United States Patent

[11] 3,633,952

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[54] **SUSPENDED CEILING GRID JOINT STRUCTURE**
2 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **287/189.36A,** 52/668
[51] **Int. Cl.** **F16b 7/00**
[50] **Field of Search** ..... 287/189.36 A; 52/664, 665, 666, 667, 668

[56] **References Cited**

UNITED STATES PATENTS

971,011	9/1910	Kinnear	287/189.36 A
3,149,704	9/1964	Hodapp	52/668 X
3,343,309	9/1967	Netz et al	52/665 X

FOREIGN PATENTS

1,364,379	5/1964	France	287/189.36 A
829,786	1/1952	Germany	287/189.36 A
400,502	4/1966	Switzerland	52/665

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ABSTRACT: A ceiling board suspension system has a flexible crossmember with bent-out tabs on opposite ends of its supporting flanges. The tabs, when the crossmember is compressed, will slide into a cutout slot in the center of the flanges of the main runner and, when the crossmember is released, the tabs of the crossmember will lock into place into the openings formed on the opposite edges of the cutout slot of the main runner. The edges of the cutout slot of the main runner are diagonally cut toward the center of the slot opening so that a level joint surface may be formed if the tabs of the crossmember have a lowered portion or ridge which abuts with the cutout slot edges.

