

12 **EUROPEAN PATENT APPLICATION**

21 Application number: 85304918.7

51 Int. Cl.⁴: **E 04 B 1/41**

22 Date of filing: 10.07.85

30 Priority: 11.07.84 GB 8417697
25.07.84 GB 8419009
29.08.84 GB 8421803
03.10.84 GB 8424900

43 Date of publication of application: 05.03.86
Bulletin 86/10

84 Designated Contracting States: BE DE FR GB LU NL

71 Applicant: **TRULINE BUILDING PRODUCTS LIMITED**,
70 Albert Road, Buckhurst Hill Essex IG9 6BH (GB)

72 Inventor: **Perry, Christopher Guy**,
"Woodside" 14 Campions Goldings Manor, Loughton
Essex IG10 2SG (GB)
Inventor: **Perry, David Graham**,
"Rotherwood" 77 Roebuck Lane, Buckhurst Hill Essex
IG9 5QX (GB)

74 Representative: **Eder, Ephry, E.EDER & CO.** 2 Chichester
Rents Chancery Lane, London WC2A 1EG (GB)

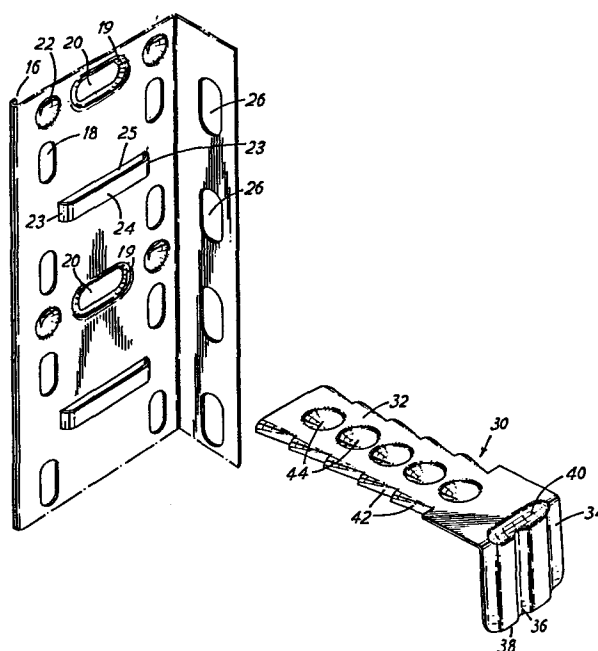
54 **Improvements in or relating to walls.**

57 Method and apparatus for building onto a first wall a second wall of brick or building components in which an elongate metal attachment member is fastened to the first wall, the attachment member being stamped to provide means for use in tying that member to the end components of the second wall.

The attachment member (10) has transverse straps (24) defining vertical guide slots (25) each of which can slidably receive the vertical limb (34) of a tie member (30) having a horizontal limb (32) to be embedded in the mortar between courses of the second wall. The limits of vertical motion of the tie member (30) are determined by its vertical dimension. The sides of the tie member's horizontal limb (32) comprise a plurality of teeth (42).

The attachment member (10) can have a projecting side limb (14) to provide an alignment surface for the side faces of the second wall's end components. Due to the stamped out transverse straps (24), the L-section alignment member (10, 14) thus formed is non-handed and can be utilised with its alignment surface (14) either on the left or on the right of the second wall.

Additionally or alternatively, the attachment member (10) can have means (19) in the vicinity of its fixing apertures (20) to act as a restraint against bowing of the attachment member (in the vertical and/or horizontal direction) due to over-tightening of the fixing means, e.g. screw-threaded fasteners, used for attaching attachment member (10) to the first wall.



IMPROVEMENTS IN OR RELATING TO WALLS

This invention relates to walls and in particular to methods of and apparatus for building walls.

5 Background to the Invention

It is already known, e.g. from UK Patent No. 1604941, to build onto a first wall a second wall of brick or building blocks by fixing to the first wall an upright alignment member of U-shape cross-section and aligning the end bricks or blocks of the second wall within the two projecting limbs of the U-shape cross-section upright. The upright alignment member is provided with hook-like projections to receive so-called standard butterfly wall ties which are laterally
10 slidable therein and enter into the mortar or cement between two rows of the bricks or blocks of the second wall. Unfortunately dimensioning difficulties can arise, e.g. vertical building tolerances or height differences between rows of the bricks or blocks in the two walls (e.g. where
15 one is of imperial size bricks and the other is of metric size bricks) whereby it is difficult or impossible to ensure that the ties are properly held on the alignment upright such that they can enter horizontally between two said rows at a fixed lateral position.

25

Brief Summary of the Invention

The present invention aims to provide a method and apparatus whereby the above-mentioned and/or other difficulties can be
30 obviated or at least reduced.

According to a first aspect of this invention there is provided a method of building onto first wall a second wall of building components (e.g. bricks or blocks) to be
35 interconnected via a jointing compound (e.g. mortar or cement), said method comprising the steps of attaching to

the first wall an upright attachment member, constructing the second wall in courses with an end of each course abutting against said upright attachment member, and providing between at least one pair of superimposed courses
5 a tie member connected to the attachment member characterised in that the tie member is slidably connectable to the attachment member such as to be guided for vertical motion with respect thereto over a distance limited by the vertical dimensions of the tie member.

10

Preferably, said attachment member is an alignment member providing a lateral alignment surface for said second wall's building components, the second wall being constructed with one side face of its end components in alignment with and
15 substantially abutting said lateral alignment surface.

The said tie member is thus positionally adjusted vertically with respect to the attachment member such as to compensate for or accomodate vertical building tolerances, e.g. height
20 variations between courses of the building components of the first and second walls.

According to a second aspect of this invention there is provided apparatus for use in a method according to said
25 first aspect of the invention, said apparatus comprising an elongate attachment member to be in use upright and attached to said first wall, and at least one tie member for connection to said attachment member and for disposition between two superimposed courses of the said second wall,
30 the attachment member having guide means for slidably guiding said tie member with respect to the wall plate, the guide means being characterised in that they permit said slidably guided motion over a distance limited by the vertical dimensions of the tie member.

35

The guide means thus enable at least one of said tie members to be positionally adjusted vertically to compensate for or

accomodate vertical building tolerances.

Advantageously said guide means is provided by said wall attachment member. Alternatively said guide means is
5 provided by the tie member.

In a preferred embodiment said guide means comprises a finger spaced from a generally planar part of said wall attachment member, part of said tie member being insertable
10 slidably into said space.

Preferably, said generally planar part is engaged by said tie member part both above and below said finger such that said tie member part is thereby restrained against angular
15 movement in a plane normal to said generally planar part.

Alternatively, and where said wall attachment member has an alignment surface provided by a limb projecting away from the plane of a rear surface of the wall attachment member,
20 said guide means may comprise a finger spaced from the plane of said limb such as to permit slidable entry into the said space of part of the tie member.

Preferably said finger is connected at each end to the wall attachment member in the manner of a strap and such that
25 said space provides a slot-like opening.

Advantageously the opposite side edges of said tie member part in use engage the ends of said strap-like finger such
30 that said tie member part is thereby restrained against angular movement in a plane parallel to said generally planar part.

According to a third aspect of this invention there is
35 provided a tie member comprising first and second limbs substantially at right angles to one another and respectively to extend in use substantially horizontally and

substantially vertically, characterised in that said first limb has at least part of its sides formed by a plurality of individual teeth extending normally to the main body of said first limb.

5

In a preferred embodiment the part of the tie member to enter said space in said wall attachment member progressively reduces in cross-section as it extends towards its free end thereby to facilitate entry of said part into said space.

10

Preferably, said teeth are of generally planar form and disposed in a plurality of individual planes angled to the general direction of said first limb; and, on each side of the first limb, all the planes of said teeth on that side are parallel to one another and at the same angle to the first limb's general direction.

15

Advantageously, the teeth are each of generally triangular form; and said teeth extend from the main body of the first limb in the same direction as the said second limb of the tie member.

20

Preferably said second limb is provided with one or more reinforcing ridges or channels extending longitudinally thereof. If further strengthening is required a laterally extending elongate depression may be formed in the arris between the first and second limbs of the tie member.

25

According to a fourth aspect of this invention there is provided an elongate attachment member to be fixed upright to a said first wall, said member having apertures to receive screw-threaded fasteners for such fixing and being characterised by restraining means in the vicinity of one or more of the apertures to provide a restraint against bowing of the member (preferably in both horizontal and vertical directions) due to over-tightening of the screw-threaded fastener.

30
35

Preferably said restraining means comprises a flange-like wall along at least part of the perimeter of said one or more of the apertures.

- 5 Alternatively said restraining means may comprise one or more deformed portions, e.g. conical indentations, adjacent said one or more of the apertures.

10 According to a fifth aspect of this invention there is provided an attachment member of substantially L-shape cross-section for attachment by one limb of the "L" to an existing first wall such as to extend vertically with its other limb projecting away from the face of said first wall to provide an alignment surface against which the end bricks
15 or blocks of a second wall can be aligned during building of said second wall, said attachment member having a plurality of elements at discrete locations for use in tying said member to the second wall, characterised in that said attachment member is a metal stamping having said elements
20 formed to permit the attachment member to be used with said other limb either to the left of the said one limb or to the right of said one limb.

According to a sixth aspect of this invention there is
25 provided a method of building onto a first wall a second wall of building components to be interconnected via a jointing compound, said method comprising the steps of

(a) attaching to the first wall an upright alignment member providing an alignment surface for said second wall's
30 building components,

(b) constructing the second wall with an end thereof in alignment with and substantially abutting said alignment surface, and

(c) interposing between at least one pair of
35 superimposed building components at said wall end a tie member that is connected to said upright alignment member by guide means permitting relative sliding motion between the

alignment and tie members in the vertical direction, characterised in that said guided sliding motion is vertically limited by the vertical dimensions of the tie member.

