

July 9, 1963

B. O. PURDY

3,096,862

CEILING SUSPENSION SYSTEM WITH DOUBLE LOCKING CLIP

Filed Sept. 7, 1960

3 Sheets-Sheet 1

Fig. 1

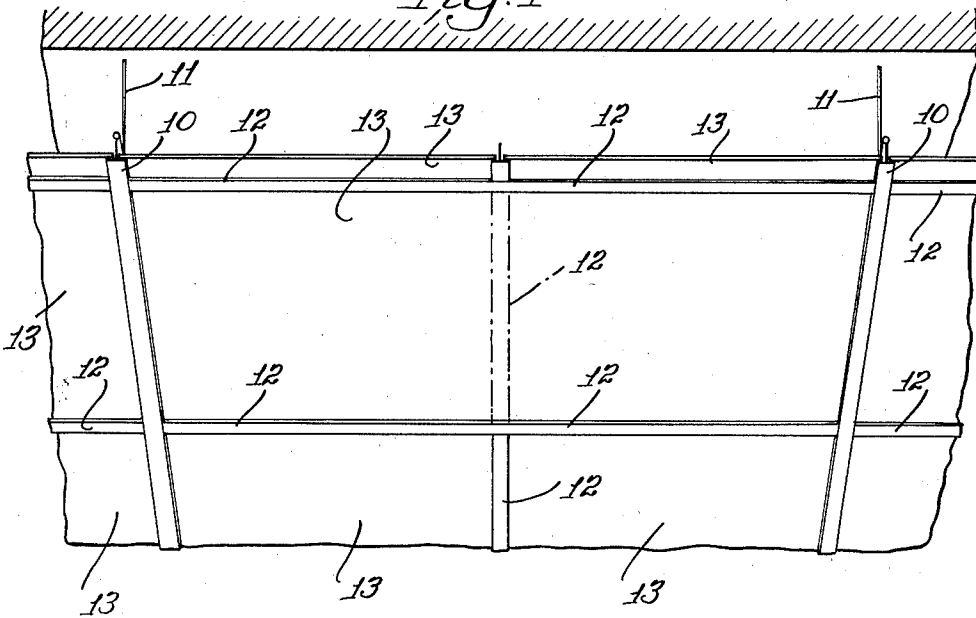


Fig. 2

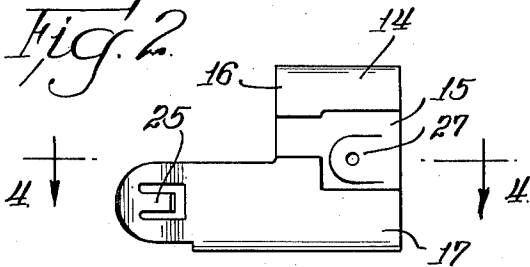


Fig. 3

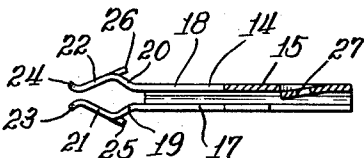
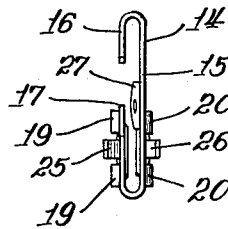


Fig. 4

INVENTOR.  
*Burl O. Purdy*

BY  
*Jones, Danko + Robertson*  
Att'ys.

