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A. C. OLSEN

2,335,302

BUILDING STRUCTURE

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Fig. 1.

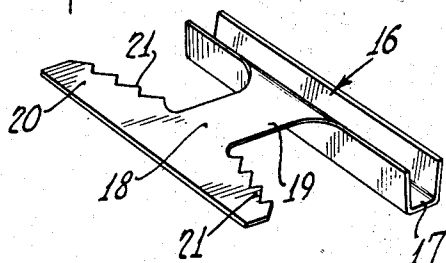


Fig. 3.

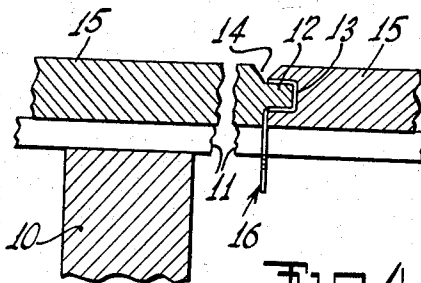


Fig. 5.

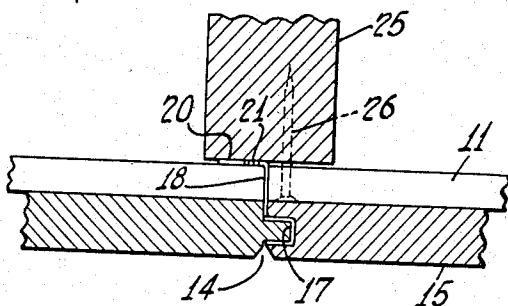


Fig. 4.

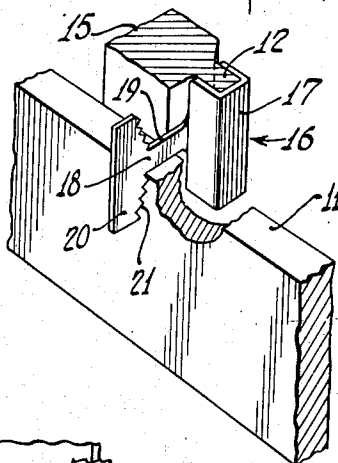
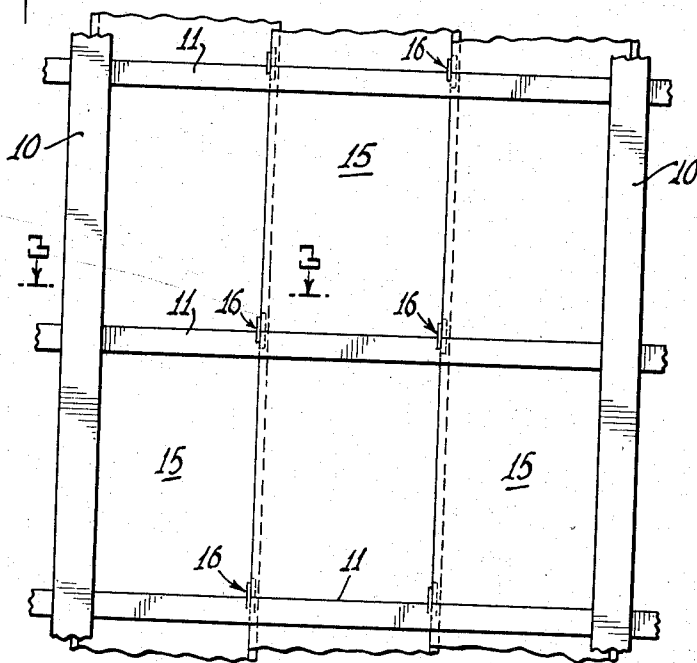


Fig. 2.



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BUILDING STRUCTURE

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9 Claims. (Cl. 72-118)

This invention relates to building structures and particularly to wall and ceiling constructions of the built-up panel type.

