

Feb. 21, 1967

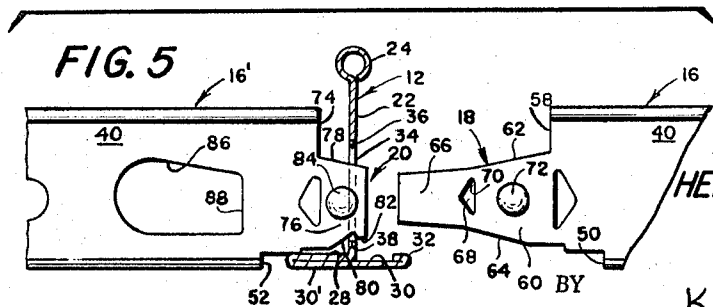
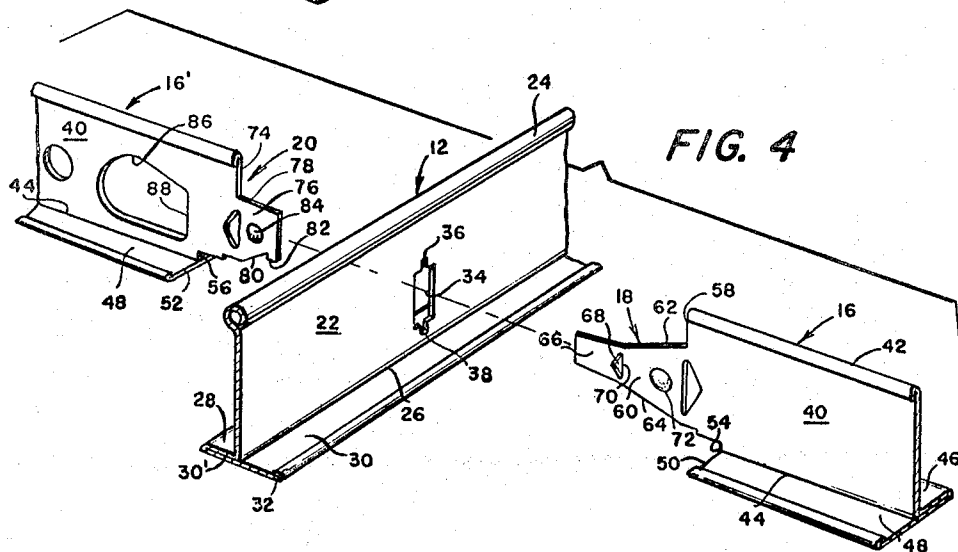
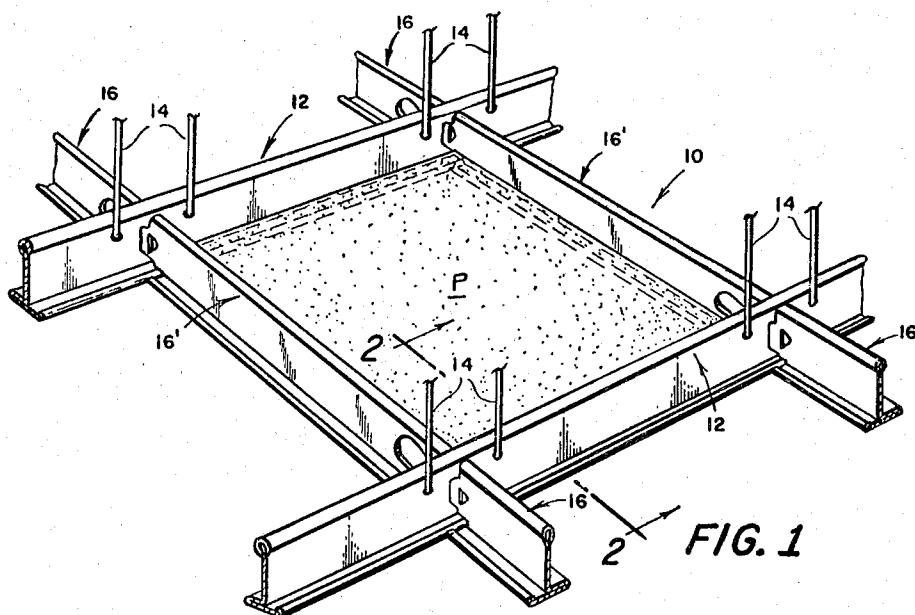
H. ZNAMIROWSKI

