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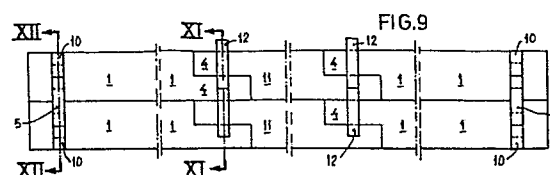
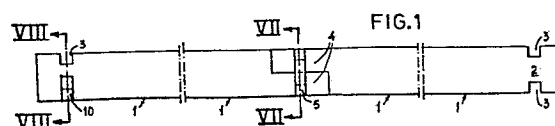
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54 **Elongated building structure.**

57 An elongated building structure comprises a plurality of building elements (1,11), some of which constitute end elements (1). Said elements, which may be considered as being comprised in a building set, have a uniform thickness and generally a uniform, constant length (l) and a uniform constant height. To make possible construction of building structures which are elongated, i.e. have a greater extension than the elements proper, these are devised with specially designed connection ends (4) provided with notches (3). The building elements are interconnected pairwise by means of special connection elements (5,12) which extend in the transverse direction of the building elements and are also provided with notches (3), into which portions of the connection ends of the building elements engage. These are in their turn engaged from the outside by those portions of the connection elements which are located on opposite sides of the notches of the connection elements.

The building structure according to the invention can be erected without the utilization of screws, nails, bolts, nuts and the like and be made full size or constitute a toy model.



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ELONGATED BUILDING STRUCTURE

Background of the Invention

This invention relates to an elongated building structure of the kind generally defined in the preamble of
5 claim 1.

For the building structure in question a plurality of different, standardized, pre-fabricated, unitary building elements are used which suitably are comprised in a building or construction set and of which at least the
10 major portion have the same thickness (cross dimension), the same height and in most instances also the same length. Examples of building structures which may be constructed of building elements comprised in the building set are floors, walls and ceilings as well as parts thereof. The
15 building elements are in a manner known per se so designed, that the building structures in question, which may be made either in full size or may constitute toy models, can be erected by means of the building elements without the use of nails, screws, nuts and similar connection
20 means.

Many building structures of the kind in question known in the art, which are disclosed e.g. in the Swedish patent specifications 128 812 and 171 878 and the U.S. patent specification 2 874 512 have the drawback that
25 they can not be made longer than the longest construction element comprised in the building structure in question.

Building structures are also known which comprise structural elements which are interconnected in their longitudinal direction by means of transverse connection

elements. An example hereof is disclosed in the British patent specification 941 100 which discloses building elements, whose ends have slots extending in the longitudinal direction of the elements. This has the consequence
5 that of structural elements which are joined pairwise at their ends in their common longitudinal direction by means of the connecting elements none is locked in the longitudinal direction, but every pair of structural elements may be drawn out in said longitudinal direction without hind-
10 rance of the connection elements.

Summary of the Invention

The principal object of the invention is to eliminate the above drawbacks and to provide a building structure having a substantially arbitrary length, which may be
15 many times greater than the length of the longest building element comprised in the building structure, said building elements being interlocked in their longitudinal direction as well as in the transverse direction.

These objects are attained thanks to the features
20 set forth in the characterizing clause of claim 1.

Brief Description of the Drawings

Further features and advantages of the building structure according to the invention will become apparent from the following detailed description and the annexed
25 drawings, which diagrammatically and as non-limiting example illustrate some preferred embodiments of the invention.

Figs. 1 and 2 illustrate the principle of longitudinal joining or connection of a plurality of building
30 elements which overlap each other in the height direction and which together form a level (the bottom level) of a building structure, in side view and plan view, respectively.

Fig. 3 illustrates an end element comprised in the building structure in side elevation.

Fig. 4 is a side elevation of a locking or connection element comprised in the building structure.

5 Fig. 5 is a side elevation of a support element comprised in the building structure.

Fig. 6 is a side elevation of a building element comprised in the building structure.

10 Figs. 7 and 8 are cross sectional views on lines VII-VII and VIII-VIII, respectively in Fig. 1.

Fig. 9 is a side elevation of two levels of a building structure which is composed of the same building and end elements as the building structure illustrated in Figs. 1 and 3 and which also comprises connection elements of another type.

Fig. 10 is a plan view corresponding to Fig. 9.

Figs. 11 and 12 are cross sectional views on lines XI-XI and XII-XII, respectively, in Fig. 9.

20 Fig. 13 is a side elevation of another connection element comprised in the building structure according to Figs. 9 - 12.

Fig. 14 is a side elevation of a first modification of the right-hand end of the end element according to Fig. 3 and of one of the two connection ends of the building elements according to Fig. 6, said ends being intended for overlapping longitudinal joining.

Figs. 15 and 16 are partial side views of two further modifications, corresponding to Fig. 14.

30 Fig. 17 is a side view of a building structure which comprises two levels of building elements, which overlap each other in the longitudinal and transverse directions and are interconnected by means of a connection element of a further kind.

Fig. 18 is a plan view corresponding to Fig. 17.

35 Fig. 19 and 20 are diagrammatical horizontal sectional views on lines IXX-IXX and XX-XX, respectively,

in Fig. 17, only such elements having been illustrated as are located in the plane of the sectional lines.

Figs. 21 and 22 are cross sectional views on lines XXI-XXI and XXII-XXII, respectively, in Fig. 17.

5 Fig. 23 is a side elevation of a building element which is comprised in the embodiment according to Figs. 17 - 22.

10 Fig. 24 is a side elevation of the connection element utilized in the building structure according to Figs. 17 - 22.

Fig. 25 is a side elevation of a support element which is also comprised in the building structure according to Figs. 17 - 22.

15 Fig. 26 is a cross sectional view illustrating another embodiment of longitudinal joining two building elements overlapping each other in the transverse direction.

Fig. 27 is a side elevation of the connection element which is utilized in the longitudinal joining or connection according to Fig. 26.

Fig. 28 is a side elevation of a further modification of the support element according to Fig. 5.

Fig. 29 is a side elevation of a modification of the building element according to Fig. 3.

25 Fig. 30 is a plan view of two levels of a building structure which can be regarded as a modification of the building structure according to Figs. 17 - 22.

Fig. 31 is a side elevation corresponding to Fig. 30.

30 Fig. 32 is an end view corresponding to Fig. 30.

Figs. 33 and 34 are vertical sectional views on lines XXXIII-XXXIII and XXXIV-XXXIV, respectively, in Fig. 31.

35 Figs. 35 and 36 are simplified horizontal sectional views corresponding to Figs. 19 and 20, respectively, on lines XXXV-XXXV and XXXVI-XXXVI in Fig. 31, only such elements having been illustrated as are located in the

plane of the sectional lines.

Fig. 37 is a side view of a connection element comprised in the building structure according to Figs. 30 - 36.

5 Fig. 38 is a side view of a support element which is also comprised in the building structure according to Figs. 30 - 36.

 Figs. 39 and 40 are side elevations of modifications of the connection elements according to Figs. 37 and
10 13, respectively.

Description of the Preferred Embodiments

Introductorily, it is to be observed that all figures are not drawn on exactly the same scale and do not either disclose all building elements, inclusive of end
15 elements and connection elements, comprised in a building set. It is also to be noted that each of the illustrated embodiments of building constructions are to be considered as part of a respective, bigger building construction. In
20 addition hereto it is evident that the embodiments illustrated only are to be regarded as examples of building constructions which may be erected by the utilization of longitudinal connections according to the invention.

