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54 **Wall fastening method and apparatus.**

57 A wall fastening (1) system for fastening a second wall (3) to a first existing wall (2) comprises an elongate rail (4) fastened upright to said first wall (2). A plurality of wall-tie carrying members (6) for wall ties (7) each has a flange (9) engageable with a slot (8) on the rail (4) whereby the carrying members (6) are positionable spaced apart on the rail (4) as a vertical array. The spaced carrying members (6) are firmly secured to the first wall (2) eg. by wall screws, and the spacing is such that each wall tie (7) carried by the respective carrying member (6) lies between two successive brick courses of the second wall (3). The above system provides a saving in material and also a fastening system of increased rigidity.

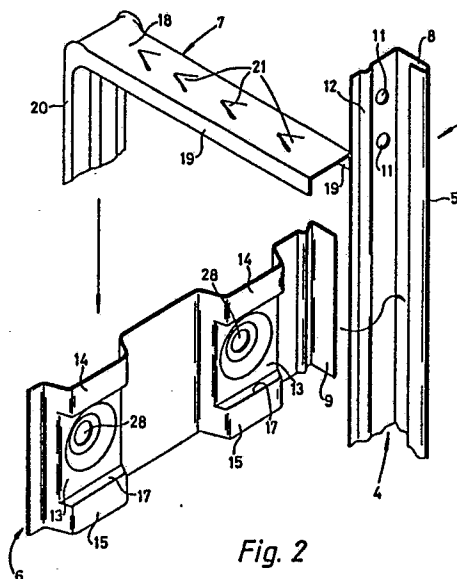


Fig. 2

Description"Wall Fastening Method and Apparatus"

The present invention relates to a wall fastening system to facilitate the building of a second wall onto a first or existing wall.

5 Wall tie devices are known comprising an elongate metal section adapted for vertical securement eg. by wall screws to an existing wall and the metal section includes at least one side flange facilitating alignment of a second wall. UK Patent 1604941 describes such a wall tie device. Tie elements are carried by the metal section so as to be located between brick (or block) courses of the second wall whereby suitable keying can be provided between the walls. Since irregularities can arise in the position of the brick courses of the second wall, provision for some vertical adjustability of the tie elements has been included in the elongate section. For example published UK Patent Applications 2154258A and 2154260A describe double-limbed tie elements with the limbs slidably received in vertical slots in the elongate section.

10 However, the previous adjustment provisions for the tie elements have not been completely adequate and/or have resulted in a tie mounting which has not been structurally satisfactory. A further disadvantage of previous wall tie systems has been that they have not been economic in use of material and have been relatively heavy.

It is an object of the present invention to obviate or mitigate these disadvantages.

According to one aspect of the present invention there is provided a method of installing a wall fastening system on a first wall to facilitate the building of a second wall onto said first wall, said second wall being formed by courses of building bricks or blocks with cementing material between said courses, said method comprising fixing upright attachment means for wall tie elements to said first wall and mounting said wall tie elements on the attachment means so that each tie element is located between two successive courses of the second wall, characterised in that a plurality of separate individual wall tie attachment members are provided, in that an elongate positioning member is located upright on the first wall, and in that said wall tie attachment members are positioned on said elongate positioning member at desired vertical spacings relative to each other and secured to said first wall at said spacings.

According to another aspect of the present invention there is provided wall fastening apparatus to facilitate the building of a second wall onto a first existing wall, said apparatus comprising upright attachment means adapted for securement to said first wall, and carrying means on said attachment means for wall ties whereby each wall tie can be positioned between two successive brick or block courses of said second wall, characterised in that there are provided a plurality of separate individual wall-tie carrying members for wall ties, and an elongate positioning member adapted for securement in an upright position on said first wall and including retaining means to receive a locating member on each wall-tie carrying member whereby the wall-tie carrying members can be positioned on said positioning member at desired vertical spacings relative to each other.

Preferably the elongate positioning member comprises a rail device, and the carrying members are preferably slidably movable on the elongate positioning member.

Preferably the carrying members are adapted for securement to the existing wall. Each tie element can comprise an L-shaped member, the carrying members including slot means to receive a first limb of the L-shaped tie element while the other limb of the element is located between courses of the second wall.

Preferably the carrying members are slidably retained on the elongate positioning member by slot-and-flange means.

