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(54) Partition.

(57) A partition structure comprises studs (12, 112) held against opposite faces of a spacer (33) by clips (34). Panels (18, 19, 118, 119) are held against respective seats on the studs by retaining members (28, 128) screwed to the studs.

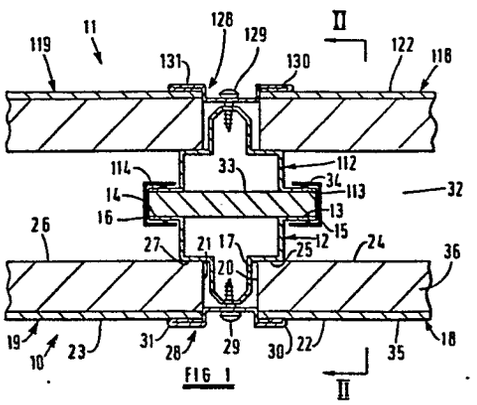

FIG 1

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Title: "Partition"

Description of Invention

This invention relates to a partition structure, by which we mean herein a structure which divides from each other adjacent rooms at the same level or at approximately the same level within a building, vehicle, vessel or the like. As used herein, the term "room" embraces spaces in which persons are accommodated for work, leisure, sleeping, eating and washing, and embraces corridors, stairways and landings. A partition structure is usually non-load bearing, in the sense that reliance is not placed on the partition structure to support higher parts of the building, vehicle, vessel or the like, but various articles may be mounted on the partition structure so that it bears the load imposed by these articles.

One known kind of partition structure is called a stud and panel partition. This kind of partition structure generally comprises two skins between which there is a cavity. The skins comprise panels, for example of plasterboard, permanently secured to a series of posts called studs. Electric cables and water pipes can be concealed in the cavity of a stud and panel partition but they are then substantially inaccessible, except where they emerge from the partition.

It is also known to form a partition with a single skin of panels, each of which panels has opposite surfaces exposed to respective rooms. Pairs of adjacent panels are usually connected together in this kind of partition by a pair of elongate plates, one adjacent to each face of the panels, and between which marginal

portions of the panels are received, the plates being connected to each other at intervals along their lengths by bolts or other fasteners. This arrangement has the advantage that non-combustible materials can be used for the plates and panels without providing a path for unimpeded flow of heat through the partition from one face to the other, except at the fasteners.

According to one aspect of the present invention, there is provided a stud and panel partition structure comprising first and second panels in mutually spaced face-to-face relation, first and second studs which are secured to each other and first and second retaining members secured respectively to the first and second studs, wherein a marginal portion of the first panel is trapped between the first retaining member and the first stud and a marginal portion of the second panel is trapped between the second retaining member and the second stud.

In a partition structure in accordance with the invention, the retaining members are not required to possess strength and stiffness as great as are possessed by the studs and a retaining member having the same length as the stud may be less massive than the stud.

In the preferred structure, there is no substantial thermally conductive path between the first and second studs. There may be interposed between these studs a spacer element formed of a material having a lower thermal conductivity than does the material of which the studs are formed. The studs may be held in engagement with respective faces of the spacer element by securing means.

The securing means is preferably formed separately from the studs but it would be within the scope of the invention for some at least of the securing means to be formed integrally with two studs.

The retaining members are preferably secured to corresponding studs by releasable fasteners so that a

partition structure in accordance with the invention can be partly disassembled in order for access to be gained to service lines behind a panel.

According to a second aspect of the invention, there is provided a stud and panel partition comprising a panel, a pair of studs disposed one adjacent each of two opposite edges of the panel and a pair of retaining members secured one on each stud, wherein each stud is formed with a seat for a marginal portion of the corresponding panel, said marginal portion is trapped between the seat and the corresponding retaining member and each stud includes a flange spaced from the panel in a direction away from the retaining member and at least a part of which flange is spaced from the seat in a direction along the partition.

The flanges facilitate securing of the studs to corresponding studs of an adjacent partition or to some other underlying structure.