 All building elements, inclusive of the end elements illustrated in the Figures, have the same length
25 (extension in the longitudinal direction) $\underline{l}$ (see Figs. 2 and 3), the same (maximum) height (extension in the vertical direction) $\underline{h}$, and transverse dimension (thickness) $\underline{t}$. The connection elements are plane-parallel, like the building elements, and have the same height and thickness $\underline{h}$
30 and $\underline{t}$, respectively, as the building elements but are substantially shorter than these. The width $\underline{y}$ of the notches or grooves is, with the exception of the elements according to Figs. 24 and 25, equal to or somewhat greater than the thickness of the elements. Apart from the elements

according to Figs. 13, 26, 29 and 39 - 40, the grooves have an equal (average) deep $\underline{d}$ which amounts to about a fourth of the height of the respective elements. The distance $\underline{a}$ (Fig. 3) from each element end to the groove located nearest to the end in question of respective elements is constant in the elements.

In Figs. 1, 2 and 7 a joint or connection between two mutually similar end elements is shown which are generally designated with 1 and which overlap each other in the (generally) common longitudinal direction of the elements as well as in the vertical height direction perpendicular hereto. Such an element 1 is individually disclosed in Fig. 3.

Each end element 1 has a "termination end" 2 which is located at one end of the building structure in which the element is comprised, and in which two grooves or notches 3 are provided, which are located substantially opposite each other and each of which opens into one of the longitudinal edges of its respective elements. The edges of the notches are mutually approximately parallel and are, like the grooves, substantially perpendicular to the longitudinal edges of the elements. As mentioned above, the grooves or notches 3 have a width $\underline{v}$ (measured between the edges) and a deep $\underline{d}$ ($= 1/4 h$) and are located at the distance $\underline{a}$ from the end of the element 1, when measured between said end and the nearest edge of the notch 3.

The other end of the element 1 is a joining or connection end 4 which overlaps, and is overlapped, respectively, by a similar connection end 4 of an adjoining or adjacent building element, which is an end element in Figs. 1 - 2 but which, of course, also could be a building element 11 according to Fig. 6. With the latter definition introduced above, the connection end 4 has the height $h/2$ and the length $(2a + v)$ and may be considered to have been formed by the removal of a rectangle having

said dimensions from the upper right-hand corner of the element 1 in Fig. 3. In the middle of the edge extending along the longitudinal central line of the connection element, the connection end has a similar notch or groove

5 3.

The two elements 1 of Figs. 1 and 2 are interconnected by means of a connection element or locking member which is illustrated in Fig. 4 and generally designated with 5. The connection element 5 has a length of $(2a + v)$ and a height of h and comprises a pair of mutually opposite notches 3 which are located in the middle of a respective one of the two longitudinal edges of the connection member. The connection member accordingly consists of two shanks 7 and an interconnecting bridge or web 8, which means that it substantially has the shape of the letter H. The bridge 8 of the connection member penetrates into, or engages, the closed rectangular aperture which is created by the supplementing grooves 3 of the respective connection ends 4, and the shanks 7 of the connection member enclose the two connection ends while engaging their lateral surfaces, whereby the elements 1 are substantially rigidly interconnected with each other in a registering position, as is apparent from Fig. 7.

To stabilize the building structure according to Figs. 1 - 2 it may be provided, at one of its ends (as shown) or at both ends with such a support element 10 as is illustrated in Fig. 5 and in principle constitutes one half of the connection element 5 according to Fig. 4, said half being located at one side of a horizontal centre line. The cooperation of the support elements 10 with the end elements 1 is apparent from Fig. 8.

Between the two end elements 1 of Figs. 1 and 2 there may be introduced into the building structure according to the invention, one or several building elements of the kind disclosed in Fig. 6, in which they are generally designated 11. These building elements are at their

ends provided with such connection ends as are illustrated in the right-hand portion of Fig. 3 and fit together with the connection ends of the other building elements, inclusive of the end elements.

5 In Figs. 9 - 12 there are illustrated two levels of another building structure according to the invention which comprises building elements and end elements 11 and 1, respectively, of the same kind as in the embodiment according to Figs. 1 - 2. In the building construction
10 according to Figs. 9 - 12 there are, however, in addition to the connection elements 5 according to Fig. 4 and the support element 10 according to Fig. 5, other connection elements, which are illustrated individually in Fig. 13 and are designated with 12. The connection element according to Fig. 13 has a single groove 9, whose depth ($2 \underline{d}$)
15 is twice of that of the grooves 3 and opens centrally into one of the longitudinal edges of the element 12. The connection element 12 does not lock building elements located within the same level mutually in the lateral direction but
20 instead hereof makes possible addition or connection of further levels, adjoining each other in the vertical direction while being mutually interlocked laterally by means of the connection element 12, as is apparent from Fig. 11 which is a cross sectional view on line XI-XI in
25 Fig. 9. Fig. 12 illustrates in the same way the support and connection elements 10 and 5, respectively, at the ends of the building structure according to Figs. 9 and 10. Laterally interlocking as well as expansion in the vertical direction can be made possible by means of such H-shape
30 connection elements as are illustrated in Fig. 40.

Figs. 14, 15 and 16 are each a side view of a modification 4a, 4b and 4c, respectively, of the connection end of an end or building element 1 and 11, respectively.

In Figs. 17 - 22 there are illustrated two levels of a modified building structure constructed according to the invention and in which adjoining building elements overlap each other in the longitudinal direction as well as in the transverse direction.

The building structure according to Figs. 17 - 22 comprises building elements 13 according to Fig. 23, connection elements 14 according to Fig. 24 and support elements 15 according to Fig. 25 as well as connection elements 5 according to Fig. 4. The latter elements 5 are here utilized for stabilizing purpose at the two ends of the building structure to fill up a gap which would otherwise occur. At their two termination or connection ends the building element 13 has the same design as the termination end 2 of the end element 1.

The connection elements 14 according to Fig. 24 are H-shaped like the connection elements 5 and have grooves or notches 16, which are substantially twice as wide as the notches 3, i.e. approximately equal to $2y$. On account hereof the connection elements 14 will get a length of $(2a + 2v)$.

Basically, the support elements 15 corresponds to the support element 10 of Fig. 5 but has a groove 16 which is twice as wide as that of Fig. 5 and may be considered to constitute one half of the connection element 14 according to Fig. 24, which is located on one side of a central line which is parallel to the longitudinal edges of the element.

As most clearly is evident from Figs. 19 and 20 which are simplified, horizontal sectional views through the upper level and the lower level, respectively, of Fig. 17, the connection ends of the elements 13 overlap each other. The lateral surfaces of each element, which face the other elements, substantially contacts or engages the respective other elements due to the fact that the width

2 y of the notches 16 is only insignificantly greater than
the total thickness 2 t of the ends 4. This width has been
substantially exaggerated in Figs. 19 and 20 to make the
Figures clearer. Apart from those locations, where the
5 ends of the building elements 13 overlap each other or an
element 5, the building structure according to Figs. 17 -
22 comprises only one single layer, every second element
13 in the horizontal as well as in the vertical direction,
however, being located in another vertical plane than the
10 remaining elements 13 which in their turn are located in
a common plane which is parallel to and located immediate-
ly adjacent the first-mentioned vertical plane.

