Nov. 7, 1967 P. H. MILLER 3,350,831

MOUNTING DEVICE WITH FLEXIBLE TAB FOR WALLBOARD

Filed July 1, 1965 2 Sheets-Sheet 1

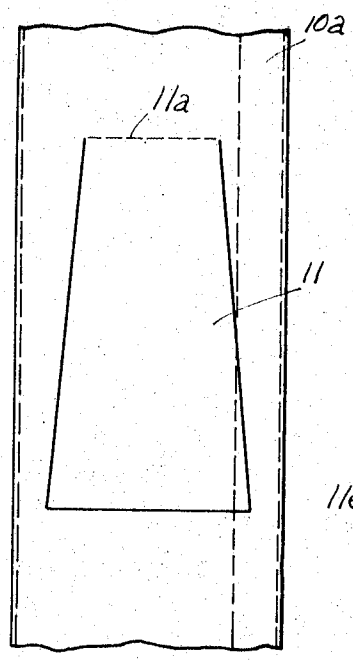


FIG. 1

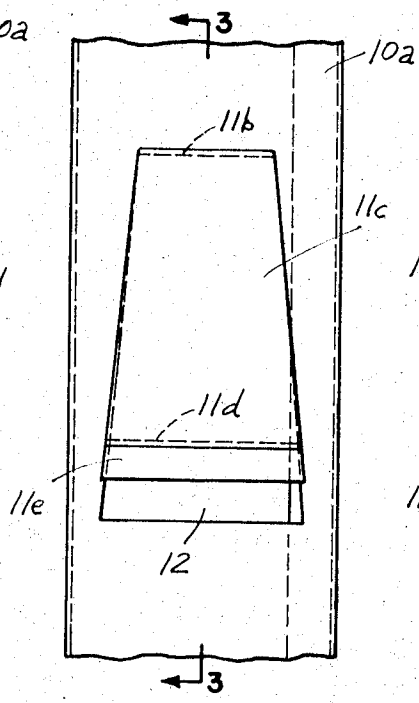


FIG. 2

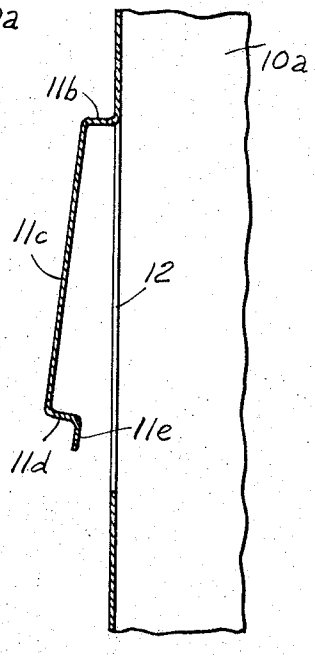


FIG. 3

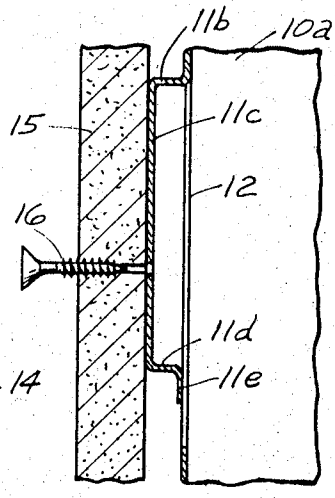


FIG. 4

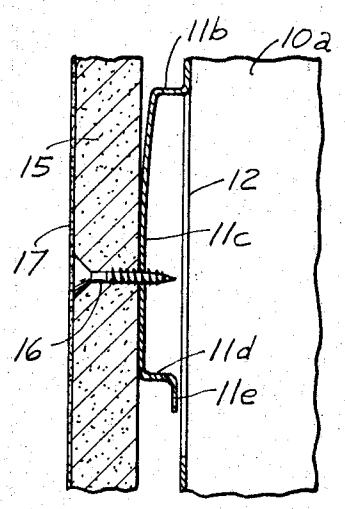


FIG. 5

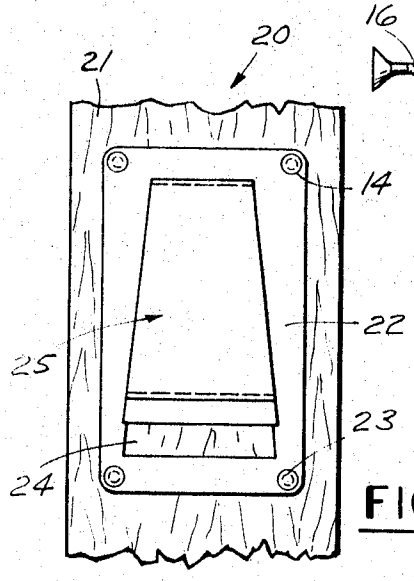


FIG. 7

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MOUNTING DEVICE WITH FLEXIBLE TAB FOR WALLBOARD

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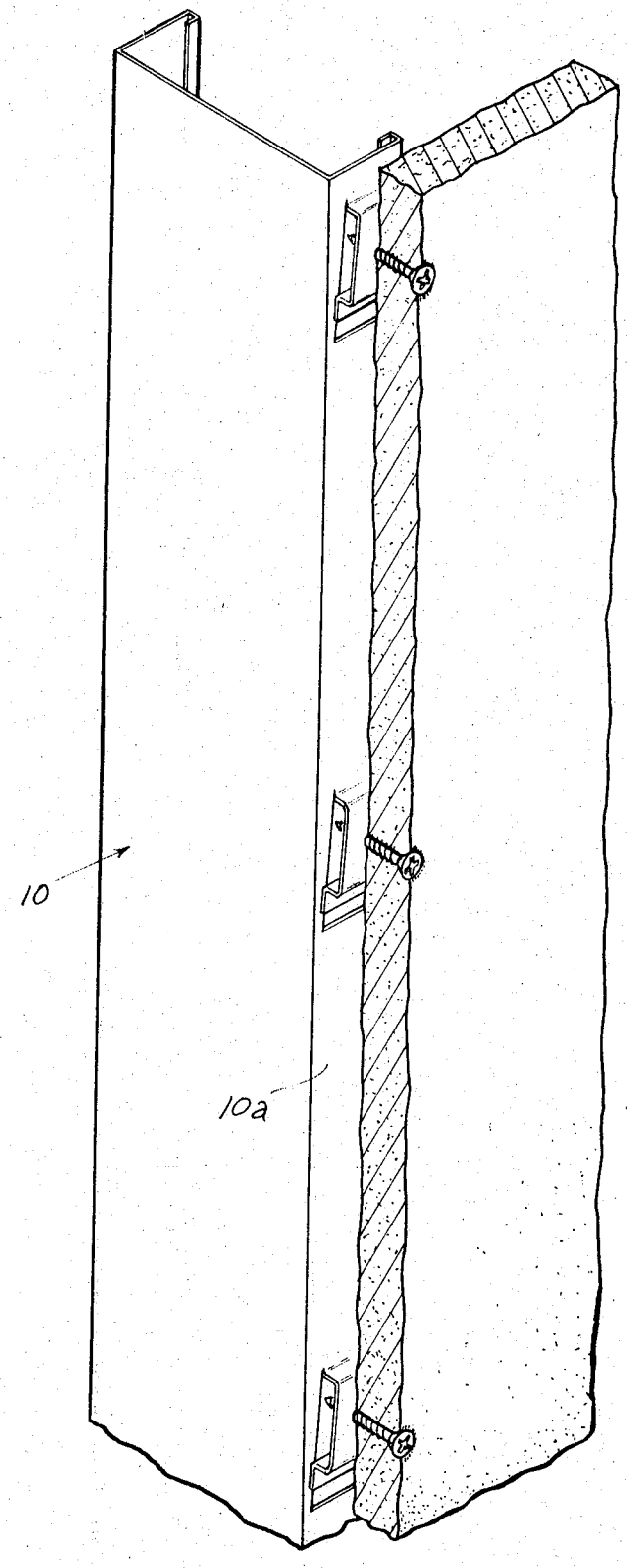


FIG. 6

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MOUNTING DEVICE WITH FLEXIBLE TAB FOR WALLBOARD

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ABSTRACT OF THE DISCLOSURE

A sound-damping device for securing a wallboard to a structural support member such as a wooden 2 x 4 which supports the wallboard by a shaped flexible tab secured rigidly to the support member and to the wallboard by means of a flexible web, thereby breaking the sound resonance chain between the wallboard and the support member.

The present invention relates to a mounting device for securing wallboard of any type to a structural framing.

The mounting device of the invention is particularly advantageous for securing wallboard to the framing for a non-load-bearing wall, but it is also suitable for securing wallboard to load-bearing structural members, such as wooden 2 x 4's as widely used in the building industry.

In modern commercial building, such as office buildings and multi-unit apartment buildings, the load-carrying structure is generally a skeleton frame of steel girders and beams. The construction of the partition walls in such buildings by means of non-load-carrying sheet metal frames to which wallboard is directly and fixedly secured, is sturdy, rapid and inexpensive, but it has the disadvantage that it offers a low insulation to the transmission of sound, so that there is or may be an objectionable lack of privacy for the occupants of the building.

