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54 Plate-shaped, rectangular linkable building element.

57 A plate-shaped, rectangular building element (1) of stone-like material comprising a front face (2), a rear face (3) parallel to said front face (2) and two pairs of side faces (4, 5; 6, 7) extending between the front face and the rear face, the side faces of each pair being parallel to one another whereby one (5) of the one pair of side faces (4, 5) is provided with at least one projecting rib (8) extending in the longitudinal direction of the side face (5), the cross-section of which gradually decreases in a direction away from the side face (5) concerned, whilst a given distance from the ends of said side face (5) the rib (8) has two parts (9, 10) broader than the further parts of the rib (8) and the other side face (4) of said pair has a corresponding recess (12) in a manner such that when two of these building elements are stacked straight one above the other, the rib (8) fits with some amount of play in the recess (12) and when these building elements (1) are stacked in an off-set manner in the longitudinal direction of these side faces (4, 5), the boundary planes of the parts of the recess (12) having the smaller cross-section co-operate for the relative disposition of the building elements relatively to one another with the boundary planes of the broader parts (9, 10) of the rib (8).

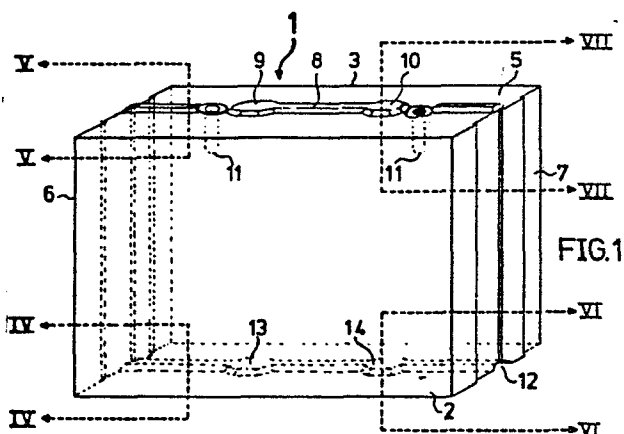


FIG.1

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Plate-shaped, rectangular linkable building element.

5 The invention relates to a plate-shaped, rectangular, linkable building element of stone-like material having a front face, a rear face parallel to the front face and two pairs of side faces extending between the front face and the rear face, the side faces of each pair being parallel to one another.

10 Such plate-shaped building elements, which are made from stone-like material, for example, lime sand stone, concrete or the like, are often manufactured in a factory in given dimensions. On the building site the building elements are stacked side by side and one on the other for erecting a wall or the like. It has then to be ensured that the front faces and the rear faces of the various building elements should lie as much as possible in one plane for obtaining a wall which will be as glad as possible. Such wall surfaces are often finished by applying a plaster layer or the like, but it will be obvious that the flatter is the wall surface for applying the plaster layer, the smaller will be the quantity of plaster material to be applied, which not only means saving of material but also an important reduction of labour time.

20 According to the invention one side face of a pair of side faces is provided with at least one projecting rib extending in the longitudinal direction of the side face, the cross-section of which gradually decreases in a direction away from the side face concerned, whilst at a given distance from the ends of this side face the rib is

provided with two parts, which are broader than the further parts of the rib, whereas the other side face of the pair is provided with a corresponding recess in a manner such that in stacking two building elements straight one above the other the rib fits with some amount of play in
5 the recess and in stacking these building elements one on the other in a relatively off-set manner in the longitudinal direction of these side faces the boundary faces of the parts of the recess of the smallest section co-operate with the boundary faces of the broader parts of the rib for the relative disposition of the building elements relatively
10 to one another.

The use of such building elements permits of stacking them for transport and storing one on the other without causing problems with respect to the presence of the projecting ribs, since they can be arranged with ample amount of play in the recesses of the neighbouring building
15 elements, whilst there is no risk of damage of the projecting ribs.

In erecting a wall or the like the building elements are, however, usually relatively off-set, whereby a broader part of a rib will fall into a part of a recess of smaller cross-section, so that, so to say, a kind of directional effect will occur between the plates and in
20 stacking up the building elements it is automatically ensured that the front and rear faces of the building elements will become as far coplanar as possible.

In practice it has been found that the use of the construction embodying the invention can provide a saving of about 30 percent for es-
25 tablishing, setting and aligning the building elements, so that using the building elements in the erection of walls or the like involves an important saving, in addition to the fact that considerable saving is obtained in the further finishing of the walls owing to the materially flatter wall surfaces, than usually.

30 Preferably also the side faces of the other pair have projecting ribs and grooves so that in neighbouring building elements the projecting ribs of a side face of a building element fit into grooves in the adjacent side face of the other building element. Also in this case the ribs and grooves can contribute to orientating the neighbouring building
35 elements relative to one another, whilst by using building elements provided with projecting ribs fitting in grooves of adjacent building

elements, in addition, a satisfactory sound insulation can be obtained, which is particularly desirable for walls erected between neighbouring dwellings.

The invention will be described hereinafter with reference to
5 the accompanying drawing.

Fig. 1 is a perspective view of an embodiment of a building element in accordance with the invention.

Fig. 2 is a side view of the element of Fig. 1.

Fig. 3 shows the relatively facing ends of two building elements
10 as shown in Fig. 1.

Fig. 4 shows part of a cross-sectional view taken on the line IV-IV in Fig. 1.

