MODULAR PANEL WALL SYSTEM

ABSTRACT: A system of single face and double faced panel walls having vertically aligned ceiling and floor channel members, grooved studs extending vertically between the channel members, wall forming panels marginally engaged for support in the channel members and grooves of the studs and locking key members engaged in the vertical stud grooves to unite the studs and panels in a substantially rigid wall. In the single face wall the key members may be hidden or more or less revealed, and in the double face wall the key members may be hidden or more or less revealed so that in either character of assembly the key members may when revealed form a wall panel.
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BRIEF DESCRIPTION OF THE INVENTION

This invention relates to improvements in a wall panel assembly system, and more particularly to certain improvements in the panel wall system of my prior U.S. Pat. No. 3,423,894, granted Jan. 28, 1969.

The present improvements are directed to a modular panel wall system in which the principal components may be prefabricated to suit the installation requirements and assembled with a minimum of tools and erection skills. The character of wall system is well adapted to the art of providing a panel wall as a covering for an existing building wall, for surfacing building walls to provide contemporary decorating requirements, or for renewing older building spaces with an easy to erect and inexpensive wall having a wide range of decorative schemes from flush panel designs to multicolor and multitexture wall panel designs. In brief, the present panel wall system provides a range of room or space wall surfacing modes that is adaptable to an infinite variety of tastes and needs, and may be altered from time to time by the simple expedient of removing panels and replacing the same with other panels without the need to replace certain of the basic components. Once the room or space dimensions have been accurately determined, the panel wall system components may be prefabricated in the shop, moved to the job site, and rapidly erected with simple tools and quickly acquired skills so that the room or space is not rendered unusable for an extended period of time.

A preferred embodiment of the panel wall system comprises the installation of floor and ceiling mounted channels to receive a plurality of vertically directed grooved studs which engage and support the wall panels and key members which lock the wall panels and studs in a substantially rigid wall assembly. In such a panel wall system the components are configured in a manner to have interchangeable uses so that a minimum of component shapes are required to effect a wide range of installation variations and security of fits.

BRIEF DESCRIPTION OF THE DRAWINGS

Several preferred embodiments of the modular panel wall system of this invention are illustrated in the accompanying drawings, wherein:

FIG. 1 is a fragmentary perspective view of the modular panel wall system installed on three sides of a building space and showing a partition wall dividing the space into separate compartments;

FIG. 2 is a fragmentary sectional view taken at line 2-2 in FIG. 1;

FIG. 3 is a greatly enlarged and fragmentary perspective view of one embodiment of the present panel wall system to illustrate the components thereof;

FIG. 4 is a greatly enlarged and fragmentary perspective view of another embodiment of the present panel wall system to illustrate the components thereof;

FIG. 5 is a fragmentary sectional elevational view of the manner of assembly of a single face panel wall system;

FIG. 6 is a fragmentary sectional elevational view of the manner of assembly of a double face panel wall system;

FIG. 7 is a fragmentary sectional elevational view of the manner of assembly of the removable panel in the wall system of this invention;

FIG. 8 is a perspective view of the fastening clips for the removable panels in the wall system;

FIG. 9 is a longitudinal sectional view of a single face recessed panel assembly of this invention;

FIG. 10 is a view similar to FIG. 9 of a single face batten panel assembly;

FIG. 11 is a view similar to FIG. 9 of a double face flush panel assembly, a partition dividing a building space; and

FIG. 12 is a view similar to FIG. 9 of a double face recessed panel assembly of this invention.

DESCRIPTION OF THE PANEL WALL SYSTEM

In FIGS. 1 and 2 the wall system is shown in an arrangement in which a large existing building space may be modernized and divided into two spaces A and B. The original walls of the space may be covered with a single face panel wall and the space may be divided by a partition which has a double face. In these views the single face panel assembly is composed of a ceiling channel 14 and floor channel 15 in vertically spaced relation to receive wall panels 16, and panel supporting studs 17 and keys 18. In the single face wall of spaces A and B there is incorporated a panel 16a which is mounted differently so it may be inserted last and removed first.

The partition wall in these views is a double face panel assembly composed of a ceiling channel 19 and floor channel 20 in vertically spaced relation to receive wall panels 21 and panel supporting studs 22 and keys 23. A pair of wall panels 21a are mounted differently so the partition panels may be inserted last and removed first. The character of the two types of wall assemblies will be described in detail in the following views.

