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(54) **Universal wall connector**

Universeller Wandverbinder

Dispositif universel de fixation des murs

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(56) References cited:
EP-A- 0 159 804
EP-A- 0 252 696
DE-A- 3 333 635
GB-A- 2 206 139

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Description

This invention relates to wall connectors and in particular to those including a wall tie for tying in an existing wall to a second, new, wall as it is being constructed.

In published German patent application DE 3333635 A1, there is disclosed a wall tie for anchoring a wall to a ceiling, this wall tie comprising an elongate member, means for attaching the elongate member to the ceiling, the elongate member having edge portions which, when the elongate member is attached to the ceiling, are spaced therefrom, and tying means suitable to extend in use in between courses of building elements of the wall as it is being erected and to interconnect the wall and said elongate member. The wall tie as disclosed comprises a U-shaped member having inwardly-turned end portions which are intended to engage edge portions of a rail which has been previously clamped to a ceiling. The body of the U-shaped member is intended to be set in mortar as the uppermost courses of the wall are completed. In one form, the U-shaped member can be opened out so that the end portions can engage the rail when the member is closed around it. In a second form, where a bridge is welded to the legs of the member, each tie is located on the rail from an end thereof and slid along to the required position.

The first form of tie disclosed in the prior art can, according to the description of the published application, be opened by hand and it must therefore be assured that this is a measure of whatever resilience it possesses to lateral forces exerted on a wall in which this tie is embedded. It would appear potentially to afford little resistance to such lateral force. The second form can only be attached to a rail from one end or the other, a considerable disadvantage when linking a new wall to an existing wall, where the equivalent rail may have only one free end adjacent the top of the existing wall.

In United Kingdom patent application no. 2206139A, there is disclosed wall tying apparatus comprising an elongate member, means for attaching the elongate member in upright attitude to a first wall such that, when attached and in use, it can move relative to the first wall in a direction longitudinally of the elongate member, and tying means to extend in use in between courses of bricks or building blocks of a second wall and to interconnect the second wall and said elongate member.

The present invention provides a wall connector for tying an existing wall to a second wall as it is being erected, the connector comprising an elongate member, means for attaching the elongate member to the existing wall, the elongate member having edge portions which, when the elongate member is attached to the existing wall, are spaced therefrom, and tying means suitable to extend in use in between courses of building elements of a second wall as it is being erected and to interconnect the second wall and said elongate member, the tying means comprising portions for engaging the edge portions of the elongate member and means which can be fitted onto the tying means to maintain the portions of the tying means in secure embracing relationship on the edge portions of the elongate member, the connector being characterised in that the means which can be fitted onto the tying means comprises a sleeve and/or clip which can be fitted onto the tying means before the tying means is located substantially in said second wall to maintain said portions of the tying means in embracing relationship on the edge portions of the elongate member.

Preferably, the tying means is formed as a plurality of wire ties each providing two arms whose end portions provide said portions of the tying means. Each wire tie may be formed from wire bent into substantially U-shaped form. Other shapes may also be provided.

The sleeve is of dimensions such as to close said portions of said tying means onto the opposed edge portions in frictional engagement therewith.

Alternatively the dimensions of the sleeve may be such as to allow the building tie to slide readily on the edge portions of the member.

Wherever a sleeve is used, it can serve a number of different purposes. In addition to being useful in locating the end portions of the tying means when the latter is formed of wire and engages the edge portions of the elongate member, it provides lateral strength to the tying means and additionally will allow limited movement of the tying means, within the sleeve, to accommodate expansion and/or contraction of the building materials from which the walls are constructed.

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 front view of a first, elongate, member of a wall connector according to the present invention for attaching to an existing wall;
Figures 1A and 1C illustrate two forms the building tie can take
Figure 2 is a diagrammatic part-sectional view of a wall connector according to the present invention;
Figure 3 is a diagrammatic sectional view on the line III-III in Figure 2;
Figure 4 is an enlarged view of part of the member which is shown in Figure 1;
Figure 5 shows, inter alia, an alternative cross-sectional profile for the member of Figure 1;
Figure 6A shows the cross-sectional profile of the member of Figures 1 and 2;
Figure 6B shows a further alternative croos-section-

al profile for the member of Figure 1;

Figure 7A and 7B show two alternative croos-sectional profiles of a sleeve for a building tie of a wall connector according to the present invention;

Figures 8A and 8B show two alternative cross-sectional profiles of a clip which can be used with a building tie of a wall connector according to the present invention;

Figure 9 is a side view of another form of sleeve;

Figure 10 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 11 to 14 show respective possible applications of the present invention.

