

# United States Patent

Allen

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## [54] SNAP ON DRYWALL FASTENING SYSTEM

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[21] Appl. No.: 87,124

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[51] Int. Cl. .... E04b 1/343, E04b 1/40

[58] Field of Search ..... 52/243, 281, 483, 488, 499, 52/720, 729, 732, 289

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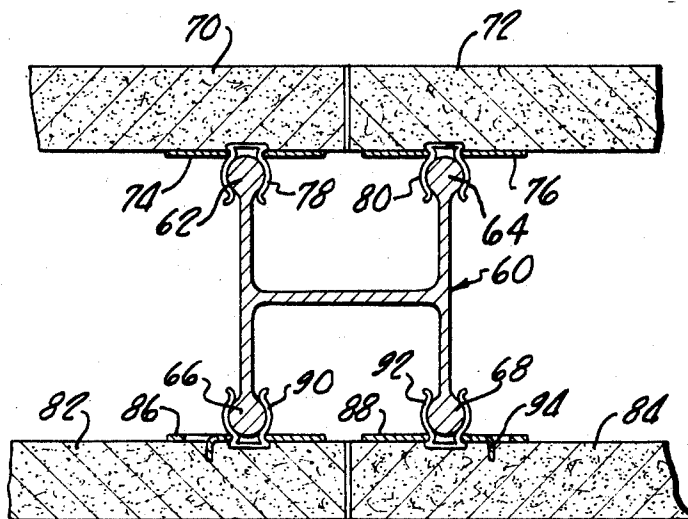
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### [57] ABSTRACT

A building wall or other partition and a system for making such partitions in which individual wallboards or panel members can be removed and rearranged by being simply snapped into place and removed from studs is disclosed. The wallboards are held in position by resilient fastener clips which receive beads formed on supporting beams or studs.

