

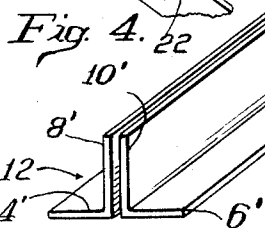
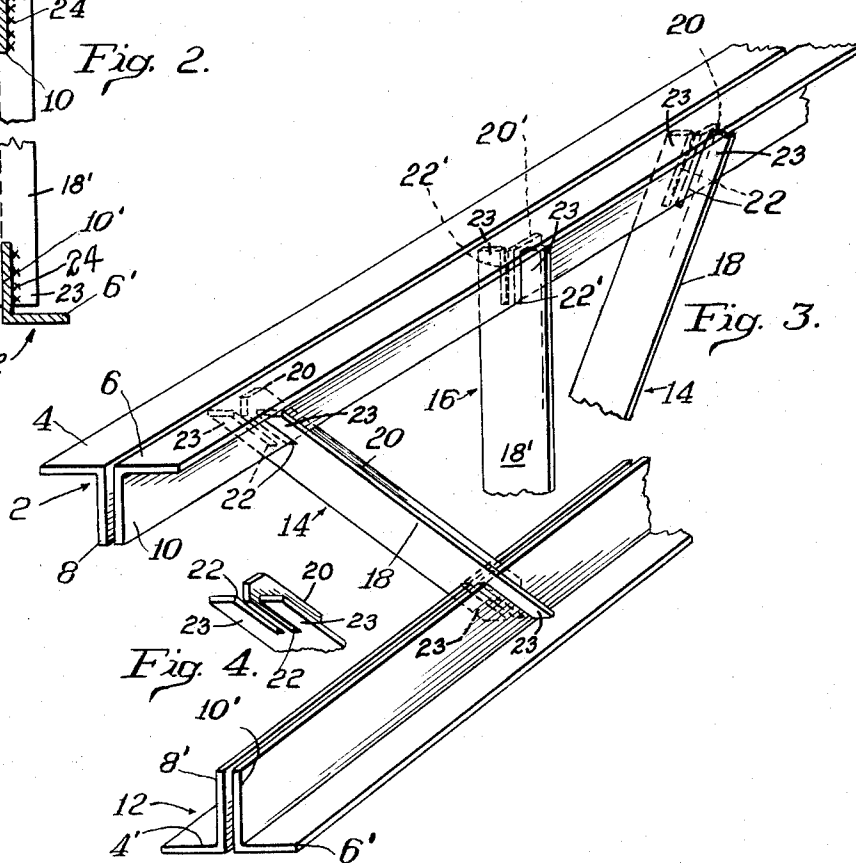
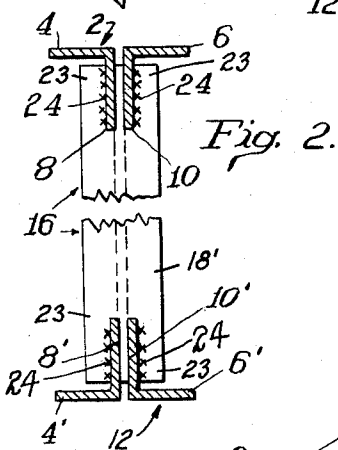
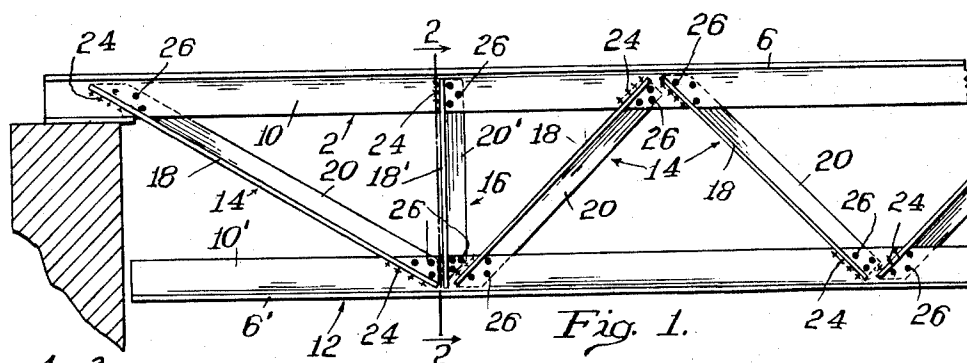
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2,860,743

OPEN WEB METAL JOIST

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2,860,743

OPEN WEB METAL JOIST

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5 Claims. (Cl. 189—37)

This invention relates to an open web metal joist, of the type comprising upper and lower chord members interconnected by vertical and diagonally extending struts. The joists of this type are used particularly for floor joists and in roof construction.

The principal object of the invention is to provide a novel type of connection at each end of each strut member, so that each strut member may be easily and rigidly connected to the upper and lower chord members.

Another important object of the invention is to provide a strong, easily assembled structural unit, composed of types of fabricated metal readily available in the metal market which can be readily fabricated and assembled, preferably by the economical process of spot welding. Another important object is particularly to provide a construction utilizing the full strength of the diagonal and vertical struts.

The invention comprises essentially a joist having upper and lower chord members with diagonal and vertical struts interposed between those chords; each chord member is composed of two angles, back to back, one leg of each angle extending horizontally, the other leg of each angle extending inwardly relative to the joist. The struts connecting the top and bottom chords are T-sections consisting of a flange and a central web perpendicular thereto; each end of each strut is provided with two inwardly extending slots adjacent each web and parallel thereto, each slot having a width approximately equal to the thickness of a vertical leg of the chord member it is adapted to receive.

The diagonal and vertical struts are of similar construction at their ends for fitting into and cooperating with the legs of the upper and lower chord members.

