

Sept. 10, 1935.

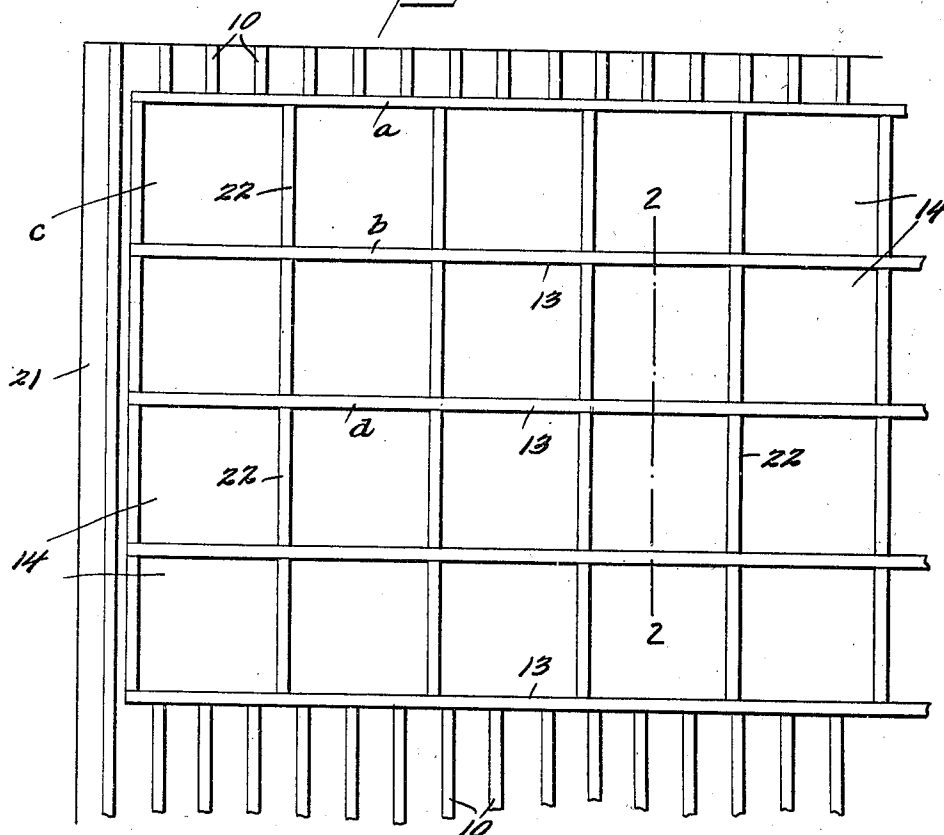
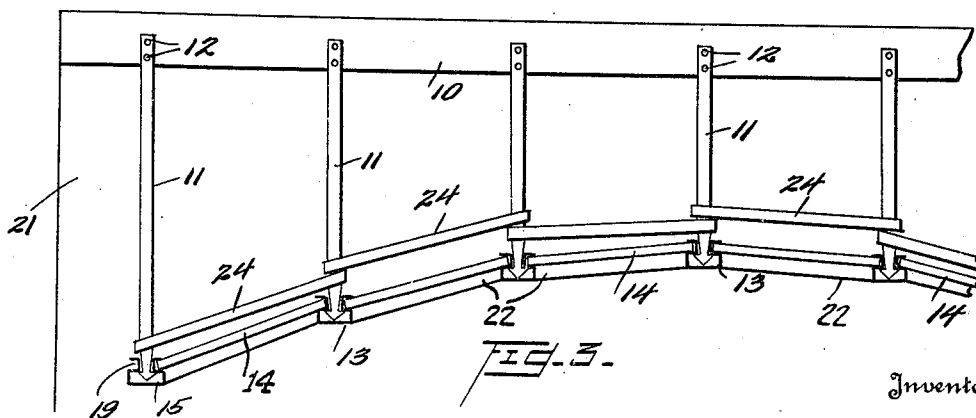
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2,013,762

BUILDING CONSTRUCTION

Original Filed Dec. 9, 1929 2 Sheets-Sheet 1

FIG. 1-



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FIG. 2.

