May 12, 1970 E. BRADY 3,511,012

STRUCTURAL UNITS FOR FORMING GRIDS FOR SUSPENDED TILE CEILINGS

Filed March 22, 1968

FIG. 2

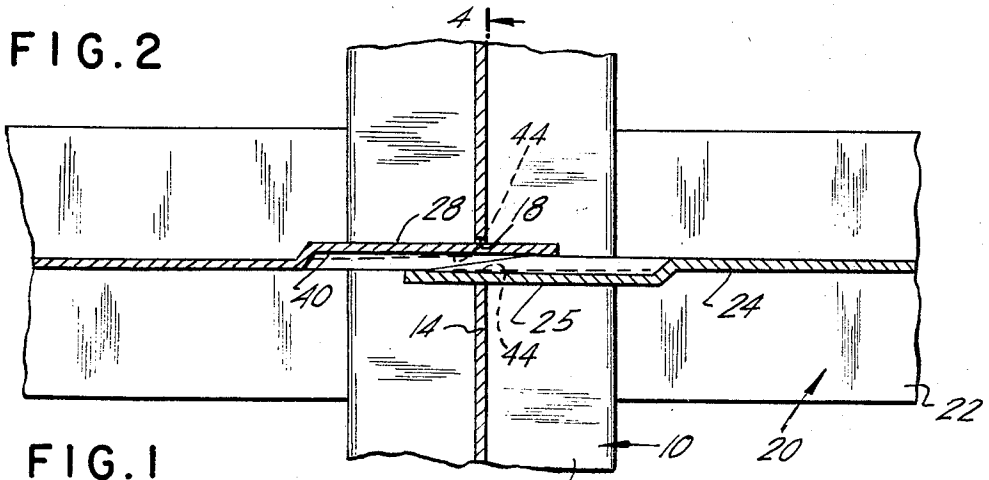
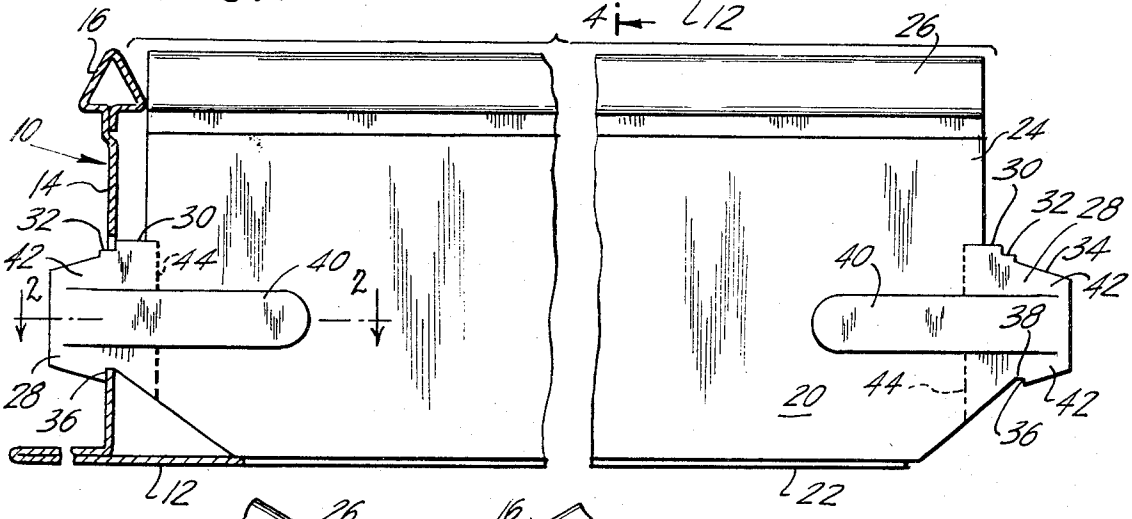



