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(54) Metal Channel for wall panels

(57) A metal channel for positioning and retaining metal studding and wall panels to form partition walls, comprising a central web (1) with retaining flange portions (2,3) along its opposite sides. The web (1) is segmented, being divided along its length into discrete segments (4) by transverse slots (5). One of the flange portions (2) is similarly divided into segments (9) by transverse slots (7) aligned with the slots (5). Adjacent segments (7) of the flange portions (2) are however connected together by expansible bridges (10) and optionally by frangible bridges (12). The other of the flange portions (3) is provided with lines of perforations (11) aligned with the slots (5 and 7) and defining flexure zones. The channel is formed straight but can be bent into smooth curves by expansion of the expansible bridges (10).

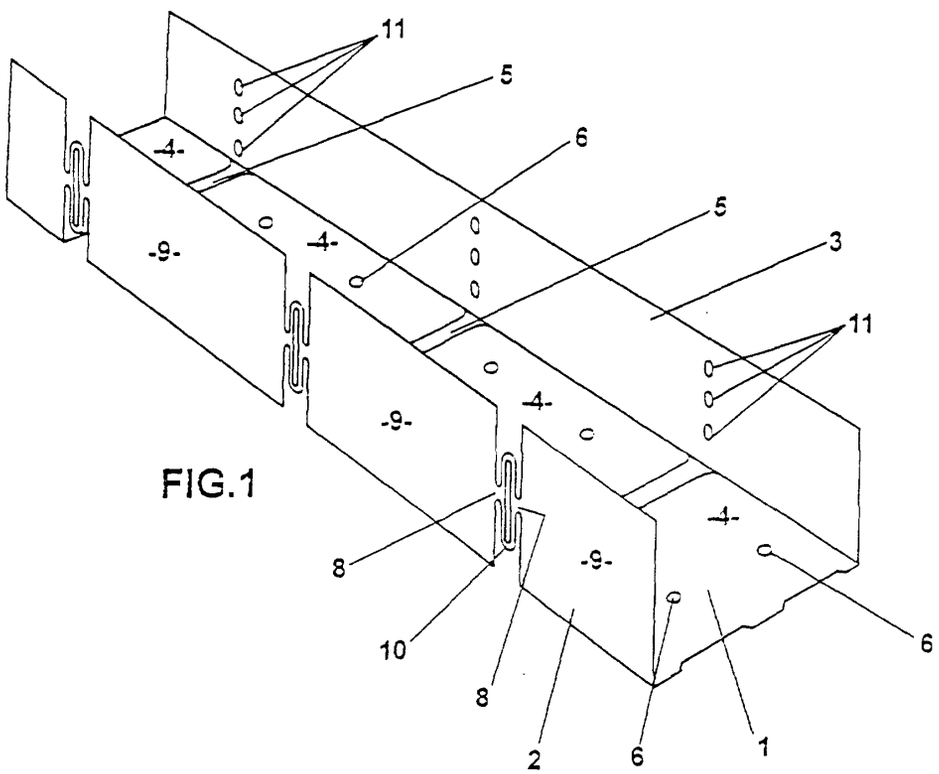

FIG.1

EP 1 182 304 A2

Description

Field of the Invention

[0001] The invention relates to metal channels for positioning and retaining partition wall systems, and provides a novel channel member for use as a head or base channel for straight or curved partition wall systems.

Background Art

[0002] Partition panels for the creation of dividing walls in office and industrial premises has made it possible for architects to design buildings with completely open-plan interiors which can then be internally divided in virtually any format according to the working practices of the end user. Furthermore, the partition panels once installed can be modified or removed and replaced as a user's demands change or whenever the building is occupied by another user with different requirements.

[0003] Typically the partition systems comprise double-skinned wall panels which are supported at the sides by metal studding and above and below in metal channels. One metal channel, the base channel, is secured fast to the internal floor of the building, and another metal channel, the head channel, is secured to the ceiling vertically above the first channel. Vertical metal stud rails are then fitted between the head and base channels, and partition wall panels are then secured to the studs and form the partition extending between the head and base channels. It should be understood that in the context of such partition systems it is the mounting channels and studding that are essentially metal, and not the wall panels. The wall panels themselves may be made of metal, or from any other wall-boarding material, such as plasterboard.

