

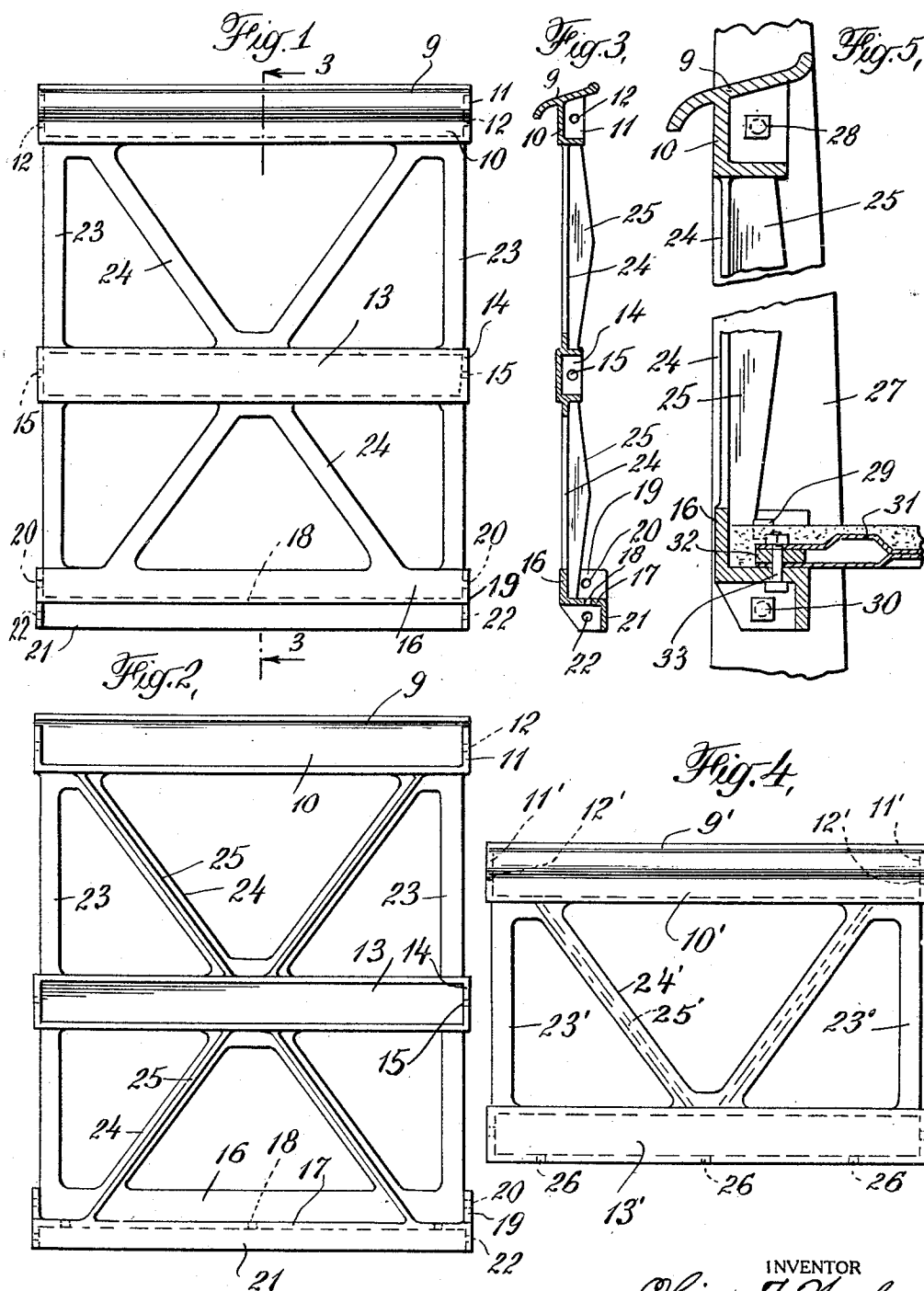
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BUILDING UNIT

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BUILDING UNIT

Original application filed August 6, 1926, Serial No. 127,505. Patent No. 1,673,786, dated June 12, 1928.
Divided and this application filed June 2, 1928. Serial No. 282,491.

