



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 962 713 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
18.08.2004 Bulletin 2004/34

(51) Int Cl.7: **F24D 19/02**

(21) Application number: **99109336.0**

(22) Date of filing: **31.05.1999**

(54) **Support for radiating panels**

Halterung für Strahlungsheizkörper

Support pour panneaux radiants

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI NL SE
Designated Extension States:
LT LV RO SI

(72) Inventor: **Bordignon, Pietro Luigi**
36061 Bassano Del Grappa (IT)

(30) Priority: **02.06.1998 IT PD980140**

(74) Representative: **Modiano, Guido, Dr.-Ing. et al**
Modiano & Associati SpA
Via Meravigli, 16
20123 Milano (IT)

(43) Date of publication of application:
08.12.1999 Bulletin 1999/49

(56) References cited:
DE-A- 19 624 586 **DE-A- 19 701 103**

(73) Proprietor: **MB S.r.l.**
I-36061 Bassano del Grappa (Vicenza) (IT)

EP 0 962 713 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention relates to a support for radiating panels.

[0002] Conventional supports for radiating panels are substantially constituted by an upright with means for resting on the ground or for cantilevered fixing and means for fixing to the radiating panel.

[0003] One of these supports is disclosed in PCT/EP96/01026.

[0004] Therein a tubular upright is disclosed to be inserted between the shaped regions of the convection lamina of a radiating panel that form two vertical tubular air passage gaps.

[0005] A sleeve is slidably coupled to the tubular upright in a downward region and supports one or two wings to be inserted in the gaps which are located adjacent to the upright when installed.

[0006] A screw acts between the sleeve and the upright and engages a through hole of the sleeve which is perpendicular to the plane of arrangement formed by the radiating panel; said screw mutually divaricates the wing or wings and the upright at right angles to the plate, so that the upright is pushed toward the plate and the wing or wings are pushed in the opposite direction and therefore against the wall of the corresponding gap.

[0007] The support has the drawback that the divaricating action between the upright and the wing or wings associated therewith entails a traction between the convection laminae that form the gaps and the heating body that constitutes the panel in the regions where they are mutually joined, usually by spot welding.

[0008] Traction is applied in particular to the joining portions that lies opposite with respect to the support.

[0009] Owing to the fact that the spot welding is not particularly strong, because it is provided merely to keep the convection lamina joined to the heating body, the traction due to the divarication of the components of the support may easily lead to the separation of the spot welds.

[0010] Moreover, the traction in any case produces a deformation of the shape of the gaps, accordingly ruining their painting and causing rust formation

[0011] The preamble of claim 1 is derived from DE-A-19 701 103.

[0012] The aim of the present invention is to provide a support for radiating panels which eliminates the above drawbacks of conventional supports.

[0013] Within the scope of this aim, a primary object is to provide a support for radiating panels whose action is applied without subjecting the components of the panel to stresses.

[0014] Another important object is to provide a support whose action is applied without deforming the components of the panel.

[0015] Another important object is to provide a support which is particularly handy and simple to use.

[0016] Another object is to provide a support which is

constructively simple and can be manufactured at a low cost with conventional equipment and machines.

[0017] This aim, these objects and others which will become apparent hereinafter are achieved by a support for radiating panels according to claim 1.

[0018] Further characteristics and advantages of the invention will become apparent from the detailed description of an embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a support according to the invention, fixed to a radiating panel;

Figure 2 is a side view of the support of Figure 1;

Figure 3 is an exploded perspective view of the support of Figure 1;

Figure 4 is a top view of the support of Figure 1, fixed to the panel;

Figure 5 is a vertical sectional view of the panel of Figure 1, with the support fixed thereto;

Figure 6 is an enlarged-scale view of a detail of the support of Figure 1;

Figure 7 is a top view of a different constructive embodiment of the support.

[0019] With reference to the above Figures 1 to 6, a support for radiating panels comprises an upright 10, which in this case is welded below a plate 11 for resting on the ground but can be provided with cantilevered fixing means of the bracket type or the like, and means for fixing to the radiating panel 12 which are generally designated by the reference numeral 13.

[0020] The radiating panel 12, in this case, is of the type constituted by a platelike heating body 14 to which a convection lamina 15 is spot-welded on one face; said lamina is shaped so as to form a plurality of vertical corrugations which form gaps 16 having a quadrangular cross-section, particularly for example a trapezoidal one.

