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(54) Ceiling panel system.

(57) A ceiling panel system comprising a plurality of intersecting grid members (12, 14) defining a plurality of open, cells (16), said grid members (12, 14) intersecting on a combined upper and lower level and including a first upper set of parallel elongate upper grid members (12) spanning two or more cells, a second set of parallel elongate lower grid members (14) extending at an angle to said first set and located therebelow and spanning two or more cells, in that a plurality of upper grid elements (20) are mounted above each grid member (14) of the second set, to form a continuation thereof and extending between or beyond adjacent upper grid members (12) of the first set and in that a plurality of lower grid elements (22) are mounted below each grid member (12) of the first set, to form a continuation thereof and extending between or beyond adjacent grid members (14) of the second set.

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CEILING PANEL SYSTEM

DESCRIPTION

The present invention relates to a ceiling panel system comprising a plurality of intersecting grid members defining a plurality of open, cells.

Various such decorative ceilings have been proposed. For example, such a construction is illustrated in British Patent No. 1,472,285 wherein elongate grid members are formed of channel cross-section members usually of aluminium or steel. These members are provided with various cutout or notch portions in the sides of the channels which cooperate with one another to enable the various elements to be interlocked with one another.

A further construction is illustrated, for example, in British Specification No. 1,429,488 in which the grid members are mounted at two different levels.

The structures of the prior art are relatively expensive to manufacture and assemble.

It is now proposed, according to the present invention, to provide a ceiling panel system comprising a plurality of intersecting grid members defining a plurality of open, cells, said grid members intersecting on a combined upper and lower level and including a first upper set of parallel elongate upper grid members spanning two or more cells, a second set of parallel elongate lower grid members extending at an angle to said first set and located therebelow and spanning two or more cells, a plurality of upper grid elements mounted above each grid member of the second set, to form a continuation thereof and extending between or beyond adjacent upper grid members of the first set and a plurality of lower grid elements mounted below each grid member of the first set, to form a continuation thereof and extending between or beyond adjacent grid members of the second set.

The above structure can be made very simply and the various members can be held together in an easy, cheap and effective manner. It is furthermore possible to produce a two tone or multitone colour combination of the various parts in an easy manner.

Preferably, the upper and lower elongate grid members and the upper and lower grid elements are each in the form of channel section profiles and, in order to provide a solid appearance to the panel system when viewed from below, the lower grid members and the lower grid elements are arranged with the web of the channel at the bottom. The upper grid members and upper grid elements may also be arranged with the web and the channel at the bottom, but preferably the web of the channel is at the top.

The channel section members may each be provided with inturned rims on the free ends of the side walls of the channel, the rims of the upper grid members and the lower grid elements and the rims of the upper grid elements and the lower grid members respectively overlying one another, clips being provided to engage and hold together the overlying rims. This is a very simple and cheap way of holding the grid members and grid elements together. Advantageously, the clips include on each side, at least one upper lug and at least one lower lug, an upper lug on one side being offset, in the longitudinal direction of the associated channel section members, from a lower lug on the other side of the clip.

Retaining means are preferably provided at at least some of the cross-over points, where the upper grid members pass over and intersect the lower grid members, these serving to retain the relative positions of the members at the cross-over points. These retaining means may, for example, be square plates with four tabs extending from each of four sides of the square, the tabs being turned to engage the adjacent grid members.

In an alternative construction the retaining means

comprise a body provided with notches at three spaced locations, a notch at one location engaging one rim of a first grid member and notches at two other locations engaging the other rim of the first grid member and both rims of the second grid member at that cross over point. Preferably there are two notches at each of said two other locations arranged at two different levels of the body of said retaining means, one of which is at the same level as the notch engaging the one rim of said first grid member, the two notches at said one level engaging the other rim of said first grid member, and the two notches at the other level engaging the rims of a second grid member.******

To save expense, the retaining means may be derived so that they can.

Advantageously, at least some of the grid members and/or grid elements have a different surface finish, for example, colour, from at least some of the grid elements and/or grid members. In this way one can produce a relatively cheap different decorative effect by altering the combinations of the different coloured or finished parts.