July 9, 1963

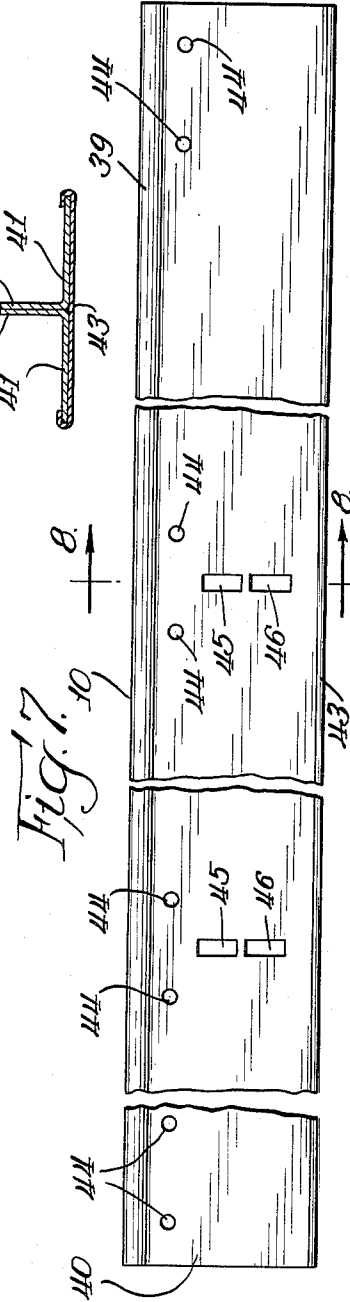
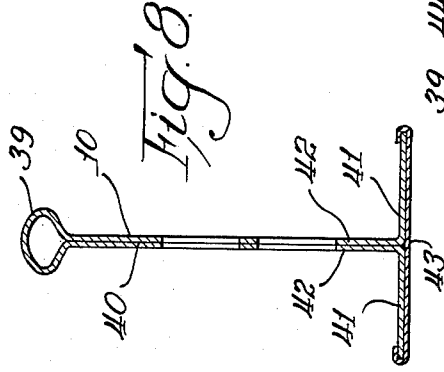
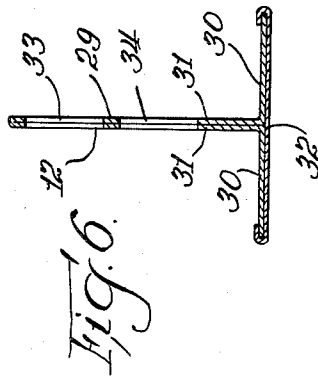
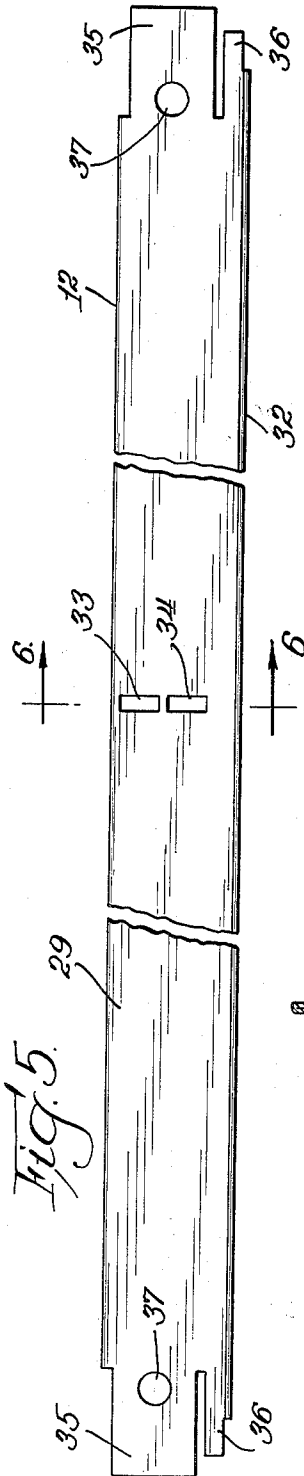
B. O. PURDY

