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71 Applicant: **Lopez Martinez, Jose Maria**
C. Ribera del Beiro, 13, 5e piso C
Granada (ES)

72 Inventor: **Lopez Martinez, Jose Maria**
C. Ribera del Beiro, 13, 5e piso C
Granada (ES)

74 Representative: **Naranjo Marcos, Maria Antonia**
Paseo de la Habana 200
E-28036 Madrid (ES)

64 **System of construction based on prefabricated elements.**

57 System of construction based on prefabricated elements which

Consists of pillars, partitions, floors, rooves and various accessories of special material, shape, size and sections, to be able to jointed together.

The pillars are generally prismatic, with grooves on their sides in the longitudinal direction, of the female dovetail type or similar, to receive by jointing partitions, windows, railings or any other element with a male dovetailed edge or corresponding similar.

The floors have their corners removes for the housing of the pillars and a special shape on their edges to connect with others by pressure or an intermediate piece.

With the connections, jointing and overlaying of pieces with others, real or toy prefabricated constructions, as large and high as desired will be achieved.

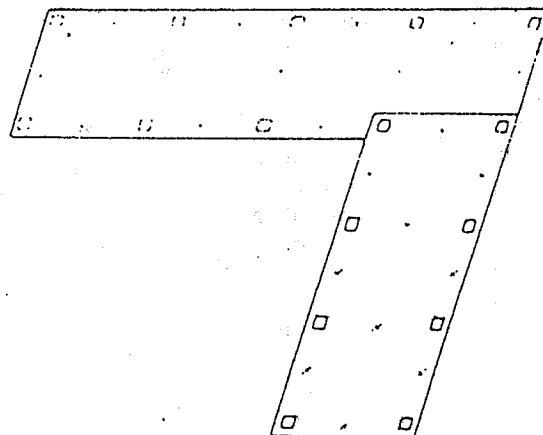


Fig. 58

EP 0 284 537 A2

Description

SYSTEM OF CONSTRUCTION BASED ON PREFABRICATED ELEMENTSDescription

This invention refers, as its name indicates, to a system to construct sets of elements perfectly combined on an idea of structuring, previously conceived or developed progressively according to the requirements and imagination of the builder, and real or toy architectural erections may be made, construction toy and of characteristics similar to those of real construction or unbounded fantasy.

The material employed for its manufacture will preferably be plastic or others of suitable conditions with regard to strength, stiffness, insulation, impermeability and elasticity.

This system will logically be comprised by loose pieces provided with suitable shapes and sizes, which in parts constitute the elements which could give form to a building of real, fantastic, ordinary or slightly complicated structure.

By way of example we may cite the accompanied drawings, and a very extensive range of constructions such as: Buildings, castles, forts, hangars, warehouses, barracks, garages, typical houses, chalets, developments, dolls' houses of one storey or several storeys, shops, ports, classical, historical or futuristic buildings, reproductions of buildings, monuments, models, and also all the above applied to the construction toy.

To give a fuller idea of all the constructions to be realised, the most common parts and their instructions for use are cited and explained.

As the basis of the construction, the principal elements are: Floors, pillars and partitions, which, when complemented with other parts, give form to the construction, without discarding in some cases, including as one of the main elements, a broad base on which the construction rests.

In known procedures of constructions by elements, generally multiple pieces, some of them complicated, are used. This makes the manufacture expensive and makes the storage and connection of the various parts difficult, whereas the system which is the object of this invention deals with reducing and unifying parts to avoid the above.

Furthermore, generally in known systems, many parts and much time must be employed to achieve a small amount of construction, whereas with this invention a notable quantity of construction is manufactured from few parts.

For a better understanding of the idea proposed, we refer to the drawings accompanied with this description, in which rather schematically and only by way of example, the preferred embodiments of the invention are represented.

Fig. 1 represents a type of pillar in perspective

Fig. 2, detail 1, open holes.

Fig. 3, detail 2, slot.

Fig. 3, detail 3, rod or pin.

Fig. 4, detail 4, blind hole.

Fig. 4, detail 5, rod or pins in the correspond-

ing open holes.

Fig. 5, various rods or pins.

Figs. 6, 7, 8 and 9, possible sections of the pillar.

Fig. 10 represents the partition-window.

Fig. 11, octagonal section of the partition.

Figs. 12, 13 and 14, different models of perimeter or contours of partition.

Fig. 15, partition with a single leaf door.

Fig. 16, opening and holes in partition to connect windows or other accessories.

Fig. 17, window abutable to partition.

Fig. 18, railing abutable to partition.

Figs. 19 and 20, single leaf doors.

Fig. 21, revolving door in accessory indicated in detail 6.

Fig. 21, detail 6, accessories introduced into the slot of the pillar or fixed to the hollow partition, on the inside.

Fig. 22, partition representing the window and entrance door to a house.

Fig. 23, partition representing the window of a castle.

Fig. 24, palisade.

Fig. 25, gate.

Fig. 26, railing.

Fig. 27, turret.

Fig. 28, fence.

Fig. 29, farm fence.

Fog. 30, farm two leaved door.

Fig. 30, detail F, support of the leaf door, housed in pillar slot.

Fig. 31, saloon type two leaf doors.

Fig. 31, detail 8, accessories for support of leaf door.

Fig. 32, section of partition of different thickness.

Fig. 33, form of partition for circular tower.

Fig. 34, design of longer partition.

Fig. 35, example of connection of curved partitions.

Fig. 36, fixing accessory for partitions with rib on back.

Fig. 37, another model of curved partition.

Fig. 38, longer partition for assembly in front slot of pillar.

Fig. 39, accessory for curved partition, similar to Fig. 36.

Fig. 40, representation in section, of different connection of curved partition.

Fig. 41, folding door, garage system.

Fig. 42, three leaf revolving door.

Fig. 42, detail 9, section of axis of revolving door.

Fig. 43, lifting door castle type.

Fig. 44, ornament for finish of pillar.

Figs. 45 and 46, various objects for embellishment of housing development.

Figs. 47 and 48, plugs for holes in floors.

Fig. 49 horizontal platform connectable to open holes.

Figs. 50 and 51 are floor elements seen in plan.

Fig. 52, a plan of a floor constituent element.

Figs. 53, 54, 55, 56, 57, 58 and 59 represent plans of modules for floors.

Fig. 60 is a view of a structure.

Fig. 61 is a possible embodiment of a construction.

According to these drawings, as shall now describe the different modules.

Pillars

The pillars or columns are constituted by geometrical bodies with a form generally of a prism, cylinder or of variable section, with its corresponding exterior decoration according to the construction in question, i.e. simulating columns of various styles, arts or ages.