There is provided in accordance with a further aspect of the invention a stud for a structure according to the first aspect, the stud comprising two spaced, substantially flat and co-planar seats for marginal portions of respective panels, a nose which extends from the seats to lie between said panels when the panels are engaged with the seats and two flanges at opposite margins of the stud, each flange being spaced from the plane of the seats in a direction opposite to that in which the nose extends from said plane, being at least approximately parallel to the plane of the seats and having a free edge at its margin furthest from the other flange.

Examples of structures embodying the invention will now be described, with reference to the accompanying drawings wherein:-

FIGURE 1 shows a cross-section in a horizontal plane through certain parts of a partition structure comprising a pair of partitions in accordance with the invention;

FIGURE 2 shows a cross-section on the line II-II of Figure 1, certain parts of the structure being broken away for ease of illustration;

FIGURE 3 illustrates diagrammatically a cross-section similar to Figure 1 of a partition structure comprising six partitions in accordance with the invention; and

FIGURE 4 is an illustration similar to Figure 3 of a partition structure comprising four partitions in accordance with the invention.

The structure illustrated in Figure 1 comprises first and second partitions 10 and 11 arranged back-to-back. The partitions have the same structure and identical components may be used to construct the two partitions. The partition 10 comprises a stud 12 which may be formed by cold rolling from steel strip. The stud includes a pair of substantially co-planar flanges 13 and 14 which face towards the partition 11 and have respective free edges 15 and 16 which face away from each other along the partition structure. The stud further includes a nose 17 which is remote from the flanges 13 and 14 and faces in a direction away from the partition 11.

The partition 10 further comprises a pair of panels 18 and 19 having respective edges 20 and 21 which face towards each other and between which the nose 17 lies. Respective front faces 22 and 23 of the panels are substantially co-planar and are almost entirely exposed at a face of the partition structure. A rear face 24 of the panel 18 is seated on a shoulder 25 presented by the stud 12 at a position between the nose 17 and the flange 13. A rear face 26 of the panel 19 is seated on a corresponding shoulder 27 of the stud which lies between the flange 14 and the nose 17. The shoulders 25 and 27 are substantially parallel to the flanges 13 and 14. It will be noted that the panels are spaced somewhat from these flanges in a direction towards the exposed face of the partition.

The partition 10 further comprises a retaining member 28 which is secured by releasable fasteners 29 to the tip of the nose 17. The retaining member is of elongated form and extends along almost the entire length of the stud 12. The retaining member has the form of a shallow channel and has laterally outwardly projecting flanges 30 and 31 which overlap respective marginal portions of the front faces 22 and 23 of the panels. Marginal portions of the panels are thus trapped between respective flanges of the retaining member and corresponding shoulders on the stud. Each panel may be subjected to some degree of compression between the retaining member and stud. It will be noted that the retaining member is spaced somewhat from the nose 17 when the panels are compressed between the retaining member and the stud 12. Thus, the fasteners 29, which are usually of steel, provide the sole thermally conductive path between the retaining member and the stud. This path has a very small cross-sectional area.

The nose 17 may be substantially shorter than the nose shown in the drawing and the channel of the retaining member correspondingly deeper to receive a snap-in cover strip which may be formed of a plastics material or of metal. The channel defined by the retaining member may have a dove-tail form to ensure adequate retention of the cover strip.

The partition 11 comprises components corresponding to those of the partition 10 and these corresponding components of the partition 11 are indicated by like reference numerals with the prefix 1. The panels 18 and 118 are in mutually-spaced face-to-face relation and between them there is a cavity 32 in which service lines can be disposed. Alternatively, the cavity could contain a body of thermally and accoustically insulating material and may be filled by such material.

The partition structure of Figure 1 further comprises a spacer element 33 disposed between the studs

12 and 112. The spacer element is in the form of a flat strip having a length almost as great as the length of the studs and being formed of a material which has a lower thermal conductivity than does the metal of which the studs are formed. Material used for lining ceilings to provide resistance to fire or material used to provide resistance to fire in doors may be used to form the spacer element.