Fig. 5 shows a part of a cross-sectional view of Fig. 1 taken on the line V-V in Fig. 1.

Fig. 6 shows a part of a cross-sectional view of Fig. 1 taken
15 on the line VI-VI in Fig. 1.

Fig. 7 shows a part of a cross-sectional view taken on the line VII-VII in Fig. 1.

Fig. 8 illustrates the manner in which the building elements
20 shown in Fig. 1 can be piled up for transport and storage.

Fig. 9 shows a sectional view of parts of two building elements bearing one on the other for transport and/or storage.

Fig. 10 shows the manner in which the building elements can be relatively off-set in erecting a wall.

Fig. 11 is a sectional view of two relatively off-set, stacked
25 building elements, between which a mortar layer is arranged.

Fig. 12 is a sectional view like Fig. 11 without mortar layer.

Fig. 13 shows a further plate-shaped building element which can be used in erecting walls or the like in conjunction with the plate-
30 shaped building element of Fig. 1.

Fig. 14 is a side view of the element of Fig. 13.

Fig. 15 is a plan view of the ends of two neighbouring building elements as shown in Fig. 13.

Fig. 16 is an elevational view of a wall erected by means of
35 the building elements shown in Figs. 1 and 15.

Fig. 17 is a lateral view of the wall shown in Fig. 16.

Figs. 18 and 19 are lateral views of further embodiments of walls that can be constructed by using building elements in accordance with the invention.

The building element 1 of Fig. 1 is mainly a parallelepiped having a front face 2, a rear face 3 parallel to said front face, a first pair of relatively parallel side faces 4 and 5 and a second pair of relatively parallel side faces 6 and 7.

The side face 5 is provided with a rib 8 extending in the longitudinal direction of the building element 1 and at a given distance from the two ends of the side face concerned provided with widened parts 9 and 10.

For the invention it is not decidedly necessary that the rib covers the whole length of the side face 5, but the rib may have local interruptions. In the embodiment shown local interruptions are provided at the height of holes 11 internally of the building element at right angles to the side face 5. In the case of heavier building elements such holes 11 can be made in order to enable catching such building elements with the aid of suitable pincers for lifting them.

From Fig. 1 it is furthermore apparent that in the side face 4 parallel to side face 5 perpendicularly below the rib 8 there is a corresponding groove or recess 12 having perpendicularly below the widened parts 9 and 10 of the rib 8 widened, recessed part 13 and 14 respectively.

From Figs. 4 to 7 it will be apparent that, in a cross-sectional view, the broad side of a rib 8 and the wider parts 9 and 10 of said rib 8 gradually become smaller in a direction remote from the side 5. The recess 12 and the wider parts 13 and 14 of this recess have a correspondingly shaped sectional area.

For storage and transport building elements of the kind set forth are piled straight one above the other, as is illustrated in Fig. 4. The rib 8 then falls in the recess 12 and the wider parts 9 and 10 of the rib 8 get into the wider parts 13 and 14 of the recess 12. As is shown in Fig. 9 the embodiment is such that there is some amount of play between the boundary faces of the rib 8 with its wider parts 9 and 10 and the boundary faces of the recess 12 with its wider parts 13 and 14. It is ensured that the dimension of the wider parts 13 and 14 of the recess

12, measured in the longitudinal direction of the side faces 4 and 5 is slightly greater than the dimension of the widened parts 9 and 10 of the rib 8, measured in the longitudinal direction. Consequently the building elements can be readily stacked one on the other for transport and/or storage without the risk of damage of the projecting ribs 8.

It is furthermore shown in Figs. 1 to 3 that one side face 6 is provided with two projecting ribs 15 and 16, a groove 17 between said ribs and a groove 18 located near the rib 16 and extending up to the front face 2. The rib 15 adjoins the rear face 3. The opposite side face 7 of the building element concerned is provided with two ribs 19 and 20, a groove 21 between the ribs 19 and 20 and a groove 22 located at the side of the rib 19 and adjoining the rear face 3. The projecting rib 22 adjoins the front face 2.

It will be obvious, in particular, from Fig. 3, that in this construction the ribs 15 and 16 of a plate-shaped building element can be slid into the grooves 21 and 22 of the adjacent building element, the projecting ribs 19 and 20 of the last-mentioned building element automatically falling into the grooves 17 and 18 of the first-mentioned building element.

When erecting a wall by using the building elements described above the building elements arranged in layers lying one above the other are relatively off-set in the direction of length of the building elements as is illustrated in Figs. 10 and 14. As a result the widened parts 9 and 10 of a building element get into the non-widened parts of the recess 12 of an element disposed thereabove. Prior to disposing the elements one on the other a mortar layer 23 is frequently applied between the elements to a conventional thickness of about 2 mm. From Fig. 11 it will be obvious that the boundary faces of the widened parts 9 and 10 of the rib 8 co-operate with the boundary faces of the non-widened parts of the recess 20 in order to carry out the orientation of the stacked building elements so that the front faces and the rear faces of these building elements will lie in one plane as satisfactorily as possible.

When no mortar is applied between the elements, the situation of Fig. 12 is obtained.

As a matter of course the arrangement is carried out so that

with the interposition of a mortar layer the projecting ribs 15, 16, 19 and 20 of the side faces 6, and 7 fall into the recesses 17, 18, 21 and 22. Also then the boundary faces of the tapering ribs and the co-operating, inclined boundary faces of the recesses ensure the orientation of the building elements arranged side by side.