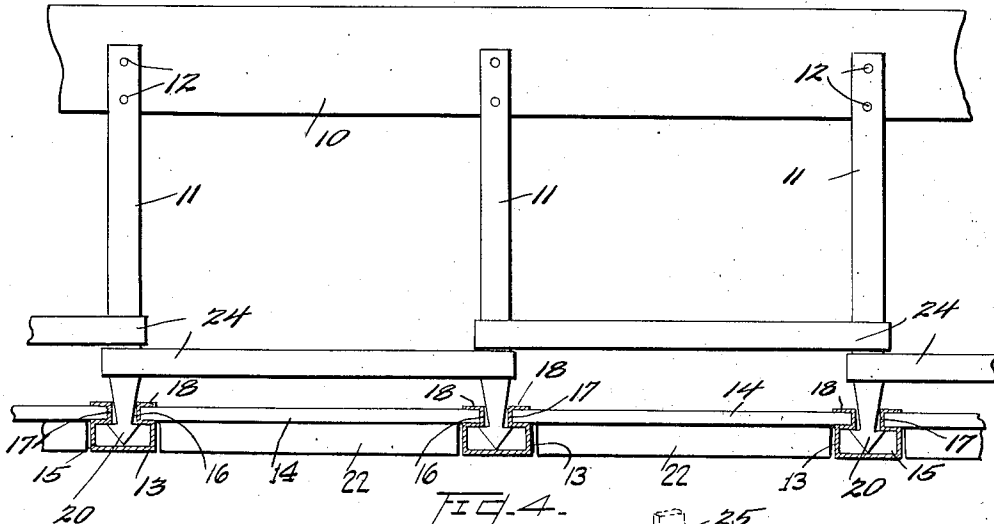
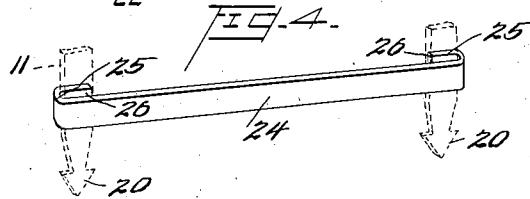


FIG. 5.

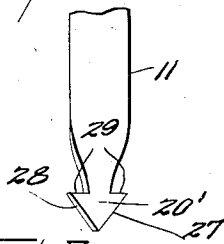


FIG. 6.

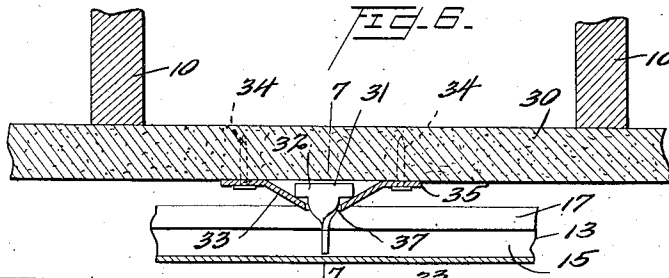


FIG. 7.

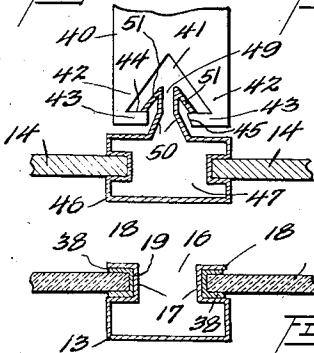


FIG. 8.

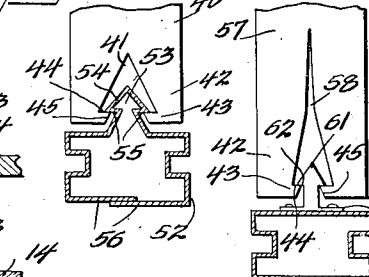


FIG. 9.

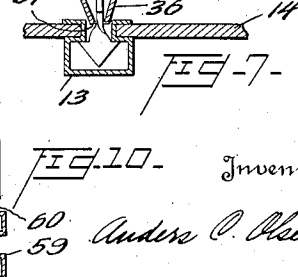
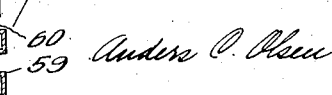


FIG. 10.



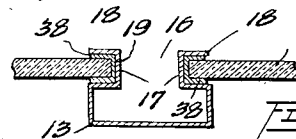
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FIG. 11.