22 Claims, 8 Drawing Figures



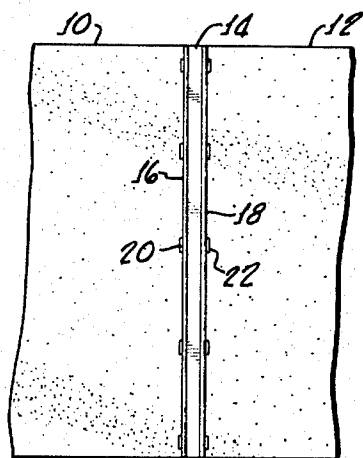


FIG. 1

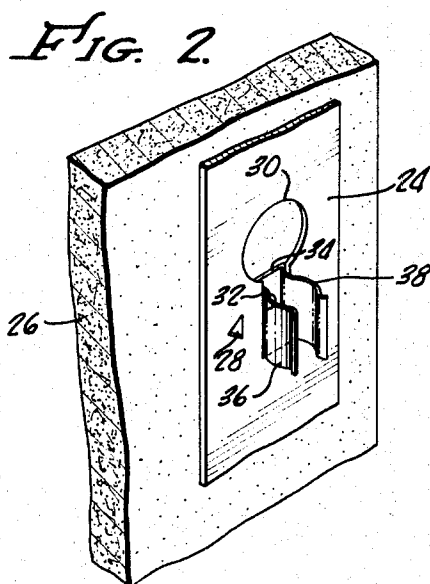


FIG. 2

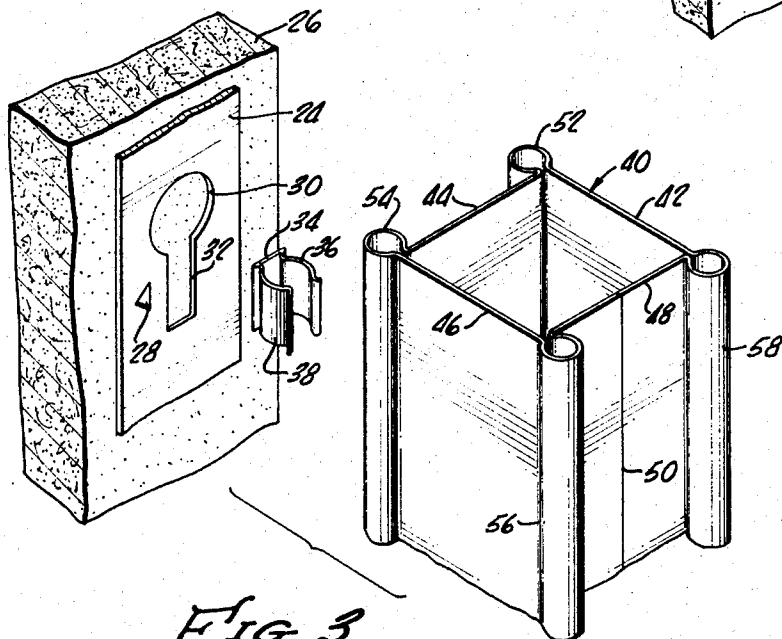


FIG. 3

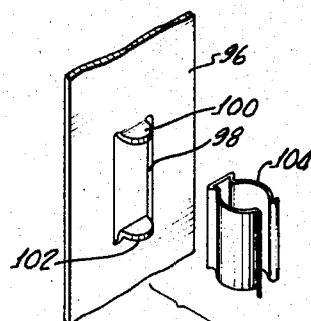


FIG. 5

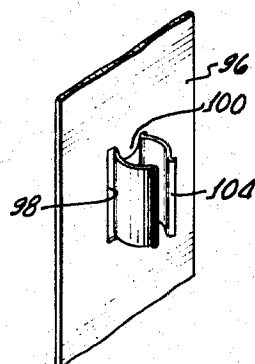


FIG. 6

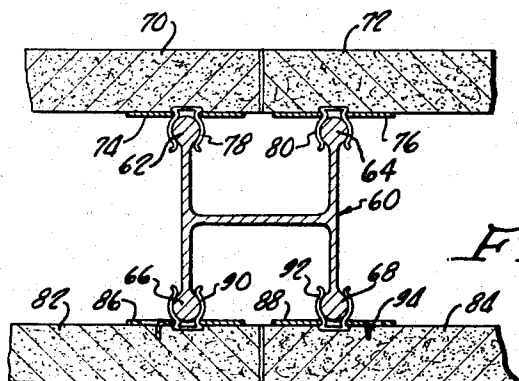


FIG. 4

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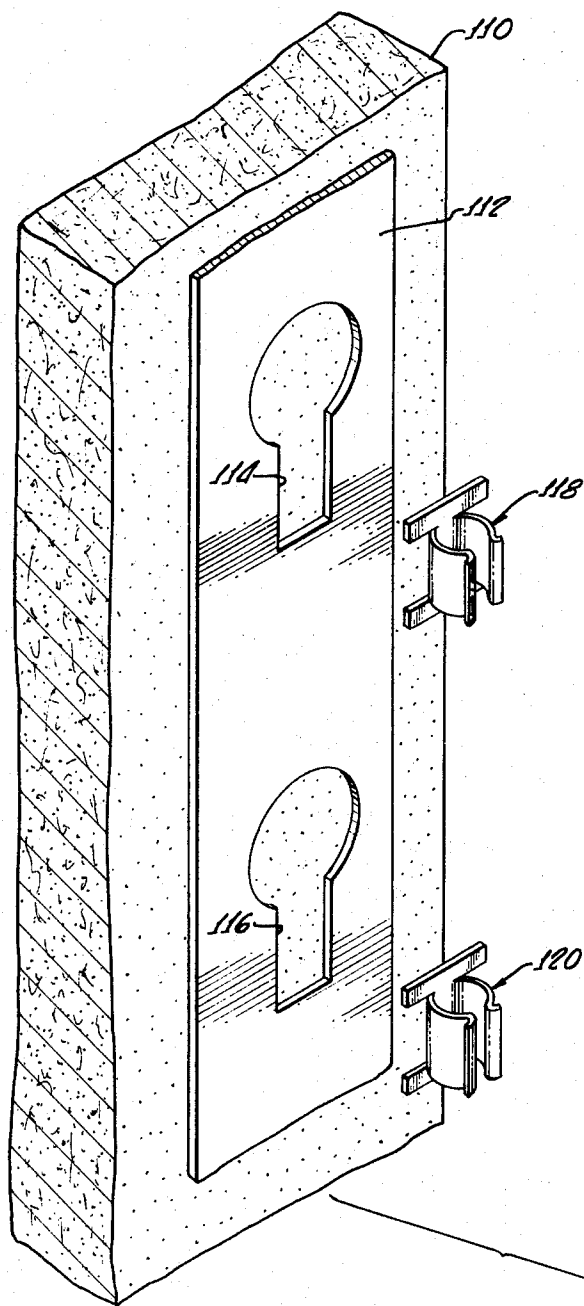