3,096,862

CEILING SUSPENSION SYSTEM WITH DOUBLE LOCKING CLIP

Filed Sept. 7, 1960

3 Sheets-Sheet 2



INVENTOR.  
*Burl O. Purdy*  
 BY  
*Jones, Darbo & Robinson*  
 Att'ys

July 9, 1963

B. O. PURDY

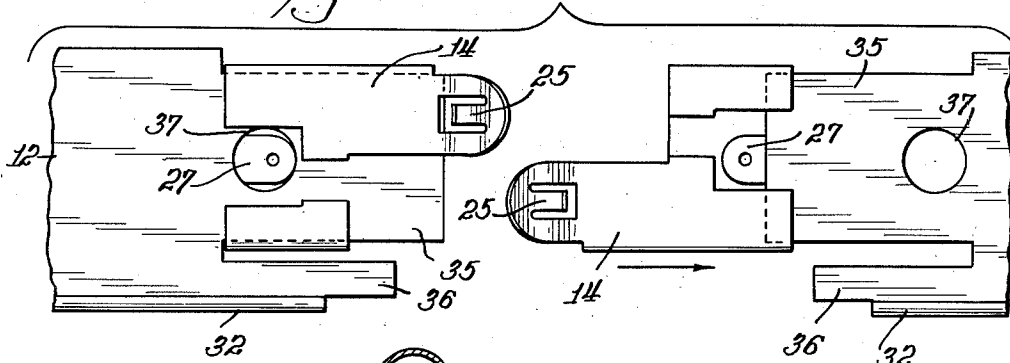
3,096,862

CEILING SUSPENSION SYSTEM WITH DOUBLE LOCKING CLIP

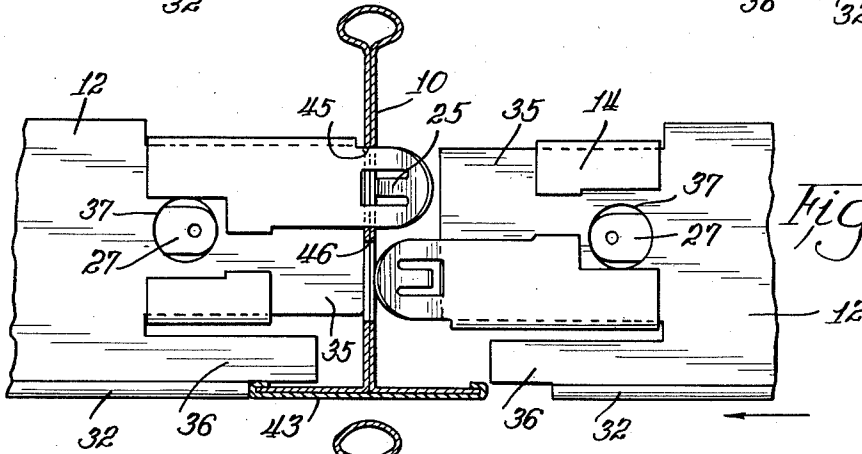
Filed Sept. 7, 1960

3 Sheets-Sheet 3

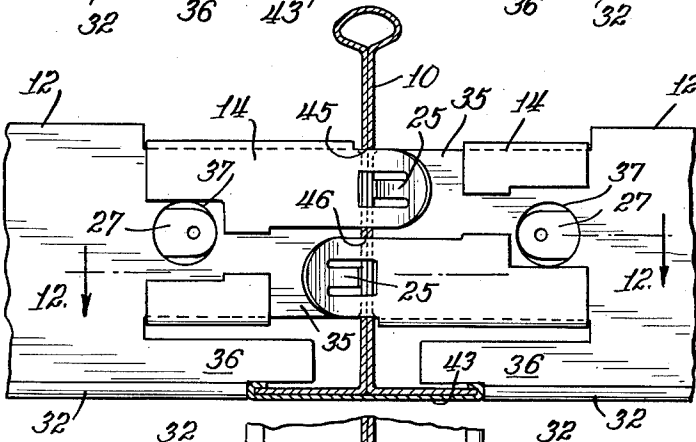
*Fig. 9.*



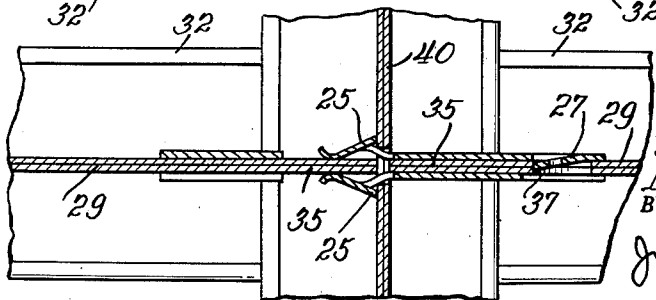
*Fig. 10.*



*Fig. 11.*



*Fig. 12.*



INVENTOR.  
Burt O. Purdy  
BY  
Jones, Darbo & Robertson  
Attys.