FIG. 1



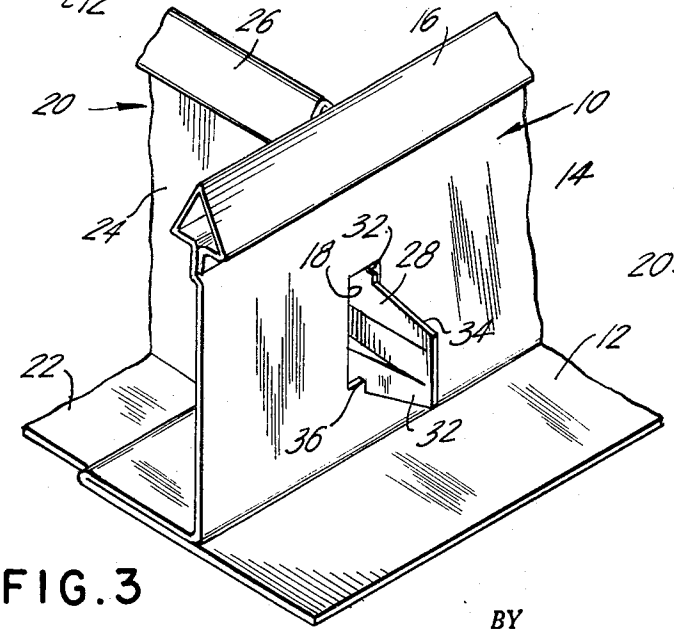




FIG. 3

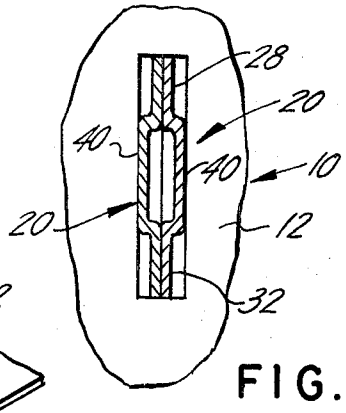



FIG. 4

INVENTOR.
EUGENE BRADY

BY

ATTORNEY

United States Patent Office

3,511,012

Patented May 12, 1970



3,511,012

# STRUCTURAL UNITS FOR FORMING GRIDS FOR SUSPENDED TILE CEILINGS

Eugene Brady, Ardsley, N.Y., assignor to Acoustical Ceiling Accessories Co., Inc.

Substitute for application Ser. No. 581,612, Sept. 23, 1966. This application Mar. 22, 1968, Ser. No. 720,433

Int. Cl. E04c 2/42, 5/52

U.S. Cl. 52—667

7 Claims

## ABSTRACT OF THE DISCLOSURE

In a grid for a suspended tile ceiling, transverse runners of inverted T-shape, including a web and flanges normal thereto at one edge thereof and engageable by its ends in vertical slots formed in the web of correspondingly-shaped main runners, said ends comprising a tongue extending from each end edge of the web, said tongue of lesser height than the web and having a notch formed in its lower edge, adjacent the end of the web, adapted to engage over the edge of a slot, in a main runner web, and an embossment formed in the tongue and extending into the end of the web, said embossment spaced from the longitudinal edge of the tongue and tapering from and merging with the lead end thereof.

The present invention relates to grid structures for use in forming suspended tile ceilings, such as acoustical tile ceilings, or the like.

Suspended tile ceilings, of the character to which the present invention relates, are generally formed of inverted T-shaped runners or beams whose transverse sections form flanges for supporting the edges of the tiles and whose upright web sections serve for supporting the runners in suspended position from the structure from which the ceiling is to be suspended. Such runners forming the grid include main runners which are suspended in spaced parallel relation to one another, and are relatively long and are generally connected in end-abutting relation to one another; and transverse runners which are connected in spaced, parallel relation between adjacent main runners by forming T-joints between their ends and the main runners.

In many forms of grids for suspended tile ceilings, the transverse runners are connected to the main runners by extensions of the upright web sections of the transverse runner which engage through openings formed in the upright web sections of the main runners. Such T-joints between the transverse and the main runners, as heretofore used, were not satisfactory for the reason that a tight, fixed and rigid joint was frequently difficult to attain, thus rendering the grid unstable. Further, difficulty was generally experienced in inserting the extensions of transverse runners from each of the main runners into the opening therefor provided in the web of the main runner.

It is an object of the present invention, therefore, to provide transverse runners for grids of suspended tile ceilings, of the character described, which will have extensions, two of which may be easily and quickly inserted into the receiving openings in the main runners.

It is another object of the present invention to provide transverse runners for a suspended ceiling grid, of the character described, which, though easy to insert into the receiving openings, will, nevertheless, fit tightly in such openings to form a tight and rigid joint between the transverse and the main runners.

It is still another object of the present invention to



provide transverse runners for a suspended ceiling grid, of the character described, which will fit and lock tightly within the openings of the main runner allowing, even, for limited variation in their width or in the thickness of the locking tongue extensions of the transverse runners.

It is a further object of the present invention to provide transverse runners for the grid of a suspended ceiling, of the character described, which may be as simply and as easily, and as economically fabricated as similar articles of the prior art.

The foregoing and other objects and advantages of the runners for suspended ceiling grids of the present invention will become more readily apparent to those skilled in the art from the embodiments thereof shown in the accompanying drawings, and from the description following. It is to be understood, however, that such embodiments are shown by way of illustration only, to make the principles and practice of the invention more readily comprehensible and without any intent of limiting the invention to the specific details therein shown.

