the other (2) of said two profile elements in the mouth thereof at the end cut surface.

5. A system of profile elements according to claim 1 for the construction of load-carrying frame structures comprising at least one column profile element (20) which with an end surface forms an angle joint with a transverse girder profile element (21), **characterized** in that the shank part (23) of the insertion guide element (22) is fastened in a channel (24) in the column profile element (20), whereas the head part (25) is inserted in a channel (26) in the girder profile element (21) either from its mouth at an end cut surface or through an opening (27) in an outer wall of said channel, the head part being retained in the girder profile element by means of a locking engagement.

6. A system of profile elements according to claim 5, **characterized** in that the locking engagement is provided by means of transversely flushing holes (28,29,30) in the head part (25) of the insertion guide element and opposite wall portions of said channel (26) in the girder profile element.

7. A system of profile elements according to claim 5 or 6, **characterized** in that between the shank part (23) and head part (25) of the insertion guide element (22) a ledge (31) with a shoulder surface (32) is formed, which extends between said opposite sides (33,34) of the shank part and forms an angle therewith corresponding to a prescribed minimum angle for said angle range.

8. An insertion guide element (4;22) for use as an angle joint between two elongate profile elements with at least one longitudinal channel comprising a substantially rod-shaped shank part (5;23) for insertion with comparatively tight sliding adjustment into the mouth of said channel at a cut surface in one of said two profile elements and a head part (6;25) formed integrally with the shank part **characterized** in that said shank part (5;23) and said channel in said one profile has a substantially rectangular cross-section and that said head part (6;25) has a first flat side wall portion (7;35) intersecting one (8;33) of two opposite parallel sides of the shank part under a prescribed maximum angle (v) and a cylindrical wall section (9;36) joining said first side wall portion (7;35) and extending toward the other (11;34) of said

opposite sides of the shank part, said cylindrical wall section (9;36) having its axis at the intersection of said first side wall portion (7;35) and said one side (8;33) of the shank part (5;23), the length of said first side wall portion (7;35) and the radius of said cylindrical wall section (9;35) corresponding to the width of a channel in the other (2;21) of said two profile elements to provide stable connection between said profile elements for any angle therebetween within a prescribed angular range limited by said maximum angle (v) by local surface engagement of part of said cylindrical wall section (9;36) with an internal surface of said channel in said other profile element.

**9.** An insertion guide element according to claim 8, **characterized** in that the length of said first side wall portion (7) of the head part (6) and the radius of said cylindrical wall section (9) correspond to the width (b) of the shank part (5) between said opposite parallel sides (8,11), the cylindrical wall section extending through a curved length of 90° and joining the other of said opposite parallel sides of the shank part through a second wall portion (10) of the head part parallel with said first wall portion.

**10.** An insertion guide element according to claim 8 or 9, **characterized** in that said maximum angle (v) amounts to 135°.

**11.** An insertion guide element according to claim 8, **characterized** in that between the shank part (23) and head part (25) of the insertion guide element 22) a ledge (31) with a shoulder surface (32) is formed which extends between said opposite sides (33,34) of the shank part and forms an angle therewith corresponding to a prescribed minimum angle for said angle range.