DESCRIPTION OF SPECIFIC EMBODIMENT

Referring firstly to Figure 1, there is shown an elongate member provided by an elongate metal strip 4 which is intended to be mounted on a wall. The metal strip can be formed as an extrusion or as a pressing and comprises a flat plate which has a plurality of uniformly spaced elongate slots 5 formed therein through which coach screws 6 or the like can be passed, the head of each screw locating a washer 7 between itself and the strip, whereby to fasten the strip to a wall. This can also be seen in the embodiments shown in Figures 4 and 5. The strip is also formed with two elongate grooves 10 which act as spacing elements for spacing the strip from the surface to which it is to be affixed. Alternatively to the strip 4 shown in Figure 1, other forms of strips are shown in Figures 5 and 6B. For example, as shown in Figure 5, the spacing elements 10 are in the form of solid studs.

The elongate metal strip 4 provides an elongate member of a wall connector for use in attaching a part, such as a new wall, indicated generally at A, to another part such as an existing wall, indicated generally at B. It can be provided in 1200mm lengths and can be butt-jointed or overlapped longitudinally to provide any desired length.

The new wall, as it is constructed, is secured to the existing wall by tying means comprising a plurality of building ties according to the invention, each of which is made of heavy duty wire. These building ties according to the invention are, like traditional building ties, made from wire of stainless steel (typically 22 gauge) or galvanised steel (typically 3.15/3.25mm diameter) to conform with building requirements. In addition to steel, the building ties according to the invention can be made from any convenient materials, for example other metals or from plastics materials having the required strength.

Typical tying means of a wall connector according to the invention comprises a plurality of ties formed from wire, each of which comprises a general body portion which can be and is intended to be laid in and embedded in the mortar between any two adjacent building bricks or building blocks or courses thereof, the wire of the tie being so shaped as to provide two end portions 11A which are shaped by bending to extend inwardly towards one another so that the ties can be located on opposed edge portions 3 of the strip 4 with the end portions themselves being located behind the edge portions between the edge portions and the wall to which the strip 4 is affixed.

In Figures 2 and 3, the wire tie 11 shown therein has a body portion which is of generally U-shape and the end portions 11A of the tie are themselves each also formed into a U-shape with the U's facing one another. Being formed of wire, the tie has an inherent flexible resilience which allows the end portions of the tie to be pulled apart a sufficient distance that the end portions can be located behind the edge portions 3 of the strip 4 and can then be released, or forcibly closed onto the edge portions, so that the end portions engage the edge portions of the strip to locate the tie on the strip.

According to the invention, and as shown in each of the embodiments illustrated in Figures 2 and 3, and 7 to 10 in particular, a sleeve 8 is provided to fit over the body portion of the tie 11. The building tie including the sleeve thereon is intended to be embedded in mortar provided between vertically adjacent strata of building materials such as building bricks or concrete blocks, and the sleeve may be provided with one or more apertures therein so that the mortar can key the sleeve into the mortar when set, or alternatively can be formed as a lattice structure.

The sleeve 8 itself is in the form of a flat tubular element such as is shown in Figure 2 and 3, confining the wire tie 11 as shown therein. A further sleeve intended for use with the U-shaped form of wire building tie is shown in Figure 9; in this instance, the sleeve is in the form of a flat plate 8 which can simply be placed over the wire tie and to this end the sleeve has two grooves for accommodating the parallel arms of the tie. If desired, the sleeve can be formed of thin metal material so that it can be wrapped around the wire tie.

Once located on the edge portions 3 of the strip, the arms of the building tie 11 can be prevented from splaying apart either by the sleeve 8 such as is shown in Figure 2 or by a clip such as is shown diagrammatically in Figure 10, or by any other suitable means. The sleeve shown in Figure 2 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 10, 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 10, a single large rectangular aperture 8A formed in one or both faces of the sleeve may be provided for keying purposes.