5

According to a seventh aspect of this invention there is provided apparatus for use in a method according to said sixth aspect of the invention, said apparatus comprising an elongate alignment member to be in use upright and attached
10 to said first wall, said alignment member in use providing an alignment surface for said second wall, means for holding tie members, and guide means in use to permit relative sliding motion between the alignment and tie members in the vertical direction, characterised in that said guided
15 sliding motion is vertically limited by the vertical dimensions of the tie member.

Description of the Drawings

20 By way of non-limiting example, embodiments of this invention will now be described with reference to the accompanying drawings of which;

Figure 1 is a front elevational view of a wall
25 attachment member according to a first embodiment of this invention,

Figure 2 is an enlarged view of the part of Fig 1 between the lines A-A and B-B,

Figure 3 is a side elevation in the direction of arrow
30 C in Fig 2,

Figure 4 is a cross-sectional view taken on line D-D in Fig 2,

Figure 5 is a front perspective view of the part shown in Figs 2 and 3,

35 Figure 6 is a rear elevation of the part shown in Figs 2 and 3,

Figure 7 is a schematic perspective view of a tie

member for use with the attachment member of Figs 1-6,
Figure 8 is a side view of the tie member of Fig 7,
Figure 9 is an end view taken in the direction of arrow
E in Fig 8,
5 Figure 10 is an underneath plan view of the tie member
of Fig 7,
Figure 11 is a front elevational view of part of a wall
attachment member according to a second embodiment of
this invention,
10 Figure 12 is a side elevation in the direction of arrow
XII in Fig 11,
Figure 13 is a plan view in the direction of arrow
XIII in Fig 11,
Figure 14 is a front elevational view of part of a wall
attachment member according to a third embodiment of
15 this invention,
Figure 15 is a front elevational view of part of a wall
attachment member according to a third embodiment of
this invention,
20 Figure 16 is a side elevation in the direction of arrow
XVI in Fig 15,
Figure 17 is a plan view in the direction of arrow
XVII on Fig 15,
Figures 18a and 18b are respectively front elevational
25 and plan views of a wall attachment member according to
a fourth embodiment of this invention,
Figure 19 is a front elevational view of a part of a
wall attachment member according to a fifth embodiment
of this invention,
30 Figure 20 is a front elevational view of part of a wall
attachment member according to a sixth embodiment of
this invention, and
Figure 21 is a plan view of a tie member for use with
the attachment member of Fig 20.

Description of Preferred Embodiments

The wall attachment member 10 of Figs 1-6 is a stainless steel stamping or pressing of generally L-shaped cross-section having a rear or main limb 12 and a forwardly extending limb 14 at an angle thereto. The main limb 12 is substantially wider and fractionally longer at its upper and lower ends 11,13 than the side limb 14. In use the main limb 12 is plumbed vertically and attached to the face of a first wall onto which a second wall is to be built at an angle thereto. The side limb 14 defines an alignment surface against which the end bricks, blocks or other building components of the second wall are in use aligned, the angle between the limbs 12, 14 (in this example, a right-angle) defining in use the said angle between the first and second walls.

The elongate edge of main limb 12 opposite side limb 14 is rolled or peened over to provide an elongate reinforcing bead 16. Preferably the bead 16 is to the rearward surface of limb 12. The main limb 12 has apertures 18 therethrough disposed in substantially two general rows adjacent side limb 14 and bead 16 respectively. A central row of apertures 20 is provided at a wider longitudinal spacing than apertures 18. Each of these apertures 20 is bounded by an encompassing wall 19 directed rearwardly, e.g. to a depth of approximately 3mm, the wall 19 being integral with limb 12 and inclined thereto at an obtuse angle all round the hole 20.

Closely adjacent each side of each aperture 20, and substantially in line with said apertures 18 adjacent that side of limb 12, the main limb 12 is provided with a somewhat conical indentation 22 directed rearwardly, i.e. oppositely to the side limb 14. The indentations 22 may extend to a depth greater than walls 19, e.g. to a depth of approximately 4mm. Midway between each pair of central

apertures 20, the main limb 12 is cut with two closely adjacent transverse slits at 21 that define between them a finger 24 which is pressed out to extend (in the manner of a strap) in front of and spaced from the plane containing the main body of limb 12 such as to define a slot-like opening 25 when viewed in plan (see Fig 4).

A single row of apertures 26 is provided in the side limb 14, horizontally in alignment with apertures 18.

All the apertures 18, 20 and 26 have the form of elongate oval-like holes which essentially appear defined by two parallel sides coupled together by semi-circular ends. The elongate holes 18 and 26 are directed longitudinally of the alignment member 10 whereas the elongate holes 20 are directed transversely of the member's rear limb 12 and normal to its longitudinal centre-line.

The apparatus of this embodiment also comprises a plurality of tie members for sliding co-operation with the attachment member 10, such co-operation being by guided insertion of part of the tie member into a slot-like opening 25 and its retention therein by the transversely-directed finger 24. A suitable tie member 30, as shown in Figs 7-10, is of generally L-shaped form having longer and shorter limbs 32 and 34 at right-angles to one another. The shorter limb 34, which is the part to enter a slot-like opening 25 of the attachment member, and in use extend vertically, is provided with three similar longitudinally directed reinforcing ribs 36 of narrow trough-like cross-section. It also has its free end 38 tapered or provided with rounded or radiussed corners to provide a progressive reduction in the limb's cross-section as it extends towards its free end 38 thereby to facilitate entry of limb 34 into any one of the slot-like openings 25. A transversely directed, elongate depression 40 at the arris between limbs 32, 34 serves to reinforce this corner of the L-shaped tie member 30. The limb 32,

which is to extend in use generally horizontally in between two courses of end bricks, blocks or other building components of the second wall and in the second wall's direction, is provided at each side with a plurality of
5 pressed-out individual tags or sprags 42. These tags or sprags 42 provide triangular shaped teeth of generally planar form extending in a plurality of individual planes normal to the main body of limb 32, i.e. in use substantially vertically. On each side of limb 32, all the
10 individual planes of said teeth 42 are parallel to one another and at the same angle, e.g. of between 30° to 60° (preferably about 45°), to the extending direction of limb 32. The limb 32 also has a central row of separate conical depressions 44 to provide a reinforcement of the limb and/or
15 to improve its mortar bonding capability.

In use, the existing first wall surface is first cleaned of dirt and foreign matter. The main or rear limb 12 of the wall attachment member 10 is then offered up to the face of
20 the first wall, is positioned with the upper edge of the straps or fingers 24 at approximately the proposed level of the mortar or cement between horizontal courses of the second wall's building bricks, blocks or like components, and is plumbed to extend vertically. In this vertically
25 plumbed position, appropriate fixing holes are marked on the wall through the apertures 20. The fixing holes are drilled and plugged, and the attachment member then secured to the wall by appropriate fasteners, e.g. coach-screws or the like, inserted through the apertures 20 into the prepared
30 fixing holes. Prior to final tightening of the screw-threaded fasteners the vertical alignment of the attachment member 10 is checked, the elongate nature of holes 20 enabling adjustment to be effected. It will be appreciated that in this surfacial abutment position the
35 conical indentations 22 create a substantial engagement pressure on the existing wall whilst serving to space the main plane of limb 12 away from the surface of the existing

5 wall. Such spacing allows any unevenness or out-of-true of
that wall to be accomodated, and also permits mortar, cement
or other jointing composition used in building the new wall
to extend through the apertures 18 (and any unused apertures
20) and effect a somewhat keyed connection or join (thereby
assisting in the bonding of the attachment member 10 to both
the existing and newly-built walls). Moreover, substantial
over-tightening of the screw-threaded fasteners, which could
cause excessive buckling or bowing of limb 12 and
10 consequential deformation of the alignment limb 14, is
effectively prevented by the rearwardly extending flange or
wall 19 which encompasses each hole 20.

15 The first row or course of the new wall's building
components is laid with the end component (with jointing
composition applied) being placed end on against rear limb
12 and side on against the alignment surface provided by
limb 14 extending forwardly away from the existing wall
(and, in this example, at right-angles thereto). Before
20 commencing the second row or course of building components
of the new wall, a tie member 30 is attached to the
alignment member by downwardly sliding into the lowermost
visible opening 25 the shorter limb 34 of tie member 30.
Such sliding attachment is facilitated by the reducing
25 cross-section free end 38 of limb 34, the guidance for such
sliding being provided by the ends 23 of finger 24 (which
ends connect finger 24 to the main planar body of the
attachment member's limb 12). These ends 23 also serve to
restrain the inserted tie member 30 against angular movement
30 in a plane parallel to limb 12 and against sideways motion
out of the member's limb 12. Longitudinal horizontal motion
of the tie member towards and away from member 10 is
restricted by the finger 24 itself and by the main planar
body of limb 12. The latter is engaged by the tie member's
35 limb 34 both above and below the finger or strap 24 thereby
to restrain the tie member against angular movement in a
plane normal to limb 12. The inwardly directed nature of

the laterally extending elongate depression 40 (providing
arris reinforcement of the tie member) assists in ensuring
that the head of any fastener projecting from an adjacent
aperture 20 does not unduly hinder the entry of the tie
5 member's limb 34 into the slot-like opening 25, the length
of this shorter limb 34 being commensurate with the spacing
between an aperture 20 and the nearest finger 24 above or
below it. Further tie members 30 are provided between
appropriate upper courses as the new wall is built up, e.g.
10 at 300mm centres. Where necessary the limb 34 of tie member
30 can be inserted upwardly into a slot-like opening 25 and
before the end building component below it is laid (rather
than downward limb insertion after the end building
component is laid, as described above).

15 It will be appreciated that the facility for guided sliding
motion of tie member 30 longitudinally of the wall
attachment member 10 (i.e. vertically in use) that is
provided by the co-operation of the tie member's limb 34 and
20 the attachment member's slot-like opening 25, enables the
apparatus to compensate for or adjust for variations in
vertical building tolerances or height differences between
the various courses - especially upper courses - of the
building components (a) in the new wall and (b) as compared
25 between the new wall and the old wall.