**Patentansprüche**

**1.** System von Profilelementen zum Aufbau von Rahmenkonstruktionen, umfassend längliche Hohlraum-Profilelemente (1,2,3;20,21) mit mindestens einem längsverlaufenden Kanal und Sammelelementen zum Herstellen von Eckensammlungen zwischen zwei solchen Profilelementen, welche Sammelelemente ein zentrierendes und belastungsübertragendes Einsatzsteuerelement (4;22) mit einem im wesentlichen stangenförmigen Schaftteil (5;23) zum Einführen mit verhältnismässig strammem Gleitsitz in die Mündung erwähnten Kanals in einer Schnittfläche in das eine (1,3;20) der beiden Profilelemente, und einen mit dem Schaftteil integriert ausgebildeten Kopfteil (6;25) umfassen, dadurch **gekennzeichnet**, dass der Schaftteil (5; 23) und der Kanal des einen Profils einen im wesentlichen rechtwinkeligen Querschnitt aufweisen, und dass der Kopfteil (6;25) einen ersten flachen Seitenwandteil (7;35) aufweist, der die eine (8;33) der zwei gegenüberliegenden parallelen Seiten des Schaftteils unter einem vorgeschriebenen Maximumwinkel (v) schneidet, und einen zylinderförmigen Wandabschnitt (9; 36), der an den ersten Seitenwandteil (7;35) anschliesst und in Richtung der anderen (11;34) der gegenüberliegenden Seiten des Schaftteils verläuft, wobei die Achse des zylinderförmigen Wandabschnittes (9;36) beim Schnittpunkt des ersten Seitenwandteils (7;35) und der ersten Seite (8;33) des Schaftteils (5;23) liegt, und die Länge des ersten Seitenwandteils (7;35) und der Radius des zylinderförmigen Wandabschnittes (9;35) der Breite eines Kanals in dem anderen (2;21) der beiden Profilelemente entspricht, zwecks Herstellung einer stabilen Verbindung zwischen erwähnten Profilelementen in einem beliebigen dazwischenliegenden Winkel innerhalb eines durch erwähnten Maximumwinkel (v) begrenzten vorgeschriebenen Winkelbereichs, welche Verbindung durch örtliches Ineinandergreifen eines Teils des zylinderförmigen Wandabschnittes (9;36) in eine Innenfläche des Kanals des anderen Profilelements zustandekommt.

**2.** System von Profilelementen nach Anspruch 1, dadurch **gekennzeichnet,** dass die Länge des ersten Seitenwandteils (7) des Kopfteils (6) und der Radius des zylinderförmigen Wandabschnitts (9) der Breite (b) des Schaftteils (5) zwischen den gegenüberliegenden parallelen Seiten (8,11) entspricht, und dass sich der zylinderförmige Wandabschnitt über eine Bogenlänge von 90° erstreckt und über einen zum ersten Wandteil (7) parallel verlaufenden zweiten flachen Wandteil (10) des Kopfteils (6) an die andere der gegenüberliegenden parallelen Seiten des Schaftteils anschliesst.

**3.** System von Profilelementen nach Anspruch 2, dadurch **gekennzeichnet**, dass der Maximumwinkel (v) 135° beträgt.

**4.** System von Profilelementen nach Anspruch 1, 2, oder 3, dadurch **gekennzeichnet**, dass erwähnte zwei Profilelemente dasselbe Querschnittsprofil aufweisen und zum Zustandebringen einer Eckensammlung mit abgeschrägten Endschnittflächen hergestellt sind, dadurch **gekennzeichnet,** dass der Kopfteil (6) des Einsatzsteuerelements (4) in den Kanal des anderen (2) der beiden Profilelemente in dessen Mündung an der Endschnittfläche eingeführt wird.

**5.** System von Profilelementen nach Anspruch 1 zum Aufbau von lasttragenden Rahmenkonstruktionen umfassend mindestens ein Säulenprofilelement

(20), das an seiner Endfläche eine Eckensammlung mit einem querverlaufenden Tragbalkenprofilelement (21) bildet, dadurch **gekennzeichnet**, dass der Schaftteil (23) des Einsatzsteuerelements (22) in einem Kanal (24) des Säulenprofilelements (20) befestigt ist, während der Kopfteil (25) entweder durch dessen Mündung an der Endschnittfläche oder durch eine in einer Aussenwand des Kanals vorhandene Öffnung (27) in einen Kanal (26) im Tragbalkenprofilelement (21) eingeführt wird, wobei der Kopfteil mittels eines Verriegelungseingriffes im Tragbalkenprofilelement festgehalten wird.

**6.** System von Profilelementen nach Anspruch 5, dadurch **gekennzeichnet**, dass die Verriegelung mit Hilfe von querverlaufenden versenkten Löchern (28,29,30) im Kopfteil (25) des Einsatzsteuerelements und in gegenüberliegenden Wandteilen des erwähnten Kanals (26) im Tragbalkenprofilelement zustandekommt.