Preferably said other limb of the L-shaped tie element is of flanged form. In a preferred embodiment the slot means of the carrying member receives the tie elements first limb so that the limb is positioned over a hole on the member, said hole serving for through-passage of a screw to secure the carrying member to said existing wall.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings wherein:-

Fig. 1 shows a schematic side view of the construction of a second wall onto an existing wall using a wall fastening system in accordance with the present invention;

Fig. 2 shows an "exploded" isometric view of the wall fastening system shown in Fig. 1;

Fig. 3 is a plan view of the fastening system of Fig. 2;

Fig. 4 shows a detail of the fastening system in side view and embodying clip means for retainment of parts of the system;

Fig. 5 shows a similar view to Fig. 4 but in the locked condition with the system parts clipped together;

Fig. 6 shows a sectional end view of the system through section X-X in Fig. 3 but including a modification.

Fig. 7 shows a front view of a modified tie carrying member in accordance with the present invention; and

Fig. 8 shows a sectional end view (corresponding to M-M of Fig. 3) of a further modified form of the wall fastening system.

Referring to Figs. 1 to 3 of the drawings, a wall fastening system 1 is shown facilitating the building of a second wall 3 onto an existing wall 2, and (as shown in Fig. 1) particularly for a second wall 3 extending at right

angles to the first. The wall fastening system 1 comprises an elongate positioning member 4 providing an edge flange 5, a series of wall-tie carrying members 6 (only one shown in Fig. 2) which are fitted on the elongate member 4, and wall tie elements 7 carried by the carrying members 6. The parts of the system 1 are of metal plate construction, preferably of mild or stainless steel, and can be formed by metal stamping.

The flange 5 of member 4 is bent over to form a slot 8 receiving a flange 9 of each carrying member 6; the elongate member 4 being fastened to the wall 2 by wall screws 10 passing through holes 11 on the member 4. Member 4 includes a reinforcing ridge 12. The carrying member 6 is of corrugated plate form and raised corrugations thereof provide apertured land portions 13 for wall screws (not shown) to secure the members 6 to the wall 2. Strap portions 14, 15 standing proud of lands 13 provide slots 16, 17 to receive the wall tie elements 7. Each element 7 is of L-shaped form and is stamped out so that the longer limb 18 has side flanges 19, while the shorter limb 20 of element 7 is received in slots 16, 17 so as to cover the recessed screw aperture 28 in land 13 (two elements 7 being provided per carrying member 6). The wall tie 7 is consequently firmly gripped between the land 13 and the strap portions 14, 15 such that any free (pivotal) movement of the tie 7 in the plane of the land 13 or in a plane perpendicular thereto can be substantially precluded. Tongue apertures 21 are present on each element 7 for through-passage of mortar cement thereby assisting the keying action.

Further it is preferable that each carrying member 6 is movable into a locked condition on the elongate positioning member 4. Thus, referring to Figs. 4 and 5, for this end the positioning member 4 can have a concave channel 25 while each carrying member 6 has a corresponding mating channel 26, the width W_P of the channel 25 being slightly less than the width W_C of the channel 26, so that the channel 25 can serve as a clip for the channel 26. Fig. 4 shows the position of initial fitting of a carrying member 6 onto the positioning member 4. In this position the member 6 is inclined relative to the member 4 with the flange 9 partially in the slot 8, and in this position the member 6 is capable of a sliding guided movement on the positioning member 4. To lock the member 6 in the positioning member 4, a downward force F is applied to the member 6 to cause the channel 26 to clip into channel 25 as shown in Fig. 5, held by the side walls 25A, 25B of the channel 25.

A further preferred feature is that the limb 18 of the tie element 7 is located slightly above the top edge of the relevant carrying member 6 and to achieve this requirement a stop element 27 is provided on the limb 20 of tie element 7 as shown in Fig. 6 and engages an outer edge 13A of the land 13 to limit downward movement of the tie element 7. With this arrangement, the top of a brick or block can be positioned level with the top edge of the carrying member 6 as shown so that a small space is present between the bricks and the limb 18 for cement or mortar 3A bonding the brick courses of wall 3.