It will also be appreciated that the sideways movement of
the new wall is restricted by the keyed bond of the mortar
(between the new wall's courses) to the tie members'
30 vertically directed and transversely angled teeth (provided
by side tags or sprags 42) embedded in this mortar, the tie
member being held against lateral movement by the finger
ends 23 of the attachment member 10 fastened to the older
wall.

35 The apertures 26 in the side limb 14 of the attachment
member provide for a keyed connection of plaster or other

rendering of the new wall at the vertical arris between it and the older wall.

- Where the desired wall height exceeds the length of attachment member 10, two (or more) such members may be connected longitudinally, the lower projecting end 13 of the upper member 10 being positioned behind the the upper projecting end 11 of the lower member 10. In this position the side edge of said end 13 is received within the top part of bead 16 of the lower member 10, and the bottom hole 20 of the upper member 10 overlies the top hole 20 of the lower member 10, the obtusely angled walls 19 nesting within one another and aiding such alignment. It will be appreciated that the obtusely angled walls 19 need not totally encompass each hole 20 of an attachment member 10, but may extend over part only of such hole outline. In alternative arrangements the wall 19 may be at an acute angle (rather than an obtuse angle), at 90°, or omitted altogether.
- Where necessary or convenient a new wall (e.g. a two-leaf cavity wall) may be built with its end abutting two limbs 12 of a pair of wall attachment members 10 disposed in a mutually mirror image formation with limbs 14 adjacent one another (inside the cavity) and the limbs 12 directed and away from the limbs 14. In this regard it will be noted from Fig 1 that the attachment member 10 is shown with its limb 14 providing a right-hand-side alignment surface. Where a left-hand-side alignment surface is required, the selfsame alignment member 10 is merely turned upside down, i.e. rotated 180° about a horizontal axis normal to the plane of limb 12. In other words the self-same wall attachment member 10 can be used (alone or in mirror-image formation with another indential wall attachment member 10) with its alignment limb 14 either to the left of its attachment limb 12 or to the right of its attachment limb 12. This is achieved because the straps or fingers 24 and the slot-like openings 25 provide guide means for permitting

guided relative motion between a tie member 30 and the attachment member 10 irrespective of the attitude adopted by the attachment member.

5 If desired each of the rearwardly directed conical indentations 22 may be burst through at its apex to provide sharp edged tips, e.g. of triangular or cruciform shape, that may enhance the frictional grip provided by the attachment member's indentations on the older (existing)
10 wall.

The embodiment of Figs 11-13 shows an alternative attachment member 50 which is identical to the wall attachment member 10 of Figs 1-6 except that each aperture 20 is simply
15 punched out and is not bounded by an encompassing wall 19. Instead, the means to provide a restraint against bowing of the member - due to over-tightening of the screw-threaded fasteners used for fixing the upright alignment member to the existing (first) wall - are provided by rearwardly
20 directed, deformed portions 59 of the main limb 12 in the vicinity of, and preferably closely adjacent, the fixing apertures 20.

Conveniently, these aperture-adjacent deformations 59 can
25 have the form of conical indentations mutually spaced around each aperture 20. In the non-limiting example shown, four conical indentations 52,53 are provided around each elongate aperture 20 : one (52) adjacent each end and one (53) adjacent each side of each elongate aperture 20.

30

It will be appreciated that the conical indentations can also provide the same spacing/gripping function of the indentations 22 in attachment member 10 of Figs 1-6, and thus physically replace those indentations 22. Although all
35 four conical indentations 52,53 are shown having the same depth or rearward projection, it will be appreciated that (if desired) the indentations 52 can extend slightly beyond

the indentations 53.

In a preferred arrangement of the embodiment of Figs 11-13 the alignment member 50 has an overall length of approximately 1183mm; the vertical spacing between adjacent apertures 20 is 76.2mm; the fingers or straps 24 are approximately 8mm wide and are disposed mid-way between such adjacent apertures 20. The straps 24 are spaced from main limb 12 by a distance (gap 25) of approximately 4.75mm. The elongate apertures 20 are approximately 25mm x 12mm overall whereas the apertures 18 are approximately 16mm x 8mm overall. The conical indentations 52,53 have a "base" diameter of approximately 6mm and a "height" of approximately 3 or 4mm. The lateral spacing between centres of opposite indentations 52 and between centre lines of opposite apertures 18 is, in each case, approximately 38.5mm. The above dimensional features may be provided in a wall attachment member 50 (of Figs 11-13) having a main limb 12 60mm wide and, with the same dimensions, in a wall attachment member 60 having a wider main limb 62 (see Fig 14), for example 93mm wide. In each case the minimum width of metal between an aperture 20 and an indentation 52 or 53 is less than 5mm and preferably between 3 and 4mm.

The embodiment illustrated in Figs 15-17 is similar to those of Figs 1-6, Figs 11-13 and Fig 14 except that no restraint is provided against bowing in the vertical direction due to over-tightening of the screw-threaded fasteners, i.e. the features 19 and 59 described above are omitted and bowing in the horizontal direction only restrained by indentations 22. Moreover the wall attachment member 70 of Figs 15-17 has additional elongate apertures 18 disposed adjacent the ends of each finger or strap 24, although these additional apertures 18 are not in line with the remaining apertures 18.

The embodiment of Figs. 18a and 18b, like that of Fig 14, is for use with a new wall of increased width. Thus, instead of having a single column or line of transverse fingers or straps 24, the attachment member 80 of Figs 18a and 18b has
5 its main limb 82 sufficiently wide to accommodate two columns side by side with each stamped with the same features, viz. the transverse fingers 24, the fixing holes 20, the there-adjacent bowing restraint means provided by conical indentations 52 and 53, and the mortar-keying
10 apertures 18. The two columns of fingers 24, enable two columns of the tie members 30 to be used.

It will be appreciated that the tie member 30 of Figs 7-10 is also utilisable with the above-described wall attachment
15 members 50, 60, 70 and 80, and also with the wall attachment member 90 of Fig 19 described below. In each case the tie member 30 is slidably connectable with the wall attachment member 10, 50, 60, 70, 80 or 90 such as to be guided for vertical motion with respect to the attachment member over a
20 distance limited by the vertical dimensions of the tie member, i.e. by the length of its limb 34 which engages behind finger or strap 24 anywhere between the limbs free end 38 and its root (defined by its arris with limb 32).

25 The embodiment of Fig 19 is similar to that of Figs. 11-13 except that the wall attachment member 90 of Fig 19 is pierced and stamped out to provide a pocket-like "receptacle" 94 with its open top or mouth spaced below each strap or finger 24. In use, the existing wall provides a
30 back for the pocket-like receptacle 94, and the limb 34 of tie member 30 is received therein after passing through the slot 25 provided by finger 24. The degree of vertical movement for tie member 30 provided by this arrangement is determined by the length of limb 34 and, in particular,
35 either by abutment of the limb's free end 38 with the bottom of receptacle 95 or by abutment of limb 32 with the top of strap 24. If desired (and as illustrated) the main limb 12

of attachment member 90 is provided with a transverse rib 95 indicating the level to which the new wall's bricks or blocks should be aligned. Conveniently the limb 12 is embossed with the words "LEVEL WITH TOP OF BRICK" adjacent the transverse rib 95. Optionally the attachment member 90 may be provided with a projecting side flange (not shown) to provide an alignment surface, the member 90 thus having a generally L-shaped cross-section.

It will be appreciated that the pocket-like receptacle 94 provides a cover for the vertical limb of the tie member and thus aids in preventing ingress of mortar which might obstruct vertical sliding motion of the tie member, e.g. upon relative movement of the first and second walls due to settlement, subsidence or the like.

Fig 20 shows an alternative form of wall attachment member 100 which, like each of the above-mentioned members 10, 50, 60, 70, 80 and 90, is a stamping or pressing of sheet steel, preferably stainless steel. The attachment member 100 has its main limb 112 formed with fixing holes 120 each having an obtusely angled encompassing skirt 119. Closely adjacent each hole 120 the main limb 112 is provided with conical indentations 122, 123. A transverse rib 195 is provided mid-way between each pair of neighbouring holes 120 and the limb 112 may be embossed adjacent each rib 195 with the words "LEVEL WITH BRICK TOP" or a like expression. The elements 119, 120, 122, 123 and 195 of attachment member 100 correspond to the elements 19, 20, 52, 53 and 95 respectively of the attachment members described above. However, instead of a single transverse finger or strap 24, the attachment member 100 is stamped to provide a plurality of pairs of longitudinally directed vertical fingers or straps 126 spaced forwardly of the front surface of limb 112. The fingers 126 are connected by their upper and lower ends 127 to the main body of limb 112 and provide pairs of opposite slot-like gaps 125. The two fingers 126 of each

pair are parallel to one another and spaced apart a distance slightly less than the width of a tie member 130 (see Fig 21).

5 The tie member 130 of Fig 21 comprises horizontal and vertical limbs 132, 134 and is similar to the tie member 30 of Figs 7-10 except that its vertical limb 134 is substantially shorter than limb 34, the transverse aris reinforcing depression 40 is omitted, and a notch 128 is
10 provided in each side of horizontal limb 132 adjacent its root, i.e. where it meets vertical limb 134. In use, the tie member 130 is offered up to the space between a pair of stamped out fingers 126 and twisted about a horizontal axis normal to main limb 112 to rotate the side edges of vertical
15 limb 134 such that they slide into the slot-like gaps 125 between the main body of limb 112 and its stamped out fingers 126 and rest behind these fingers. In such position the tie member 130 is guided for vertical motion with respect to the attachment member 100 over a distance limited
20 by the length of the tie member's vertical limb 134, a stop to such motion being provided either by the free bottom end or the upper end of limb 134 engaging respectively the lower end or the top end 127 of the fingers 126. The depth of the notches 128 provides a width 129 between them substantially
25 equal to the horizontal spacing between the fingers 126 of each pair so that the tie member 130 is restrained against sideways movement and is effectively guided for vertical motion with respect to the attachment member 100. Optionally the attachment member 100 may be provided with a
30 projecting side flange (not shown) to provide an alignment surface, the member 100 thus having a generally L-shaped cross-section.