The flanges 13 and 14 are held in contact with one face of the spacer element 33 whilst the flanges 113 and 114 are held in contact with the opposite face of the spacer element by a number of releasable fasteners 34 engaged with the flanges at intervals along the length of the studs. The particular fastener provided in the structure of Figure 1 has the form of a metal clip which embraces a pair of adjacent flanges, one from each stud, and overlies respective parts of the free edges of the flanges. Each clip is provided with teeth which bear on the flanges so that the area of contact between each clip and the flanges is small. Thus, each clip provides only a very restricted thermally conductive path between the studs 12 and 112. The clips are spaced apart longitudinally of the studs by a distance considerably greater than the spacing of exposed faces 22 and 122 of the panels. The clips may be spaced 30cm or more apart. Screws may be used in place of the clips to secure the flanges in contact with the spacer element.

It will be noted that the flanges 13 and 14 are spaced from the shoulders 25 and 27 in a direction away from the retaining member 28 and that all but a margin of each flange is spaced from the corresponding shoulder in a direction along the partition structure. Thus, each flange has a surface which faces towards the corresponding panel but is spaced therefrom and is exposed by other parts of the stud so that, prior to application of the associated panel, a fastener can be engaged easily with the exposed surface of the flange without the fastener

subsequently obstructing proper seating of the associated panel on its shoulder.

The primary function of the clips 34 is to maintain the thermally insulating spacer element 33 between the studs 12 and 112. The studs have sufficient stiffness to resist significant bending under normal conditions of use. If a stud is subjected to an unusually large bending load, a part of that load can be transmitted through the spacer element 33 to the other stud without excessive deflection of either of the studs, provided the studs are held in firm contact with the spacer element. Thus, a secondary function of the clips is to maintain firm contact between the flanges of the studs and the spacer element and thus to make a contribution to the stiffness of the structure.

As shown in Figure 1, each of the panels 18, 19, 118 and 119 is preferably a laminate comprising at least a relatively thin front layer 35 which is capable of withstanding wear and a rear layer 36 which has a relatively low thermal conductivity. The front layer may be sheet metal or a plastics material. The rear layer is preferably formed of mineral wool. The retaining member 28 is preferably formed of sheet steel.

It will be noted that there is no substantial thermally conductive path from one exposed face of the partition structure to the opposite exposed face. It will also be noted that a selected panel can be demounted from the partition structure if the retaining members engaged with that panel are first removed. Thus, access can be gained to service lines within the cavity 32. If required, a reinforcing board or plate may be provided in the cavity 32 and adhered to the panel 18. Fittings or appliances can then be mounted on the panel 18 by means of fasteners engaged with the reinforcing board or plate. Since the reinforcing board or plate can be applied to the panel after the partition structure has been completed, the position in which the appliance or fitting

is to be mounted can be chosen when the appliance or fitting is to be mounted on the partition structure.

It will also be noted that each of the studs 12 and 112 projects from the panels with which it is engaged in a direction towards the panels associated with the other stud for a distance not exceeding twice the thickness of the panels. In consequence of this, the overall thickness of the partition structure is not excessive, notwithstanding the presence of the spacer 33 between the studs. If a thicker spacer is required, the studs may be modified to position the flange 13 and other corresponding flanges nearer to the shoulder 25 and the respective other shoulders. These flanges and those parts of the studs intervening between the flanges and the shoulders may be omitted entirely. In this case, fasteners for securing the studs together would be engaged with the shoulders on which the panels are seated. The shoulders or the panels or both may be recessed to accommodate the fasteners without spacing the panels from the shoulders. In the preferred arrangement, the flange 13 is spaced from the panel 18 by a distance not exceeding the thickness of the panel.