1

3,096,862

**CEILING SUSPENSION SYSTEM WITH  
DOUBLE LOCKING CLIP**

Burl O. Purdy, Bensenville, Ill., assignor to W. J. Haertel & Co., Melrose Park, Ill., a corporation of Illinois  
Filed Sept. 7, 1960, Ser. No. 54,506  
21 Claims. (Cl. 189—36)

This invention relates to a ceiling suspension system using a double locking clip for securing the longitudinal support members and transverse support members in an interlocking engagement. More particularly, this invention relates to a ceiling suspension system wherein the transverse support members are supported upon a longitudinal support member and are interlockingly engaged therewith and with each other through the use of a novel double locking clip.

This invention provides an improved support system for suspended ceilings of the acoustic tile type or the like. The support system of the present invention combines longitudinal support members which are hung or otherwise secured preferably to the overhead construction by means of wires or the like and transverse support members which are supported upon and interlockingly engaged with the longitudinal support member and with each other through the medium of a novel double locking clip as is described hereinafter. The double locking detachable clip of the present invention is slidably positioned on an extended end portion of a transverse support member and has a spring nose that enters a slot in the web of the longitudinal support member, the respective clips on each of the transverse support members on opposite sides of the web of the longitudinal support member being inverted vertically to enter one of the aligned slots in the web of the longitudinal support member so that the transverse support members on the opposite sides of the longitudinal support member will be in alignment and so that the clips on each of the transverse support members will be in interlocking engagement with the transverse member on the opposite side of the web.

The interlocking engagement of the clip on transverse support member forces the nose of the clip to expand and the tongues thereof to engage the opposite side of the web on each side of a slot to cause a double locking action by locking each transverse support member to its oppositely positioned member with respect to the web of the longitudinal support member and also to lock each transverse support member to the longitudinal support member on which it is supported.

The clips are releasable from the transverse supports to permit interchange from an upper position on a transverse support member to a lower position on a transverse support member. This feature of interchangeability of the clip permits the use of a standard clip in both upright and inverted positions on the transverse support member, thereby effecting an economic benefit in both standardization of manufacture and in the use of only one type of clip at the job site.

An object of the present invention is to provide a ceiling suspension support system whereby the under surfaces of the longitudinal support members and transverse support members are coplanar.

A second object of the present invention is to provide a ceiling suspension system wherein through the use of a novel double locking clip, a substantially unitary suspension system is provided.

Other objects and advantages of the present invention will become apparent to those skilled in the art from the following description of the invention taken in conjunction with the accompanying drawings in which:

FIG. 1 is a fragmentary perspective view of a suspended ceiling construction utilizing the present invention, and

2

disclosing the coplanar features of the under surface transverse and longitudinal support members.

FIG. 2 is a side-elevational view of the improved double locking clip of the present invention.

FIG. 3 is an end-elevational view of the clip shown in FIG. 2.

FIG. 4 is a sectional view through line 4—4 of FIG. 2 of the novel double locking clip.

FIG. 5 is a side-elevational view of a transverse member according to the present invention, the member being broken for the convenience of the drawing.

FIG. 6 is a vertical sectional view of a transverse member taken through the line 6—6 of FIG. 5.

FIG. 7 is a side-elevational view of the longitudinal support member of the present suspension ceiling system, being broken for the convenience of the drawing.

FIG. 8 is a vertical sectional view taken through the line 8—8 of FIG. 7.

FIG. 9 is an enlarged view of the ends of two of the transverse support members with the left member having the novel clip in complete engagement thereon, and the right member having the novel clip in partial engagement therewith.

FIG. 10 is an enlarged view showing the longitudinal support member in vertical section and the left transverse support member being supported thereby and in interlocking engagement therewith through the novel clip of the present invention, while the right transverse member is shown just prior to engagement with the longitudinal support member with the double locking clip nose about to enter the lower slot in the longitudinal support member and each transverse support member about to be engaged by the respective upper and lower clips on opposite sides of the longitudinal support.

FIG. 11 shows the completed assembly with the longitudinal support member in vertical section and the two transverse support members being in complete engagement therewith and engaged with each other by the novel double locking clip members.