In the constructions of the second wall 3 onto existing wall 2, the elongate member positioning member 4 is firstly located in a vertical position on wall 2 eg. using a plumb line, and the member 4 is secured to the wall 2 by wall screws 10. For the formation of the various courses (ie. A, B, C of Fig. 1) of the second wall 3, the respective carrying member 6 is located in position as shown in Fig. 1 prior to building the course so that the limbs 18 of the elements 7 will be at the top level of the course (or slightly above) and the element 6 is secured in this position on wall 2 by means of fastening screws inserted through the screw apertures 28. Further carrying members 6 are fitted to the member 4 and screwed to the wall 2 to form a vertical array of members 6 with selected vertical spacings S_1 , S_2 etc. and each member 6 carries tie elements 7 located between successive courses of the wall 3.

Alternatively, the vertical array of members 6 can be fitted to the positioning member 4 at the desired vertical spacings S_1 , S_2 etc. and secured to the wall 2 prior to the formation of the wall 3. The spacings S_1 , S_2 etc would normally be uniform eg. 300 mm. As seen in Fig. 3, the edge flange 5 serves to align the brick courses. The flange 9 located in slot 8 has sufficient width to prevent tilting of the element 6 so that the elements 6 will be set precisely normal to member 4 and hence horizontal. Similarly tie elements 7 are restrained from pivoting by slots 16, 17 and this provides satisfactory structural rigidity and hence improved keying between the walls 2, 3. As will be noted the carrying members 6 are symmetrical about a horizontal (longitudinal) axis so that the members 6 suffice without alteration for left hand or right hand positioning of the elongate member 4, the flange 9 being placed at the left or right hand side simply by rotating the member 6. The flange 9 can be provided with a sideways directed tongue 9A to improve the securement of the flange 9 in the slot 8.

As will be appreciated, the above wall fastening system of the present invention provides an infinite vertical adjustment of the wall tie elements 7 relative to the member 4 so that all irregularities in course levels can be compensated for. Further in the present invention, the wall tie elements are carried by separate carrying members rather than by a single integral elongate metal section as in previous systems and this enables substantial reduction in the amount of material required for the construction of the wall tie since the elongate member 4 can be relatively narrow. Additionally, the specific and firm securement of each carrying member 6 to the wall 2 by means of the fastening screws give greatly improved strength to the fastening system in comparison to systems using a single integral elongate tie attachment member which may be secured to the base wall only at random positions.

The present fastening system 1 can be conveniently used for the building of "second" walls having substantially different brick or block sizes since only the tie carrying members 6 need be substituted, all other items being common for all brick or block sizes.

The length L of the element 6 determines the brick size to be catered for, specifically for brick (or block) widths in the range B_1 to B_2 . By way of example the following sizes are indicated:-

<u>L</u> for brick size	<u>B1</u>	-	<u>B2</u>
120 mm	125	-	170 mm
170 mm	190	-	250 mm

Where the brick or wall width is to be relatively small ie. less than 100 mm, the tie carrying member 6A shown in Fig. 7 will be preferred. As can be seen, element 6A is retained by only a single screw and only a single set of slots 16/17 is provided for a single tie element 7.

Modifications are of course possible. Thus the mounting of the tie elements 7 on the carrying members 6 could be achieved in some alternative manner. For example, referring to Fig. 8, the tie element 7 could be provided with a downwardly projecting finger 29 at the upper end which clips over an extended portion of the land 13 as shown, one or both of the strap portions 14, 15 being dispensed with. However for improved securement it may be preferable to couple the tie elements 7 to the carrying member 6 at or towards the bottom end thereof for example by means of a hook element 30 on the member 6 engaging a slot 31 on the element 7, as shown, and for this arrangement the tie element 7 could be symmetrical about a vertical axis with similar retainment means at each end of the element 7 for fitment to the positioning member 4 so that the elements 7 are still usable for left or right hand positioning of the member 4.

Claims

1. A method of installing a wall fastening system on a first wall to facilitate the building of a second wall onto said first wall, said second wall being formed by courses of building bricks or blocks with cementing material between said courses, said method comprising fixing upright attachment means for wall tie elements to said first wall and mounting said wall tie elements on the attachment means so that each tie element is located between two successive courses of the second wall, characterised in that a plurality of separate individual wall tie attachment members are provided, in that an elongate positioning member is located upright on the first wall, and in that said wall tie attachment members are positioned on said elongate positioning member at desired vertical spacings relative to each other and secured to said first wall at said spacings.

2. A method as claimed in claim 1, characterised in that the wall tie attachment members are slidable on the elongate positioning member to the relevant spaced positions.