The dimensions of the grid members and of the grid elements and/or the construction and arrangement is preferably such that the common plane to the webs of the lower grid elements is parallel with, and spaced above the common plane through the webs of the lower grid members. This provides a pleasing decorative appearance.

A cross-section of the lower grid members and grid elements is advantageously identical and the lower grid elements may be spaced below the upper grid members and the grid elements are mounted in abutment with the associated upper grid members respectively. The grid ceiling panel system may be supported by supporting means on one side fixed to a structure and on the other side connected to the upper grid members.

In order that the invention may more readily be understood, the following description is given, merely by

way of example, reference being made to the accompanying drawings, in which:-

Figure 1 is a perspective view from below of one embodiment of ceiling panel system according to the present invention;

Figure 2 is a fragmentary perspective view showing the method of connecting a grid member and a grid element;

Figure 3 is a fragmentary perspective view showing the retaining together of two grid members at a crossover point;

Figure 4 is a schematic fragmentary sectional view showing one way of supporting the ceiling system;

Figure 5 is a view similar to Figure 4 showing another arrangement of the channel section members;

Figure 6 is a perspective view of a second form of retaining element for use as a crossover point of two grid members;

Figure 7 is a perspective view showing the retaining element of Figure 6 on position in two grid members, which are shown partly broken away; and

Figure 8 is a perspective view of a further embodiment of clip for holding a grid element to a grid member.

Referring first to Figure 1, the ceiling grid indicated by the general reference numeral 10 includes first set of parallel elongate upper grid members 12 and a second set of parallel elongate lower grid members 14 arranged at right angles to the first set and defining therewith rectangular cells 16. The members 12 and 14 in fact span two or more cells 16. The thus formed assembly is held up, in the construction illustrated, by supports 18 suspended from the ceiling 19.

Mounted on top of each lower grid member 14 are upper grid elements 20. Similarly, mounted below each upper grid member 12 are lower grid elements 22. The grid elements have the length equal to the internal dimension of the associated cell 16.

Each of the upper grid members is of channel

cross-section comprising side walls 24 and 25 having inturned rims 26 and 27, the side walls being joined by webs 28. Similarly, the lower grid members comprise side walls 29 and 30 with rims 31 and 32, the side walls being joined by webs 33. Again, the upper grid elements are of identical channel cross-section and comprise side walls 34, 35, rims 36, 37 and webs 38 while the lower grid elements comprise side walls 39, 40, rims 41, 42 and webs 43.

In the construction illustrated the cross-over points 45 (see Figure 3) have generally square retaining plates 47 mounted between the upper and lower grid elements, these retaining plates including tabs 46 which engage the exterior of the channel section members, and thereby retain their relative positions at the cross-over points 45.

Again as illustrated, the channel section lower grid members 14 and lower grid elements 22 have their webs 33 and 43, respectively, at the bottom, while the upper grid members 12 and upper grid elements 20 have their webs 28 and 33 at the top so that the rims 36, 37 overlie the rims 31, 32 and the rims 26, 27 overlie the rims 41, 42. In order to retain the grid elements on the associated grid members, clips 48 (Figure 2) are provided, these being of a spring construction and including a bowed part 50 and an outwardly extending legs 52 forming therebetween, on each side, a re-entrant 53. The clip is arranged, as can be seen in Figure 2, so that the re-entrants 53 engage over the rims and thereby hold the grid elements to the grid members.

It will be noted that the web portions of the grid members and grid elements are all joined to the side wall portions thereof by radiussed or curved parts 55. If the webs of the lower grid members were arranged to be flush with the webs of the lower grid elements, then a gap would appear adjacent these curved parts 55. It is preferred, therefore, to have the webs 43 of the lower grid elements, arranged so that they are flush with a straight portion, that is above the curved part 55, of the adjacent side wall

of a lower grid member. This can be achieved, for example, by placing a spacer 56 between the rims of the upper and lower grid elements at the crossover points 45, and the spacer could, in fact, be formed by rather thicker retaining plates 44 or an element mounted thereon.