**7.** System von Profilelementen nach Anspruch 5 oder 6, dadurch **gekennzeichnet**, dass zwischen dem Schaftteil (23) und dem Kopfteil (25) des Einsatzsteuerelements (22) ein Absatz (31) mit einer Schulterfläche (32) gebildet ist, der zwischen den gegenüberliegenden Seiten (33,34) des Schaftteils verläuft und mit diesen einen Winkel entsprechend einem vorgeschriebenen Minimumwinkel für erwähnten Winkelbereich bildet.

**8.** Einsatzsteuerelement (4;22) zur Verwendung als Eckensammlung zwischen zwei länglichen Profilelementen mit mindestens einem längsverlaufenden Kanal umfassend einen im wesentlichen stangenförmigen Schaftteil (5;23) zum Einführen mit verhältnismässig strammem Gleitsitz in die Mündung erwähnten Kanals in einer Schnittfläche in das eine der beiden Profilelemente, und mit einem mit dem Schaftteil ausgebildeten Kopfteil (6;25) dadurch **gekennzeichnet**, dass der Schaftteil (5;23) und der Kanal des einen Profils einen im wesentlichen rechtwinkeligen Querschnitt aufweisen, und dass der Kopfteil (6;25) einen ersten flachen Seitenwandteil (7;35) aufweist, der die eine (8;33) der zwei gegenüberliegenden parallelen Seiten des Schaftteils unter einem vorgeschriebenen Maximumwinkel (v) schneidet, und einen zylinderförmigen Wandabschnitt (9;36), der an den ersten Seitenwandteil (7;35) anschliesst und in Richtung der anderen (11;34) der gegenüberliegenden Seiten des Schaftteils verläuft, wobei die Achse des zylinderförmigen Wandabschnittes (9;36) beim Schnittpunkt des ersten Seitenwandteils (7;35) und der ersten Seite (8;33) des Schaftteils (5;23) liegt, und die Länge des ersten Seitenwandteils (7;35) und der Radius des zylinderförmigen Wandabschnittes (9;35) der Breite eines Kanals in dem anderen (2;21) der beiden Profilelemente entspricht, zwecks Herstellung einer stabilen Verbindung zwischen erwähnten Profilelementen in einem beliebigen dazwischenliegenden Winkel innerhalb eines durch erwähnten Maximumwinkel (v) begrenzten vorgeschriebenen Winkelbereichs, welche Verbindung durch örtliches Ineinandergreifen eines Teils des zylinderförmigen Wandabschnittes (9;36) in eine Innenfläche des Kanals des anderen Profilelements zustandekommt.

**9.** Einsatzsteuerelement nach Anspruch 8, dadurch **gekennzeichnet**, dass die Länge des ersten Seitenwandteils (7) des Kopfteils (6) und der Radius des zylinderförmigen Wandabschnittes (9) der Breite (b) des Schaftteils (5) zwischen den gegenüberliegenden parallelen Seiten (8,11) entspricht, und dass sich der zylinderförmige Wandabschnitt über eine Bogenlänge von 90° erstreckt und über einen zum ersten Wandteil parallel verlaufenden Wandteil (10) des Kopfteils (6) an die andere der gegenüberliegenden parallelen Seiten des Schaftteils anliegt.

**10.** Einsatzsteuerelement nach Anspruch 8 oder 9, dadurch **gekennzeichnet**, dass der Maximumwinkel (v) 135° beträgt.

**11.** Einsatzsteuerelement nach Anspruch 8, dadurch **gekennzeichnet**, dass zwischen dem Schaftteil (23) und dem Kopfteil (25) des Einsatzsteuerelements (22) ein Absatz (31) mit einer Schulterfläche (32) gebildet ist, der zwischen den gegenüberliegenden Seiten (33,34) des Schaftteils verläuft und mit diesen einen Winkel entsprechend einem vorgeschriebenen Minimumwinkel für erwähnten Winkelbereich bildet.