3. A method as claimed in claim 1 or 2, characterised in that the wall tie attachment members are locked to said elongate positioning member at the relevant spaced positions.

4. A method as claimed in any one of the preceding claims, characterised in that upright outwardly-projecting flange means are provided for alignment of said courses of the second wall.

5. A method as claimed in any one of the preceding claims, characterised in that each wall tie attachment member is formed by a metal stamping.

6. Wall fastening apparatus to facilitate the building of a second wall onto a first existing wall, said apparatus comprising upright attachment means adapted for securement to said first wall, and carrying means on said attachment means for wall ties whereby each wall tie can be positioned between two successive brick or block courses of said second wall, characterised in that there are provided a plurality of separate individual wall-tie carrying members (6) for wall ties (7), and an elongate positioning member (4) adapted for securement in an upright position on said first wall (2) and including retaining means (8) to receive a locating member (9) on each wall-tie carrying member (6) whereby the wall-tie carrying members (6) can be positioned on said positioning member (4) at desired vertical spacings relative to each other.

7. Apparatus as claimed in claim 6, characterised in that the elongate positioning member (4) is in the form of a rail having flange means (5) defining an elongate recess (8) to receive a co-operating flange (9) on each wall-tie carrying member (6).

8. Apparatus as claimed in claim 7, characterised in that each wall-tie carrying member (6) is positionable on the positioning member (4) with the flange (9) of the carrying member (6) located in said recess (8) so that the carrying member (6) is slidably guidable on the positioning member (4).

9. Apparatus as claimed in any one of claims 6 to 8, characterised in that parts (25, 26) of said positioning member (4) and said wall-tie carrying members (6) define co-operating clip means whereby each wall-tie carrying member (6) can be moved to a locked position on said positioning member (4).

10. Apparatus as claimed in any one of claims 6 to 9, characterised in that each wall-tie carrying member (6) includes at least one hole (28) for a screw serving to secure the carrying member (6) to said first wall (2).

11. Apparatus as claimed in claim 10, characterised in that said hole (28) is recessed.

12. Apparatus as claimed in any one of claims 6 to 11, characterised in that each wall tie (7) comprises an L-shaped member, the carrying members (6) including slot means (16, 17) to receive a first limb (20) of

the L-shaped tie member (7) while the other limb (18) of the L-shaped member is located between courses of the second wall (3).

13. Apparatus as claimed in any one of claims 6 to 12, characterised in that stop means (27) are provided to position the portion (18) of the wall tie (7) located between courses of the second wall (3) at a level above the top edge of the wall-tie carrying member (6).

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14. Apparatus as claimed in claim 12, characterised in that each wall-tie carrying member (6) includes holding means (14, 15) which engages spaced apart portions of said first limb (20) of the L-shaped member (7) for firm location of the wall tie (7) in the carrying member (6).

15. Apparatus as claimed in claim 14 when dependent on claim 11, characterised in that a land (13) is provided at said recessed hole (28), and in that said holding means (14, 15) comprises straps on either side of said land (13) and standing proud of the land (13) whereby said one limb (20) of the L-shaped member (7) is gripped between said straps (14, 15) and the land (13) with the recessed hole (28) covered by said one limb (20).

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16. Apparatus as claimed in any one of claims 6 to 15, characterised in that each wall-tie carrying member (6) comprises a corrugated form metal stamping.

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17. Apparatus as claimed in any one of claims 6 to 16, characterised in that each wall-tie carrying member (6) is symmetrical about an axis.