FIG. 7.

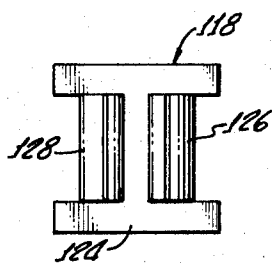
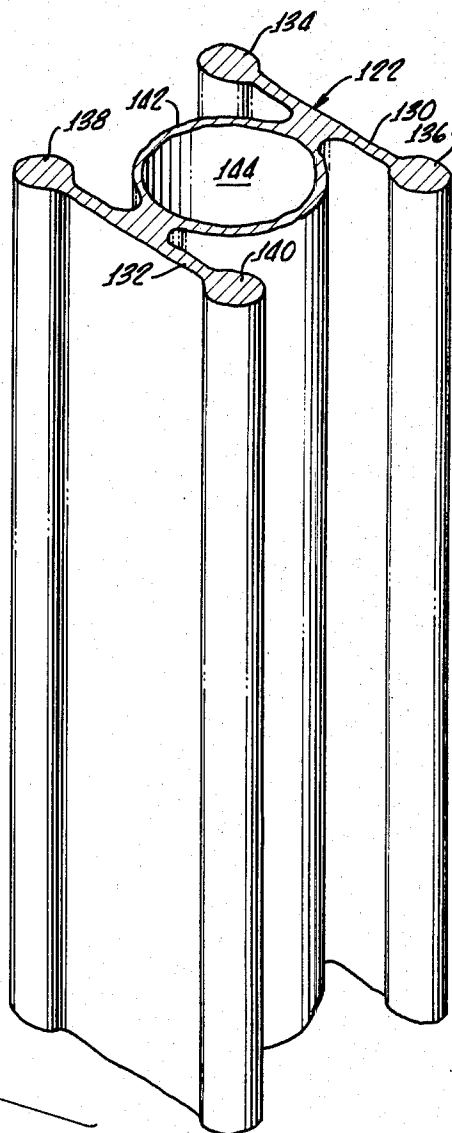


FIG. 8.

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## SNAP ON DRYWALL FASTENING SYSTEM

This invention relates to fixed and portable building construction and, more specifically, relates to building partitions, such as walls, ceilings, etc. which usually are constructed after completion of the supporting structure of the building. Still more specifically, this invention relates to building partitions made up of panel members in which the panel members may be removed, rearranged, and replaced individually without the necessity of disturbing adjacent panel members.

It has long been recognized, especially in commercial building construction, that it is desirable to provide building partitions and systems for assembling building partitions in which the entire partition may be removed and in which individual panel members making up the partition can be removed, rearranged, or replaced with doors, windows, or other openings or units. Many systems and wall or partition structures have been proposed for accomplishing this result. In general, the proposed solutions involve comparatively complex structures and many of the proposals require that the panel members of which the partition is made be constructed of special materials and be of special design suitable only for use in a particular structure or system.

Many of the prior attempts to solve the problems associated with the construction of removable panel partitions have relied upon the association of hooks and slots. When this is the case, enough space must be left at one or both ends of each panel to permit the panel to be moved longitudinally with respect to the supporting beam or stud. Generally, this requires that special moulding, soundproofing, or finishing materials be provided at one or both ends of the panel.

In the prior art, wall or other partition construction systems involve panels which include elements which protrude from the surface of the panel or from the edge of the panel, or both, thereby making it difficult or impossible to stack the panels during storage and use without injury to the panels or to the fastening means. It is extremely important, in terms of economics and practical handling, that the panel members of which a partition is constructed be capable, before assembly, of being stacked for storage, transportation and general handling.

