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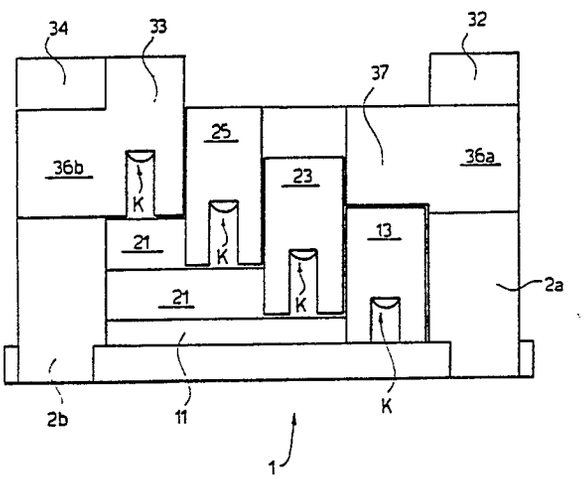
(54) Built-up stepped terminal board.

(57) The proposed terminal board consists of superimposable terminal holder plates (11, 21, 31), each of which is provided with a single head. Each terminal holder plate is independent of the rest and has its own terminals on a plane which is at a different height from that of the nearby terminals. Preferably the plates (11, 21) are equal to each other two by two.

Assembly of the terminal board is carried out by fitting the terminal holder plates on top of each other in a pack, and then this on the terminal board strip (1). Both the strip (1) and the terminal holder plates (11, 21, 31) have reciprocal engaging means which fasten the strip to the plates and the plates to each other.

FIG. 11



EP 0 352 649 A2

"BUILT-UP STEPPED TERMINAL BOARD"

The present invention concerns the field of terminal boards intended for the semiportable connection of a certain number of rigid or flexible electric conductors, insulated from each other.

Many embodiments of terminal boards are already known, consisting of a variable number of terminals, constructed enbloc or in different pieces for assembling together.

These terminal boards suffer from drawbacks due to the difficulty in connecting the connecting wires to the individual terminals one beside the other, all at the same height. In addition, in order to assure the required insulation between a terminal and the adjacent ones, it is necessary to space out the terminals and provide insulating separators, thus realizing a very large terminal board.

Aim of the present invention is therefore to avoid the above-mentioned drawbacks, providing a terminal board which will facilitate the connection of the conductor wires to the same, and which will have small plan dimensions in comparison with the terminal board of the known type, with the requested insulation remaining the same, or, in other words, greater insulation for the same dimensions.

A further aim of the present invention is that of realizing a simple and economical type of manufacture.

The above aims have been achieved by the realization of a built-up terminal board consisting of superimposed terminal holder plates, each of which is provided with terminals which correspond to a single head, said terminals each being located on one specific level, different from the adjacent plates. Preferably the plates are similar or identical two by two.

In addition the strip and each plate preferably foresee a reciprocal engaging means which realizes a fixed joint with the strip or with the adjacent plates.

The reciprocal engaging means can for example consist of a square projection (correspondingly a square recess).

Preferably each terminal holder unit is in addition realized with a parallelepiped block projecting both upwards and downwards, so that the interior side wall in its central area serves as a connection with the body of the respective plate, while its upper and lower areas serve as a stop for the strip or for the other adjacent plates.

Another solution also foresees the use of the other side walls of the block as elements suitable for defining the reciprocal position of the plates.

The present invention will now be described in one of its preferred embodiments, with reference to the enclosed drawings, in which:

fig. 1 represents a top view of the strip of the terminal board which is the object of the invention;

fig. 2 represents a sectional view along the line 2-2 in fig. 1;

fig. 3 represents a top view of the lower terminal holder plate;

fig. 4 represents a sectional view along the lines 4-4 of fig. 3;

fig. 5 represents a top view of the intermediate terminal holder plate;

fig. 6 represents a sectional view along the line 6-6 of fig. 5;

fig. 7 represents a top view of the upper terminal holder plate;

fig. 8 represents a sectional view along the line 8-8 of fig. 7;

figs. 9 and 10 represent the connections inside the lower and upper terminal holder plates and the intermediate terminal holder plates respectively;

fig. 11 represents a side view of the proposed terminal board as a whole.

In figs. 1 and 2 a strip 1 for a terminal board is shown, with square plan, provided with four projections 2a, 2b, 2c and 2d, equal to each other, at the four vertices, being square in section with the external vertex rounded; such projections are each crossed by a through hole, 3a, 3b, 3c and 3d respectively, for inserting the locking screws, not shown in the figures. In the inner zone contained within the four projections a base structure is foreseen, having vertical side walls 5 forming a square. On the base structure, a stepped rise 8 is foreseen, also with square plan, having sides parallel to the walls 5; the vertices of the stepped rise 8 are near the inside vertices of the four projections 2a, 2b, 2c, 2d. Along the sides of the projections 2a, 2b, 2d there are notches 4a, 4b, 4c, 4d, with square plan, whose side is equal to that of the projection 2a, for coupling with the lower terminal holder plate 11, as will be seen later. These notches are positioned in correspondence with the terminal holder blocks of the lower plate 11.