In FIG. 3 the principal components of a single face wall assembly include the ceiling channel 14 which has a pair of spaced flanges 24 directed downwardly. The channel may be suitably secured to the ceiling of a building space by nailing or by adhesive material (not shown). The floor-mounted channel 15 is formed with a high rear flange 25, a low front flange 26 and an inturned lip 27 on the front flange. The channels 14 and 15 are vertically aligned and longitudinally coextensive, except for door or window openings. In this view a fragmentary part of a door opening is shown in the building wall W. The floor channel 15 is positioned flush with the opening and a vertical stud 15' is placed upon the lip 27 with its high flange 25' outermost and its low flange 26' adjacent the wall so the inturned lip 27' faces outwardly. This illustrates the adaptability of using a floor channel member as a stud to frame the panel assembly at an opening. A typical door jam J has flanges 28 directed to cover the stud 15' and the opposite surface of the wall W.

The vertical stud 15' receives a vertical edge of a wall panel 16 and the bottom edge of the panel is thereby aligned on the lip 27 of the floor channel 15 by the inturned lip 27' of the stud 15'. Panel 16 extends along the lip 27 where its opposite edge is engaged in a vertical stud 17. All studs 17 are similar and symmetrically shaped with oppositely opening grooves defined by outer flanges 29 spaced from an inner web 30. Thus the groove formed by a flange 29 and the web 30 embraces the edge of the panel 16 and its companion groove opens in the opposite direction behind the panel 16. It is apparent that the stud 17 is dimensioned so that either groove may be engaged to direct the panel 16 and the dimensions are also entirely compatible with the dimensions of the stud 15'. This feature will allow the components to fit together in several configurations of assembly to be referred to presently. The width of the web 30 is greater than the width of the flanges 29 so that a portion of the web 30 is exposed as a guide for laying up the panels.

The first stud 17 is next abutted by a second similar stud 17 turned so that its front groove faces away from the front groove and its rear groove faces the rear groove of the first stud 17. Prior to placing the second stud a key member 18 is maneuvered into position engaged in the rear groove of the first stud 17. This key member has its bottom end resting in the bottom of the floor channel 15 between the rear flange 25 and the edge of the lip 27. The manner of assembly of the key member 18 locks the first stud 17 in alignment with the stud 15'. The second stud 17 when positioned in abutment with the first stud 17 will have its rear groove engaged by the key member 18 to align its front groove over the lip 27 of the floor channel 15. A second panel 16 may then be engaged in the front groove of the second stud 17, and this step-by-step manner of assembly of studs, key members and panels may be
3 repeated along the wall W to result in a single face wall covering having a flush face in which the exposed flanges 29 are butted. The panels 16 and stud flanges 29 may be given a surface finish treatment which blends or contrasts for the desired decorative effect.

As will presently appear, the upper ends of the panels 16 and studs 17 are captured behind the front flange 24 of the ceiling mounted channel 14. This results in a secure assembly, and the width of each panel 16 between vertical studs 15 or 17 may be dimensioned to avoid flexing inwardly, but great resistance to panel flexing is obtained from the studs 15, 17 or 17A.

In FIG. 4 there may be seen the components for a double faced partition panel wall assembly. The ceiling channel 19 is similar to channel 14 in that it is provided with rear and front flanges 31 opening downwardly. The floor mounted channel 20 differs from channel 15 in that it is formed with low flanges 32 and returned lips 33 aligned in the same plane, and terminating in spaced relation to provide a central open slot. The widths of the lips 33 is slightly greater than the width of the intervening slot.

The vertical studs 22 for this wall assembly are formed to provide three alternately opening grooves with the central groove somewhat deeper and facing oppositely to the lips 33 on the channel 20. Thus, the stud 22 has outer flanges 34 and spaced inner webs 35 such that a groove is formed between the flange 34 and the next inwardly spaced web 35, and a central groove is formed by the spaced webs 35. It can be seen in FIG. 4 that the studs 22 are supported on the floor channel lips 33 with the central groove between lips 35 aligned over the slot between the lips 33. As the at this view, the stud 22 is positioned with the grooves at flanges 34 opening to the right and the central groove opening to the left. A pair of wall panels 21 have the vertical edges engaged in the grooves at flanges 34. A second stud 22 is reversed turned so its grooves at flanges 34 engage the opposite vertical edges of these panels 21, and the central groove opens to the right. A key member 23 is positioned in the central groove with its bottom end passing downwardly in the slot between lips 33 to rest in the bottom of the floor channel 20. The extended width of stud webs 35 provides backing support for the panels 21, and the key member 23 locks the stud 22 to the channel 20.