Lengthwise they have grooves of a certain section with the purpose of receiving by jointing various partitions and accessories.

Equally well said pillars may have small blind holes at both ends of variable section such as a cross, square or others in order to house the rods or pins of a shape suitable for said hole for the purpose of being able to join two pillars or be fixed between one or two floors.

Also and likewise, they may have small open holes transversely at various heights of the aforesaid pillars, so that with the same aforesaid pins to fix other accessory parts such as washers for example and give greater strength to certain types of constructions.

Figure 1 represents a type of pillar in perspective. Figure 2 detail (1), open holes; Figure 3, detail (2), slot; Figure 3, detail (3), rods or pin; Figure 4, detail (4), blind hole; Figure 4 detail (5), rods or pins in the corresponding open holes; Figure 5, different rods or pins; Figures 6, 7, 8 and 9, some of possible sections of pillar.

Partitions

Owing to its importance the partition is considered to be the second principal element of the construction in its various forms of partitions proper, partition with window, partition with door, fences, railings, palisades, turrets or similar. In general it is the most characteristic part of the construction, as in addition they may be in relief or plain and with the suitable decoration for each case, being similar to bricks, coverings, logs, stone or as many decorations as may be achieved by the fantasy.

As indicated earlier, said partitions may be blind or have a series of cuts, recesses, openings, enlargements, drill holes to seem or house fixed doors, leaf, knock down or revolving doors, windows with the same characteristics or false abutting, railings, balconies, panels, cornices and similar.

In full or in part of its perimeter it has an enlargement, the section of which will vary according to that of the slots of the pillars, so that by simple sliding it may be housed in them by a dovetail joint, these enlargements constituting the male part and the slots of the pillars logically being the female part, in such a way that when inserted they cannot come

out.

With the purpose that in some cases the pillars must be concealed, because this is required by the characteristics of the construction, said partitions may be of measurements different from the rest of the construction and have a system of seating, either by means of the rib at the back in the external slot of the pillar or in the form of a fixed or independent dihedral angle with jointing in the back of the partition and on the end edges of which they have the enlargement corresponding to the edges of a normal partition.

In other constructions in which balconies are required, belvederes of a house or tower of a castle these partitions may be curved or straight of greater length to give the appropriate curvature with the same jointing systems as that last described or to have their edges in a shape similar to normal partitions, but with a different angle to the rest of the surface.

The partitions correspond to the embodiments represented in figures 10 to 49, with the different possibilities of application, for example, with doors, window, or with their decorative adaptation, as a fence, railings or similar.

Floors

As a third principal element in the construction we shall consider the floors.

Of all the pieces constituting the architecture, the floor may be the most variable part both in shape and its connections, as it depends on its most appropriate fabrication, on the consistency, profitability and simplicity in the assembly of the whole.

The shape of these may be square, rectangular, round or any other geometrical shape which is adapted to the type of construction it is desired to make. These floors may be solid or hollow.

In principle, it will be based on square projection floors with recesses at their four corners, as will be specified in the accompanying drawings and in their edges with the different thickness and variable form according to that chosen for the characteristics required.

The edges will be where they have the system of connection between them, either by pressure between their projections and recesses, or by tonguing between them or by an intermediate piece or by overlaid pieces serving to groove into each other in such a way that their extension may be as broad as may be wished or in the form it is desired to give to that surface.

Independently of this and in certain cases it may have floors in which each of these is equivalent in area to the sum of several of the above mentioned ones as modular. Inserted in these are the recesses corresponding to the position of the pillars or vice versa and small holes making possible their compartmentalisation or terraces in some rooms.

The connection between these large floors will be similar to that of the modular ones.

Likewise, in the absence of partitions on which the floors must rest or either through wanting to give greater firmness or because this is required by the construction, washers of the appropriate shape will

be used for the support of said floors.

These washers will be placed over the top of the pillars until they meet the rods over pins which will previously have been inserted into the transverse holes of the pillars. See some examples in Figures 50 and 51.

The floors described may also be utilised as a base for the construction and logically as the ceilings of the top floors and different terraces of the construction made.

Figure 52 represents a quadrangular floor with recesses at the four corners as most of those described. This may be solid of small thickness and of two different thicknesses of which the thinner is situated in the overlaps which constitute the perimeter and which in turn have a fixed number of small slots into which the projections of an intermediate piece will be inserted, Figure 52 details (10 and 11) for its connection with the next floor in the same system. The thickness of this intermediate piece will be equal to the difference of the thicknesses of the floor mentioned, its length equal to that of the overlaps and its width the double of each.

Another model of floors may be cited, similar to the preceding one but with the overlaps of double width and its system of connection by means of projections in the form of spherical caps larger than a half sphere on opposing overlaps and in the other two overlaps the housings corresponding to these projections to connect a floor to the adjacent one to be joined.

In this case the overlaps will be half as thick as the rest of the piece. These floors will be coupled in an inverted position with respect to each other.

A system similar to that described earlier but with the variant that in the overlaps has a groove and a tongue, cylindrical rib along the whole length of its surface, most of it remaining exposed and the 4 overlaps being completely the same as shown in Figure 53

When the floors have been joined, they will have fitted on the outside of the building some cornices which embracing the pillars give consistency and embellish the construction.

Figure 54. This type of module may be hollow in the form of an inverted box and the same as the above recessed at its four corners. In each side it will have a small number of slots which will serve to join to the corresponding ones of the next module by means of small "U" shaped pieces to clip both floors on being inserted into the slots of both. If it were desired to give more solidity to this connection some more "U" pieces may be coupled at the bottom of these two modules. "U" pieces, see Fig. 54, detail (12).

Figure 55. Same as the previous one, with the difference that on its lateral faces or walls there are slots of a dovetail type section. They may be joined together by a side member, the section of which is similar to two trapezoids joined at their lesser base, and which will serve to join both floors by sliding between the slots described.

Figure 56. Following the same type, this will only have on its opposite sides one slot and one edge along its whole length or one edge and one slot in

the other two faces of sufficient depth and relief so that simply by pressure one floor may be fixed with the following one.

Figure 57. Among these many models which we could cite, we shall mention this one which has on its opposite faces vertical slots of dovetail section and on the other two faces the male projections, with the appropriate form to fit in by vertical sliding into the female parts of the following floor and vice versa. The same in this one as in all the others, they have small holes in the form of a cross, half cross or any other, in which the rods which may serve as a support to other pillars may be housed.

The large floors to which we referred earlier, similar to those of figure 58, may be in a single piece, of surface equivalent to several modules, and occupy part or all of a floor, either with a rectangular or irregular form. It will be observed that in this case the recesses for the pillars are all inside this same piece.