Figures 8A and 8B illustrate two alternative configurations of clip which can be used with a wire tie such as those shown in Figures 4, 5, 7 and 12. The clip indicated at 12A (Figure 8A) is essentially a strip having in-

wardly curved ends in which the arms of the wire tie can be constrained; the clip 12B (Figure 8B), on the other hand, has outwardly curved ends to allow a snap fit onto the arms of the wire tie.

Figure 11 illustrates how a connector 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 connector allows, through use of the sleeve 8, limited relative horizontal movement between the existing and new walls.

Figure 12 illustrates a connector according to the present invention in an inline wall connection between an existing wall 13 and new wall 14 wherein the sleeve 8 allows for limited horizontal relative movement (expansion/contraction).

Figure 13 shows an existing floor or ceiling 15 from which a new wall 14 extends and here the sleeves 8 provide for limited relative vertical movement.

In Figure 14, connectors according to the present invention are used to provide a parallel wall connection between an existing wall 13 and a parallel new wall 14. The connectors are spaced to allow preferably one connector per square metre of wall.

It will be appreciated that connectors according to the present invention allow for both vertical and horizontal movement between the parts 11 and 8 and between the parts 11 and 4. It will be further appreciated that, although the invention has been hereinbefore described with reference to a connector for joining walls, the invention is just as applicable for use in joining walls to ceilings and floors as shown in Figure 13.

Claims

1. A wall connector for tying an existing wall to a second wall as it is being erected, the connector comprising

   an elongate member (4),
   means (6,7) for attaching the elongate member to the existing wall, the elongate member having edge portions (3) which, when the elongate member is attached to the existing wall, are spaced therefrom, and tying means (11) suitable to extend in use in between courses of building elements of a second wall as it is being erected and to interconnect the second wall and said elongate member,
   the tying means comprising portions (11A) for engaging the edge portions (4) of the elongate member and means which can be fitted onto the tying means to maintain the portions of the tying means in secure embracing relationship on the edge portions of the elongate member,
   the connector being characterised in that the means which can be fitted onto the tying means comprises a sleeve (8) and/or clip (12) which can be fitted onto the tying means (11) before the tying means is located substantially in said second wall to maintain said portions (11A) of the tying means in embracing relationship on the edge portions (3) of the elongate member (4).

2. A wall connector according to claim 1 characterised in that the tying means comprises a plurality of wire ties each providing two arms whose end portions provide said portions of the tying means.

3. A wall connector according to claim 2 characterised in that each wire tie is formed from wire bent into substantially U-shaped form.

Patentansprüche

1. Wandverbinder für die Verbindung einer vorhandenen Wand mit einer zweiten Wand während diese errichtet wird, der Verbinder umfaßt

   ein langgestrecktes Teil (4),
   Mittel (6, 7) für die Befestigung des langgestreckten Teils an der vorhandenen Wand, das langgestreckte Teil besitzt Kantenbereiche (3), welche, wenn das langgestreckte Teil an der vorhandenen Wand befestigt ist, davon beabstandet sind, und Verbindungsmittel (11), die geeignet sind, sich bei Gebrauch zwischen Lagen von Bauelementen einer zweiten Wand zu erstrekken, während diese errichtet wird, um die zweite Wand und das langgestreckte Teil miteinander zu verbinden,
   die Verbindungsmittel besitzen Bereiche (IIA) für den Angriff an die Kantenbereiche (4) des langgestreckten Teils und Mittel, welche auf die Verbindungsmittel aufgesetzt werden können, um die Bereiche der Verbindungsmittel in sicherer Umklammerungslage an den Kantenbereichen des langgestreckten Teils zu halten,
   der Verbinder ist dadurch gekennzeichnet, daß die Mittel, welche auf die Verbindungsmittel aufgesetzt werden können, eine Hülse (8) und/oder Klammer (12) umfassen, welche auf die Verbindungsmittel (11) aufgesetzt werden können, bevor die Verbindungsmittel im wesentlichen in der zweiten Wand angeordnet sind, um die Bereiche (IIA) der Verbindungsmittel in sicherer Umklammerungslage an den Kantenbereichen (3) des langgestreckten Teils (4) zu halten.