In the drawing:

FIG. 1 is a side elevational and partly sectional view of one form of a transverse, grid-forming runner embodying the invention; broken across to indicate indeterminate length and shown with one end thereof engaged in the upright section of a main runner;

FIG. 2 is a fragmentary, longitudinal section showing the ends of a pair of transverse runners lockingly engaged in the upright web section of a main runner; the section through the transverse runners being taken substantially on a line equivalent to line 2—2 of FIG. 1;

FIG. 3 is an isometric view showing one of the transverse runners engaged in locked position in the upright openings of a web section of a main runner; and

FIG. 4 is a section taken on line 4—4 of FIG. 2, showing the transverse runners in locked position.

Referring now to the accompanying drawings illustrating the present invention, the numeral **10** designates generally, a main, tile-supporting runner, which may be of generally conventional construction; being formed of preferably coated sheet metal, in the shape of an inverted T, including the horizontal cross-piece, **12**, and with an upright web, **14**, rising from its center, preferably in unitary construction. The web **14** is provided, at its upper edge, with a bulb bead, **16**, which may be of conventional shape or of the shape described and claimed in the companion application of Jack I. Zuckerman, Ser. No. 581,611 filed Sept. 23, 1966. The portions of the cross-piece **12** to each side of the web **14** may be of even width and form flanges for supporting the edge of a ceiling tile, as is conventional. The upright web **14** of the runner **10** may be provided with a plurality of spaced upright rectangular openings, **18** (only one shown), for receiving and engaging in locked position therein, from each side thereof, the ends of transverse runners each generally designated as **20**.

Each transverse runner **20** may likewise be of a generally conventional shape, size, and material, comprising an inverted T-shaped body having the cross-piece, **22** and the upright web, **24**, extending upwardly from the center of the cross piece **22**, and formed with a reinforcing bulb bead, **26**, which may be similar in form with the bead **16** of runner **10**. Upright webs **14** and **24** may preferably be of substantially equal height and the cross-piece **22** of runner **20** may preferably be shorter than the beaded edge **26** thereof, terminating short of each end of the web **24**, a distance to accommodate a flange portion of the cross-piece **12** of runner **10**, when runners **10** and **20** are placed in substantial abutment, at right angles to one

another. Likewise, the bead **26**, may, if desired be shorter than the web **24**, terminating a distance from each end of the web, equal, approximately, to half the thickness of a bead **16** of a runner **10**, to accommodate the bead **16** when runners **10** and **20** are interlocked at right angles to one another.

A lock-tongue extension, **28**, may be provided at each end of the upright web **24** of a runner **20**. Such extension may be of lesser height than the web **24** and spaced, both, from the upper and lower edge of web **24**. The inner portion of the upper edge of tongue **28** may be parallel to the edges of web section **24**, for a short distance, as at **30**, and then offset slightly downwardly to form a step, **32**, from which such edge slopes slightly downwardly, as at **34** (FIG. 1).

The lower edge portion of tongue **28** slopes inwardly and downwardly and is preferable in continuation with the sloping edge portion of web **24** that extends outwardly and upwardly from the adjacent terminal of its cross-piece **22**, and its outer portion is stepped downwardly to form a hook **36**, opposite the outer end of step **32**. Preferably, a flat shoulder, **38**, is formed in the lower edge of tongue **28** immediately inwardly of hook **36** in register with step **32** (FIG. 11).

The tongue **28** is formed with a horizontal embossment, **40**, which is spaced from its upper and lower edges to leave marginal edge portions, **42**, above and below the embossment **40**, and which preferably extends into web **22**. The marginal edge portions **42** of tongue **28** and the portion of the web **24** to each side of embossment **40** lying outwardly of bead **26** are offset at an angle to web **24**, along line, **44** as indicated by broken lines, in FIG. 2, in the direction of the embossment **40**, so that the ends of the portions **42** merge with the end of the embossment **40** to form a tapered embossed tongue structure.

To assemble the transverse runners **20** with the main runners **10**, the tongue **28** of one transverse runner is inserted into an opening, **18**, with the embossed side of the tongue preferably facing a vertical edge of the opening, until the hook **36** engages over the bottom edge of the opening; the opening being slightly smaller than the distance between the step **32** and the hook **36**, causing a force fit, to prevent accidental dislodgement of the tie runner. A second transverse runner **20** is then inserted into the opening **18** from the other side of the web **14**; such tongue being disposed with its embossment **40** engaging against the other vertical edge of the opening. The second runner **20** is pressed inwardly until its hook **36** overlies the lower edge of the opening.

