

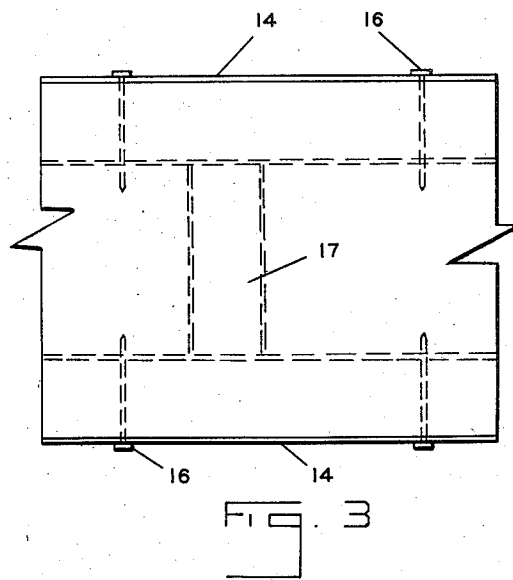
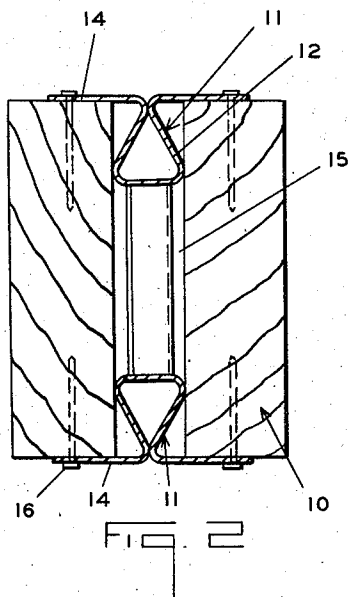
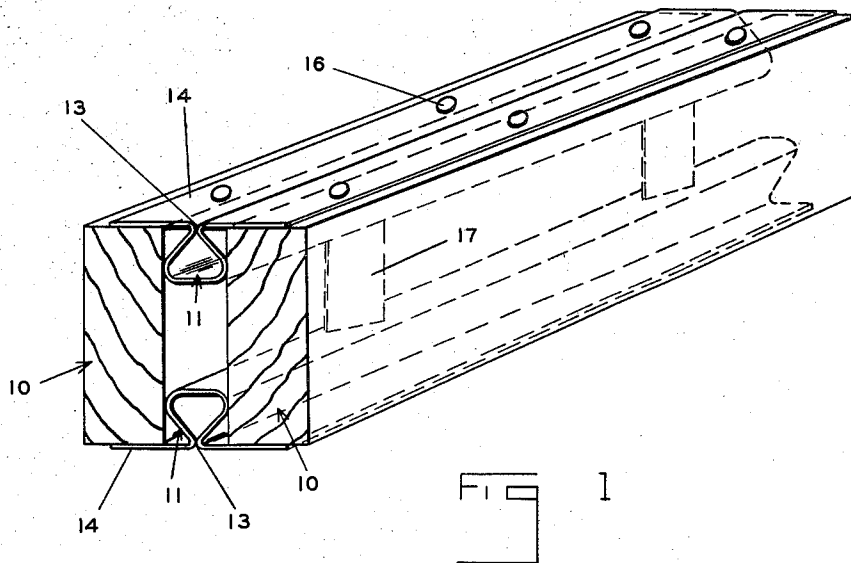
Sept. 16, 1958

C. R. ROLEN

2,851,747

STRUCTURAL MEMBER

Filed July 2, 1957



INVENTOR.
CARL R. ROLEN

BY
CORBETT, MAHONEY & MILLER,
ATTYS.

BY *Wm. V. Miller*

1

2,851,747

STRUCTURAL MEMBER

Carl R. Rolen, Pataskala, Ohio

Application July 2, 1957, Serial No. 669,506

2 Claims. (Cl. 20—91)

My invention relates to a structural member. It has to do, more particularly, with a structural member which can be used as a beam or as a column. In the following description I will refer to such member as being used in a horizontal position as a beam, girder, or joist, but it is to be understood that it can be used in a vertical position as a column or post.

The structural element of this invention is a composite member formed of wood and metal. For illustrative purposes, I will show and describe it in the form of a hollow beam or box girder. The beam is composed of laterally spaced vertically disposed wood webs extending the full length thereof. Also extending the full length thereof at the upper and lower edges of the beam and disposed in the space between the wood webs is a steel chord member. Each of these steel chord members is so formed as to permit nailing thereinto and each is attached throughout its length to both of the wood web members so that the web members and chord members are joined to function as a composite beam. The steel chord members are further joined together by vertically disposed spacers which are disposed at longitudinally spaced intervals and which have their upper and lower ends secured to the chord member so as to serve as additional webs for joining the steel chord members together. However, these vertical spacers are so arranged in the longitudinally extending space between the laterally spaced web members and the vertically spaced chord members that they do not completely obstruct such space which serves as a chase for the passage of wires, pipes, etc. These spacers also serve to hold the chord members in vertically spaced parallel relationship to facilitate assembly of the wood web members thereto in the fabrication of the beam.

