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3,091,313

LONG SPAN DECK MEMBER

Filed March 13, 1958

Fig. 1

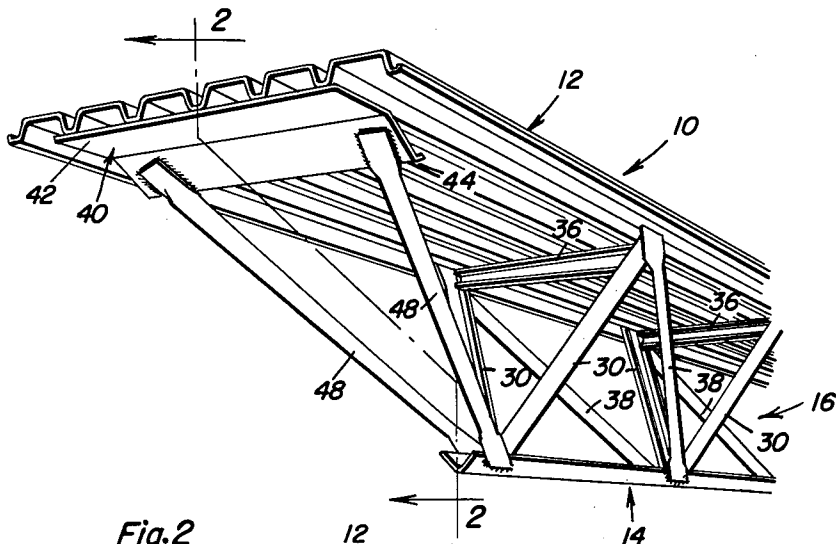


Fig. 2

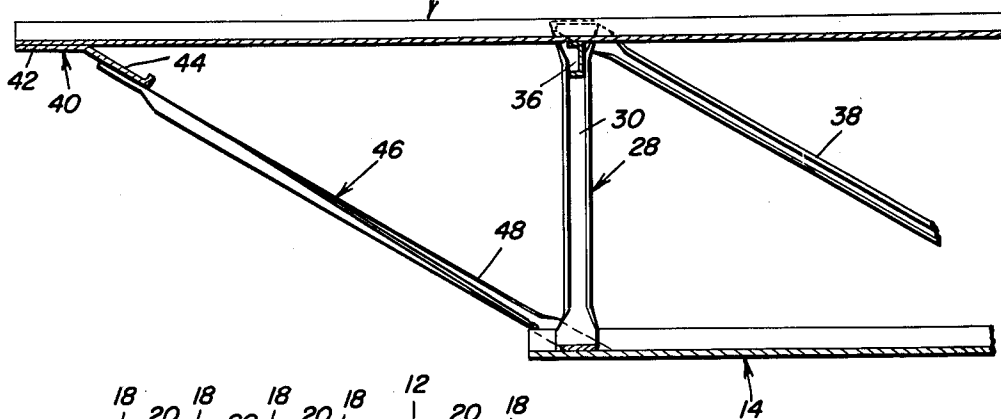
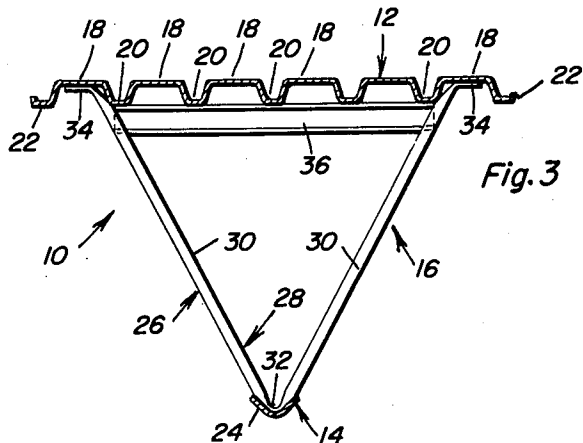


Fig. 3

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LONG SPAN DECK MEMBER
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1 Claim. (Cl. 189—37)

This invention relates in general to new and useful improvements in building construction, and more specifically to a new long span deck member especially adapted for the construction of roofs and floors.

In the construction of buildings at the present time, in addition to the normal construction such as a floor, a roof formed of beams, joists and floorboards, or a reinforced concrete flooring, there is also used a floor and roof construction which includes a plurality of truss-type joists which are disposed at relatively close intervals and which have disposed in overlying relation thereto a deck member, which deck member may either serve as the deck surface, or may have poured thereover a thin layer of concrete or other material applied in a suitable manner. However, such a construction requires an unnecessary amount of steel and also requires additional steps in the erection thereof.

It is therefore the primary object of this invention to provide a long span deck member which is so constructed that it is self-supporting thereby eliminating the requirement for supporting joists.

Another object of this invention is to provide a long span deck member for the formation of trusses or joists in the construction of floors and roofs, the long span deck member including the normal sheet metal deck which is utilized as the top chord thereof and which has secured thereto the web and bottom chord of the trusses.

A further object of this invention is to provide an improved floor or roof structure, which structure for all practical purposes is the same as the conventional beam, joist and sheet metal deck forming construction, but which combines the joists and deck and relies upon the deck forming member as the upper chord thus eliminating the normal upper chord and the necessity of securing the deck forming member to the upper chord.