It will be recalled and the same as in the other cases, it would be feasible that it were to have small holes of varied shape for the housing of rods as the support of other pillars, for the greater compartmentalisation of each of the places or rooms.

The connections of these with other similar ones of the same or different area will be similar to any of the systems described earlier among the modular floors.

Also they may be of very thin thickness so that some may be overlaid by overlap above others, complementing each other in such a way that they may cover the desired surface between all of them. This is the case of figure 58.

Lastly, as a supplement to the above and for certain constructions, such as turrets, belvederes or similar, there will be accessory floors in the form of a crescent which fitting as any of the systems described will give these floors a circular form, curve, etc. See figure 59.

Complementary pieces

With this title we designate some of the infinite pieces which fantasy or fashion may require to embellish, give style and finish the very varied range of types of construction that can be built.

It will frequently occur in constructions that it is intended to finish the construction with a Nordic roof of one or two slopes.

In this case, pediments and rooves will be required and these are described below:

As pediments, according to the dimensions of the roof, one or several pieces would be used in the facing, intermediate part and back.

In the case of covering a room the pediment of Figure 60, detail (13) would be used if of two slopes and if desired of a single slope, detail (14) of Figure 60.

In the case of desiring to cover two or more rooms, the pediments mentioned would be combined at the criterion of the builder to finish the construction with one or two sides.

The roof proper would be supported on these two or more pediments and would be constituted of pieces similar to the modular floors, joined in the

form described and the square recesses of which, designed for the pillars, would not exist or would be closed by the plugs described in Figure 47 and 48 and the "connecting pieces" would be of greater length than those described in the formation of the floors. Figure 52, detail (10).

The holding of the two sides will be performed by means of angle connecting pieces, the symmetrical edges of which will connect with the modular floors, by any of the systems described earlier when referring to these, Figure 60, detail (15).

On occasions in which large rooms or open plan premises are desired, the square recesses or holes will be covered by means of the plugs mentioned.

Lastly and among the many accessories which could be described, there are cited spheres, cones, turrets or similar, which would appear as a finish to pillars or other pieces, to utilise them establishing the construction.

How to build

Independently of the infinity of pieces of which this system may consist, its form of making it cannot be simpler.

It is a case of combining pillars, partitions, floors and free spaces as the builder fancies.

For guidance we will cite some simple examples, to give an idea of each type of construction, within the very extensive variation existing in each of the different styles.

Block of flats

Assuming that one has preconceived the construction to be made, the number of floors and the number of pillars of each size will be selected.

One starts from connecting all the floors together giving the area the form one desires. On this base and in the recesses the pillars will be housed according to the heights the building will have in some zones or others.

Then there will be inserted by jointing between each two pillars, a partition, door, window, balcony railing or other pieces, thus closing all the openings according to the utility it is desired to have in this first phase of the building constituting the ground floor.

When this has terminated the part, the ceilings of the rooms or premises will be joined, which in turn will be the terraces or floors of the upper storeys. When all have been jointed, the assembly will be slid by passing the recesses along the pillars, from the top of same until they come against the partitions or washers.

If washers are required for a large lounge, open plan building or greater firmness, they will be placed prior to the last operation, resting on the transverse pins inserted into the holes in the pillars at the height of the above mentioned floors of the first storey.

Thus more storeys will be erected, the terminations of which will be terraces, logically formed by the last floors and the railings marking them out, fitted in the termination of said pillars. Naturally the elements or modules desired may be used to fix the position of the modules in the construction.

Dolls' House

Of the most typical types such as: a) of a single storey without ceilings and b) of several storeys, we shall refer to the second option.

For this, its realisation will be the same as the "Block of flats", with the variant of the absence of all or part of the partitions in the facing and having the classical terrace or the single or double sloped roof described earlier.

Castles, farms and forts

The characteristics of this class of constructions consists of erecting one or more small buildings in capricious places and surrounding or complementing them in the rest of the perimeter of the surface, with walls, fences or palisades appropriate to the style of the construction obtained.

To complete this description, figure 61 represents a chalet as the most elementary construction.

Finally, and after the above description, all that remains to be indicated is that in this invention there will be as many variants of embodiment as may be possible, without altering the essence of the description, and its object may be manufactures in all manner of forms, sizes and materials, without limitation.

Claims

1 - System of construction based on prefabricated elements, characterised in consisting of pillars, partitions, floors, rooves and several accessories of special material, shape, size and sections, to be fitted together, the pillars of which are generally prismatic, with grooves on their sides, in the longitudinal direction of the female dovetailed type or similar, to receive by jointing partitions or any other element with an edge with a male dovetail or corresponding similar.

2 - System of construction, according to claim 1, characterised in that said pillars can have at the centre of their ends a blind hole of variable section to receive by fitting a rod of corresponding section, which in turn will serve to connect to same another pillar or appropriate accessory; also other open transverse holes, for the coupling of pins or other pieces, the purpose of which is the holding of floor bearing washers or handrails, balcony floors and other additions.

3 - System of construction, according to claim 1, characterised in that the aforesaid partitions of generally flat and square or rectangular shape have on some or all of their sides, enlargements of male section occupying part or the whole of one side, suitable for the grooves of the pillars for their jointing by dovetail sliding or pressure on said pillars.

These partitions will be blind or with openings for window or doors and with small holes, eyes or pivots to receive by pressure, flat lock

seaming or housing other accessories such as glass, railings, window frame, door and other complementary elements.

4 - System of construction, according to claim 1 and 3, characterised in that some partitions, for the use of larger facings and the formation of constructions in curved zones or of circular section, will have larger dimensions. Of these, some will be jointed similar to that described in claim 3, with a different variation of angle of the rib or enlargement of the joint. Others will have the system of jointing by means of vertical ribs at the back or with ribs in the form of a dihedron and on the extreme vertical edge of which there will be a corresponding jointing enlargement. Others may be by means of independent dihedra seating ribs into pillars.

5 - System of construction, according to claim 1, characterised in that the hollow or solid floors are of a preferably square or rectangular form or section, with recesses in their four corners to take the pillars, with small holes and with different systems of jointing together at their edges, either by pressure between their projections and recesses or by intermediate pieces or by an overlaid piece, in such a way that as large an area as is desired is achieved by the connection of some with others.

6 - System of construction, according to claims 1 and 5, characterised in that the floors may be of area equivalent to the sum of several floors, which may be of greater thickness forming the base of the construction of of very fine thickness to cover a storey of the building of part thereof.