The low sound insulation capability of partition walls constructed by directly securing wallboard to sheet metal framing, or also to wooden 2 x 4's, is primarily due to the fact that sound waves impinging upon the wallboard on one side of the framing are directly transmitted to the framing proper and again directly transmitted by the framing to the wallboard on the opposite side thereof. As a result, the entire wall structure tends to function in the manner of a resonant body and produces what is sometimes referred to in the building trades as a drum effect.

Attempts have been made to break the above-described resonance chain in the wall structure by interposing separate resilient members between the wallboard and the supporting framing. While such resilient members as heretofore known may serve the purpose, they are expensive to manufacture and to install.

It is a broad object of the invention to provide a novel and improved sound-damping device which is highly efficient and also inexpensive to manufacture and to install.

A more specific object of the invention is to provide a novel and improved device which constitutes an integral part of a supporting metal framing. This has the advantage that the sound-damping device need not be mounted on the framing before the wallboard is secured thereto by means of the device according to the invention.

Another more specific object of the invention is to provide a novel and improved device which is formed out of the material of the metal framing by a simple cutting and bending or pressing operation.

Still another more specific object of the invention is to provide a novel and improved device which is substantially rigid when and while a wallboard is secured to the framing by screwing in a conventional manner and automatically becomes resilient upon completion of the screwing operation.

A further object of the invention is to provide a novel and improved sound-damping device which can be simply and rigidly secured to a wooden structure, such as 2 x 4's, for instance, by nailing, screwing or gluing.

It is also an object of the invention to provide a novel and improved method of producing sound-damping mounting devices according to the invention.

Other and further objects, features and advantages of the invention will be pointed out hereinafter and set forth in the appended claims constituting part of the application.

In the accompanying drawing, several preferred embodiments of the invention are shown by way of illustration, and not by way of limitation.

In the drawing:

FIG. 1 is an elevational view of a structural member in which a cut has been made for producing a sound-damping device according to the invention;

FIG. 2 is an elevational view of the finished device;

FIG. 3 is a section taken on line 3—3 of FIG. 2;

FIG. 4 is an elevational section showing a wallboard in the process of being secured to the device of the invention as shown in FIGS. 2 and 3;

FIG. 5 is a sectional elevational view showing the wallboard secured to the device;

FIG. 6 is a perspective view, partly in section, of a wall board secured to the framing by three sound-damping devices according to the invention; and

FIG. 7 is an elevational view of a finished sound-damping device secured to a wooden structural member.

Referring now to the figures in detail, the device is shown as being integral with a support or framing member to which a wallboard, such as a gypsum board or plasterboard, is to be secured. More specifically, the sound-damping device of the invention is formed directly out of the material of the structural member. The member shown in FIGS. 1 through 6 should be visualized as being a U-shaped girder **10** made of a suitable more or less flexible sheet metal; that is, the structural framing member is not designed to carry the load of the structure in which it is used. FIG. 6 shows the member in cross section. The sound-damping device is formed out of the material of one of the flanges of member **10**. FIGS. 1 through 5 should be visualized as presenting a view upon flange **10***a* of structural member **10**. The web of the member determines the thickness of the wall, as is customary in wall constructions of the kind here involved.

To produce the sound-damping device of the invention, a generally frusto-conical cut-out **12** is made in the material of flange **10***a* by any means known and suitable for the purpose to form a generally frusto-conical tongue **11**. The narrow end of the tongue is left attached at **11***a* to the material of flange **10***a*. The tongue in its entirety is then bent up in reference to the plane of the flange, preferably at approximately a right angle. As is shown in FIG. 3, the tongue is then again bent off to form a narrow strip **11***b* and a major tongue portion **11***c* which extends at substantially a right angle from the narrow tongue portion **11***b*. The end of tongue **11***c* is again bent off at **11***d*. The length of the bent-off tongue portion **11***d* is preferably approximately equal to the length of tongue portion **11***b*. Strip **11***d* thus formed may again be bent off to form a flange **11***e* which extends substantially parallel to major tongue portion **11***c*. The resulting structure can best be seen in FIG. 3.

As a result of the afore-described bending operations, the effective length of tongue **11** between its attached edge **11***a* and the end of flange **11***e* is less than the total length of the cut-out, as is clearly apparent from FIG. 2. The maximal width of the tongue, that is, the width of the tongue at the edge of flange **11***e*, of course remains unchanged. Accordingly, the tongue, and more specifically

the flange portion **11***e* thereof, when pressed against the underlying material of flange **10***a*, will overlie the same, or in other words, the underlying material of the flange **10***a* will constitute an abutment for flange **11***e* of the tongue.

Due to the inherent elasticity of flange **10***a*, the tongue will tend to occupy the position shown in FIG. 3. To assure that the tongue is biased away from the flange, the angle between the tongue portion **11***b* and the tongue portion **11***c* is preferably slightly greater than 90°.