[0021] According to the invention, the upright 10 is telescopic and is constituted in practice by two tubular elements, respectively designated by the reference numerals 17 and 18, which have for example a rectangular cross-section and are inserted in each other.

[0022] The two elements 17 and 18 are associated by screws 19 which act between them so as to produce mutual locking.

[0023] According to the invention, the means for fixing to the panel 12 further comprise two elements 20 and 21 which are mutually articulated by means of a threaded pivot 22 and form respective contoured jaws which are designated by the same reference numerals 20 and 21.

[0024] In particular (Figure 3), the first jaw 20 is constituted by an elongated lamina 23 which is shaped, by subjecting a metal plate to blanking and plastic deformation, so as to have a cross-section which is omega-shaped over most of its extension.

[0025] In the omega-shaped part, the jaw 20 therefore has two co-planar flaps or wings 24 and 25.

[0026] Moreover, the lamina 23 is butt-welded, with a U-shaped portion 23a, to the tubular element 17 of the upright 10 and is therefore axially rigidly coupled thereto.

[0027] The jaw 21 is instead constituted, in this case, by two parallel blades 26 and 27 which are joined one another by a U-shaped portion 28 which is monolithic therewith, the assembly being obtained by subjecting a metal plate to blanking and plastic deformation.

[0028] In particular, the U-shaped portion 28 is arranged in the portion 23a of the jaw 21 and has a flat portion 29 which is perpendicular to the blades 26 and 27 and is crossed by a through hole 30

[0029] . The two blades 26 and 27 are arranged so that the jaw 20 is located therebetween and so that they cooperate with the flaps 24 and 25.

[0030] A screw 31 passes through the through hole 30 and engages a diametrical threaded hole 32 of a cylindrical pivot 33 which is inserted in holes 34 between the wings of the U-shaped portion 23a of the jaw 20.

[0031] The shape of the jaws 20 and 21 causes them to be first-class levers which therefore have a centrally located fulcrum.

[0032] As regards operation, the jaw 20 is arranged outside the radiating panel 12 between two adjacent gaps 16, while the blades 26 and 27 of the jaw 21 are inserted in said gaps 16.

[0033] By tightening the screw 31, the convection lamina 15 is clamped between the blades 26 and 27, which act edgewise, and the flaps 24 and 25.

[0034] It is therefore evident that no stress is induced between the convection lamina 15 and the heating body 14 and that no deformation stress is induced on the lamina 15.

[0035] With reference now to the above-cited Figure 7, in a different constructive embodiment the regions with which the blades 26 and 27 and the flaps 24 and 25 make contact with a convection lamina 15 can be continuously or partially covered with a trim

[0036] . In particular, said trim can be constituted by a U-shaped element which is cut to size and placed so as to straddle the edges of the blades 26 and 27 and of the flaps 24 and 25 so as to form the elements designated by the reference numerals 35, 36, 37 and 38 in Figure 7.

[0037] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A support for radiating panels comprising an adjustable upright (10) with means for resting on the ground or for cantilevered fixing and a radiating panel (12) comprising a heating body (14) and a convection lamina (15) fixed to it, **characterized in that** said upright (10) comprises means in form of an articulated jaw comprising a second jaw (21) with two blades (26, 27) and a first jaw (20) with two coplanar flaps or wings (24, 25) to fix said radiating panel (12), a centrally located fulcrum (22) about which the second jaw (21) can pivot and a cylindrical pivot (33) to allow by means of a screw (31) to urge the blades (26, 27) of said second jaw (21) tightly to the flaps or wings (24, 25) to press by means of the blades (26, 27) the convection lamina (15) of the radiation panel (12) onto the flaps or wings (24, 25).
2. A support according to claim 1, **characterized in that** said upright (10) is telescopic and constituted by two tubular (17, 18) elements which have a quadrangular cross-section, are inserted in each other and can be mutually locked by means of at least one screw (19).
3. A support according to claim 1, **characterized in that** a first jaw of said shaped jaws (20) comprises an elongated element (23) which is constituted by a lamina having an omega-shaped cross-section.
4. A support according to claim 3, **characterized in that** said first jaw (20) is butt-welded, by means of a U-shaped end portion (23a), to said telescopic upright (10).
5. A support according to claim 1, **characterized in that** a second jaw (21) of said shaped jaws is constituted by two parallel blades (26, 27) which are joined by a U-shaped portion at one end, said U-shaped portion (28) having a flat region (29) with a through hole (30) for said screw (31).
6. A support according to claim 1, **characterized in that** the mutual articulation of said jaws (20, 21) is provided by means of said cylindrical pivot (33).
7. A support according to claim 4, **characterized in that** the articulation between said jaws (20, 21) is provided at said U-shaped portion (23a) of said first jaw (20).
8. A support according to claim 5, **characterized in that** said blades (26, 27) of said second jaw (21) cooperate to the fastening action with flaps (24, 25) of said first jaw (20) formed by said omega-shaped cross-section of said first jaw (20).

