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(54) Universal wall connector.

(57) The invention discloses a building tie and a system using the building tie for tying a new wall, ceiling or floor to an existing wall, ceiling or floor. The system comprises a channel (4) to be mounted on an existing wall and one or more building ties (11) which are shaped such as to embrace edge portions of the channel when placed in situ.

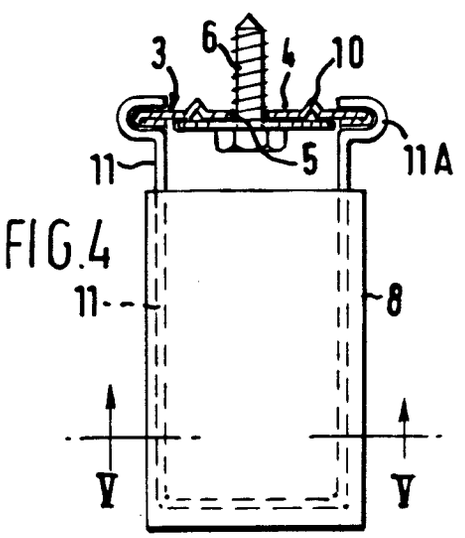

FIG.4

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SUMMARY OF THE INVENTION

This invention relates to a universal wall connector and in particular to a wall tie for tying in a first part, which may be a wall, ceiling or floor, to a second part, which is an existing wall, ceiling or floor.

The present invention provides a building tie for use in tying a first part, which is a new wall, ceiling or floor, to a second part which is an existing wall, ceiling or floor, the tie comprising a member which is to be located substantially in said first part, said member having end portions that, in use, embrace opposed edge portions of a second member which is elongate and is securable to said second part.

In a building tie as set forth in the last immediately preceding paragraph, said member may be provided by a shaped wire fitting providing two arms whose end portions provide the end portions of said member, the end portions being bent to embrace the opposed side edge portions of said second member. Said member may be provided by a wire fitting of substantially U-shaped form. Alternatively said member is provided by a wire fitting formed by bending the wire into a substantially X-shape with the feet of the X integrally connected and the free end portions of the X providing the end portions for embracing the opposed side edge portions of said second member, the wire fitting being so bent that the end portions are spring loaded towards each other when separated by a distance which is at least equal to the separation of the opposed side edge portions of said second member. Other shapes may also be provided.

In a building tie of the type set forth in the last preceding paragraph, the end portions of said member may be clipped together to hold them in position on the opposed side edge portions of said second member.

A building tie as set forth in either one of the last two immediately preceding paragraphs may also comprise a sleeve which can be fitted onto said member, before said member is located substantially in said first part, to maintain the end portions of said member in embracing relationship on the opposed side edge portions of the second member. The sleeve may be of dimensions such as to close the end portions of said member onto the opposed edges in frictional engagement therewith. Alternatively the dimensions of the sleeve may be such as to allow the building tie to slide readily on the second member.

In an alternative building tie to those set forth in either one of the last two immediately preceding paragraphs but one, said member may be in the form of a flat, substantially rectangular plate having at one end thereof a cut-out providing the end portions of said member.

In a building tie as set forth in the last preceding paragraph, a sleeve of the type set forth in the last preceding paragraph but one may be provided on the plate.

Wherever a sleeve is used, it can serve a number of different purposes. In addition to being useful in locating the end portions of any form of said member which is formed of wire or of like formable material on the opposed edge portions of the second member, it provides lateral strength to the tie member and additionally will allow limited movement of said member, within the sleeve, to accommodate expansion and/or contraction of the building materials from which the walls, ceiling or floors are constructed.

The present invention further provides a system for joining a first part, which is a wall, ceiling or floor, to a second part, which is an existing wall, ceiling or floor, the system comprising one or more building ties according to the present invention, and a second member of elongate form arranged to be mounted on a surface of the second part, the second member having opposed side edge portions spaced from said surface when the second member is mounted thereon whereby the building ties can each be positioned on the second member in desired positions along the length of said second member.

DESCRIPTION OF THE DRAWINGS

The invention will now be hereinafter described with reference to the accompanying drawings which illustrate by way of example several embodiments of the present invention; it is to be clearly understood that these embodiments have been selected for description by way of example only.