Figure 5 shows a somewhat modified arrangement in which the upper grid members and upper grid elements are arranged with the webs thereof at the bottom, as with the lower grid members and elements. In the illustrated construction tabs 60 in the webs 28 of the upper grid members are engaged by the rims 41, 42 of the lower grid members.

Figure 6 illustrates a further form of retaining element 70 having two arms 70a, 70b, extending approximately at right angles to one another. At the junction of the two arms the body 61 is provided with two notches 72, 73 and at the free ends of the arms 70a, 70b there are two more notches 74, 75 and 76, 77 respectively. This retaining element can be made out of a punched and stamped sheet of metal. In use, as shown in Figure 7, the notch 72 shown engaged with the inturned rim 26 of the upper grid member 12 and the upper notches 74, 76 on the arms 71a, 71b are shown engaged in the other rim 27 of the upper grid member 12. The lower notches 75, 77, are shown engaged with the inturned rims 31, 32 of the lower grid member 14. Because the upper notches 74, 76 are spaced from the lower notches 75, 77, the grid members 12, 14 are spaced from one another as in the earlier construction as shown in Figure 4. It is possible, of course, to have only a single notch in place of these double notches in which case the rims will be held into contact with one another.

Figure 8 shows a different form of clip for holding a grid element to a grid member, the clip 65 being formed of a plastics material as a U-shaped member, the web of the U being strengthened by a ridge 66. Each arm of the body 65 is provided with at least one upper lug 67 and at least one

lower lug 68, these being of arcuate ramp-like shape and being spaced from one another by approximately the thickness of two rims so that the rims of a grid element are firmly held against the rims of a grid member. The upper lug or lugs 67 on each arm of the U is spaced from the lower lug or lugs 68 on the other arm of the U, in the longitudinal direction of the channel members which are being held by the clip.

Other fixing arrangements could be provided, of course. It is also contemplated that instead of having a channel cross-section as illustrated, the grid members and grid elements could have other shapes, for example the grid members being cylindrical and the grid elements part-cylindrical.

CLAIMS

1. A ceiling panel system comprising a plurality of intersecting grid members (12,14) defining a plurality of open, cells (16), said grid members (12,14) intersecting on a combined upper and lower level and including a first upper set of parallel elongate upper grid members (12) spanning two or more cells, a second set of parallel elongate lower grid members (14) extending at an angle to said first set and located therebelow and spanning two or more cells, characterised in that a plurality of upper grid elements (20) are mounted above each grid member (14) of the second set, to form a continuation thereof and extending between or beyond adjacent upper grid members (12) of the first set and in that a plurality of lower grid elements (22) are mounted below each grid member (12) of the first set, to form a continuation thereof and extending between or beyond adjacent grid members (14) of the second set.

2. A ceiling panel system according to claim 1, characterised in that the upper and lower elongate grid members (12,14) and the upper and lower grid elements (20,22) are each in the form of channel section profiles.

3. A ceiling panel system according to claim 2, characterised in that the lower grid members (14) and the lower grid elements (22) are arranged with the web (33,43) of the channel at the bottom, to give the grid members of the panel system a solid appearance as viewed from below.

4. A ceiling panel system according to claim 3, characterised in that the upper grid members (12) and the upper grid elements (20) are arranged with the web (28,38) of the channel at the top.

5. A ceiling panel system according to claim 4, characterised in that the channel section members are each provided with inturned rims (26,27,31,32,36,37,41,42) on the free ends of the side walls (24,25,29,30,34,35,39,40) of the channel, the rims (26,27,41,42) of the upper grid members (12) and of the lower grid elements (22) and the rims (36,37,31,32) of the upper grid elements (20) and of the lower grid members (14) respectively overlying one another, and that clips (48,65) are provided to engage and hold together said overlying rims.

6. A ceiling panel system according to claim 5, characterised in that said clips (65) include, on each side, at least one upper lug (67) and at least one lower lug (68), an upper lug (67) on one side being offset, in the longitudinal direction of the associated channel section members, from a lower lug (68) on the other side of the clip (65).