9. A support according to claim 5, **characterized in that** said screw (31) passes through said through hole (30) of said U-shaped element (28) and engages a diametrical threaded hole (32) of said cylindrical pivot (33) which is inserted in holes (34) between the wings (24, 25) of the U-shaped portion (23a) of said first jaw (20).
10. A support according to claim 3, **characterized in that** said first jaw (20) is joined axially to said upright (10).
11. A support according to one or more of the preceding claims, **characterized in that** the regions by means of which said blades (26, 27) of said second jaw (21) and said flaps (24, 25) of said first jaw (20) make contact with said convection lamina (15) are continuously or discontinuously covered by a trim.

Patentansprüche

1. Halterung für Heizplatten, umfassend eine verstellbare Konsole (10) mit Mitteln zur Auflage am Boden oder zur freitragenden Befestigung, und eine Heizplatte (12), die einen Heizkörper (14) und eine an diesem befestigte Konvektionsschicht (15) umfasst, **dadurch gekennzeichnet, dass** die Konsole (10) Mittel in Form einer Gelenkbacke, die eine zweite Backe (21) mit zwei Blättern (26, 27) und eine erste Backe (20) mit zwei koplanaren Klappen oder Flügeln (24, 25) zum Befestigen der Heizplatte (12) umfasst, einen zentral angeordneten Drehpunkt (22), um den sich die zweite Backe (21) drehen kann, und einen zylindrischen Zapfen (33) umfasst, um mittels einer Schraube (31) zu ermöglichen, die Blätter (26, 27) der zweiten Backe (21) fest gegen die Klappen oder Flügel (24, 25) zu drängen, um mittels der Blätter (26, 27) die Konvektionsschicht (15) der Heizplatte (12) auf die Klappen oder Flügel (24, 25) zu drücken.
2. Halterung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Konsole (10) teleskopisch ist und aus zwei rohrförmigen Elementen (17, 18) besteht, die einen viereckigen Querschnitt haben, ineinander geschoben sind und mittels zumindest einer Schraube (19) miteinander verriegelt werden können.
3. Halterung nach Anspruch 1, **dadurch gekennzeichnet, dass** die erste Backe der geformten Backen (20) ein längliches Element (23) umfasst, das aus einer Schicht besteht, die einen omegaförmigen Querschnitt hat.
4. Halterung nach Anspruch 3, **dadurch gekennzeichnet, dass** die erste Backe (20) mittels eines

U-förmigen Endabschnitts (23a) an die teleskopische Konsole (10) stumpfgeschweißt ist.

5. Halterung nach Anspruch 1, **dadurch gekennzeichnet, dass** die zweite Backe (21) der geformten Backen aus zwei parallelen Blättern (26, 27) besteht, die durch einen U-förmigen Abschnitt an einem Ende verbunden sind, wobei der U-förmige Abschnitt (28) einen flachen Bereich (29) mit einem Durchgangsloch (30) für die Schraube (31) hat.
6. Halterung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Backen (20, 21) mittels des zylindrischen Zapfens (33) gelenkig miteinander verbunden sind.
7. Halterung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Gelenkverbindung zwischen den Backen (20, 21) an dem U-förmigen Abschnitt (23a) der ersten Backe (20) vorgesehen ist.
8. Halterung nach Anspruch 5, **dadurch gekennzeichnet, dass** die Blätter (26, 27) der zweiten Backe (21) mit Klappen (24, 25) der ersten Backe (20) zu der Befestigungswirkung beitragen, die durch den omegaförmigen Querschnitt der ersten Backe (20) gebildet sind.
9. Halterung nach Anspruch 5, **dadurch gekennzeichnet, dass** die Schraube (31) durch das Durchgangsloch (30) des U-förmigen Elements (28) tritt und in ein diametrales Gewindeloch (32) des zylindrischen Zapfens (33) greift, der in Löcher (34) zwischen den Flügeln (24, 25) des U-förmigen Abschnitts (23a) der ersten Backe (20) eingesetzt ist.
10. Halterung nach Anspruch 3, **dadurch gekennzeichnet, dass** die erste Backe (20) axial mit der Konsole (10) verbunden ist.
11. Halterung nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Bereiche, mittels derer die Blätter (26, 27) der zweiten Backe (21) und die Klappen (24, 25) der ersten Backe (20) mit der Konvektionsschicht (15) in Kontakt treten, durchgehend oder unterbrochen mit einem Rand bedeckt sind.