In the accompanying drawings:-

Figure 1 is a diagrammatic part-sectional plan view of a first form of system according to the present invention;

Figure 1A to 1C illustrate diagrammatically other shapes of wire fitting which may be employed as the member of a building tie according to the present invention;

Figure 2 is a sectional view on the line II-II in Figure 1;

Figure 3 is a diagrammatic front view of the second, elongate, member of a system according to the present invention for fitting to an existing wall, floor or ceiling;

Figure 4 is a view similar to Figure 1 of another form of building tie according to the present invention;

Figure 5 is a diagrammatic sectional view on the line V-V in Figure 4;

Figure 6 is an enlarged view of part of the second member which is shown in Figure 3;

Figures 7, 8A and 8B show, inter alia, two alternative cross-sectional profiles which can be given to the second member of Figure 3;

Figures 9A and 9B show two alternative cross-sectional profiles for a sleeve of a building tie according to the present invention;

Figures 10A and 10B show two alternative cross-sectional profiles of a clip which can be used in a building tie according to the present invention;

Figure 11 is a side view of another form of sleeve;

Figure 12 is a diagrammatic part-sectional plan view of another form of building tie according to the present invention which includes both a sleeve and a clip, and

Figures 13 to 16 show respective possible applications of the present invention.

DESCRIPTION OF SPECIFIC EMBODIMENT

Referring to Figure 1 of the accompanying drawings, there is shown therein a first system according to the present invention. This system is for use in attaching a first part, such as a new wall, indicated generally at A to a second part such as an existing wall, indicated generally at B. The system comprises a fixed member 1 in the form of a rectangular metal plate which has a cut-out portion 2 defining leg elements 20, 21 which provide end portions including slots or grooves 22 and 23 respectively which are in opposed relationship.

The system of Figure 1 further comprises a second, metal, member in the form of an elongate strip 4 as shown in Figure 3 and in more detail in Figure 6. This strip 4 has a plurality of apertures 5 spaced along its length to enable it to be secured to the existing wall B by means of coach screws 6 or the like secured in the wall, the head of each screw locating a washer 7 between the elongate strip 4 and the head, as shown in Figures 1, 4, 6, 7 and 8A.

Raising the main body of the strip 4 away from the surface of the part on which it is mounted allows the edge portions 3 of the strip to be spaced from that surface so that the end portions of the member 1 can be fitted over the edge portions and moved up or down to the appropriate position.

The strip 4 in the various embodiments is formed with solid or hollow protrusions or extrusions 10 to allow the main body thereof to be spaced from the face of the existing wall, ceiling or floor to which it is fitted in practice. For example, as shown in Figure 7, the protrusions 10 are in the form of solid studs, whilst in Figure 8A they are formed by grooves pressed or rolled in the strip.

In Figure 8B, a further strip profile is shown. This comprises a simple shallow U-shaped channelling having edge portions extending laterally from the walls of the channelling. The channelling is provided with spaced screw-hole apertures 5 and the main body is placed flat against the surface on which it is to be mounted and bolted thereto with the edge portions thereof spaced from that surface so that a building tie can be attached thereto.

The metal plate 1 of Figure 1 is provided with a central aperture 1A. In the embodiment shown in Figure 1, a sleeve 8 is provided which may be fitted over the metal plate, the sleeve being provided with an aperture 8A in each face which aperture 8A, is smaller than the aperture 1A and, when the sleeve is properly positioned in the plate 1, both apertures are aligned with the aperture 1A.

The metal plate 1 with the sleeve 8 thereon is intended to be embedded in mortar provided between vertically adjacent strata of building materials, such as bricks or other building blocks, and the alignment of the apertures 1A and 8A permits the mortar to flow therethrough and key the plate and sleeve into the mortar when set. If desired, both the plate and the sleeve can be provided with a plurality of aligned apertures, such as those shown, and even to the extent that both the plate and the sleeve have a substantially lattice structure. If desired, when the building tie is in the form of a metal plate, the sleeve need not be deployed on the plate.