**Revendications**

**1.** Système d'éléments de profile pour construire des constructions de cadre, système qui comprend des éléments de profile allongés et creux (1,2,3;20,21) avec au moins un canal longitudinal et des éléments de liaison pour établir des assemblages d'angle entre deux tels éléments de profile, lesdits éléments de liaison comprenant un élément de guidage d'insertion, centreur et transmetteur de force (4;22) avec une portion d'arbre essentiellement en forme de bâton (5;23) à insérer avec un ajustage glissant relativement serré dans l'embouchure dudit canal à une coupe dans l'un (1,3;20) desdits deux éléments de profile et une portion de tête (6;25) formée d'une seule pièce avec la portion d'arbre, **caractérisé** en ce que ladite portion d'arbre (5;23) et ledit canal dans l'un dit profil présentent une coupe transversale essentiellement rectangulaire et en ce que ladite portion de tête (6;25) présente une pre-

mière portion de paroi latérale et plane (7;35) entrecroisant l'un (8;33) de deux côtés parallèles et opposés de la portion de l'arbre sous un angle maximum prédéterminé (v) et une portion de paroi cylindrique (9;36) joignant ladite première portion de paroi (7;35) et s'étendant vers le deuxième (11;34) desdits côtés opposés de la portion d'arbre, ladite portion de paroi cylindrique (9;36) ayant son axe au point d'intersection de ladite première portion de paroi latérale (7;35) et l'un dit côté (8;33) de la portion d'arbre (5;23), la longueur de ladite première portion de paroi (7;35) et le rayon de ladite portion de paroi cylindrique (9;35) correspondant à la largeur d'un canal dans le deuxième (2;21) desdits éléments de profile pour établir une liaison stable entre lesdits éléments de profile pour tout angle entre ceux-ci dans un étendue angulaire prédéterminée et limitée par ledit angle maximum (v) par engrenage de surface locale d'une partie de ladite portion de paroi cylindrique (9;36) avec une surface intérieure dudit canal dans ledit deuxième élément de profile.

**2.** Système d'éléments de profile selon la revendication 1, **caractérisé** en ce que la longueur de ladite première portion de paroi (7) de la portion de tête (6) et le rayon de ladite portion de paroi cylindrique (9) correspondent à la largeur (b) de la portion d'arbre (5) entre lesdits côtés opposés parallèles (8,11), la portion de paroi cylindrique s'étendant par une longueur d'un arc de courbe de 90° et joignant le deuxième desdits côtés parallèles et opposés de la portion d'arbre par une deuxième portion de paroi plane (10) de la portion de tête (6) parallèle à ladite première portion de paroi (7).

**3.** Système d'éléments de profile selon la revendication 2, **caractérisé** en ce que ledit angle maximum (v) s'élève à 135°.

**4.** Système d'éléments de profile selon la revendication 1, 2 ou 3, où lesdits deux éléments de profile présentent des profils de section identiques et ont été conçus avec des coupes d'extrémité biseautées pour établir un assemblage d'angle, **caractérisé** en ce que la portion de tête (6) de l'élément de guidage d'insertion (4) est insérée dans ledit canal dans le deuxième (2) desdits deux éléments de profile dans l'embouchure de ceux-ci à la coupe d'extrémité.

**5.** Système d'éléments de profile selon la revendication 1 pour construire des constructions de cadre portantes, système qui comprend au moins un élément de profile de colonne (20) avec lequel une surface d'extrémité forme un assemblage d'angle avec un élément de profile de poutre transversal (21), **caractérisé** en ce que la portion d'arbre (23) de l'élément de guidage d'insertion (22) est fixé dans un canal (24) dans l'élément de profil de colonne (20), tandis que la portion de tête (25) est insérée dans un canal (26) dans l'élément de profile de poutre (21) soit depuis son embouchure à une coupe d'extrémité soit par une ouverture (27) dans une paroi extérieure dudit canal, la portion de tête étant retenue dans l'élément de profile de poutre au moyen d'un engrenage de fermeture.