It will be readily apparent that the first inserted tongue **28** of a runner **20** will be inserted into the opening with any difficulty whatsoever. It will also be apparent that because of the tapered shape of the end of the tongue, the initial insertion of the tongue of the second transverse runners **20** will likewise be relatively easy, and upon completion of its insertion will be firmly and tightly wedged in place to form a rigid and tight joint between the three runners. It will be understood that the opening **18** is to be formed of a width to snugly accommodate the thickness of the two tongues **28** at their point of engagement over the lower edge of the opening. It will be clear, however, that the embossments on the two tongues **28** of the oppositely-directed runners **20** inserted into openings **18** will be somewhat compressible, so as to permit insertion of tongues that may, to a limited extent, vary in thickness relative to that of an opening **18** or in the openings **18** that may, to a limited extent, vary in width.

This completes the description of the grid elements for forming a grid structure for suspended tile ceilings of the present invention. It will be readily apparent that such grid elements may be readily and easily assembled into a grid, by reason of the tapered ends of the lock tongues of the transverse runners; that they may be assembled without the use of any tools; and that when assembled they will form, because of thickened embossed construction of the lock tongues, a tight and rigid grid. It will also be apparent that the grid elements of the present invention are not critical as to thickness of the locking tongue nor the width of the receiving openings therefor, permitting slight variations in either or both without affecting the ease and rapidity of assembly nor a resultant tight and rigid joint.

It will be further apparent that numerous variations and modifications may be made in the grid elements of the present invention by anyone skilled in the art, in accordance with the principles of the invention hereinabove set forth, without the exercise of any inventive ingenuity. I, therefore, desire to be protected for any and all such variations and modifications that may be made within the spirit of the invention and scope of the claims hereto appended.

What I claim is:

**1.** In a grid for a suspended tile ceiling, or the like, a main runner including an upright web section and a tile-supporting flange section at right angles to said web section, said web section having a vertically-extending, straight-edged slot formed therethrough, and transverse runners joined with said main runner from opposed sides of said web section, each said transverse runner comprising an upright web section and a tile-supporting flange at right angles thereto, a lock tongue extending from an end of the web section of each said transverse runner of lesser height relative thereto, the lower edge of each said lock tongue being stepped to form a hook engaging over the lower edge of a main runner slot, said flange of said transverse runner terminating short of the tongue-connected end of the web section thereof, said tongue having a longitudinal embossment formed therein extending substantially the length thereof, the edges of said embossment spaced inwardly of the longitudinal edges of the tongues, said embossment being of substantially U-shaped cross-section and including sides and a web, said embossment web lying in a plane substantially parallel to said transverse runner web; the marginal portions of said tongue above and below said embossment being angularly inclined relative to said transverse runner web in the longitudinal direction of said embossment, thereby tapering the depth of said embossment along said tongue, with said embossment merging with said tongue adjacent the end thereof; said slot in said main runner of a width to snugly accommodate the thickness of two tongues at the point immediately inwardly of the hooks thereof.

**2.** The grid of claim **1**, wherein the longitudinal marginal edge portions of the tongue of each said transverse runner, at each side of said embossment, are offset relative to said web section, at an angle thereto, in the direction of said embossment, whereby said embossment is tapered in the direction of the end of said tongue to merge therewith.

**3.** The grid of claim **1**, wherein said tongues are formed with outwardly convergent edges.

**4.** The grid of claim **1**, wherein said embossments on said tongues extends a distance into the adjacent portion of said web section.

**5.** The grid of claim **11**, wherein a horizontal shoulder portion is provided in the lower edge of said tongue immediately inwardly of said hook, and a horizontal edge portion is formed in the upper edge thereof, in vertical register with said horizontal edge portion in said lower edge, said horizontal edge portions spaced a distance less than the height of said opening in said main runner web section.

**6.** The grid of claim **4**, wherein said embossment is trough shaped, and its bottom side is substantially parallel to the tongue in which it is formed.

7. The grid of claim 1, wherein said tongues are each inserted with their embossments engaging against a vertical edge of said slot in the web of said main runner.


**References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 3,193,063 | 7/1965 | Brown | 52—667 |
| 3,305,256 | 2/1967 | Zanamirowski | 52—667 |
| 3,367,695 | 2/1968 | Haertel | 52—484 |
| 3,378,976 | 4/1968 | Meredith | 52—484 |
| 3,396,997 | 8/1968 | Adams | 52—484 |
| 3,399,915 | 8/1968 | Stanzak | 52—726 |





HENRY C. SUTHERLAND, Primary Examiner

U.S. Cl. X.R.

52—484