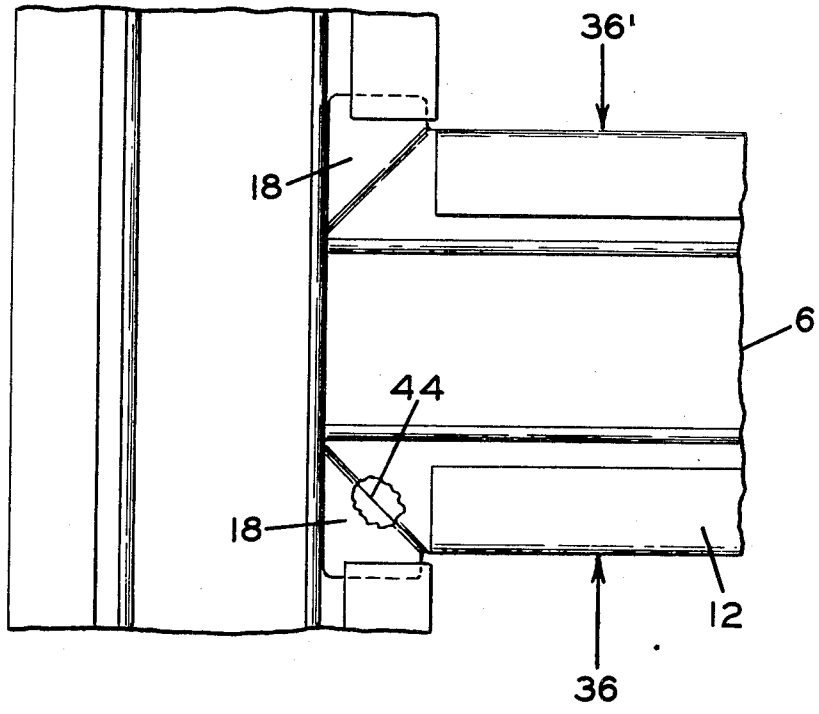


Fig. I

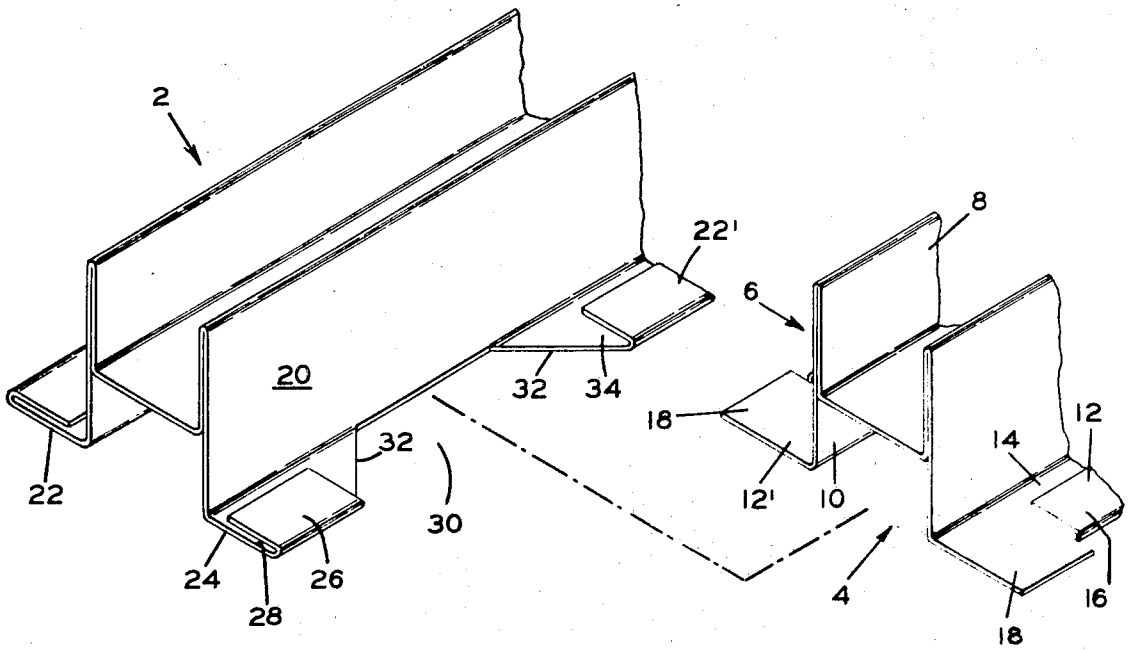
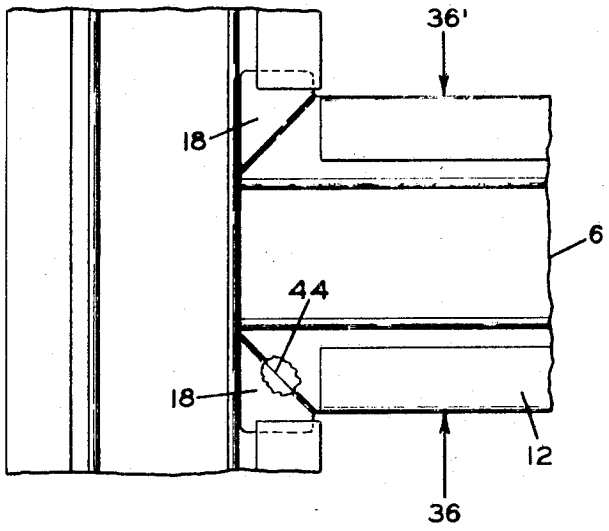


Fig. II



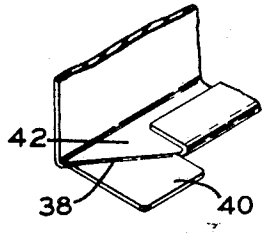


Fig. III

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SUSPENDED CEILING GRID JOINT STRUCTURE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a suspended ceiling grid joint system and, more particularly, to a tab structure for joining the members of a suspended ceiling grid joint system.

2. Description of the Prior Art

U.S. Pat. No. 3,169,614, discloses the most commonly used type of joint structure for connecting together the cross member and main runner member of a suspended ceiling system. U.S. Pat. No. 3,023,865, discloses a joint structure for a ceiling suspension system, which joint structure is somewhat similar to that set forth in the paragraphs hereafter. This particular patent discloses a plurality of joint structures, but in every case each joint structure requires a channel-type structure which is used in coaction with a tab member. The main runner member is provided with a slot structure, and the cross member is provided with a tab structure. However, a slide-lock engagement is maintained between the tab and the channel structure, and the two elements are assembled in a manner completely different from that set forth below.

Herein there is set forth a structure for providing a positively locked-together joint structure which is very simple to utilize and very simple in construction.

SUMMARY OF THE INVENTION

The ceiling board suspension system herein has a flexible cross member having a U-shaped web portion and a two-part runner flange extending from each side of the base of the web. The upper part of the flange is formed by an extension of the lower flange part that is folded to overlie the lower flange. A main runner is used having a web portion and a two-part runner flange extending from the base of the web. The flange is the same as on the cross member flange above and an opening exists between the upper and lower flange parts. The flange has a cutout slot in its center. The two-part supporting flanges of the cross member have tabs at one end, which tabs, when the cross member is compressed will slide into the cutout slot in the flanges of the main runner. When the cross member is released, the tabs of the cross member will lock into place into the openings formed on the opposite ends of the cutout slot between the two parts of the flange of the main runner. The edges of the cutout slot of the main runner may be diagonally cut toward the center of the slot opening so that a level joint surface is formed if the tabs of the cross member have a lowered portion or ridge to abut with the cutout slot edges.