The projecting ribs and the grooves receiving the projecting ribs ensure not only a satisfactory orientation of the building elements relative to one another, but contribute considerably to sound insulation.

In order to obtain in the off-set disposition of the building element lying one above the other the desired effect between the widened parts 9 and 10 of the ribs and the non-widened parts of the recesses 12 co-operating therewith, care is taken that the distance between the two parts 9 and 10 on a particular building element differs from the distance between the nearest parts 9 and 10 of two building elements arranged side by side, so that it is avoided that in a relatively off-set position of superjacent building elements nevertheless a widened part of a rib should fall into a widened part of a recess.

As a matter of course, building elements of the kind set forth can be made with many different dimensions, whilst also the dimensions of the ribs and the recesses can be freely chosen.

In an advantageous, practical embodiment the widened parts 9 and 10 of a rib 8 and the widened parts 13 and 14 of a recess 12 resp., measured from the side 6 are located at a distance of about 29/90 and 61/90 respectively of the length of the side 5 from the respective side 6. In the non-widened part the rib had a trapezoidal section having a base width of 29 mms, a top width of 10 mms and a height of 10 mms. The dimensions of the cross-sections of the widened parts 9 and 10, also having a trapezoidal shape, were: base width $33 \frac{3}{4}$ mms, the top width 16 mms and the height 10 mms. Measured in the direction of length the dimension of a widened part was about 50 mms and the transition between the widened part of the rib and the part of the rib with the normal width had a length of about $32 \frac{1}{2}$ mms.

In a building element having a rib of this construction the trapezoidal cross-sectional area of the recess 12 had a base width of 32 mms, a top width of $11 \frac{1}{2}$ mms and a height of $11 \frac{1}{2}$ mms. A widened part 13 and 14 respectively of the recess 12 had also a trapezoidal cross-section having a base width of $37 \frac{1}{2}$ mms, a top width of $18 \frac{1}{2}$ mms and a height of

11½ mms. The length of such a widened part was about 70 mms.

For finishing the walls erected by the building elements of the kind set forth on the top side it is not desirable to have ribs projecting on the top side. In conjunction with the embodiments described above it is, therefore, efficient to use the building element 24 shown in Figs. 13 to 15, which has, at least for the major part the same structure as the building element shown in Fig. 1, the corresponding parts of which are, therefore, designated by the same reference numerals as in Fig. 1. Instead of using a rib 8, the side face 5 has, however, a recess 25, the section of which corresponds with the recess 12, but this recess 25 does not have widened parts. Such stones can be used for finishing the top layer of a wall. Furthermore such stones can be sawn through the middle along a diagonal line for finishing a ridge façade of Fig. 16 so that two rectangular, trapezoidal building elements 24' and 24'' are obtained, with the aid of which a triangular gable can be built in the manner shown in Fig. 16.

As a matter of course, within the spirit and scope of the invention variations and/or completions of the constructions are possible.

As is shown in Figs. 1 to 17 relatively broad building elements with a rib and a groove respectively can be used and, of course, a plurality of ribs and grooves can be arranged side by side. A further embodiment is shown in Fig. 18, in which is used a building element as described in Dutch Patent Application 8203653, in which each building element is built up from two plate-shaped parts 26 and 27 of stone-like material with an interposed layer of insulating material. As is shown, the two plate-shaped parts 26 and 27 can be provided with ribs and grooves, but it is also possible to provide only one of these plates with ribs and grooves.

Fig. 19 shows an embodiment in which building elements 29 of the kind of the construction of Fig. 17 are used which may have a smaller thickness and which are furthermore provided in a similar manner with projecting grooves and recesses. These building elements are employed as the inner plate of a hollow wall, to which insulating material is applied, whilst the hollow wall is furthermore provided with an outer plate 32 of bricks.

-1-

CLAIMS

1. A plate-shaped, rectangular building element (1) of stone-like material comprising a front face (2), a rear face (3) parallel to said front face (2) and two pairs of side faces (4,5; 6,7) extending between the front face and the rear face, the side faces of each pair being parallel to one another characterized in that one (5) of the one pair of side faces (4,5) is provided with at least one projecting rib (8) extending in the longitudinal direction of the side face (5), the cross-section of which gradually decreases in a direction away from the side face (5) concerned, whilst a given distance from the ends of said face (5) the rib (8) has two parts (9,10) broader than the further parts of the rib (8) and the other side face (4) of said pair has a corresponding recess (12) in a manner such that when two of these building elements are stacked straight one above the other, the rib (8) fits with some amount of play in the recess (12) and when these building elements (1) are stacked in an off-set manner in the longitudinal direction of these side faces (4,5), the boundary planes of the parts of the recess (12) having the smaller cross-section co-operate for the relative disposition of the building elements relatively to one another with the boundary planes of the broader parts (9,10) of the rib (8).
2. A building element as claimed in Claim 1 characterized in that the distance between two broader parts (9,10) of a rib (8) arranged on an element (1) differs from the distance between the most adjacent broader parts of the ribs of two building elements disposed side by side with their

ribs (8) aligned to one another.