One of the important features of this invention is that panel members, such as wallboards, etc., may be of any conventional construction and composed of any desired material or combination of materials. Substantially any type of unfinished, partially finished, or completely prefinished panel member may be used in the system and construction of the present invention without modification, except for the addition of a fastener strip which does not affect the storage, shipping, or handling characteristics of the panel members.

Another important feature of the invention is that the fastener strips which form a part of the inventive system and construction can be permanently secured to the panel members at the factory without making the panel members delicate, unwieldy, or difficult to store, ship and handle. Fastener clips are quickly and easily attached to the panel members at the job site during the assembly operation, thereby avoiding the difficulties inherent in the prior art systems which use preattached but complex fasteners and the difficulties associated with the prior art systems in which complicated and ex-

pensive attachments, fasteners, edges, etc. must be secured to the panel at the job site.

One of the more significant features and advantages of the invention is that the panel members which form a part of the system and of the partition can be snapped into place and removed simply by moving the panel members directly toward the supporting beam or stud for installation and by moving the panel members directly away from the supporting beam or stud to un-snap the panel from its position. Longitudinal or vertical movement is, therefore, not required. This obviates the necessity for providing large and often unsightly space at the end of each of the panel members.

An important economic feature of the invention is that all of the elements of the system and of the wall or other partition structure are easily, simply and economically constructed using conventional materials and techniques. The strips, clips and beams or studs which form elements of the system and the structure can be manufactured on a large scale using mass production techniques and a minimum of equipment, since the structures are simple and easily fabricated.

Snap-on building elements are known in the prior art, but such elements usually require the association of a large number of complex elements which must be assembled entirely or largely in the field. The system and construction of the present invention significantly reduces the number of parts required for field assembly, simplifies the field construction techniques and substantially reduces the time and cost of installation.

Most of the prior art snap in systems involve elements which of necessity must remain exposed in the finished structure. In the structure of the present invention, none of the fastening elements are exposed. It is not necessary, therefore, that the fastening elements be enameled, painted, or otherwise finished so as to conform to the appearance of the partition under construction. In addition, the conspicuous and often unsightly strips, clips, etc. which are involved in prior art systems are completely avoided by the present invention.

According to the present invention, a wallboard, or other panel member, of any desired size, shape, finish or style is provided with a fastener strip along one or more edges. The fastener strip lies flat on the wallboard and is provided with means for securing fastening clips to the wallboard during assembly of a wall at the job site. Fastening clips having a base portion by which the clips are attached to the wallboards and resilient grippers are attached to the wallboards at the construction site. The resilient grippers receive beads formed on studs or other supporting beams for securing the wallboards to the studs to form a wall, or other partition.

In the following discussion, reference will most often be made to elements of conventional vertical walls which form partitions in buildings, but the same systems, structures and techniques as are used in the construction of wall type partitions are equally applicable to other partitions, such as ceilings, half walls, etc. and features of the invention will appear from the specification which follows and from the drawing, in which:

FIG. 1 is an elevational view of a section of a wall partition constructed according to this invention;

FIG. 2 is a perspective showing the wallboard in partial cross-section and a portion of a fastener strip on the wallboard securing a fastener clip to the wallboard;

FIG. 3 is an exploded view of the elements of the inventive system and construction showing one form of a supporting stud-type beam, a fastener clip, and a fastener strip secured to a wallboard;

FIG. 4 is a transverse section of a wall joint showing the construction of the invention using another type of stud;

FIG. 5 is an exploded view of another type of means for fastening clips to a wallboard showing a fastener strip and a fastener clip;

FIG. 6 is a perspective showing the fastener means of FIG. 5 in assembled position;

FIG. 7 is an exploded view of a preferred alternative embodiment of the inventive system;

FIG. 8 is a plan view of the modified fastener clip shown in FIG. 7.

FIG. 1 of the drawing illustrates in elevation the structure and system of the present invention in which panels 10 and 12 are secured to a stud 14 by means of fastening strips 16 and 18 which, respectively, are secured to the panels 10 and 12 and by means of a plurality of fastener clips exemplified at 20 and 22. The wall or building partition comprises two or more stud type beams as illustrated at 14.

