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MODULAR BUILDING STRUCTURES EMBODYING SLOTTED CEILINGS AND MODULAR PARTITION WALLS

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FIG. 1

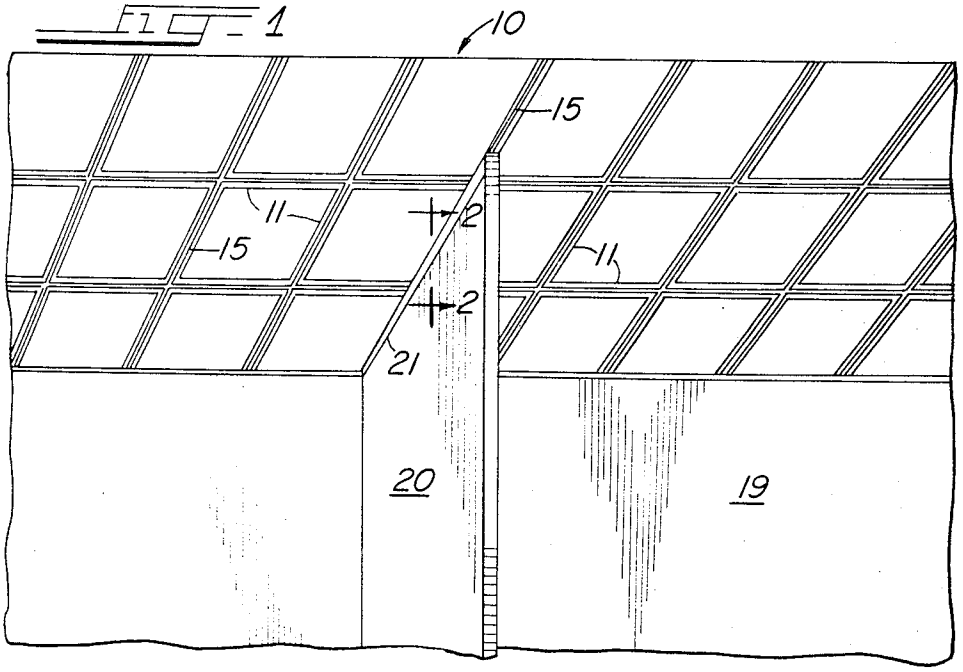


FIG. 2

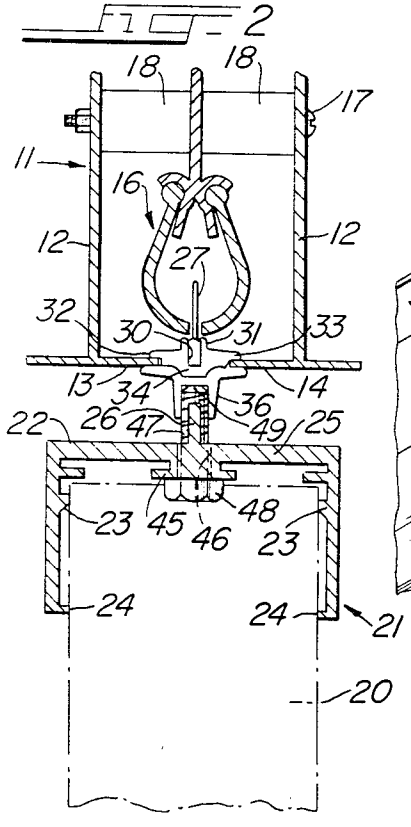
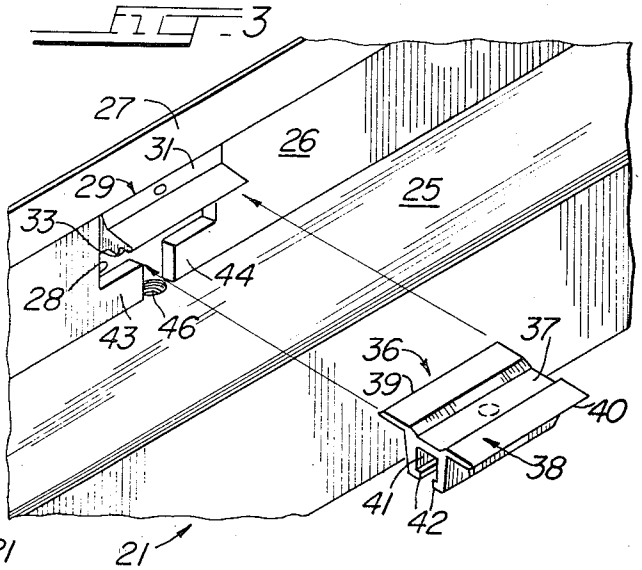