This plate is represented in figs. 3 and 4. It too has a base structure with square plan, having vertical walls 5 identical with those of the strip 1. The base structure has in addition a seating 7 on its lower part, suitable for receiving the stepped rise 8 of the strip 1 and, in turn, another stepped rise 8 on its upper part. The seating 7 is interrupted in correspondence with four zones forming cavities 6 suitable for receiving the electrical connection 51 (fig. 9), as will be seen later.

Four lateral parallelepiped blocks, 12, 13, 14 and 15 respectively, having square sections and

being crossed axially by the same numebr of through holes 0, come out from the square base structure. The blocks have sections which are able to be received into the cavities 4a, 4b, 4c, 4d of the strip 1. The blocks are identical with each other; each of them has a vertical wall A which faces the square base structure and has its intermediate zone connected to the wall 5 of the square base structure. The walls A project from the base structure both upwards and downwards. They are positioned on the edge of the wall 5, and therefore their lower and upper portions will be such as to adhere to the walls 5 of the strip and to those of the adjacent plates.

The same walls A have in addition an opening F on their lower part, in correspondence with the cavities 6, which allow the passage of the electrical connection 51 (fig. 9), as will be seen later. The outer wall D of the block facing them also have openings F which allow the introduction of the electric cables for connection with the outside.

As can be noted from the drawings, the blocks are arranged symmetrically with respect to a diagonal X-X of the terminal holder plate 11, and are all near to one end of one of the four walls 5.

Each block has as well two other vertical walls B and C, facing each other. These walls are such as to adhere to the corresponding vertical side walls of the projections 2a, 2b, 2c, 2d of the strip 1.

In figs. 5 and 6 an intermediate terminal holder board 21 is shown, which is, in concept, alike in every way to the first, that is having a square plan base structure with side walls 5 and a seating 7 on its lower part (with corresponding cavities 6), suitable for inserting into the stepped rise 8 of the lower terminal holder plate 11. This in its turn is provided with a further stepped rise 8.

The plate 21 is also provided with four blocks 22, 23, 24 and 25 respectively, alike in every way to the blocks previously described, that is having an axial hole 0, and side walls A, B, C, and D arranged in a wsy completely analogous to the previous ones, and having openings F arranged in correspondence with the cavities 6, these cavities 6 and openings F being such as to receive the connection 61 (fig. 10), as will be seen later.

The blocks 22, 23, 24 and 25 are positioned symmetrically with respect to the same diagonal X-X, but they are offset with respect to those of the first plate, so that the side walls C of the blocks 22 and 25 adhere to the corresponding side walls B of the adjacent blocks 12 and 15, while the walls B of the blocks 23 and 34 adhere to the walls 6 of the blocks 13 and 14.

The additional plate which is mounted onto the terminal holder board is once again an intermediate plate 21, identical with the one which has just been described; it will be mounted, however, rotated through 180° with respect to the latter, so that the axes X-X will still be contained in the one same vertical plane. Once again the walls B of a block will adhere to the walls C of the adjacent one.

The last plate which is mounted onto the terminal holder board is the upper plate 31, represented in figs. 7 and 8. This plate is identical with the lower one rotated through 180°, except that on it, in addition to the blocks 32, 33, 34 and 35, four locking lugs 36a, 36b, 36c and 36d have been made integral to the base structure, arranged in such a way that they are superimposed on the projections 2a, 2b, 2c and 2d. An extension 37 has been provided on the edge without a block, which allows the lug 36a to be locked securely. Here also the base structure foresees on its lower part a seating 7, suitable for receiving the stepped rise 8 of the plate below. This seating is also provided with cavities 6 arranged in correspondence with the openings F of the blocks.

In fig. 9 the connection 51 can be seen which connects the terminals of the lower plate 11 and of the upper plate 31. In fig. 10 the connection 61 can be seen which connects the terminals of the two intermediate plates 21. The connections 51 and 61 are formed by a metal strap which penetrates the openings F of each wall A of the blocks. The metal straps are then inserted into each plate in the cavities 6 which divide locally each seating 7.

Once assembled, the terminal board appears as shown in fig. 11, in which the terminals K suitable for realizing the effective electrical connection can be seen on the blocks.

The terminal board which is the object of the present invention has the following advantages with respect to the already known realizations;

- easy connection of the electric cables, thanks to the arrangement of the terminal holders on different planes;
- greater insulation of the electric cables, with respect to a terminal board of the known type with the same dimensions in plan, since the distance between the said cables is greater; or smaller dimensions, insulation being equal, with respect to a terminal board of the known type;
- easy assembly and a smaller number of components, resulting in reduced manufacturing costs.

Although a terminal board with four plates has been described, an expert in the field can easily see that, by varying the construction characteristics of the said plates, terminal boards can be realized with a different number of terminal holder plates.

Claims

1. A terminal board characterized in that it consists of superimposed terminal holder plates

(11, 21, 31), each of which is provided with terminal holders (12, 13, 14, 15; 22, 23, 24, 25; 32, 33, 34, 35), which correspond with a single head, the said terminals arranged each on one specific level, different from the one of the adjacent plates (11, 21, 31).