End-to-end overlapping is also present in the embodi-
ment according to Fig. 26, which illustrates a cross
15 sectional view through the two opposite ends of a pair of
adjacent building elements 13 which are located on diffe-
rent levels. These ends engage each other in the joining
or overlapping area. The cross sectional view according to
Fig. 26 also illustrates a connection element 18 which in-
20 terconnects the building elements and is illustrated in
plan view in Fig. 27.

This connection element 18 is also substantially
H-shaped and has grooves 19, which have the same width as
the notches 3 but a greater depth than the notches 3 and
25 16 and whose mutually parallel edges form an angle with
the two longitudinal edges of the connection element which
deviates from 90° .

Each notch or groove 19 has an edge which is loca-
ted substantially in the same plane as one of the edges of
30 the opposite groove. Provided that the connection elements
18 are mounted with their height direction vertical, the
planes of the building elements will form an acute angle
with the vertical plane, as is evident from Fig. 25. The
embodiment diagrammatically indicated in Fig. 18 does not

provide a tight wall or panel but one, in which building elements 13 alternate with openings which are located beside as well as above and below the elements 13 in a chess-board pattern.

5 The connection element 18 may also be utilized for the mounting of scale panels or the like.

 Fig. 28 is a plan view illustrating a support element 20 which constitutes one half of the connection element 18 and is intended for the embodiment according to
10 Fig. 26.

 In Fig. 29 there is illustrated a modified building element 22 which may be utilized in the embodiment according to Fig. 26 instead of the element 13.

 The building structure illustrated in Figs. 30 -
15 36 basically corresponds to the one disclosed in Figs. 17 - 22 apart from the fact that adjacent building elements are arranged with an interspace in the transverse direction at their connection ends instead of engaging each other there. These interspaces have been created by replacing the
20 notches 16 having the width $2y$ of the connection element 14 according to Fig. 24 with two distant notches 3 having the width y in the connection element 24 according to Fig. 37, which is utilized in the embodiment according to Fig. 30 - 36, in which also the support element 25 according to
25 Fig. 38 as well as connection elements 5 according to Fig. 4, which are utilized as filling, are comprised. As is evident from Fig. 37, the connection element 24 has the shape of a double comb having three pairs of teeth, and it may also be regarded as two H:s joined together and having
30 a common central shank. The support element 25 illustrated in Fig. 38 constitutes one half of the connection element 24 according to Fig. 37, said half being defined by the axis of symmetry of element 24.

When comparing the building structures according to Figs. 17 - 22 on one hand with those according to Figs. 30 - 36 on the other hand it is evident that said structures are substantially similar and that the most essential difference resides therein that the first structure is denser than the last-mentioned one.

In fig. 39 there is illustrated an embodiment 26 which constitutes a variant of the connection member 24 according to Fig. 37 modified in accordance with Fig. 27.

As is evident from the above an almost unlimited number of different building structures can be constructed of the different elements according to the invention. It is therefor obvious that the embodiments described above and illustrated in the drawings are to be regarded merely as non-limiting examples which may be modified with respect to their individual features and dimensions within the scope of the following claims. In particular, new embodiments which are also encompassed by the inventive concept, may be created by combining details which are taken from different ones of the exemplificatory embodiments described above. In particular connecting members according to both Fig. 13 and Fig. 40 may be utilized in combination with building elements according to Fig. 3 and/or 6 in the same building structure.

CLAIMS

1) An elongated building structure comprising a plurality of solid, substantially plane-parallel building elements (1, 11, 13, 22) having four substantially parallel edges and each having a longitudinal direction, a height direction substantially perpendicular thereto, and a thickness dimension which is perpendicular to said two directions, said elements being interconnected at at least one of their ends in such a way that the longitudinal direction of each element substantially registers with the longitudinal direction of the other elements, and adjacent building elements overlap each other at their said ends (connection ends) (4, 4a, 4b, 4c) in their common longitudinal direction as well as in the height direction or the transverse direction corresponding to said thickness dimension, said building elements being provided with mutually supplementary, preferably congruent notches or grooves (3, 3a, 19) in their mutually overlapping connection ends, c h a r e c t e r i z e d in that the grooves or notches (3, 3a, 19) extend substantially in the height direction, and that the connection ends (4, 4a, 4b, 4c) of the building elements are interconnected by means of substantially plane-parallel connection elements (5, 12, 14, 18, 22) which are substantially perpendicular to the longitudinal direction and have substantially the same thickness and extension in the height direction as the building elements and are substantially shorter than these and engage into said notches to hereby prevent mutual displacement of the building elements (1, 11, 13, 22) in said longitudinal direction, said connection elements having also one or more notches (3, 9, 16, 19), into which such areas of the mutually overlapping connection ends (4, 4a, 4b, 4c) engage as are adjacent to respective notches and which hereby prevent mutual displacement of the building elements in said transverse direction.

2) An elongated building structure according to claim 1 comprising building elements overlapping each other in the longitudinal and height directions, c h a r a c t e r i - z e d in that the extension in the height direction of the mutually overlapping connection ends (4) of the building elements is half of that of the remaining portion of the respective building elements (11) due to the fact that a piece, which is rectangular as seen in a plan view, of at least one of the ends of the respective building elements has been removed or omitted, and that the notch has a depth (3), which is about half of the extension in the height direction of the connection ends (4), and opens substantially centrally into that edge of the connection end which is parallel to the longitudinal direction of the building element and has been formed by the omission or removal of said rectangular end piece (Fig. 6).

3) An elongated building structure according to claim 1 comprising building elements overlapping each other in the longitudinal and height directions, c h a r a c t e r i - z e d in that the extension in the height direction of the mutually overlapping connection ends (4b) of the building elements is half of that of the remaining portion of the respective building elements due to the fact that a piece of the connection end of the building element, which is rectangular as seen in a plan view, has been removed or omitted, and that the notch of each connection end (3) has a depth, which is approximately half of the extension in the height direction of the connection end (4b), and opens substantially centrally into that one of the edges of the connection end which also constitutes one of the longitudinal edges of the building element which are parallel to its longitudinal direction (Fig. 15).

4) An elongated building structure according to claim 1 comprising building elements mutually overlapping each other in the longitudinal and height directions, characterized in that the connection ends (4a) of the building elements have an extension in the height direction which decreases substantially linearly to zero due to the fact that a piece which is triangular, as seen in a plan view, of at least one of the ends of the respective building elements has been removed or omitted, and that the notch (3a) of each connection end has a depth which is approximately a fourth of the maximum extension in the height direction of the building elements, and opens substantially centrally into the oblique edge which has been formed by the removal of said triangular end piece and corresponds to the longest side of the triangular end piece (Fig. 14).

5) An elongated building structure according to claim 1 comprising building elements overlapping each other in the longitudinal and height directions, characterized in that the connection ends (4c) of the building elements have an extension in the height direction which decreases substantially linearly due to the fact that a piece which is substantially triangular as seen in a plan view of the connection end has been removed or omitted, and that the notch (3) of each connection end has a depth, which is about a fourth of the maximum extension in the height direction of the building element, and opens into that longitudinal edge of the building element which is parallel to its longitudinal direction, substantially just opposite the centre of the oblique edge which has been formed by the removal of said triangular end piece and corresponds to the longest side of the triangular piece (Fig. 16).

6) An elongated building structure according to claim 1, c h a r a c t e r i z e d in that the building elements (11) have connection ends (4, 4a, 4b, 4c) according to any of the claims 2 - 5 at their two ends, said omitted or removed rectangular or triangular pieces being located diagonally (e.g. Fig. 6).