While the sound-damping device is preferably formed directly out of the material of flange **10***a*, it is also possible and within the scope of the invention to produce the device out of several webs or strips fixedly secured to each other and to flange **10***a*, for instance, by soldering or welding.

Furthermore, the springy tongue may have a shape other than the exemplified frustoconical shape. For instance, the tongue may be oval or circular. It is essential only that the tongue, after being cut out of the material of flange **10***a* and bent as described and illustrated, has a maximal width greater than the maximal width of the cut-out, so that the material of the flange constitutes an abutment for the tongue, the purpose of which will be more fully explained hereinafer.

The wallboard **15** is secured to the sound-damping device, and more particularly the portion **11***c* thereof, in a conventional manner, for instance, by driving a suitable wallboard screw **16** through the wallboard and through tongue portion **11***c*, as is shown in FIGS. 4 and 5.

As is evident, the pressure of the screwing operation and/or manual pressure applied to the wallboard will press tongue portion **11***c*, which is biased away from the flange (see FIG. 3) into firm engagement with the marginal material of flange **10***a*, thereby providing a stable and substantially rigid support base for the screwing operation.

Upon completion of the screwing operation, tongue portion **11***c* will spring back slightly, due to its inherent elasticity, as is shown in FIG. 5. As has been previously explained, such resiliency of the support for the wallboard produces the desired break in the transmission of sound from the outside of wallboard **15** to the outside of a wallboard on the opposite side of the wall structure.

The mounted wallboard may be papered or paneled in a conventional fashion, as is indicated at **17**.

Several suitably spaced sound-damping devices are provided along the length of the structural support or frame member **10**, as is indicated in FIG. 6.

FIG. 7 shows a sound-damping device **20** utilizing the same principle as does the previously described device, but constructed as a separate unit attachable to a wooden support member or stud **21**, such as is conventionally and widely used in the building industry.

The device according to FIG. 7 comprises a base plate **22** made of a suitable elastic material and secured to the wooden support member by suitable fastening means, such as screws or nails **23**. Plate **22** includes a frustoconical cut-out **24**, and the material of the cut-out is used to form a tongue of the configuration previously described and illustrated in the preceding figures.

The function of the device of FIG. 7 is evident from the foregoing description.

While the invention has been described in detail with respect to certain now preferred examples and embodiments thereof, it will be understood by those skilled in the art, after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention, and it is intended, therefore, to cover all such changes and modifications in the appended claims.

What is claimed is:

1. A sound-damping device for securing wallboard to a structural support member, said device comprising a base plate including an elongated lengthwise widening cut-out, a first web extending from said base plate adjacent to the narrow end of said cut-out at an angle in reference to the plane of said base, a flexible second web of generally increasing width extending from the free edge of said first web toward the wide end of the cut-out substantially parallel to the plane of the base plate but spaced apart therefrom and a third web extending from the free end of said second web toward said base plate, said third web overlying a portion of said cut-out and having a terminal edge bridging a portion of the cut-out.

2. A device according to claim **1**, wherein a fourth web extends from the terminal edge of the third web substantially parallel to the plane of the second web.

3. A device according to claim **1**, wherein said base plate is made of flexible material, and wherein said cut-out and said second web each have a substantially frustoconical outline.

4. A device according to claim **1**, wherein said cut-out and said second web each have a generally frustoconical outline.

5. A sound-damping structural support member for mounting wallboard, said support member having a flat wall portion including a cut-out of generally widening outline, a first web extending from said wall portion adjacent and parallel to the narrow end of said cut-out at an angle in reference to the plane of said wall portion, a second web made of flexible material extending from said first web at the free edge thereof toward the wide end of the cut-out substantially parallel to the plane of said wall portion but spaced apart therefrom and a third web extending from the free end of the second web toward said flat wall portion, said third web overlying a portion of said cut-out and having a terminal edge bridging a portion of said cut-out.

6. A sound-damping structural support member according to claim **5**, wherein a fourth web extends from the free end of said third web substantially parallel to the plane of the second web.

7. A sound-damping device for securing a wallboard to a structural support member, said device comprising:

a base plate made of flexible material and including a tab of generally frusto-conical outline struck out of the material of the base plate and defining a corresponding opening therein, the narrow end of said tab being integral with the base plate, said tab having a first portion outwardly extending from the tab integral with the base plate and disposed at an angle thereto, a second portion contiguous with the first portion and disposed in a plane substantially parallel to the plane of the base plate, and a third portion contiguous with the second portion and extending toward said base plate, the terminal edge of said third tab portion bridging a portion of said opening in the base plate.

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