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

(11) Publication number: **0 198 983**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **18.07.90**

(51) Int. Cl.[5]: **E 04 B 9/36**

(21) Application number: **85309510.7**

(22) Date of filing: **24.12.85**

(54) **Panel for a grid ceiling.**

(30) Priority: **26.04.85 GB 8510637**

(43) Date of publication of application:
29.10.86 Bulletin 86/44

(45) Publication of the grant of the patent:
18.07.90 Bulletin 90/29

(84) Designated Contracting States:
DE FR IT

(56) References cited:
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NL-A-7 806 980
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Courier Press, Leamington Spa, England.

EP 0 198 983 B1

Description

The present invention relates to a panel for a grid ceiling.

Many forms of panel for grid ceilings have been proposed and these often involve the use of generally hollow metal members of U or V-shaped or channel cross-section formed with side flanges and slots are cut out of the upper part of the side flanges of one set of parallel members and out of the lower part of the flanges of the other set of parallel members to enable the panels to be interfitted at the points of intersection of the grid. While it is known to provide lugs to engage in apertures or openings in the other panel at a cross-over point, this does not provide an entirely satisfactory arrangement in which the interconnection between the panels is fully rigid.

It has been proposed in NL—A—7806980 to provide a panel for a grid ceiling said panel comprising first and second metal panel members of U or V-shaped cross-section, formed with side flanges and with the closed end of the cross-section of each of said panel members facing downwardly and with the first panel members also being parallel to one another, but perpendicular to and intersecting the first panel members to form rectangular cells therebetween, the two side flanges of the first panel members being formed with slots extending from the free edges of the respective side flanges to a point spaced from the closed end of the cross-section and with apertures on the respective side flanges between said point and the closed end of the cross-section, the two side flanges of the second panel members being formed with cooperating slot extending from the closed end of the cross-section to a location spaced from the free edge of the respective flange, the cooperating slots of the second panel members being spaced to interfit with the slots of the first panel members at the cross-over points of the panel members, with the closed end of the first and second panel members then in substantially the same plane and each side of each cooperating slot of the second panel having a lug extending inwardly of the slot at a position whereby the apertures in the side flanges of the first panel member are engaged lockingly by the four lugs of the second panel member.

Such a construction has the lugs of the second panel member engaged with the apertures of the first panel member at a location close to the closed ends of the cross-section, that is close to the lower surface of the grid ceiling at the cross-over points. It has been found that this can provide a simple way of forming a reasonably rigid connection at the cross-over points. However, this is not fully satisfactory.

FR—A—2390610 shows a different type of grid ceiling in which the panels are formed of simple flat sheet material, first and second panels having interfitting slots. A lug on each panel is engaged in an aperture in the other panel to provide a locking effect. The grid ceiling is designed so that the first and second panels can be adjusted to any desired relative angle.

It is now proposed, according to the invention that the two side flanges of each second panel are provided with openings, between said cooperating slot and the free edge of the respective flange, each side of each slot of the first panel member having a further lug extending inwardly of the slot at a position whereby the openings of the first panel member are engaged lockingly the four lugs of the first panel member. In this way not only is the connection rigid adjacent the lower surface of the grid ceiling but an even greater rigidity can be provided by the spaced apart cooperation between the lugs of the second panel and the apertures of the first on the one hand and the further lugs of the first panel and openings of the second on the other hand.

Preferably each flange of the second panel is formed, in order to provide even greater rigidity, at the vicinity of each slot, with an opening between said location and the free edge of the flange and each of the edges of each slot of the first panel member is formed with a further lug extending inwardly of the slot, whereby, when the panels are interfitted, the thus formed four further lugs engage in a separate end of an opening of the second panel member.

It will be appreciated that this latter arrangement ensures an even more rigid interconnection of the panels adjacent the lower surface of the grid ceiling.

To facilitate insertion, at the cross-over points, the closed ends of the slots may be provided with a guide tongue which fits snugly within the space between the flanges of the other panel and the free ends of these guide tongues are smoothly curved to facilitate insertion and also to facilitate the formation of the tool used to punch out the panel members.