7) An elongated building structure according to claim 1, c h a r a c t e r i z e d in that it comprises end elements located at the ends of the building structure and each having a connection end (4, 4a, 4b, 4c) which is formed according to anyone of the claims 2 - 5, and that the opposite end (2) of each element has a pair of mutually opposite notches (3) which have a depth, which substantially equals a fourth of the extension in the height direction of the end elements, and open into an individual one of the longitudinal edges of the end element which are parallel to its longitudinal direction (e.g. Fig. 3).

8) An elongated building structure according to claim 1 comprising building elements overlapping each other in the transverse direction, c h a r a c t e r i z e d in that the building elements (13) at each of their respective ends have a pair of notches (3) which are located just opposite each other as seen in the height direction and open into an individual one of those two longitudinal edges of the building elements which are parallel to the longitudinal direction of the building elements, the depth of said notches being approximately a fourth of the extension in the height direction of the building element (Fig. 23).

9) An elongated building structure according to claim 1, c h a r a c t e r i z e d in that at least some of the connection elements (5, 14, 18) have two notches (3, 16, 19) which are located substantially just opposite each other and open substantially centrally into an individual one of

the edges of the connection elements which are substantially perpendicular to the height direction whereby these connection elements obtain substantially the shape of a H (Figs. 4, 24, 27).

10) An elongated building structure according to claim 9, characterized in that the notches (3, 19) of the connection elements (5, 18) have a width, as measured between the mutually parallel edges of the notches, which substantially equals the thickness of the building elements (Figs. 4, 27).

11) An elongated building structure according to claim 9, characterized in that the edges of the notches (3, 16) of the connection elements (5, 14) are all substantially parallel to the height direction (Fig. 4, 24).

12) An elongated building structure according to claim 9, characterized in that the parallel edges of the notches of the connection elements (18) are all substantially parallel to each other and form an acute angle with the height direction, said building elements preferably overlapping each other in the transverse direction (Fig. 27).

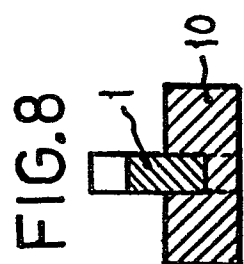
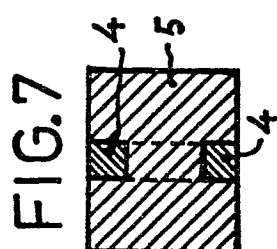
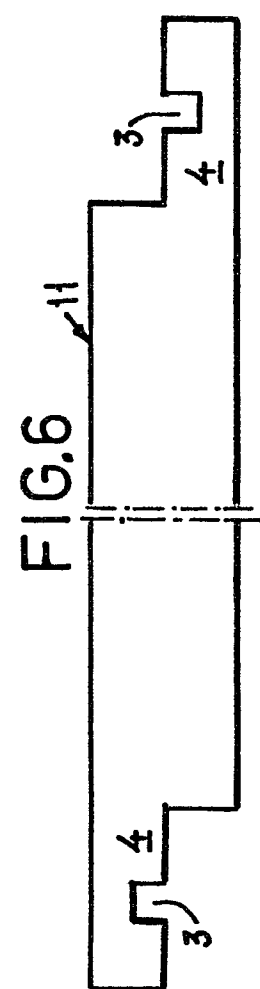
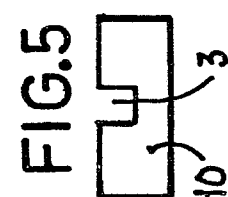
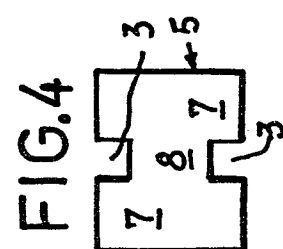
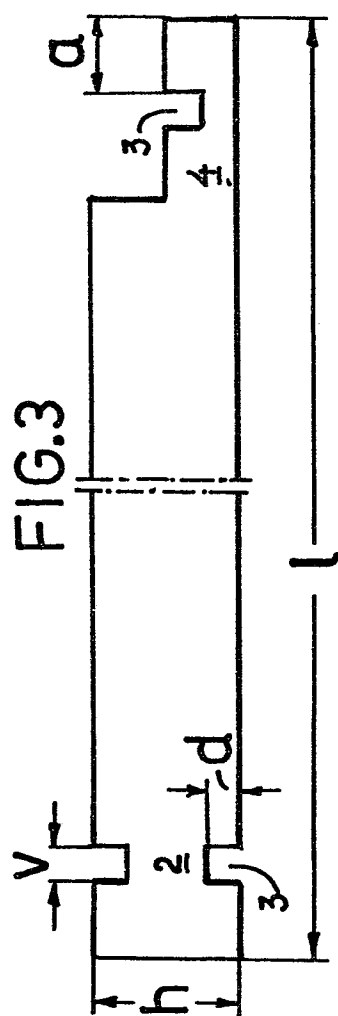
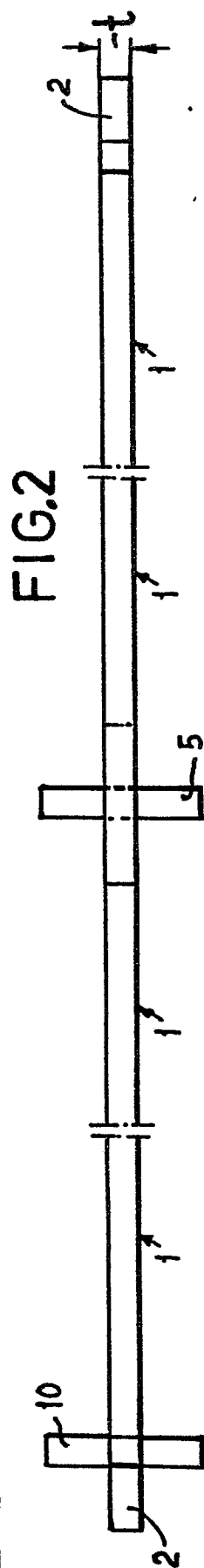
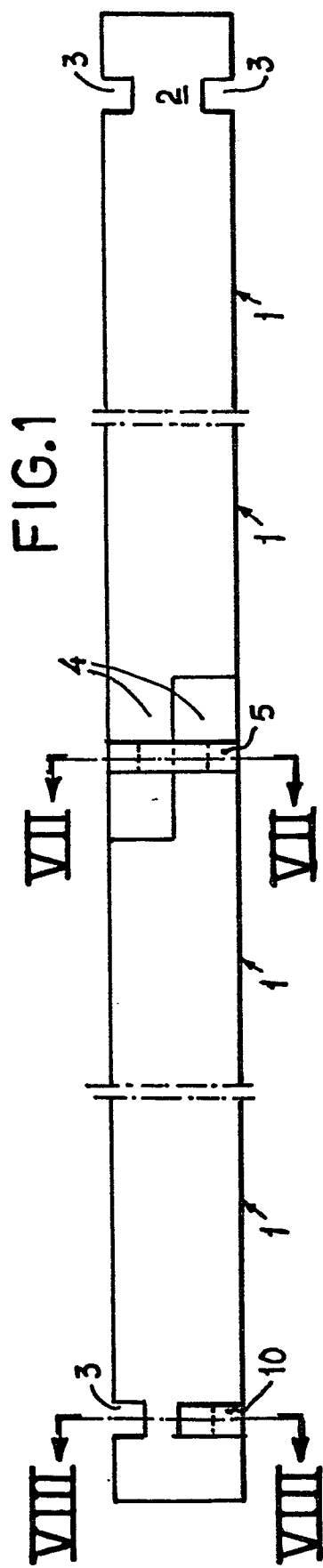
13) An elongated building structure according to claim 9, characterized in that the depth of the notches (3, 16) of the connection elements (5, 14) substantially equals a fourth of the height (h) of the building elements (Fig. 4, 24).