The next adjacent panels 21A in the assembly of FIG. 4 are assembled differently in that single groove studs 36 are engaged over the vertical edges of these studs 36 with the channel 20 being opposed to the lips 33 of the adjacent studs 22. The panels 21A are placed on the lips 33 or the floor channel 20 and abut the key members 23 which extend outwardly of the central grooves of the adjacent studs 23. The panels 21A are secured by clip means of the character seen in FIG. 8 so that these panels may be inserted when assembling the wall are removed first if the wall needs to be disassembled for any reason.

It is seen in FIG. 4 that the upper ends of the studs 22 and 36 and the panels 21 and 21A are captured in the flanges 31 of the ceiling channel 19. This binds the wall in a stable and secure assembly.

In FIG. 5 a vertical section of a single face panel wall assembly is shown to illustrate the manner of fitting the components together. The first step is to vertically align the ceiling channel 14 and floor channel 15 along the building wall W. A stud 17 is next put in position by inserting the upper end between the flanges 24 of the ceiling channel 14 so the lower end may be placed upon the returned lip 27 of the floor channel 15. A key member 18 is positioned in the innermost groove of the stud 17 by inserting the upper end into channel 15 behind the lip 27 to lock the stud 17 in position. A wall panel 16 is next placed in position by inserting the upper edge in the ceiling channel 14 to allow the bottom edge to rest on the lip 27. The panel 16 may now be slid sideways to engage its vertical edge in the outermost groove of the stud 17. The next adjacent stud 17 is assembled to secure the opposite vertical edge of the panel 16 and a second key member 18 is positioned to lock the panel 16 in position. This step-by-step procedure is followed along the channels 14 and 15 to complete the wall, except that in any given wall run there is incorporated a coplanar panel installation, as may be seen in FIG. 9.

In this latter view the final panel 16A is provided with single groove studs 17A on its vertical edges to match the flanges 29 on the studs 17. This panel 16A is inserted top edge first into ceiling channel 14 and while still raised it is pushed inwardly so the securing clip means (seen in FIG. 8) may be aligned to engage as the panel is allowed to drop onto the lip 27 of the floor channel 15.

As may be seen in FIG. 7 the single groove studs 17A for the vertical edges of panel 16A are formed with a depending key 37 on the rear flange so that the key 37 engages behind the edge of the lip 27 on the floor channel 15. A key member 38 or filler block is positioned in the floor channel 15 adjacent the rear flange 35 to secure the bottom ends of the studs 17A against inward movement. This feature is repeated in the panels 16A where it is found necessary to stabilize the panels.

The assembly of the double face panel wall is illustrated in FIG. 6. In this view the ceiling and floor mounted channels 19 and 20 respectively are vertically and longitudinally aligned in the positions desired, for example as seen in FIGS. 1 and 2. A stud 22 is positioned with its upper end in channel 19 and its lower end resting on the lips 33 of channel 20. A second key member 23 is inserted in the central groove of the stud 22 with its bottom end in the slot between lips 33 to key the stud in position. Next the two opposed wall panels 21 are inserted top edge first in channel 19 so the bottom edges rest on the respective lips 33 of channel 20. They are then slid sidewardly to engage the vertical edges in the respective grooves of the stud 22 at outer flanges 34. A second stud 22 is placed in position in channel 19 and on the lips 33 of channel 20 and move sidewardly to engage the opposite vertical edges of the panel 21. A second key member 23 is then put into position to lock the first two panels 21 in assembly. This procedure is followed for subsequent panels 21, studs 22 and key members 23, except for the final pair of wall panels 21A. For the final wall panels 21A the single groove studs 36 are each formed with a depending key of the character seen at 37 in FIG. 7. A key element or filler block 38 is not necessary in this wall assemble as the deeper form of webs 35 for the central groove of the adjacent studs 22 will extend behind the studs 36 to support the same in conjunction with key members 23.