In order that the present invention may more readily be understood, the following description is given merely by way of example, reference being made to the accompanying drawing in which:-

Figure 1 is a perspective exploded view showing schematically the first and second panel members of one form of panel for a grid ceiling according to the invention.

In Figure 1 there are shown a first panel member 10 and a second panel member 12 each of identical cross-section formed of generally U shaped cross-section metal, in fact being channel shaped having a web 14 joining two parallel side flanges 16, 18 provided with inturned rims 20, 22. The first panel 10 is provided from the free edge defined by the rims 20, 22 with a slot 24 having side edges 26, 28, the slot terminating at a point 25 spaced from the web 14. At the closed end of the slots 24 there is provided a guide tongue 30 having a smooth curved upper surface 32. At a position between the point 25 and the web 14 there is provided an aperture 34 of rectangular

cross-section having ends 36, 38.

The flanges 16, 18 of the second panel member 12 are each provided with a cooperating slot 40 having a closed end 42 with a guide tongue 44 again having a rounded free end 46. The side edges 47, 49 of the slot 40 are formed with lugs 48, 50 respectively these being of triangular cross-section having a lower surface inclined to these edges at an acute angle and upper surfaces substantially perpendicular to the edges 47, 49.

When the second panel member 12 is moved downwardly relative to the first panel member 10 and the slots 40, 24 are interfitted, the panels 30, 44, will pass within the space between the flanges of the other panel and upon further downward movement the lugs 48, 50 will engage in the apertures 34 with a snap-fit action and abut against the ends 36, 38 of these apertures thereby providing a very rigid interconnection of the panel members adjacent the webs 14 thereof.

The second panel members 12 are additionally provided, between the location 42 of the closed end of the slot 40, with a generally rectangular opening 51 having, adjacent the end thereof, recesses 52, 54. The edges 26, 28 of the slots 24 are formed with further lugs 58, 56 respectively of generally similar shape to the lugs 48, 50.

When these panels are interfitted, in addition to the lugs 48, 50 engaging the ends 38, 36 of the slots 34, the further lugs 56, 58 engage in the openings 51 and in particular in the recesses 52, 54 thereof, with a snap-fit action. It will be appreciated that this provides great rigidity.

Because the slots 40 also remove a portion of the web 14 of the channel section of the second panel members, these produce an inherent weakness in the second panel members at the points of intersection. The lugs 48, 50 engaging in the apertures 34, and preferably abutting the ends 36, 38 thereof, prevent the lower parts of the second panel members moving relative to the first panel members and leaving unsightly gaps as has been the case hitherto.

Claims

1. A panel for a grid ceiling, said panel comprising first and second sheet metal panel members (10, 12) of U- or V-shaped cross-section, each formed with side flanges (16,18) and with the closed end (14) of the cross-section of each of said panel members (10, 12) facing downwardly and with the first panel members (10) being arranged parallel to one another and the second panel members (12) also being parallel to one another, but perpendicular to and intersecting the first panel members (10) to form rectangular cells therebetween, the two side flanges (16, 18) of the first panel members (10) being formed with slots (24) extending from the free edges (20, 22) of the respective side flanges (16, 18) to a point (25) spaced from the closed end (14) of the cross-section and with apertures (34) on the respective side flanges (16 and 18) between said point (25) and the closed end (14) of the cross-section, the two side flanges (16, 18) of the second panel members (12) being formed with cooperating slots (40) extending from and through the closed end (14) of the cross-section to a location spaced from the free edge (20, 22) of the respective flange (16, 18), the cooperating slots (40) of the second panel members (12) being spaced to interfit with the slots (24) of the first panel members (10) at the cross-over points of the panel members (10, 12) with the closed end (14) of the first and second panel members (10, 12) then in substantially the same plane and each side (47, 49) of each cooperating slot (40) of the second panel member (12) having a lug (48, 50) extending inwardly of the slot (40) at a position whereby the apertures (34) in the two side flanges (16, 18) of the second panel members (10) are engaged lockingly by the four lugs (48, 50) of the second panel members (12), characterised in that the two side flangs (16, 18) of each second panel member (12) are provided with openings (51) between said cooperating slot (40) and the free edge (20, 22) of the respective flange (16, 18), and in that each side (26, 28) of each slot (24) of the first panel member (10) has a further lug (56, 58) extending inwardly of the slot (24) at a position whereby the openings (51) of the second panel member (12) are engaged lockingly by the four lugs (56, 58) of the first panel member (10).