FIG. 3



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MODULAR BUILDING STRUCTURES EMBODYING SLOTTED CEILINGS AND MODULAR PARTITION WALLS

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ABSTRACT OF THE DISCLOSURE

A partition wall is secured to the lips of an elongated slot diffuser in a ceiling by means of opposing jaws carried by a vertical bar which extends into the slot from a header channel at the top of the partition wall.

This invention in general relates to building structures comprising the combination of a ceiling with an elongated, longitudinally slotted member therein, a partition wall extending substantially to the ceiling, and fastening means extending into the slot and attaching the upper edge of the partition wall to said slotted member. More particularly, the invention relates to the aforesaid combination wherein the elongated slotted member is an elongated slot diffuser with spaced, co-planar, elongated, opposing lips defining the longitudinal edges of the slot; said fastening means comprises a downwardly facing channel extending longitudinally about the upper edge of the partition wall immediately below the slot, a vertical member extending from the channel into the slot and grip means (preferably opposing jaws on the vertical member) securing the vertical member to the lips.

In the preferred form of the invention, the jaws comprise an upper jaw attached to the vertical member, an opposing lower jaw vertically slidable on the vertical member, said opposing jaws gripping opposing sides of the elongated slot, and a threaded member threaded in the upper wall of a downwardly facing, U-channel with an end of the threaded member bearing against the lower jaw for purposes of tightening or loosening the grip of the lower jaw against the lips of the slot diffuser.

The invention herein is particularly useful in building structures having modular partition walls, i.e., which may be mounted, removed, and/or rearranged to better suit the particular needs of the building occupants. Such modular building structures integrate the air distribution system in the ceiling of each floor in a modular arrangement. These air distribution systems often provide as the air distribution units elongated slot diffusers of the type described in U.S. Patents Nos. 3,183,821, 3,242,847, 3,185,068, 3,185,069, 3,126,811, etc. Buildings of the modular type often provide considerably greater number of linear feet of slot diffusers than is necessary for air distribution in the various spaces on each floor. Some portions of the slot diffusers are active, i.e., used for supply or return of air, whereas other sections are inactive. The purpose in providing the extra linear feet of slot diffusers is to provide for later rearrangement of the air distribution system when rooms or other occupancy spaces are rearranged by shifting partition walls.

This invention takes advantage of integrated slot diffuser systems in ceilings of buildings by providing for releaseable attachment of the upper edges of the partition walls with the ceiling slot diffusers to provide the upper support for the partitioned walls, thereby providing a large number of possible space and/or room arrangements on each floor of the building. The attachment of the upper edge of the partition wall to the slot diffuser does not block off the air discharge slot, whereby said

slot may be utilized, if desired, in the air distribution system either as an air supply or return.

The advantages of the invention will be further appreciated from the following description of a preferred embodiment of the invention, which is illustrated in the drawing, wherein:

FIG. 1 is a perspective, fragmentary view of a side wall and ceiling of a modular room with a partition wall therein and with elongated slot diffusers in the ceiling;

FIG. 2 is a sectional view taken on section plane 2—2 in FIG. 1; and

FIG. 3 is a fragmentary, perspective, detail of the inverted, U-channel, partition wall-mounting member and the diffuser-gripping jaws thereof, the lower portion of which is shown in exploded view.