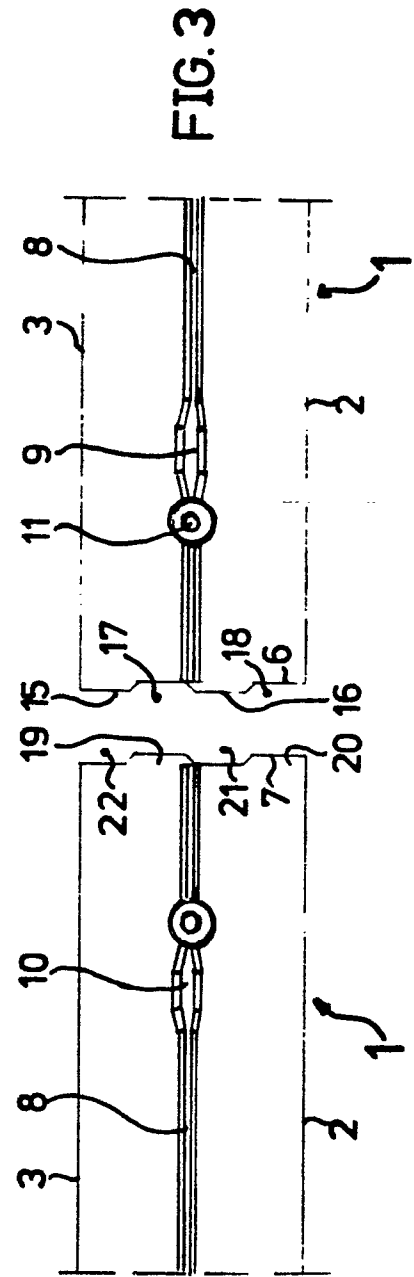
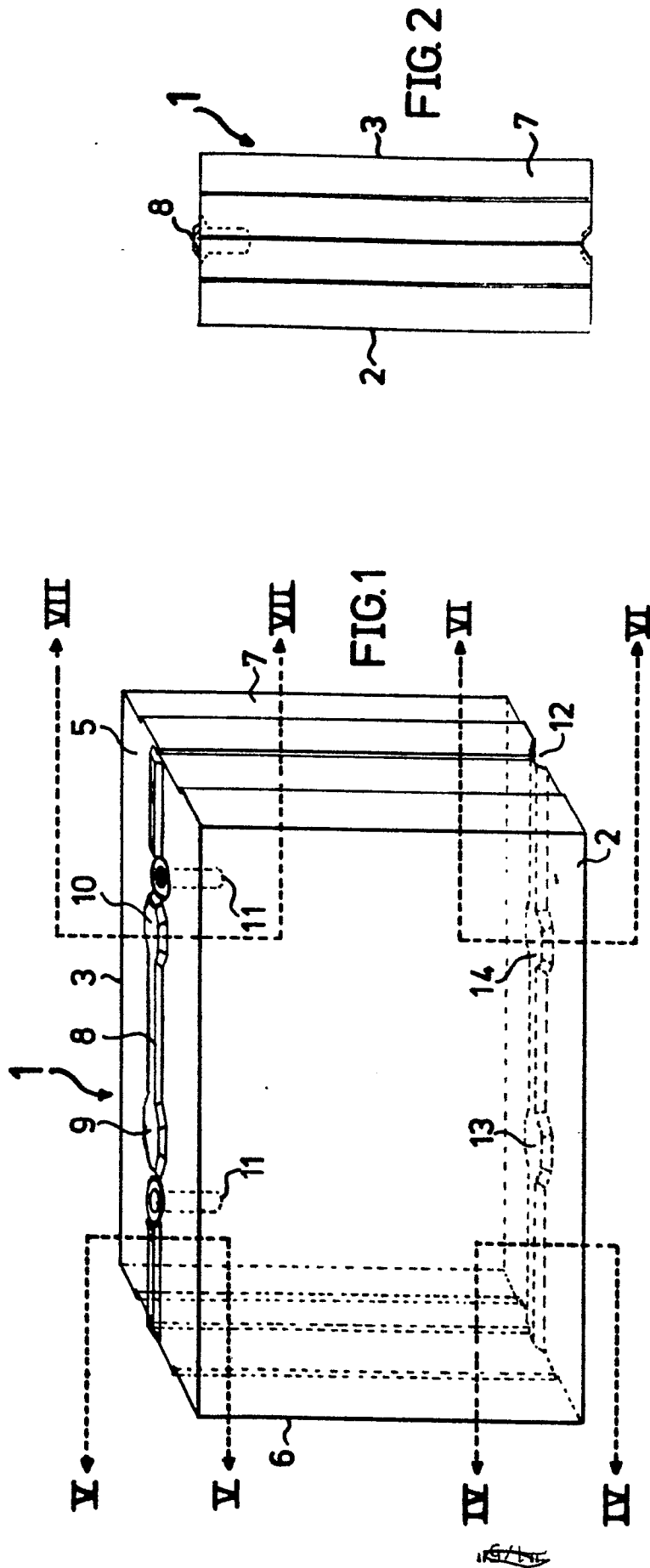
3. A building element as claimed in Claim 1 or 2 characterized in that a rib (8) and recess (12) respectively have a trapezoidal cross-section.

5 4. A building element as claimed in anyone of the preceding Claims characterized in that the side faces (6,7) of the other pair are provided with projecting ribs (15,16; 19,20) and grooves (17,18; 21,22) so that the projecting ribs of neighbouring building elements (1) of a side face fit into grooves in the adjoining side face of the other building element.

10 5. A building element as claimed in Claim 4 characterized in that the projecting ribs (16,19) have a trapezoidal shape.

