March 3, 1942. L. W. BENZ 2,274,653

PANEL SECURING MEANS

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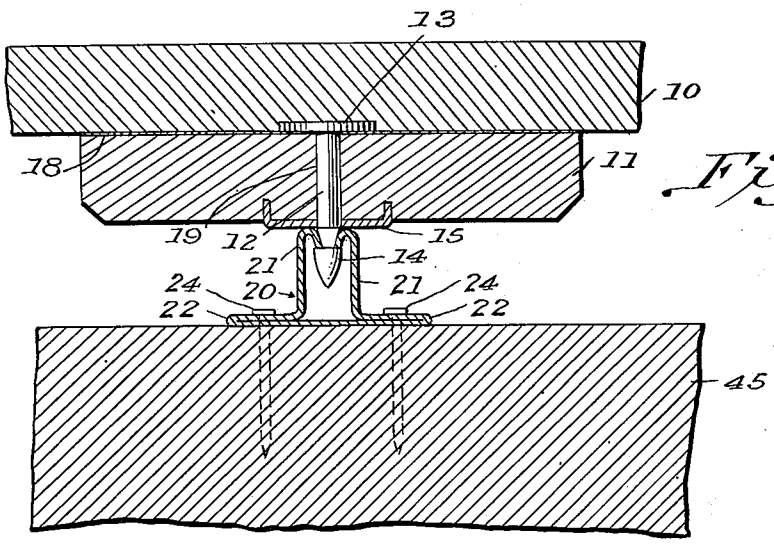


Fig. 1.

Fig. 3.

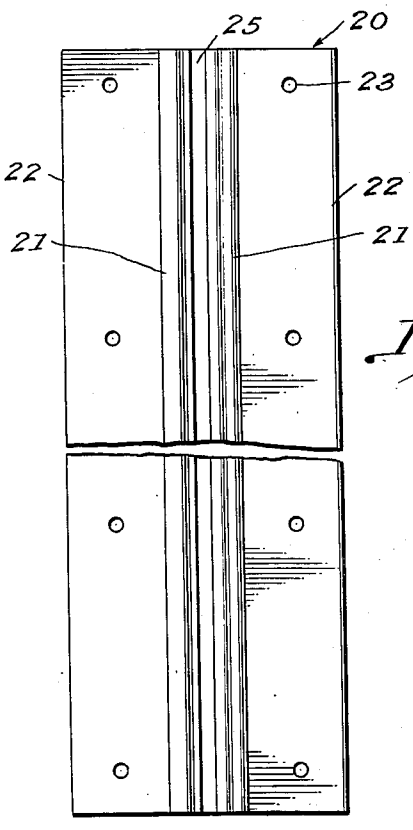
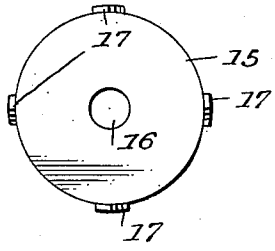


Fig. 2.



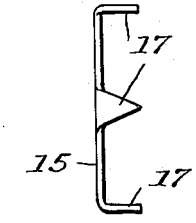


Fig. 4.

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Fig. 5.

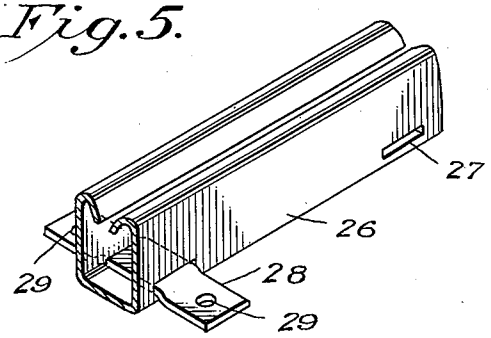


Fig. 6.

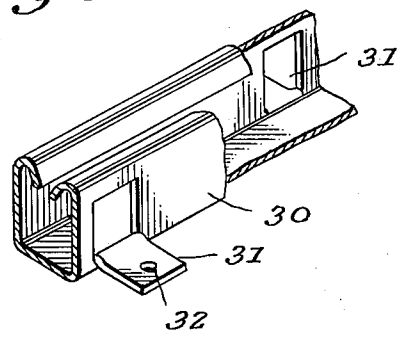


Fig. 7.