14) An elongated building structure according to claim 9, characterized in that the depth of one (3) of the notches of the connection elements substantially equals a fourth of the height (h) of the building elements, and that the depth of the other notch (9) substantially equals half of the height of the building element (Fig. 40).

15) An elongated building structure according to claim 9, characterized in that the width, as measured between the mutually parallel edges, of the notches (16) of the connection elements (14) is substantially twice as great as the thickness (t) of the building elements, adjacent building elements preferably overlapping each other in the transverse direction while being in mutual contact with each other (Fig. 24).

16) An elongated building structure according to claim 1, characterized in that at least some of the connection elements (24; 26) have two pairs of symmetrical-ly located notches (3; 3, 19) which are located substantially just opposite each other within each pair and open into an individual one of those edges of the connection element (24, 26), which are substantially perpendicular to the height direction, at a distance from the nearest end of the connection element which substantially equals a third of the length of the connection element, whereby these connection elements approximately get the shape of a double H having a central shank common to the two H:s, adjacent building elements overlapping each other in the transverse direction without contacting each other (Fig. 37, 39).

17) An elongated building structure according to claim 1 characterized in that at least part of the connection elements (12) have a notch (9) which is substantially parallel to the height direction and has a width between its edges, which equals the thickness of the building elements, and a depth, which substantially equals half of the height of the building elements, and which opens substantially centrally into one of the side edges of the connection elements (Fig. 13).



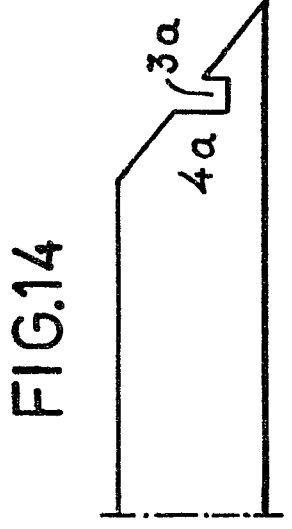
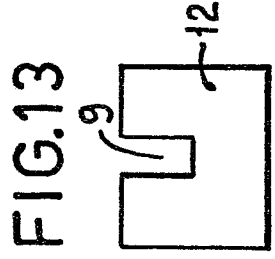
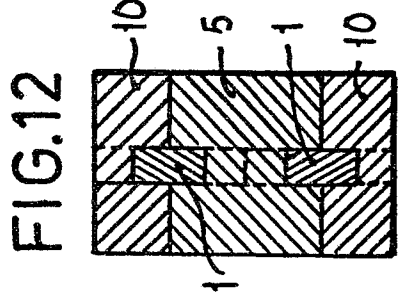
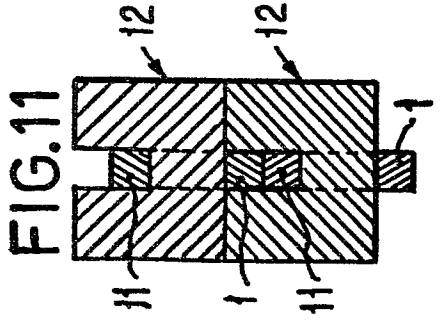
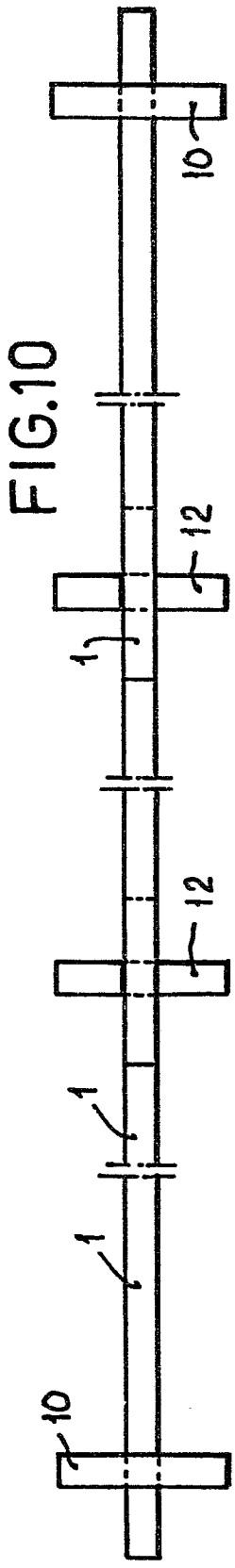
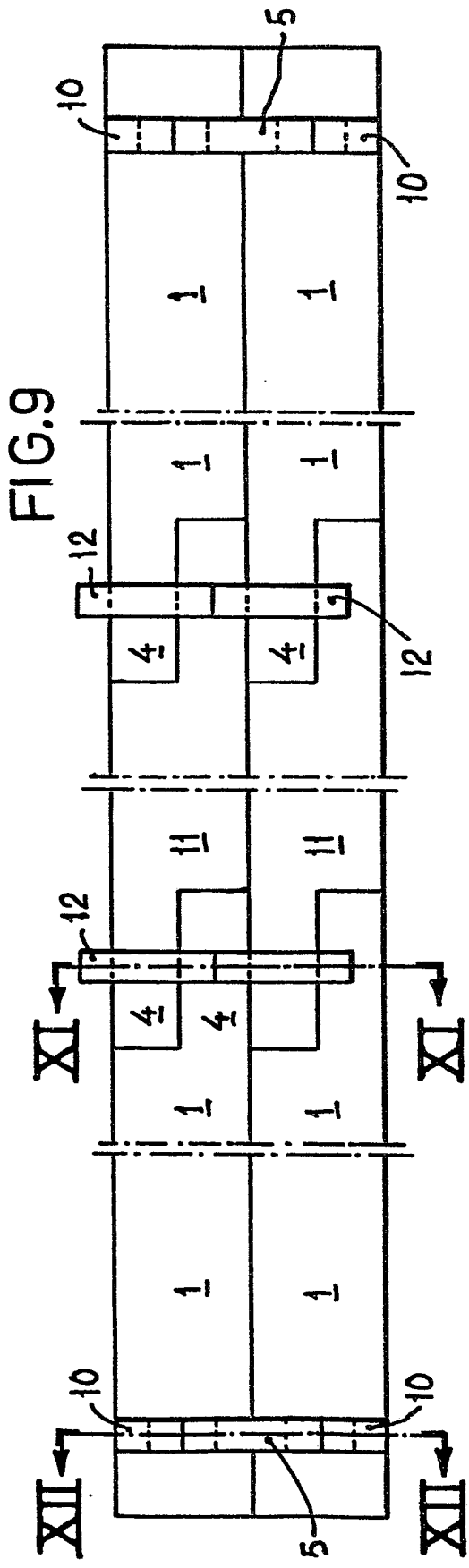