[0004] The construction of the head and base channels is perfectly simple for straight wall sections. The channels are generally U-shaped, with a central longitudinal web from opposite edges of which are formed upstanding or depending flanges. The central web is secured to the floor or ceiling, and the wall panels held in place between the two flanges.

[0005] A more labour-intensive system of assembly is needed for the construction of curved walls. Typically curved timber head and sole plates are prepared, cut to the precise radius of the intended curve. The sole and head plates are first secured to the floor and ceiling of the interior of the building that is to be partitioned and then the vertical metal stud rails are secured directly to the head and sole plates. There are no continuous metal head and base channels extending around the curve of the head and sole plates. The process is labour-intensive, and there is a need for a simpler and cheaper method for the positioning and anchorage of curved partition walls.

[0006] It is an object of the invention to provide a channel system for such a simpler and cheaper anchorage system, which can be used for either straight or curved partition wall anchorage.

THE INVENTION

[0007] The invention provides a metal channel for the positioning and retention of metal studding and wall panels to form straight, angled or curved partition walls, comprising a straight longitudinal web for anchorage to a floor or ceiling of a building and first and second flange portions upstanding or depending (as appropriate to floor or ceiling mounting respectively) from opposite longitudinal edges of the web for abutting opposite sides of metal studding supporting a partition wall panel, characterized in that the web is divided along its length into discrete segments spaced each from the next by a transverse slot, and the first flange portion on one side of the web is similarly divided along its length into discrete segments spaced each from the next by a transverse slot, with each pair of adjacent segments being connected together by an expansible bridge of metal, and the second flange portion on the other side of the web has a flexure zone aligned with the transverse slots in the web and in the first flange portion, so that bending the channel around any of the flexure zones causes widening of the associated transverse slots in the web and in the first flange portion, with associated expansion of the bridge of metal across the widened transverse slot in the first flange portion.

[0008] The expansible bridge of metal may be created by a suitable pattern of stamping apertures in the sheet metal from which the channel is formed, before bending it into channel section. For example a plurality of slots stamped out of the metal of the first flange portion, each having a length slightly less than the height of the first flange portion and each overlapping appreciably in transverse extent and location from the immediately adjacent slot or slots can leave a sinusoidal bridge of metal connecting together the segments of the flange on opposite sides of the bridge. Or the bridge may have the form of a circular or oval or rectangular or diamond-shaped annulus of metal connected at opposite sides to the adjacent segments, and capable of distortion as the segments are moved apart.

[0009] The expansible bridges preferably have a modulus of expansion which increases with increasing expansion. Such a modulus ensures that if a length of channel is bent into a curve, each bridge will expand by approximately the same amount so that the curve naturally conforms, approximately, to the arc of a circle. It will be understood of course that the actual shape will be a series of interconnected straight channel sections, but it has been found that the overall shape is visually indistinguishable from a true circle if the transverse slots and bridges in the web and first flange are about 75mm apart.

[0010] Advantageously the expansible bridges have a limit of expansion which defines the radius of the

smallest curve to which the associated metal wall partition panels can conform. For example with all bridges expanded to their ultimate limit the channel could desirable have a 600mm radius.

[0011] The flexure zone in the second flange portion could simply be a straight and unperforated transverse portion of the second flange portion aligned with the slots in the web and first flange portion. Advantageously however a line of weakness across the second flange portion defines each flexure zone. For example a line of perforations across the height of the second flange portion would define a clear and accurate flexure line. Such a line of perforations would also create a clear guide for cutting the channel to length in situ.

[0012] In one modification of the invention the segments of the first flange portion may be temporarily attached to one another at, or near, their edges distal to the web by frangible bridges of metal. Such a channel would retain its straight configuration until the frangible bridges were severed, for example by a hacksaw or other cutting tool. Such a channel could be used as supplied for straight partition walls. For curved walls a number of the frangible bridges could be severed corresponding to the length of the arc of the curve, and the resulting wall would then run smoothly from straight to curved and again to straight. Or for a single obtuse angle in the wall, only one of the frangible bridges would be cut.