This invention relates to building units, and has particular reference to individual structural units adapted to be joined together to build up a vehicle body of any desired size.

5 A body so constructed is structurally strong enough to bear the vehicle load, whereby the customary sills, chassis, and other similar underframing may be wholly eliminated, because these units serve as the sole load transferring members intermediate the parts between which they are located.

10 A vehicle body constructed of individual units in this way is disclosed in my Patent No. 1,673,786, issued June 12, 1928, of which this application is a division, being directed particularly to the said individual unit.

15 In this patent a vehicle body is built up by joining together a series of individual parts, the principal load transferring parts consisting of truss-like structural units comprising rigid frame members so related as to make a unit which will bear particularly the compressional loads to which a unit so arranged in a vehicle body is subjected in use.

20 These truss-like units are joined end-to-end to build up the side frames of the vehicle body, as many being used as are necessary to make a body of the required size and length. Between these units are secured the vertical pillars for supporting the roof, while the longitudinal members for supporting the floor are secured to the lower ends of these pillars, the floor resting partly upon these members and partly upon the units, the entire floor load being borne by the units, however, since the pillars which carry the roof and floor are also carried by the units. Transverse end members joining the opposite ends of the side frames complete the box-like body, which is directly mounted upon front and rear sets of wheels without the necessity of employing sills, chassis or other similar underframing for supporting the load upon the wheels. The space between the pillars and the top edges of the units may serve as

windows, while door frames may be interposed between these units at the required points, these door frames being also structural units and serving as the sole load transferring members intermediate the parts between which they are located. Thus the entire vehicle body is fabricated of individual load supporting units.

It is the principal object of the invention disclosed by this divisional application of said patent, to provide the individual building unit for constructing vehicles of all kinds in the manner of said copending application, this unit having special adaptation and properties for performing this function.

25 In accordance with this object, a preferred embodiment of the invention comprises an open frame particularly designed to stand compressional as well as tensional loads, these properties being augmented by longitudinally ribbed diagonals formed within the frame, these diagonals being also designed to stand compressional as well as tensional loads. In order to obtain lightness without sacrificing strength, this unit is preferably made of aluminum alloy, cast, extruded, or otherwise formed into the proper shape. The unit preferably consists of channel-shaped or otherwise ribbed, horizontal cross-pieces having flanged ends provided with apertures for bolts, rivets or other fastening devices. In one form of unit these cross-pieces form the upper and lower edges of the unit, and the upper cross-piece may be specially shaped so as to serve as a window-sill. In the second form, these two channels serve as the upper and intermediate cross-pieces of the unit, and a third horizontal, lower cross-piece is used, which is preferably L-shaped in cross-section and provided with apertured end flanges, one arm thereof forming a ledge for supporting the floor of the vehicle in the manner described. The ends of these horizontal cross-pieces are joined by vertical side members, thus forming an open frame, while

the adjacent edges of these cross-pieces are joined by longitudinally ribbed diagonals within this open frame. These longitudinally ribbed cross-pieces and diagonals provide an exceptionally strong and rigid structural unit, which will not only bear heavy compressional loads in the direction of these cross-pieces, but in the diagonals as well.

The dimensions and shape of the first unit are preferably like the second unit between and including the two channel-shaped top and intermediate cross-pieces thereof. The first unit may therefore be used in places where the rise is less than that of the second unit, such as over the wheel or truck boxes, or two or more of the smaller first units may be associated one above the other to make a composite truss unit, and the like. Accordingly, the building unit of this invention may be used in any desired way to fabricate vehicle bodies or the like, these units being adapted to withstand compressional as well as tensional loads so that an assembly of them will support the entire vehicle load, each unit acting as the sole load-transferring member intermediate the parts between which it is located.

For a better understanding of the invention, reference is made to the accompanying drawings, in which

Figure 1 is a front view of one of the building units of this invention;

Fig. 2 is a rear view of the same;

Fig. 3 is a vertical section of the unit taken along the line 3—3 of Fig. 1;

Fig. 4 is a modified form of the unit; and

Fig. 5 illustrates one way of employing the unit.

