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(71) Applicant
C & T Metals,

(Incorporated in United Kingdom),

10 Carlyle Avenue, Hillington Industrial Estate,
Glasgow G52 4JJ

(72) Inventors
David Kenneth Cusick,
John Lamont

(74) Agent and/or Address for Service
Fitzpatricks, 4 West Regent Street, Glasgow G2 1RS

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(56) Documents cited

GB A	2162217	GB A	2154260
GB A	2162216	GB A	2154258
GB A	2161843	GB	1575501
GB A	2161515	US	4598518

(58) Field of search
E1D
Selected US specifications from IPC sub-class E04B

(54) Wall ties for added walls

(57) A wall fastening (1) system for fastening a second wall (3, Fig. 1) to a first existing wall (2, Fig. 1) 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) e.g. by wall screws, and the spacing is such that each wall tie 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.

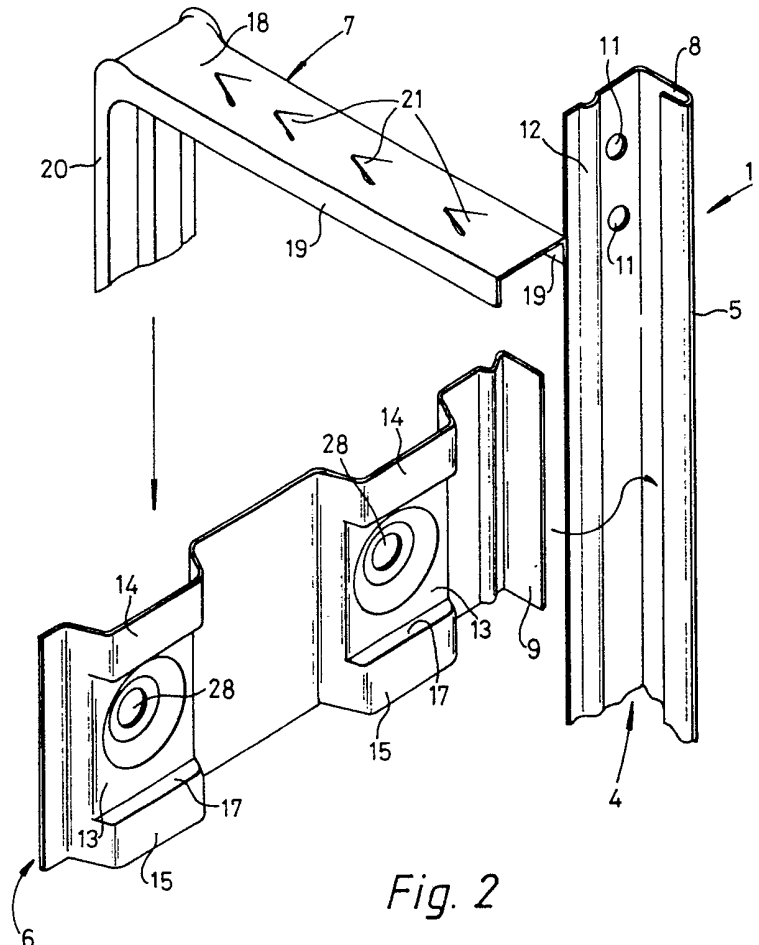


Fig. 2

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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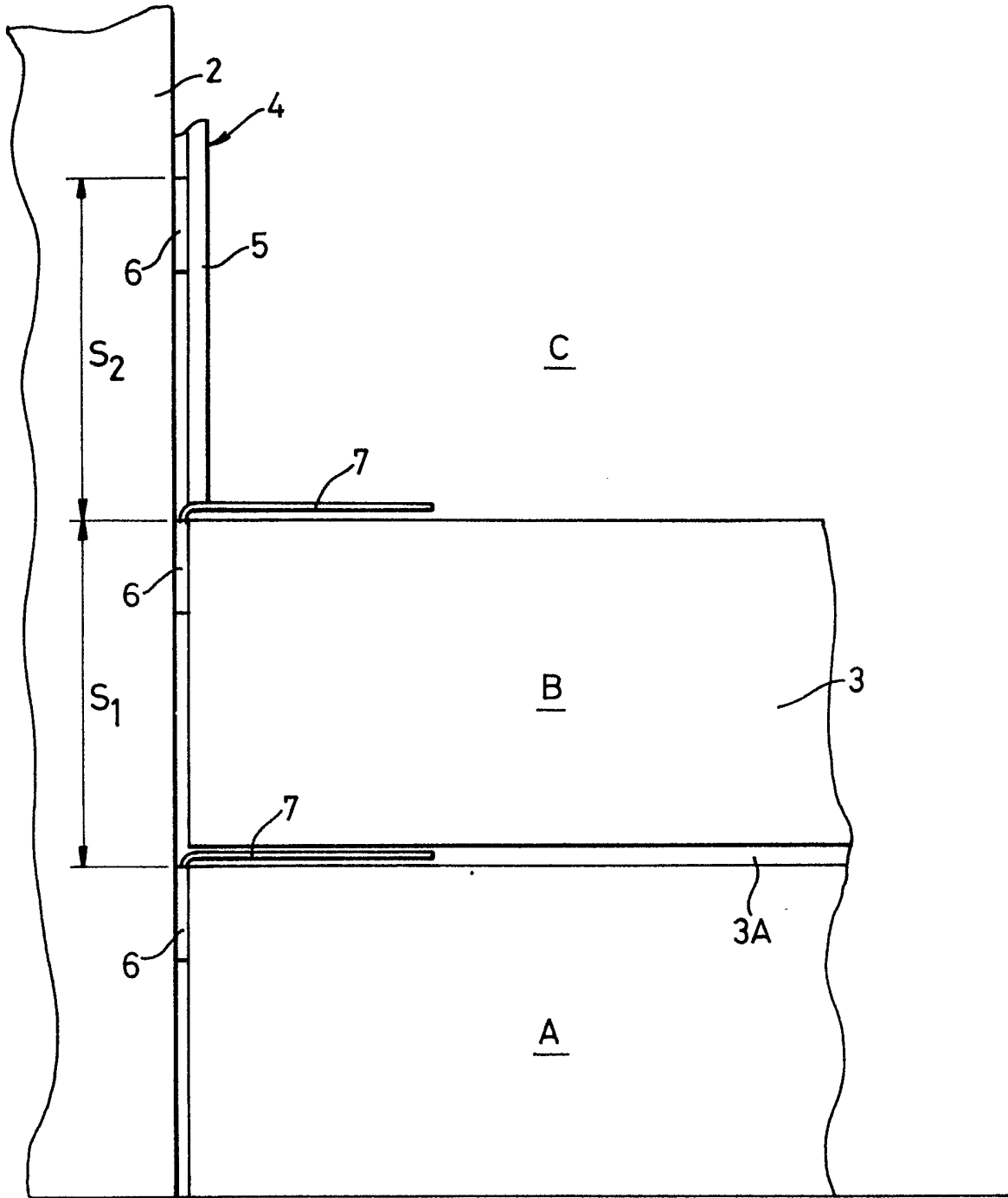