Referring to the drawing, the building structure comprises a ceiling **10** having provided therein elongated, longitudinally slotted members, which may be elongated slot diffusers **11** and may be arranged in parallel relationship extending in only one direction, or, as illustrated, in two directions at right angles. Such slot diffusers and their arrangements are generally well known in the art. The ceiling **10** may be a fixed ceiling, which is rigidly attached to the building structure or to maybe a suspended ceiling supported by hangers and wires, rods or the like from a fixed ceiling or from rigid framework of the building.

The slot diffusers **11** are described in only general detail inasmuch as they are generally well known in the art. They comprise elongated, opposing side walls **12** having at least one, and usually two lips or flanges **13** and **14**, defining in the bottom wall of the air flow channel between side walls **12** an elongated, air distribution slot **15**.

The active sections of the slot diffusers **11** normally have an air pattern controller mounted between the side walls **12**. Such air pattern controller is used to direct air discharge from the slot **15** in either a substantially horizontal pattern along the ceiling, or in a downward vertical pattern. Such patterns and the means for attaining the same are described in the aforesaid patents and the like.

The air pattern controller **16**, as shown in FIG. 2, is mounted in the air flow channel between the side walls **12** by means of bolts **17** and spacers **18**, substantially as described in U.S. Patent No. 3,185,069. The air pattern controller, per se, does not constitute a part of this invention, and the illustrated pattern controller **16** is provided for purposes of illustration as a preferred type for use in the slot diffusers **11**. It is also capable of functioning as a close-off damper. For further details of the pattern controller and its mode of operation, reference is made of U.S. Patents Nos. 3,185,068, 3,185,069 and 3,242,847.

The modular building structure will have fixed, outer or partition walls **19** and modular or movable partition walls **20**. The partition wall **20** has an elongated partition wall support **21** extending along and about its upper edge. The partition wall is conveniently made in the form of an extrusion, or, if desired, by roll forming or the like. It comprises a downwardly facing, elongated, U-channel **22** fitted about the upper edge of the partition wall. If desired, the partition wall may have on the interface of its side walls elongated longitudinally extending ribs or lips **23** and **24**, the latter at the mouth of the downwardly facing U-channel. These ribs or lips constitute bearing surfaces which seat against the respective sides of the upper edges of the partitioned walls **20**.

The upper wall **25** of the U-channel **22** has an elongated, vertically upwardly extending bar **26** having a thinner upper edge **27**. The bar **26** has a plurality of T-slots **28** provided therein at desired intervals, one of which is shown in FIG. 3. The upper edge of the hori-

zontal leg of the T-slot receives an upper jaw **29**, which is mounted tightly on the bar **26** by fitting the upper edge of the T-slot in the longitudinal slot **30** of jaw **29**, whereby the latter extends along the upper edge of the horizontal leg of the T-slot. The longitudinal slot **30** is formed in the longitudinally extending raised portion **31** of the upper jaw **29**.

The upper jaw has on its longitudinal edges lips **32** and **33** providing gripping faces adapted to bear on the upper surfaces of flanges or lips **13** and **14** adjacent the slot **15**. The upper jaw also has on its lower surface a longitudinal, centrally disposed, rib or raised portion **34** adapted to substantially matingly receive the longitudinal channel **37** in the upper surface of top wall **38** of the vertically movable lower jaw **36**.

The lower jaw **36** has longitudinal flanges **39** and **40** adapted to bear against and grip, in coaction with lips **32** and **33**, the lower surfaces of the diffuser lips or flanges **13** and **14** adjacent slot **15**, whereby the jaws **29** and **36** coact as vise-like clamps in securing the partition wall support **21** to the slot diffuser **11**.