6. A building element as claimed in Claim 4 or 5 characterized in that each side face (6,7) is provided with a plurality of ribs (15,16; 19,20) having the same cross-sections and a plurality of grooves (17,18; 15 21,22) of the same cross-sections, whilst, viewed in a direction normal to the longitudinal direction of these ribs and grooves, at a place where one side face has a groove, the other side face is provided with a rib.

7. A building element to be used in conjunction with a building
20 element as claimed in anyone of the preceding Claims characterized in that the building element is provided on one side face (5) with a recess (25) instead of a rib, at least the smaller section of said recess (25) corresponding with the smaller section of the recess (12) in the other side face (4).



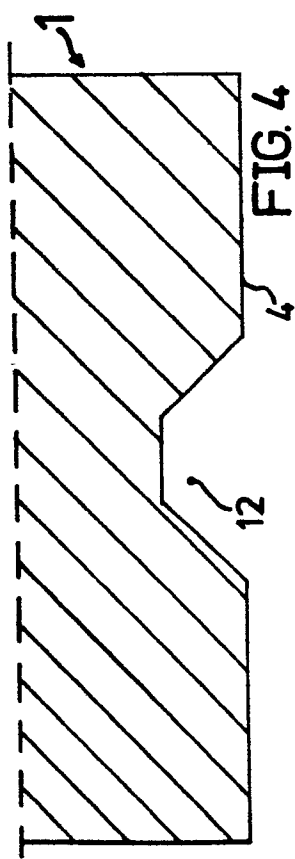


FIG. 4