UNITED STATES PATENT OFFICE

2,013,762

BUILDING CONSTRUCTION

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Application December 9, 1929, Serial No. 412,833
Renewed October 1, 1934

11 Claims. (Cl. 189—88)

This invention relates to building constructions and more specifically to ceiling or wall structures and means for installing the same.

Among the objects of this invention is the provision of an improved metallic supporting means for the ceiling or wall plates or panels which may also be metallic or may be formed of plaster-board, tile, glass, or other non-metallic materials. This supporting means comprises attaching strips for the margins of the panels and hanger units of novel conformation together with improved means for connecting them with each other and with the framing structure of the room.

Another object is to provide means for bracing the hanger units or suspending elements in spaced positions.

A further object is to provide means for supporting ceiling plates of glass or other frangible material in such a manner as to protect them from breakage and prevent the chipping of their edges which they might suffer by being held in direct contact with the metal spacing and supporting strips.

Further objects and features of novelty will be apparent from the following detailed description and from the accompanying drawings in which several embodiments of the invention are illustrated by way of example.

Figure 1 is a plan view of a portion of the overhead structure of a room showing a partially installed ceiling embodying the principles of this invention;

Figure 2 is a cross-sectional view taken on line 2—2 of Figure 1;

Figure 3 is a view similar to Figure 2 showing a modification in which an arched ceiling structure is employed.

Figure 4 is a detail view showing the application of the bracing members to the hangers;

Figure 5 is a detail view of the lower end of one form of hanger;

Figure 6 is a fragmentary sectional view of a ceiling construction in which another form of hanger is used, showing means for connecting the upper end of this hanger to the overhead structure of a room;

Figure 7 is a cross-sectional view taken on line 7—7 of Figure 6;

Figures 8, 9 and 10 are detail views of several modifications of hanger and strip constructions; and

Figure 11 is a cross-sectional view showing the installation of glass panels or plates within the supporting strip.

Referring to Figures 1, 2, 3 and 6, the numeral

10 denotes the joists or beams forming part of the overhead framing structure of the interior of a room. These joists are usually arranged parallel to each other as shown in Figure 1 and the lower edges thereof are generally, though not necessarily for the purposes of this invention, arranged in the same horizontal plane. Depending from these members 10 at intervals corresponding to the width of panel to be used are the hanger units 11 which are attached to these members by means of nails or other fastening means 12.

The ceiling structure which is adapted to be supported from the lower ends of these hanger units 11 comprises the panel supporting strip designated generally by the numeral 13 and the panels 14. In the embodiments of the invention shown in Figures 2, 3, 6, 7 and 11 each of these strips has a body portion 15 substantially rectangular in cross-section with the upper side divided along the center line to form a longitudinal slot 16 running from end to end of the strip. This slot 16 is formed with vertically extending parallel walls 17 which flare outwardly at the top to form horizontal flanges 18. On each side of these supporting strips 13 there is formed between the flanges 18 and the top of the box-like body portion 15, the grooves 19 which are adapted to receive the edges of the panels 14, the width of these grooves being predetermined according to the thickness of the panels to be employed. These panels 14 may be formed of wall-board, plaster-board, sheet metal, glass or any other material suitable for forming an ornamental and protective covering for the walls or ceiling of a room.

As shown in the drawings the hangers 11 comprise flat metal strips which have their lower ends pointed and provided with barbs as at 20. The strips 13 are fabricated of thin sheet metal and the body portions 15 thereof are resilient so that when a strip is presented to the pointed head of a hanger with the points thereof vertically above the slot 16, and the strip is pressed upwardly, the walls of strip will yield or spring outwardly, permitting the slot to widen until the edges thereof extend over and around the lateral points or barbs of the head of the hanger, whereupon the strip will snap into locking engagement with the head of the hanger as shown in Figure 2 of the drawings.

In applying this suspended ceiling construction to the wooden ceiling beams or other overhead structures of a room, the hangers are nailed to the beam in parallel longitudinal rows which

are equally spaced across the room, the outer rows being spaced from the sides of the room as at 21 a sufficient distance to provide for the mounting of a cornice as indicated in Figures 1 and 3.

