Sept. 5, 1939. F. N. ROPP 2,171,673

TRUSS CONSTRUCTION

Filed Feb. 11, 1938

Fig. 1.

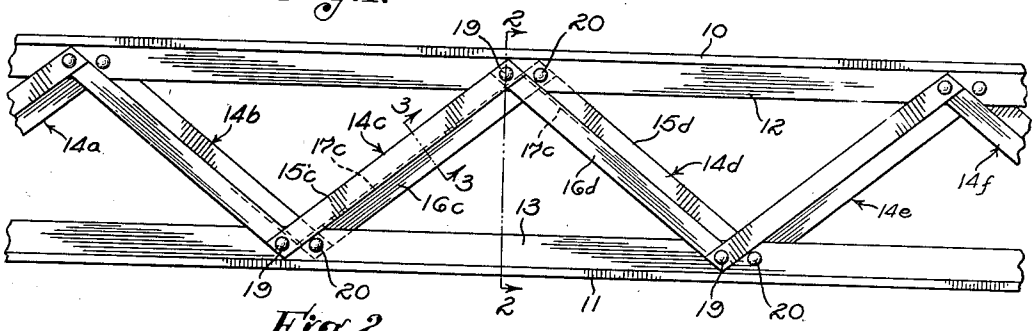


Fig. 2.

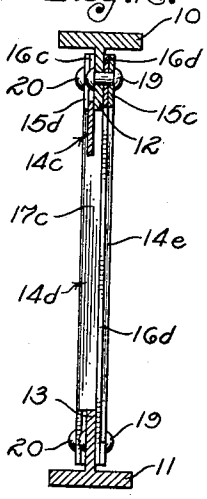


Fig. 3.

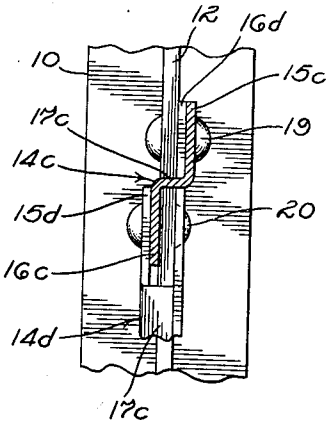


Fig. 5.

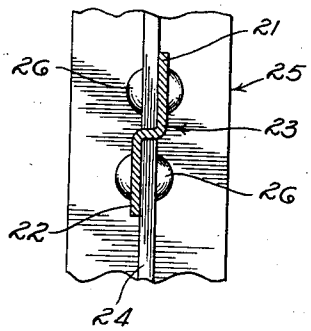
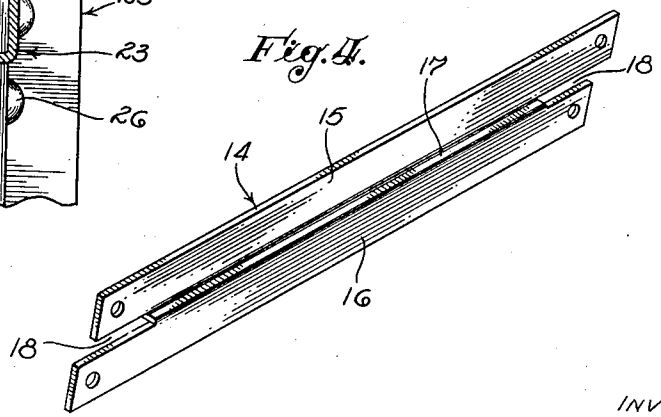


Fig. 4.



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2,171,673

TRUSS CONSTRUCTION

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Application February 11, 1938, Serial No. 189,990

3 Claims. (Cl. 189—37)

My invention relates to fabricated metal structures for buildings and the like, with special reference to truss construction, and is directed particularly to an improved form of web member for interconnecting the chords of a truss.

While my invention is applicable to various types of fabrication, it has special utility in riveted constructions. In a riveted truss comprising two spaced chords and a plurality of interconnecting web members, it is highly desirable, and in certain building codes mandatory, that each riveted joint include at least two rivets. In most constructions, however, the web of the chord member and the width of an interconnecting web member are both so narrow that there is room for only one rivet. Of necessity, a gusset plate is commonly incorporated in each joint construction to provide for at least two rivets, the addition of such a gusset plate being more economical than increasing the widths of the truss members.

Various attempts have been made to avoid the necessity of resorting to gusset plates. The problem involved is complicated by certain considerations. Eccentricity or the tendency of a joint to spread or twist should be avoided. A second consideration is the desirability that the ends of adjacent web members overlap to make a common juncture with a chord member, or at least be joined to the chord at closely adjacent points. Since a simple plate or strap will not serve as a web member for carrying compression stress, the practice is to employ flanged web members; but eccentricity in joints for the usual type of flanged web member may be avoided only by using the web members in pairs attached to opposite sides of the chord member, and such a construction is not economical. The employment of the usual flanged web members moreover makes it difficult to have the axes of the web members intersect at the chord member without resorting to gusset plate construction.

The general object of my invention is to avoid the necessity of employing a gusset plate at the riveted juncture of a flanged web member with a relatively narrow chord member, and in doing so to avoid eccentricity at such juncture.