FIG.15

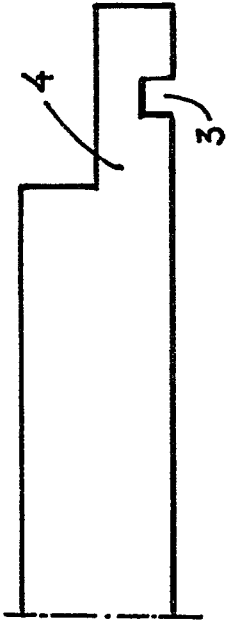


FIG.16

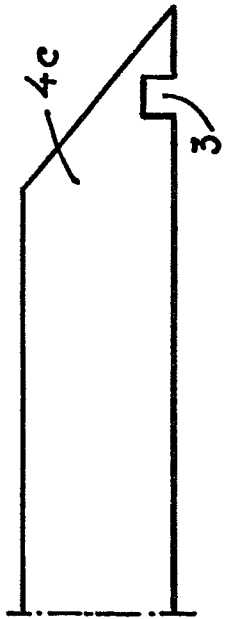


FIG.17

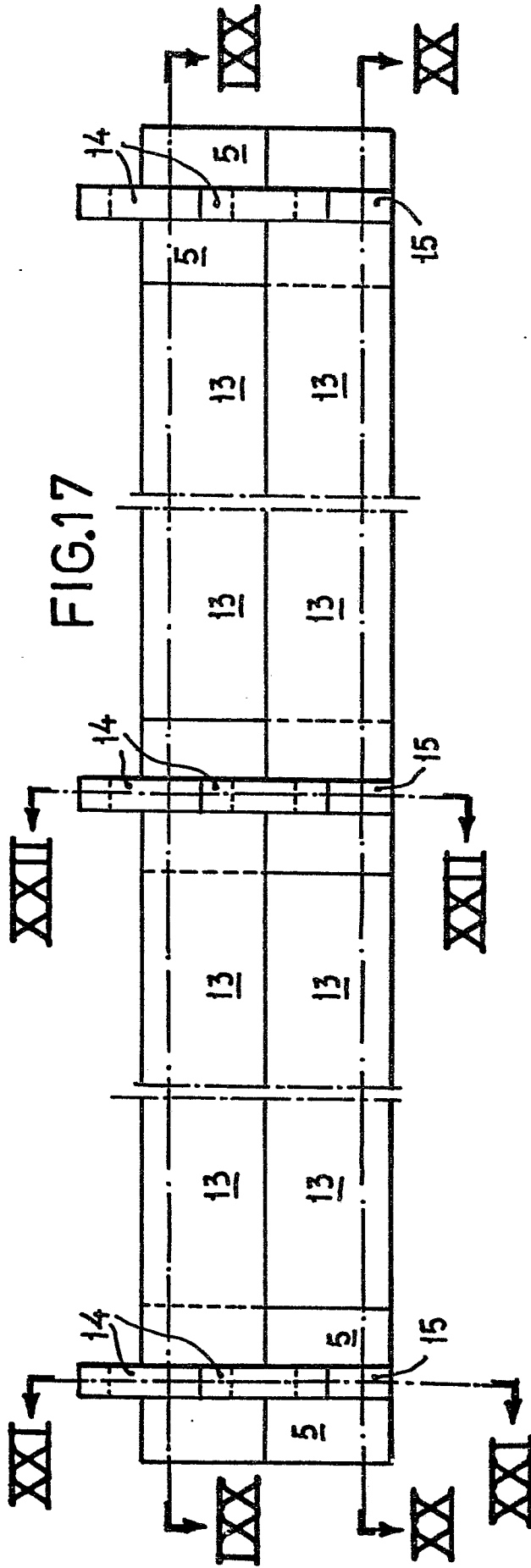
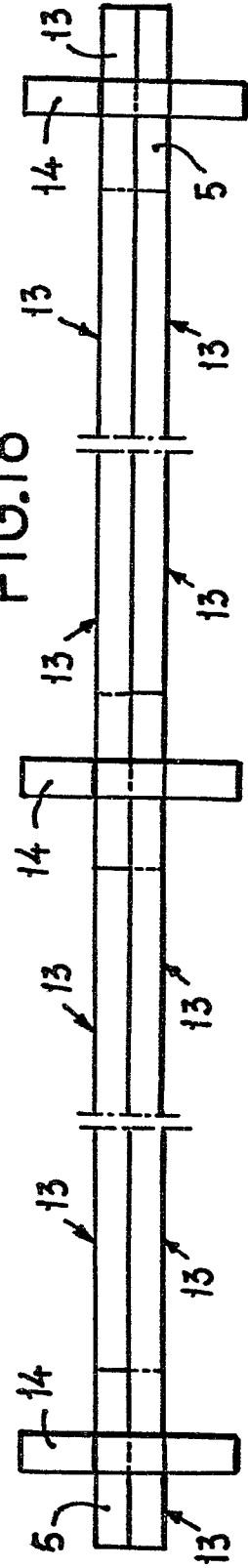


FIG.18



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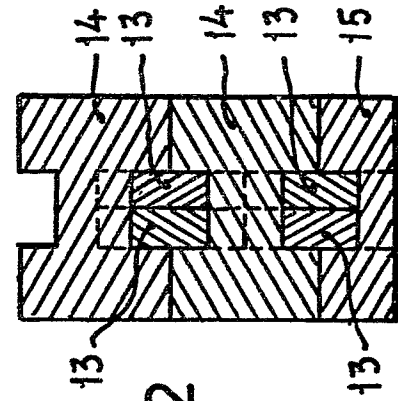
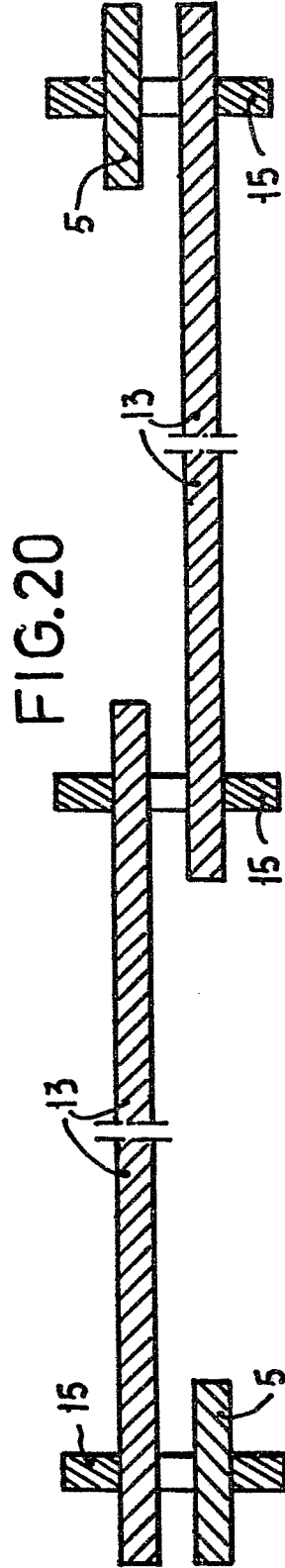
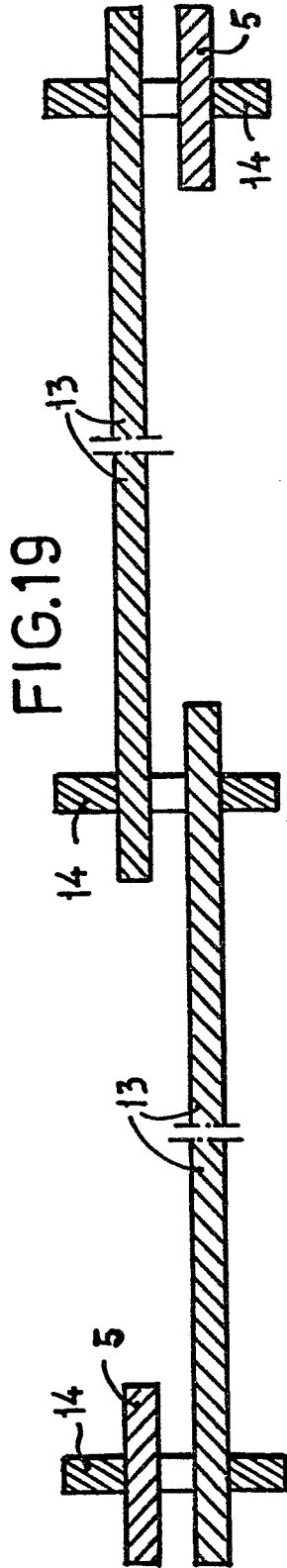