[0013] For curved walls, always the first flange portion of the channel, with its expansible bridges, lies on the outside of the curve. A sinusoidal wall can therefore be created by securing to the floor and ceiling of the building lengths of channel in end-to-end abutment, each length being inverted relative to the next so that the expansible bridges always lie on the outside of the curve. If sinusoidal walls form a significant use of the channel, however, it may be desirable to form identical slots and expansible bridges in both flange portions, preferably both accompanied by the frangible bridges described above. Cutting the frangible bridges on one flange portion therefore permits the expansion of the expansible bridges on that flange portion, permitting that flange portion to lie on the outside of the curved wall, while the associated expansible bridges and uncut frangible bridges on the other flange portion define the flexure zones and permit that other flange portion to lie on the inside of the curved wall. By a judicious pattern of severing the frangible bridges along the length of the channel the functions of first and second flange portions can thus alternate along the channel to create from a single channel length a support for a sinuous wall.

DRAWINGS

[0014]

Figure 1 is a perspective view of a short length of a first embodiment of a channel according to the invention;

Figure 2 is a plan view of the channel of Figure 1, with the flange portions beneath the plane of the paper;

Figure 3 is a side elevation of the first flange portion of the channel of Figure 1;

Figure 4 is a side elevation of a second flange portion of the channel of Figure 1;

Figure 5 is a transverse section through the channel of Figure 1;

Figure 6 is a side elevation of an expansible bridge formation of a second embodiment of a channel according to the invention;

Figure 7 is a side elevation of an expansible bridge formation of a third embodiment of a channel according to the invention; and

Figure 8 is a side elevation of an expansible bridge formation and associated frangible bridge of a fourth embodiment of a channel according to the invention.

[0015] Referring first to Figures 1 to 5, a channel according to the invention is illustrated in an orientation suitable for floor fixing, to create the base channel locating and retaining metal studding to support a partition wall. The same channel section can be inverted to form the head channel for the same wall. The channel comprises a central web 1 bounded on its opposite sides by first and second flange portions 2 and 3. The web 1 is divided into discrete segments 4 longitudinally of the channel by transverse slots 5 spaced apart by equal distances of 75mm. The web 1 is longitudinally profiled (see Figures 1 and 5) for added rigidity, and has preformed holes 6 for fastening the channel to the floor or ceiling of a building.

[0016] The first flange portion 2 is similarly divided into discrete segments by transverse slots 7 aligned with the slots 5, the significant difference between the slots 5 and 7 being that the slots 7 do not extend completely through the first flange portion 2 whereas the slots 5 do extend completely through the web 1. The slots 7 leave two short anchorage portions 8 of the first flange portion 2 connecting adjacent segments 9 of the first flange portion 2 to an expansible metal bridge 10. The expansible bridge 10 is in the form of an oval-shaped annulus of metal joined to the segments 9 by the anchorage portions 8 across its short axis. Expansion of the bridge, as described below, causes extension of that short axis and deformation of the oval annulus until ultimately the oval is reformed with its long axis connecting together the anchorage portions 8.

[0017] The second flange portion 3 has a line of perforations 11 defining a flexure line or flexure zone aligned with each of the slots 5 and 7.

[0018] The channel is formed by first punching the appropriate apertures from a straight strip of metal and then forming the metal into the channel shape shown.

[0019] The metal of the channel is preferably made

by the ULTRASTEEL (Trade Mark) process which is a process protected by, inter alia, Patents GB-B-2063735 and GB-B-2095595 in the name of Hadley Industries plc.

[0020] In use, the channel may be kept straight as it is secured to the floor and ceiling, and used to position and retain metal studding and partition panels to form straight walls. Or it may be bent into curves, each bending being accompanied by flexure of the second flange portions 3 along the flexure zones and expansion of the expansible bridges 10 as the slots 5 and 7 widen.