The stud is referred to as a form of a beam even though it is normally constructed and arranged for vertical disposition, since insofar as the present invention is concerned, it is not material whether the beam is vertically or horizontally disposed. In the vertical position such a beam would normally be referred to as a stud, whereas, it would normally be referred to as a joist in the horizontal position, herein it would support a ceiling partition rather than a wall partition as illustrated in FIG. 1.

At least one fastener strip is secured to each wall board, or other type of panel member, to form means for securing fastener clips to the wallboard. The fastener strip may be secured to the wallboard adhesively using any of the conventional construction adhesives, such as phenolic, epoxy and urea formaldehyde type adhesives. In addition to, or in lieu of, adhesive securement, the fastener strip, such as is illustrated at 24 in FIG. 2, may be secured to a wallboard 26 by means of frictional fasteners such as a tine formed from the strip, at opening 28, and extending into the wallboard. Other types of frictional fasteners such as screws, rivets, nails, etc., may also be used.

As illustrated in FIGS. 2 and 3, the fastener strip may have formed therein a plurality of key shaped apertures having an enlarged portion formed and adapted to receive the base of a fastener clip and a smaller portion 32 formed and adapted to engage the base of a fastener clip to secure the fastener clip to the wallboards or other panel member.

The fastener clip comprises a base portion 34 and a pair of opposed resilient grippers which, when assembled, extend approximately perpendicularly outwardly from the plane of the panel member to which the clip is attached. As best illustrated in FIG. 2, the clip is attached to the panel member by means of a fastener strip on the panel member which, in the embodiment illustrated in FIGS. 2 and 3, is provided with apertures which receive and engage the base of the fastener clip. Other means for securing the fastener clip to the wallboard and fastener strip may, of course, be provided without deviating from the present invention. For ex-

ample, the fastener clip could be provided with a hook which would engage in a slot in the fastener strip, could be secured to the fastener strip by means of a frictional fastener such as a screw, rivet, etc., or could even be adhesively secured to the fastener strip, although the latter procedure would severely impair field assembly of walls according to this invention.

The stud 40 as illustrated in FIG. 3 is in the form of a hollow beam having four side or web portions 42, 44, 46 and 48, side 48 showing a seam line 50 which would normally result from fabrication of the stud from sheet metal. The seam may be welded or otherwise joined, if required. A plurality of beads, four beads in the example illustrated in FIG. 3, extend outwardly from the center of the stud, as illustrated at 52, 54, 56 and 58. In the illustrated embodiment, the stud is shown to be a rectangle in substantially square configuration; however, no significance is attached to the rectangularity or the squareness of the configuration. Indeed, the stud may be of any desired shape so long as beads or sets of beads extend outwardly from the center and are constructed and adapted to be received resiliently between the grippers of the fastener clip.

For the construction of walls, as illustrated in FIG. 1, for example, the studs are conventionally so constructed as to include two sets of spaced beads extending outwardly in opposite directions from the center of the studs. The studs are so constructed and the beads are so disposed that the respective sets of beads are adapted to receive fastener clips on the edges of two different wallboards on each side of the stud, only one set of two wallboards being shown in FIG. 1. Thus, a double wall is constructed of the wallboards wherein the adjacent edges of the wallboards on each side of the studs are in closely abutting relationship.

Such a wall partition construction is illustrated in FIG. 4. A stud 60, in generally H-shaped cross-sectional configuration, has one pair of beads 62 and 64 extending in one direction and another pair of beads 66 and 68 extending in the other direction from the center of the stud. The wall also includes wallboards 70 and 72. Fastener strips 74 and 76 are secured proximate and substantially parallel to each longitudinal side of the wallboards and are so secured and arranged on the wallboards as to cause adjacent edges of the wallboards to lie in the closely abutting relationship illustrated in the finished wall partition. A plurality of fastener clips, such as clip 78 are secured along the length of the fastener strip 74. In like manner, a plurality of fastener clips 80 are secured along the length of the fastener strip 76. The fastener clips exemplified at 78 and 80 resiliently receive the beads 62 and 64 along the length of the wallboard. The wallboards 82 and 84 are in like manner held in position by means of fastener strips 86 and 88 and by fastener clips arranged in spaced relationship along the length of the strips as illustrated at 90 and 92.