To provide for movement of the lower jaw **36** toward and away from the upper jaw **29**, the lower jaw has on its underside a longitudinal channel **41** having inwardly directed lips **42** at the bottom edge thereof. The lips **42** are in sliding contact with the segments **43** and **44** of the vertical bar **26**, said segments being immediately below the horizontal crossing of the T-slot **28** and on opposite sides of the vertical leg thereof. The lower jaw is thus movable toward and away from its opposing upper jaw **29** and is guided in this movement by the edges of the horizontal crossleg of the T-slot against opposite ends of the lower jaw **36** and by a sliding fit of lips **42** against the segments **43** and **44**.

The upper wall **25** of the channel **21** has on its inner side a longitudinal, flanged rib **45** in which a plurality of vertical, tapped holes **46** are provided at spacing intervals corresponding to the spacing of the T-slots **28**. The tapped holes **46** are positioned below and in alignment with the vertical T-slots **28** as shown in FIG. 3. The threaded shank **47** of bolt **48** is threaded into the tapped hole **46** and extends into the channel **41** of the lower jaw **36**, with sufficient portions of lips **42** being removed to permit the shank **47** to extend into the channel **42**. The upper end **49** of the shank **47** bears against the lower surface of the wall forming the bottom of the channel **37**, whereby threading of the bolt **48** provides for movement of the lower jaw **36** toward and away from the upper jaw to tighten or loosen the clamping action of the two jaws on the lips **13** and **14** of the slot diffuser by turning of the bolt **48**.

It will be seen from the foregoing disclosure that the invention provides new combinations in building structures enabling the utilization of soltted members in a ceiling to be used as partition wall supports, and has particular application in modular room structures in which the partition walls are easily added, removed, or changed to suit the desires of the occupant. The invention further provides new partition wall mounting members with a member adapted to fit about and hold the upper edge of a partition wall and a grip member or grip means for attaching the mounting member for attaching the latter to an elongated slot in a ceiling in the preferred form, the grip member or grip means comprising jaw members with jaw faces adapted to grip opposite sides adjacent the slot of an elongated slot diffuser with an elongated slot in the bottom wall thereof.

It is thought that the invention and its numerous attendant advantages will be fully understood from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, the forms herein disclosed being preferred embodiments for the purpose of illustrating the invention.

The invention is hereby claimed as follows:

1. A building structure comprising the combination of a ceiling with an elongated member having elongated, coplanar, opposing lips defining the longitudinal edges of an elongated slot, a partition wall extending substantially to said ceiling below said slot, a downwardly facing channel extending longitudinally about the upper edge of said partition wall immediately below said slot, a vertical member extending from said channel into said slot, an upper jaw attached to said vertical member, an opposing lower jaw vertically slidable on said vertical member, said jaws gripping opposing sides of said lips, and a threaded member threaded in said channel with the upper end of said threaded member bearing against said lower jaw.

2. A partition wall mounting member comprising an elongated, downwardly facing, U-channel adapted to fit about the upper edge of a partition wall, a vertical member extending upwardly from said channel, an upper jaw attached to said vertical member, an opposing lower jaw vertically slidable on said vertical member, said jaws having jaw faces adapted to grip opposite sides of lips forming the elongated slot of a slotted member in a ceiling, and a threaded member threaded in said channel with the upper end of said threaded member bearing against said lower jaw.

3. A building structure comprising the combination of a ceiling with an elongated member having elongated, opposing lips defining the longitudinal edges of an elongated slot, a partition wall extending substantially to said ceiling below said slot, a downwardly facing channel extending longitudinally about the upper edge of said partition wall immediately below said slot, an elongated, vertical bar extending upwardly from the mid portion of said channel into said slot, said bar having a plurality of T-slots with the vertical legs thereof intersecting the lower edge of said bar, an upper, fixed jaw mounted in the upper portion of respective cross-legs of said T-slots, a lower, movable jaw slidably mounted in the lower portion of respective cross legs of said T-slots, means guiding movement thereof toward and away from respective upper jaws, and a member having a threaded shank threaded in said channel immediately below respective vertical legs of said T-slots with said shank extending into respective vertical legs and the upper end thereof bearing against said lower jaw for imparting clamping movement to said lower jaw.

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