[0021] Figure 6 shows another possible shape for the expansible metal bridge 10. Figure 7 shows a further possible shape, illustrating how the adjacent segments 9 of the first flange portion 2 may be connected together by more than one expansible bridge 10.

[0022] Figure 8 illustrates how a temporary and frangible bridge 12 may be left in the manufacturing process, connecting together the adjacent segments 9 of the first flange portion 2 at its end remote from the web 1. If the frangible bridges 12 are left intact, the channel is straight and can be used for the positioning and retention of straight walls where the majority of partition walls are expected to be straight. Whenever a curved wall section is desired, however, the frangible bridges 12 can be severed by a hacksaw or by tinsnips, and the channel formed into an appropriate curve. The slot 7, frangible bridge 12 and expansible bridge 10 formation of Figure 8 can advantageously be repeated on the second flange portion 3 to create the flexure zones of the second flange portion, so that the functions of first flange portion (supporting the outer curve of a curved wall) and the second flange portion (supporting the inner curve) can alternate along the length of the channel to support an undulating wall.

Claims

1. A metal channel for the positioning and retention of metal studding and wall panels to form straight, angled or curved partition walls, comprising a straight longitudinal web (1) for anchorage to a floor or ceiling of a building and first and second flange portions (2,3) upstanding or depending (as appropriate to floor or ceiling mounting respectively) from opposite longitudinal edges of the web (1) for abutting opposite sides of metal studding for supporting a partition wall panel, **characterized in that**

   the web (1) is divided along its length into discrete segments (4) spaced each from the next by a transverse slot (5), and
   the first flange portion (2) on one side of the web (1) is similarly divided along its length into discrete segments (9) spaced each from the next by a transverse slot (7), with each pair of adjacent segments (9) being connected together by an expansible bridge of metal (10), and
   the second flange portion (3) on the other side of the web (1) has a flexure zone (11) aligned with the transverse slots (5,7) in the web (1) and in the first flange portion (2), so that bending the channel around any of the flexure zones (11) causes widening of the associated transverse slots (5,7) in the web (1) and in the first flange portion (2), with associated expansion of the bridge of metal (10) across the widened transverse slot (7) in the first flange portion (2).

2. A channel according to claim 1, wherein the expansible bridges of metal (10) are formed by a suitable pattern of stamping apertures in the sheet metal from which the channel is formed, before bending the sheet into a channel section.

3. A channel according to claim 1 or claim 2, wherein the expansible bridges (10) have a modulus of expansion which increases with increasing expansion.

4. A channel according to any preceding claim, wherein the expansible bridges (10) have a limit of expansion which defines the radius of the smallest curve to which the associated metal wall partition panels can conform.

5. A channel according to any preceding claim, wherein adjacent segments (9) of the first flange portion (2) are attached to one another at or near their edges distal to the web (1) by frangible bridges of metal (12).

6. A channel according to any preceding claim, wherein each flexure zone is defined by a line of perforations (11) through the second flange portion (3).

7. A channel according to claim 6, wherein each flexure zone (11) is defined by a transverse slot (7) dividing the second flange portion (3) into adjacent segments (9), the segments (9) being attached to one another at or near their edges distal to the web (1) by frangible bridges of metal (12) and at intermediate portions by an expansible bridge of metal (10).