2. A terminal board according to claim 1, characterized in that the plates are similar or identical two by two.

3. A terminal board according to claim 1 or 2, characterized in that a possible strip (1) and each plate (11, 21, 31) comprise at least one reciprocal engaging means (7, 8, 5, A, B, C), which realizes a fixed joint with the strip or with the adjacent plates.

4. A terminal board according to claim 3, characterized in that the reciprocal engaging means consists of a stepped rise (8) and respectively a seating (7), preferably having a square plan.

5. A terminal board according to claims 3 or 4, character ized in that each terminal holder unit is in addition realized with a parallelepiped block projecting both upwards and downwards, so that its interior side wall (A) in its central zone serves as a connection with the body of the respective plate, while its upper and lower zones serve as a stop with the walls (5) of the strip (1) or of the other adjacent plates (11, 21, 31).

6. A terminal board according to any one of the previous claims from 3 to 5, characterized in that the side walls (B, C) of each terminal holder (12, 13, 14, 15; 22, 23, 24, 25; 32, 33, 34, 35) are used as elements suitable for further defining the reciprocal position of the plates (11, 21, 31) and of the strip (1).

FIG. 1

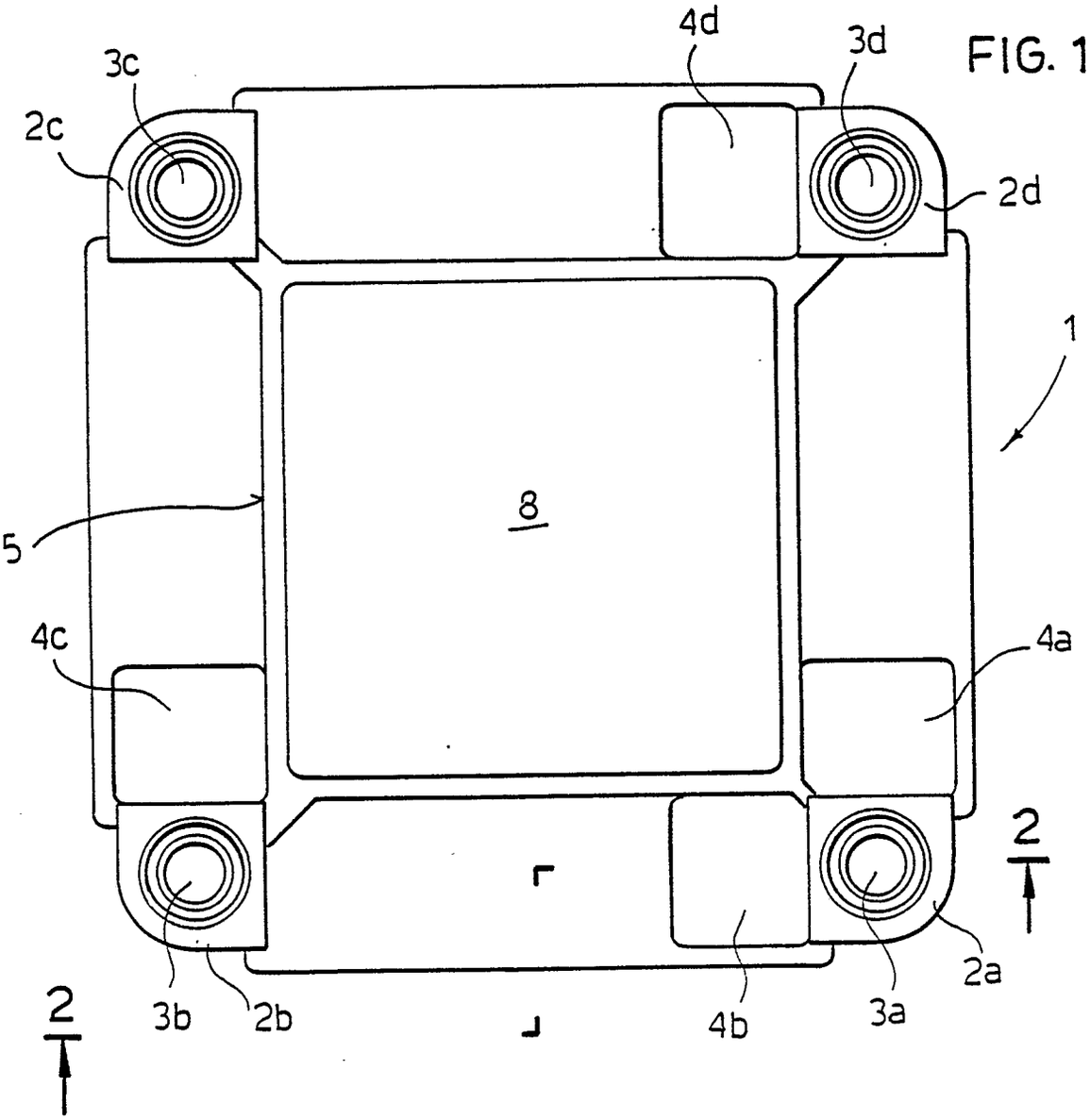


FIG. 2

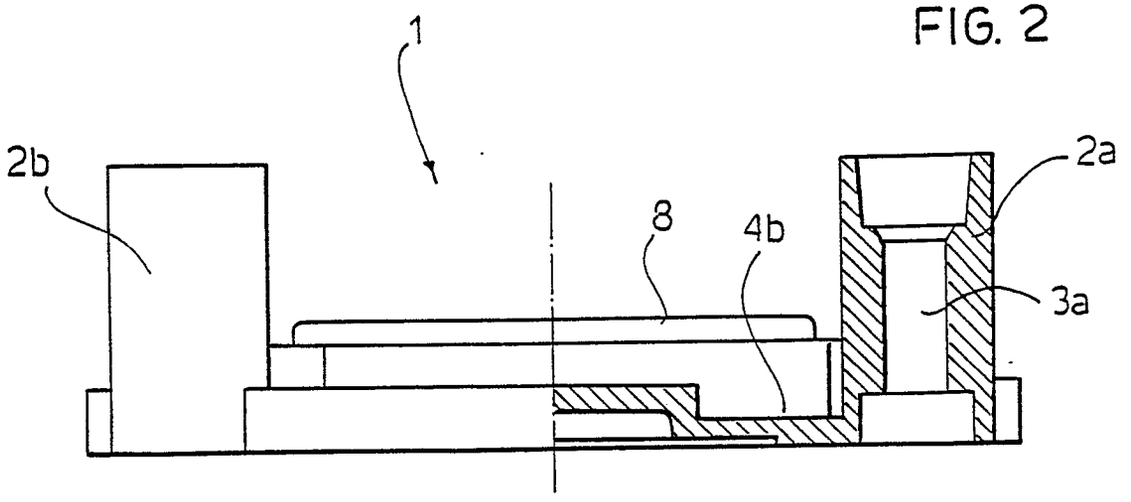
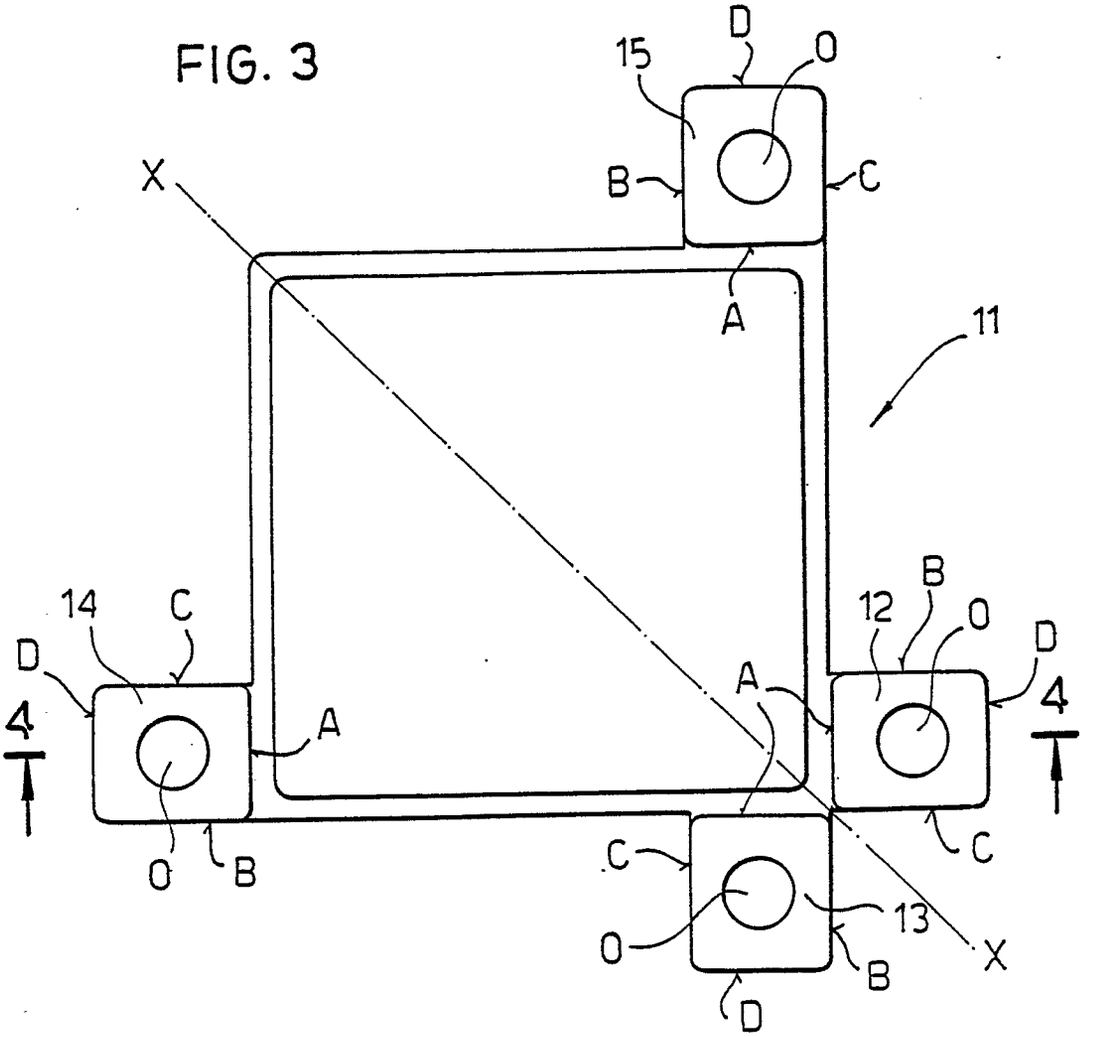