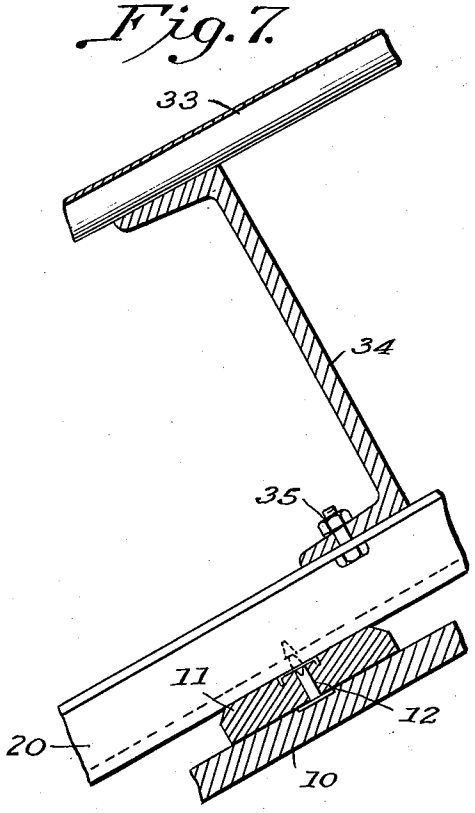
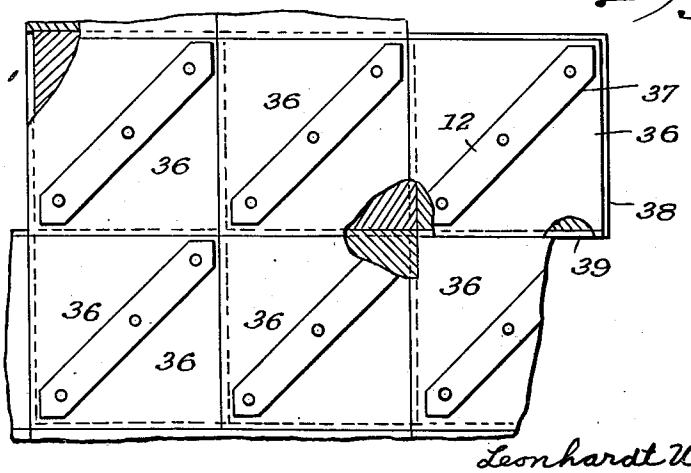


Fig. 8.



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PANEL SECURING MEANS

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9 Claims. (Cl. 72—118)

The present invention pertains to panel securing means for building construction in which walls, ceilings or ducts are paneled with suitable materials.

It is customary to secure panels of material directly to the wall structure by fastenings such as brads or nails. While snap-fastening devices recently have been introduced for the above purpose, this invention represents a marked improvement over other known forms of snap-fastened panels.

A dominant object of this invention is to provide simple and efficient snap-fastening means for securing structural panels.

Another object is the provision of concealed fastening means which serve also to reinforce the panel to which they are attached.

It is also an object of the present invention to provide a novel manner of attaching structural panels in place.

One of the specific objects which the present invention attains is the provision of novel means for mounting or securing panels of acoustic board which are of relatively low density and nearly negligible structural strength.

Other objects and the further nature of the invention will be obtained from the accompanying drawings and the ensuing specification and claims.

With reference to the drawings which illustrate simple and preferred embodiments of this invention:

Fig. 1 shows a detailed cross section of one embodiment of the invention.

Fig. 2 is a plan view of one element of the fastening means.

Fig. 3 illustrates in plan view a washer which forms a part of the invention.

Fig. 4 is a side elevation of the washer.

Fig. 5 represents a modified form of fastening element.

Fig. 6 shows a further modification of the same fastening element.

Fig. 7 illustrates by a partly sectioned view an application of the invention.

Fig. 8 shows an additional application of the invention, fragmentary sections being taken at certain points.