50 Revendications

1. Support pour panneau radiant comprenant un montant ajustable (10) ayant des moyens pour prendre appui sur le sol ou, pour se fixer en cantilever et un panneau radiant (12) comprenant un corps chauffant (14) et une feuille de convection (15) fixée à celui-ci,
caractérisé en ce que ledit montant (10) comprend

- des moyens en forme de mâchoire articulée comprenant une seconde mâchoire (21) ayant deux branches (26, 27) et une première mâchoire (20) ayant deux ailes ou pans coplanaires (24, 25) pour assujettir ledit panneau radiant (12); un point d'articulation (22) situé de manière centrale sur lequel la seconde mâchoire (21) peut pivoter et un pivot cylindrique (33) pour permettre au moyen d'une vis (31) de presser les branches (26, 27) de ladite seconde mâchoire (21) de manière serrée contre les ailes ou pans (24, 25) afin d'appuyer au moyen des branches (26, 27) la feuille de convexion (15) du panneau de radiation (12) contre les ailes ou les pans (24, 25).
2. Support selon la revendication 1, **caractérisé en ce que** ledit montant (10) est télescopique et constitué par deux éléments tubulaires. (17, 18) qui présentent une section transversale quadrangulaire, sont insérés l'un dans l'autre et peuvent être bloqués mutuellement par l'intermédiaire d'au moins une vis (19).
3. Support selon la revendication 1, **caractérisé en ce que** une première mâchoire, parmi lesdites mâchoires profilées (20) comprend un élément allongé (23) qui est constitué par une feuille présentant une section transversale profilée en oméga.
4. Support selon la revendication 3, **caractérisé en ce que** ladite première mâchoire (20) est soudée en bout, par l'intermédiaire d'une partie d'extrémité (23a) profilée en U, sur ledit montant télescopique (10).
5. Support. selon la revendication 1, **caractérisé en ce qu'**une seconde mâchoire (21) parmi lesdites mâchoires profilées est constituée par deux branches parallèles, (26, -27) qui sont assemblées par une partie profilée en U à une extrémité, ladite partie (28) profilée en U présentant une région plate (29) avec un trou traversant (30) pour ladite vis (31).
6. Support, selon la revendication 1, **caractérisé en ce que** l'articulation mutuelle des dites mâchoires (20, 21) est prévue au moyen dudit pivot cylindrique (33).
7. Support selon la revendication 4, **caractérisé en ce que** l'articulation entre lesdites mâchoires (20, 21) est prévue à ladite partie (23a) profilée en U de ladite première mâchoire (20).
8. Support selon la revendication 5, **caractérisé en ce que** lesdites branches (26, 27) de ladite seconde mâchoire (21) coopèrent à faction d'assemblage avec des pans (24, 25) de ladite première mâchoire (20) formés par ladite section transversale profilée en oméga de ladite première mâchoire (20).
- 5 9. Support selon la revendication 5, **caractérisé en ce que** ladite vis (31) passe à travers ledit trou traversant (30) dudit élément (28) profilé en U et s'engage dans, un trou diamétral, fileté (32) dudit pivot cylindrique (33) qui est inséré dans des trous (34) entre les ailes (24, 25) de la partie (23a) profilée en U de ladite première mâchoire (20).
- 10 10. Support selon la revendication 3, **caractérisé en ce que** ladite première mâchoire (20) est assemblée axialement sur ledit montant (10).
- 15 11. Support selon l'une ou plusieurs des revendications précédentes, **caractérisé en ce que** les régions par l'intermédiaire desquelles lesdites branches (26, 27) de ladite seconde mâchoire (21) et lesdits pans (24, 25) de ladite première mâchoire (20) prennent contact avec ladite feuille de convexion (15) sont couvertes de manière continue ou discontinue par une garniture.
- 20 25 30 35 40 45 50 55