7 - System of construction, according to claims 1 and 5, characterised in that some floors will be circular, curved or of mixed-type perimeter and with the same characteristics of jointing, holes and housing of the pillars as those mentioned above.

8 - System of construction, according to the above claims, characterised in that the rooves may be of one or two slopes, formed by a variable number of jointed pieces, of the floor type and resting on pediments formed by two or more special partitions, with preferably quadrilateral or pentagonal shapes.

9 - System of construction, according to the above claims, characterised in that various accessories such as open wedges or ribs jointed in pillars for doors and opening windows, cylindrical pivots for coupling of the axis of a revolving door, decorative elements, staircases, ramps and other complements.

10 - SYSTEM OF CONSTRUCTION BASED ON PREFABRICATED ELEMENTS

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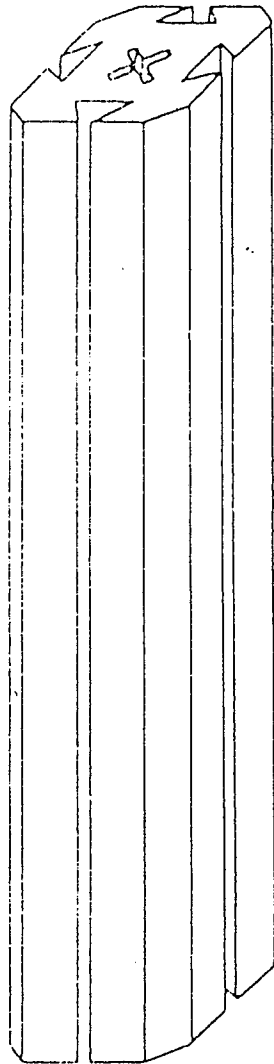


Fig-1

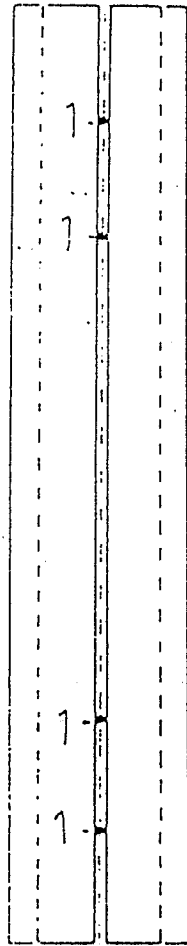


Fig-2

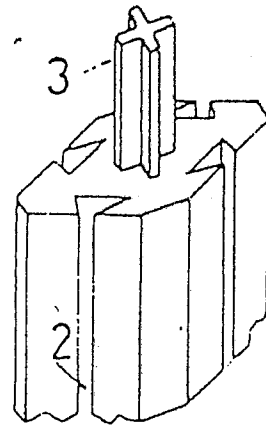


Fig-3

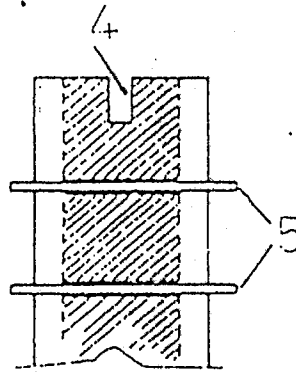


Fig-4

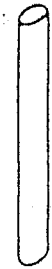
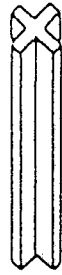


Fig-5

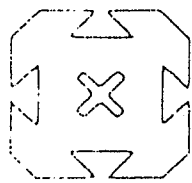


Fig-6

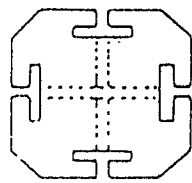


Fig-7

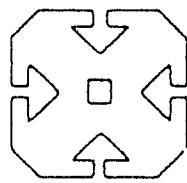


Fig-8

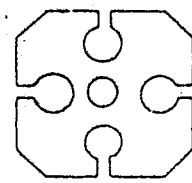


Fig-9

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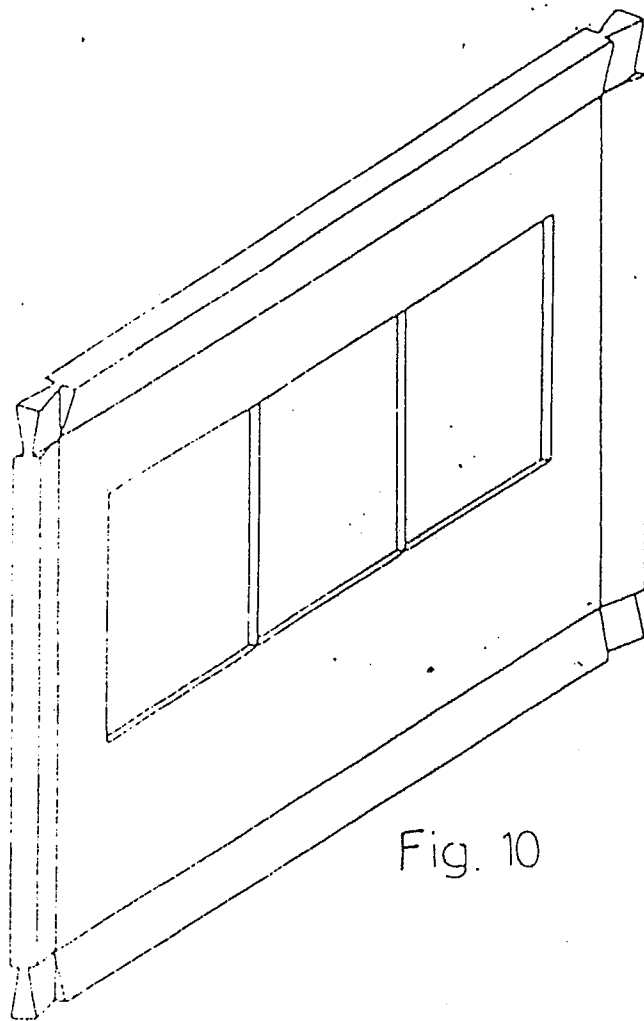