Frictional fastening of the fastener strip 88 by means of a tine 94 which extends into the wallboard 84 is illustrated in FIG. 4 also.

Another form of fastener strip and fastener clip attachment is illustrated in FIGS. 5 and 6. In this embodiment of the invention, the fastener strip 96 is provided with an aperture 98 and lugs 100 and 102. A fastener clip 104 is received in the aperture 98 and secured in

place by driving the lugs 100 and 102 downwardly into the position illustrated in FIG. 6. During storage and shipment the lugs 100 and 102 are in the same plane as the strip 96.

At least one fastener strip is secured on each panel member so as to lie substantially flat on the panel member, such as the wallboard panel members illustrated, such that no protrusions extend beyond the surface or the edge of the wallboard. This permits a multiplicity of such wallboards to be stacked, prior to assembly, without damage either to the fastener strips or to the panel members.

In assembling the wall using the structure illustrated in FIGS. 5 and 6, the first step, on the site, is to lift the lugs 100 and 102. Thereafter, the clip 104 is placed in position and the lugs are driven back into the plane of the strip, thereby securing the fastener clips to the wallboard.

In the embodiment of the invention illustrated in FIGS. 2, 3 and 4, the fastener clips are simply slid through the enlarged portion of the key shaped aperture into the smaller portion of the aperture for securement to the fastener strip and the wallboard. In practice, the clip is placed in the proper position and hit once or twice with a hammer to drive it into abutting relationship with the end of the smaller portion of the key shaped aperture. These methods of attachment of the fastener clip to the fastener strip are merely exemplary of the invention and it is expected that other fastening means may be used.

FIGS. 7 and 8, to which reference is now made, illustrate an alternative and preferred form of the inventive system and construction. In this embodiment, a wallboard or other panel member 110 is secured by means of a fastener strip 112, which includes spaced keyhole shaped apertures 114 and 116, and by fastener clips 118 and 120 to a stud type beam 122. The fastener clips 118, shown in greater detail in FIG. 8, and 120 include a square base portion 124 from which resilient gripper portions 126 and 128 extend. The clips can be received in the apertures so that the clip openings are aligned with longitudinal axis of the strip, as shown in FIG. 7, or so that the clip openings are transverse of the axis of the strip, as desired.

The modified stud 122 is normally composed of extruded aluminum but other materials can be used. The stud 122 has two side web portions 130 and 132, each carrying two beads shown respectively at 134 and 136 and at 138 and 140. The two side web portions 130 and 132 are secured in spaced relation by a center web portion 142 which is so constructed as to form a raceway 144 for receiving electrical conductors, such as telephone cables, intercommunication system wiring, etc. The walls of the raceway can be drilled or cut at any desired point to provide for entry and exit of the electrical conductors into and out of the raceway.

It will be apparent from the foregoing discussion and the illustrations of the drawing that the wallboards may be secured into position simply by pushing the individual wallboards directly toward the stud such that the fastener clips resiliently engage the respective beads on the studs. No vertical movement is required and, consequently, it is not necessary to provide a space at the end of the panel, as is the case in all or most of the prior art systems.

It is also apparent that none of the fastening means of the system are visible once the wall or other partition is completed. The configuration of the partition is easily changed by simply removing one or more of the wallboards or other panel members, by moving the panel member directly away from the supporting stud or beam, and rearranging or replacing the panel member with doors, windows, etc.

While various embodiments of the invention are illustrated as exemplary of the system and structure of the invention, it is contemplated that many variations of the illustrated structures will be made within the skill of the art without departing from the spirit of the invention, the scope of which is defined in the following claims.