7. A ceiling panel system according to any preceding claim, characterised in that retaining means (47,70) are provided at at least some of the cross-over points (45) where the upper grid members (12) pass over and intersect the lower grid members (14), to retain the relative positions of said members at said cross-over points.

8. A ceiling panel system according to claim 7, when dependent on claim 5 or 6, characterised in that said retaining means (71) comprise a body provided with notches (72-77) at three spaced locations, a notch (72) at one location engaging one rim of a first grid member and notches (74-77) at two other locations engaging the other rim of the first grid member and both rims of the second grid member at that cross over point.

9. A ceiling panel system according to claim 8,

characterised in that there are two notches (74-77) at each of said two other locations arranged at two different levels of the body of said retaining means, one of which is at the same level as the notch (72) engaging the one rim of said first grid member, the two notches (74,76) at said one level engaging the other rim of said first grid member, and the two notches (75,77) at the other level engaging the rims of a second grid member.

10. A ceiling panel system according to claim 8, when appendant to claim 6, characterised in that the retaining means can also serve as the clips which serve to hold the rims of grid elements to the rims of grid members.

11. A ceiling panel system according to any preceding claim, characterised in that at least some of the grid members and/or grid elements have a different surface finish from at least some of the grid elements and/or grid members.

12. A ceiling panel system according to any preceding claim, characterised in that the dimensions of the grid members (12,14) and lower grid elements (22) and/or the constructional arrangement is such that the common plane through the webs (43) of the lower grid elements (22) is parallel with and spaced above the common plane through the webs (33) of the lower grid members (14).

13. A ceiling panel system according to claim 12, characterised in that the cross-section of the lower grid members (14) and lower grid elements (22) are identical and the lower grid members (14) are spaced below the upper grid members (12) and in that the lower grid elements (22) are mounted in abutment with the associated upper grid members (12) respectively.

14. A ceiling panel system according to any of the preceding claims, characterised in that the grid ceiling panel system is supported by supporting means (18) on one side fixed to a structure (19) and on the other side connected to the upper grid members (12).