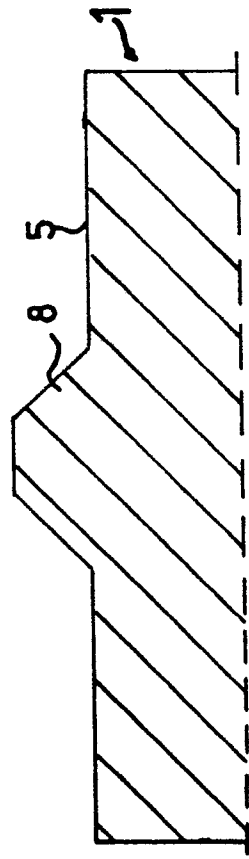


FIG. 5

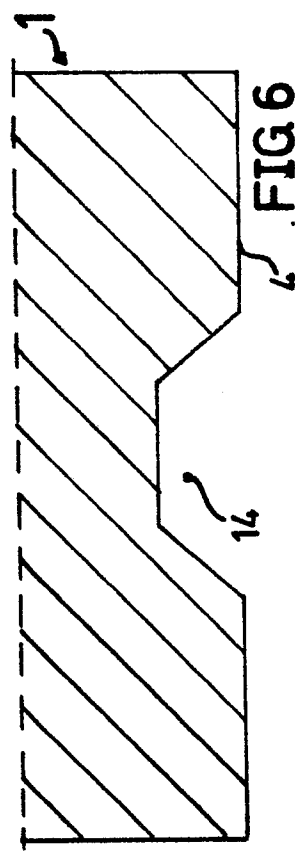


FIG. 6

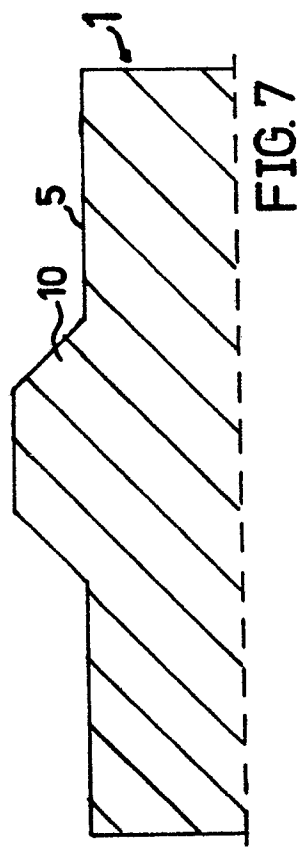


FIG. 7

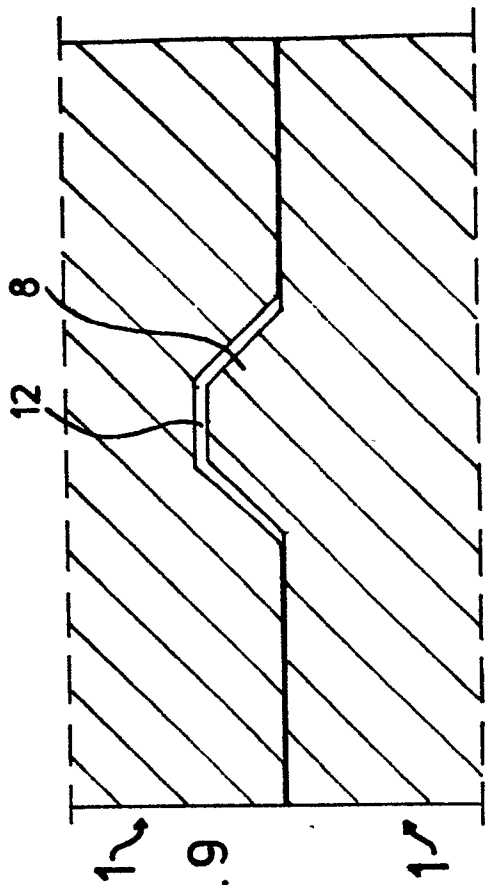


FIG. 9

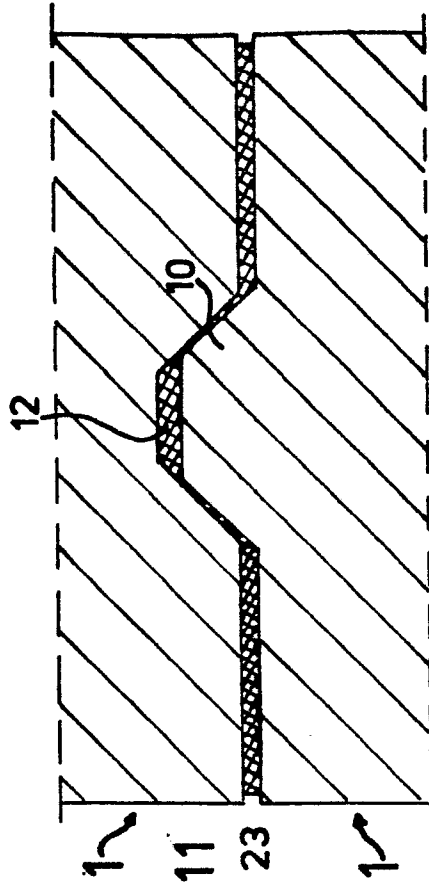


FIG. 11

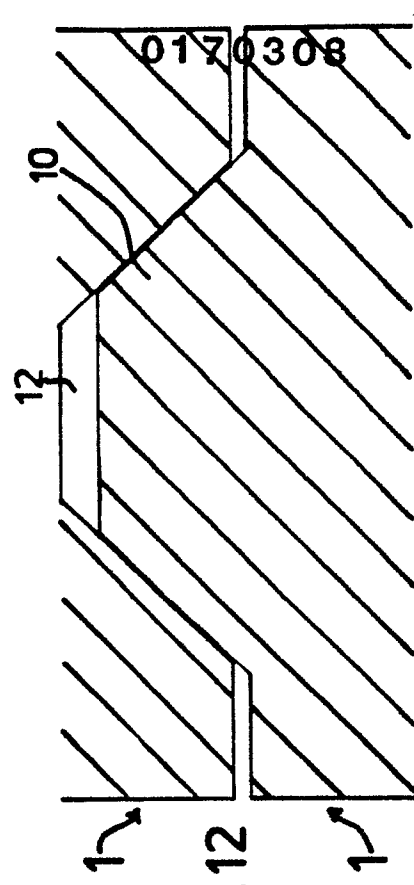


FIG. 12

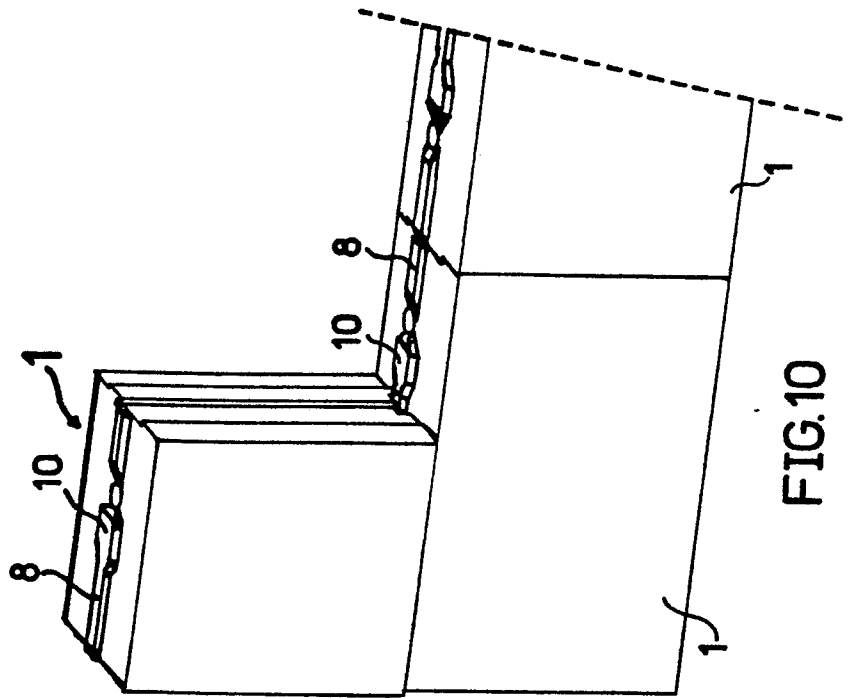
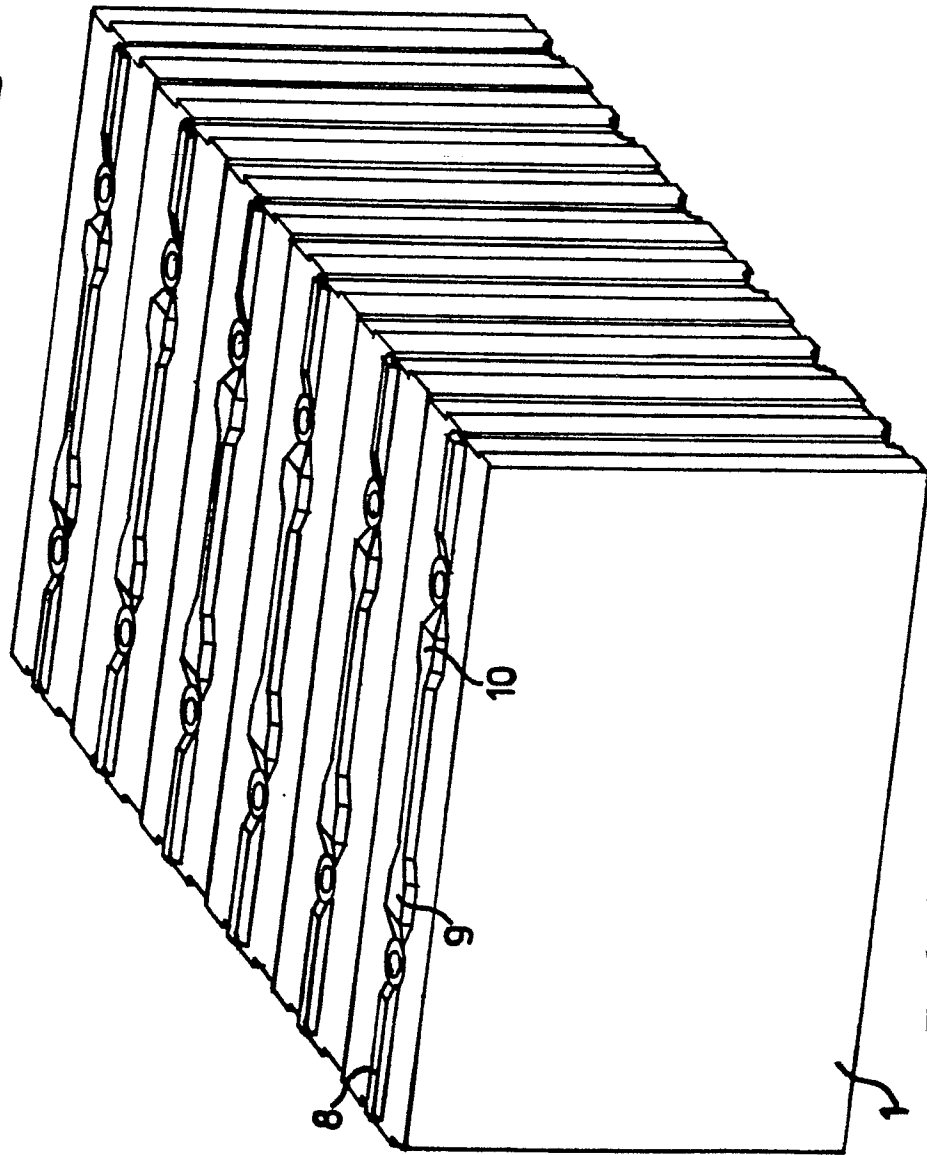
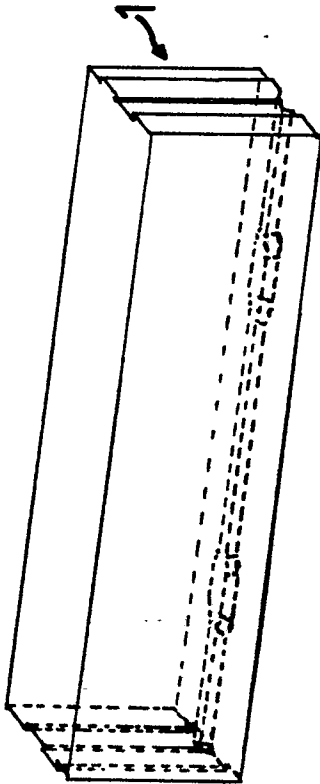