**6.** Système d'éléments de profile selon la revendication 5, **caractérisé** en ce que l'engrenage de fermeture est pourvu au moyen de trous transversales affleurantes (28,29,30) dans la portion de tête (25) de l'élément de guidage d'insertion et des portions de paroi opposées dudit canal (26) dans l'élément de profile de poutre.

**7.** Système d'éléments de profile selon la revendication 5 ou 6, **caractérisé** en ce qu'entre la portion d'arbre (23) et la portion de tête (25) de l'élément de guidage d'insertion (22), une saillie (31) est formée avec une surface d'épaule (32) qui s'étend entre lesdits côtés opposés (33,34) de la portion d'arbre et forme un angle avec ceux-ci correspondant à l'angle minimum prédéterminé pour ladite étendue d'angle.

**8.** Elément de guidage d'insertion (4;22) à utiliser comme un assemblage d'angle entre deux éléments de profile allongés avec au moins un canal longitudinal comprenant une portion d'arbre essentiellement en forme de bâton (5;23) à insérer avec un ajustage glissant relativement serré dans l'embouchure dudit canal à une coupe dans l'un (1,3; 20) desdits deux éléments de profile et une portion de tête (6;25) formée d'une seule pièce avec la portion d'arbre, **caractérisé** en ce que ladite portion d'arbre (5;23) et ledit canal dans l'un dit profile présentent une coupe transversale essentiellement rectangulaire et en ce que ladite portion de tête (6; 25) présente une première portion de paroi latérale et plane (7;35) entrecroisant l'un (8;33) de deux côtés parallèles et opposés de la portion de l'arbre sous un angle maximum prédéterminé (v) et une portion de paroi cylindrique (9;36) joignant ladite première portion de paroi (7;35) et s'étendant vers le deuxième (11;34) desdits côtés opposés de la portion d'arbre, ladite portion de paroi cylindrique (9;36) ayant son axe au point d'intersection de ladite première portion de paroi latérale (7;35) et l'un dit côté (8;33) de la portion d'arbre (5;23), la longueur de ladite première portion de paroi (7;35) et le rayon de ladite portion de paroi cylindrique (9;35) correspondant à la largeur d'un canal dans le deuxième (2;21) desdits éléments de profile pour établir une liaison stable entre lesdits éléments de profile pour tout angle entre ceux-ci dans une étendue angulaire prédéterminée et limitée par ledit angle maxi-

mum (v) par engrenage de surface locale d'une partie de ladite portion de paroi cylindrique (9;36) avec une surface intérieure dudit canal dans ledit deuxième élément de profile.

**9.** Elément de guidage d'insertion selon la revendication 8, **caractérisé** en ce que la longueur de ladite première portion de paroi (7) de la portion de tête (6) et le rayon de ladite portion de paroi cylindrique (9) correspondent à la largeur (b) de la portion d'arbre (5) entre lesdits côtés opposés parallèles (8,11), la portion de paroi cylindrique s'étendant par une longueur d'un arc de courbe de 90° et joignant le deuxième desdits côtés parallèles et opposés de la portion d'arbre par une deuxième portion de paroi plane (10) de la portion de tête parallèle à ladite première portion de paroi.

**10.** Elément de guidage d'insertion selon la revendication 8 ou 9, **caractérisé** en ce que ledit angle maximum (v) s'élève à 135°.

**11.** Elément de guidage d'insertion selon la revendication 8, **caractérisé** en ce qu'entre la portion d'arbre (23) et la portion de tête (25) de l'élément de guidage d'insertion (22), une saillie (31) est formée avec une surface d'épaule (32) qui s'étend entre lesdits côtés opposés (33,34) de la portion d'arbre et forme un angle avec ceux-ci correspondant à l'angle minimum prédéterminé pour ladite étendue d'angle.