A further object of this invention is to provide a long span deck member, the long deck member being in the form of a self-contained unit which includes an upper chord comprising a deck forming member, a web and a lower chord, each of the long span deck members being separately supportable and being normally connected together by merely overlapping and fastening with self-tapping screws adjacent edge portions of the upper chords thereof.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a fragmentary perspective view as viewed from the underside of one end of the long span deck member which is the subject of this invention;

FIGURE 2 is an enlarged fragmentary longitudinal sectional view taken substantially upon the plane indicated by the section line 2—2 of FIGURE 1 and shows further the details of construction of the long span deck member; and

FIGURE 3 is a transverse sectional view taken through the long span deck member and shows the general construction of the upper chord member, the lower chord member and a web unit connecting together the two.

This application is a continuation in part of my application Serial No. 404,334, filed January 15, 1954, now Patent No. 2,924,310 of February 9, 1960.

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Illustrated in FIGURES 1, 2 and 3 of the drawings is a long span deck member which conforms to the spirit of my invention, as disclosed in my prior application, but which is slightly modified in structural details. The long span deck member is referred to in general by the reference numeral 10 and includes an upper chord, which is referred to in general by the reference numeral 12, a lower chord member, which is referred to in general by the reference numeral 14, and an open web, which is referred to in general by the reference numeral 16.

In accordance with the spirit of the invention, the upper chord member is a deck forming member and is preferably rolled of sheet metal having longitudinally extending, transversely spaced convolutions whereby bending of the upper chord member 12 from its plane is resisted. The upper chord member 12 includes a plurality of uppermost deck forming areas 18 which are separated by trough portions 20. It is to be noted that the upper chord member 12 terminates in partial trough forming portions 22 at opposite edges thereof. The purpose of this construction is to permit adjacent upper chord members 12 of adjacent long span deck units to be disposed in overlapping interlocked relation.

As noted in FIGURE 3 in particular, the lower chord member 14 is preferably in the form of a V-shaped structural member 24, although the cross-section of the member 24 could vary and could be channel-shaped or some other shape, if desired.

The web 16 includes a web unit which is referred to in general by the reference numeral 26 and comprises a V-shaped strut 28 having a pair of legs 30 of a channel-shaped cross section integrally connected as at 32. The upper ends of the legs 30 are flattened as at 34 and are secured by welding to the undersides of the outermost ones of the deck forming areas 18. The web unit 26 also includes a purlin 36. Each purlin 36 extends between and is secured to upper portions of the legs 30 and directly underlies and engages the undersides of the trough portions 20.

The web 16 also includes diagonals 38. The interior diagonals 38 are of a V-shaped cross section with flattened ends, and extend between the upper ends of struts 28 and the lower chord member 14 and are secured thereto by welding.

Disposed at opposite ends of the long span deck member 10 are transverse seat forming plates 40. The seat forming plates 40 are secured to the undersides of the trough portions 20 and include flat seat forming parts 42 and downwardly and longitudinally sloping connecting parts 44. The ends of the lower chord member 14 terminate short of the ends of the upper chord member 12 and the ends of the exterior diagonals 48 are welded to the parts 44 and the corresponding ends of the lower chord member 14, as is best shown in FIGURE 1.

From the foregoing description of the long span deck member 10 it will be seen that there has been provided a self-sustaining unit which requires a minimum of steel and while it may be easily fabricated, also reduces the construction time required for the formation of a floor or roof. By utilizing the normal deck forming member as the upper chord member of the truss and by preferably making the truss triangular in cross-section, it will be seen that the normal or conventional upper chord member or chord members are no longer required. At the same time, the normal deck forming member has sufficient strength to function as the upper chord member and thereby the same strength is obtained with the elimination of the metal usually provided in the upper chord members. Further, because the long span deck units are self-sustaining units, it is merely necessary that they be positioned and anchored with respect to the beams (not shown) on which the opposite ends thereof seat.

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This greatly increases the rate of erection. It is also to be understood that in use, it may be desired to provide a suitable covering over the upper chord member 12. This may be in the form of a thin concrete layer, or of a built-up roof over a layer of insulating material, or the like. The construction of this will be conventional as has been used in the past and in no way involves the present invention.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

A long span deck unit of the self-sustaining truss-type comprising an upper chord member, a lower chord member and an open web fixedly interconnecting said upper chord member and said lower chord member, said upper chord member consisting solely of an elongated straight sheet metal deck forming member comprising a plurality of flat, elongated deck members disposed in side-by-side relation and lying in a common plane, said open web being secured directly to said deck forming member, said deck forming member having longitudinal extending, transversely spaced convolutions whereby bending of said deck forming member from its plane is resisted, said open web including V-shaped struts extending between

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and secured directly to said upper chord member and said lower chord member and said open web including diagonal members in pairs extending diagonally from the top of each V-shaped strut to the lower chord member at the location of the next V-shaped strut, transverse seat forming end plates disposed at opposite ends of said upper chord member and secured to the underside of said troughs, and upwardly and longitudinally sloping diagonal members extending between said end plates and ends of said lower chord member, said lower chord member being shorter than said upper chord member.

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