2. A panel according to claim 1, characterised in that the ends of the slots (24, 40) are provided with a guide tongue (30,44) which fits snugly within the space between the flanges of the other panel member and in that the free end of the guide tongue is smoothly rounded.

3. A panel according to claim 1 or 2, characterised in that the first and second panel members (10, 12) are of channel shape, having parallel side flanges (16, 18) joined by a perpendicular web (14) at the closed end of the cross-section, and in that the free edges of the flanges (16, 18) have inturned rims (20, 22).

4. A panel according to any preceding claim, characterised in that each of the lugs (48, 50) and of the further lugs (56, 58) is of generally triangular shape having a sloping surface and a locking surface substantially perpendicular to the edge of the respective slot, whereby, when the panel members are interfitted, the flanges of one panel member slide up the inclined surface and then spring back as a snap-fit behind the locking surface to hold the two panel members together at that intersection.

Patentansprüche

1. Paneel für eine Rasterdecke mit ersten und zweiten Metallblech-Paneelelementen (10, 12) mit U- oder V-förmigem Querschnitt, die jeweils mit Seitenflanschen (16, 18) versehen sind, wobei das geschlossene Ende (14) des Querschnittes eines jeden Paneelelementes (10, 12) nach unten weist, die ersten Paneelelemente (10) parallel zueinander angeordnet sind und auch die zweiten Paneelelemente (12) parallel zueinander ange-

ordnet sind, jedoch senkrecht zu den ersten Paneelelementen (10) verlaufen und diese schneiden, um rechteckige Zellen dazwischen auszubilden, die beiden Seitenflansche (16, 18) der ersten Paneelelemente (10) mit Schlitzen (24) versehen sind, die sich von den freien Rändern (20, 22) der entsprechenden Seitenflansche (16, 18) bis zu einem punkt (25) erstrecken, der vom geschlossenen Ende (14) des Querschnitts im Abstand angeordnet ist, Öffnungen (34) an den entsprechenden Seitenflanschen (16 und 18) zwischen diesem Punkt (25) und dem geschlossenen Ende (14) des Querschnitts angeordnet sind, die beiden Seitenflansche (16, 18) der zweiten Paneelelemente (16) mit zusammenwirkenden Schlitzen (40) versehen sind, die sich vom geschlossenen Ende (14) des Querschnitts aus und durch dasselbe bis zu einer Stelle erstrecken, die im Abstand vom freien Rand (20, 22) des entsprechenden Flansches (16, 18) angeordnet ist, die zusammenwirkenden Schlitze (40) der zweiten Paneelelemente (12) im Abstand angeordnet sind und mit den Schlitzen (24) der ersten Paneelelemente (10) an den Kreuzungspunkten der Paneelelemente (10, 12) passend in Eingriff stehen, wobei sich das geschlossene Ende (14) der ersten und zweiten Paneelelemente (10, 12) dann im wesentlichen in der gleichen Ebene befindet, und jede Seite (47, 49) eines jeden zusammenwirkenden Schlitzes (40) des zweiten Paneelelementes (12) einen Ansatz (48, 50) aufweist, der sich vom Schlitz (40) an einer solchen Stelle einwärts erstreckt, daß die Öffnungen (34) in den beiden Seitenflanschen (16, 18) der ersten Paneelelemente (10) mit den vier Ansätzen (48, 50) der zweiten Paneelelemente (12) verriegelnd in Eingriff gebracht werden, dadurch gekennzeichnet, daß die beiden Seitenflansche (16, 18) eines jeden zweiten Paneelelementes (12) mit Öffnungen (51) zwischen dem zusammengewirkenden Schlitz (40) und dem freien Rand (20, 22) des entsprechenden Flansches (16, 18) versehen sind und daß jede Seite (26, 28) eines jeden Schlitzes (24) des ersten Paneelelementes (10) einen weiteren Ansatz (56, 58) aufweist, der sich vom Schlitz (24) an einer solchen Stelle einwärts erstreckt, daß die Öffnungen (51) des zweiten Paneelelementes (12) mit den vier Ansätzen (56, 58) des ersten Paneelelementes (10) verriegelnd in Eingriff gebracht werden.