FIG. 12 is a fragmentary sectional view taken through the line 12—12 of FIG. 11 showing the double locking clip of the present invention engaging the longitudinal support member and each of the respective transverse members engaging the opposite transverse support member aligned therewith on each side of the longitudinal support.

Referring to the drawings in detail and describing first the novel suspension ceiling support system of the present invention as shown in FIG. 1, there is shown two longitudinal support members 10 being supported from the overhead construction by wires 11. A plurality of transverse support members 12 are supported on and locked to the longitudinal supports 10. A plurality of acoustical tile members 13 are shown supported on the longitudinal supports 10 and transverse supports 12. As seen in the drawing FIG. 1, the present invention permits the under surfaces of the flanged portions of the longitudinal support members 10 and the transverse support members 12 to be coplanar and to give the effect of a substantially unitary suspension support system.

The novel clip 14 of the present invention as shown in FIGS. 2, 3 and 4, has a body section 15 having portions 16 and 17 thereof spaced apart and bent approximately 180° from the plane of the body, as can best be seen in FIG. 3, for slidable engagement with the extended portion of the transverse support members. The bent over portions 16 and 17 are shown substantially parallel with the body 15. The portion 17 extends longitudinally forwardly from the body portion 15 to be parallel with the vertically reduced extended section 18 of the body 15 as shown in FIG. 4. The spring nose terminal ends of

the forwardly extended sections 17 and 18 have, in order of distances from the body 15, outwardly forwardly flaring portions 19 and 20 and inwardly forwardly flaring portions 21 and 22 and outwardly forwardly flaring lips 23 and 24 all of which can best be seen in FIG. 4. The spring nose terminal end of the clip 14 is also provided with tongue members 25 and 26 which flare outwardly and rearwardly substantially in a plane with the inwardly flaring portions 21 and 22, which tongue members engage the opposite sides of the longitudinal support members after passing through slots provided therein. The clip 14 also has on the body portion 15 an inwardly biased tongue member 27 which cooperates with a hole in the ends of the extended web of the members 12 for retaining the clip positioned thereon, which cooperation will be more fully described hereinafter.

The transverse support member 12 shown in FIG. 5 is shown in the form of a T-beam having a laminated vertical web 29 as can best be seen in FIG. 6, and lateral coplanar horizontal flanges 30 on opposite sides thereof. The web 29 of the transverse support member 12 is here shown formed by the folded laminations 31. The under surfaces of the flange members 30 are then covered by decorative sheet metal as at 32, with the sheet metal being folded around the flange members 30 to be held thereby. The transverse support member 12 is further provided with slots in the web 29 or slots at 33 and 34 into which the spring nose of the clip member 14 is insertable.

The ends of the transverse member 12 are constructed as shown in FIG. 5, one end of which will be described inasmuch as both ends are identical. The laminated web 29 is reduced vertically to form the integral extended portions 35 and 36. The extended portion 35 is slidably engaged by the clip 14 with the tongue 27 of the clip 14 being positionable in the hole 37 for interlocking relationship therewith.

The extended portion 36 extends upon and is supported by a flange of the longitudinal support member 10 as hereinafter described. The decorative sheet metal covered flange 32 abuts against a flange portion of the longitudinal support member 10 so as to have their under surfaces in a coplanar relationship.

The longitudinal support member 10 shown in FIGS. 7 and 8, is shown in the form of an I beam having a top rail 39, a laminated vertical web 40 and lateral coplanar horizontal flanges 41 on opposite sides of the web. The laminated web 40 is here shown of folded laminations 42 as seen in FIG. 8. In accordance with the present invention, the under surfaces of the flanges 41 are also covered by decorative sheet metal 43 which can be matching or contrasting to that of the decorative sheet metal 32 of the transverse support members 12. The longitudinal support members 10 are suspended from overhead construction by wire 11 shown in FIG. 1 which wires are insertable in the holes 44 in the web of the longitudinal support member 10, as shown in FIG. 7. Upon one of the longitudinal support members 10 being securely suspended from the overhead construction, and upon the detachable double locking clip member 14 being slidably engaged with the extended portion 35 of the web 29 so that the tongue 27 engages the hole 37, the transverse members 12 are then positioned relative the longitudinal support member 10 so that the extended portion 36 of the web 29 is supported thereby. In this position the spring nose portions of the clip 14 are received in the slots 45 and 46 in the web of the longitudinal support member, as can be seen in FIG. 10. The under surfaces of the decorative sheet metal coverings 32 and 43 are then coplanar while the extended portion 36 of the transverse support member 12 rests upon the flange 41 of the longitudinal support member 10. The spring nose portion of the double locking clip 14 is shown inserted into one of the slots 45 of the longitudinal support member 10 and the tongue 25 is flared out to retain the left transverse support mem-