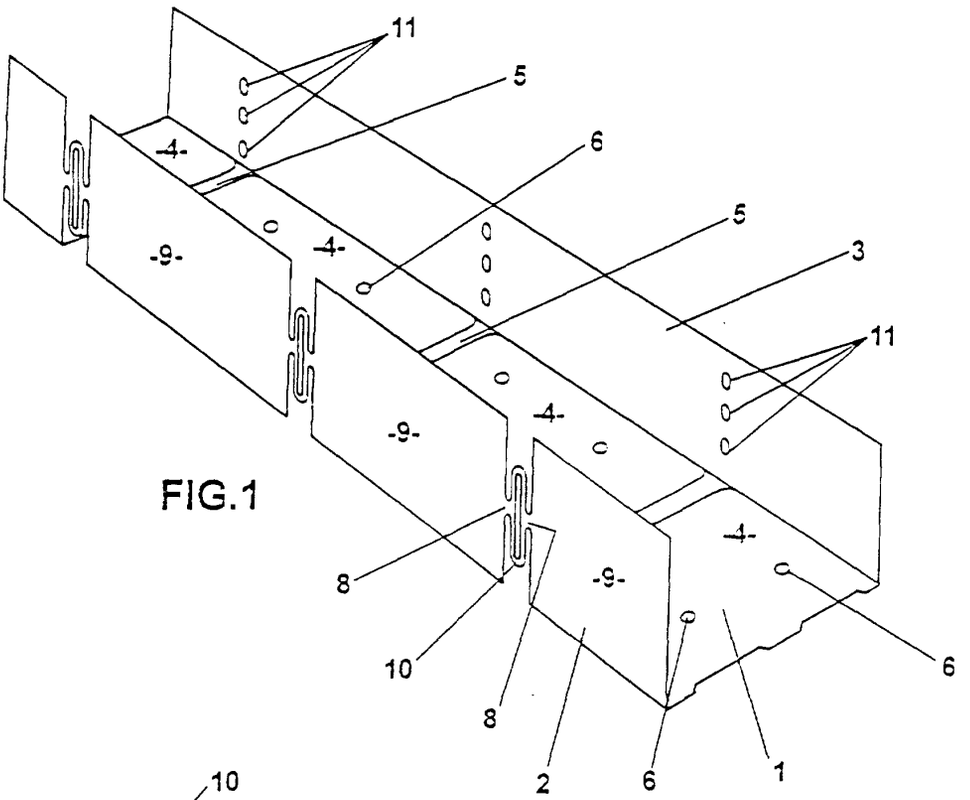

FIG.1

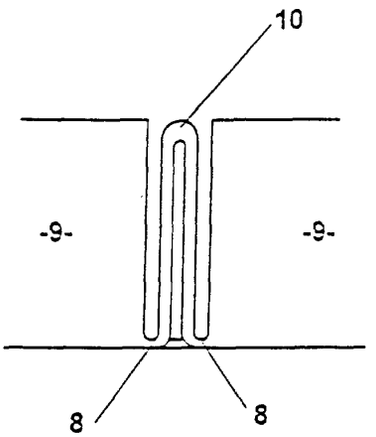

FIG.6

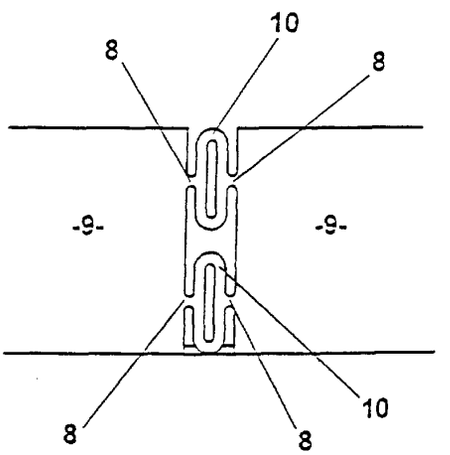

FIG.7

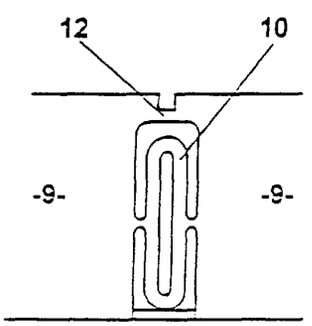

FIG.8

