

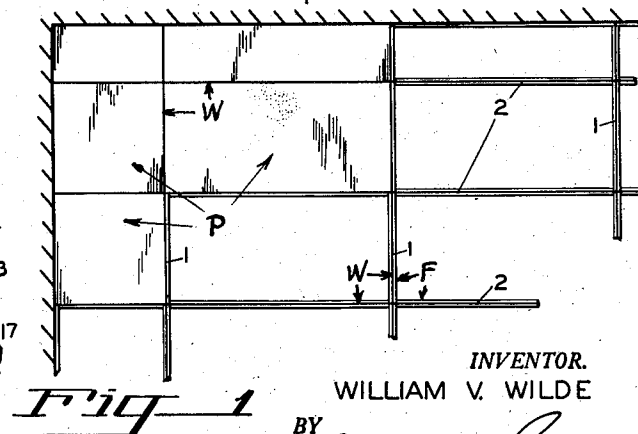
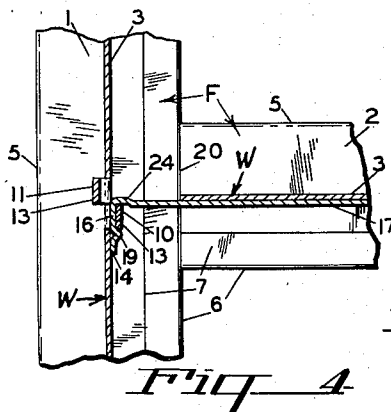
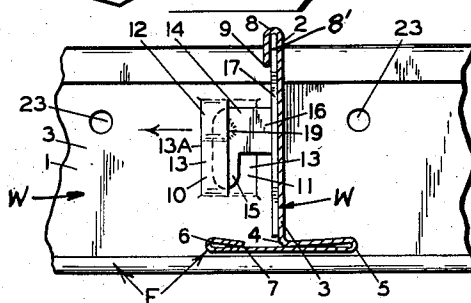
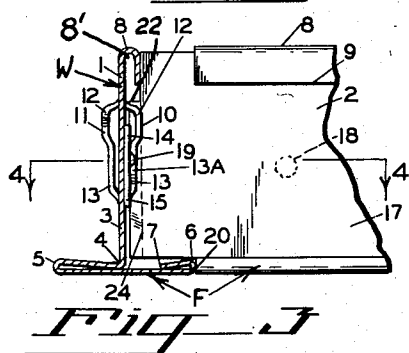
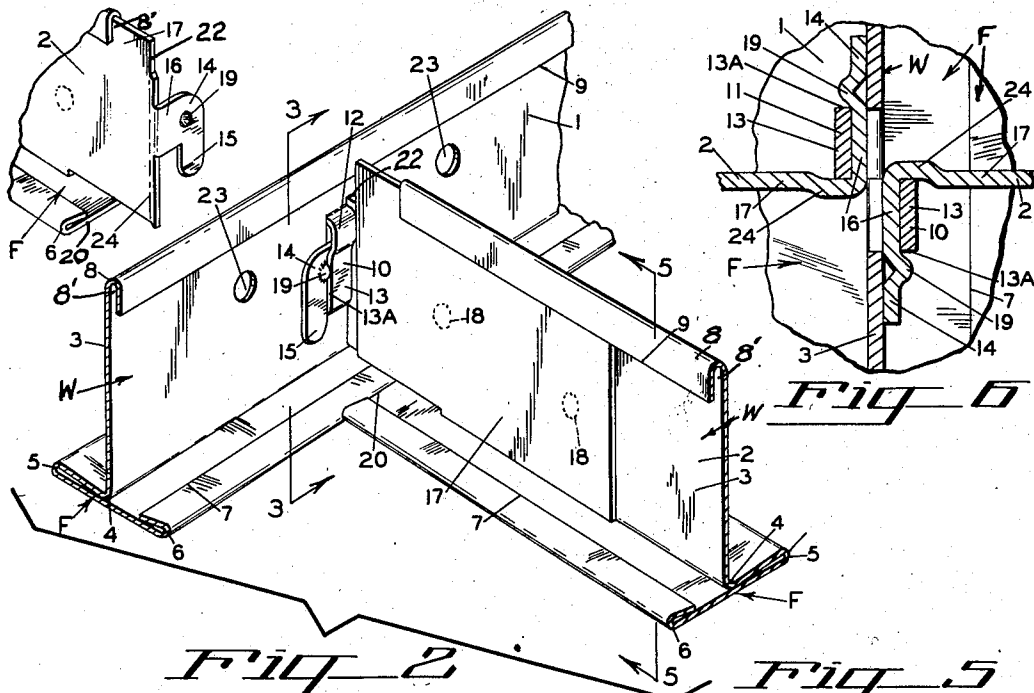
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SUSPENDED CEILING GRID CONSTRUCTION

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SUSPENDED CEILING GRID CONSTRUCTION

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2 Claims. (Cl. 189—36)

This invention relates to interior construction, especially suspended ceilings and more particularly to ceiling grids for supporting ceiling panels.