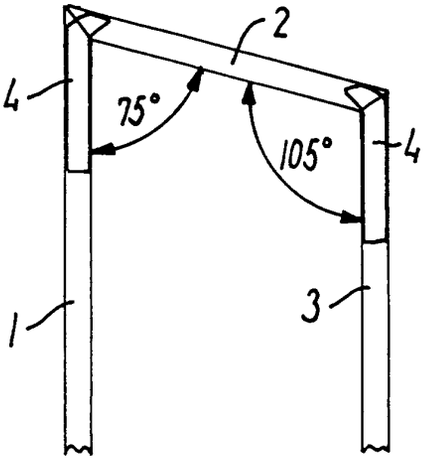


FIG.1

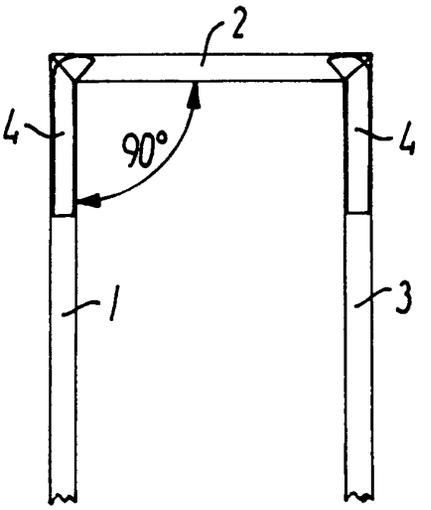


FIG.2

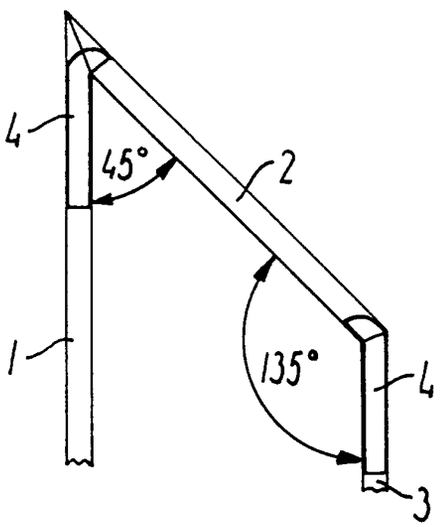


FIG.3

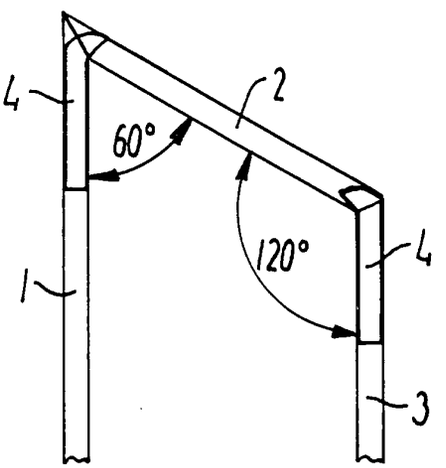


FIG.4

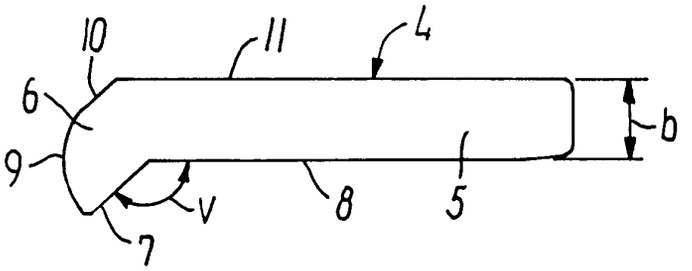