3,305,256

CEILING GRID SYSTEM

Filed April 1, 1966

3 Sheets-Sheet 1



INVENTOR
HENRY ZNAMIROWSKI

KARL W. FLOCKS
ATTORNEY

Feb. 21, 1967

H. ZNAMIROWSKI

3,305,256

CEILING GRID SYSTEM

Filed April 1, 1966

3 Sheets-Sheet 2

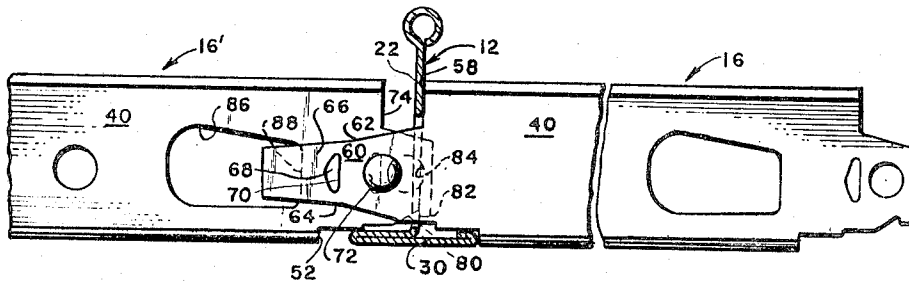


FIG. 6

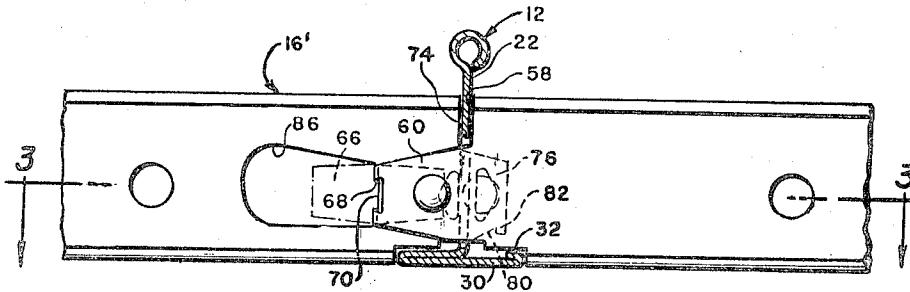


FIG. 2

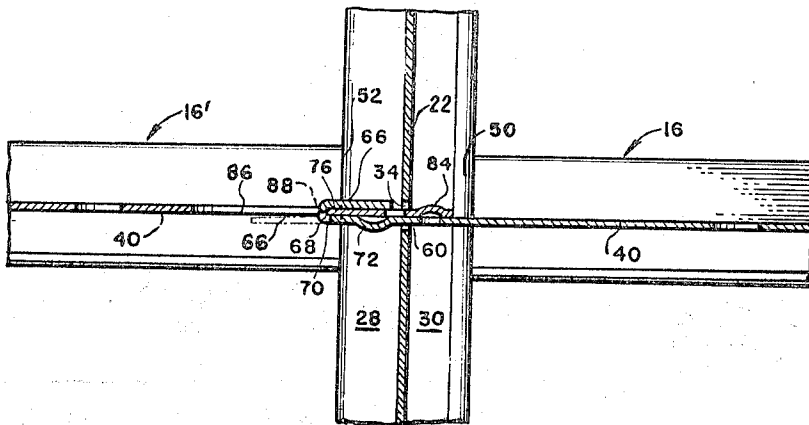


FIG. 3

INVENTOR
HENRY ZNAMIROWSKI

BY

KARL W. FLOCKS
ATTORNEY

Feb. 21, 1967

H. ZNAMIROWSKI
CEILING GRID SYSTEM

3,305,256

Filed April 1, 1966

3 Sheets-Sheet 3

FIG. 8

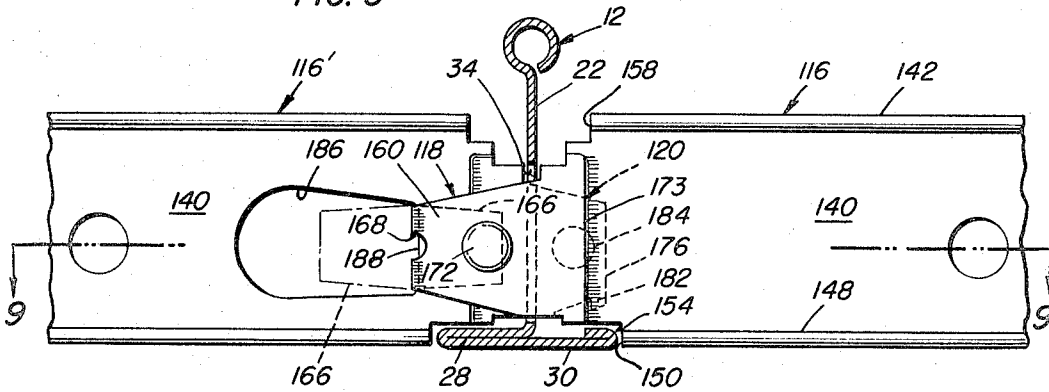


FIG. 9

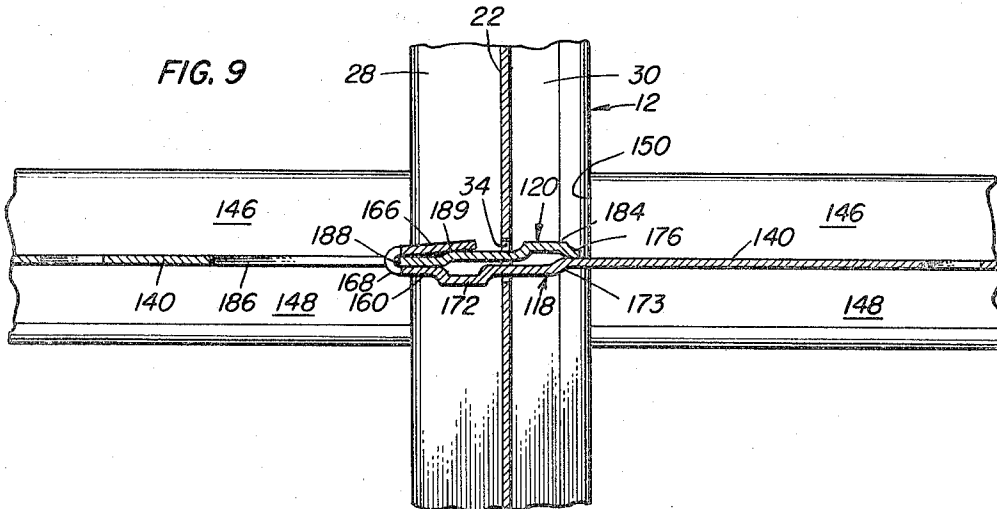
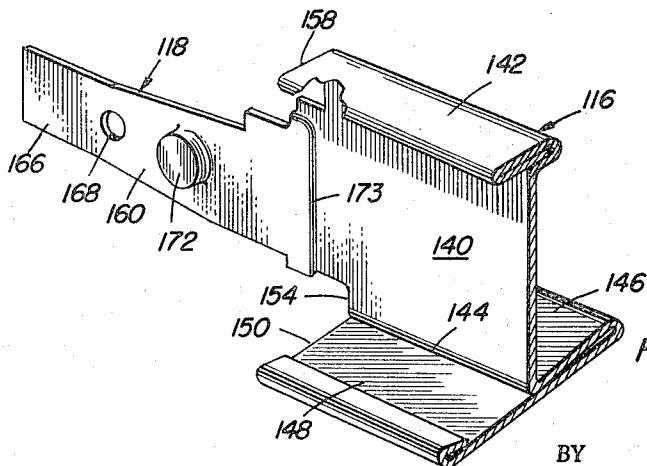


FIG. 7



INVENTOR
HENRY ZNAMIROWSKI

BY

KARL W. FLOCKS
ATTORNEY

1

3,305,256

CEILING GRID SYSTEM

Henry Znamirowski, Baltimore, Md., assignor to Eastern Products Corporation, Baltimore, Md., a corporation of Maryland

Filed Apr. 1, 1966, Ser. No. 539,426

5 Claims. (Cl. 287—189.36)

This application is a continuation-in-part of application Serial No. 425,854, filed January 15, 1965, now abandoned.

This invention relates generally to a suspended ceiling, and more particularly to improvements in the means for mounting or locking transverse support members onto longitudinal support members.

In the grid or framework constructions for suspended ceilings of the prior art (see, for example, the patents to Drury #2,689,630 and Gordon et al. #2,946,414), several different arrangements for mounting the transverse support members with respect to longitudinal support members are disclosed.