As shown in Figure 2, the partition structure is connected with a ceiling 37 by means of an inverted channel 38 which is secured to the ceiling prior to erection of the partition structure. The channel is provided with two depending limbs 51 and 52 which lie between and are parallel to the sides of the channel. These limbs may be provided on angle section elements secured to the base of the channel and are spaced somewhat apart. An upper end portion of each stud 12 is introduced into the channel 38 by raising the stud, and then lies between the limb 51 and one of the sides of the channel. Small tongues are then bent out of the limb 51 adjacent to its lower edge and adjacent to the stud so that the stud is trapped between the tongues and thereby constrained against movement longitudinally of the

channel. Subsequently, the panels associated with the stud 12 are inserted into the channel by raising the upper edges of the panels to lie between the shoulder 25 and the adjacent side of the channel which holds the panels in engagement with the stud. When the retaining member 28 is applied to the panels, an upper end portion of that member also may be introduced into the channel. The partition 11 is assembled with the channel in a similar way so that the partition structure is then trapped within the channel, flanges 30, 31, 130 and 131 of the retaining members engaging side walls 39 and 40 of the channel. These side walls may have horizontal flanges to support respective suspended ceilings.

The studs 12 and 112 are secured to a floor 41 by a pair of angle section brackets 42 and 43 respectively. One limb of each bracket is screwed to the floor 41 and further limbs of the brackets project vertically upwards in mutually spaced parallel relation to be received between the flanges 13 and 113 and between the flanges 14 and 114. These flanges are secured to the brackets by screws or other fasteners. It will be noted that the upright flanges of the brackets 42 and 43 are received in the gap between the studs 12 and 112 and are spaced apart so that the brackets do not provide a thermally conductive path between opposite faces of the partition structure. If required, similar brackets may be used to connect the studs with the ceiling.

Usually, the studs 12 and 112 would be connected to the ceiling 37 by the channel 38 and connected to the floor 41 by the brackets 42 and 43 prior to assembly of the panels with the studs. Service lines, for example electric cables and water pipes may then be installed in the partition structure in such positions that, when the panels of the partition structure are added, the service lines will lie in the cavities between panels.

The partition structure illustrated in Figure 3 comprises partitions 45 and 46 arranged in mutually

spaced back-to-back relation and a further pair of partitions 47 and 48 arranged in mutually spaced back-to-back relation and extending from the partition 46 in a direction away from the partition 45 and generally at right angles to the partitions 45 and 46. The partition 45 may be identical with the partition 10 hereinbefore described.

The partitions 46, 47 and 48 are each generally similar to the partition 10 but differ therefrom in that, at the junction of the partition 46 with the other two partitions, there is provided a first stud 49 common to the partitions 46 and 47 and a second stud 50 common to the partitions 46 and 48. The studs 49 and 50 have the same form which differs from that of the stud 12. The stud 49 has at opposite lateral margins respective flanges 51 and 52 which present respective free edges of the stud. These flanges are mutually perpendicular and between the flanges the stud presents a series of mutually perpendicular shoulders, there being at least one shoulder parallel to the flange 51 and at least one shoulder parallel to the flange 52. Respective panels 53 and 54 of the partitions 46 and 47 are held in engagement with these two shoulders by a retaining element (not shown) releasably secured to the stud 49. Further panels 55 and 56 of the partitons 46 and 48 respectively are held in engagement with corresponding shoulders of the stud 50.

Between the flange 52 and the corresponding flange of the stud 50, there is provided a spacer element 57 and these flanges are held in engagement with opposite faces of the spacer element by metal clips 58 identical with the clips 34.

The flange 51 of the stud 49 and the corresponding flange of the stud 50 are held in engagement with the same face of a somewhat wider spacer element 59, an opposite face of which is engaged by a stud of the partition 45. Clips or other releasable fasteners may be

used to maintain these flanges in engagement with the spacer element 59.

In the place of the partition 45 illustrated in Figure 3, there may be provided an arrangement of three partitions identical to the partitions 46, 47 and 48. The spacer element 59 would be retained but along opposite edges of the spacer element corresponding flanges of adjacent studs would be embraced by clips arranged as the clips 58.