The sleeve 8 itself is in the form of a flat tubular element such as is shown in Figure 2, embracing the metal plate 1 or confining a wire tie 11 as shown in Figure 5. A further sleeve intended for use with the U-shaped form of wire-fitting type of building tie is shown in Figure 11; in this instance, the sleeve is in the form of a flat plate 8 which can simply be placed over the wire fitting and to this end the sleeve has two grooves for accommodating the parallel arms of the fitting. If desired, the sleeve can be formed of thin metal material so that it can be wrapped around the wire fitting.

As an alternative to the building tie shown in Figures 1 and 2, a tie such as is shown in any of the forms illustrated in Figures 1A to 1C, 4, 7 and 12 can be provided. Referring particularly to Figures 4, 7 and 12, the tie shown therein comprises a member provided by a wire fitting 11 which is generally U-shaped and has two arms whose end portions 11A are bent to form inwardly-opposing slots which when the wire fitting is located on the elongate strip 4 will engage with the opposed edge portions of the strip.

Once located on the edge portions 3 of the strip, the arms of the wire fitting 11 can be prevented from splaying apart either by a sleeve 8

such as is shown in Figure 4 or by a clip such as is shown diagrammatically in Figure 12, or by any other suitable means. As in the case of the sleeve shown in Figure 1, the sleeve shown in Figure 4 may be provided with one or more apertures which allow mortar to flow therethrough to key the sleeve into place when the mortar is set.

As shown in Figure 12, it may be advisable in some instances to employ a clip 12 together with a sleeve 8 to increase the lateral strength of the tie when embedded in mortar. As shown in Figure 12, a single large rectangular aperture 8A formed in one or both faces of the sleeve may be provided for keying purposes.

Figures 10A and 10B illustrate two alternative configurations of clip which can be used with a wire fitting such as those shown in Figures 1B, 1C, 4, 5, 7 and 12. The clip indicated at 12A is essentially a strip having inwardly curved ends in which the arms of the wire fitting can be constrained; the clip 12B, on the other hand, has outwardly curved ends to allow a snap fit onto the arms of the wire fitting.

The various components of the tie can be made of any convenient material, for example metal or plastics material having the required strength. Traditionally building ties which are formed of wire are made from stainless steel (typically 22 gauge) or galvanised steel (typically 3.15/3.25 mm diameter) to conform with building requirements. The strip 4 can be provided in 1200 mm lengths and can be butt jointed or overlapped longitudinally to provide any desired length.

Figure 13 illustrates how a system according to the present invention, employing building ties according to the present invention, can provide a 90 degree wall connection between an existing wall 13 with a new wall or walls 14. The tie allows, through use of the sleeve 8, limited relative horizontal movement between the existing and new walls.

Figure 14 illustrates a system according to the present invention, employing building ties according to the present invention, in an inline wall connection between an existing wall 13 and new wall 14 and again the sleeve 8 allows for limited horizontal relative movement (expansion/contraction).

Figure 15 shows an existing floor or ceiling 15 from which a new wall 14 depends and here the sleeves 8 provide for limited relative vertical movement.

In Figure 16, ties according to the present invention are used to provide a parallel wall connection between an existing wall 13 and a parallel new wall 14. In this particular case, sleeves 8 are not provided. The wall ties are spaced to allow preferably one tie per square metre of wall.

It will be appreciated that a building system according to the present invention allows for both vertical and horizontal movement between the parts 1/11 and 8 and between the parts 1/11 and 4.

In another form, not illustrated, the U-shaped member can comprise two wire arms interconnected by a plastics sleeve fitted on inner ends of the arms to form the base of the "U".

Claims

1. A building tie for use in tying a first part, which is a new wall, ceiling or floor, the tie comprising a member which is to be located substantially in said first part, said member having end portions that, in use, embrace opposed edge portions of a second member which is elongate and is securable to said second part.

2. A building tie according to claim 1 and further comprising a sleeve which can be fitted onto said member, before said member is located substantially in said first part, to maintain the end portions of said member in embracing relationship on the opposed side edges of the second member.

3. A building tie according to claim 2 wherein the sleeve is of dimensions such as to close the end portions of said member onto the opposed edges in frictional engagement therewith.

4. A building tie according to any one of the preceding claims wherein said member is provided by a wire fitting providing two arms whose end portions provide the end portions of said member, the end portions being bent to embrace the opposed side edges of said second member.