These prior art installations generally fail to show means whereby the transverse members are integrally connected to each other as well as to the longitudinal support member.

A primary object of the present invention is to provide improved means for mounting a pair of colinear transverse support members on a longitudinal support member for use in a suspended ceiling.

Another object of the present invention is to provide in a grid system means whereby proper installation of colinear transverse support members is substantially assured.

A further object of the present invention is to provide an improved transverse support member for use in a suspended ceiling grid.

Other objects and the nature and advantages of the instant invention will be apparent from the following description, taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a downward, fragmentary perspective view showing a grid work for a suspended ceiling embodying the invention;

FIG. 2 is a fragmentary enlarged vertical section taken substantially on the plane of line 2—2 of FIG. 1;

FIG. 3 is a horizontal section taken substantially on the plane of line 3—3 of FIG. 2;

FIG. 4 is an exploded perspective view of the components of the grid work prior to mounting them in assembled relationship;

FIG. 5 is a vertical elevation showing the manner in which one of the transverse members cooperates with a longitudinal support member;

FIG. 6 is a vertical elevation of the next step of assembly of the component parts at the connection between the transverse and longitudinal support members;

FIG. 7 is an enlarged fragmentary perspective view of another embodiment of transverse support member, similar to a portion of FIG. 4;

FIG. 8 is a side elevational view similar to FIG. 6 showing a pair of the support members of FIG. 7 connected to a longitudinal support member; and

FIG. 9 is a horizontal section taken on line 9—9 of FIG. 8 and is similar to FIG. 3.

Referring to the drawings, and first considering FIG. 1, a grid or framework for a suspended ceiling is indicated generally at 10 and an appropriately dimensioned panel P will be inserted in the rectangular spaces between the support members to be supported on supporting flanges.

The framework 10 comprises a plurality of mutually parallel longitudinal support members 12 which are suspended in spaced relation on wires 14 or the like hanging

2

down from the roof or structural members of a room or building. Spaced perpendicular on the longitudinal support members 12 are a plurality of transverse support members indicated generally at 16 and 16'. The support members 16, 16' are of a length to maintain the proper distance between the longitudinal support members 12; however, the transverse support members 16 and 16' on opposite sides of the longitudinal support members 12 are in substantial colinear relationship and, when viewed from below, appear to extend continuously or in an uninterrupted line intersecting the longitudinal support members 12.

The support members are produced from any suitable material such as aluminum, sheet metal, etc., and the terms "longitudinal" or "transverse" are used for purposes of orientation and identification of the respective members.

Each of the support members, as seen in FIG. 4, for example, has an inverted T-shaped cross-section. Further, the transverse members 16 and 16' have on respective opposite ends thereof differently conformed connector portions indicated generally at 18 and 20.

The longitudinal support members 12 are most conveniently produced with a vertically extending web 22 having an upper, rolled, reinforcing edge 24. Integral with the web 22 and extending laterally from a lower fold 26 are laterally extending support flanges 28 and 30. The flange 28 comprises two layers of sheet metal, the lower of which comprises an extension 30' of the flange 30, and the flange 30 includes a reversed-bend fold portion 32 whereby the effective thickness of the flanges 28 and 30 are substantially the same.

Spaced along the web 22 at the distances at which the transverse members 16, 16' are to be disposed are vertically extending slots 34, each of which includes opposed upper and lower notches 36 and 38, respectively, having a width substantially less than the width of the slots 34.

The width of the opposed notches 36 and 38 will be slightly greater than twice the thickness of the gauge of the metal from which the transverse support members are produced. The purpose of this dimension will subsequently become apparent with respect to details of assembly or mounting of the transverse members on the longitudinal support members.

Additionally, the transverse members, though being of the same general construction as the longitudinal support member 12, i.e. with respect to the manner in which the transverse members are produced from a single piece of sheet metal, are of a height less than the height of the web 22 of the longitudinal support members 12. The members 16, 16' are identical; however, the two reference numerals are used for purposes of orientation with respect to assembly details to be described.

The transverse support member 16 includes a vertically extending web 40 reinforced at its upper edge by a reversed-bend fold 42 and having extending laterally from a lower fold line 44 support flanges 46 and 48.

The flanges 46 and 48 include terminal, transverse abutment edges 50 and 52 which will engage the side edges of the flanges 30 and 28, respectively, of the longitudinal members 12. The edges 50 and 52 are substantially in alignment with shoulder portions 54 and 56 extending into the web 40.