2. Paneel nach Anspruch 1, dadurch gekennzeichnet, daß die Enden der Schlitze (24, 40) mit einer Führungszunge (30, 44) versehen sind, die in enger Passung in dem Raum zwischen den Flanschen des anderen Paneelelementes angeordnet ist, und daß das freie Ende der Führungszunge in glatter Weise abgerundet ist.

3. Paneel nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die ersten und zweiten Paneelelemente (10, 12) kanalförmig ausgebildet sind und parallele Seitenflansche (16, 18) besitzen, die am geschlossenen Ende des Querschnitts über einen senkrechten Steg (14) verbunden sind, und daß die freien Ränder der Flansche (16, 18) einwärts geführte Endabschnitte (20, 22) aufweisen.

4. Paneel nach einem der vorangehenden Ansprüche, dadurch gekennzeichnet, daß jeder der Ansätze (48, 50) und der weiteren Ansätze (56, 58) allgemein dreieckförmig ausgebildet ist und eine geneigte Fläche sowie eine Verriegelungsfläche besitzt, die im wesentlichen senkrecht zum Rand des entsprechenden Schlitzes verläuft, so daß beim Einpassen der Paneelelemente die Flansche eines Paneelelementes die geneigte Fläche hinaufgleiten und dann als Rastverbindung hinter die Verriegelungsfläche zurückfedern, um die beiden Paneelelemente an diesem Schnittpunkt zusammenzuhalten.

Revendications

1. Panneau pour un plafond en treillis, le panneau comprenant des premiers et seconds éléments (10, 12) de panneau en tôle ayant une section transversale en forme de U ou de V, chacun présentant des ailes latérales (16, 18) et une extrémité fermée (14) ayant la même section transversale que chacun des éléments de panneau (10, 12) dirigés vers le bas et les premiers éléments de panneau (10) étant disposés parallèlement les uns aux autres et les seconds éléments de panneau (12) étant également parallèles les uns aux autres, mais perpendiculaires aux premiers éléments de panneau (10) et les coupant de manière à former des cellules rectangulaires entre eux, les deux ailes latérales (16, 18) des premiers éléments de panneau (10) comportant des fentes (24) qui s'étendent à partir des bords libres (20, 22) des ailes latérales respectives (16, 18) jusqu'à un point (25) distant de l'extrémité fermée (14) de la section transversale et des ouvertures (34) sur les ailes latérales respectives (16 et 18) entre ledit point (25) et l'extrémité fermée (14) de la section transversale, les deux ailes latérales (16, 18) des seconds éléments de panneau (12) comportant des fentes (40) de coopération qui s'étendent à partir et à travers l'extrémité fermée (14) de la section transversale jusqu'à un endroit distant du bord libre (20, 22) de l'aile respective (16, 18), les fentes de coopération (40) des seconds éléments de panneau (12) étant espacées de manière à se monter dans les fentes (24) des premiers éléments de panneau (10) aux points de croisement des éléments de panneau (10, 12), l'extrémité fermée (14) des premier et second éléments de panneau (10, 12) se trouvant alors pratiquement dans le même plan et chaque côté (47, 49) de chaque fente de coopération (40) du second élément de panneau (12) ayant une patte (48, 50) s'étendant vers l'intérieur de la fente (40) à un certain endroit, d'où il résulte que les ouvertures (34) ménagées dans les deux ailes latérales (16, 18) des premiers éléments de panneau (10) reçoivent en blocage les quatre pattes (48, 50) des seconds éléments de panneau (12), caractérisé en ce que les deux ailes latérales (16, 18) de chacun des seconds éléments de panneau (12) comportent des ouvertures (51) entre la fente de coopération (40) et le bord libre (20, 22) de l'aile respective (16, 18), et en ce que chaque côté (26, 28) de chaque fente (24) du premier élément de panneau (10) comporte en