In the accompanying drawing, I have illustrated my invention in the form of a beam or box girder but as previously indicated, it can also be used as a column or post.

In this drawing:

Figure 1 is a perspective view of a beam formed according to my invention.

Figure 2 is a transverse vertical sectional view through the beam.

Figure 3 is a side elevational view of the beam.

With particular reference to the drawing, the beam or box girder is shown as comprising the laterally spaced vertically disposed web members 10, and the vertically spaced chord members 11 which are associated with the upper and lower edges of the web members 10. All of the members 10 and 11 are continuous for the full length of the beam. They are all joined together so that they cooperate to function structurally as a composite beam.

The web members 10 are formed of standard size wood members which are ordinarily used as joists or rafters and which are readily available. The chord members 11 are in the form of rolled steel members. Each member 11 is provided with a body 12 of substantially

2

triangular cross-section. At the outer side of each member 11 the walls converge to form a nail-receiving groove 13 and then turn laterally in opposite directions to form the laterally extending attaching flanges 14. It will be apparent that the body 12 is disposed in the space 15 formed between the webs 10. The flanges 14 overlap the adjacent edges of the webs 10. The flanges 14 are attached to the edges of the webs 10 by a series of longitudinally spaced nails 16. These nails are passed through openings in the flanges 14 and are driven into the edges of the members 10. Thus, the metal chords 11 are structurally joined to the webs 10.

To facilitate assembly of the beam and to further structurally join the chord members 11, a series of vertically disposed spacers 17 are provided at longitudinally spaced intervals in the form of metal bars set at an angle relative to the center line of the beam. These members are preferably welded at their upper and lower ends to the chord members 11 and will hold the chord members 11 in vertically spaced parallel relationship to facilitate insertion of the webs 10 between the flanges 14 of the chord members when the beam is being assembled. However, as shown in Figure 2, they do not fill the space 15 but there is space at each side of each spacer 17 to permit passage of wires, conduit, or pipe, through the entire length of the beam.

The spacers 17 are of such length that when the wood web members 10 are inserted between the flanges 14, they must be sprung apart slightly which will result in closing the joint 13 tightly, as shown in Figure 2. Thereafter, if the wood shrinks, the resulting springing action will still keep the flanges 14 tightly in contact with the edges of the web members and the joints 13 will open slightly which is their normal condition as rolled.

Thus, it will be apparent that I have provided a composite beam which is formed of the wood web members 10 and the metal chord members 11. These members are joined together to produce a composite structural element in the form of a box girder or beam. Flooring and ceiling may be nailed to the upper and lower edges thereof by means of nails passed into the nailing grooves 13 of the upper and lower chord members 11, as indicated in Figure 2. The beam will have an attractive appearance and can be used as an exposed beam. However, if desired, it can be boxed in by members nailed to the top and bottom surfaces thereof as well as to the side surfaces. It will be noted that the flanges 14 terminate within the outer surfaces of the webs 10 so as to provide an area at the upper and lower edges of the webs into which nails may be driven when attaching flooring or ceiling or boxing in the beam.

Various other advantages will be apparent.

According to the provisions of the patent statutes, the principles of this invention have been explained and have been illustrated and described in what is now considered to represent the best embodiment. However, it is to be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

Having thus described my invention, what I claim is:

1. A composite structural unit in the form of a box girder comprising longitudinally extending vertically disposed and laterally spaced web members of wood extending the full length of the girder and longitudinally extending chord members of metal attached to the upper and lower edges of the web members and extending the full length thereof, each chord member being attached to both web members throughout its length so that all the chord members and the web members are joined to function as the structural unit, each chord member comprising a body of triangular cross-section disposed within the web members having converging unconnected side

3

walls which form an outwardly-opening nail-receiving slot but are free of each other at the slot and laterally extending flanges which extend over the adjacent edges of the wooden web members where they are attached thereto, and vertically disposed metal spacers connected at their upper and lower ends to the metal chord members and disposed in the space between the wooden web members, said spacers being of such length that the laterally extending flanges at each side of the unit are initially spaced a distance slightly less than the vertical dimension of said web members so that the two flanges at each side are sprung apart to receive the cooperating web member which will thereby be gripped between such flanges and will create a vertical outward force on each of such flanges which will, in turn, tend to

4

move the converging walls of the nail-receiving slot of each chord member closer together.

2. A composite structural member according to claim 1 in which the spacers are metal bars welded at their upper and lower ends to the chord members and each is set in a vertical plane at an angle extending laterally relative to the center line of said space and having its side edges spaced from the inner surfaces of the web members.

References Cited in the file of this patent

UNITED STATES PATENTS

159,685	Kittoe	Feb. 9, 1875
1,075,845	Mills	Oct. 14, 1913
1,900,541	Buelow	Mar. 7, 1933
2,457,250	Macomber	Dec. 28, 1948