2. Wandverbinder nach Anspruch 1, dadurch gekennzeichnet, daß die Verbindungsmittel eine Mehrzahl von Drahthaltern umfassen, von denen jeder zwei Arme vorsieht, deren Endabschnitte die Bereiche

der Verbindungsmittel bereitstellen.

3. Wandverbinder nach Anspruch 2, dadurch gekennzeichnet, daß jeder Drahthalter geformt ist aus im wesentlichen U-förmig gebogenem Draht.

Revendications

1. Connecteur de murs pour raccorder un mur existant à un deuxième mur lorsqu'il est construit, le connecteur comportant :

   un élément allongé (4),
   des moyens (6, 7) pour fixer l'élément allongé au mur existant, l'élément allongé comportant des parties de bord (3), qui, lorsque l'élément allongé est fixé au mur existant, sont espacées de celui-ci, et des moyens de raccordement (11) appropriés pour s'étendre lors de l'utilisation entre des étendues d'éléments de bâtiment d'un deuxième mur lorsqu'il est construit et pour interconnecter le deuxième mur et ledit élément allongé,
   les moyens de raccordement comprenant des parties (11A) destinées à venir en prise avec les parties de bord (4) de l'élément allongé et des moyens qui peuvent être adaptés sur les moyens de raccordement pour maintenir les parties des moyens de raccordement en relation d'entourage ferme sur les parties de bord de l'élément allongé,
   le connecteur étant caractérisé en ce que les moyens qui peuvent être adaptés sur les moyens de raccordement comprennent un manchon (8) et/ou une attache (12) qui peuvent être adaptés sur les moyens de raccordement (11) avant que les moyens de raccordement ne soient disposés sensiblement dans ledit deuxième mur pour maintenir lesdites parties (11A) des moyens de raccordement en relation d'entourage sur les parties de bord (3) de l'élément allongé (4).

2. Connecteur de murs selon la revendication 1, caractérisé en ce que les moyens de raccordement comportent une pluralité de liaisons à fils métalliques constituant chacune deux bras dont les parties d'extrémité constituent lesdites parties des moyens de raccordement.

3. Connecteur de murs selon la revendication 2, caractérisé en ce que chaque liaison à fils métalliques est formée en fil courbé sensiblement sous une forme de U.

Fig.1.

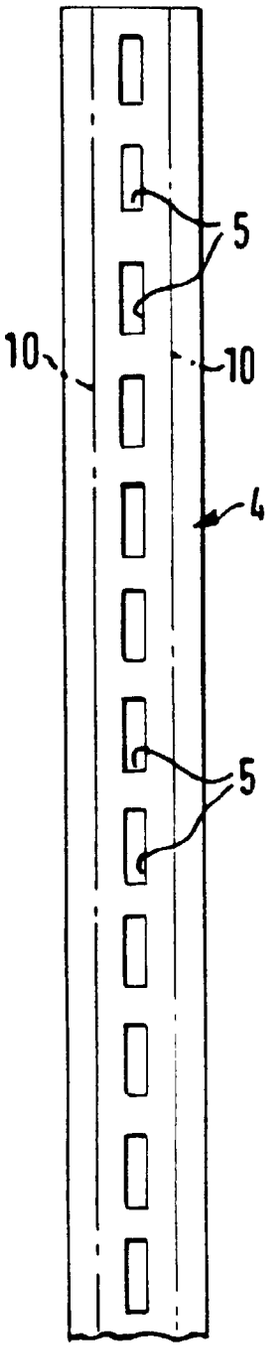


Fig.2.