FIG.22

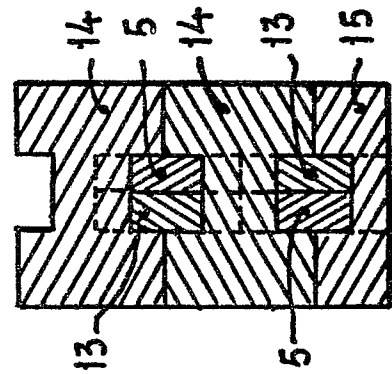


FIG.21

FIG.23

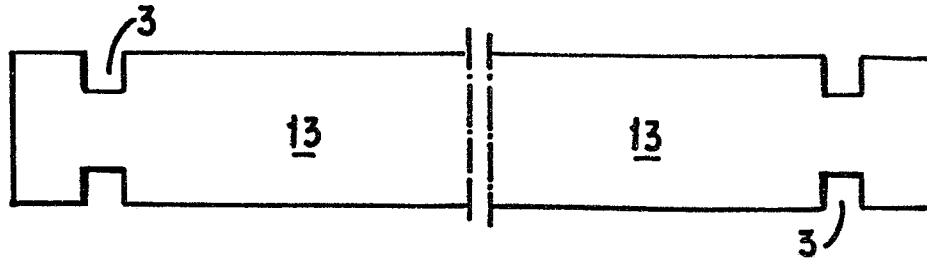


FIG.24

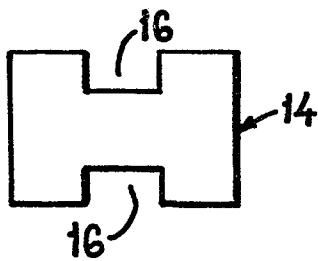


FIG.25

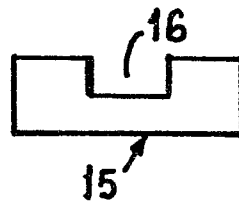


FIG.26

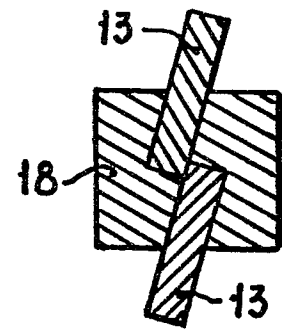


FIG.27

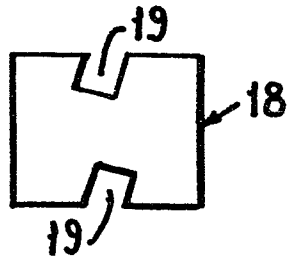


FIG.28



FIG.29

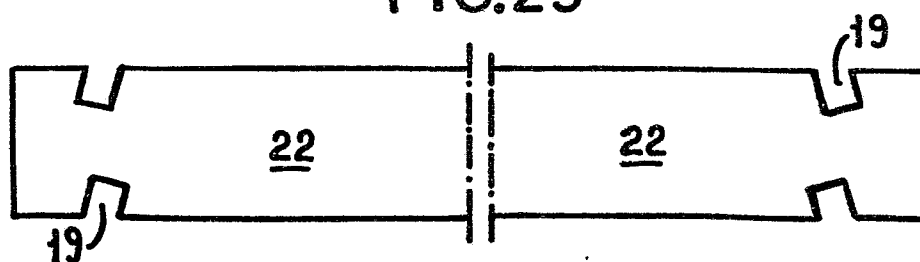


FIG. 30

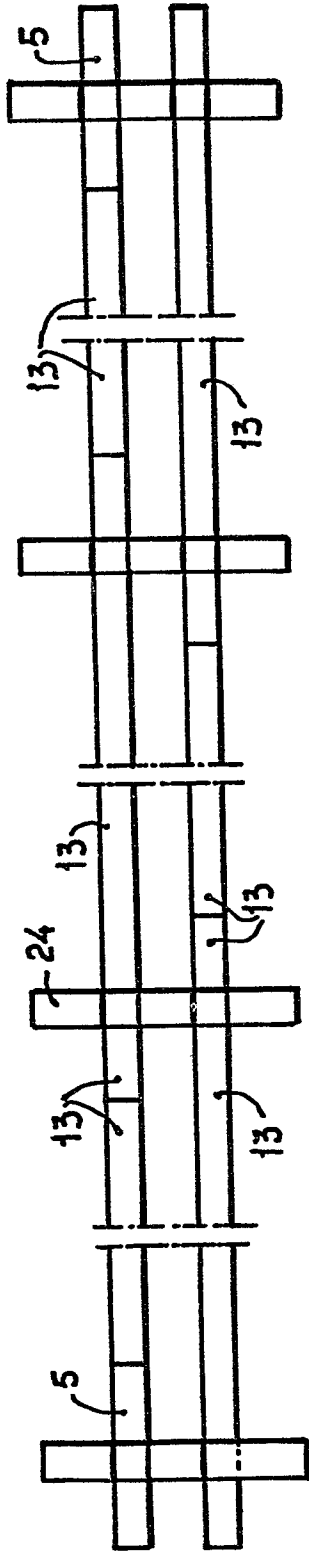
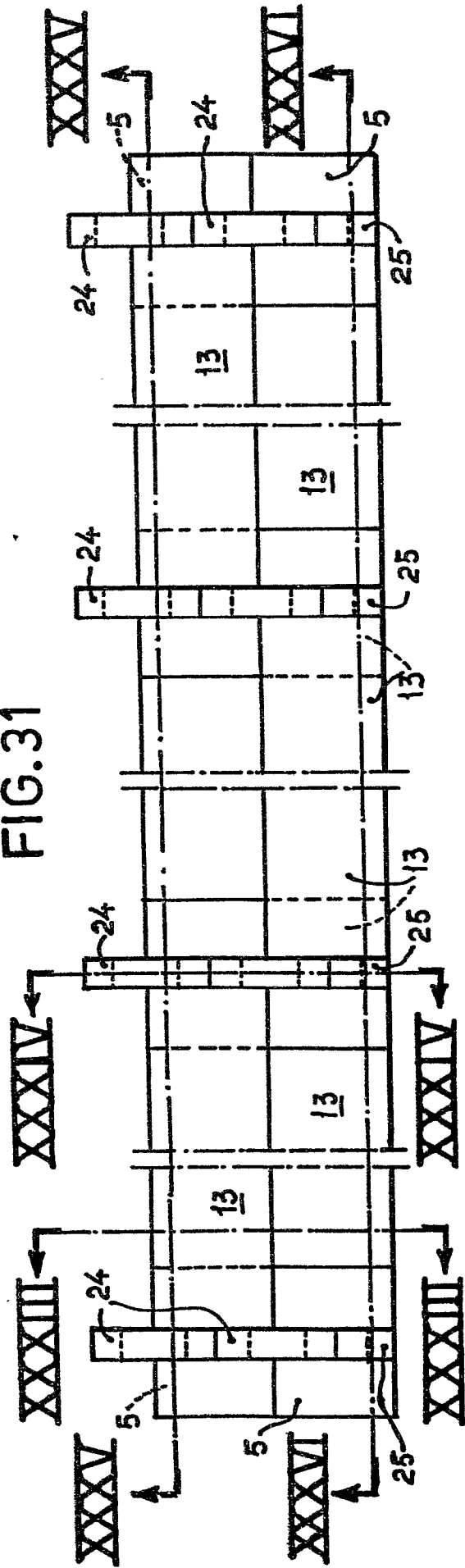