When the hangers have been thus mounted, two longitudinal strip sections *a* and *b* are snapped into position over and interlocked with the heads of the series of hangers at one side and corner of the room.

The opposite edges of the first panel *c* are then inserted in the inner grooves 19 of the strips *a* and *b* and the panel is slid into its correct position near the end of the strip. Next there is inserted a cross strip 22 which has a similar cross section to the longitudinal strip 13 but may be provided with projecting flanges at its ends, which are adapted to enter the groove 19 for the purpose of supporting the cross strip. Panels and cross strips are then alternately slid into position between the longitudinal strips *a* and *b* until the row is completed. Then another longitudinal strip *d* is snapped into position over the end of the next row of hangers and another series of panels and cross strips inserted between the strips *b* and *d*. Additional rows of panels are built up in the same manner until the ceiling is complete. To prevent swinging of the hangers 11 and consequent disalignment of individual hangers and also to prevent the possible spreading of the attached supporting strips 13 and displacement of the intervening row of panels, there are provided the brace bars 24 which are adapted to space and rigidify the series of hangers attached to one of the beams 10. These brace bars 24 comprise flat metal strips with hooked ends 25 which are adapted to embrace the lower ends of the hangers 11 just above the head 20 thereof. These hooked ends 25 may either loosely surround the hangers 11 or the ends 26 of the hook may be bent inwardly toward the body portion of the brace bars 24 so that they must be forced apart by the insertion of the hangers 11, and so that they will embrace the hangers 11 with considerable spring pressure. This bracing means is particularly useful in connection with a low-hung ceiling employing unusually long hanger units 11 or in connection with an arched ceiling in which long hanger units must be used near the sides of the arch, as shown in Figure 3.

In Figure 5, there is shown a modified form of hanger unit in which the head 20' is given a slight twist out of the plane of the body portion of the hanger. This form of hanger unit is made of resilient sheet metal and is adapted for use with either a resilient panel supporting strip or a rigid one which is not adapted to spread apart when being applied to the end of a hanger unit. When a panel supporting strip 13 is applied to the head 20' of this type of unit the walls 17 of the slot 16 of the strip contact with the diagonally opposite corner edges 27 and 28 of the point of the hanger unit and cause the hanger unit to be further twisted until the shoulders 29 clear the inner ends of the slot walls 17 and the head 20' snaps back into its initial position. Of course, in cases where this type of hanger unit is employed in connection with a resilient panel supporting strip, a resiliency of both of these members may be taken advantage of in attaching the strip to the hanger unit.

In Figures 6 and 7, there is illustrated a ceiling supporting device particularly adapted to supporting a new ceiling of the built-up type from an old ceiling designated by the numeral 30.

The panel supporting strip at the lower end of the hanger unit may be of any desired type in this embodiment, and the cooperating lower portion of the hanger unit will naturally be modified to correspond thereto, but the hanger unit 31 is preferably given a 90° twist around its vertical axis and is provided with a T-head 32. For suspending each of these hanger units 31 from the old ceiling 30, there are provided socket members 33 which are attached to the ceiling 30 by means of the nails or screws 34 which pass through the marginal flanges 35. The socket member 33 is provided with a raised center portion 36 which is provided at its apex with a slot 37 the length of which is sufficient to permit the insertion of the head of the hanger member 31 from the upper side of the socket member 33, the hanger member 31 being rotated through an angle of 90° as it is being inserted in the slot 37.

For use in supporting panels made of glass or other frangible material, the arrangement shown in Fig. 11 may be used. In this construction the walls of the grooves 19 are preferably rigid although the box-like portion 15 of the strip may be made resilient so that the walls 17 of the slot 16 may be spread apart for the insertion of the head of a hanger unit. The slots 19 are made slightly wider than the thickness of the panels to be employed and a cushioning strip 38, made of felt, rubber or other suitable material, is inserted between the walls of the grooves 19 and the edges of the panel. This cushioning strip 38 may be cemented to the walls of the groove 19 or to the edges of the panel before the panels and strips are assembled, or it may be wedged and compressed in the groove by the edge of the panel by making the clearance between the walls of the groove and the panel less than the thickness of the cushioning strip 38. These strips 38 are inserted in the corresponding grooves 19 of the cross strip 22 also. In lieu of the non-metallic cushioning strip 38, flat laterally or longitudinally corrugated leaf springs may be inserted in the grooves 19 in positions to bear against the upper or lower surfaces of the panel edges or both of them. If desired, similar springs may also be disposed along the bottoms of the grooves to engage the sides of the panels.