Fig. 10



Fig. 11

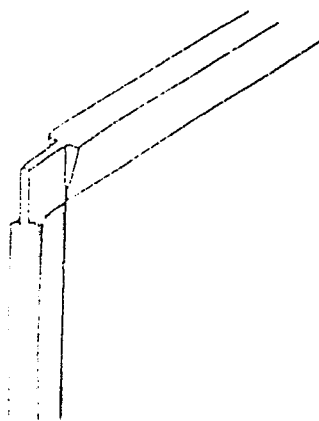


Fig. 12

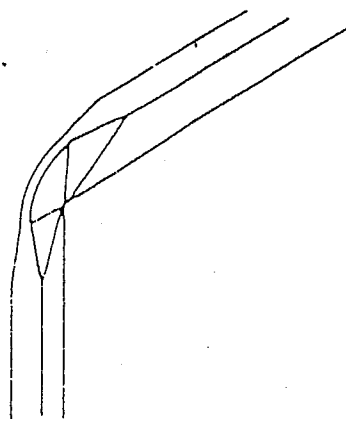


Fig. 13

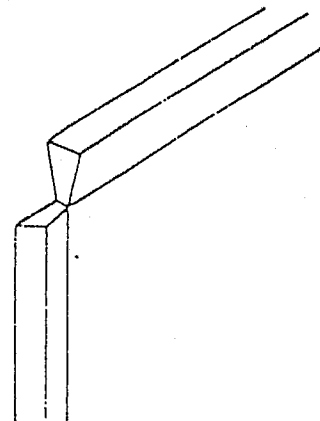


Fig. 14

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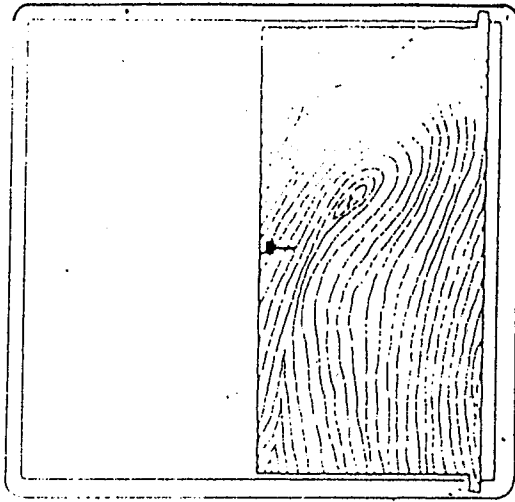


Fig. 15

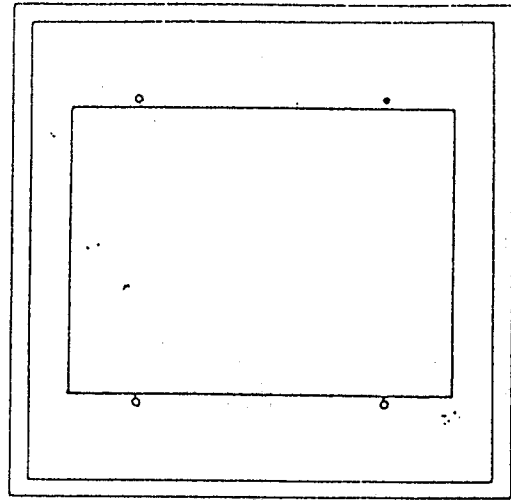


Fig. 16

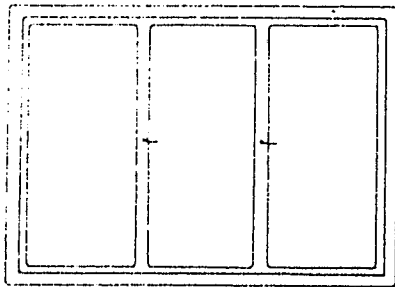


Fig. 17

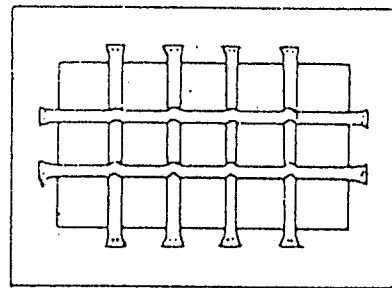


Fig. 18

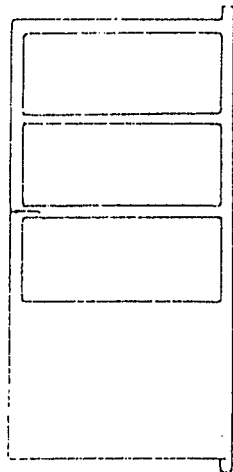


Fig 19

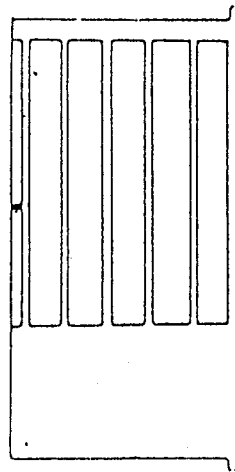


Fig. 20

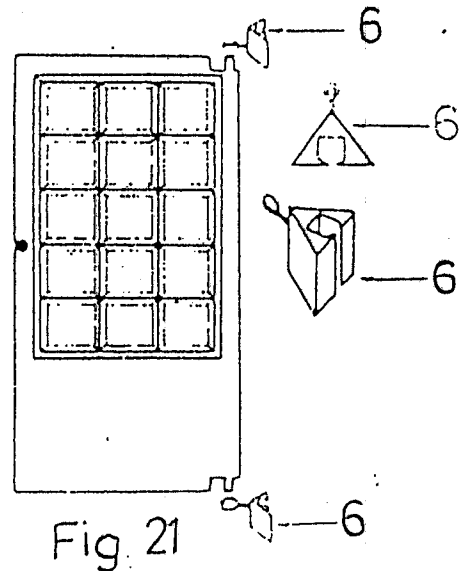


Fig. 21

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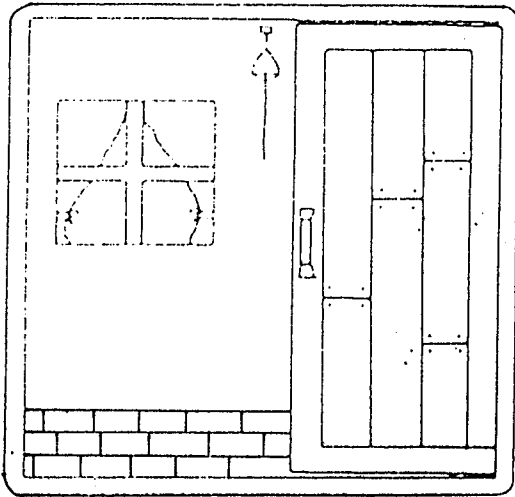