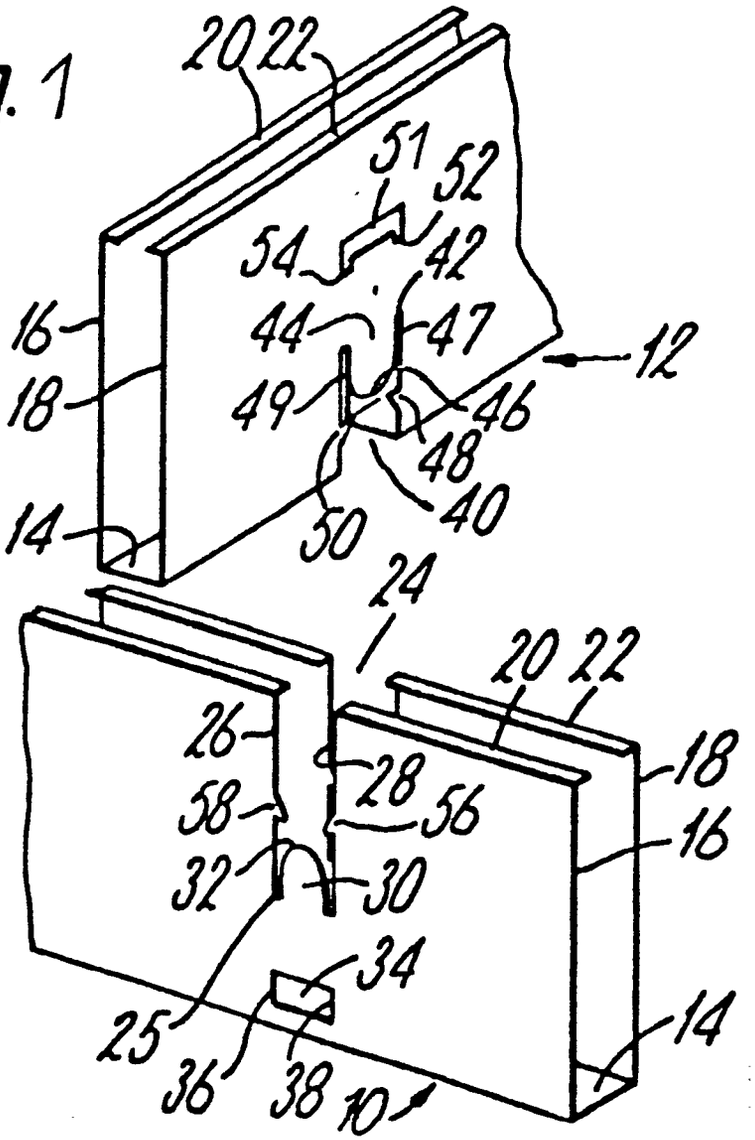
outre une patte (56, 58) s'étendant vers l'intérieur de la fente (24) à un certain endroit, d'où il résulte que les ouvertures (51) du second élément de panneau (12) reçoivent en blocage les quatre pattes (56, 58) du premier élément de panneau (10).

2. Panneau selon la revendication 1, caractérisé en ce que les extrémités des fentes (24, 40) comportent une languette de guidage (30, 44) qui se monte par ajustement serré à l'intérieur de l'espace séparant les ailes de l'autre élément de panneau et en ce que l'extrémité libre de la languette de guidage est régulièrement arrondie.

3. Panneau selon la revendication 1 ou 2, caractérisé en ce que les premiers et seconds éléments de panneau (10, 12) ont chacun la forme d'un canal ayant des ailes latérales parallèles (16, 18) réunies par un voile perpendiculaire (14) à l'extrémité fermée de la section transversale, et en ce que les bords libres des ailes (16, 18) présentent des pourtours tournés vers l'intérieur (20, 22).

4. Panneau selon l'une quelconque des revendications précédentes, caractérisé en ce que chacune des pattes (48, 50) et des autres pattes (56, 58) a la forme générale d'un triangle qui comporte une surface en pente et une surface de blocage sensiblement perpendiculaire au bord de la fente respective, d'où il résulte que, lorsque les éléments de panneau sont montés les uns dans les autres, les ailes d'un élément de panneau coulissent sur la surface inclinée et reviennent alors élastiquement en arrière comme un montage à enclenchement à l'arrière de la surface de blocage afin de maintenir ensemble les deux éléments de panneau à cette intersection.

Fig. 1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