FIG. 3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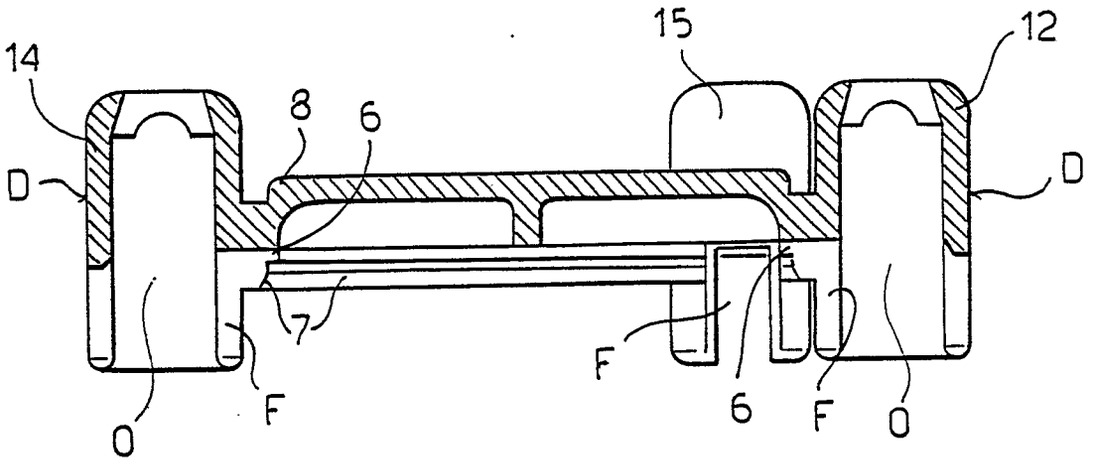
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FIG. 4