Fig.1

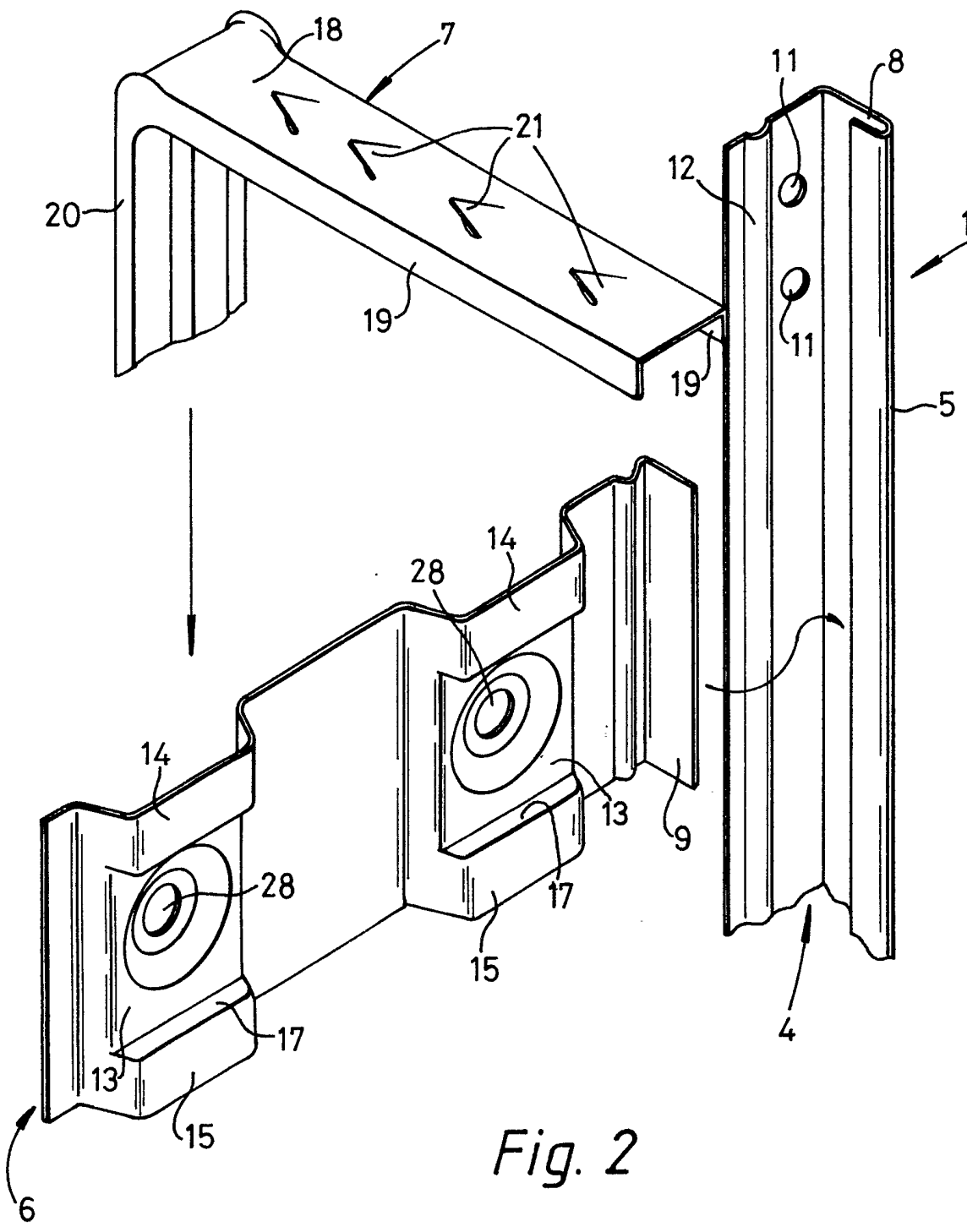


Fig. 2

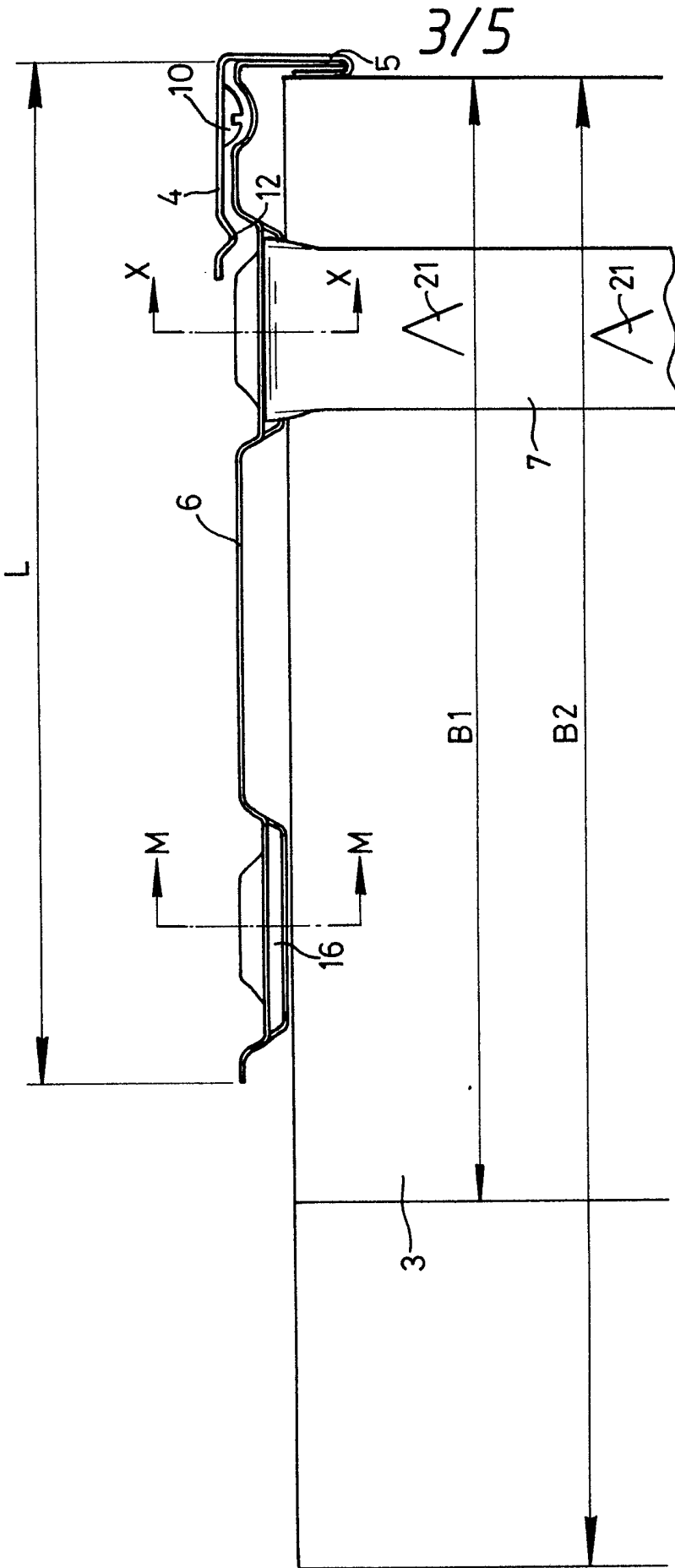


Fig. 3