ber 12 and longitudinal support member 10 in interlocking engagement.

The complete interlocking of the support members is shown in FIGS. 11 and 12 where the left and right transverse members are in interlocking relationship with the longitudinal support member 10 and in interlocking relationship one with the other by being engaged by the spring nose portion of the detachable double locking clip which is in locking engagement on the extended portions 35 of the transverse support member on the opposite side of the longitudinal support member.

The relative positions of the detachable double locking clips 14 on the extended portions 35 of the transverse support members 12 is clearly shown in FIG. 9. The left transverse support member has in engagement thereon a clip 14 in an upright position vertically, so that the spring nose portion extends from the top portion of the extended portion 35. The right transverse support member has in engagement thereon a clip 14 in an inverted position vertically, so that the spring nose portion extends from the lower portion of its extended portion 35.

The spring nose portions of the clips are inserted into the vertically aligned slots 45 and 46 respectively in the web of the longitudinal support member 10. The nose portions extend through and beyond the depth of the slots and engage interlockingly the extended portions 35 of the transverse support members aligned with but on opposite sides of the longitudinal support member 10.

The ceiling suspension system of the present invention is characterized by its ease of installation and the use of the novel detachable double locking clip arrangement, which provides the trade with a suspension system that approaches that of a unitary system. The component parts of the present invention are so interlocked in assembly that strength is added to the system as well as presenting an appearance which due to the coplanar relationship of the visible surfaces lends beauty to the ceiling.

What is claimed is:

1. A ceiling suspension structure comprising: a flanged longitudinal support member having a web normal to the flange, said web having vertically aligned slots therein; a flanged transverse support member having a web normal to its flange, said web having a bifurcated end comprising first longitudinally extended portion supported by said longitudinally support member, and a second longitudinally extended portion in vertical alignment with said first extended portion, said portions defining an opening therebetween, whereby the second portion has exposed top and bottom edges; and a detachable interlocking clip carried by said second extended portion of said transverse support member inserted in a slot in the web of said longitudinal support member so that the flanges on said longitudinal support member and said transverse support member are disposed coplanar, said clip fitting about said top and bottom edges to align the clip with said second portion.

2. The structure of claim 1 wherein the second longitudinally extended portion of said transverse support member has a hole therein and said clip has a spring tongue biased inwardly to engage said hole to provide a detachable securement with said transverse support member.

3. The structure of claim 2 wherein the clip has a spring nose having an outwardly rearwardly flaring tongue to engage the web of said longitudinal support member in a detachable locking arrangement.

4. The structure of claim 2 wherein the clip has a spring nose having a pair of outwardly rearwardly flaring tongues to engage the web of said longitudinal support member on opposite sides of said slots in a detachable locking arrangement.

5. A ceiling suspension structure comprising: a longitudinal support member having a web and a pair of

5

flanges normal thereto, said web having vertically aligned slots therein; a pair of transverse support members each having a web and a pair of flanges normal thereto, each of said webs having a first extended portion extending beyond the flanges to be supported by said longitudinal support member, and a second extended portion extending beyond the flanges; and a detachable double locking clip on each of said second extended portions of said transverse support members, said clips being insertable in the vertically aligned slots in the web of said longitudinal support member, to align the webs of the transverse support members on opposite sides of the web of the longitudinal support member, said clips locking each transverse support member to the longitudinal support member and interlocking each transverse support member to each other transverse support member aligned on the opposite side of the web of the longitudinal support member.