FIG. 31



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FIG.32

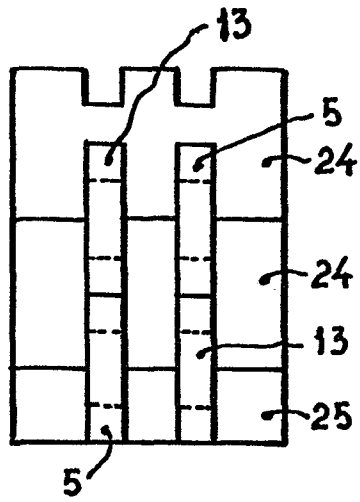


FIG.33

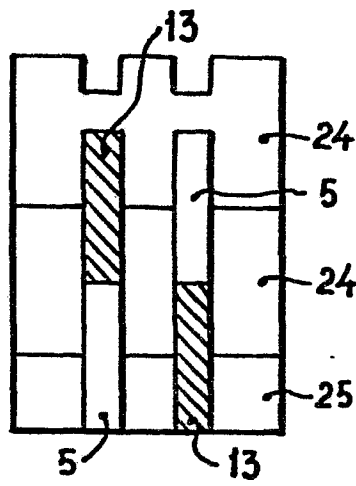


FIG.34

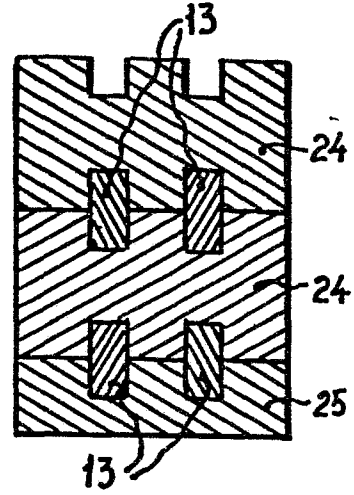


FIG.35

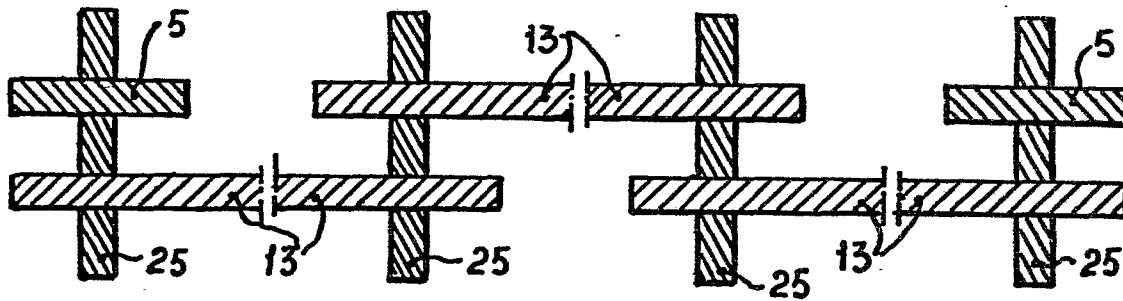
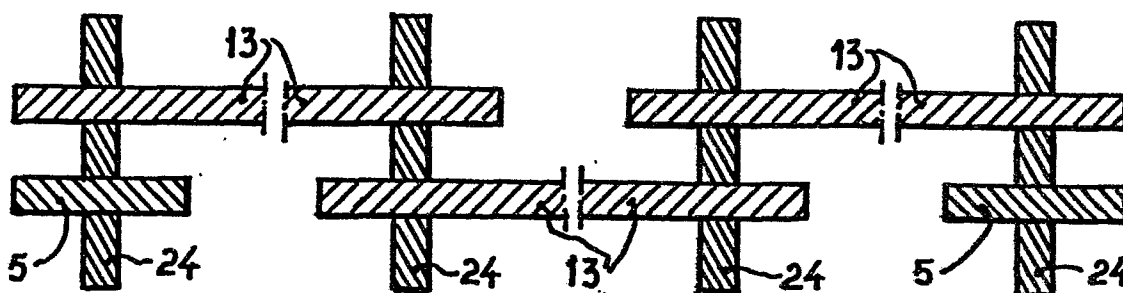


FIG.36



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FIG.37

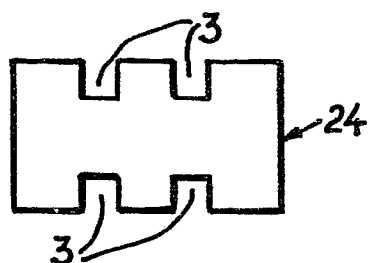


FIG.38



FIG.39

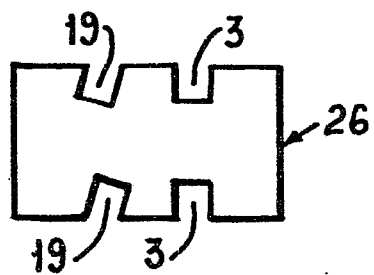
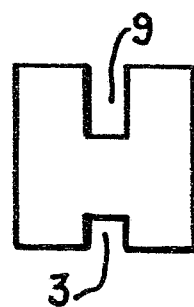


FIG.40



0022100



European Patent
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EUROPEAN SEARCH REPORT

Application number

EP 80 85 0079.7

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.3)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	DE - U - 1 960 232 (F. PILZNER) * claims 1, 6, 7; fig. *	1,9,11	E 04 C 3/00 A 63 H 33/08 F 16 S 3/00
	DE - C - 887 477 (W. JÜRGENSMEYER) * fig. 1 to 8 and 33 to 41 *	1	E 04 B 2/70 E 04 B 2/02
	DE - U - 1 607 279 (H. SCHOWANEK) * fig. 2 *	1	
	DE - U - 1 949 627 (L. FORNASIER) * fig. 6, 10 *	1	
P	DE - A1 - 2 814 192 (P. GÖSSEL) * claims 1 to 15; fig. 1 to 7 *	1,9,11	A 63 H 33/00 E 04 B 2/00 E 04 C 3/00 F 16 S 3/00
A	DE - U - 1 799 933 (F. WILD) * fig. 1 to 3 *		
A	DE - C - 805 135 (C. CARLBERG) * fig. 1 to 7 *		
			TECHNICAL FIELDS SEARCHED (Int. Cl.3)
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family, corresponding document
X The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
Berlin	08-09-1980	v. WITTKEN	