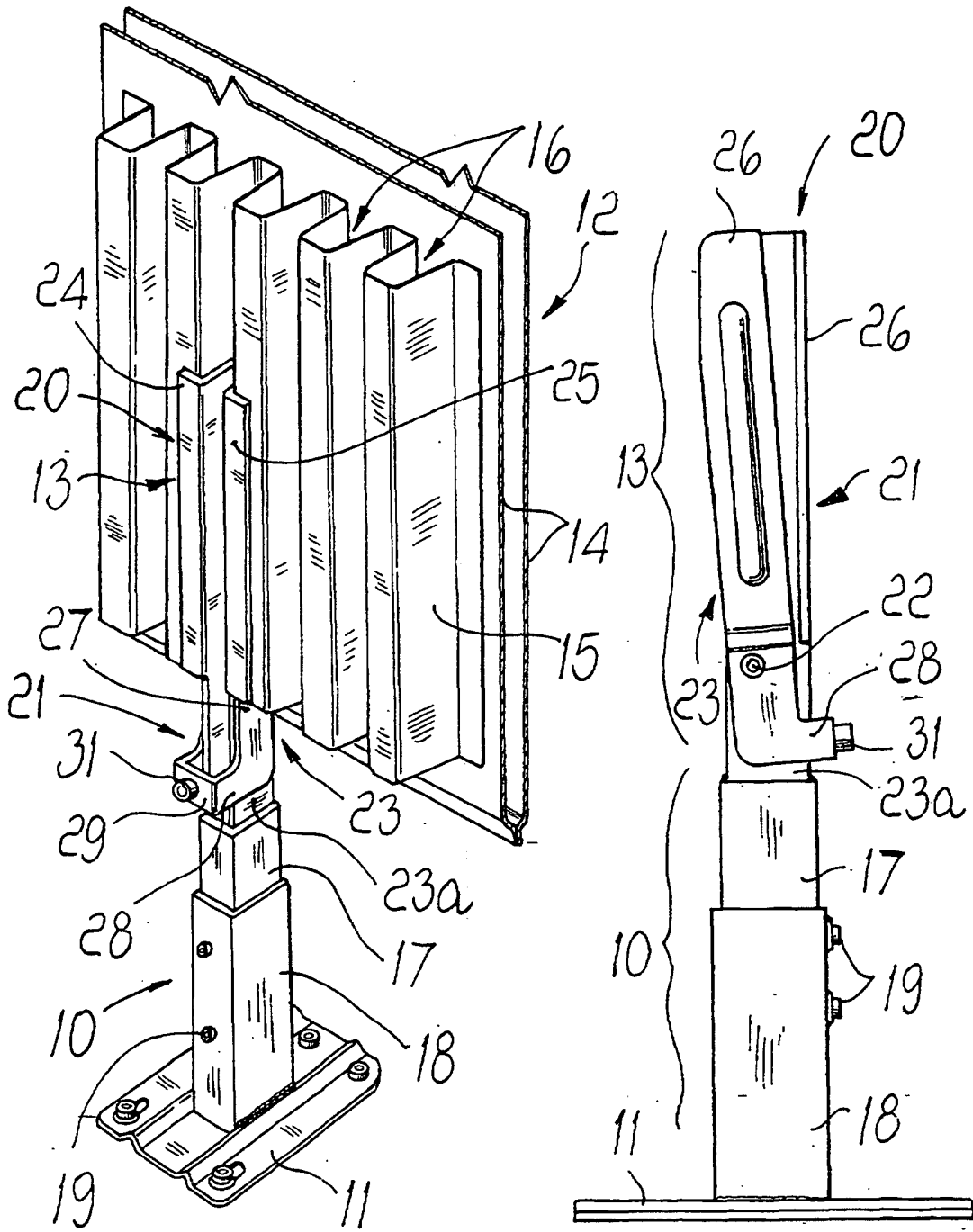