6. The structure of claim 5 wherein the second extended portion of each of said transverse support members has a hole therein and each clip has a spring tongue biased inwardly to engage said hole to provide a detachable securement between said clip and said transverse support member.

7. The structure of claim 6 wherein the clip has a spring nose having an outwardly rearwardly flaring tongue to engage the web of said longitudinal support member in a detachable locking arrangement.

8. The structure of claim 6 wherein the clip has a spring nose having a pair of outwardly rearwardly flaring tongues to engage the web of said longitudinal support member on opposite sides of said slots in a detachable locking arrangement.

9. The structure of claim 6 wherein the clip has a spring nose having a pair of outwardly forwardly flaring lips to interlockingly engage the transverse support member aligned on the opposite side of said web of the longitudinal support member.

10. The structure of claim 9 wherein the clip has a spring nose having an outwardly rearwardly flaring tongue to engage the web of said longitudinal support member in a detachable locking arrangement.

11. The structure of claim 9 wherein the clip has a spring nose having a pair of outwardly rearwardly flaring tongues to engage the web of said longitudinal support member on opposite sides of said slots in a detachable locking arrangement.

12. The structure of claim 11 wherein the clips carried by the transverse support members on opposite sides of the web of the longitudinal support member are in inverted positions to be insertable in the vertically aligned slots in the web of the said longitudinal support member.

13. A clip for use in ceiling suspension systems comprising: a body portion, having upper and lower spaced apart vertical portions thereof bent substantially 180 degrees out of the plane of said body; a spring nose portion comprising a vertically reduced longitudinal forward extension of said body portion and a longitudinal forward extension of one of said bent portions; and an outwardly rearwardly flaring tongue on each said extension of said spring nose.

6

14. A clip for use in ceiling suspension systems comprising: a body portion, having upper and lower spaced apart vertical portions thereof bent substantially 180 degrees out of the plane of said body; a spring nose portion consisting of a vertically reduced longitudinal forward extension of said body portion and a longitudinal extension of one of said bent portions, each said extension having forwardly thereof an outwardly forwardly extending portion, an inwardly forwardly extending portion and an outwardly forwardly extending lip thereon; and an outwardly rearwardly flaring tongue on each said extension of said spring nose.

15. The clip of claim 14 wherein the lips of said clip are spaced apart a predetermined distance to permit a spring clamping action thereby when they are expanded.

16. The structure of claim 14 wherein the body portion of said clip has an inwardly biased tongue member.

17. A ceiling suspension structure comprising: a longitudinal support member having a vertical web and a pair of flanges normal thereto, said web having two slots therethrough in vertical alignment; a transverse support member having a vertical web normal to the web of the longitudinal member and a pair of flanges co-planar with the flanges of the longitudinal support member, said transverse web having an extension on the end adjacent the longitudinal member, said extension being centered with respect to the two slots with the midline half-way between the top and bottom of the extension being aligned with the longitudinal web half-way between said slots; and a clip attached to said extension and having a nose extending from the end thereof, said nose being vertically offset with respect to said midline and extending through one of said slots; whereby said clip may be detached from said extension and turned over with the nose then entering the other of said slots.

18. A structure as set forth in claim 17 wherein, said transverse member has a second extension resting on a portion of the longitudinal member.

19. A structure as set forth in claim 18 wherein, said second extension is on the transverse web immediately below the extension to which the clip is secured, and the second extension rests on the adjacent web of the longitudinal member.

20. A structure as set forth in claim 17 wherein, there are means on the transverse member releasably engaging the web of the longitudinal member.

21. A structure as set forth in claim 20 wherein, said means comprises the end of the clip extension abutting the longitudinal web on one side and ears on the nose abutting the other side of the longitudinal web.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

2,786,249	Poupitch	Mar. 26, 1957
2,816,623	Wong	Dec. 17, 1957
2,830,683	Griffith	Apr. 15, 1958
2,840,200	Wong	June 24, 1958
2,963,132	Rosenbaum	Dec. 6, 1960

##### FOREIGN PATENTS

347,857	Germany	Jan. 26, 1922
---------	---------	---------------