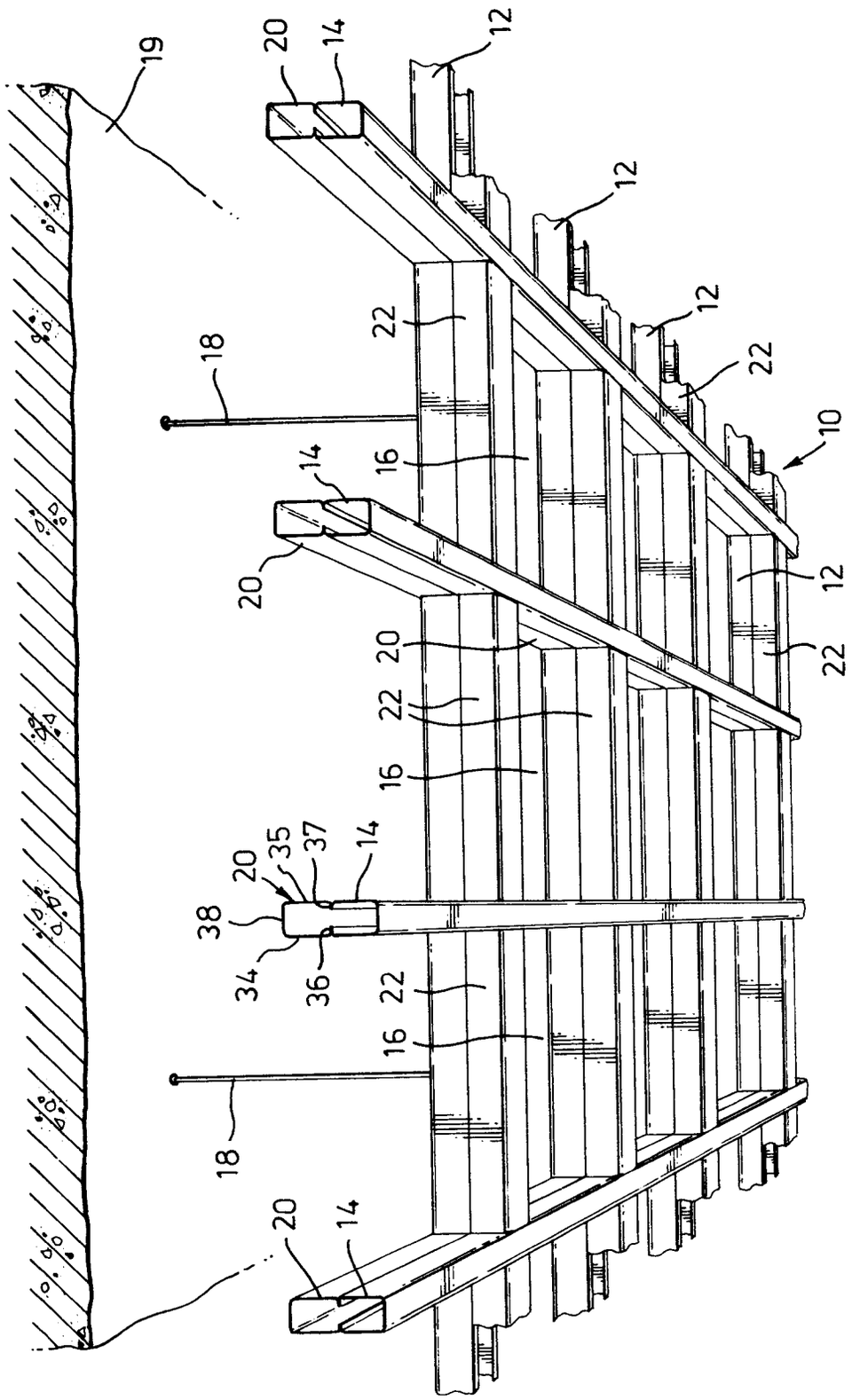

Fig.1.

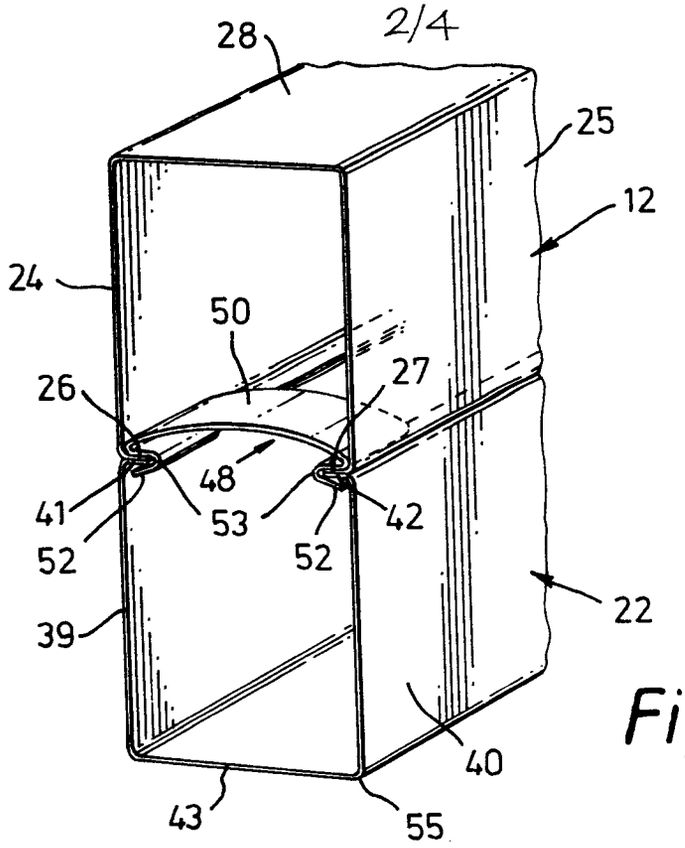
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Fig.2.

Fig. 3.