FIG.10

FIG.8

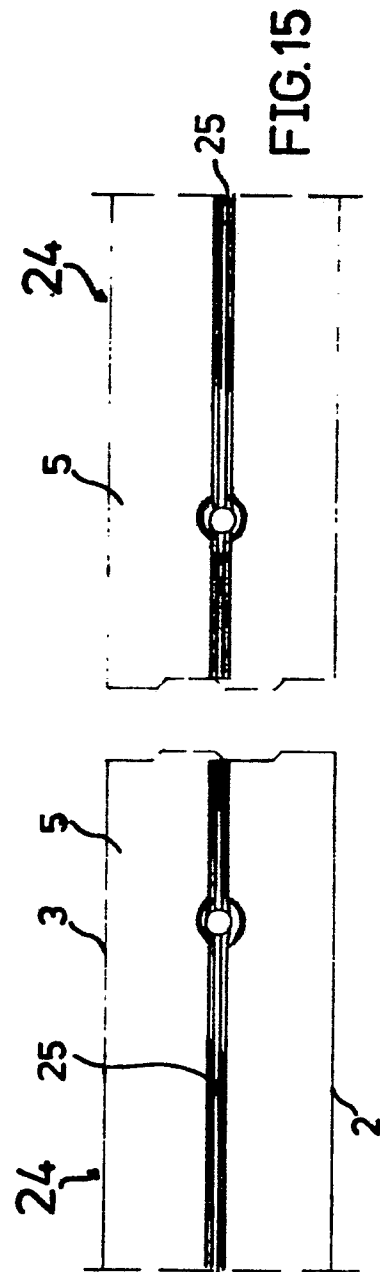
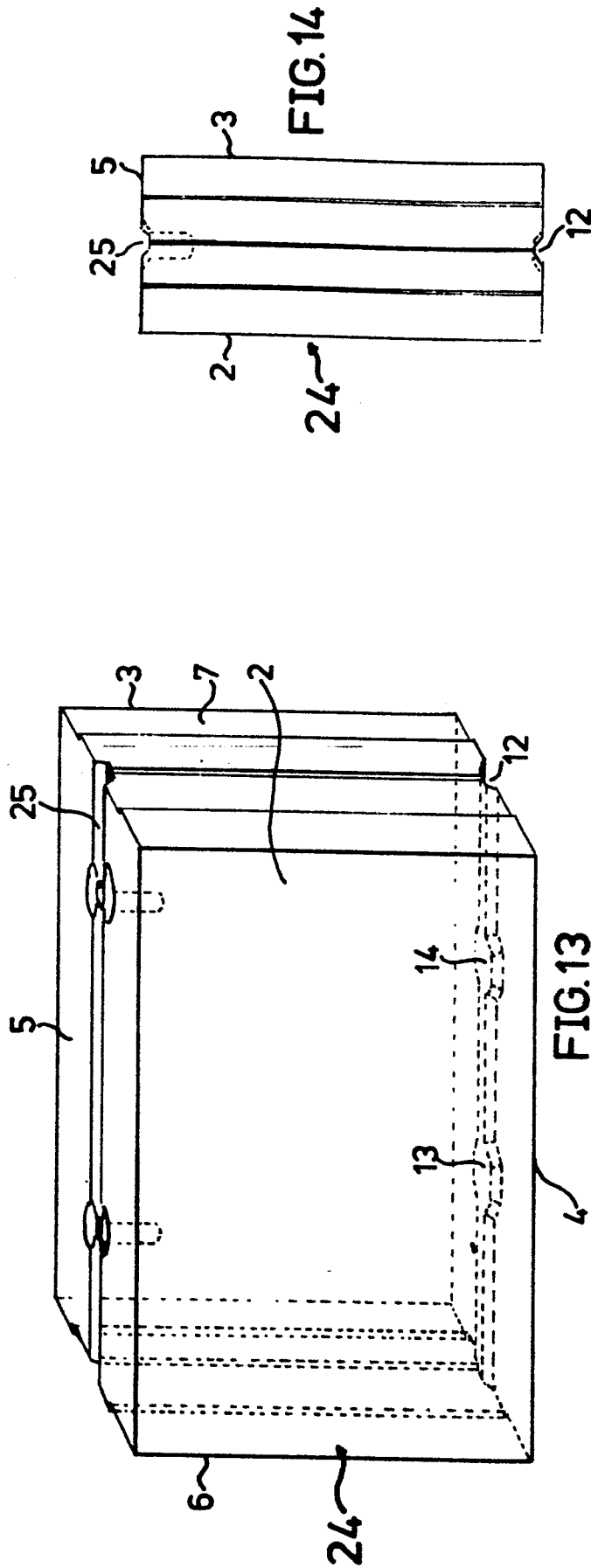


FIG. 17

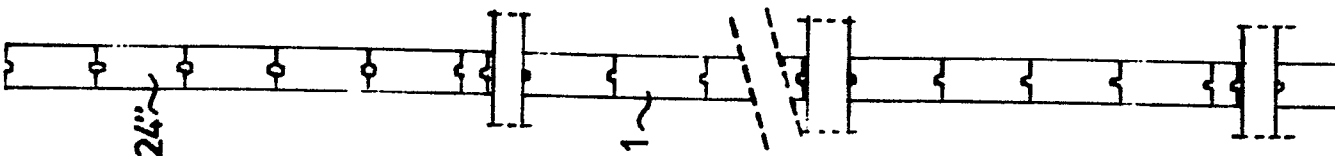


FIG. 18

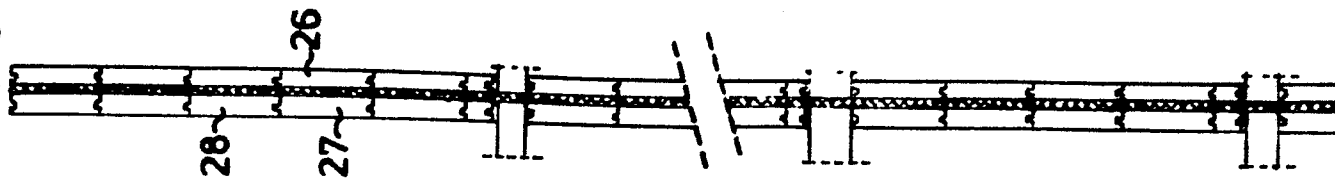
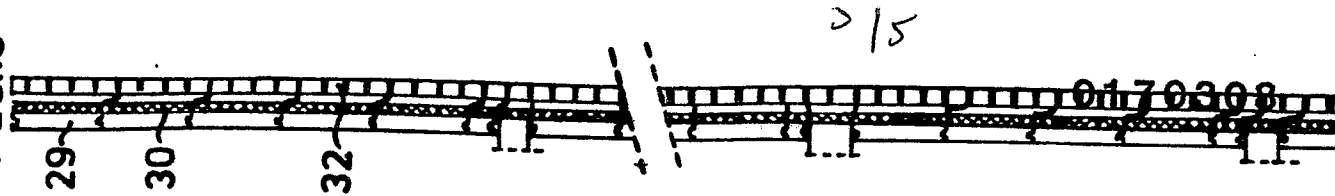


FIG. 19



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FIG. 16