Where the terms "panel," "panel member" and "architectural panel" are used herein it is to be understood that they include any suitable sheet material. The invention is illustrated in its application to wall board, but obviously other paneling material such as wood, wood veneer, and glass may be substituted. Some of the commercial paneling materials to which the invention is applicable are Masonite, Presswood, Celotex, Temlock, Catalin, and Formica.

In its fundamental aspects the invention comprises a pair of complemental fastening elements, one of which is secured to a panel by means of a perforated strip, and the other of which is secured independently to a beam or the like. The fastening element on the panel is not visible from the outer face thereof, and does not weaken, because it does not penetrate the panel.

In Figs. 1, 2, 3, and 4 there is illustrated one embodiment of the invention which comprises a sheet or imperforate panel 10, a rectangular strip member 11 which may be of material similar to the panel, a layer of adhesive 18 for securing the strip to the panel, a stud-like fastening element 12 carried by said strip 11, and a snap-fastening element 20 which is complemental to the element 12.

The strip or member 11 is perforated as at 19 to receive the shank of a fastening element 12 which is provided with an enlarged, circular head 13 on the end which rests between the inner or under face of the panel 10 and the upper side of the strip 11. The other end of the fastening element 12 extends a short distance below strip 11 and has a head 14 shaped like the point of a bullet. A shoulder is provided at the base of the head 14 by reducing the diameter of the shank of element 12 at this point.

Any commercially available adhesive which will give a satisfactory bond between the materials constituting the panel and the strip may be used.

A female or complemental snap-fastening element 20 is shown in retaining engagement with the element 12. The element 20 may be formed by bending a somewhat resilient, rectangular, metal sheet to provide a pair of horizontal shoulders or attaching flanges 22 and a pair of vertical side walls 21 with inturned, opposed edges for engaging the shoulder at the base of head 14 of the fastening element 12.

These walls 21 with their inturned edges provide an extended slot 25, indicated in Fig. 2. Nails 24 passing through apertures 23 may be used to secure the snap-fastening element 20 to a beam 45, the element 20 serving as a furring strip and spacing the panel 10 from the beam or structural framework.

A washer member 15 (Figs. 3 and 4), having an aperture 16 encircles the fastening element 12 and provides a reinforcing member and a bearing surface for the side of the strip 11 from which

the head 14 extends; it is secured to strip 11 by means of four integral prongs 17.

After the stud-like fastening element 12 has been snapped into engagement with the resilient, snap-fastening element 20, it may be slid along the slot 25, and may be removed from the end of said slot.

In Fig. 5 there is shown a modified form of snap-fastening element 26, which may be substituted for the element 20. It differs from the latter only in the plate 28 which extends through aligned slots 27 in the sides and near the base of the element 26, and takes the place of the integral flanges 22. Attaching apertures 29 are provided in the plate 28 for receiving a nail, rivet, screw or bolt.

An additional modification of the snap-fastening element is illustrated in Fig. 6. A fastening element 30, similar in most respects to the element 20 has integral attaching lugs 31 struck from its opposite side walls and bent into the horizontal position shown in Fig. 6. Each lug may be provided with an attaching aperture 32. The lugs may be secured by welding when they engage another metal member.

An application of the invention to a roof construction is illustrated in Fig. 7. A roof 33 is supported by a steel section 34 and the fastening element 20 is secured to the section 34 by means of a bolt 35. The panel 10 is attached as a ceiling to the under side of the roof 33 by the fastening element 12 which has been described previously.

Various other ways of using this invention will appear to those skilled in the art. As an example, Fig. 8 shows the under surface of an assembled set of panels. To the under face of each of a plurality of square panels 36, there is secured diagonally a strip 37, similar in all respects to the strip 11. Each panel 36 has tongues 38 and grooves 39 at its edges. The snap fastening elements 20 will be secured in strips to a wall in parallel arrangement corresponding to the angular position and spacing of the strips 37 of Fig. 8. After snapping the stud-like elements 12 of a panel into engagement with one of the snap-fastening elements 20, the panel may be moved until the tongue and groove adjacent its advancing corner engage a groove and tongue respectively of previously mounted panels. The panel 36 at the upper right of Fig. 8 could be moved into tongue and groove engagement with the two panels having each a side adjacent to the first identified panel.