In the construction of suspended ceilings comprising a light gauge metal framework which is hung by wires from the structural ceiling slab or roof joists, the suspended grid framework generally consists of preformed inverted T bar sections which abut one another at right angles and are secured together by means of clips or other fastenings. The bottom flanges of the T sections are exposed, and serve to support various types of ceiling panels for decorative, acoustical, or light reflecting purposes.

The primary object of this invention is to provide a novel means for interlocking the cross runners of the grid framework to the main carrying runners in a simplified manner that will reduce the time normally required for installation.

Another object of this invention is to provide a connection between ceiling grid members having a positive locking connection between the grid members.

A further object of this invention is to provide a connection between ceiling grid members having a positive locking connection between the grid members and which is capable of being manually disengaged from each other without deformation to either member or the connector mechanism to facilitate rearrangement of grid members, complete disassembly, or provide large openings for access to the area above the suspended ceiling.

It is another object of the invention to provide a ceiling grid construction having simplicity of design, economy of construction and efficiency in operation.

Briefly, the novel connection between grid members, according to the present invention, is achieved by providing offset ears or loops on each side of the main runners at given intervals and providing slots of semi-keyhole shape for the reception of clips including hook-like portions having detents for insertion in said slots and that are securely fastened to the ends of the cross member. The clip at each end of the cross member may be an integral part thereof but it is preferred, however, to fabricate the clips separately to effect economy of material and simplicity in manufacture.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawing, wherein like reference characters indicate like parts through the several figures and in which:

Figure 1 is a fragmentary top plan view of a suspended grid ceiling with some of the ceiling panels installed;

Figure 2 is an exploded view in perspective of the adjoining portions of the grid members and the connection therebetween;

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Figure 3 is a fragmentary cross-sectional view taken on line 3—3 of Figure 2;

Figure 4 is a cross-sectional view taken on line 4—4 of Figure 3;

Figure 5 is a cross-sectional view taken on line 5—5 of Figure 2, and

Figure 6 is an enlarged fragmentary cross-sectional view similar to Figure 4 and illustrating two cross members connected to the main runner.

Referring now to the drawings in detail, specifically to Figure 1, a typical suspended ceiling comprises a grid construction formed by main runners 1 and cross members 2 connected to one another in continuous grid formation. These main runners 1 and the cross members 2 are of T-section and are positioned in inverted relation with their webs W disposed vertically and their flanges F beneath the webs and disposed horizontally. Ceiling panels P are mounted on the grid assembly with edges nesting within the webs W of opposed runners and cross members and resting on the flanges F thereof.

The structure, that is the cross-sectional conformation of the runners 1 and cross members 2 is substantially identical and preferably they are formed of strips 3 of sheet material which are bent to shape, as best shown in Figure 2. The strips 3 of sheet material are bent intermediate their longitudinal edges 7 and 9 in a right angle bend 4, the portion between the bend 4 and edge 7 forming the flange F, and the portion between the bend 4 and edge 9 forming the web W. To form the cross flange F, that portion of the strip between the bend 4 and the edge 7 is bent at a point spaced from the bend 4 in a reverse bend 5. The strip portion adjacent the edge 7 is bent in a second reverse bend 6 substantially equispaced with the bend 5 from the right angle bend 4 to provide the branches of the flange F with substantially equal width and thickness. The strip adjacent the edge 9 is bent in a U-bend 8 to provide a channel 8' at the top of the web W. This provides a rigid and strong T bar made from relatively thin sheet material. The main runners 1 may be provided with apertures 23 for the attachment of the usual suspension means, such as wires or the like.

The connector means for securing the cross members 2 to the main runners 1 comprises ears or loops 10 and 11 respectively extending from opposite sides of the web W of the main runner 1 and in line with the position of the cross members 2. These ears or loops 10 and 11 are preferably struck from the web W and formed immediately adjacent each other and at spaced intervals longitudinally of the web W. The loops are of two different depths as best shown in Figure 3, and include an upper part 12 relatively widely spaced and a lower part 13 relatively closely spaced from the web W so that the space or slot provided between each loop and the adjacent side of the web is of semi-keyhole shape, that is, a keyhole divided down the middle by a straight line.