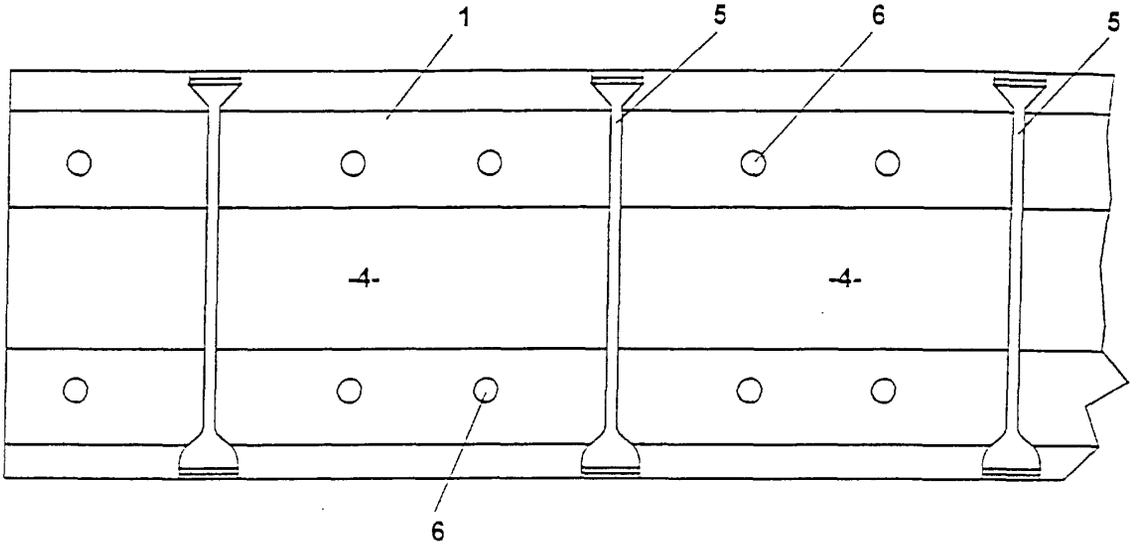

FIG.2

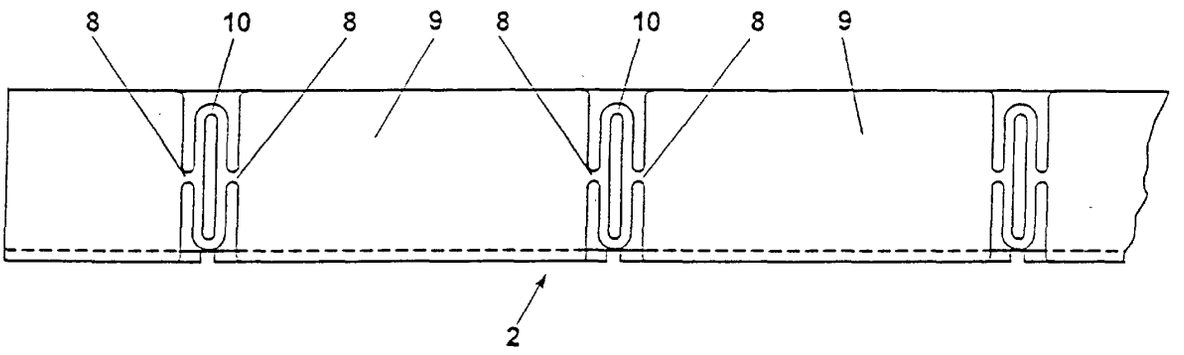

FIG.3

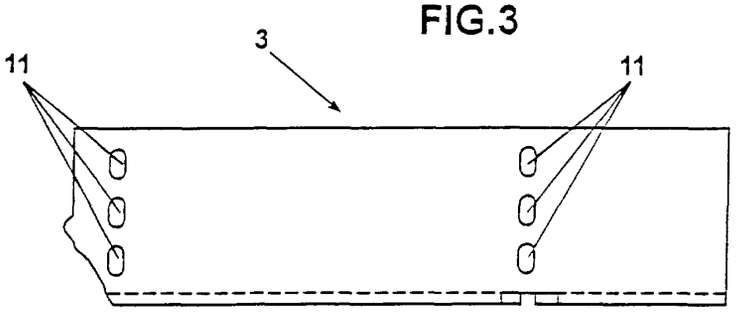

FIG.4

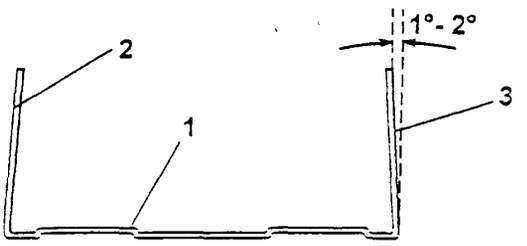

FIG.5