FIG. 5

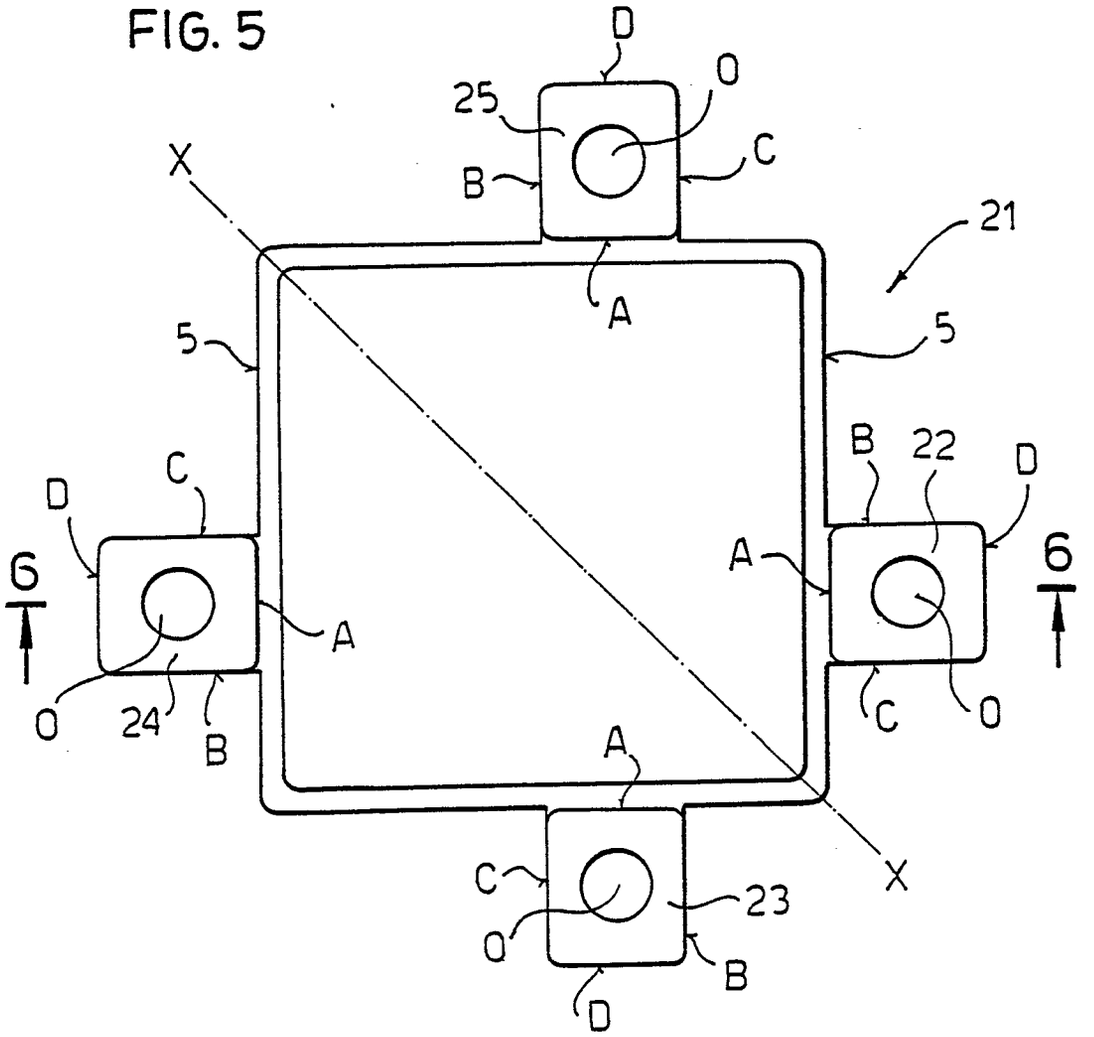
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