In Figure 4, there is illustrated a structure comprising four partitions 60 to 63. The partitions 60 and 61 are arranged in mutually spaced back-to-back relation whilst the partitions 62 and 63 are arranged in mutually spaced back-to-back relation but extend at right angles to the partitions 61 and 62. Each of the partitions 60 to 63 may be formed of the components hereinbefore described in relation to the partition 10. Parts of the partitions 60 to 63 which correspond to parts of the partition 10 are indicated in Figure 4 by like reference numerals with the prefixes 2,3,4 and 5 respectively and the description of the components of the partition 10 is deemed to apply to these corresponding components.

With the stud 212 there is engaged a single panel 218 and a single panel 318 is engaged with the stud 312. That half of the stud 312 which is remote from the panel 318 is engaged with the stud 412 which faces in a direction at 90° to the direction in which the stud 312 faces. It will be noted that the noses of all studs are chamfered at 45° so that the noses 317 and 417 can fit closely together with respective chamfers in contact with each other.

An external corner piece 64 which may be formed of the same materials as the panels and which, as viewed in plan, comprises two limbs which meet at a right angle, is engaged with the studs 212 and 512 and held against shoulders thereon by the retaining members 228 and 528 respectively.

A single partition is useful in certain circumstances. Thus, the partition 10 may be used to line a wall constructed of different materials. In this case, the studs of the partition may be spaced from the wall by spacer elements 33. Alternatively, the studs may abut and be secured directly to the wall. With either of these arrangements, there would be defined between the panels 18 and 19 on the one hand and the wall on the other hand a cavity.

It will be noted that, in all of the examples illustrated, it is not necessary for the panels to be pierced by screws or other fasteners.

CLAIMS:

1. A stud and panel partition structure comprising first and second panels which are in mutually spaced face-to-face relation, first and second studs which are secured to each other and first and second retaining members secured respectively to the first and second studs, wherein a marginal portion of the first panel is trapped between the first retaining member and the first stud and a marginal portion of the second panel is trapped between the second retaining member and the second stud.

2. A structure according to Claim 1 wherein each stud projects from the corresponding panel in a direction towards the other panel for a distance not exceeding twice the thickness of the corresponding panel.

3. A structure according to Claim 1 or Claim 2 further comprising a plurality of fasteners which secure the studs to each other, wherein each stud presents a surface towards the corresponding panel and the fasteners are engaged with said surfaces of the studs.

4. A structure according to Claim 3 wherein said surface of each stud is spaced from the corresponding panel.

5. A structure according to any preceding claim wherein said studs are spaced apart in the direction of the shortest distance between the first and second panels.

6. A structure according to Claim 5 further comprising a spacer element formed of a material having a lower thermal conductivity than does the material of which the studs are formed, the spacer element being interposed between the studs and having opposite faces engaged with respective studs.

7. A structure according to any preceding claim wherein the retaining members are secured to respective studs by means of releasable fasteners.

8. A structure according to any preceding claim wherein each retaining member is secured to a nose of the corresponding stud, the nose being disposed in a gap between adjacent panels engaged with the stud.

9. A stud and panel partition comprising a panel, a pair of studs disposed one adjacent each of two opposite edges of the panel and a pair of retaining members secured one on each stud, wherein each stud is formed with a seat for a marginal portion of the corresponding panel, said marginal portion is trapped between the seat and the corresponding retaining member and each stud includes a flange spaced from the panel in a direction away from the retaining member and at least a part of which flange is spaced from the seat in a direction along the partition.

10. In combination, a partition according to Claim 9 and a further structure wherein the stud is secured to the further structure by fasteners engaged with said flange.

11. A combination according to Claim 10 wherein the further structure is a further partition as defined in Claim 9.

12. A kit of parts adapted to form a structure as claimed in Claim 1 or adapted to form a partition as claimed in Claim 9.