Fig. 22

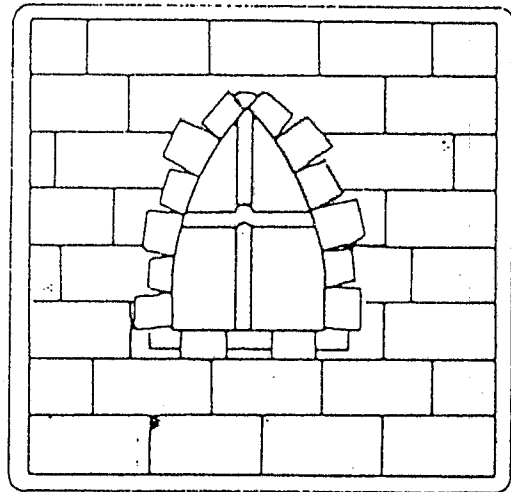


Fig. 23

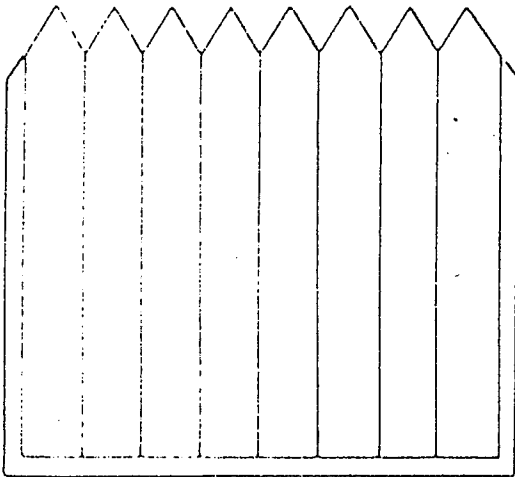


Fig. 24

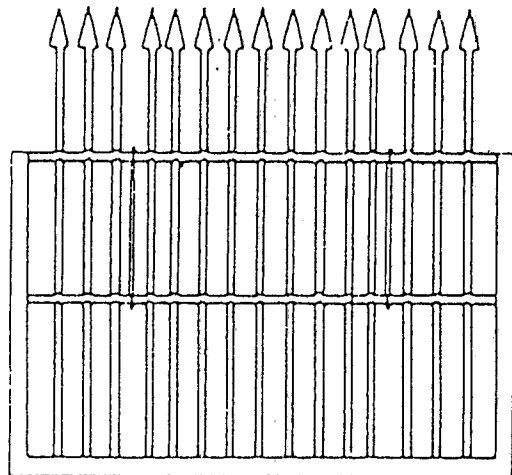


Fig. 25

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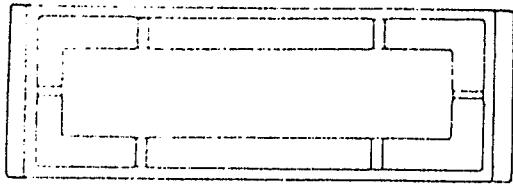


Fig. 26

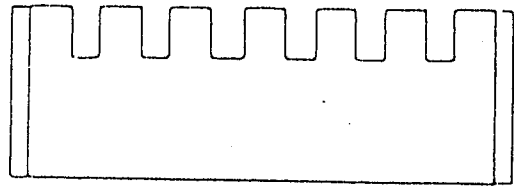


Fig. 27

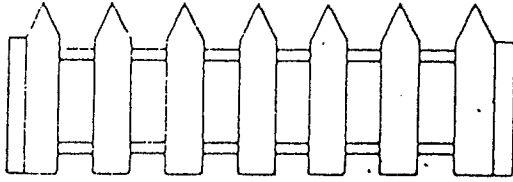


Fig. 28

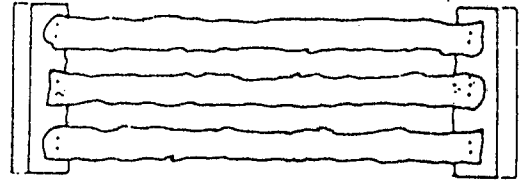


Fig. 29

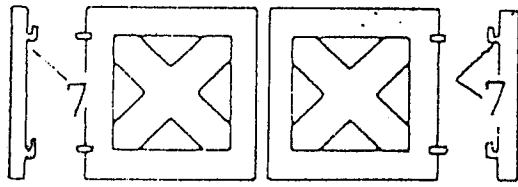


Fig. 30

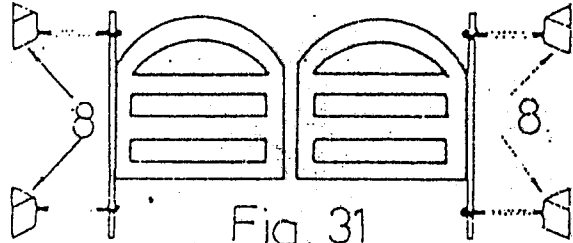


Fig. 31

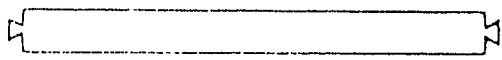


Fig. 32

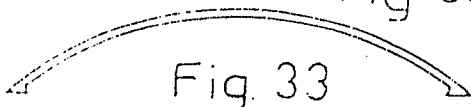


Fig. 33

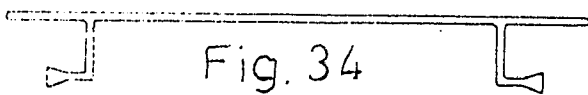


Fig. 34

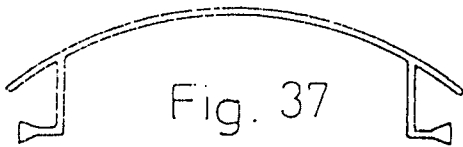


Fig. 37

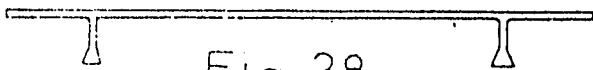


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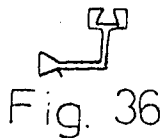


Fig. 36

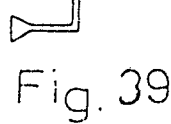


Fig. 39

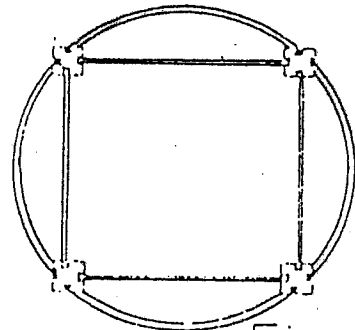


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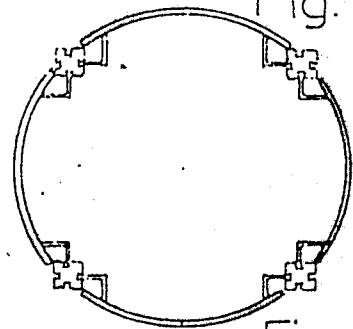