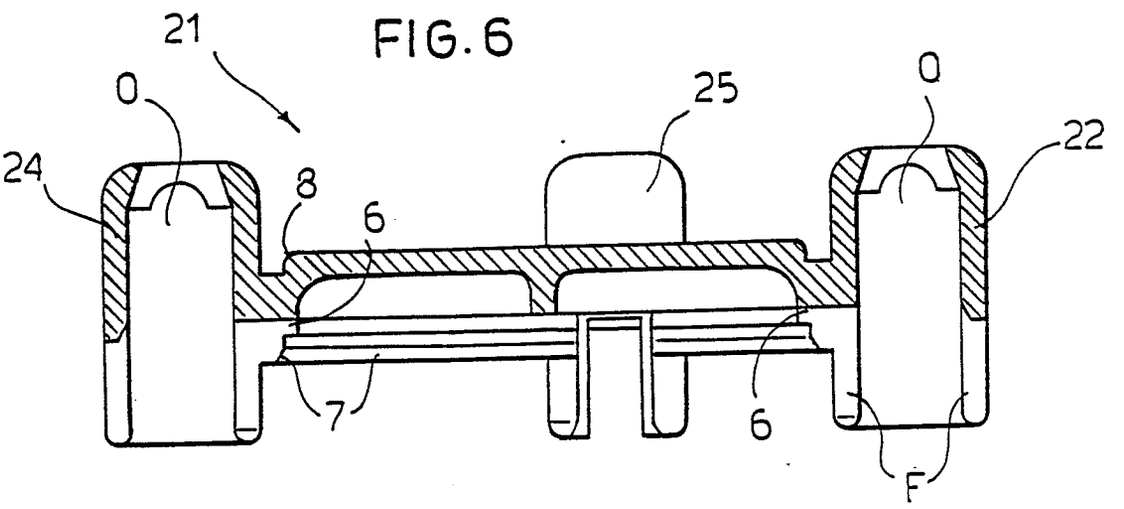
FIG. 6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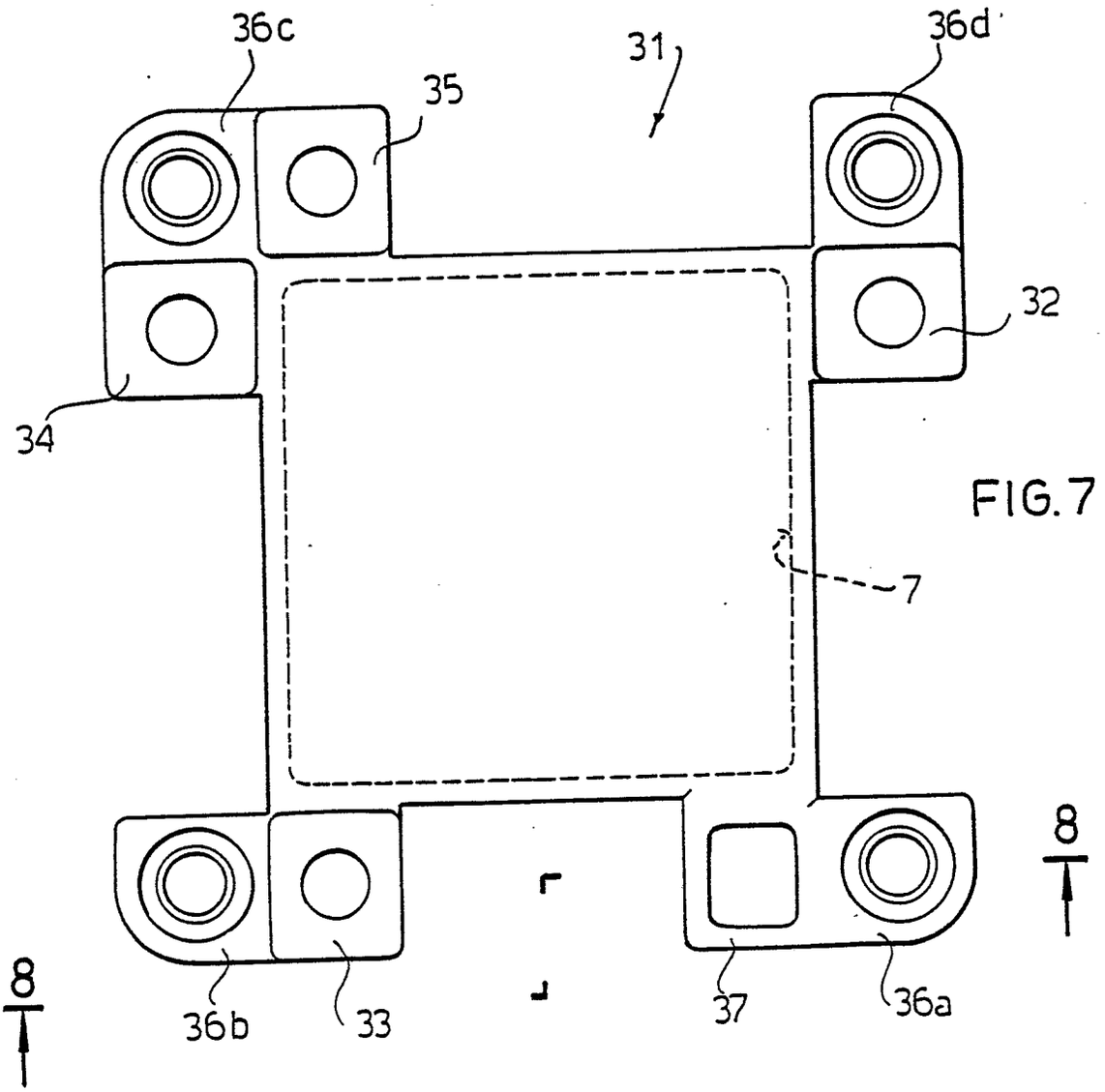