In the construction of buildings of all types, including homes as well as business and commercial structures, there is an increasing tendency to employ, as wall and ceiling coverings, assemblages of panels instead of plaster, stucco, and the like. Panels made of fiber insulating board are extensively used for that purpose. These panels generally include the types known in the trade as tile and plank. The designation "tile" is generally used to indicate relatively small size sections, including square sections, such as 12" x 12", 16" x 16", and rectangular sections such as 16" x 32" and 24" x 48". The designation "plank" is generally used to indicate relatively elongated rectangular panels which are usually furnished in lengths of 6' to 12' and in widths of 8" to 16". By the use of these panels, ornamental effects of variable character can be easily realized, and sound absorbing materials employed over specified areas. Panels made of gypsum or like materials may be similarly utilized, particularly where fireproofing is desired. In addition, savings are generally realized when a wall or ceiling covering of the panel type is employed, the cost of installation being reduced, in some cases to a substantial extent.

The present invention has for its purpose to provide an improved panel attachment means which is particularly suitable for use in the assembly of wall and ceiling coverings of the type in which the panels are formed with tongues and grooves or similar mating formation on their opposite edges. It contemplates the provision of attachment elements embodying a portion which is adapted to be received within the groove formed in one edge of one panel and to extend around the tongue projecting from the edge of the adjacent panel and a transversely extending portion which is adapted to extend toward and be attached to the supporting structure.

More particularly, it is an object of the invention to provide a novel attaching element adapted to maintain an assembly of panel coverings in a position relative to the supporting structure so that the exposed surfaces of the panels are retained in a common plane, independent of any unevenness, limited dimensional variations or movement of the supporting structure. This independent retention is obtained by reason of the fact that the attaching element is designed so that it more or less automatically accommodates itself to such variations, unevenness or move-

ment. Also, the construction of the attaching element is such that the retention of the panels in a common plane is not affected by relative movements of adjacent panels under the influence of moisture absorption or the like.

As will be apparent from the drawing and from the more detailed description herebelow, the attachment elements provided by my invention may be engaged with the panels at any point along the edge thereof where it is necessary to place them in order that the transversely projecting portion of each element may be conveniently engaged with and be held by a beam, stud, or other part of the framing structure, do not interfere with the interlocking engagement of the panels in any way, and when installed, are wholly invisible from the room side of the completed panel covering. Moreover, they are more easily applied in use, less expensive, lighter in weight, and smaller in bulk than most types of panel securing devices heretofore designed or suggested. They serve equally well to attach panels to an overhead supporting structure and to a vertically disposed or side wall supporting structure.

The invention envisions the attachment of the panels to different types of supporting structures, including flat surfaces, as in the case of applying the panelling to old completed walls, and also to studs and furring members of wood and various metallic structural shapes. Consequently, certain modifications may be made in the attaching elements, as shown and described, to adapt them for use in connection with various types of supporting structures.

In adapting the invention to the erection of covering structures embodying panels of various materials and various shapes, various minor changes may be made, as will be readily appreciated by one skilled in the art. In the accompanying drawing several forms of attachment devices are illustrated.

In the drawing:

Figure 1 is an enlarged view in perspective showing the attachment element of the present invention;

Figure 2 is a rear view of a wall covering structure of the panel type showing panels attached to the supporting structure by attachment means according to the present invention;

Figure 3 is a section on line 3-3 of Figure 2;

Figure 4 is a perspective view of one of the panel attachment elements, the frame member to which this element is secured, and the engaged

edge of one panel forming a covering structure; and

Figure 5 is a fragmentary view of a panel covering assembly involving a modified form of the attaching element shown in Figure 4, parts of the assembly being shown in section.

Referring now to Figures 2, 3 and 4 of the drawing, a portion of a wall or ceiling is shown, comprising a supporting structure and a covering of inter-engaged panels which are attached to the supporting structure by means of attachment elements of the present invention. The supporting structure to which the panel covering is to be attached may comprise joists or studs of wood associated with furring members, as in the case of a partially completed house or other building, or may comprise a plastered surface to which furring may be secured, in the event that an ornamental or protective panel covering is to be applied to the surface of the wall of a building already completed. As shown in Figure 2, the supporting structure may comprise spaced vertical studs 10 to which a light framework of transversely extending furring strips 11, which may be in the form of wood lath, is nailed or otherwise secured. The covering panels 15 which may be in the form of fiber insulating plank, may extend from the floor to the ceiling. The attachment elements 16 which I have provided to secure these panels in position over the supporting structure will serve equally as well with relatively short, square or rectangular panels designated as tile, provided, of course, that the adjacent edges of adjacent panels have "tongue-and-groove" interlocking relationship with each other.