In a modification of the embodiment of Fig 20, the fingers
35 or straps 126 are not provided with the open outside edges shown but instead are also longitudinally connected to the main limb 112 so as to extend therefrom and form two shallow

receptacles with their open "mouths" - defined by the inside edges of the straps 126 - facing one another. These receptacles, like receptacles 94 of Fig 19, aid in preventing ingress of mortar which might obstruct vertical
5 sliding motion of the tie member.

It should be noted that the width of the main limb 12 of the attachment member (10, 50, 60, 70, 80 or 90) or of the limb 112 of attachment member 100 need not extend across the
10 entire end width of the new wall. Thus for example: an attachment member such as 10, 50, 70 or 90, and having the width of limb 12 at a nominal 60mm can serve for a brick or block wall either 60mm thick or 75mm thick; an attachment member such as 10, 50, 70 or 90 and having the width of limb
15 12 at a nominal 93mm can serve for a brick or block wall either 100mm thick or 115mm thick; an attachment member such as 60 or 80 and having the width of limb 12 at a nominal 125mm can serve for a block wall of thickness 125mm, 130mm, 135mm, 140mm, 150mm or 170mm; and an attachment member such
20 as 60 or 80 and having the width of limb 12 at a nominal 190mm can serve for a block wall of thickness 190mm, 200mm, 215mm, 230mm or 250mm. Thus just four sizes of attachment member can cater for almost all usual thicknesses of wall bricks and building blocks.

25 It will be appreciated that all the above-described embodiments of Figs 1-6, Figs 11-13, Fig 14, Figs 15-17, Figs 18a and 18b, and Fig 20, provide a non-handed or "ambidextrous" attachment member which can be used with its
30 alignment limb 14 either to the left or to the right of the member's main limb 12 (or 112) that is fastened to the existing (first) wall.

It will be noted that all the above-described embodiments of
35 the invention provide for the tie member to be slidably connectable to the attachment member, and such as to be guided for vertical motion with respect thereto.

Furthermore, in each said embodiment, the distance of such guided vertical motion is limited by the vertical dimensions of the tie member.

- 5 It will also be appreciated that in the embodiments of Figs 1-6, Figs 11-13, Fig 14, Figs 18a and 18b, Fig 19 and Fig 20 the elements 19, 59 (52, 53), 119 and 122, 123 provide means that are integral with the remainder of the attachment member and are to restrain bowing or buckling of the
- 10 attachment plate in both horizontal and vertical directions (i.e. about both horizontal and vertical "axes"), whereas in the embodiment of Figs 15-17 the integral elements 22 provide such restraint just in the horizontal direction.

PERRY/115-07/85

CLAIMS

1. A method of building onto a first wall a second wall of building components (e.g. bricks or blocks) to be interconnected via a jointing compound (e.g. mortar or cement), said method comprising the steps of attaching to
5 the first wall an upright attachment member, constructing the second wall in courses with an end of each course abutting against said upright attachment member, and providing between at least one pair of superimposed courses a tie member connected to the attachment
10 member characterised in that the tie member is slidably connectable to the attachment member such as to be guided for vertical motion with respect thereto over a distance limited by the vertical dimensions of the tie member.
- 15 2. A method according to Claim 1, characterised in that said attachment member is an alignment member providing a lateral alignment surface for said second wall's building components, the second wall being constructed with one side face of its end components in alignment with and
20 substantially abutting said lateral alignment surface.
3. Apparatus for use in a method according to any preceding Claim comprising an elongate attachment member to be in use upright and attached to said first wall, and at
25 least one tie member for connection to said attachment member and for disposition between two superimposed courses of the said second wall, the attachment member having guide means for slidably guiding said tie member with respect to the wall plate, the guide means being characterised in
30 that they permit said slidably guided motion over a distance limited by the vertical dimensions of the tie member.

4. Apparatus according to Claim 3, characterised in that said attachment member is an alignment member providing a lateral alignment surface for said second wall's building components.

5

5. Apparatus according to Claim 3 or Claim 4 characterised in that said guide means is provided by said wall attachment member.

10

6. Apparatus according to any one of Claims 3 to 5, characterised in that said guide means comprises a finger spaced from a generally planar part of said wall attachment member, part of said tie member being insertable slidably into said space.

15

7. Apparatus according to Claim 6 characterised in that said generally planar part is engaged by said tie member part both above and below said finger such that said tie member part is thereby restrained against angular movement in a plane normal to said generally planar part.

20

8. Apparatus according to Claim 6 or 7 characterised in that said finger is connected at each end to the wall attachment member in the manner of a strap and such that said space provides a slot-like opening.

25

9. Apparatus according to Claim 8, characterised in that the opposite side edges of said tie member part in use engage the ends of said strap-like finger such that said tie member part is thereby restrained against angular movement in a plane parallel to said generally planar part.

30

10. Apparatus according to any one of Claims 6 to 9, characterised in that said finger is substantially parallel to the generally planar part from which it is spaced.

35

11. Apparatus according to any one of Claims 6 to 10,
characterised in that the said part of the tie member
reduces progressively in cross-section as it extends towards
its free end thereby to facilitate entry of said part into
5 said space.

12. Apparatus according to any one of Claims 6 to 11,
characterised in that said tie member is of generally
right-angle form having one limb in use to extend
10 substantially vertically in said space (and constitute said
part), and the other in use to extend substantially
horizontally in between two courses of the second wall and
in the general direction thereof.

13. Apparatus according to any one of Claims 6 to 12 when
dependant from Claim 4, characterised in that said generally
planar part of the alignment member is provided by a
rearward main limb of the alignment member.

14. Apparatus according to any one of Claims 6 to 12 when
dependant from Claim 4, characterised in that said generally
planar part of the alignment member is provided by a lateral
limb of the alignment member, said limb in use also
providing said alignment surface.

25

15. A tie member (e.g. for use in a method according to
Claim 1 or 2 and/or for use in apparatus according to any
one of Claims 3 to 14) comprising first and second limbs
substantially at right angles to one another and
30 respectively to extend in use substantially horizontally and
substantially vertically, characterised in that said first
limb has at least part of its sides formed by a plurality of
individual teeth extending normally to the main body of said
first limb.

16. A tie member according to Claim 15, characterised in that said teeth are of generally planar form and disposed in a plurality of individual planes angled to the general direction of said first limb.
- 5
17. A tie member according to Claim 16, characterised in that on each side of the first limb all the planes of said teeth on that side are parallel to one another and at the same angle to the first limb's general direction.
- 10
18. A tie member according to any one of Claims 15 to 17, characterised in that the teeth are each of generally triangular form.
- 15
19. A tie member according to any one of Claims 15 to 18, characterised in that said teeth extend from the main body of the first limb in the same direction as the said second limb of the tie member.
- 20
20. A tie member according to any one of Claims 15 to 19, characterised in that said main body of the first limb is provided with a plurality of conical depressions (e.g. to increase the rigidity of the first limb and/or its mortar bonding capability).
- 25
21. A tie member according to any one of Claims 15 to 20, characterised in that said second limb is provided with one or more reinforcing ridges or channels extending longitudinally thereof.
- 30
22. A tie member according to any one of Claims 15 to 21, characterised in that said second limb reduces progressively in cross-section as it extends towards its free end.

23. A tie member according to any one of Claims 15 to 22,
characterised in that a laterally extending elongate
depression is formed in the arris between the first and
second limbs of the tie member to provide for reinforcement
5 thereof.

24. An elongate attachment member (e.g. for use in a method
according to Claim 1 or 2 and/or for use in apparatus
according to any one of Claims 3 to 14) to be fixed upright
10 to a said first wall, said member having apertures to
receive screw-threaded fasteners for such fixing and
being characterised by restraining means in the vicinity of
one or more of the apertures to provide a restraint against
bowing of the member (preferably in both horizontal and
15 vertical directions) due to over-tightening of the
screw-threaded fastener.

25. An elongate attachment member according to Claim 24,
characterised in that said restraining means comprises a
20 flange-like wall along at least part of the perimeter of
said one or more of the apertures.

26. An elongate attachment member according to Claim 24,
characterised in that said restraining means comprises one
25 or more deformed portions adjacent said one or more of the
apertures.

27. An elongate attachment member according to Claim 26,
characterised in that said deformed portions are conical
30 indentations.

28. An attachment member according to any one of Claims 24
to 27 with a tie member according to any one of Claims 15 to
23, characterised in that said restraining means also serve
35 to resist pressure applied thereon by the second
(substantially vertical) limb of the tie member.

29. An attachment member (e.g. for use in a method according to Claim 2, and/or for use in apparatus according to Claim 4 or to any one of Claims 5 to 14 when dependant from Claim 4, and/or according to any one of Claims 24 to 28) of L-shape cross-section for attachment by one limb of the "L" to an existing first wall such as to extend vertically with its other limb projecting away from the face of said first wall to provide an alignment surface against which the end bricks or blocks of a second wall can be aligned during building of said second wall, said attachment member having a plurality of elements at discrete locations for use in tying said member to the second wall, characterised in that said attachment member is a metal stamping having said elements formed to permit the attachment member to be used with said other limb either to the left of the said one limb or to the right of said one limb.

30. An attachment member according to Claim 29, characterised in that (said) elements comprise said guide means to permit (said) relative sliding motion between the said attachment and tie members in the vertical direction.

31. A method of building onto a first wall a second wall of building components to be interconnected via a jointing compound, said method comprising the steps of:

- (a) attaching to the first wall an upright alignment member providing an alignment surface for said second wall's building components,
- (b) constructing the second wall with an end thereof in alignment with and substantially abutting said alignment surface, and
- (c) interposing between at least one pair of superimposed building components at said wall end a tie member that is connected to said upright alignment

member by guide means permitting relative sliding motion between the alignment and tie members in the vertical direction, characterised in that said guided sliding motion is vertically limited by the vertical dimensions of the tie member.