In these drawings, numeral 10 designates the upper cross-piece which is channel-shaped, the upper flange 9 thereof being made sloping and curved, as shown particularly in Figs. 3 and 5, so as to serve as a window sill or the like. The ends of cross-piece 10 are provided with integral squared flanges 11 preferably having apertures 12 for the reception of bolts, rivets, or other fastening devices. An intermediate channel-shaped cross-piece 13 is also provided at its ends with squared flanges 14, also preferably having apertures 15 for the reception of bolts, rivets, or other fastening devices.

The third or lower cross-piece 16 is preferably made angle-shaped, and arranged to provide a substantial ledge 17, preferably having apertures 18 for the reception of bolts, rivets, or other fastening devices. The ends of cross-piece 16 are provided with integral squared flanges 19 preferably having fastening device apertures 20. Depending from the free edge of the ledge 17 of cross-piece 16 is a longitudinal flange 21, the ends of which engage an extension of end flange 19 which has fastening device apertures 22. It will be seen that the end flanges 11, 14 and 19

of cross-pieces 10, 13 and 16, respectively, are in the same plane at each end, thereby providing plane squared sides for the building unit. The ends of these cross-pieces are joined by side members in the form of ties 23, which are preferably spaced a slight distance from the squared ends of the cross-pieces, as illustrated particularly in Figs. 1 and 2.

Extending substantially between opposite ends of upper and lower cross-pieces 10 and 16, so as to cross at intermediate cross-piece 13, are diagonals 24. These diagonals 24 are provided with longitudinal ribs 25, the ends of which are formed integral with or are otherwise joined to the flanges of the cross-pieces 10, 13 and 16. Specifically, these ribs 25 extend between the lower flange of upper cross-piece 10 and the upper flange of intermediate cross-piece 13, and between the lower flange of intermediate cross-piece 13 and the ledge 17 of lower cross-piece 16. As shown particularly in Fig. 3, these ribs 25 are thicker at their centers between the several cross-pieces than at their ends, so that they curve inwardly to a slight extent.

Fig. 4 illustrates a modified form of the building unit, which is like the upper portion of the first unit, i. e., the portion between and including the upper and lower channel-shaped cross-pieces, which are designated 10' and 13' in Fig. 4. The lower flange of lower cross-piece 13' is also provided with apertures 26 for the reception of bolts, rivets or other fastening devices. The ends of these cross-pieces 10' and 13' are provided with integral squared flanges 11' and 14', respectively, which are provided with fastening device apertures 12' and 15', respectively. The ends of these cross-pieces 10' and 13' are joined by side members in the form of ties 23', while the ends of upper cross-piece 10' are joined to the center of lower cross-piece 13' by diagonals 24' having longitudinal ribs 25 of the form illustrated in Fig. 3 and described heretofore. In both forms of the building unit integral webs join the diagonals 24 and 24' together and to the side members or ties 23 and 23'.

The application of the building unit of this invention is particularly directed to the construction of vehicle bodies, where a series of them are assembled to fabricate a vehicle body of the desired size. As disclosed completely in the aforesaid parent patent, and shown particularly in Fig. 5, these members may be secured to either side of a vertical pillar 27 by means of bolts, rivets, or other fastening devices 28, 29, and 30 passing through apertures 12, 20 and 22, respectively. In this arrangement, the uppermost flange 9 serves as the window sill, and lowermost flange or web 17 serves as a seat for the edge portion of the flooring, which may include superimposed metallic plates 31 and a spacer

32 secured to the ledge 17 by a bolt 33 passing through aperture 18. The metallic flooring 31 may be in the form of sheets which are embossed in such a way that when two of the sheets are superimposed the projections of one sheet abut against the projections of the other sheet to form a structure of appreciable thickness and strength but of small weight. These metallic sheets 31 may then be covered with a suitable cement or other composition as shown in Fig. 5. The flooring may also be additionally supported upon a structure carried by the pillars 27 which also support the roof in the manner disclosed by the parent patent.