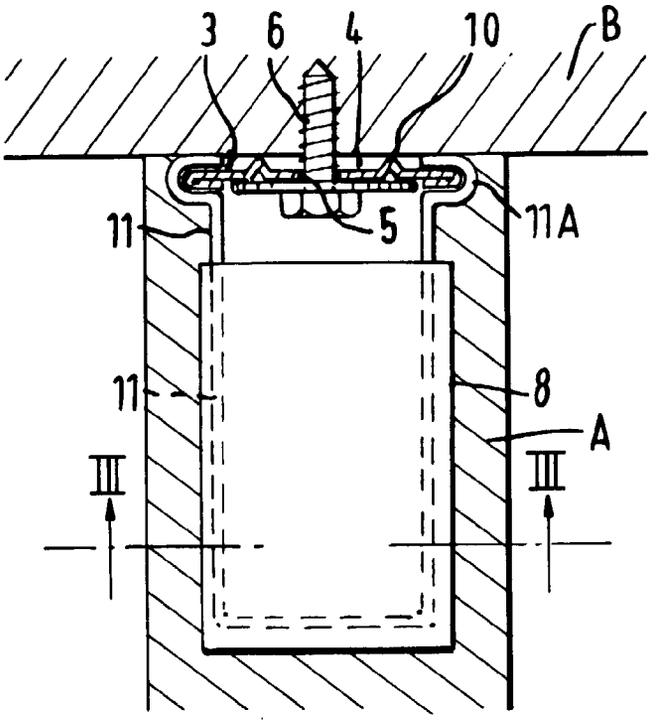


Fig.3.

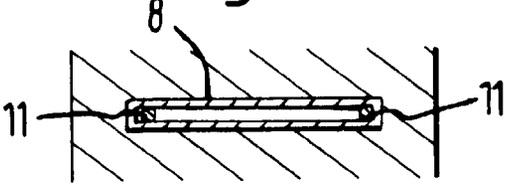


Fig.1A.

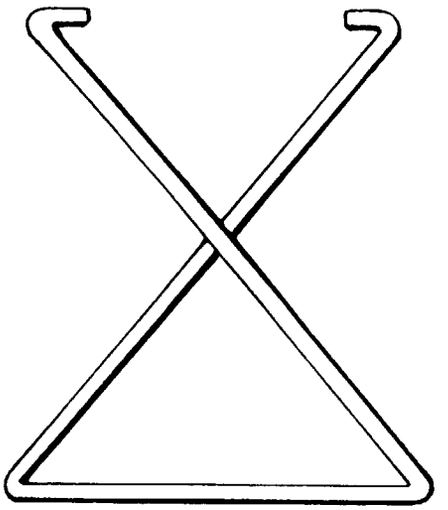


Fig.1C.

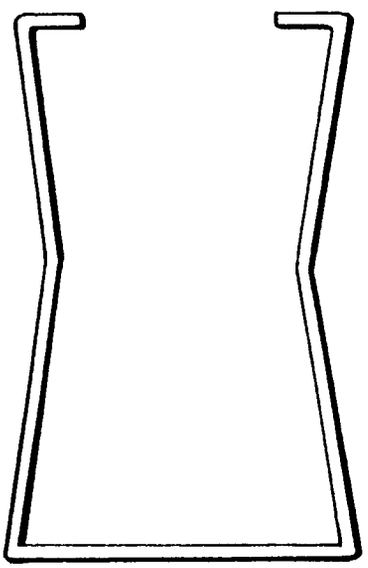


Fig.4.

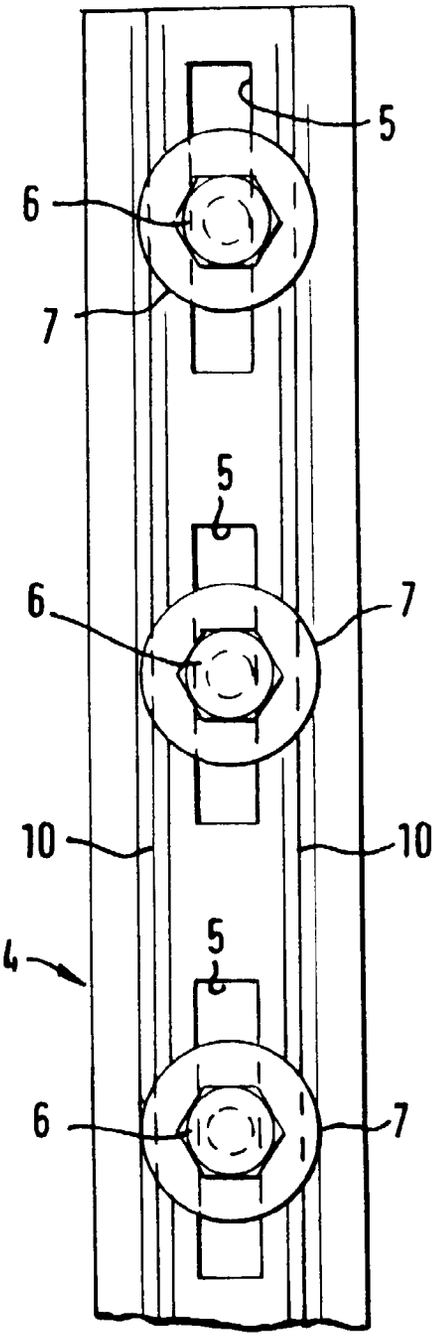


Fig.5.