In Figs. 8, 9 and 10 there are illustrated alternative forms of the invention in which the hanger units are provided with slots into which portions of the panel supporting strip are adapted to be inserted.

In Figs. 8 and 9, the hanger units 40 are preferably, though not necessarily, rigid and are each provided at its lower end with a triangular opening 41 between bifurcations 42. Inwardly directed projections 43 extend from bifurcations 42 and provide horizontal shoulders 44 and upwardly converging surfaces 45. The panel supporting strip 46 shown in Figure 8 comprises the hollow box-like portion 47 which is laterally provided with grooves for the insertion of the edges of panels 14. The upper surfaces of the strip are slotted as at 49 and provided with upstanding flanges 50, the edges of which are turned outwardly and downwardly as at 51 in general conformity with the diverging walls of the triangular opening 41 of the hanger unit. In applying this strip 46 to the hanger unit 40, the upstanding portion comprising flanges 50 and 51 is inserted between the faces 45 of the inwardly projecting portions 43, and the strip 46 is forced upwardly until the edges of flanges 51 snap past

the ends of the faces 45 and rest upon the shoulders 44 as shown.

In Figure 9, the panel supporting strip 52 is not slotted in its upper surface but is formed with a longitudinal upstanding portion 53 the cross section of which is shaped like an arrow-head, being provided with inclined surfaces 54 and horizontal shoulders 55. The bottom surface of the panel supporting strip 52 is longitudinally divided and provided with overlapping edges 56 and it will be readily seen that the body of the strip 52 may be laterally compressed so that the portion 53 may enter the triangular opening 41 in the lower end of the hanger strip 40 and the shoulders 55 may spring past the diverging faces 45 and come to rest upon the shoulders 44 of the hanger unit.

In Figure 10 the hanger unit 57 is similar to the unit 40 except that it must be constructed of resilient material and be provided with a centrally located considerably elongated opening 58. In this embodiment, the bifurcations 42, the inwardly projecting portions 43, the shoulders 44 and the faces 45 are similar to the corresponding elements of the hanger unit shown in Figures 8 and 9. In this construction, the panel supporting strip 59 is preferably provided with an unbroken continuous wall and has riveted to the upper surface thereof the supplemental attaching strip 60 which is provided with the upwardly projecting wedge-shaped head 61 having shoulders 62. In this case the hanger unit 57 is resilient and the bifurcations 42 are adapted to be spread apart when the head 61 of the attaching strip 60 is inserted between the surfaces 45 and when the shoulders 44 of the hanger unit clear the ends of the diverging surfaces of the head 61 they will snap over these ends and contact with the shoulders 62 of the attaching strip 60.

It is obvious that various changes and modifications may be made in the embodiments illustrated and described herein and still be within the scope of the present invention as defined in the subjoined claims.

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

1. In a ceiling construction, in combination, a supporting structure, a plurality of metallic hangers secured thereto, a metal strip supported by said hangers and provided on its sides with relatively wide grooves which extend from end to end of the strip and are adapted to receive the edges of a plurality of relatively thick panels, said strip being also provided with a hollow box-like body portion, the top wall thereof being divided longitudinally to form a centrally disposed slot which is coextensive with the length of the strip, said hangers having pointed ends with lateral shoulders or ledges, whereby said strip is adapted to be mounted on the hangers by entering the points of the latter in said slot and then forcing said strip upward until the top walls of said body portion snap over onto said ledges.

2. In a ceiling construction, in combination, a supporting structure, a plurality of metallic hangers secured thereto, a metal strip supported by said hangers, said strip being provided with a hollow box-like resilient body portion provided with a slot in its upper wall, said hangers having pointed ends with lateral shoulders or ledges, whereby said strip is adapted to be mounted on said hangers by entering the points of the latter in said slot and then forcing said strip upward

until the top walls of the body portions thereof snap over into said ledges, said strip being also provided along their sides with grooves adapted to receive the edges of panels, the walls of said grooves being but slightly resilient and lined with a cushioning material.