It will be seen that the building units of this invention, when assembled in the manner described, form a bridge-like construction in which each unit takes the stresses incidental to supporting the body and its load. Each unit is a truss in itself, the cross-pieces being designed to stand compressional as well as tensional loads, these cross-pieces being strengthened by the ribbed diagonals which are also designed to stand compressional as well as tensional loads. The side members or ties are strong in tension, the compressional loads in the direction of their length being borne by the diagonals in the manner described. Thus an exceptionally strong and rigid building unit is provided, which may be used in innumerable ways, either singly or in combination with other similar units, each unit serving as the sole load transferring member intermediate the parts between which it is located.

I claim:

1. In a building unit, the combination of longitudinally flanged members spaced apart, apertured flanges at the ends of said members to form a box section, and longitudinally ribbed diagonals joining said members.

2. In a building unit, the combination of parallel channels spaced apart, and flanges on said channels joining the side flanges thereof and longitudinally ribbed diagonals joining said channels, said channels and diagonals being arranged substantially in the same plane to form a frame.

3. In a building unit, the combination of parallel channels spaced apart, apertured flanges at the ends of said channels to form a box section, and longitudinally ribbed diagonals joining said channels.

4. In a building unit, the combination of a pair of channels spaced apart, end flanges on said channels joining the side flanges thereof, longitudinally ribbed diagonals joining said channels, and ties between the ends of said channels, said channels, diagonals and ties being arranged substantially in the same plane.

5. In a building unit, the combination of a pair of channels spaced apart, apertured flanges at the ends of said channels to form

a box section and longitudinally ribbed diagonals joining the sides of said channels, said channels and diagonals being arranged substantially in the same plane.

6. In a building unit, the combination of a pair of channels spaced apart, apertured flanges at the ends of said channels to form a box section, longitudinally ribbed diagonals joining the sides of said channels, and ties joining the ends of said channels, said channels, diagonals and ties being arranged substantially in the same plane.

7. In a building unit, the combination of spaced parallel channels, diagonals joining the sides of said channels, and longitudinal ribs formed on said diagonals, said ribs being joined at their ends to one of the flanges of said channels.

8. In a building unit, the combination of spaced parallel channels, diagonals joining the sides of said channels, and longitudinal ribs formed on said diagonals, said ribs being thicker at their centers and tapering toward their ends.

9. In a building unit, the combination of spaced parallel channels, diagonals joining the sides of said channels, and longitudinal ribs formed on said diagonals, said ribs being joined to one of the flanges of each of said channels and tapering toward thicker center portions.

10. In a building unit, the combination of a pair of parallel longitudinally flanged members spaced apart, a pair of longitudinally ribbed diagonals connecting substantially opposite ends of said members, and a third parallel, longitudinally flanged member between said first members and joined to said diagonals substantially at their crossing point.

11. In a building unit, the combination of a pair of outer longitudinally flanged members, a central longitudinally flanged member between said outer members, transverse flanges at the ends of said members forming a box section, said longitudinal ribs being joined at their ends to said end flanges, longitudinally ribbed diagonals extending between the central member and said outer members, the longitudinal ribs of said diagonals being joined at their ends to the ribs of said members, and apertures in the end flanges for mounting the unit.

12. In a building unit, the combination of longitudinally flanged parallel members, end flanges on said members, said end flanges and longitudinal flanges being joined together, longitudinally ribbed diagonals extending between said member, the ribs of said diagonals being thicker at their centers, and apertures in the end flanges and in the longitudinal flange of at least one of said members for mounting the unit.

13. In a building unit, the combination of longitudinally flanged parallel members, end

flanges on said members, said end flanges and longitudinal flanges being joined together, longitudinally ribbed diagonals extending between said members, the ribs of said diagonals being thicker at their centers, apertures in the end flanges and in the longitudinal flange of at least one of said members for mounting the unit, and ties between the ends of said members.

10 In testimony whereof I affix my signature.
OLIVER F. WARHUS.

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