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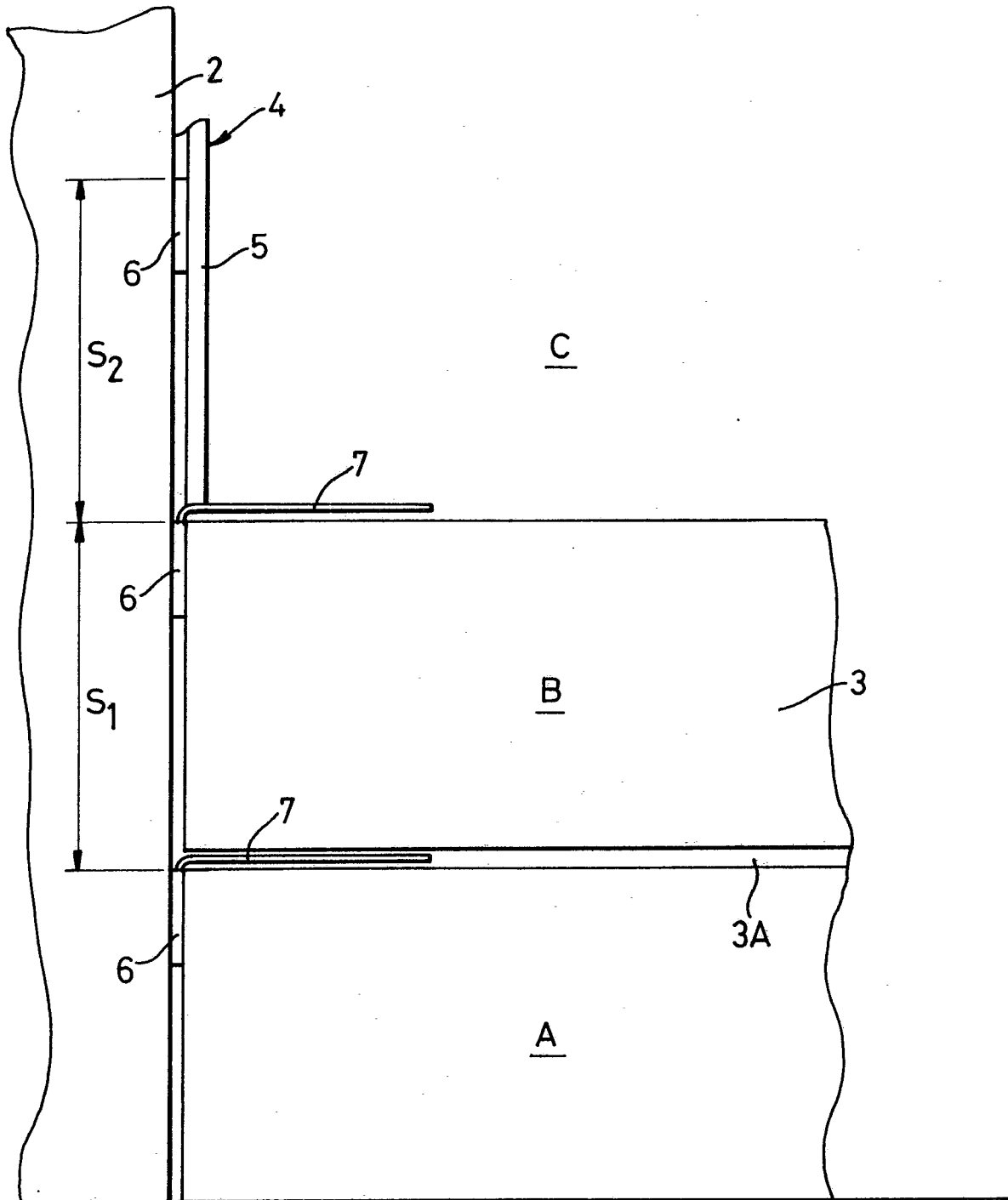
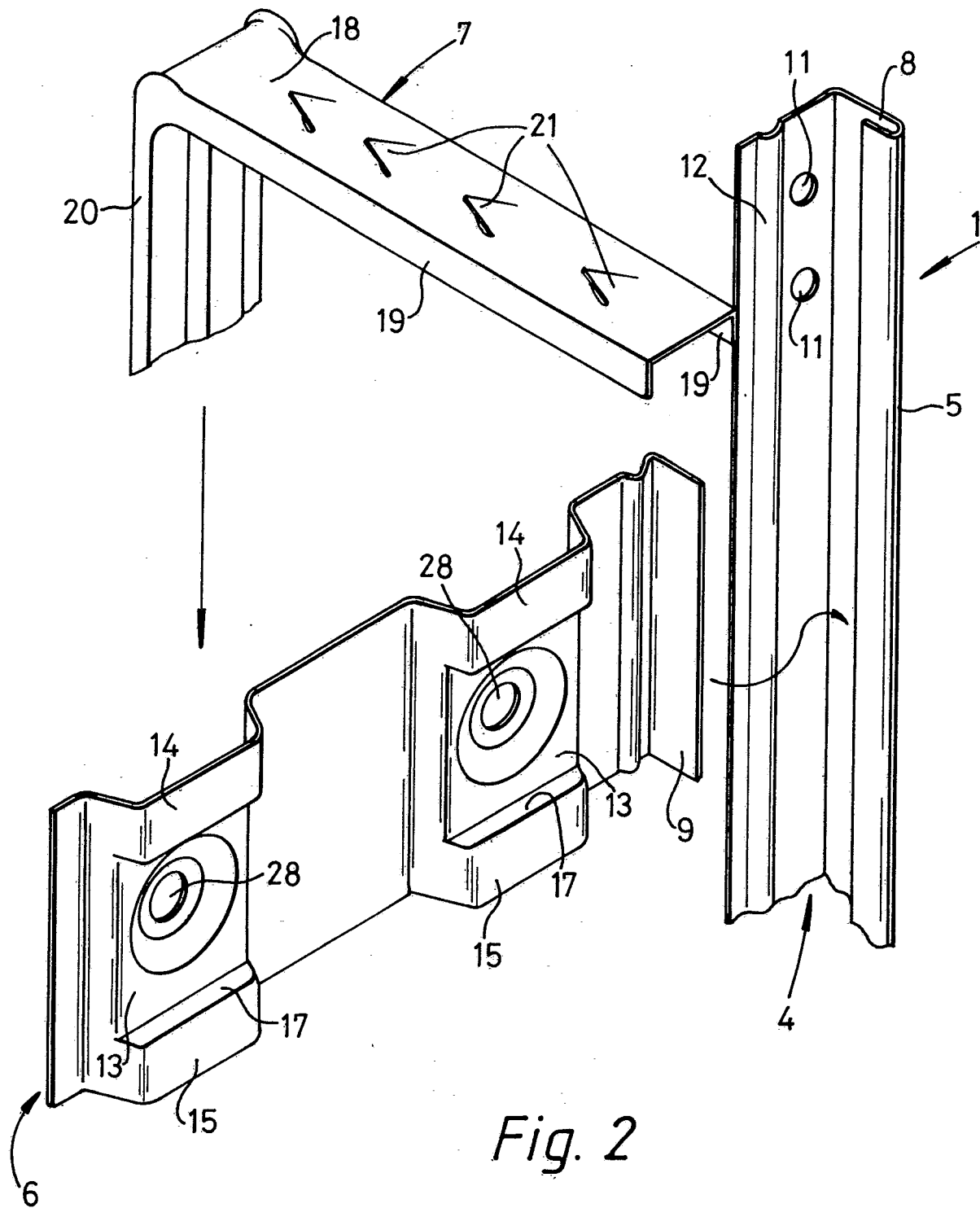