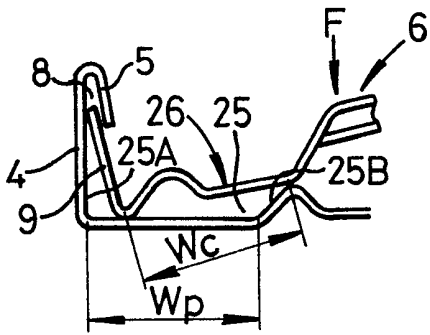


Fig. 4

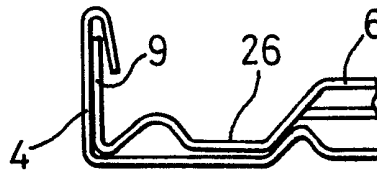


Fig. 5

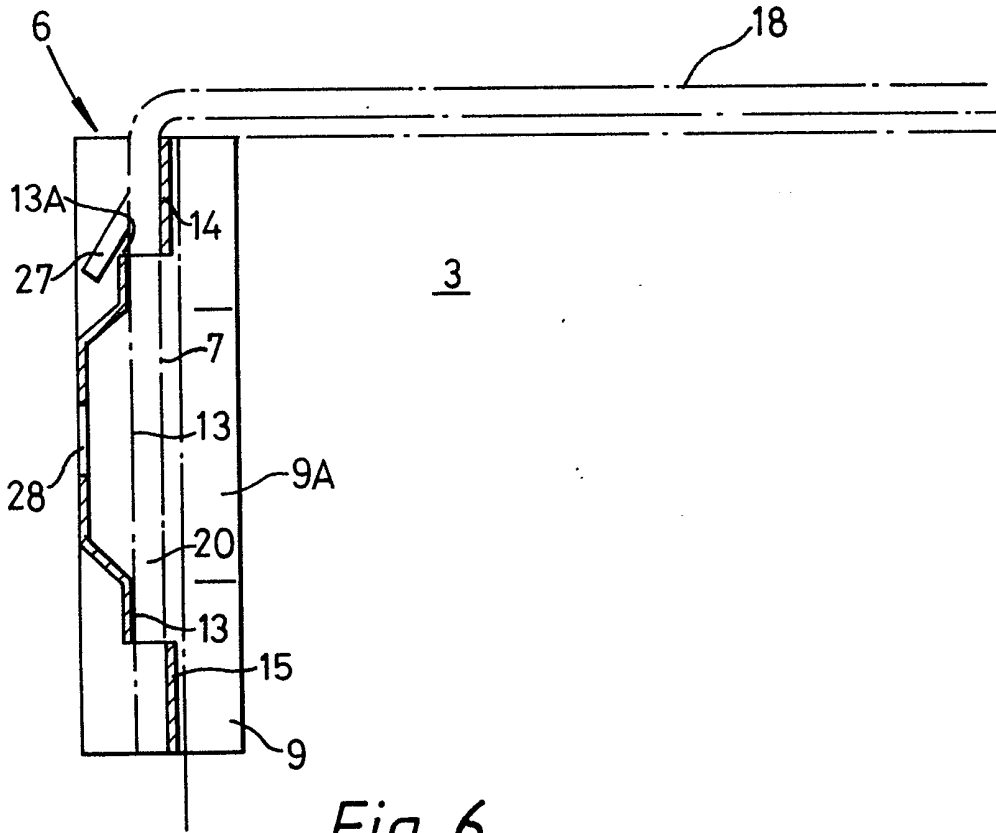
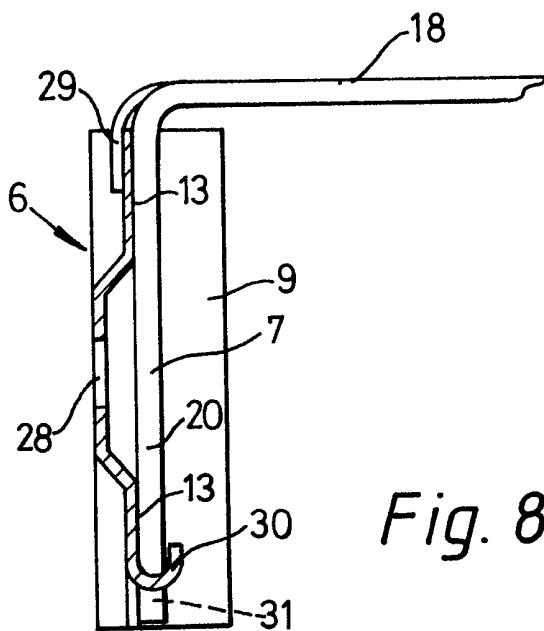
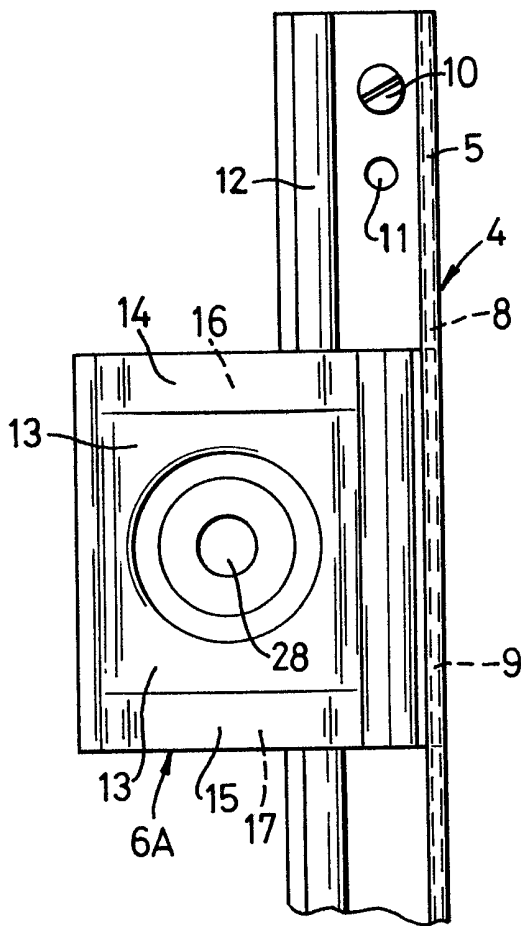