FIG. 7

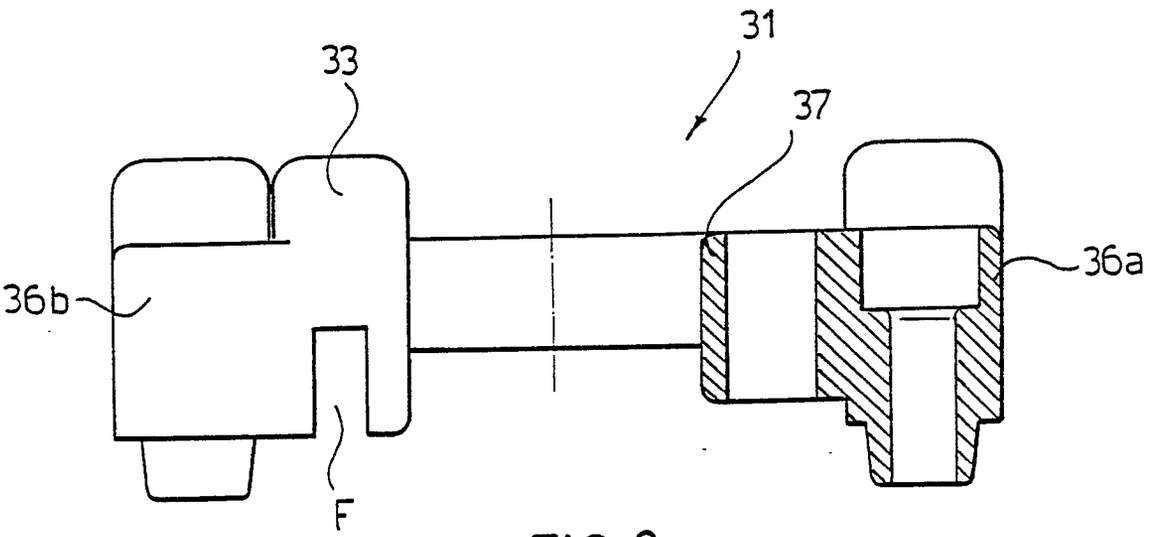

FIG. 8

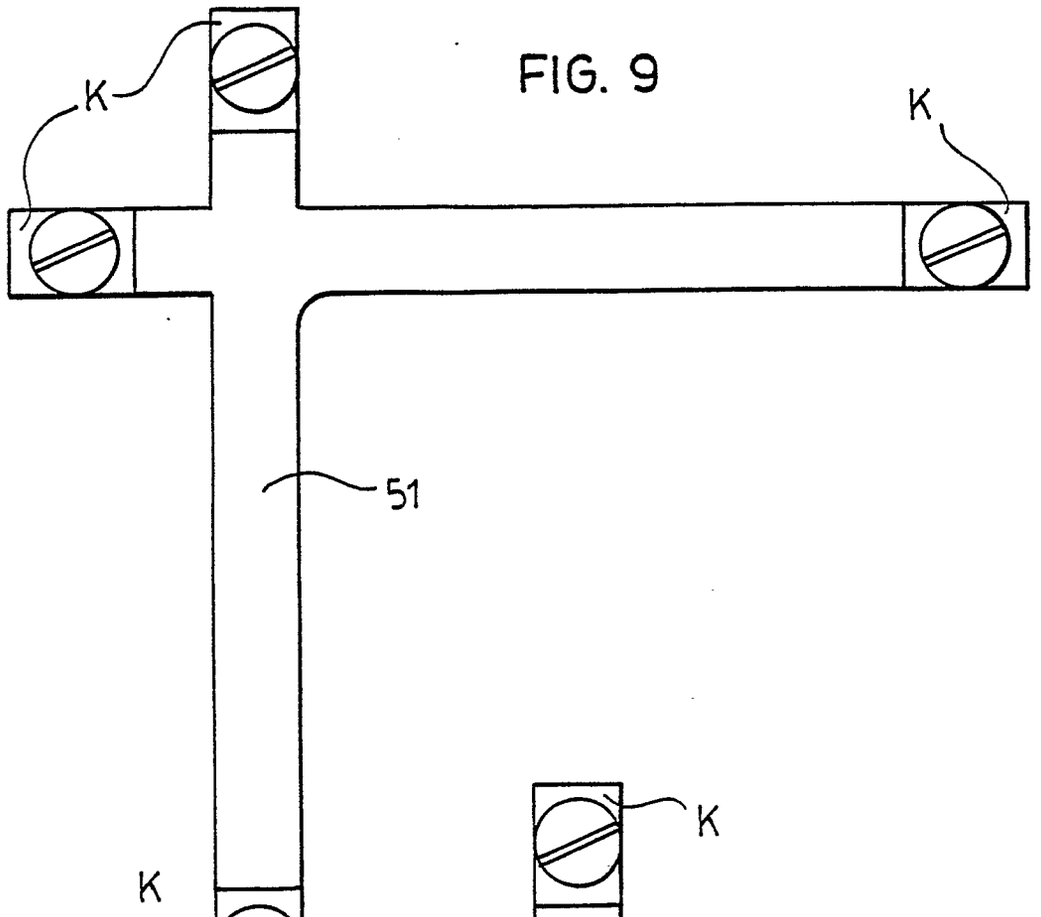

FIG. 9

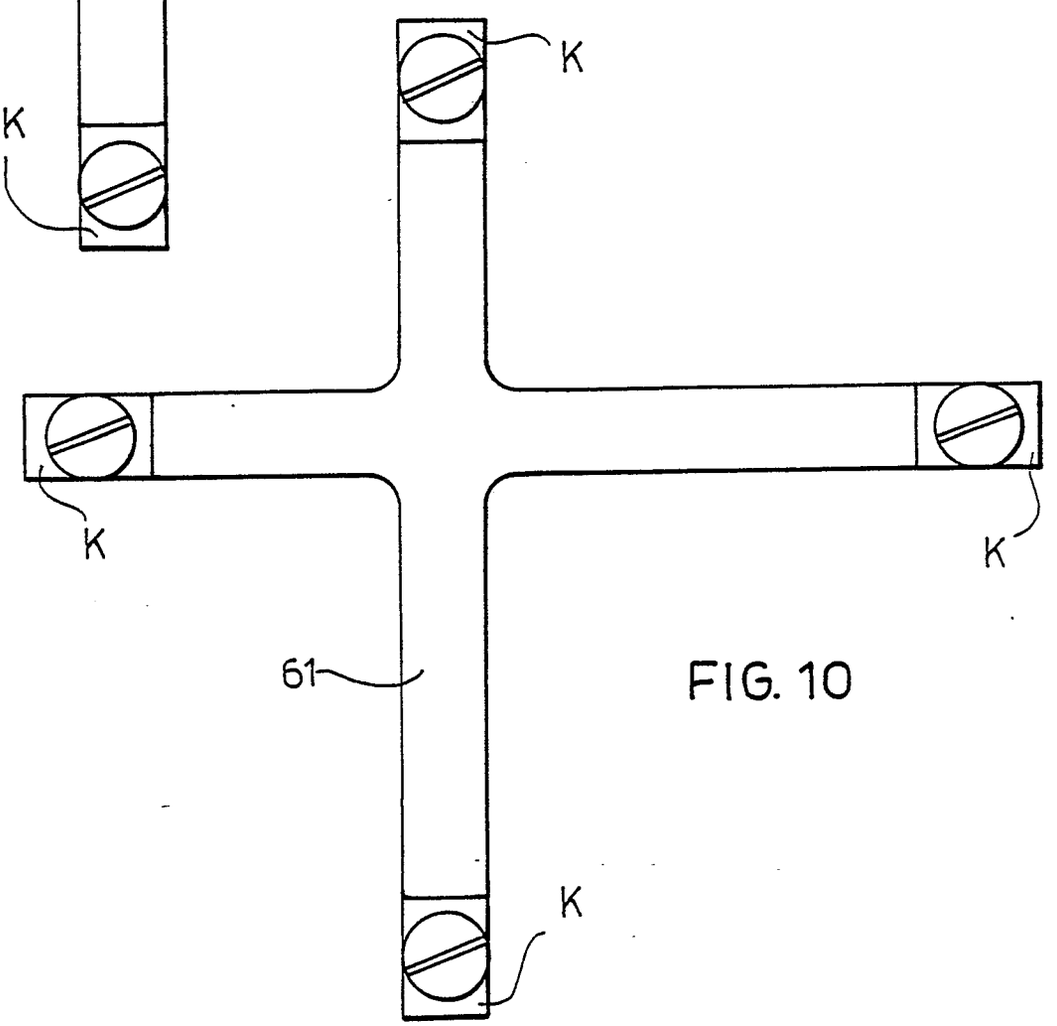

FIG. 10

FIG. 11