A suitable locking clip assembly for the final wall panels of either type of panels to secure the final wall panel 40 of FIG. 8 is shown. A key member 40 is formed with mounting flanges 41 on each side of a tapered socket 42. Securing means (not shown) may be inserted in the respective apertures 43 in the flanges 41 to mount the member 40 on the building wall W, as in FIGS. 2 and 9, or upon the inner surface of a panel 21A, as in FIGS. 2 and 11. A hook member 44 is formed with flanges 45 at each end of a tapered tongue element 46. A second tongue element is slanted outwardly by lancing the member 47 at 48 for a suitable distance. The member 44 is secured at apertures 48 to an opposed wall panel 16A or 21A. The clip assembly is located near the center of the panel 16A or 21A so the tongue element 46 slides into the receiver 42 and draws the two panels into proper alignment. The lanced portion 47 acts as a stop to prevent the panel 16A or 21A from moving inwardly.

The present panel wall system may be assembled in a variety of layouts, and certain more common assemblies have been shown in the drawings. In FIGS. 1 and 2 there is shown a slightly recessed panel wall where the exposed flanges 17 or 17A and 22 or 36 are visible to mark the vertical sides of each panel. However, these flanges may be surface treated to match the panels 16, 16A, 21 or 21A so that no contrast or very little contrast is present. Should a recessed panel effect be desired it may be obtained as in FIGS. 9 and 12 where the key members 18 or 23 can be increased in width and the adjacent panels 16 or 21 can be slimmered down or left as is. The two panels may be made equal in width, may be the same or contrasting colors, or may be the same or contrasting textures of surface treatment. If a batten wall effect is desired it may be obtained.
as shown in FIG. 10 for a single surface wall, or it may be obtained for a partition wall, as in FIG. 12, by reducing the width of panels 21 and 21A to make them much narrower than the recessed key panels 23 which are expanded in width from that shown in FIGS. 2 and 4. Other panel layup effects are possible and may be suggested to the observer of the description and drawings in this application for patent.

What is claimed is:

1. In a panel wall assembly the improvement of longitudinally extending floor and ceiling mounted channel members vertically spaced and aligned, said floor mounted channel member having a horizontally directed longitudinal lip; a vertically directed panel member engaged in said ceiling mounted channel member and supported upon said longitudinal lip; stud members at each vertical side of said panel member, said studs having grooves opening toward each other to receive the panel sides, and at least one other groove opening oppositely away from each other; and key means engaged in each of said oppositely opening grooves and extending into said channel members, they key means engaged in said floor channel member below said longitudinal lip to lock said stud members against substantial movement relative to said floor mounted channel member.

2. The improvement of claim 1 wherein said floor mounted channel is formed with a flange spaced from said lip and said flange extending vertically above the plane of said lip, said flange supporting said key means opposite said lip.

3. The improvement of claim 1 wherein said channel members are substantially equal in width, and said stud members being substantially equal to the width of said floor channel and in which there are a pair of grooves, one opening oppositely to the other.

4. The improvement of claim 1 wherein each of said stud members has a pair of grooves opening in opposite directions and defined by a medial web and spaced flanges, said web being wider than said flanges.

5. The improvement of claim 1 wherein each of said stud members has an additional groove adjacent said first mentioned grooves, said grooves being in side by side relation with the center groove deeper than said side grooves and opening oppositely to said side grooves, a second vertically directed panel member engaged in said additional groove, said key means locking both panel members, and said floor mounted channel having a second horizontally directed lip to support said second panel member, said panel members being on opposite sides and lapping said deeper center groove.

6. In a panel wall assembly the improvement of a floor mounted base member providing an upwardly opening channel, a horizontally inturned lip on said base extending partly into said channel, a ceiling mounted top member providing a downwardly open channel, vertically elongated studs extending between said base and top members, each stud providing oppositely opening grooves, one said stud grooves registering over said inturned lip on said base member and the oppositely opening groove registering over said open channel of said base member, a wall panel mounted with a bottom edge on said lip, its opposite longitudinal side edges seated in the grooves of two spaced studs registering over said lip and its top edge extending upwardly within said top member channel, and a key member having its side edges engaged in said oppositely open grooves to two vertical studs, its bottom edge seated in said base member below said lip and its top edge directed into said top member channel.

7. The assembly of claim 6 wherein there are a plurality of panels and key members and said panels and key members are of different widths, and stud members are disposed in alignment with each of said panels at the vertical sides thereof and simultaneously with adjacent key members, whereby the width of said key members disposed between panel members selectively varies from concealment to a batten wall configuration.

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