32. Apparatus for use in a method according to Claim 31, said apparatus comprising an elongate alignment member to be in use upright and attached to said first wall, said alignment member in use providing an alignment surface for said second wall, means for holding tie members, and guide means in use to permit relative sliding motion between the alignment and tie members in the vertical direction, characterised in that said guided sliding motion is vertically limited by the vertical dimensions of the tie member.

33. Apparatus for use in a method according to any one of Claims 1, 2 or 31, said apparatus comprising an attachment member according to any one of Claims 24 to 30 and a tie member according to any one of Claims 15 to 23.

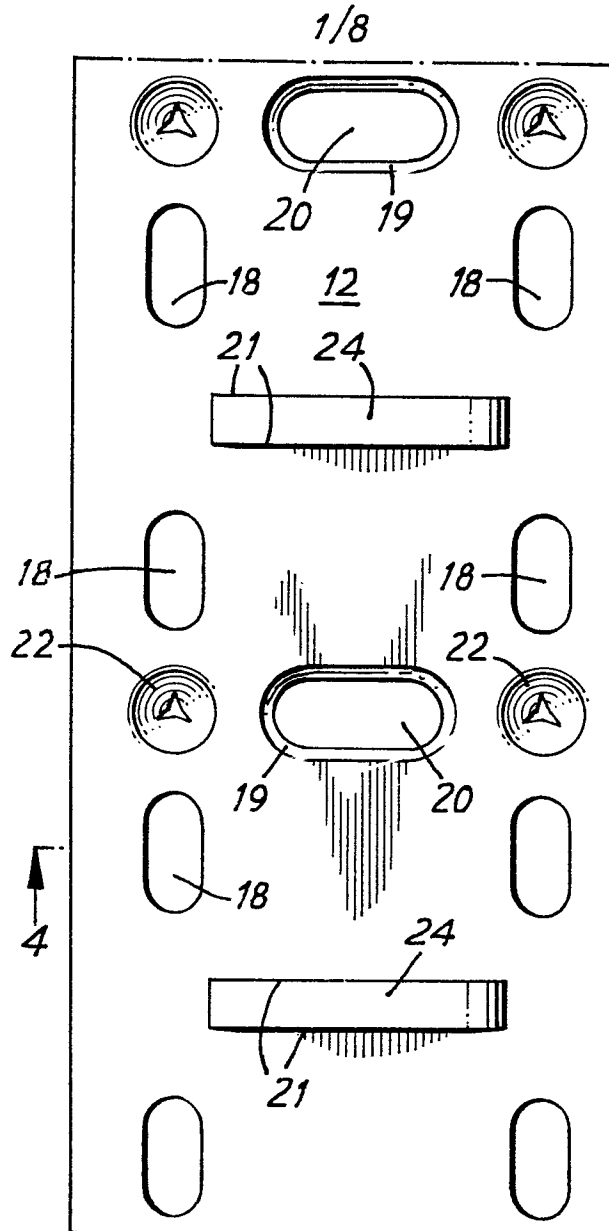
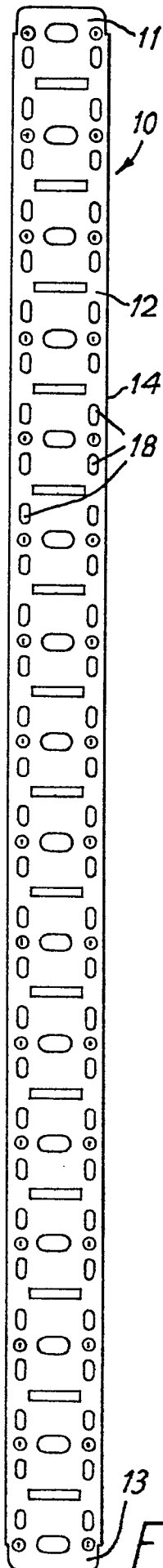