13. A stud for a structure according to Claim 1 comprising two spaced, substantially flat and co-planar seats for marginal portions of respective panels, a nose which extends from the seats to lie between said panels when

the panels are engaged with the seats and two flanges at opposite margins of the stud, each flange being spaced from the plane of the seats in a direction opposite to that in which the nose extends from said plane, being at least approximately parallel to the plane of the seats and having a free edge at its margin furthest from the other flange.

14. A partition substantially as herein described with reference to the accompanying drawings.

15. A partition structure substantially as herein described with reference to and as illustrated in Figures 1 and 2 of the accompanying drawings or substantially as herein described with reference to and as illustrated in Figure 3 of the accompanying drawings or substantially as herein described with reference to and as illustrated in Figure 4 of the accompanying drawings.

16. Any novel feature or novel combination of features disclosed herein or in the accompanying drawings.

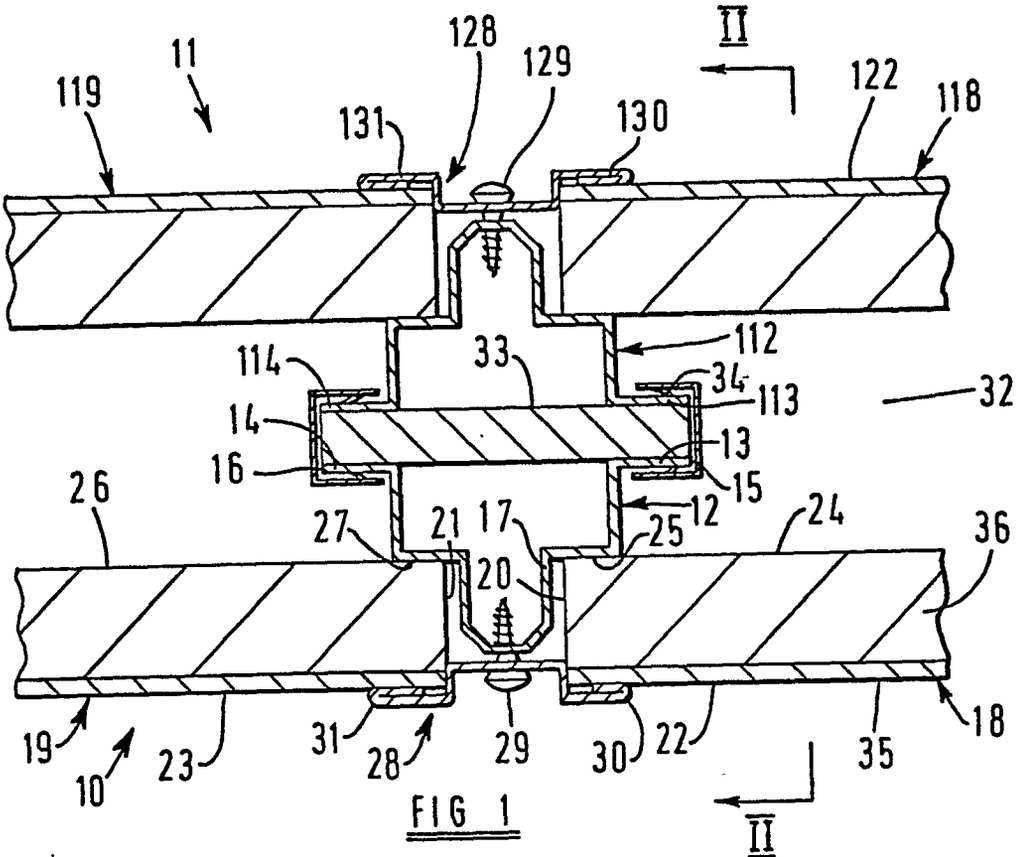
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FIG 1