Fig. 40

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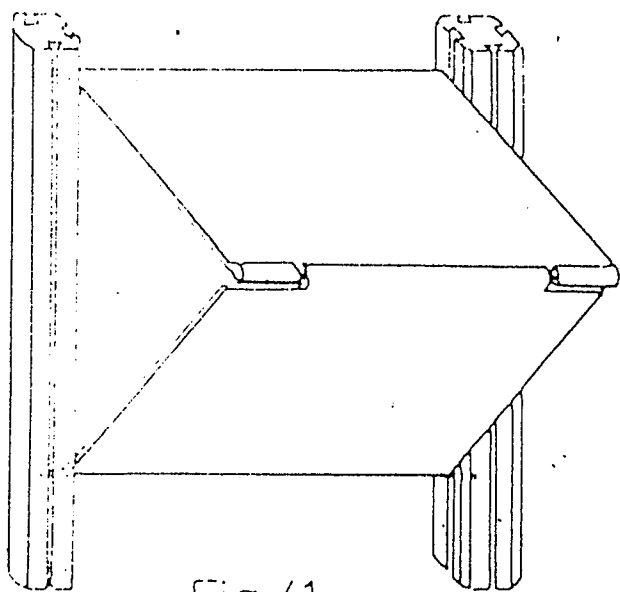
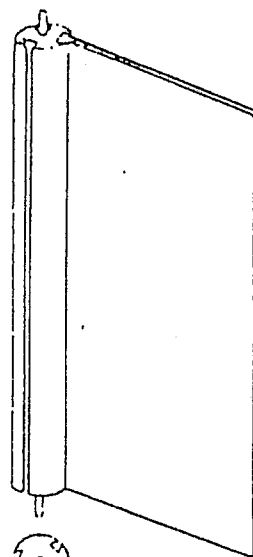


Fig 41



9 → Fig.42

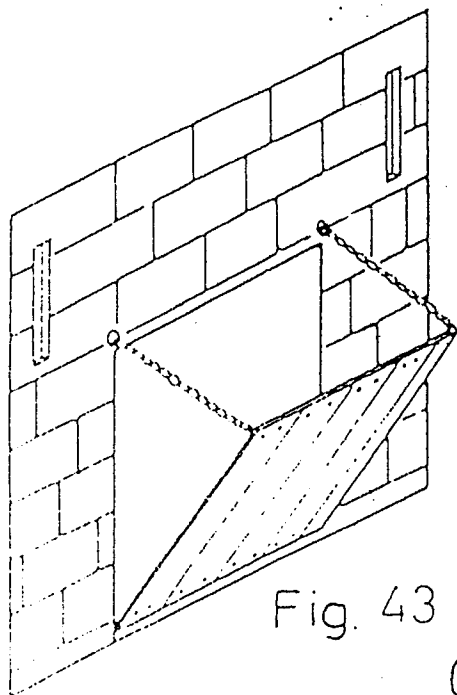


Fig. 43



Fig. 44

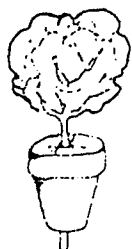


Fig. 45

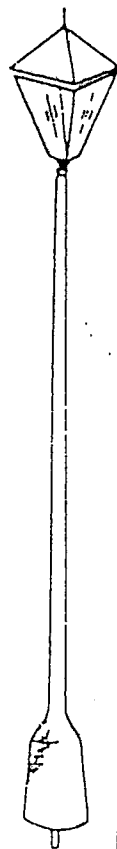


Fig. 46



Fig. 47



Fig. 48

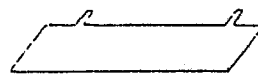


Fig. 49



Fig. 50



Fig. 51

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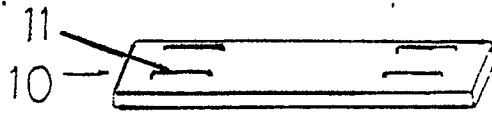