I claim:

1. A system for constructing vertical building walls comprising, in association, a plurality of wallboards; a fastener strip secured proximate and substantially parallel to at least one longitudinal edge of the wallboards, the fastener strip being so constructed and secured as to lie substantially flat on said wallboards without protrusions extending beyond the edge of the wallboards so as to permit a multiplicity of such wallboards to be stacked without damage to the fastener strip or to the wallboards during storage or shipment; a plurality of fastener clips having opposed resilient grippers and a base portion; means formed in the fastener strip for receiving the base of a plurality of fastener clips such that a plurality of the fastener clips can be quickly and easily secured at the job site to the fastener strip on the wallboards; a plurality of studs constructed for spaced vertical disposition for supporting the wallboards forming a wall, the studs having at least two beads constructed and disposed to be resiliently received in the resilient grippers of the fastener clips; the wallboards, fastener strips, fastener clips and studs being so constructed and arranged as to permit the wallboards to be removably secured in vertical position to vertically disposed studs, the removable securement being accomplished by the gripping action of the fastener clips on the beads of the studs, said wallboards being secured into position by lateral movement toward the studs and being removed from a secured position by lateral movement away from the studs.

2. The system for constructing vertical building walls as defined in claim 1 wherein the wallboards have a fastener strip secured proximate and substantially parallel to each longitudinal side, the fastener strips being so secured and arranged on said wallboards as to cause adjacent vertical edges of the wallboards to lie in closely abutting relationship in a wall constructed using the defined system.

3. The system for constructing vertical building walls as defined in claim 1 wherein the means for receiving the base of the fastener clips comprises a plurality of apertures arranged in spaced relation along the length of the strips having an enlarged portion formed and adapted to receive the base of a fastener clip and a smaller portion formed and adapted to engage the base of a fastener clip to secure the fastener clip to the wallboard.

4. The system for constructing vertical building walls as defined in claim 3 wherein the wallboards have a fastener strip secured proximate and substantially

parallel to each longitudinal side, the fastener strips being so secured and arranged on said wallboards as to cause adjacent vertical edges of the wallboards to lie in closely abutting relationship in a wall constructed using the defined system.

5 The system for constructing vertical building walls as defined in claim 1 wherein the studs are so constructed as to include two sets of spaced beads extending outwardly in opposite directions from the center of the studs, said studs being so constructed and the beads being so disposed that the respective sets of beads are adapted to receive fastener clips on the edges of two different wallboards on each side of the stud so as to form a double wall of the wallboards wherein the adjacent edges of the wallboards on each side of the studs are in closely abutting relationship.

6 The system for constructing vertical building walls as defined in claim 5 wherein the means for receiving the base of the fastener clips comprises a plurality of apertures arranged in spaced relation along the length of the strips having an enlarged portion formed and adapted to receive the base of a fastener clip and a smaller portion formed and adapted to engage the base of a fastener clip to secure the fastener clip to the wallboard.

7 The system for constructing vertical building walls as defined in claim 5 wherein the studs comprise tubular members having said beads protruding outwardly therefrom.

8 The system for constructing vertical building walls as defined in claim 5 wherein the studs comprise beams having an H-shaped cross-sectional configuration.

9 A system for assembling building panels comprising, in association, a plurality of panel members; a fastener strip secured proximate and substantially parallel to at least one longitudinal edge of the panel members, the fastener strip being so constructed and secured as to lie substantially flat on said panel members without protrusions extending beyond the edge of the panel members, so as to permit a multiplicity of such panel members to be stacked without damage to the fastener strip or to the panel members during storage or shipment; a plurality of fastener clips having opposed resilient grippers and a base portion; means formed in the fastener strip for receiving the base of a plurality of fastener clips such that a plurality of the fastener clips can be quickly and easily secured at the job site to the fastener strip on the panel members; a plurality of beams constructed for spaced disposition for supporting the panel members, the beams having at least two beads constructed and adapted to be resiliently received in the resilient grippers of the fastener clips; the panel members, fastener strips, fastener clips and beams being so constructed and arranged as to permit the panel members to be removably secured to spaced beams, the removable securement being accomplished by the gripping action of the fastener clips on the beads of the beams, said wallboards being secured into position by movement directly toward the beams and being removed from a secured position by movement directly away from the beams.