Such "tongue-and-groove" interlocking relationship of the panels 15 is indicated clearly in the drawing and the securing means which I have provided comprises a plurality of devices such as indicated at 16, for attaching the edges of the panels to the furring strips 11 of the supporting structure, wherever these strips cross the joints between adjacent panels. As seen most clearly in Figure 1, each such securing means 16 comprises a channel portion 17 and a transverse extension 18 which is substantially in the form of a T, having a shank or stem 19 and a cross member or head 20. The securing element is fabricated of relatively thin but comparatively stiff metal, although sufficiently ductile to permit the stem 19 to be bent or twisted without breaking, so that the head 20 may be disposed at an angle to the channel portion 17 or stem 19 in a manner and for purposes to be more fully described hereinafter. The inner edges of the oppositely extending portions of the head portion 20 are serrated, as indicated at 21, and likewise these edges are divergently curved with respect to the adjacent face of the channel member 17, to provide oppositely facing flaring notches or recesses between the head portion and the channel portion.

The gauge of the metal employed in the fabrication of the attachment element 16 is sufficiently thin to enable the channel portion 17 of this element to be inserted between the tongue 12 of one panel 15 and the groove 13 of the adjacent panel, the outer surfaces of the channel 17 closely fitting against the inner walls of the groove and the inner surfaces of the channel closely engaging the outer surfaces of the tongue, as shown in Figure 3. Although the channel 17 occupies some space, the panels 15 are usually fabricated of material which is compressible

or deformable to a certain extent, and no difficulty will be realized in inserting the tongue 12 of one panel into the groove 13 of the adjacent panel and maintaining the slidable inter-engagement therebetween, even when a plurality of securing devices have previously been applied either to the tongue of one or within the groove of the other. It is noteworthy that with proper dimensioning of the channel portion according to the cross-sectional size and shape of the tongues and grooves formed on the edges of the panels, the attaching element is completely invisible through the V-shaped grooves 14 with which the exposed edges of the panels are usually provided.

From Figure 4, it will be apparent that the attachment element 16 may be secured to the inter-engaging edges of two adjacent panels at any point along such edges and, in the assembly of a covering structure, the attachment elements 16 are placed so that an edge of the shank portion 19 rests upon an edge of the furring members 11, with the laterally projecting portion of each head 20 lying on the opposite side of the furring member 11. The inner edges of the head 20, on opposite sides of the stem 19, extend divergently with respect to each other and to the channel portion 17, and are formed with serrations indicated at 21. When the serrations 21 are firmly pressed into engagement with the rear face of the furring member 11, the element 16 will thereby be held in fixed position. The diverging or arc-shaped inner edges of the head 20, however, enable the attachment element to adapt itself readily to furring members of limited variations in thickness, thus insuring the maintenance of the attachment element at the desired angle relative to the supporting structure, and independently of dimensional variations therein. Therefore, when the arcuate serrated edges 21 are each engaged with the rear faces of the furring members 11 and the panels are subsequently engaged with the channel portions of the attaching elements, the covering of panels will be held and thereafter continuously maintained in a common level plane. The flexibility of adjustment thus afforded to compensate for surface unevenness and/or varying thicknesses of the furring members also serve to reduce substantially, if not eliminate entirely, the tendency of the secured panels to buckle when movement occurs in the supporting structure. It is obvious that a wall covering of panels may be quickly assembled by employing attachment elements such as described, that the cost of the elements and the cost of attachment is low, that the attaching means is invisible from the room face of the structure, and that the entire covering structure may be disassembled if desired without injury to the panels, and set up at another point.

Another mode of utilizing the attaching elements of the form described for attaching small square or rectangular panels, or tile to an overhead structure is indicated in Figure 5. As there shown, each of the attachment elements 16 is modified in shape by bending the shank 19 at or adjacent its juncture with the head 20 until the head is disposed in a plane parallel to the channel portion 17. In order that these elements, as thus modified, will hold the panels in the desired common level plane independent of any surface unevenness or limited dimensional variation that may be present in the furring members, the spacing between the head and