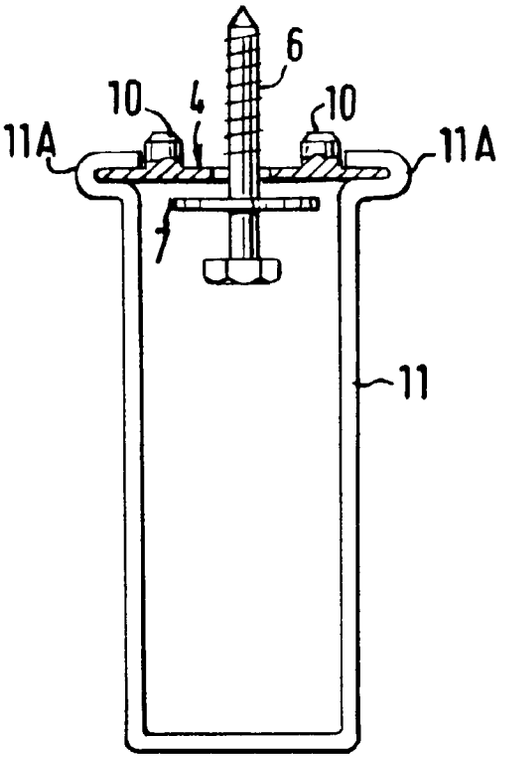


Fig.6A.

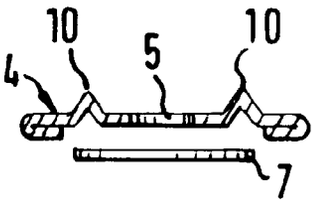


Fig.6B.

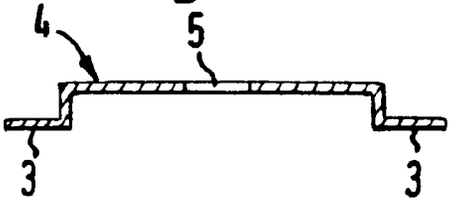


Fig.7A.

Fig.7B

Fig.8A.

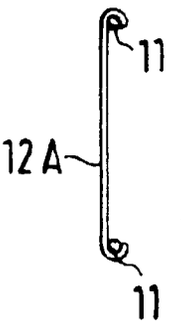


Fig.8B.

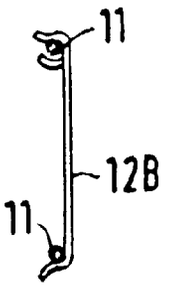


Fig.9.

Fig.10.

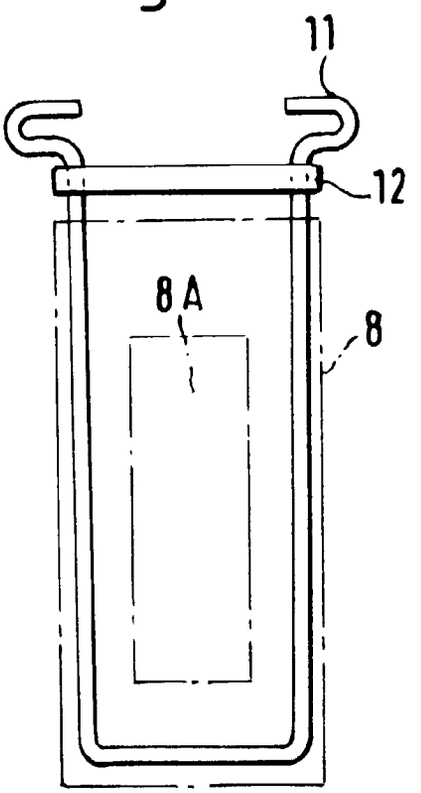


Fig.11.