The operative assembly of my invention comprises the following steps: Perforating a fastener-carrying reinforcing strip 37 at the aligned points indicated by the fastening elements 12, 12 (Fig. 8) inserting said fastening elements 12 through the strip 37 at the points of perforation so that their enlarged heads 13 lie flush with one side of the strip and their fastening heads 14, extend beyond the other side, adhesively securing the strip thus prepared to the under side of a panel 36 with the enlarged heads 13 adjacent the panel, and securing said panel to a snap-fastening element 20 which is complemental to the head 14 of the fastening element 12.

When the fastening elements are attached together, the panel may be slid with respect to the element 20. Such a mounting permits the panels to shift in response to appreciable expansion. In ordinary practice the element 20 will be carried by a member to which the panel is to be mounted, having been secured thereto before the fastening elements 12 and 20 are joined.

A wide variety of arrangements of strips on panels may be made, and for that reason those disclosed in the present specification must be considered as merely illustrative.

The invention herein disclosed has been found extremely useful in securing panels of acoustic board to air conditioning ducts. Surface condensation and subsequent deterioration of the acoustic material is prevented by spacing it from the duct. The panels are strengthened so that they can be mounted in such a spaced relationship by the reinforcing strips or members which are fastened to their under faces.

Having described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. The combination of a panel member, a strip adhesively secured to the under side of the panel member, a stud-like element projecting outwardly from and penetrating only said strip, and an element which is complemental to the stud-like element.

2. The combination comprising a panel member, a strip adhesively secured to the under side of the panel member, and a pair of complemental snap-fastening elements, one of which penetrates the strip only and the other of which is adapted to be secured to a fixed element of a building.

3. In combination, an architectural panel, a strip secured in face-to-face relation with the under side of said panel solely by adhesion, and a pair of complemental snap-fastening elements one of which penetrates only said strip and is arranged in a position adapted to engage its complemental element, said latter complemental element being provided with flange means for attaching it to the member on which the panel is to be mounted.

4. The combination comprising an architectural panel; a reinforcing strip which is secured solely by an adhesive to the back side of the panel, said strip being provided with a series of perforations; a plurality of headed stud-like fastening elements extending through said perforations and having their respective heads retained between the panel and the strip; and a complemental fastening element engaging the stud-like elements.

5. In combination an architectural panel, a perforated strip on the under side of said panel, an adhesive securing said panel and strip, a stud-like fastening element with an enlarged head and extending through a perforated portion of the strip and retained between the panel and upper side of the strip by its enlarged head, a reinforcing washer mounted on the underside of said strip and encircling said stud-like fastening element, and a snap-fastening element which is complemental to said stud-like element.

6. The combination comprising an architectural panel of relatively low density and nearly negligible structural strength, a reinforcing strip of the same material and of generally rectangular cross-section, said strip having aligned perforations extending therethrough and having one face in contact with the inner face of the panel, an adhesive securing the panel and strip together, headed stud-like fastening elements extending through the perforations of the strip and having their heads retained between the panel and strip, and means for securing the stud-like elements to a structure, said means comprising a

resilient snap-fastening strip along which the panel may be slid.

7. The combination comprising a panel of relatively low density wall board material, a reinforcing and attaching member having one face in contact with the inner face of the panel, an adhesive securing the panel and member together, a snap-fastening element penetrating only the attaching member and projecting from another face thereof, and a complemental fastening element adapted to be secured to a structure and constructed and arranged to retain the panel in spaced relation thereto.

8. In combination, an imperforate architectural panel of relatively low density and nearly negligible structural strength, a perforated reinforcing strip of generally rectangular cross-section having one face in contact with the inner face of the panel and its perforations extending from the inner face of the panel to an opposite face of said strip, an adhesive securing the panel and strip together, headed stud-like fastening elements extending through the perforations of the strip and having their heads between the panel and strip, and means for securing the stud-like elements to a member of a building structure.

9. In a building construction, a panel member, a strip secured adhesively in face-to-face relation to the inner side of the panel member, a stud-like element projecting outwardly from and penetrating only said strip, an element which is complemental to said stud-like element, and a structural framework, said complemental element being secured to said framework and adapted to support the panel member in spaced relation thereto.

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