FIG. 2

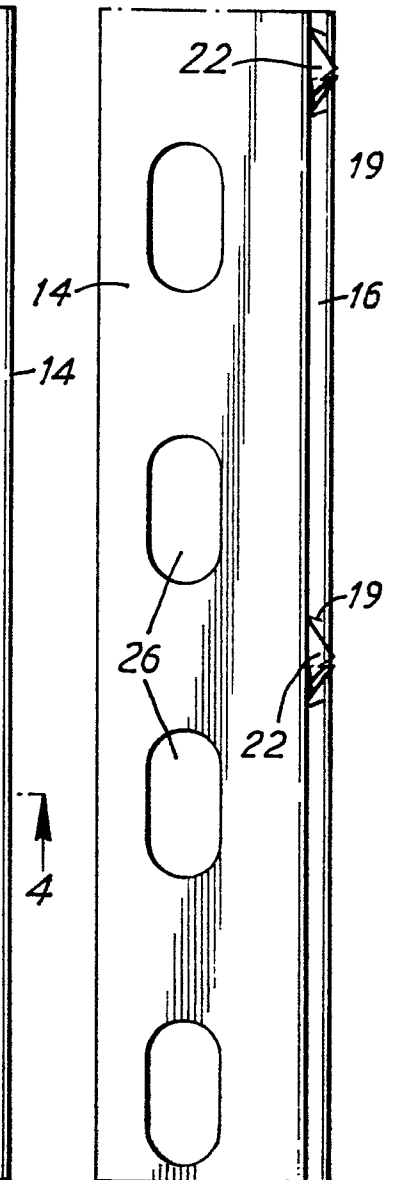


FIG. 3

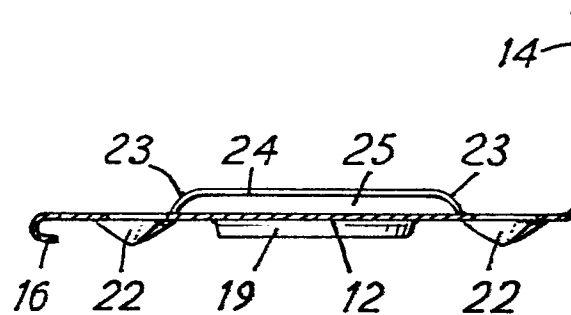


FIG. 4

FIG. 6

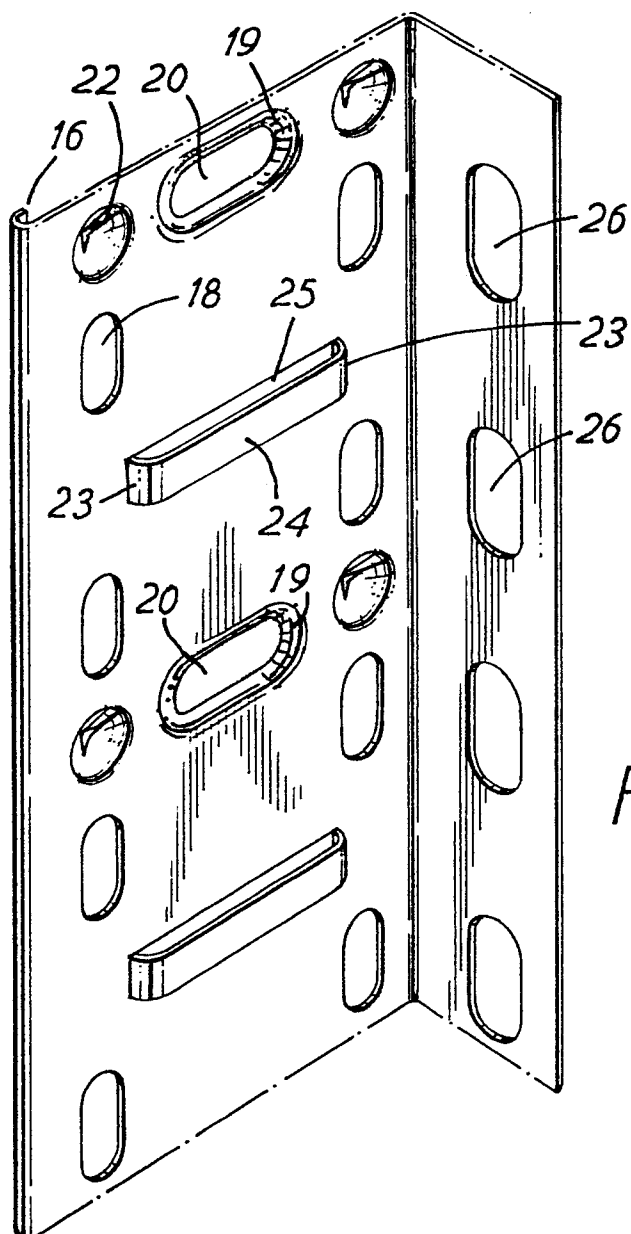
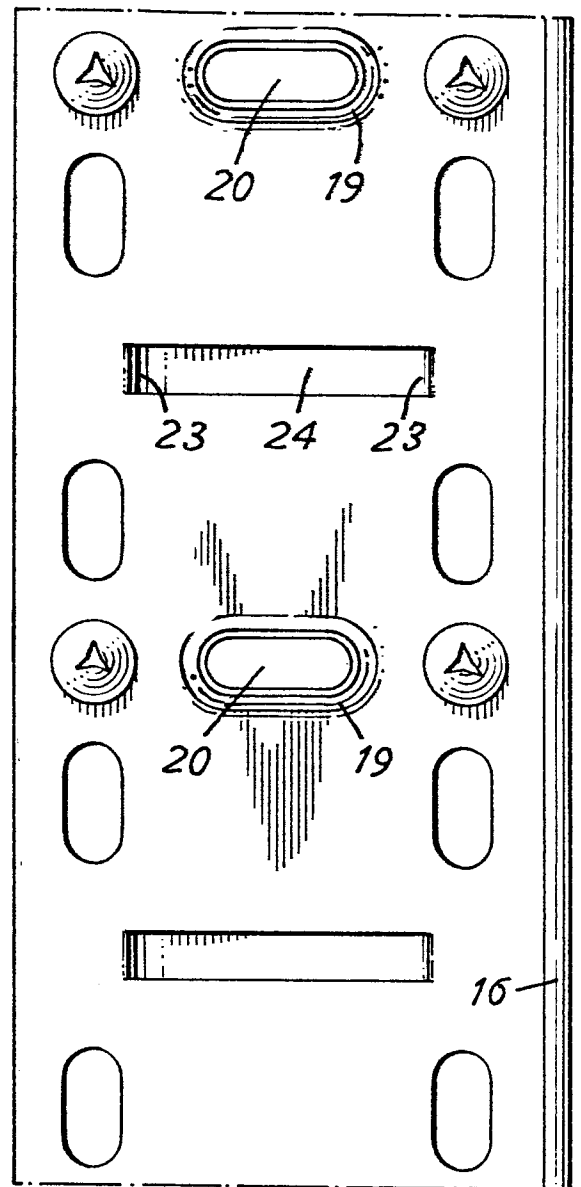
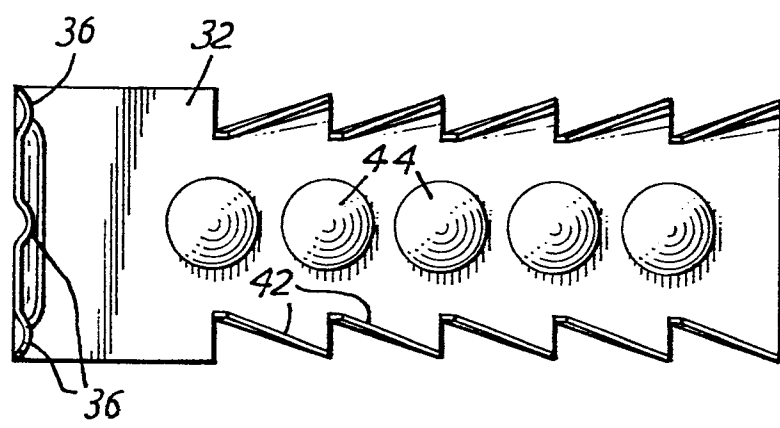
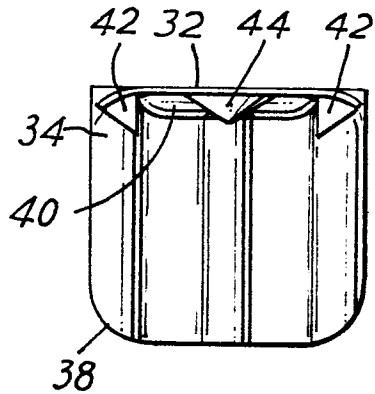
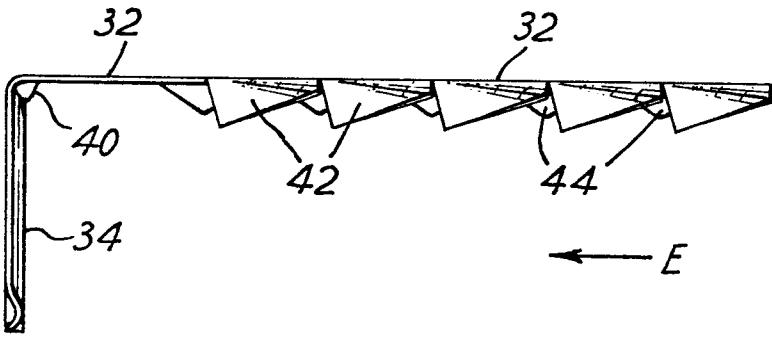
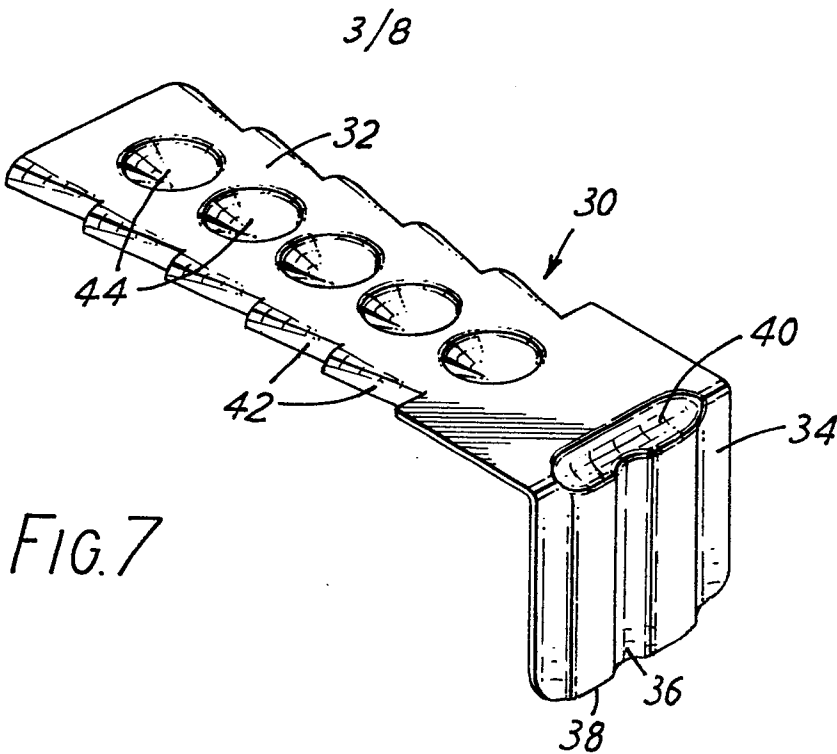