Formed in the web 40 and spaced outwardly from the shoulder 54 at the connector portion 18 is an abutment shoulder 58 which will abuttingly engage one side of the web 22 of the longitudinal support member 12. The connector portion 18 comprises a finger-bendable extension tongue 60 which is formed by converging upper and lower edges 62 and 64, respectively, and continue in a bendable tab 66 having a fold line generally defined by

3

a transverse aperture 68 having a vertically extending margin 70.

Formed on the tongue 60, intermediately thereof and extending laterally to one side is an abutment or dimple portion 72 which aids in the proper assembly or orientation of the respective connector portions 18 and 20 as will subsequently be described in detail with respect to assembly of the transverse members.

The transverse member 16 includes on the other end thereof, i.e. the connector portion 20, a shoulder portion 74 extending into the web 40 which will abuttingly engage the opposite side of the web 22 of the longitudinal support member 12 and pairs of transverse members 16, 16' are mounted in colinear relationship in an assembled grid or framework.

Formed on the terminal end of the other end of the transverse member 16' is a longitudinally extending tongue 76 having upper and lower converging margins 78 and 80. A downwardly opening hook portion 82 is formed at the terminal end of the tongue 76. The tongue 76 includes intermediately thereof an abutment or dimple 84 which extends in a direction opposite the abutment or dimple portion 72.

Formed in the web 40 rearwardly of the abutment edge 52 and shoulder 74 is an elongated slot 86 which converges toward a vertically extending abutment edge 88.

Assembly of two transverse support members on a longitudinal support member

The longitudinal support members are first suspended from the building structure at a predetermined level by means of the suspension wires 14. The now hung support members 12 initially can be spread apart; however, after some of the transverse support members 16 have been installed, the relative spreading of the support members 12 is somewhat limited.

Referring to FIG. 5, the transverse member 16 is inserted in the slot 34 and extends into the notch 38 thereof, i.e., the hook portion 82 will engage in the notch 38.

Next, the tongue 60 of member 16 is inserted through the slot 34, and it will be noted from FIG. 3 that the lateral abutments or dimples 72 and 84 of the respective tongues 60 and 76 will have to be moved past each other during this procedure. Inasmuch as these abutments extend in opposite directions, they will not interfere with the tongues being disposed in juxtaposed relationship. However, in the event the tongues are not disposed in the condition shown in FIG. 3, the abutments 72 and 84 will engage each other and throw the transverse members out of such alignment to such an extent that it will be substantially impossible to install them within the width of the notches 36 and 38 of slot 34 (see FIG. 4). In this manner, the abutments 72 and 84 substantially insure proper orientation of the transverse support members which are being connected together.

Referring to FIGS. 6 and 2, it will be noted that the bendable tab 66 of the tongue 60 extends partially in overlying relationship with respect to the elongated slot 86, and this tab, when bent laterally, in the manner apparent from FIGS. 2 and 3, through the slot 86, will be wrapped around the vertical edge 88 of the slot. When this is done, the lower angular margin 80 of the tongue 76 of member 16' tends to cam or urge the member 16' in the final aligned installed condition seen in FIG. 2. As the tab 66 is bent or wrapped around the vertical edge 88 of slot 86, the members 16', 16 are drawn together, the abutment shoulders 58, 74 will engage opposite sides of the web 22 of the longitudinal support member 12, and the lower transverse abutment edges 50, 52 will engage the side margins or edges of the flanges 30, 28. It will be noted that the aperture 68 and margin 70 thereof will be disposed in substantial alignment with the vertical edge 88 of the slot 86 and thus the bending of the tab 66 is facilitated about the edge 88 of the slot 86. Additionally, when the tongues 60 and 76 of the respective transverse sup-

4

port members 16, 16' are disposed in juxtaposed relationship, the gauge of the webs 40 from which they are produced, is of such a thickness that they will substantially fill the opposed notches 36 and 38 of the slot 34. In this manner, if the abutments 72 and 84 are not disposed in the condition shown in FIG. 3, it will be virtually impossible for the tongues or portions of the webs to enter into the opposed notches 36 and 38.

Referring to FIGS. 7-9, an installation similar to that of FIGS. 1-6 is disclosed. Reference numerals of FIGS. 1-6 will be used to identify previously described structure, and reference numerals having the prefix 100 will be used to identify structure of FIGS. 7-9 which is the structural and functional equivalent of that of FIGS. 1-6.