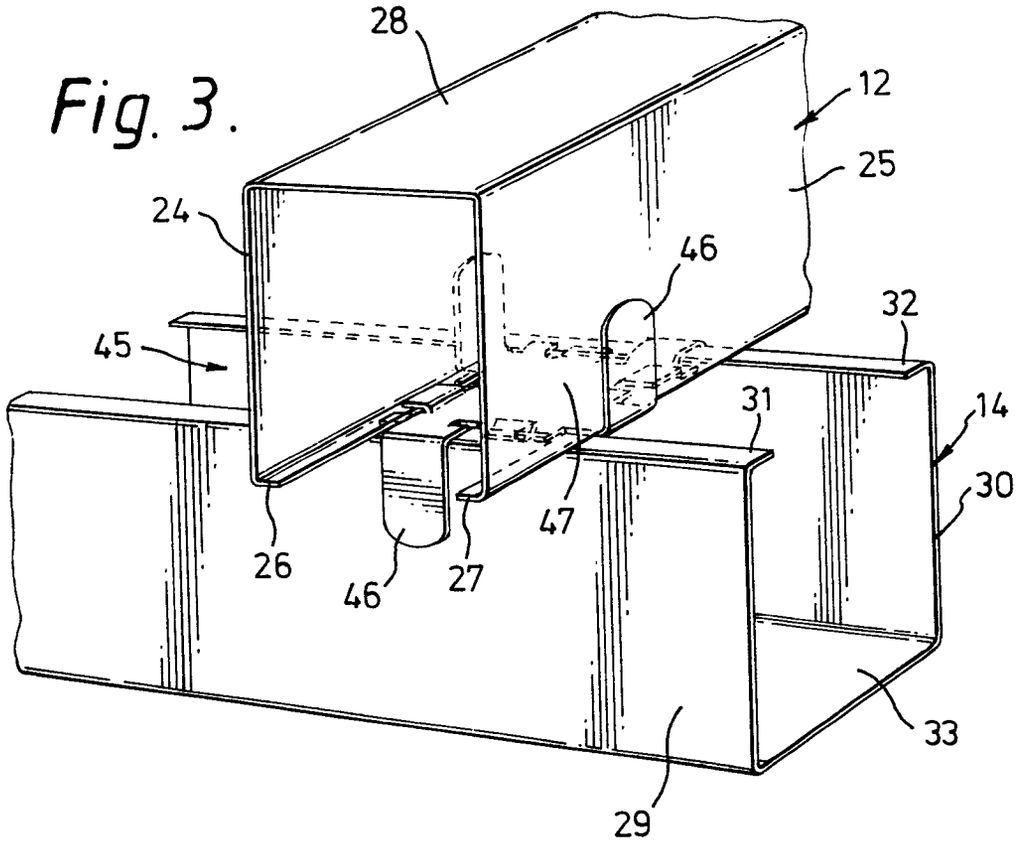
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Fig. 4.

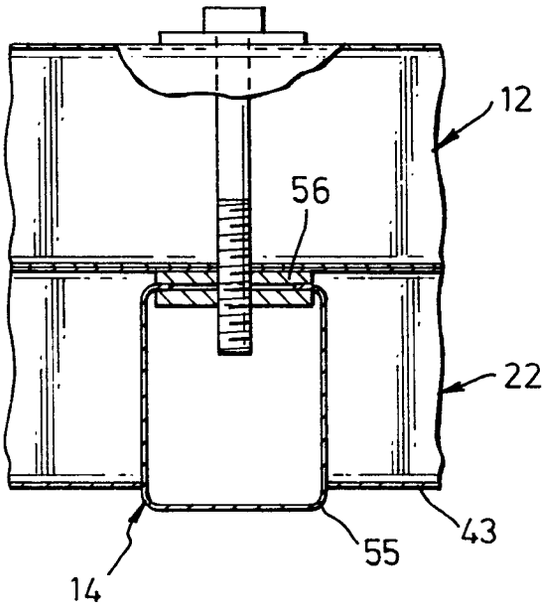
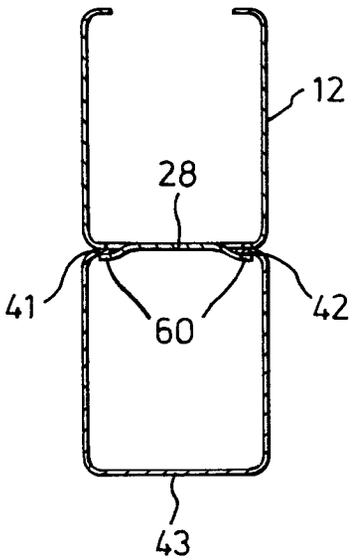


Fig. 5.