Cooperative with the ears or loops 10 and 11 is a finger or hook-like element 14 at each end of the cross members 2, and while these elements may be integral with the webs W, preferably they are formed as part of a clip 17 attached at each end of the web. Each element 14 extends at right angles to the web W or the clip 17, as the case may be, at each end of the cross members 2 and the elements at opposite ends of the members 2 are on oppositely disposed sides of the web W. The element 14 has a main horizontal body portion 16 which terminates in a downwardly extending finger 15, as best illustrated in Figures 2 and 5, the body portion 16 having a length substantially equal to the width of a loop 10 or 11. Each element 14 is provided at the juncture of the horizontal portion 16 and finger 15 with a protrusion

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sion or detent 19 extending from the finger toward the cross member a distance less than the spacing of the portions 12 but greater than that of the portions 13.

The clip 17 is illustrated as being formed by a separate plate or piece of sheet material, which is fitted in the channel 8' and secured to the web W of the cross member 2, as by spot welds 18. The ends 20 of the flanges F of the cross members 2 are recessed from the fingers 14 a distance equal to the width of the branches of the flanges F of the runners 1, either by notches formed in said members or by offsetting the clips 17 relative to the ends of said members. At their upper corners, the webs W or clips 17 are provided with notches 22 to accommodate the U-bends 8 of the webs W of the main runners 1. In order to maintain the center lines of the cross members 2 in alignment with one another on opposite sides of the main runners 1, the webs W or clips 17 are provided, immediately adjacent the fingers 14, with offsets 24 half the thickness of the webs W or clips 17.

In assembly, the end of a cross member 2 is abutted against the side of a main runner 1 and raised slightly so that the detent 19 will pass through the enlarged portion 12 of a loop 10 or 11 as the cross member is moved sidewise in the direction of the arrow (Figure 5). When the finger 15 has passed through the loop, the end of the member is lowered to the position shown in Figures 2, 3 and 4, so that the cross member will be be securely locked in the fixed position shown in these views, with the detent 19 engaged behind the edge 13A of the narrow portion 13 of the loop, assisting the tip of the finger 15 from being withdrawn or tipped out of position. The end 20 of the flange F of the cross member is adapted to engage the adjacent edge of the flange F of the main runner so that when the cross member is fully connected, a very rigid construction is obtained. Furthermore, due to the fact that the fingers 14 on the opposite ends of the cross members are on the opposite side of the webs W, the connections at opposite ends brace the members against the oppositely disposed connection to the adjacent runner and helps to prevent the cross members 2 from twisting after being brought in place.

Although a certain specific embodiment of the invention has been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

What I claim is:

1. Connecting means for ceiling grid members having vertically disposed web portions, comprising a vertically disposed loop on the web portion of one member with the upper portion of said loop extending farther from the web portion than the lower portion of said loop and forming with the web portion a vertically extending slot of semi-keyhole shape with the upper portion wider than the lower portion thereof, and a flat hook-like portion on the end of the web portion of another member disposed perpendicular to the one member, said hook-like portion being at right angles to its web portion and including a horizontal portion secured to the web portion and a downwardly extending finger on the free end of said horizontal portion and spaced from the web portion,

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said horizontal portion having a length substantially equal to the width of said loop and said finger being of such size that it may pass through said loop whereby said hook-like portion extends through said loop with said finger and web portion snugly straddling said loop, and a detent on said hook-like portion at the junction of said horizontal portion and said finger and protruding from said hook-like portion a distance greater than the narrow portion but less than the wider portion of said slot and abuts the adjacent edge of said loop retaining said hook-like portion in said loop after said detent has been passed through the wide portion of said slot and lowered into juxtaposition with the narrow portion thereof.

2. Connecting means for ceiling grid members including main runners and cross-members disposed perpendicularly between the main runners and each having vertically disposed web portions and horizontal flanges supporting ceiling panels, comprising two vertically disposed loops in side-by-side relation on the web portion of said main runners, said loops extending from opposite sides of the web portion with the upper portion of each said loop extending farther from the web portion than the lower portion of each said loop and each forming with the web portion a vertically extending slot of semi-keyhole shape with the upper portion wider than the lower portion thereof, and a flat hook-like portion on each end of the web portion of said cross-members, each of said hook-like portions being at right angles to its web portion and including a horizontal portion secured to the web portion and a downwardly extending finger on the free end of said horizontal portion and spaced from the web portion, said horizontal portion having a length substantially equal to the width of said loop and said finger being of such size that it may pass through said loop whereby said hook-like portion extends through said loop with said finger and web portion snugly straddling said loop, and a detent on said hook-like portion at the junction of said horizontal portion and said finger and protruding from said hook-like portion a distance greater than the narrow portion but less than the wider portion of said slot and abuts the adjacent edge of said loop retaining said hook-like portion in said loop after said detent has been passed through the wide portion of said slot and lowered into juxtaposition with the narrow portion thereof, said loops and hook-like portions being relatively offset and positioning the web portions of said cross-members on opposite sides of said main runners in alignment.

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