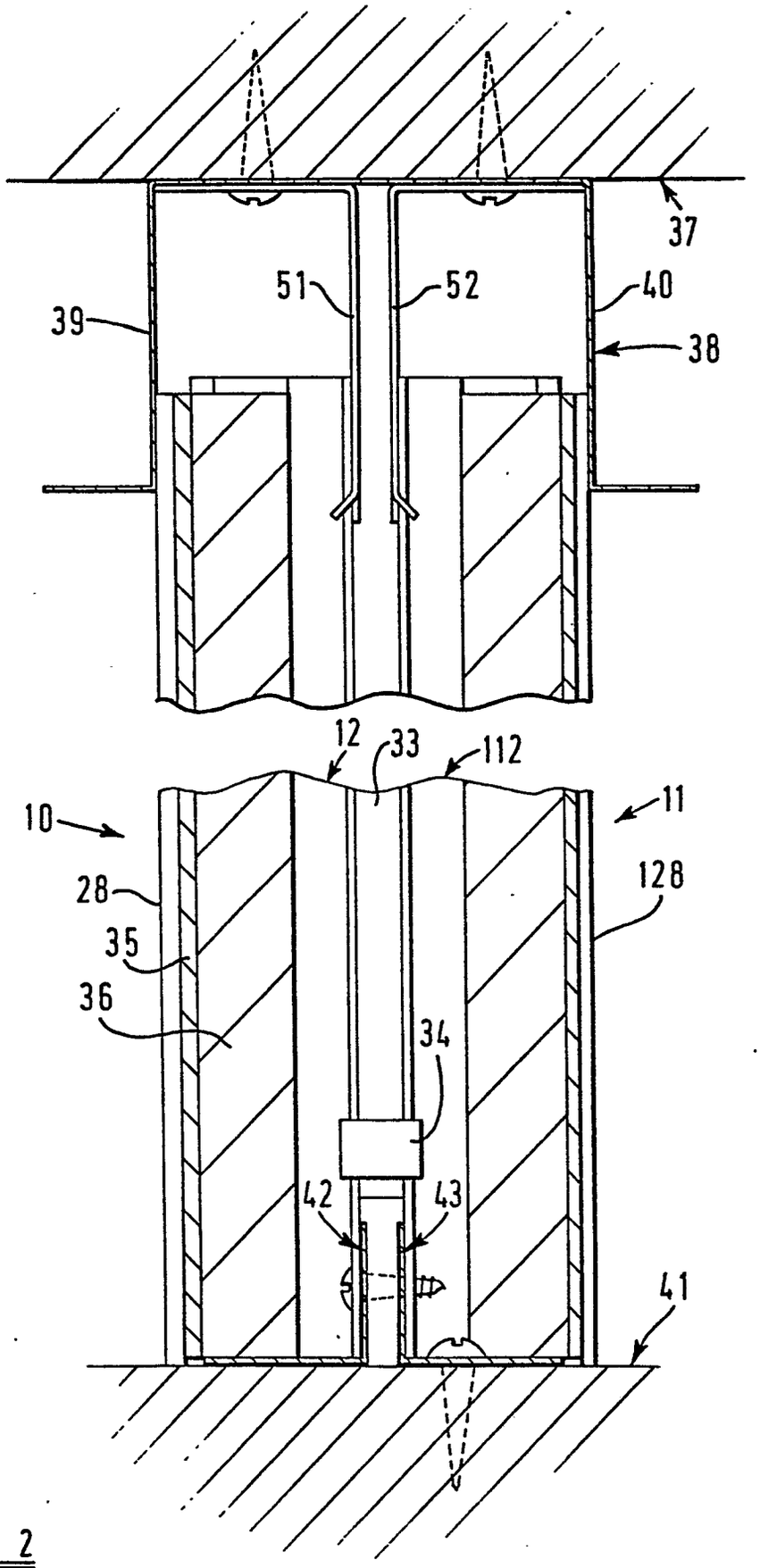

FIG 2

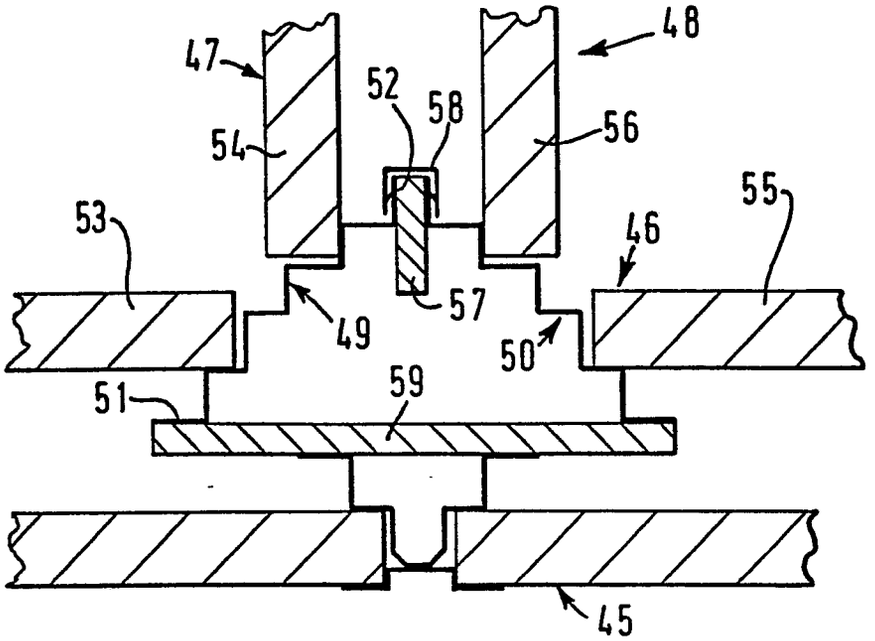
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