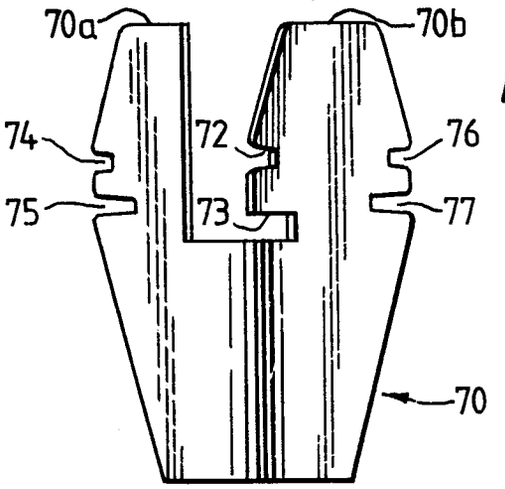


Fig.6.

Fig.7.

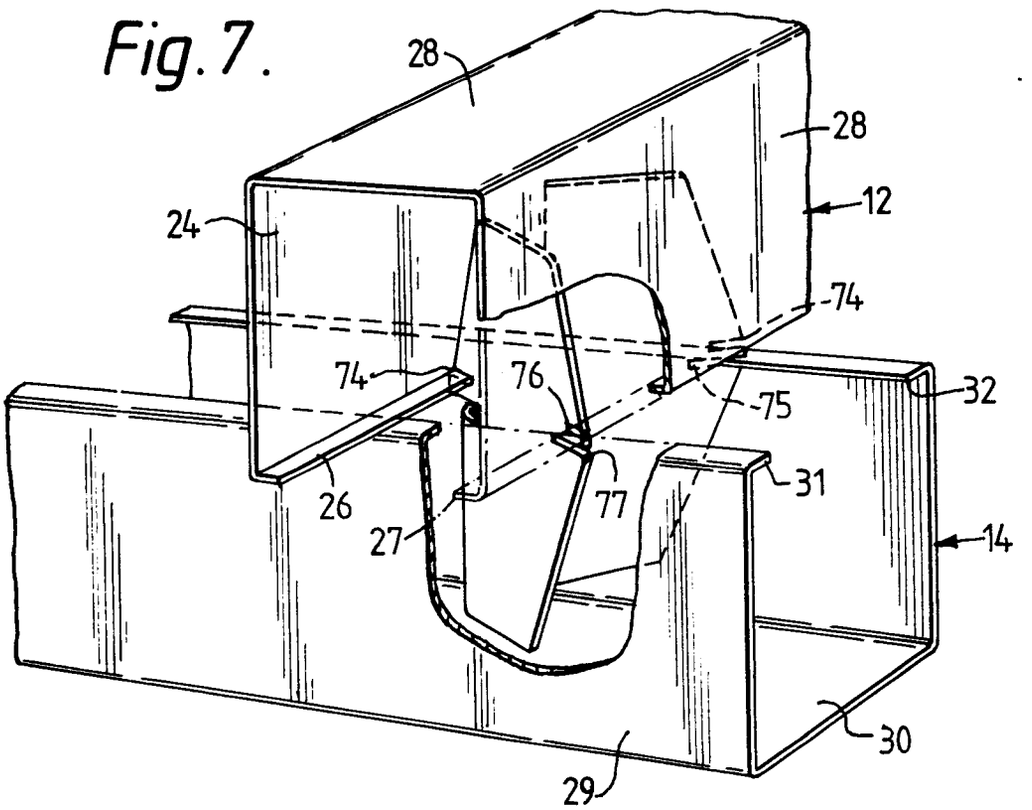


Fig.8.