5. A building tie according to claim 4 wherein said member is provided by a wire fitting of substantially U-shaped form.

6. A building tie according to claim 4 wherein said member is provided by a wire fitting formed by bending the wire into a substantially X-shape with the feet of the X integrally connected and the free end portions of the X providing the end portions for embracing the opposed side edges of said second member, the wire fitting being so bent that the end portions are spring loaded towards each other when separated by a distance which is at least equal to the separation of the opposed side edges of said second member.

7. A building tie according to any one of claims 4 to 6 wherein the end portions of said member are clipped together to hold them in position on the opposed side edges of said second

member.

8. A building tie according to any one of claims 1 to 3 wherein said member is in the form of a flat, substantially rectangular plate having at one end thereof a cut-out providing the end portions of said member.

9. A system for joining a first part, which is a wall, ceiling or floor, to a second part, which is an existing wall, ceiling or floor, the system comprising one or more building ties as set forth in any one of the preceding claims, and a second member of elongate form arranged to be mounted on a surface of the second part, the second member having opposed side edges spaced from said surface when the second member is mounted thereon whereby the building ties can each be positioned on the second member in desired positions along the length of said second member.

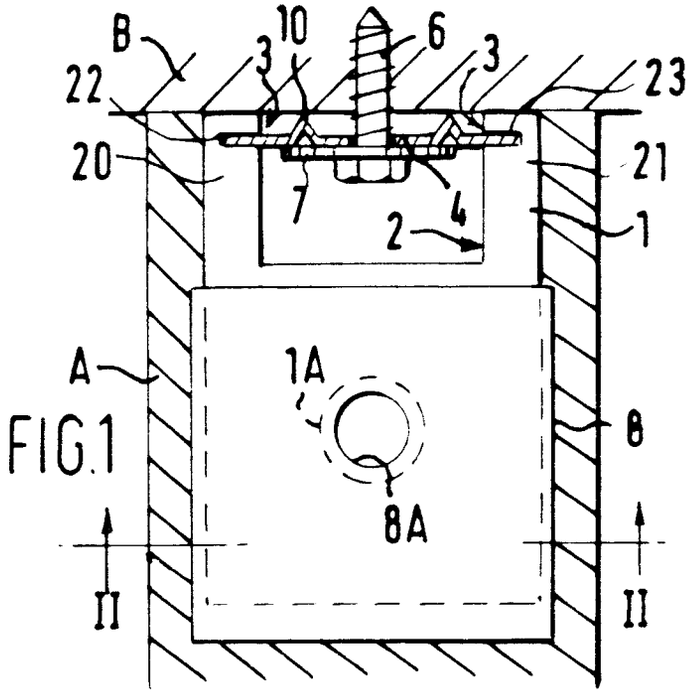

FIG.1

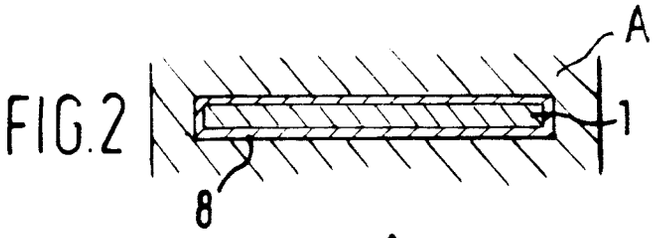

FIG.2

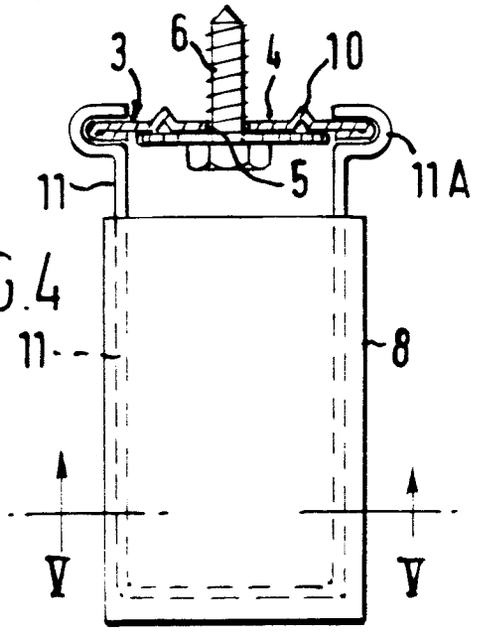

FIG.4

FIG.5

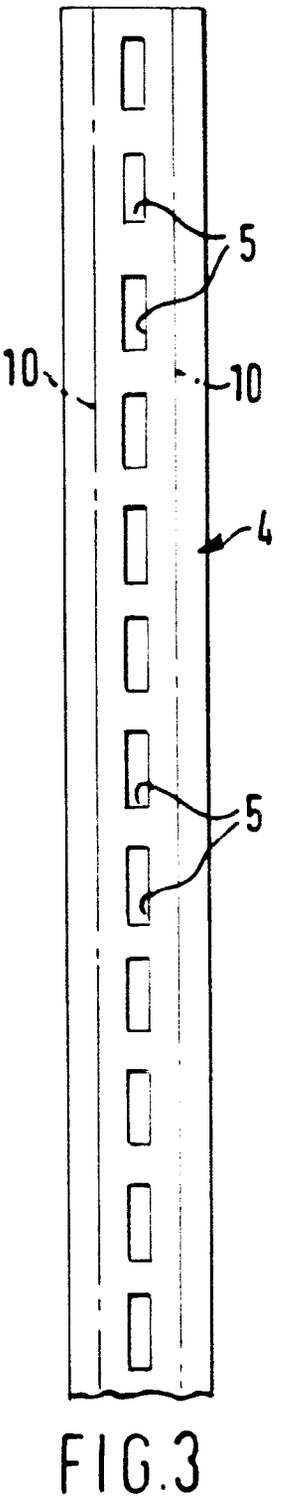

FIG.3

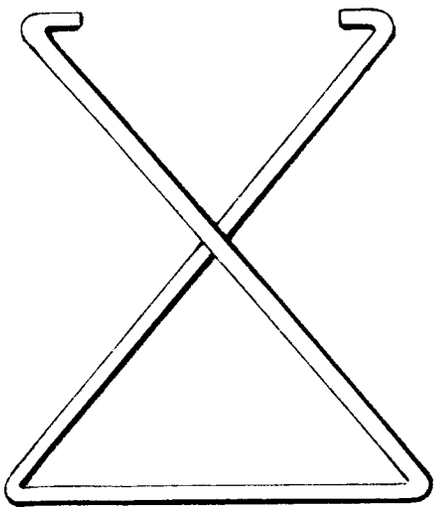

FIG.1A

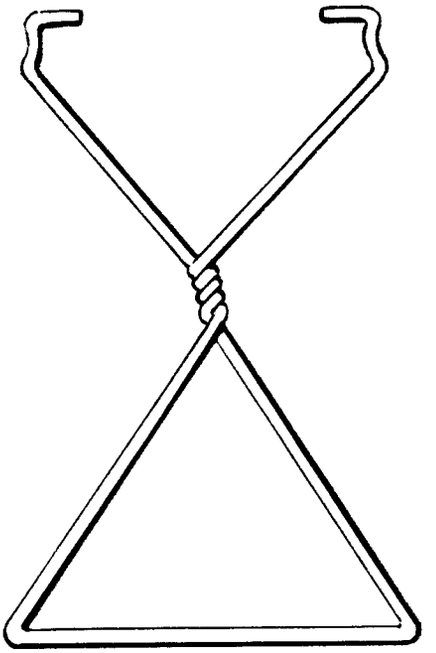

FIG.1B

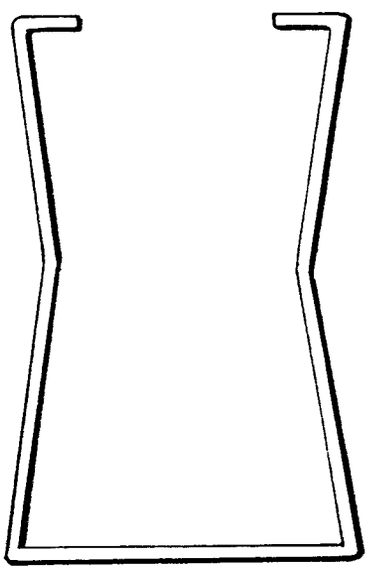

FIG.1C