Fig. 6

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SPECIFICATION

Wall Fastening Method and Apparatus

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

Wall tie devices are known comprising an
elongate metal section adapted for vertical
securement eg. by wall screws to an existing wall
10 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
15 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
20 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.

25 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
30 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
35 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
40 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
45 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
50 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
55 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
60 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
65 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
70 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.

75 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
80 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.

85 Preferably said other limb of the L-shaped tie
element is of flanged form. In the 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
90 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:—

95 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
100 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
105 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
110 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

115 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
120 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
125 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
130

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 member 6 to the wall 2. Strap portions 14, 15 standing proud of lands 13 to 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 for 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:—

L for brick size	B_1 — B_2
120 mm	125—170 mm
130 170 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, wherein there are provided a plurality of separate individual wall tie attachment members and an elongate positioning member located upright on the first wall, said wall tie attachment members being 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, wherein 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, wherein 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, wherein 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, wherein 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 a plurality of separate individual wall-tie carrying members for wall ties each of which wall tie is to be located between two successive brick or block courses of the second wall,

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.

7. Apparatus as claimed in claim 6, wherein the elongate positioning member is in the form of a rail having flange means defining an elongate recess to receive a co-operating flange on each wall-tie carrying member.

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

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

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

11. Apparatus as claimed in claim 10, wherein said hole is recessed.

12. Apparatus as claimed in any one of claims 6 to 11, wherein each wall tie comprises an L-shaped member, the carrying members including slot means to receive a first limb of the L-shaped tie member while the other limb of the L-shaped member is located between courses of the second wall.

13. Apparatus as claimed in any one of claims 6 to 12, wherein step means are provided to position the portion of the wall tie located between courses of the second wall at a level above the top edge of the wall-tie carrying member.

14. Apparatus as claimed in claim 12, wherein each wall-tie carrying member includes holding means which engages spaced apart portions of said first limb of the L-shaped member for firm location of the wall tie in the carrying member.

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

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

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

18. Apparatus as claimed in claim 7, wherein spring tongue means are provided to secure said co-operating flange in the recess.

19. A method of installing a wall fastening system

as claimed in claim 1 and substantially as
hereinbefore described.

20. Wall fastening apparatus substantially as
hereinbefore described with reference to and as

5 illustrated in Figs. 1 to 3 or these figures as modified
by Figs. 4/5 or Figs. 6, 7 or 8 of the accompanying
drawings.