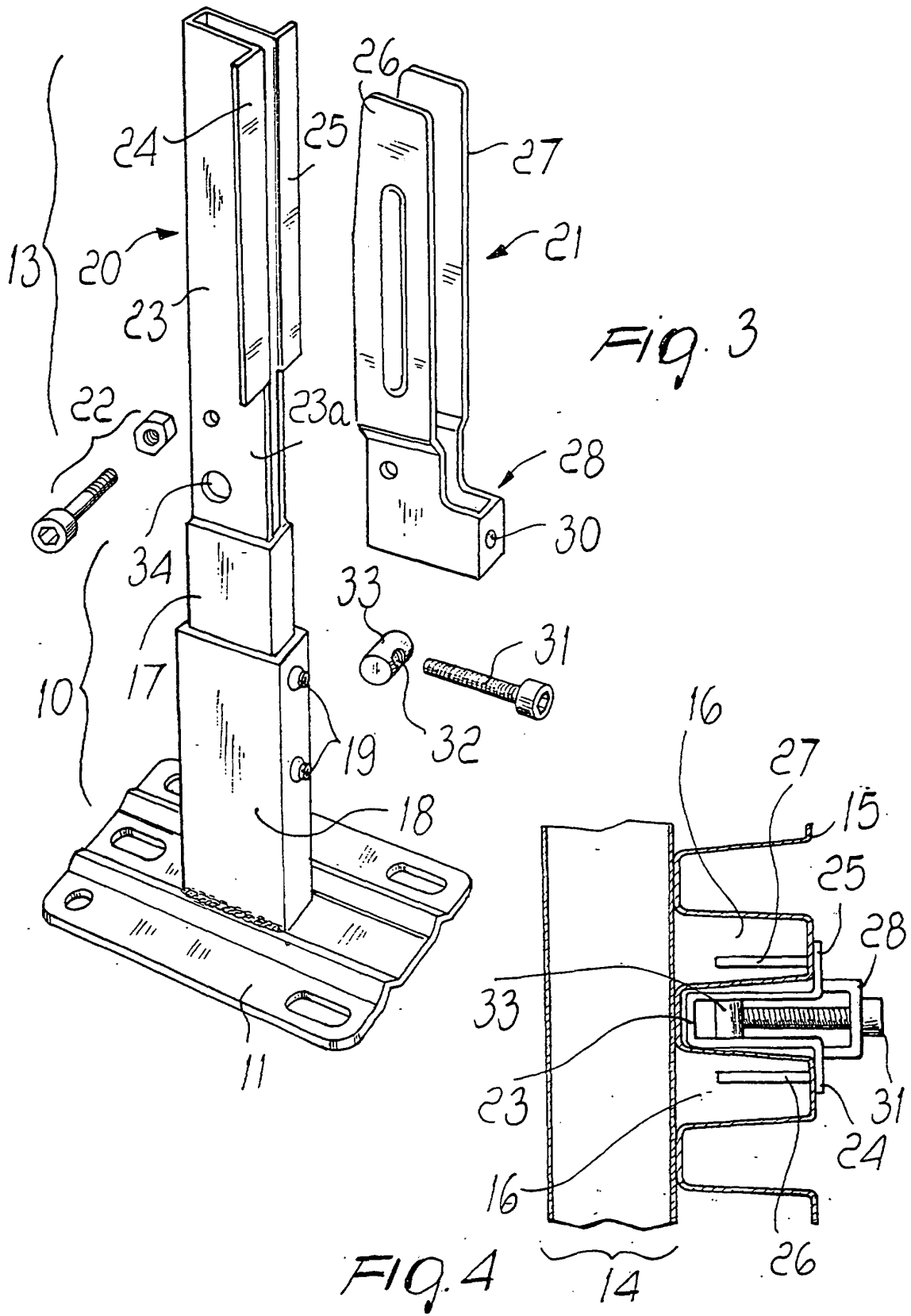