BRIEF DESCRIPTION OF THE DRAWING

FIG. I is a perspective view of a portion of the members of the ceiling system;

FIG. II is a top view of the joint structure when the members of the ceiling system are interconnected; and

FIG. III is a perspective view of a portion of the cross member showing the tab structure with a ridge thereon.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the suspended ceiling system herein, the main cross member **4** are connected by a unique joint structure, which is the invention herein. The cross member **4** has a web **6** formed of an upper U-shaped part **8** and a lower inverted U-shaped part **10**. The board supporting flanges **12** and **12'** are bent-out extensions at the base of the web **6** of the cross member and are comprised of a lower part **14** and an upper part **16** which is an upwardly and inwardly folded extension of the edge portion of the lower flange part. At one end of the flanges **12** and **12'**, there is a tab element **18** which is part of the lower flange part **14** that has not been folded to form the upper flange part **16**. The cross member must be flexible so that the tab elements can be moved toward each other.

The main runner has a web similar to that of the cross member. However, the runner may be only an inverted T-shape so that the web need not have the double U-shape. The board supporting flanges **22** and **22'** have a lower flange part **24** and an extension of this lower flange part is folded upwardly and inwardly to form an upper flange part **26**. An opening **28** is formed therebetween. A cutout slot **30** is located in the center of flange **22'**, as can be seen in FIG. I. At the sides **32** of the cutout slot **30**, openings **34** are formed between the upper flange part **26** and the lower flange part **24**. The join the cross member to the main runner, the web of the flexible cross member is compressed so that the distance from the edge of one tab **18** to the other tab **18** is reduced to the size of the width the cutout slot **30** of the main runner, therefore, the tabs will readily fit into the cutout slot.

Pressure is applied in the direction of the arrows **36** and **36'** on the cross member of FIG. II to reduce the width of the tab edges to equal that of the cutout slot **30**. When the cross member is compressed, the tabs **18** will fit into the cutout slot **30** and, when compression is released, the tabs **18** will lock into the openings **34** at the sides of the cutout slot, as is shown in FIG. II. The edges of the flanges **12** and **12'** will now have a width equal to the slot width and, with the tabs locked in place, the two members of the ceiling system are firmly joined.

Referring to FIG. III, there is shown a modification of the joint structure which will provide a smooth configuration to the joint structure. The tab **18** has a ridge **38** which separates the tab into two parts **40** and **42**. Part **40** is on a higher plane than part **42**. When the joint structure is assembled as shown in FIG. II, the ridge **38** abuts with edge **44**. Edge **44** is the same as side **32** of FIG. I. The lower flange surface of the ceiling members forms a smooth joint configuration when the joint structure is assembled because part **40** is offset a little higher than part **42**. The offset distance is equal to the thickness of the sheet metal forming the joint structure elements. The ridge **38** is the structure which causes the offset and joins parts **40** and **42**. When the joint structure is assembled, the lower surface of the flange of the cross member in part **42** are in the same plane. Part **40** of tab **18** overlies the flange member of the main runner. As a result of the offset, the lower surface of the flange of the main runner is in the same plane as the lower surface of the flange of the cross member and part **42**. The assembled joint structure creates a smooth joint configuration and gives a pleasing appearance to the eye of the viewer.

What is claimed is:

1. In a suspended ceiling structure, an elongated main runner with a web and a two-part runner flange capable of supporting ceiling boards and extending from the web of the main runner, said two-part runner flange comprising a lower flange extending outwardly from the web with a cutout slot of a predetermined width in the center portion thereof, and an inwardly turned, overlying flange which is an upwardly and inwardly folded extension of the lower flange having a cutout slot equal in size to that of the lower flange, and which is spaced a short distance above the lower flange to form an opening between the two parts of the runner flange, and an elongated cross member with a flexible U-shaped web and two-part cross member flanges capable of supporting ceiling boards and positioned on two opposite sides thereof, said two-part cross member flanges each comprising a lower flange extending from the web the length of the cross member, and an inwardly turned, overlying flange, which is an upwardly and inwardly folded extension of the lower flange, said two-part cross member flange further having a tab on two opposite ends which is part of the lower flange that has not been folded inwardly, the cross member being flexible so that when it is compressed far enough the flanges of the cross member will fit into the cutout slot of the main runner and the tabs formed on the cross member flanges will fit into the opening between the lower and overlying flanges of the main runner and thereby lock the two structures of the ceiling system together.

2. The ceiling suspension system of claim **1** wherein the cutout slot edges of the main runner are diagonally cut toward

the center of the slot opening, and wherein the tabs on the cross member flanges have a ridge so that when the main runner and cross member are interlocked the slot edges and ridged portions of the tabs abut to form a level plane where the runner flanges interlock.

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