FIG.5

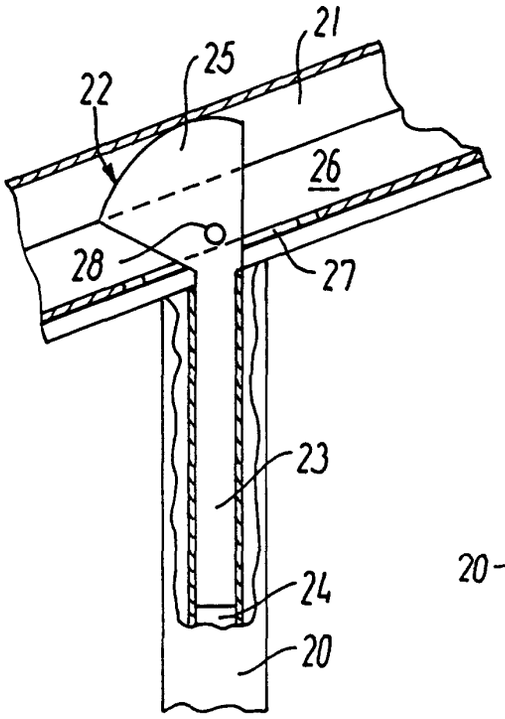


FIG. 6

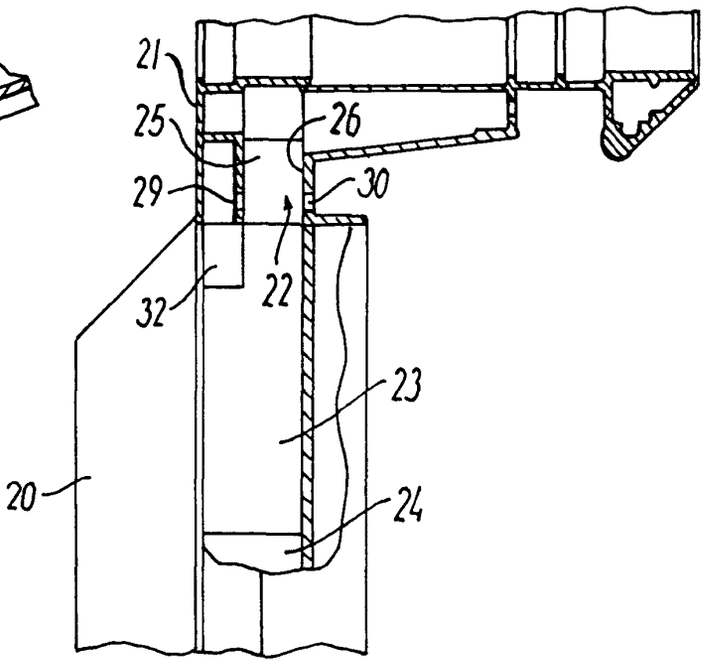


FIG. 7

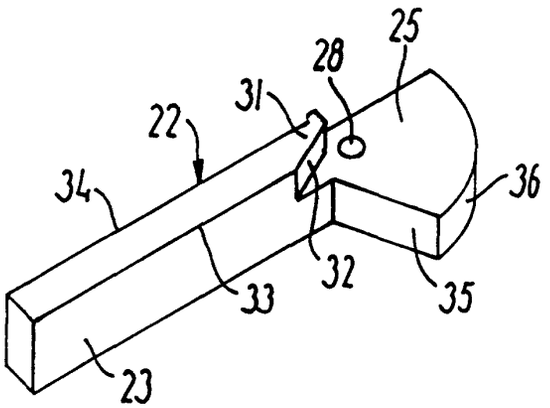


FIG. 8

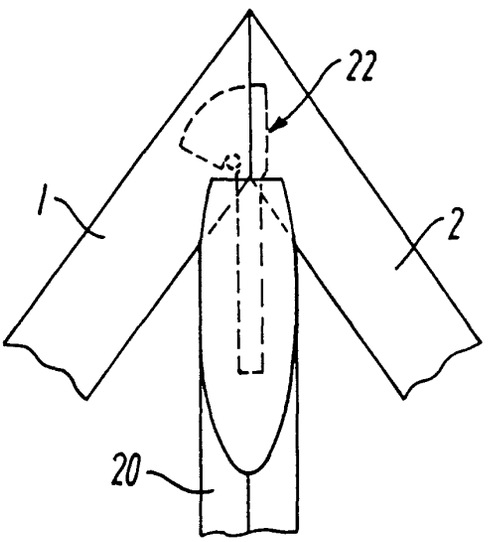


FIG. 9