The web of the struts fits between the inwardly extending legs of the chord members, causing these legs to fit snugly into the slots in the flanges of the struts, the joint being completed by spotwelding the web to both of the legs of the angle irons between which they are positioned, and arc welding each flange of the T to one of the legs of the chord members.

The invention will be described in more detail in connection with the accompanying drawings, wherein:
Fig. 1 is a view in side elevation of the metal joist of this invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary perspective view of the joist; and

Fig. 4 is a fragmentary perspective view of one end of one of the struts.

Referring now to these drawings, the upper chord member indicated generally at 2 comprises two longitudinally extending angle irons having outwardly and laterally extending legs 4 and 6 and vertically extending legs 8 and 10.

Corresponding legs on the lower chord, indicated generally at 12, are indicated by correspondingly primed reference characters.

Cooperating with the chord members just described is

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a plurality of diagonal struts indicated generally at 14 and vertical struts indicated generally at 16. To consider the diagonal struts 14, these are T-shaped in cross section and comprise a flange 18 and a web 20 projecting centrally from one face thereof and substantially perpendicular thereto.

Each end of struts 14 is provided with two inwardly extending slots 22 in its flange 18, the inner edges of these slots being adjacent or bordering the outer faces of the web 20, and parallel thereto the slots themselves being of a width to snugly receive the vertical legs 8 and 10 of the upper chord and 8' and 10' of the lower chord. These slots 22 define two end tongues 23.

The web 20 of the strut fits between the legs 8 and 10, at the upper end, and between legs 8' and 10' at the lower end. The strut is secured to the legs 8 and 10 by welding, preferably arc-welding tongues 23 to the legs 8 and 10, as shown at 24, and the web 20 of the strut is secured to both members 8 and 10, and 8' and 10' by spot welding as at 26.

The vertical struts 16 are similarly formed, including a flange 18' and are provided with slots 22' on either side of the web 20' of the T-shaped strut, these slots fitting over the legs 8 and 10 and 8' and 10' and being secured thereto, as by arc-welding. The web 20' fits between legs 8 and 10, and 8' and 10', respectively, and the web and legs secured together, preferably by spot welding or by riveting.

In the described connection, between the struts and the chord members, the central webs of the struts are sandwiched between and welded to the vertical legs of the chord members, the vertical legs of the chord members are seated in slots in the ends of the webs of the struts, adjacent these webs; such a connection is economical to produce and is substantially symmetrical and avoids any eccentricity in the struts or chord members. This connection develops the full strength of the struts, whether the struts are stressed in tension or compression.

With the described construction, a strong and light metal joist can be readily fabricated from sturdy and easily obtainable structural metal and readily assembled into a light, strong, rigid joist by welding, riveting or the like, as has been described.

I claim as my invention:

1. An upper chord member and a lower chord member, each of said chord members comprising a pair of angle irons, each angle iron having a laterally extending leg and a vertically extending leg, said vertical legs being spaced apart, and a plurality of strut members, each strut member being T-shaped in cross section and including a web portion, each strut being provided at each end with two inwardly extending slots, one on either side of the web of the strut, said slots defining two end tongues, said slots being directly adjacent said web, and having a width substantially equal to the thickness of the adjacent vertically extending leg, being positioned in said slots in the strut members, with the webs of the struts between the vertically extending legs of the chord members and with said end tongues extending over the outside of said vertically extending legs, said webs and said end tongues being secured to said vertically extending legs.

2. An open web metal joist, comprising upper and lower chords having inwardly extending substantially parallel legs, spaced laterally from each other, and a plurality of struts, T-shaped in cross section, and including a flange and a central web portion, the several struts each having two slots at each end directly bordering the web, said slots defining a pair of end tongues, each slot being parallel to said web and having a width substantially equal to the thickness of a respective inwardly extending leg, said parallel legs of the chord members being positioned in respective slots of the struts, with

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the web portion of the struts in the space between said parallel legs of the chord members, said end tongues and webs being secured by welding to said inwardly extending legs.

3. An open web metal joist, comprising a plurality of struts, T-shaped in cross section, each strut comprising a flange and a central web substantially perpendicular thereto, each strut having at each end a pair of spaced inwardly extending parallel slots directly adjacent the ends of said central web and parallel thereto, said slots defining a pair of end tongues, and a pair of parallel chord members, each comprising parallel angle irons having legs perpendicular to each other, the angle irons being reversely positioned with their inwardly extending legs fitted into said slots in the ends of the said struts and with said end tongues embracing said inwardly extending legs and secured thereto, and with the webs of the struts positioned between said inwardly extending legs and secured thereto.

4. An open web metal joist comprising double angle top and bottom chord members having legs turned inwardly relative to the joist, diagonally and vertically positioned T-shaped strut members consisting of a flange and a central web perpendicular thereto and extending between the chord members, said flanges of the struts each having two slots at each end thereof, adjacent the web and parallel thereto, said slots defining a pair of end tongues, the webs at each end of the struts being respectively positioned between the inwardly extending

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legs of the chord members, thereby causing these legs to fit snugly into the slots in the flange of the strut members, with the said end tongues engaging over the outer faces of said inwardly turned legs and secured thereto, and means rigidly joining said webs of the strut members to the legs of the chord members.

5. An open web metal joist, comprising a chord member having two horizontally and outwardly extending legs and two vertically extending, spaced, parallel legs, and a strut member substantially T-shaped in cross section and including a flange and a central web, said flange being provided with a pair of parallel, inwardly extending slots defining a pair of spaced tongues, said slots being substantially equal in width to the thickness of its respective adjacent vertical leg, said central web being positioned between and in contact with said inward vertical legs, said vertical legs being positioned in said slots, said central web and end tongues being each secured to said inwardly extending legs.

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