3. A hanger unit for use in supporting a metallic ceiling consisting of a flexible flat metal strip having means at one end thereof adapted to engage a portion of said ceiling, said unit being twisted through an angle of less than 90° about its longitudinal axis, whereby guiding the hanger into proper engagement with the ceiling is facilitated.

4. A hanger unit for use in supporting a metallic ceiling, consisting of a flexible flat metal strip having one end provided with a point at its extremity and horizontal lateral shoulders with inclined surfaces between the edges of said shoulders and said point, said ends being horizontally twisted away from the vertical plane of the remainder of the hanger.

5. In a ceiling construction, a supporting structure, a protective and ornamental covering structure, comprising panels and supporting strips, said supporting strips being formed of sheet metal and having a slot formed in the upper surface thereof for connecting said strip to said supporting structure, a plurality of hangers comprising strips of resilient sheet metal having pointed ends with lateral shoulders or ledges, said ends occupying a vertical plane which makes an acute angle with the vertical plane through the walls of said slots, said strip being adapted to be mounted on said hangers by introducing the points of the latter into said slots, and forcing the strip upward whereby said resilient hanger is resiliently twisted until the shoulders of said hanger clear the edges of the slot in said strip, when said hanger snaps back into its original form.

6. In a ceiling construction, a supporting structure, a protective ornamental covering structure comprising panels and supporting strips, said supporting strips being formed of resilient sheet metal of box-like form and having a slot in the top wall thereof, a plurality of hangers for connecting said strips to said supporting structure, consisting of a flexible flat metal strip having one end provided with a point at its extremity and horizontal lateral shoulders with inclined surfaces between the edges of the shoulders and said point, the ends of said hangers being initially permanently twisted so that when introduced into said slot a line joining the points of contact of said inclined surfaces and the edges of said slot for each hanger is oblique with respect to the edges of said slot, whereby the edges of said slot are adapted to be sprung apart and said hanger to be further and resiliently twisted when said strip is forced upward until the inner top wall of the strip and the shoulders of the hanger snap into engagement, and the strip and hanger resume their initial conformation.

7. In a ceiling construction, an overhead supporting structure, a bracket secured thereto and provided with a socket having a slot therein, a hanger unit depending from said bracket and extending through said slot, said hanger unit being provided with an enlarged upper end which is adapted to be received within said socket, the lower end of said bracket being adapted to support a suspended covering structure.

8. In a ceiling construction, in combination, a hanger unit provided with a bifurcated lower

end, inwardly projecting portions on the bifurcations thereof providing horizontal shoulders or ledges, a panel supporting strip of hollow box-like construction provided with a resilient barbed portion which is adapted to be sprung into position between said bifurcations and rest upon said shoulders or ledges.

9. In a ceiling construction, in combination, a hanger unit provided with a pair of depending legs at its lower end, inwardly projecting portions on said legs providing spaced shoulders or ledges, a panel supporting strip of hollow box-like construction, having a portion provided with shoulders adapted to rest upon said first mentioned shoulders or ledges, the side walls of said strip adapted to be pressed inwardly toward each other whereby said shouldered portion may pass between the inwardly projecting portion of said legs and whereby said walls may spring outwardly so that the shoulders of said strip are supported upon the shoulders of said hanger unit.

10. In a ceiling construction, in combination, a panel supporting strip provided with an upwardly projecting portion which is arrowheaded

in cross section, a hanger unit having a bifurcated lower end providing a pair of resilient depending legs, inwardly projecting portions on said legs the upper surfaces of which provide spaced shoulders or ledges, the inner surfaces of which are downwardly divergent to facilitate entry of said upwardly projecting portion of said strip.

11. In a ceiling construction, in combination, an overhead supporting structure, a suspended covering structure, a hanger strip secured to said supporting structure, said hanger strip having depending mutually facing resilient portions provided with inwardly directed horizontal ledges, upstanding portions on said covering structure provided with laterally, outwardly projecting portions forming wedging surfaces and shoulders, said upstanding portions adapted to be wedgingly inserted between said dependent resilient portions of the hanger strip, and said shoulders and ledges adapted to snap past each other during application of said suspended covering structure, and to rest in mutual engagement in the final applied position of said covering structure.

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