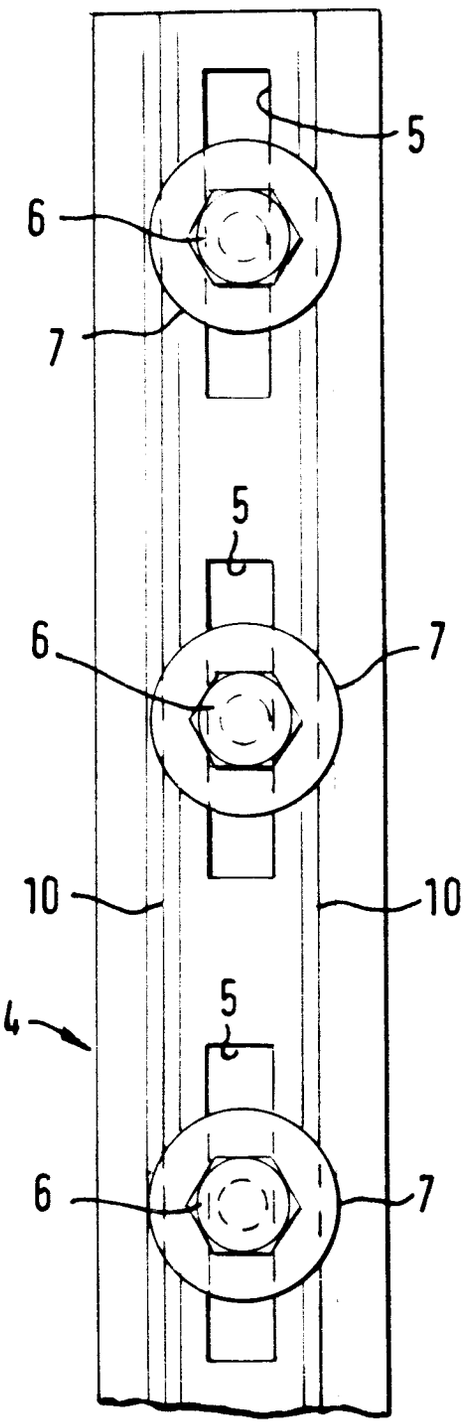

FIG.6

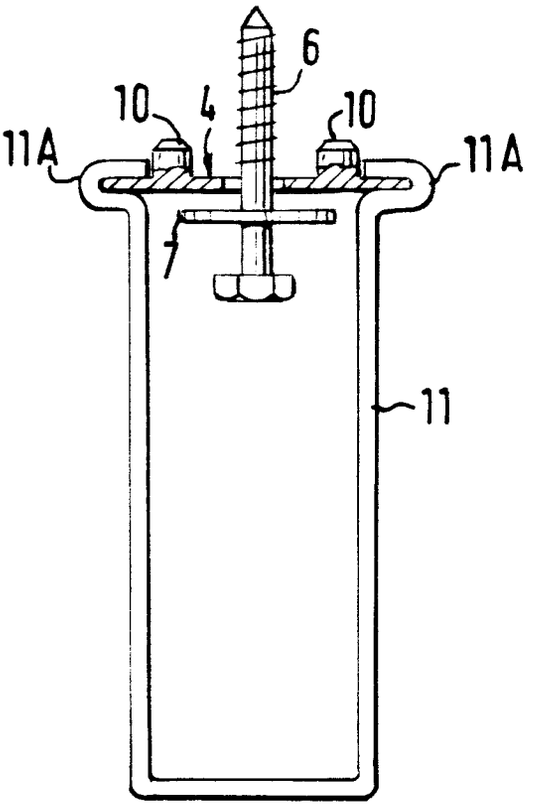

FIG.7

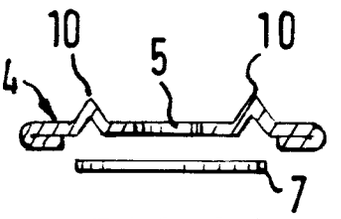

FIG.8A

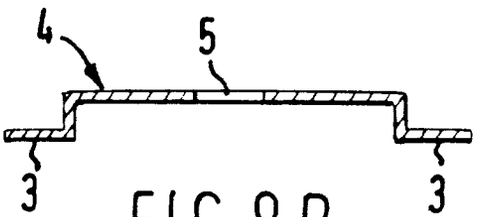

FIG.8B

FIG.9A

FIG.9B

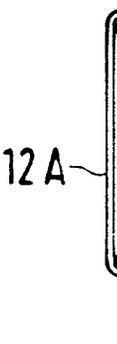

FIG.10A

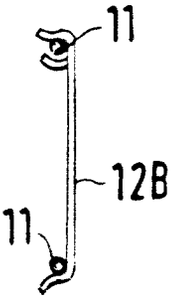

FIG.10B

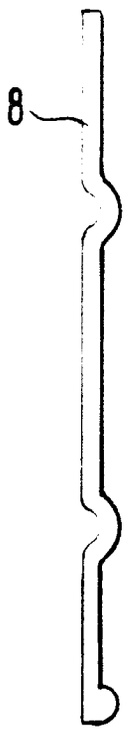

FIG.11

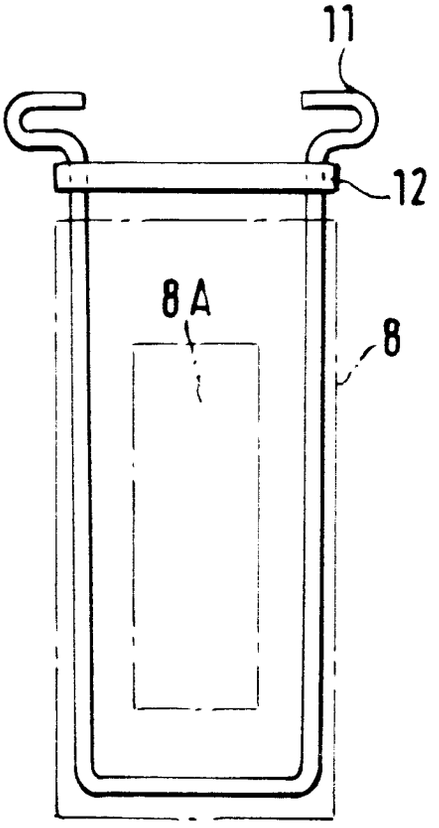

FIG.12

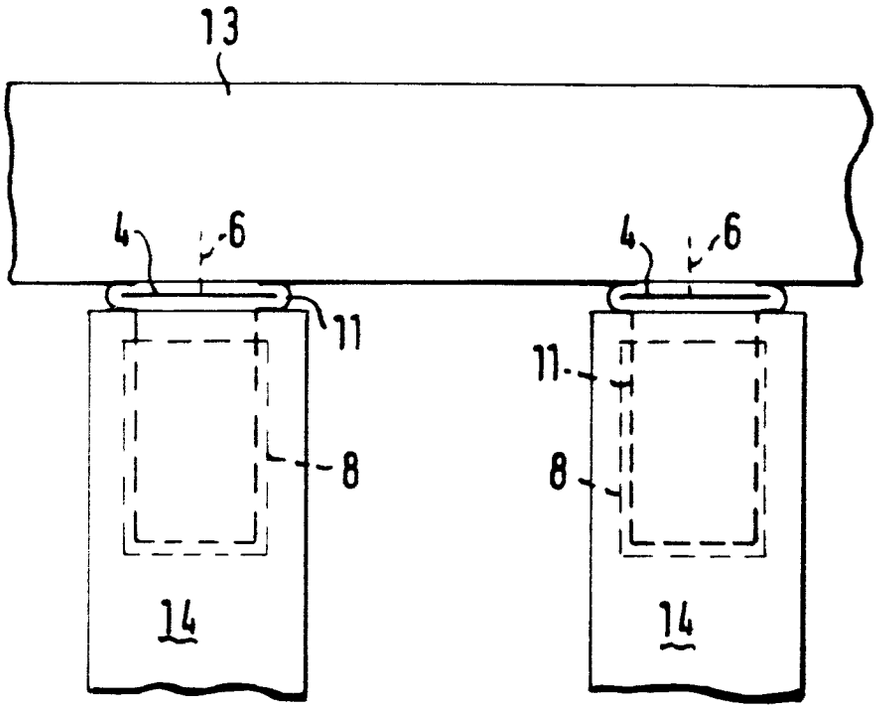

FIG. 13

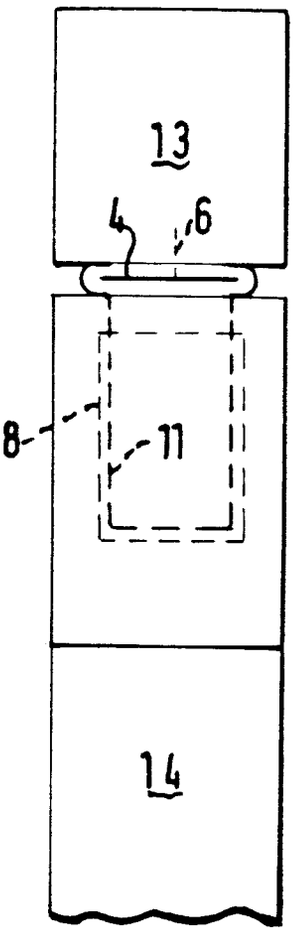

FIG. 14

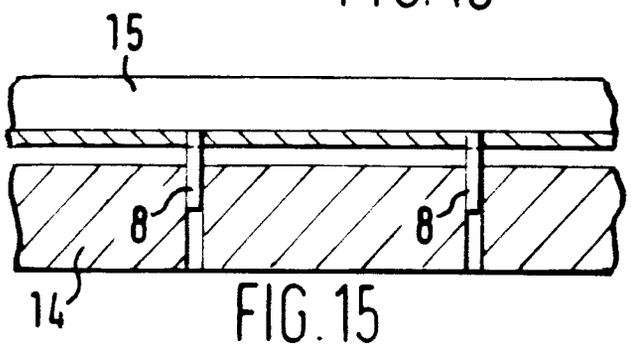

FIG. 15

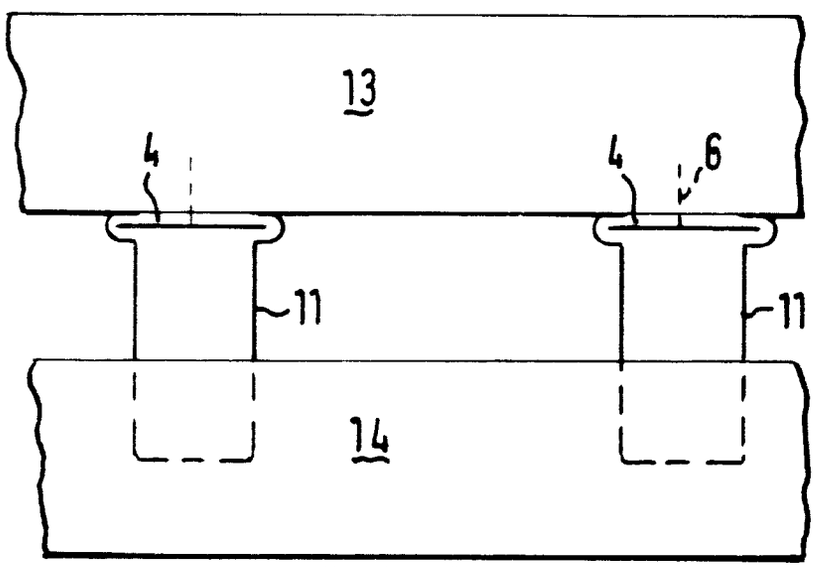

FIG. 16

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 31 1369

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	EP-A-0 252 696 (FURR) * column 4, line 1 - column 6, line 5; figures 1-8 *	1,4,5,9	E04B1/41
Y	DE-A-3 333 635 (FRICKER) * page 5, paragraph 3 - page 6, paragraph 4; figure *	1,4,5,9	
A		7	
A	EP-A-0 159 804 (FURR) * page 5, line 13 - page 8, line 18; figures 1-3 *	1,4,5,9	
A	GB-A-2 206 139 (TRULINE BUILDING PRODUCTS LIMITED) * page 4, line 19 - page 12, line 27; figures 1-10 *	1,4,5,9	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	31 MARCH 1992	CLASING M.F.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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