Fig.1

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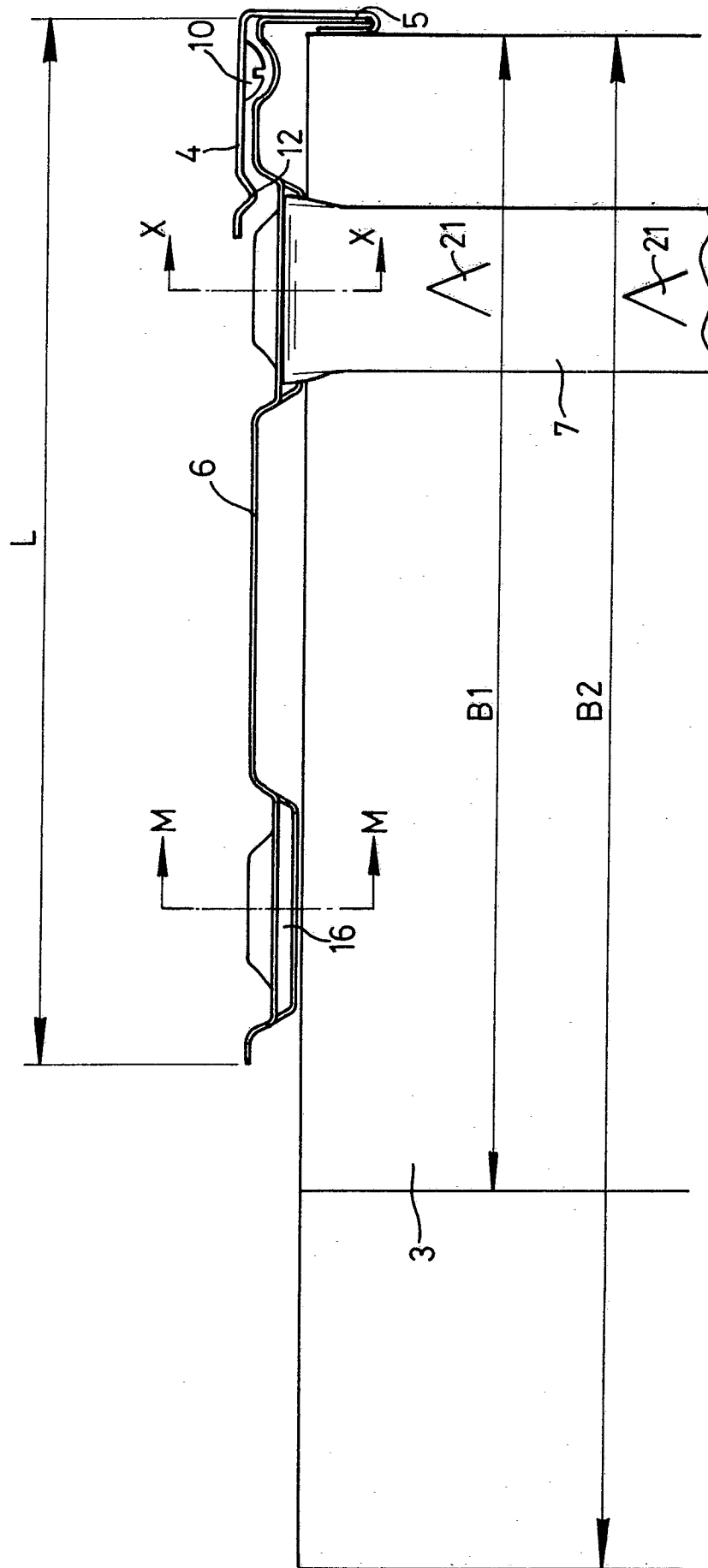