FIG 3

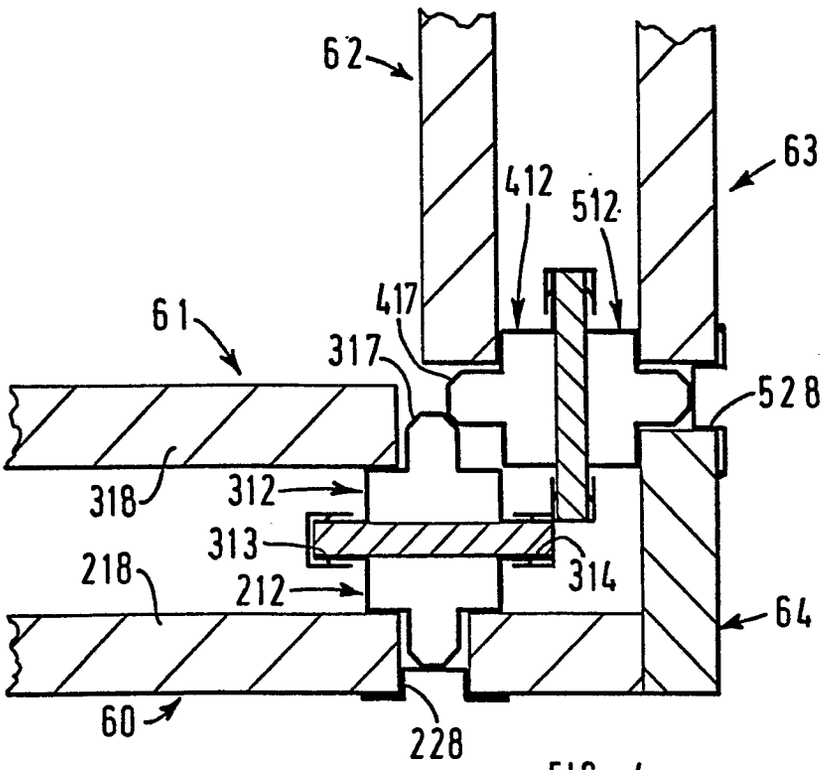
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FIG 4