Fig. 52

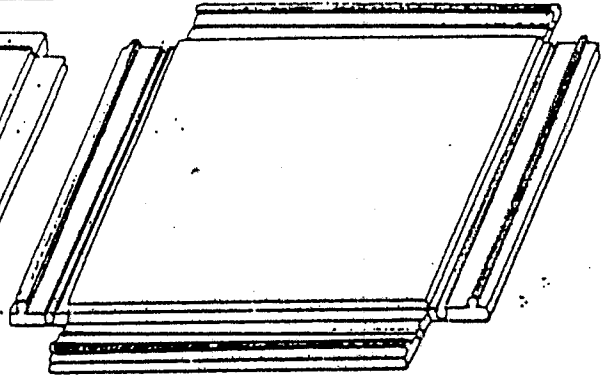


Fig. 53

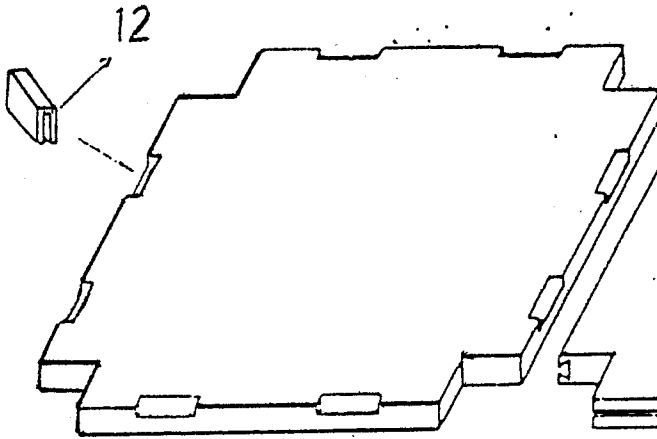


Fig. 54

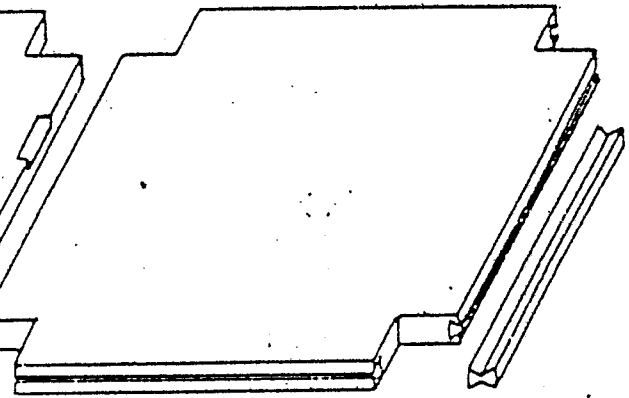


Fig. 55

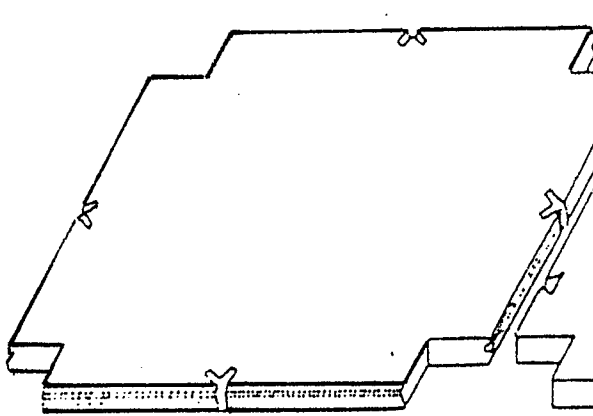


Fig. 56

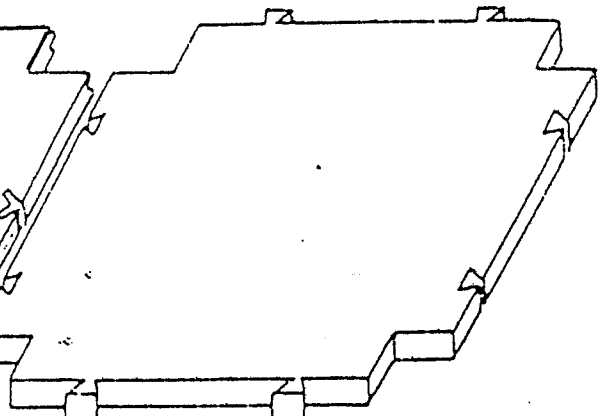


Fig. 57

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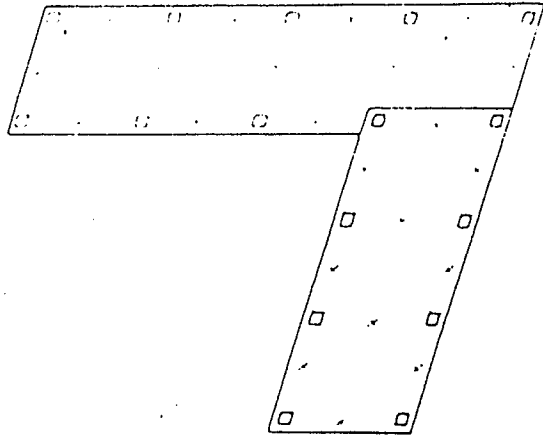


Fig. 58

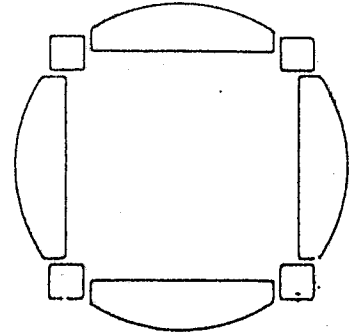


Fig. 59

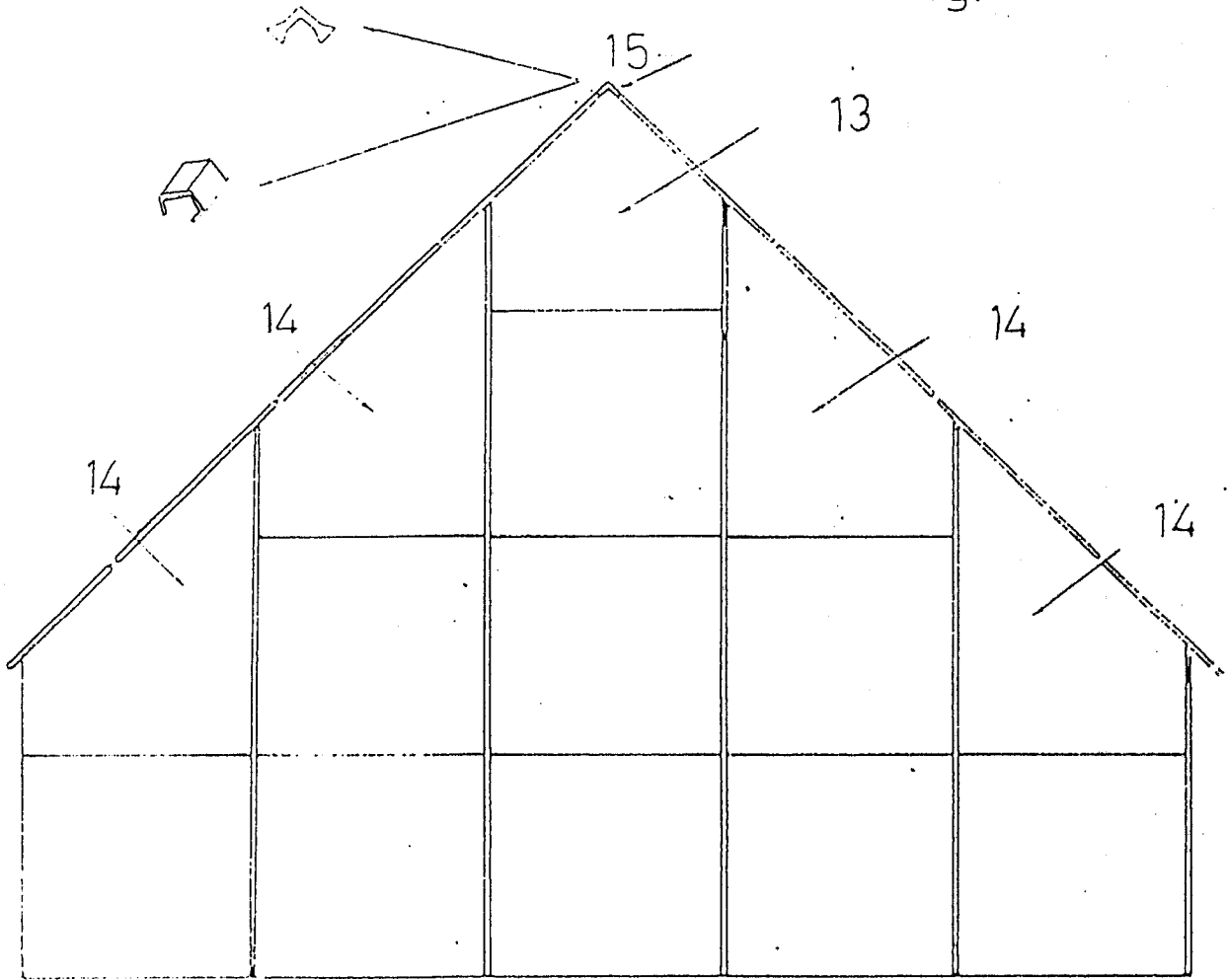


Fig. 60

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Fig. 61

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