10 The system for assembling building panels as defined in claim 9 wherein the panel members have a fastener strip secured proximate and substantially

parallel to each longitudinal side, the fastener strips being so secured and arranged on said panel members as to cause adjacent edges of the panel members to lie in closely abutting relationship.

11 The system for assembling building panels as defined in claim 10 wherein the means for receiving the base of the fastener clips comprises a plurality of apertures arranged in spaced relation along the length of the strips having an enlarged portion formed and adapted to receive the base of a fastener clip and a smaller portion formed and adapted to engage the base of a fastener clip to secure the fastener clip to the panel members.

12 The system for assembling building panels as defined in claim 9 wherein the means for receiving the base of the fastener clips comprises a plurality of apertures arranged in spaced relation along the length of the strips having an enlarged portion formed and adapted to receive the base of a fastener clip and a smaller portion formed and adapted to engage the base of a fastener clip to secure the fastener clip to the panel members.

13 A building partition comprising, a plurality of beams, each beam including at least two beads protruding outwardly from the center of the beam; a plurality of panel members; at least one fastener strip secured on each panel member so as to lie substantially flat on said panel member without protrusions extending beyond the edge of the panel member so as to permit a multiplicity of such panel members to be stacked, prior to assembly, without damage to the fastener strips or the panel members; a plurality of fastener clips secured during assembly along the length of the strips in relatively spaced relation, each of said clips including opposed resilient grippers extending approximately perpendicularly outwardly from the plane of the panel member to which such clip is attached, and being attached to the panel member by means on a fastener strip on such panel member for securing the fastener clips to the panel member, the resilient grippers being so constructed as to resiliently receive the beads which protrude outwardly from the center of the beams; the building partition including at least two beams supporting at least a portion of at least two panel members, at least one of said panel members being removably secured to the beams by the gripping action of the fastener clips on the beads of the beams; the panel members being secured to the beams by being moved directly toward the beams, and being removable by being moved directly away from the beams, so as to permit replacement and rearrangement of the individual panel members forming the partition.

14 The building partition as defined in claim 13 wherein the panel members have a fastener strip secured proximate and substantially parallel to each longitudinal side, the fastener strips being so secured and arranged on said panel members as to cause adjacent edges of the panel members to lie in closely abutting relationship in the partition.

15 The building partition as defined in claim 13 wherein each fastener clip includes a base portion and the means for securing the fastener clips comprises a plurality of apertures arranged in spaced relation along the length of the strips having an enlarged portion formed and adapted to receive the base of a fastener

clip and a smaller portion formed and adapted to engage the base of a fastener clip to secure the fastener clip to a panel member.

16. The system for constructing vertical building walls as defined in claim 15 wherein the panel members have a fastener strip secured proximate and substantially parallel to each longitudinal side, the fastener strips being so secured and arranged on said panel members as to cause adjacent edges of the panel members to lie in closely abutting relationship in the partition.

17. The building partition as defined in claim 13 wherein the beams are vertically disposed studs and the panel members are wallboards and wherein the studs are so constructed as to include two sets of spaced beads extending outwardly in opposite directions from the center of the studs, said studs being so constructed and the beads being so disposed that the respective sets of beads are adapted to receive fastener clips on the edges of two different wallboards on each side of the stud so as to form a double wall of the wallboards wherein adjacent edges of the wallboards on each side of the studs are in closely abutting relationship.

18. The building partition as defined in claim 15 wherein the means for receiving the base of the fastener clips comprises a plurality of apertures arranged in spaced relation along the length of the strips having an enlarged portion formed and adapted to receive the base of a fastener clip and a smaller portion formed and adapted to engage the base of a fastener clip to secure the fastener clip to the wallboard.

19. The building partition as defined in claim 17 wherein the studs comprise tubular members having said beads protruding outwardly therefrom.

20. The building partition as defined in claim 17 wherein the studs comprise beams having an H-shaped cross-sectional configuration.

21. The building partition as defined in claim 17 wherein the studs comprise two side web portions, each carrying two beads, joined by a center web which forms a raceway for electrical conductors.

22. The building partition as defined in claim 15 wherein the studs comprise two side web portions, each carrying two beads, joined by a center web which forms a raceway for electrical conductors.

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