Fig. 3

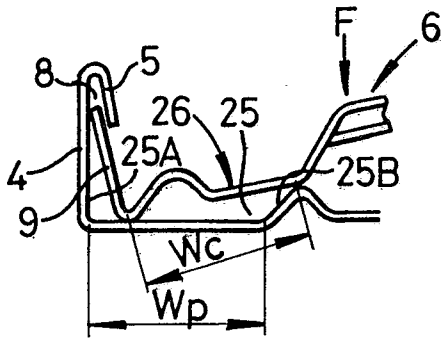


Fig. 4

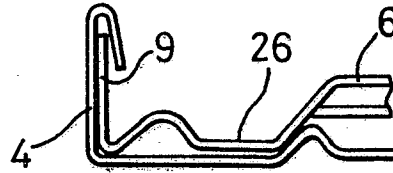


Fig. 5

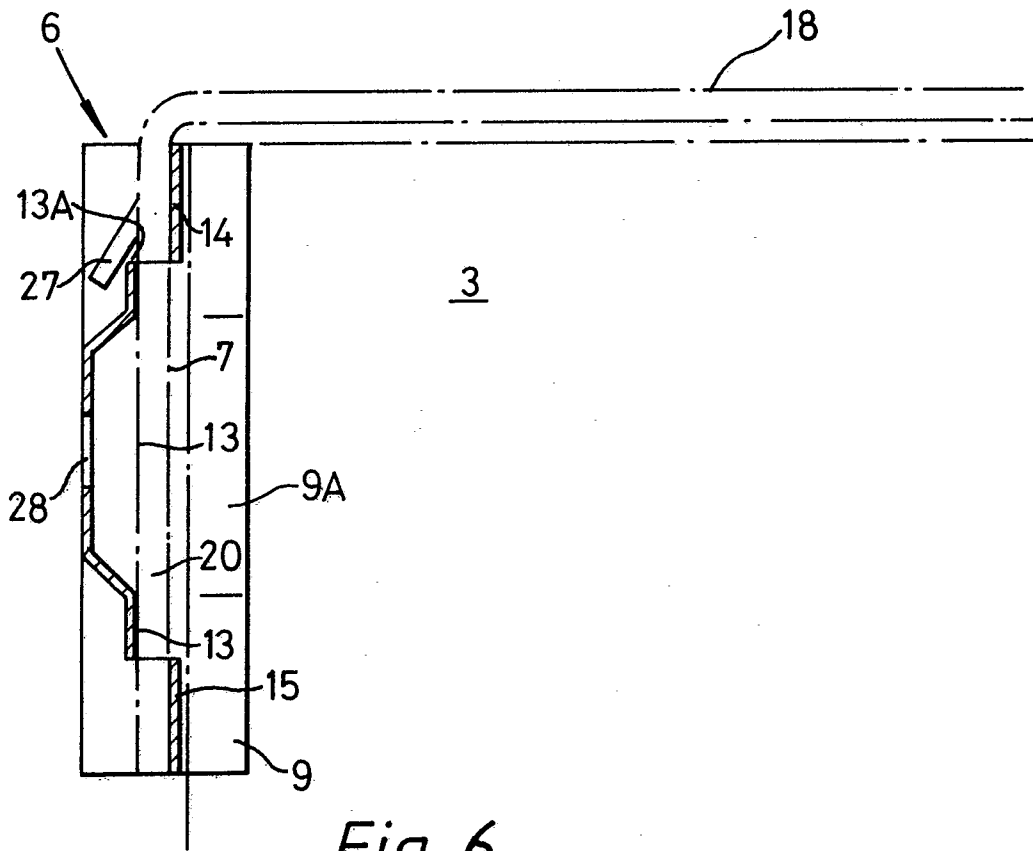


Fig. 6

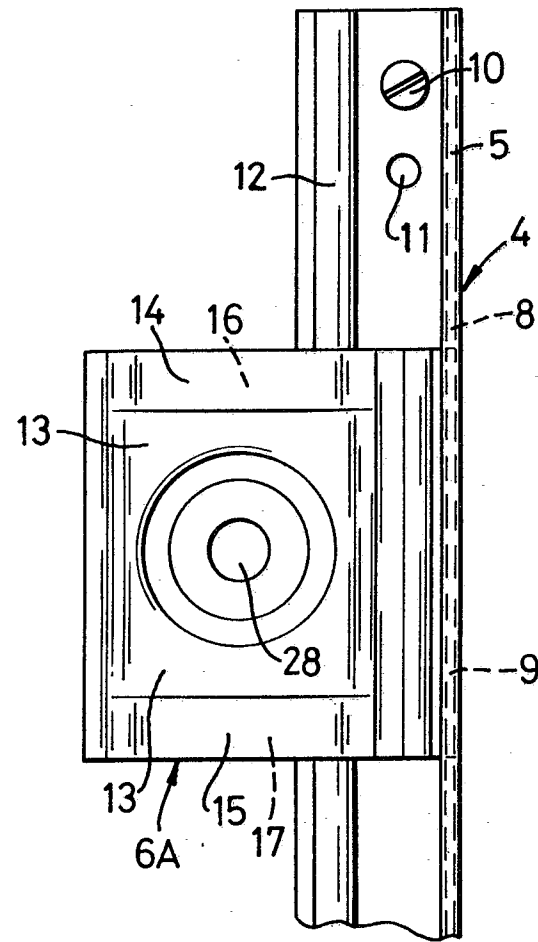


Fig. 7

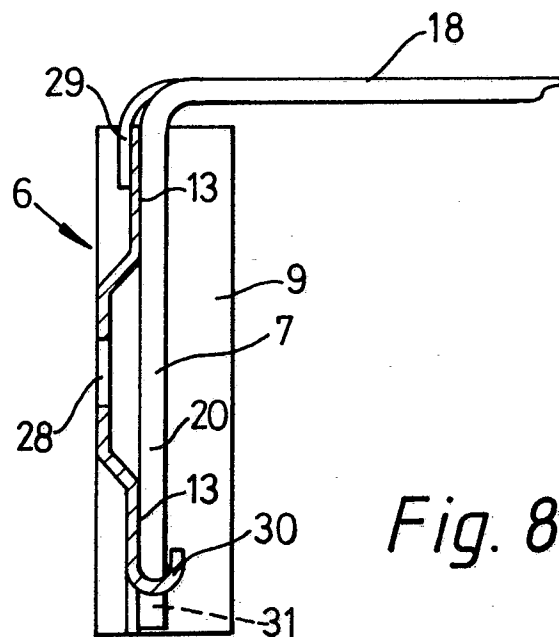


Fig. 8