One of my more specific objects is to provide a construction in which adjoining web members intersect at their junctures with a chord member. A further object in mind is to provide an efficient web member of simple and inexpensive construction that may be employed either as an isolated web member or as a web member intersecting and interlocking with other web members.

A still further object of my invention is to provide such a construction in which all the rivets employed to fasten web members to a chord member are located on the neutral axis of the chord member.

Other objects and advantages of my invention will be understood by referring to the detailed description to follow and my accompanying drawing.

In the drawing:

Fig. 1 is a side elevation of a portion of a typical truss constructed in accordance with my invention.

Fig. 2 is a transverse section taken as indicated by the line 2—2 of Fig. 1.

Fig. 3 is a section taken across a web member as indicated by the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of an isolated web member.

Fig. 5 is a section similar to Fig. 3 showing an isolated web member, having no contact with adjacent web members.

The particular truss shown in the drawing has an upper chord 10 and a lower chord 11, both being T-shaped in configuration, but it will be understood that other types of chord members may be employed. The upper chord 10 has a downwardly extending web 12 and the lower chord 11 has a similar upwardly extending web 13, to which webs are attached the series of interconnecting web members 14*a*, 14*b*, and 14*c*, et cetera.

The construction of an individual web member shown in Fig. 4 comprises two longitudinal portions 15 and 16 in offset relation joined by a lateral interconnecting web 17. The interconnecting web 17 terminates short of each end of the web member so that each end of the longitudinal portions 15 and 16 is separated by a slot 18, which slots permit the web member to engage opposite faces of a chord web. Since the two longitudinal portions of a web member are staggered, separate rivets 19 and 20 adequately spaced on the chord member may be employed for attachment. By making the offset spacing of the two longitudinal portions of a web member equal to the thickness of a chord member plus the thickness of one of the longitudinal portions of the web member, an interlocking joint may be had in which the terminal portions of adjacent web members may overlap and be secured to a chord web by the same two rivets.

The interlocking relationship of two adjacent

truss members may be understood by reference to Figs. 1 to 3 showing the web members 14c and 14d attached to the upper chord web 12. The web member 14c has a longitudinal portion 15c overlapping a longitudinal portion 16d of the web member 14d, the overlapping terminal portions of the two web members being secured to one face of the web 12 by the rivet 19. In like manner the portion 16c of the web member 14c is overlapped by the longitudinal portion 15d of the web member 14d, the two overlapping portions of the web member being secured to the other side of the chord web 12 by the rivet 20. The lateral interconnecting web of each web member may have its end edges abut against the edges of the two chord webs for additional stiffening of the truss structure, as may be understood, for example, by noting the disposition of the stiffening web 17c of the web members 14c and 14d in Figs. 2 and 3.

The construction shown in Fig. 1 requires two reversed forms of the web members, the reversed forms alternating in the series of web members shown in the truss. The web members may be either rolled shapes or plates cut and bent to the required configurations. It will be apparent to those skilled in the art that the construction is economical in material and requires relatively little labor for assembly.

If a web member is employed in a position isolated from other web members, the offset spacing laterally will correspond merely to the width of the web of a chord member; for example, the longitudinal portions 21 and 22 of the web member 23 shown in Fig. 5 are offset only sufficiently to lie against the opposite faces of the web 24 of the chord member 25, the terminal portions of the web member being secured to the chord member by rivets 26.

I have described a specific form of my invention as incorporated in a typical truss construction, but it will be apparent to those skilled in the art that the form chosen for illustration may be changed and modified without departing from the principles of my conception, and that the invention is not limited to trusses, but is applicable to building construction in general. I therefore reserve the right to all changes and modifications of my invention, and to all applications thereof, that come within the scope of my appended claims.

I claim as my invention:

1. In a fabricated metal structure, the combination of: a chord member; a first diagonal web member having two longitudinal portions extending respectively to opposite sides of said chord member at regions staggered longitudinally of the chord member; a second oppositely disposed diagonal web member having two longitudinal portions extending respectively to said two regions in overlapping relationship to said longitudinal portions of the first web member; and a rivet in each of said regions extending through the chord member and the overlapping longitudinal portions of the two web members.

2. In a fabricated metal structure, the combination of: a chord member; a first diagonal web member having two longitudinal portions extending respectively to opposite sides of said chord member at regions staggered longitudinally of the chord member, said longitudinal portions being connected by a web somewhat shorter than said portions; a second oppositely disposed diagonal web member having two longitudinal portions extending respectively to said two regions in overlapping relationship to said longitudinal portions of the first web member, said longitudinal portions being connected by a web somewhat shorter than said portions; and a rivet in each of said regions extending through the chord member and the overlapping longitudinal portions of the two web members.

3. In a fabricated truss, an upper chord member having a flange extending downwardly therefrom, and a lower chord member having a flange extending upwardly therefrom, and a series of diagonal web members extending between said chord members, each of which comprises two longitudinal portions staggered with relation to each other and connected by a web, said portions being so formed that they extend on either side of said flanges and so that adjacent web members can be secured to said flanges by a single rivet.

FRANKLIN N. ROPP.