FIG. 5



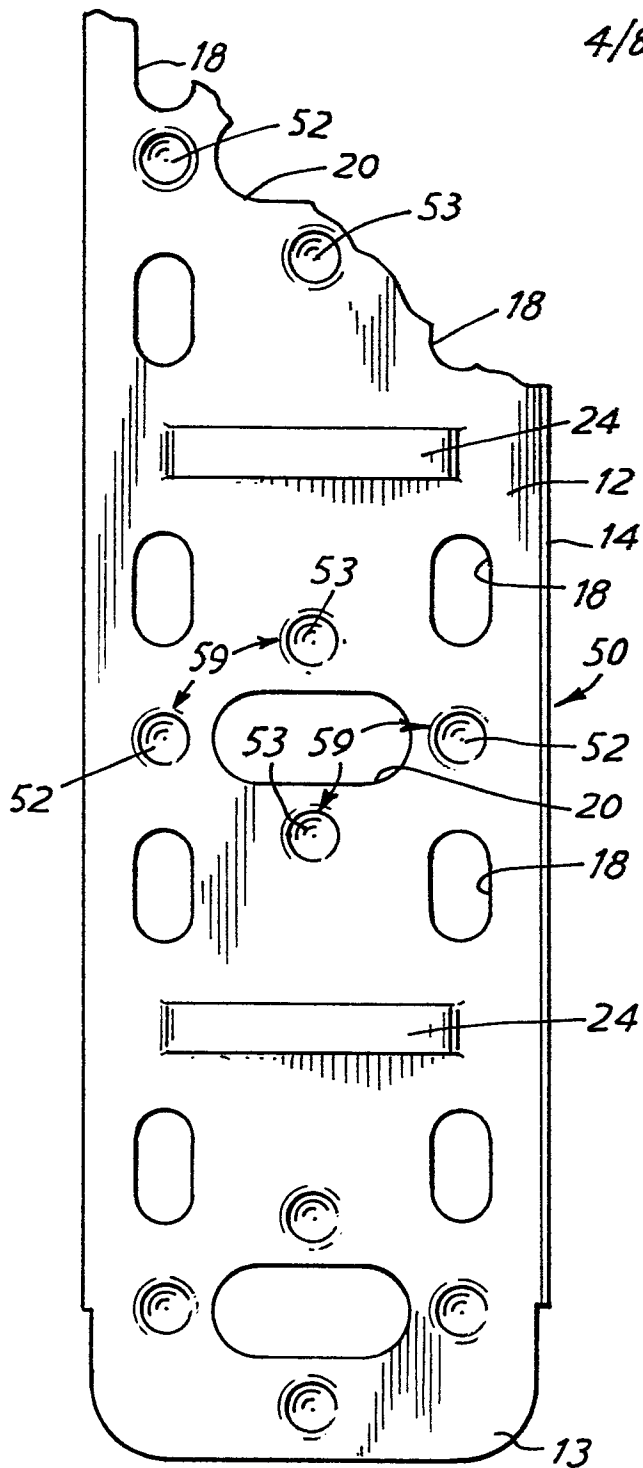


FIG. 11

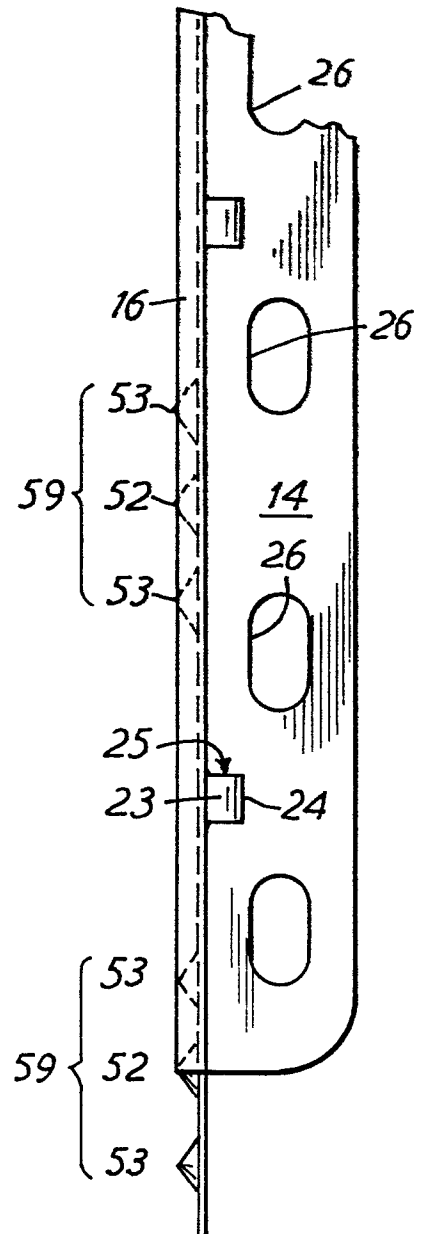


FIG. 12

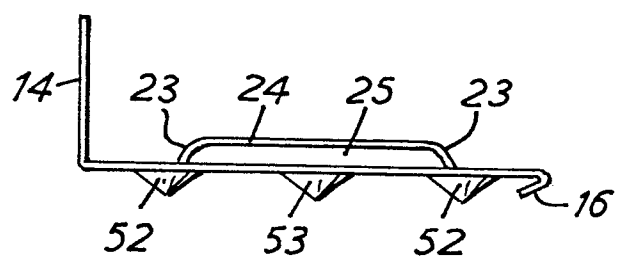


FIG. 13

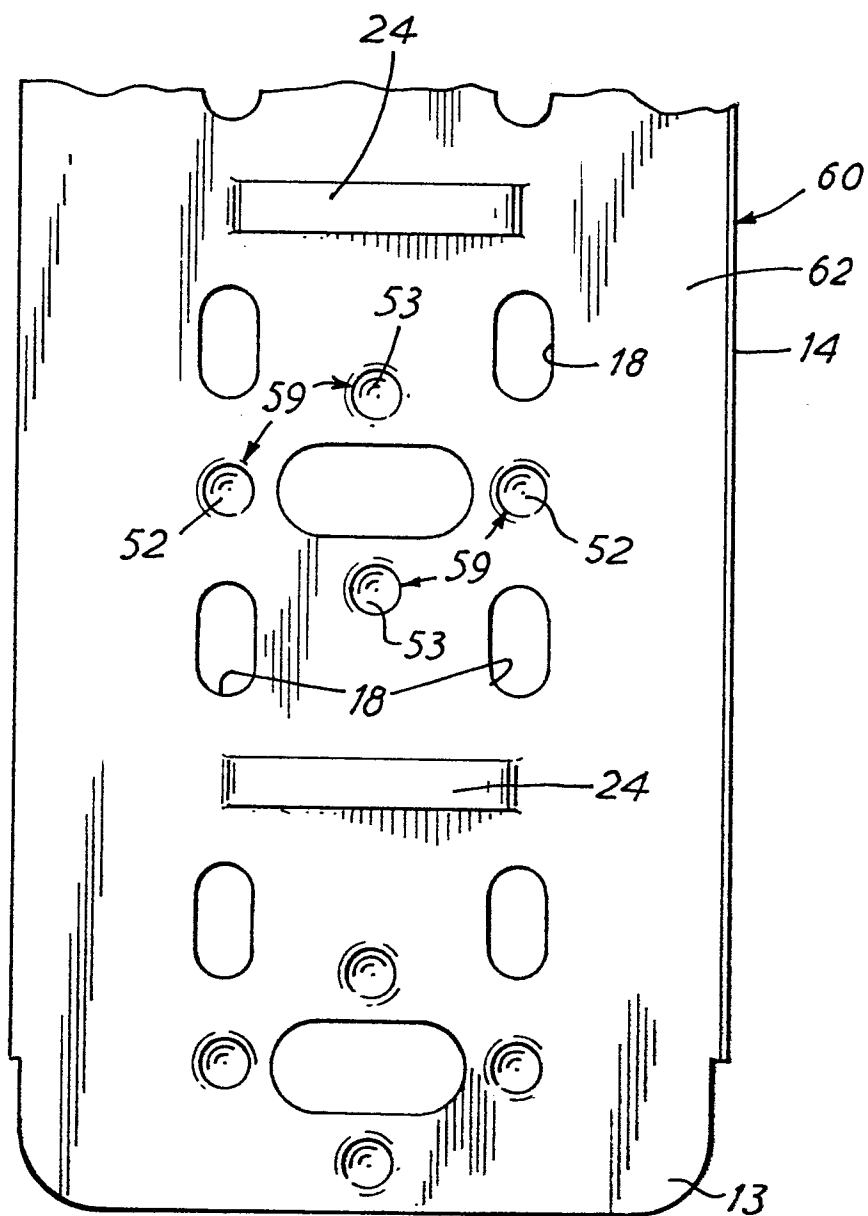


FIG. 14

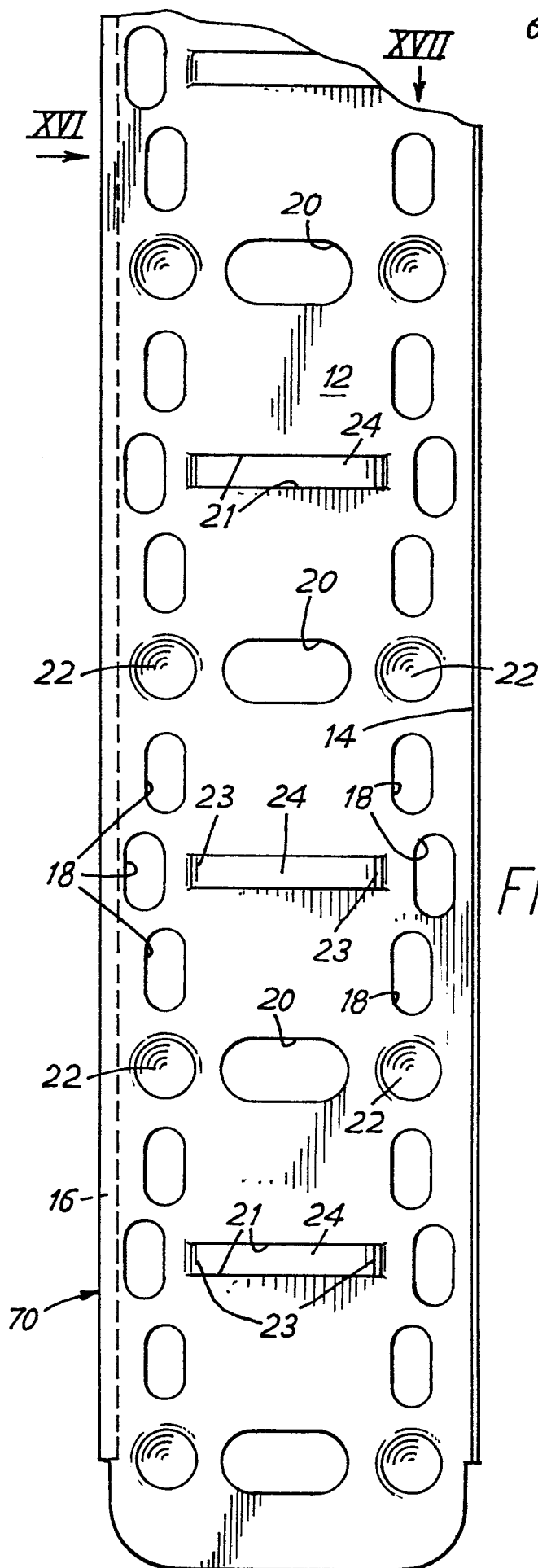


FIG. 15

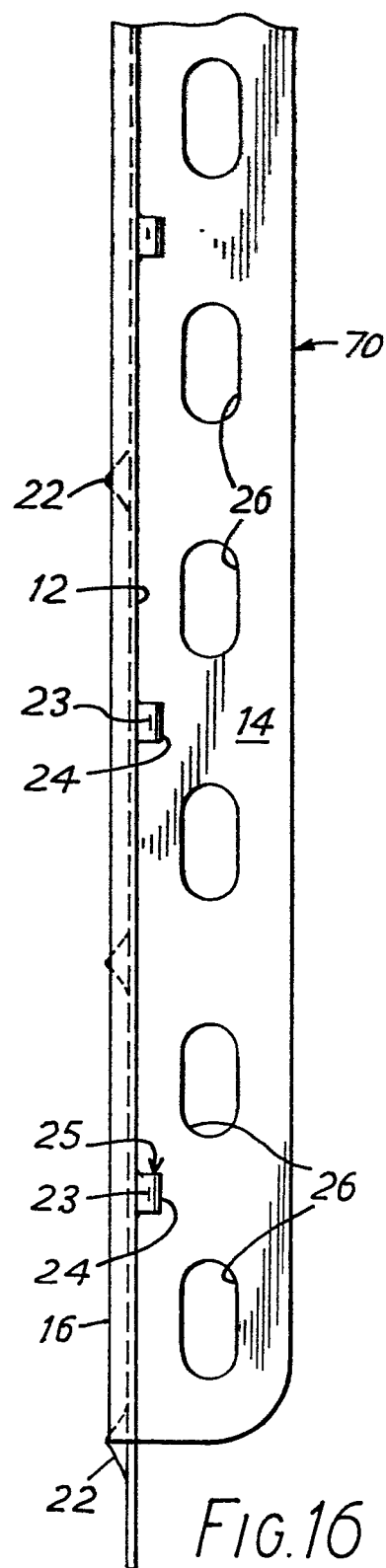


FIG. 16

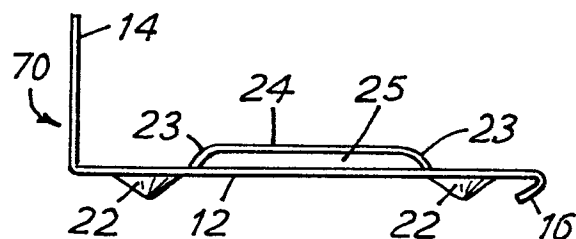


FIG. 17

7/8

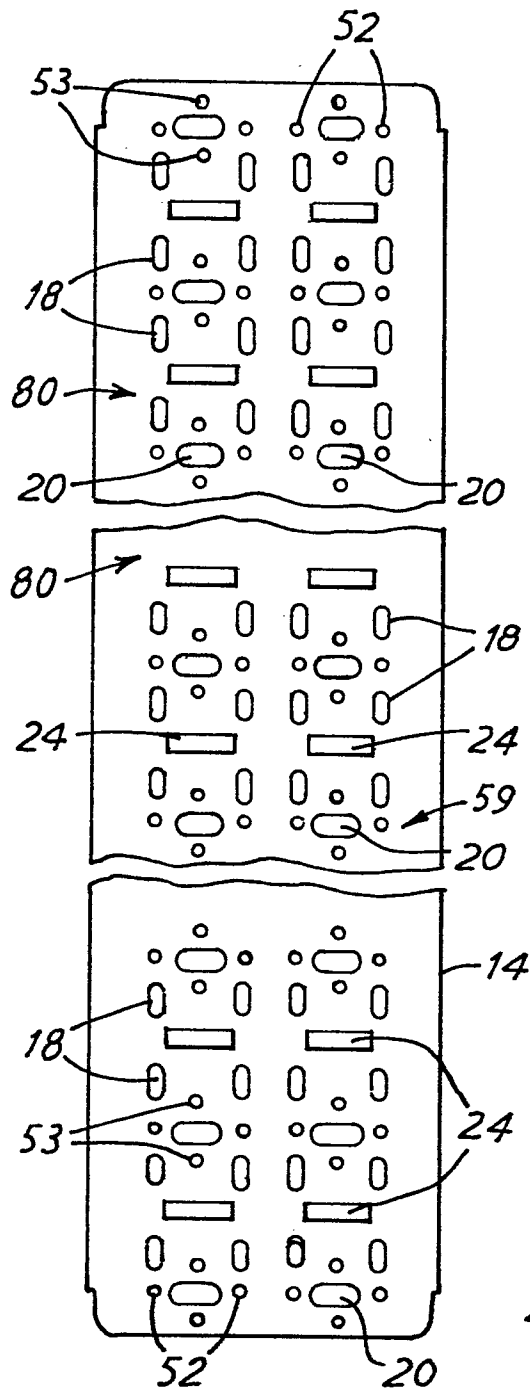


FIG. 18a

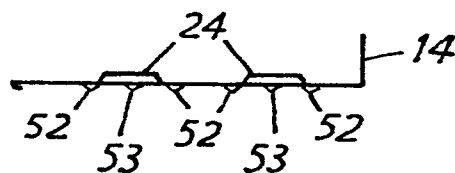


FIG. 18b

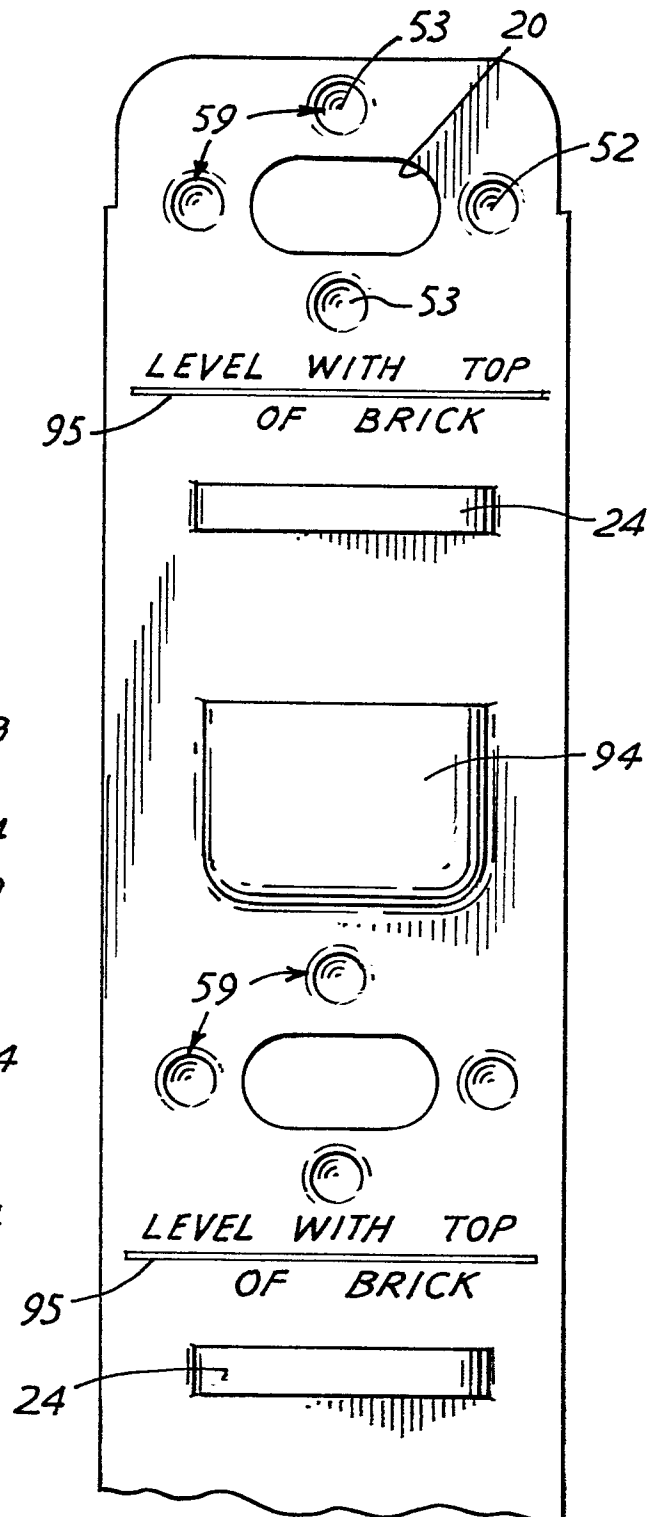


FIG. 19

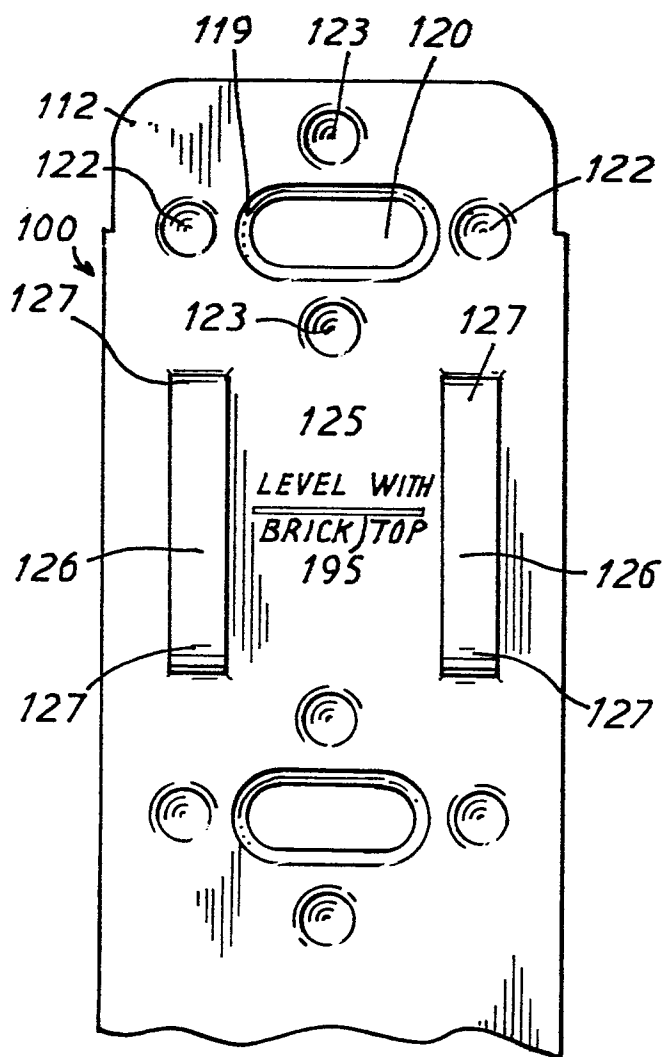


FIG. 20

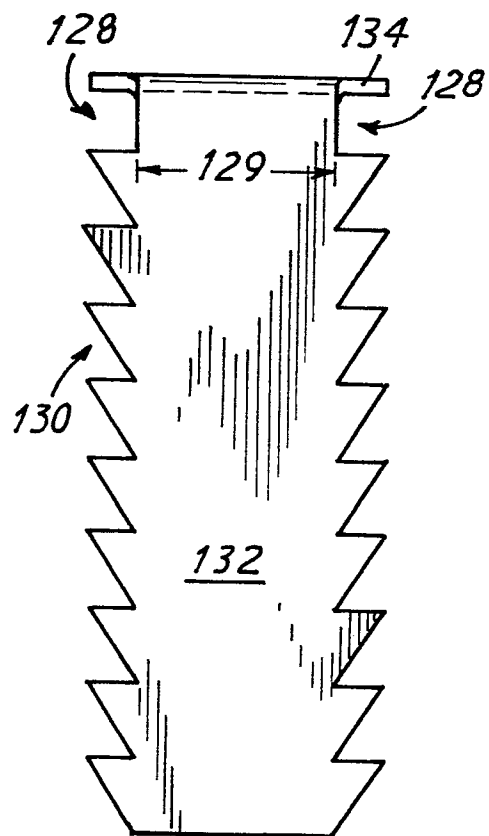


FIG. 21

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. 4)
A	US-A-2 898 758 (HENRICKSON) * Column 3, line 68 - column 4, line 8; column 5, line 57 - column 6, line 30; figures 1,2,7,8 *	1,3,5,31,32	E 04 B 1/41
A	US-A-4 021 990 (SCHWALBERG) * Column 2, line 35 - column 3, line 50; figures 1-3 *	1,3,5-8	
A	GB-A-2 132 073 (CATNIC COMPONENTS) * Page 1, lines 68-92; figures 1-3 *	1,15,23	
A	GB-A-2 044 330 (ASSET BUILDING COMPONENTS) * Abstract; figures 1-5 *	1,24	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
A	US-A-3 389 525 (MOODY)		E 04 B
A,D	GB-A-1 604 941 (FURR)		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17-10-1985	Examiner CLASING M.F.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			