A longitudinal support member 12 includes a vertical web 22 having lateral support flanges 28 and 30. Vertical slots 34 are formed in web 22.

Terminal ends of transverse support members 116 and 116' are connected in the vertical slots 34 as in the previously described embodiment.

The transverse support members 116 and 116' respectively include differently conformed connection portions 118 and 120 at opposite ends; see FIGS. 7 and 8, for example.

The member 116 includes a vertical web 140 having an upper edge 142 comprising a flattened head extending transversely of the plane of the web 140. Formed at a lower fold line 144 are lateral support flanges 146 and 148. The flanges 146 and 148 terminate in a transverse abutment edge 150 in alignment with a vertical shoulder 154. The flattened head terminates in a transverse abutment edge 158 spaced longitudinally from edge 150. The edge 150 will engage the edge of the lower flange of the support member 12.

The connector portion 118 includes a finger-bendable tongue 160 having an intermediate circular aperture 168 defining a bendable tab 166. Formed rearwardly of the aperture 168 and extending laterally from one side of the tongue 160 is dimple or embossed portion 172 and the entire tongue 160 is offset from the plane of the web 140 as indicated at 173.

The connector portion 120 (see FIGS. 8 and 9) constitutes the configuration of the end of the member 116 (not shown). The connector portion 120 has substantially the same configuration and function of connector portion 20 of the previously described embodiment, and includes a longitudinally extending tongue 176 having a downwardly extending hook portion 182 and a laterally extending dimple or embossment portion 184 which extends in a direction opposite that which embossment or dimple 172 extends. The web 140 includes a longitudinally extending slot 186 having a vertical abutment edge 188. The tongue 176 is offset from the plane of web 140 as indicated at 189.

The transverse members 116, 116' are secured to the longitudinal support member 12 in the same manner as described with respect to FIGS. 1-6. The embossments 172, 184 permit the webs 140 of members 116, 116' to be disposed in coplanar relation; however, if an attempt is made to insert the tongues 160 and 176 with the embossments in confronting relation, the tongues will not pass through slot 34 of member 12. The offsets 173 and 189 of the respective tongues 160 and 176 are one-half the gauge of the metal used and provide means whereby the webs of members 116, 116' are in coplanar alignment and alignment of the lateral support flanges 146, 148 when the ceiling is installed.

The circular apertures 168 provide a greater margin of production error, i.e. due to tool wear, etc. the entire diameter of the circular apertures 168 provide means for providing a weakened portion of the tongue 160 to facilitate manual bending of the tab 166 as illustrated in FIGS. 8 and 9.

It will be obvious to those skilled in the art that various changes may be made without departing from the scope of the invention and therefore the invention is not limited

5

to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. A transverse member for use in a suspended ceiling comprising an elongated member including a vertical web having outwardly extending ceiling-panel-supporting flanges, said member including upper shoulder portions and lower abutment edges at opposite ends thereof, said web including terminal, longitudinally extending tongues at opposite ends thereof extending beyond said shoulder portions and the lower abutment edges, one of said terminal tongues including a downwardly extending hook portion of the lower edge thereof, said web including an elongated longitudinal extending slot having a vertical edge spaced inwardly from the adjacent lower abutment edge thereof and adjacent said one terminal tongue, the other terminal tongue being of the greater length than said one terminal tongue and including a terminal, laterally-bendable, terminal tab portion.

2. The structure as claimed in claim 1 in which said other terminal tongue includes an intermediate aperture defining said terminal, laterally-bendable tab portion.

3. The structure as claimed in claim 2 in which said intermediate aperture is triangular and includes a linear

6

portion defining the fold line defining the laterally-bendable tab portion.

4. The structure as claimed in claim 2 in which said intermediate aperture is circular and affords a weakened area comparable to those diameters of said circular aperture.

5. The structure as claimed in claim 1 in which said tongues include abutment portion intermediately thereof and extending laterally in opposite directions with respect to each other from opposite sides of said web.

References Cited by the Examiner

UNITED STATES PATENTS

2,903,104	9/1959	Brown	-----	287—189.36
2,924,311	2/1960	Brown	-----	52—484 X
3,221,846	12/1965	Brown et al.	-----	287—189.36

FOREIGN PATENTS

635,717	1/1962	Canada.
671,476	10/1963	Canada.

HARRISON R. MOSELY, *Primary Examiner*.

J. K. BELL, *Assistant Examiner*.