channel portions may be varied somewhat by changing the location of the bend in the shank and thus obtain the necessary accommodation. Whether the shank is bent toward or away from the channel portion 17 is entirely optional and will depend entirely on the requirements of the construction. The channel portion 17 of the element is engaged as before, within the groove of one panel and around the tongue of the adjacent panel, while one lateral extension of the head 20 may be held securely but non-rigidly by insertion between the furring strip 11 and beam 25. The furring is nailed directly to the beam, as at 26, but the thin gauge of the metal employed in the elements 16, and particularly the head portion 20, permits the ready insertion thereof between the furring and the beam to securely hold the covering panels 15. It will be apparent that the elements 16 can be employed in substantially the same manner and with the same adjustment feature for attaching a panel covering to a vertical wall supporting structure. In this instance, a lateral extending portion of the T-head 20 is inserted downwardly between the vertical stud and horizontally extending furring strip, and is securely but non-rigidly held in that position. The panels 15, comprising the interior wall covering, are then placed in position with the tongue 12 of one panel and the corresponding groove 13 of an adjacent panel respectively engaging the correspondingly shaped sides of the channel portion 17.

I claim:

1. An attachment element for use in attaching a covering of panels to a supporting structure, said element comprising a channel portion adapted to fit within the groove and around the tongue of inter-engaging panel edges, and a head portion spaced from said channel portion, the inner edge of said head portion being serrated and directed divergently relative to said channel portion.

2. An attachment element for use in attaching a covering of panels to a supporting structure, said element comprising a channel portion adapted to fit within the groove and around the tongue of inter-engaging panel edges, and a bendable extension having a laterally directed head, the inner edge of said head being curved and serrated for hooking engagement over a part of said supporting structure whereby said covering of panels is held in a common level plane.

3. An attachment element for use in attaching a covering of panels to a supporting structure, said element comprising a channel portion adapted to fit within the groove and around the tongue of inter-engaging panel edges, and a T-shaped bendable extension, the head of the T having oppositely directed serrated inner edges adapted for selective frictional engagement with said supporting structure whereby said covering of panels is held in a common level plane.

4. An attachment element for use in attaching a covering of panels to a supporting structure, said element comprising a channel portion adapted to fit within the groove and around the tongue of inter-engaging panel edges, and a T-shaped bendable extension having inner serrated

edges divergently directed relative to said channel portion and adapted for adjustable hooking engagement over a part of said supporting structure whereby said covering of panels is held in a common level plane.

5. For use in attaching a covering of panels to a supporting means, an attachment element of relatively thin metal having a channel portion to fit within the groove and around the tongue of inter-engaging panel edges and a T-shaped extension having curved and serrated inner edges adapted to be hooked over an element of a supporting means.

6. For use in attaching a covering of panels to a supporting structure, an attachment element of relatively thin metal having a channel portion to fit within the groove and around the tongue of inter-engaging panel edges and a head portion spaced from said channel and formed with a curved serrated inner edge, the serrated edge being adapted to frictionally engage a surface of the supporting structure when said head portion lies in a plane substantially parallel to the mouth of the channel and the head portion being adapted to be gripped between opposed surfaces of the supporting structure when the head portion is bent into a plane extending substantially at a right angle to the mouth of the channel.

7. In a building structure, the combination with a supporting structure, of a plurality of panels together comprising a covering for said supporting structure, each of said panels having an edge thereof provided with a tongue for mating engagement with a corresponding groove in the adjacent edge of the adjacent panel, and means securing the covering to said supporting structure, said means including a plurality of attachment devices each having a portion positioned within the groove of one panel edge and engaging the tongue of the adjacent panel edge, and a T-shaped portion extending toward and hooked over a part of said supporting structure, the edges of said T-shaped portion which are closest to said tongue engaging portion being curved and serrated, for the purpose set forth.

8. An attachment element for use in attaching a covering of panels to a supporting structure, said element comprising a channel portion adapted to fit within the groove and around the tongue of inter-engaging panel edges, and a bendable extension having a pair of edges spaced from the channel portion and facing towards the same, said edges being serrated for selective frictional engagement with said supporting structure whereby said covering of panels is held in a common level plane.

9. For use in attaching a covering of panels to a supporting means, an attachment element of relatively thin metal having a channel portion to fit within the groove and around the tongue of inter-engaging panel edges and a bendable extension formed with a curved serrated inner edge adapted to bite into a surface of such supporting means.

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