FIG. 1

FIG. 2



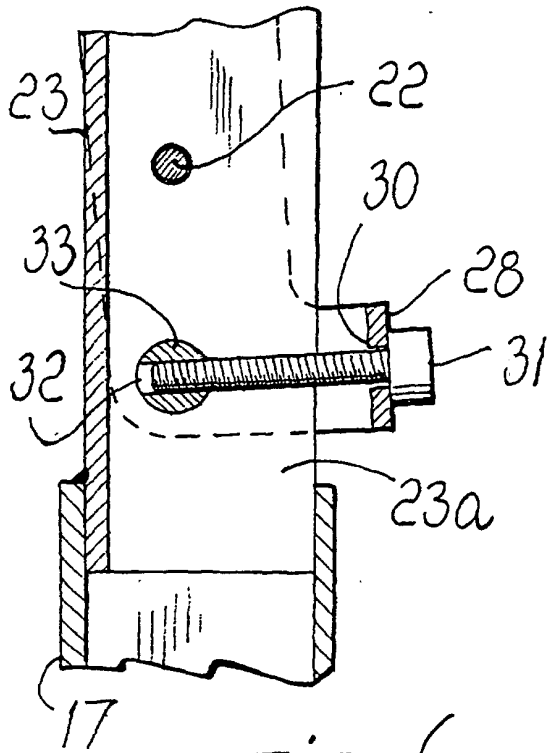


Fig. 6

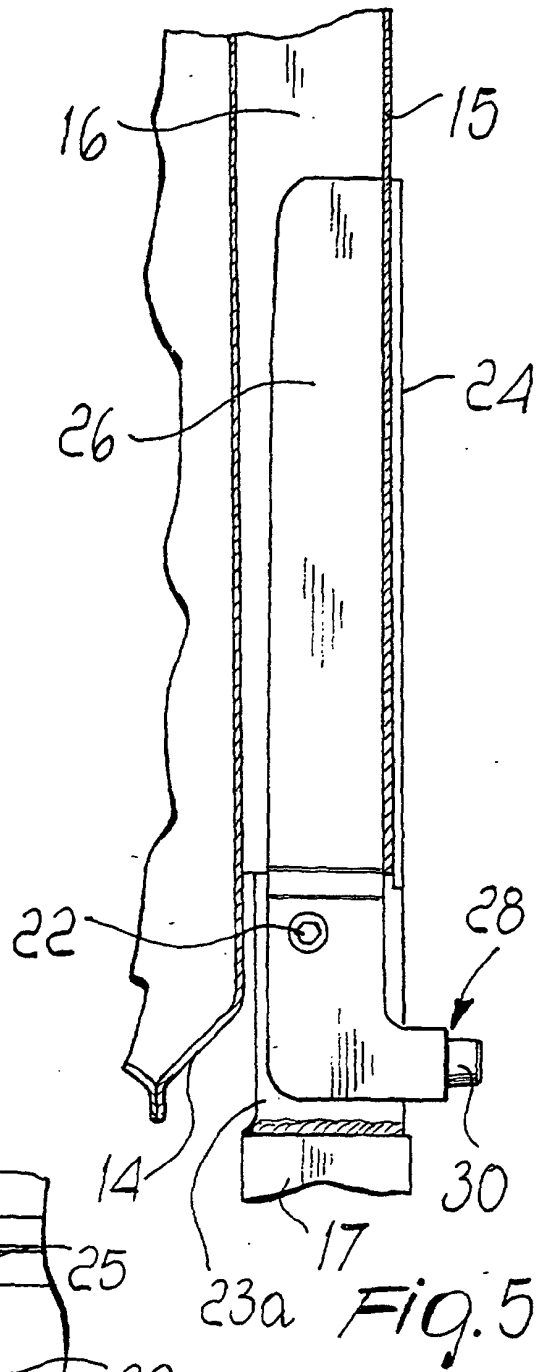


Fig. 5

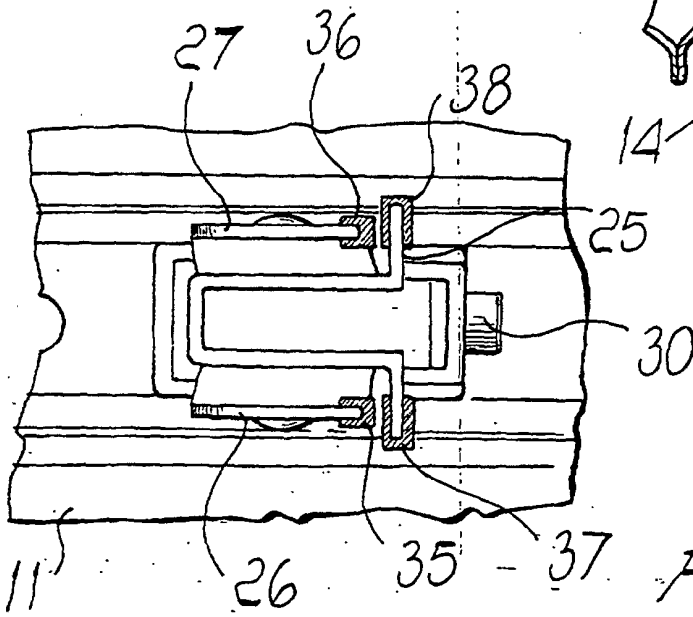


Fig. 7