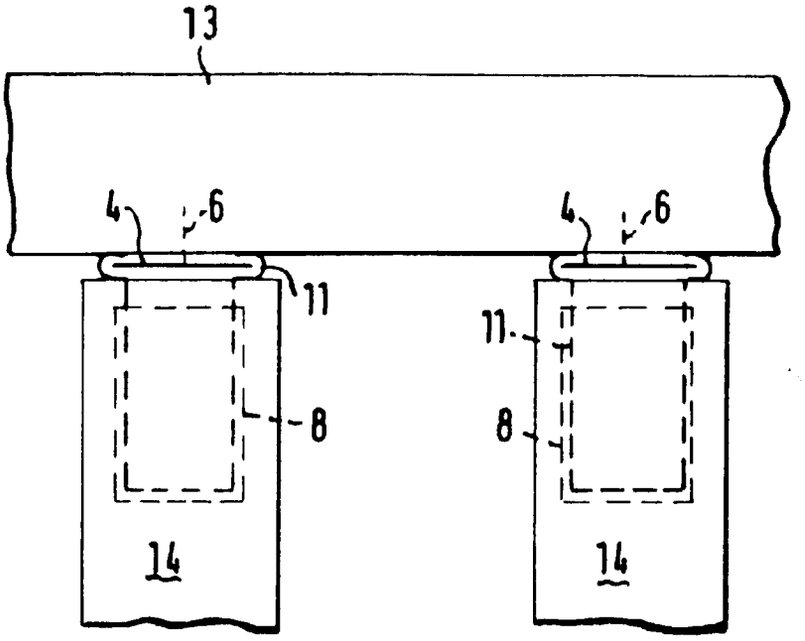


Fig.12.

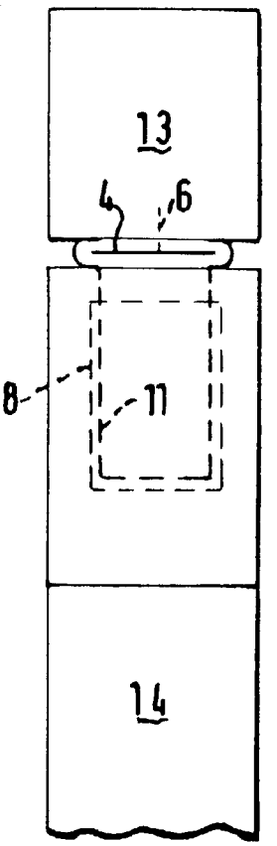
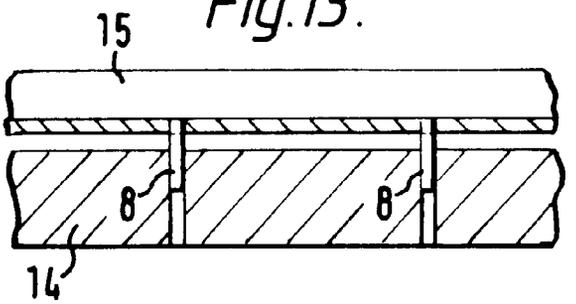


Fig.13.



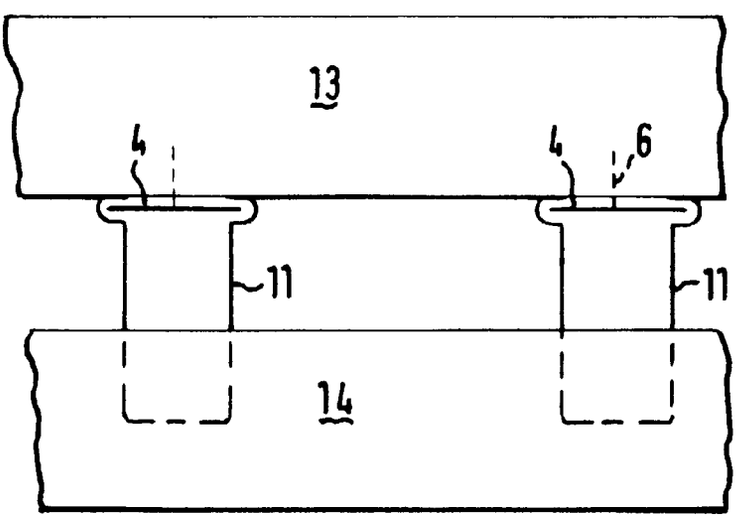


Fig.14.