June 28, 1932. E. J. W. RAGSDALE 1,865,059

GIRDER CONSTRUCTION

Filed July 18, 1929

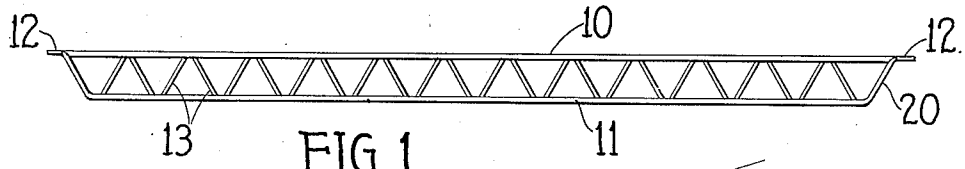


FIG. 1.

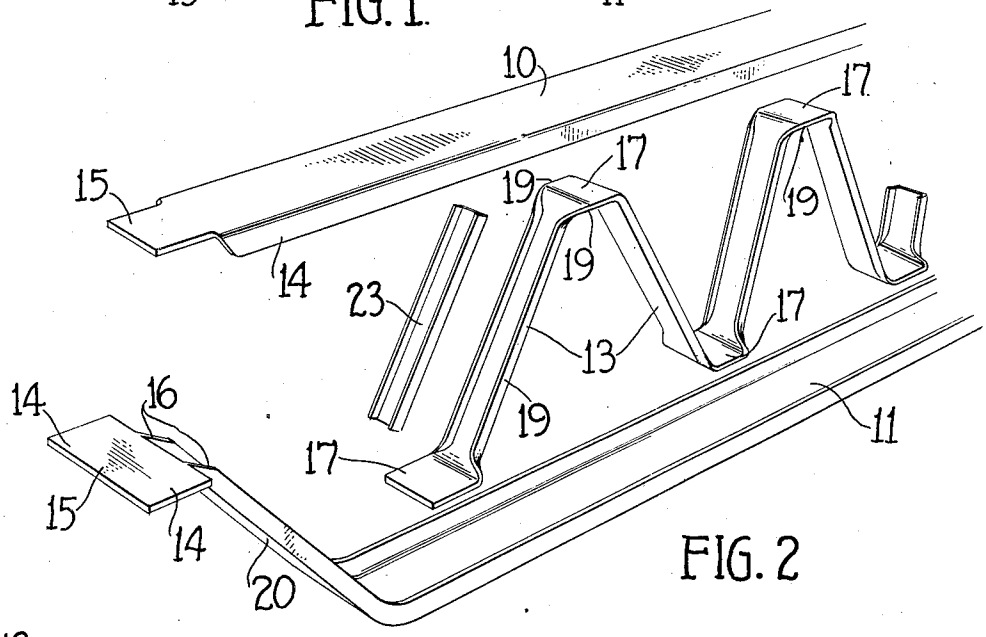


FIG. 2

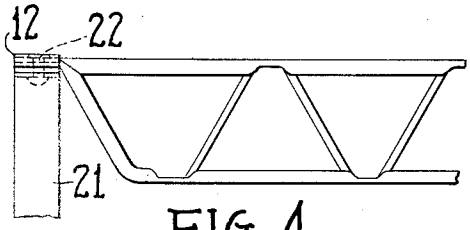


FIG. 4.

FIG. 3

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UNITED STATES PATENT OFFICE

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GIRDER CONSTRUCTION

Application filed July 18, 1929. Serial No. 379,102.

The beam of my invention is primarily devised for use in any and all structures in which girders of metal are useful. The embodiment disclosed is one having particular utility in substitution for the wooden girders commonly used in house building to support flooring, roofs and the like. But it serves full well to illustrate my invention and make known its general adaptability. Indeed, the construction may be used as an upright column and wherever structural members having the various strength, weight characteristics possessed by the structure of my invention are found to be useful.

My prime object is to produce a girder of metal of less weight and less cost, yet greater strength than a girder of the same size, and to produce in a metal girder of the same weight as the wooden girder, a greater strength at a less cost. Yet further, I aim to produce a metal girder the size of which can be adjusted in fabrication or subsequently in the suiting of the conditions of building with a facility equal to or greater than that had in the fabrication and use of wooden girders.

These ends and others of advantage I obtain by constructing the beam of longitudinally extending spaced metal members of channel cross section, connected together at their ends to form an anchorage, and transversely connected in their main bodies by members forming a Warren trussing, and in general integrally continuous, which members are formed of channel section stock flattened at their points of contact with the longitudinal members, and having the side walls of the channel section longitudinal members clinched over the flattened portions at their points of contact, and the flattened portions furthermore spot welded to the web of the channel sections of the longitudinal members. Illustrations of the accompanying drawing will assist to a perfect understanding of the invention.

Figure 1 is a side elevation of the beam.

Figure 2 is a pre-assembly view of the several component parts of the girder showing the parts as fabricated prior to the assembly and ready for assembly.

Figure 3 is a perspective showing of these same parts as assembled together.

Figure 4 shows the manner in which the beam is raised upon a girder.

The longitudinal members of channel cross section are designated 10 and 11 respectively. In the embodiment illustrated, to substitute for wooden members, these members are spaced apart uniformly as clearly appears in Figs. 1 and 3, except at their ends 12 where they are joined together. They are connected together transversely by Warren truss members 13.

The ends of the channel members 10 and 11 are especially formed for the end connections 12. One of the members, in this case 10, has the side walls 14 of the channel cut away for a short distance to leave the body 15 of the web at the end. The other 11, in this instance, has the side wall 14 at the end bent outwardly in extension of the web 15. This clearly appears in Fig. 2. The ends are then joined together by lapping the web portions 15 together and clinching over upon the lapped portions the theretofore flattened side walls 14 as clearly appears in Fig. 3.

As illustrated, the side walls 14 are cut or notched at 16 in order to facilitate this operation and the operation of bending the webs 15 into lapped relation, but the joinder may be effected without such cutting or notching if desired.

The Warren trussing 13 consists of an integrally continuous series of members of channel cross section as appears in Fig. 2, the channel section of which is flattened at their points of contact 17 with the longitudinal members 10 and 11 by outwardly turning the side walls 14 at these points of contact. The main bodies of the trussing 13 between these points of contact 17 remain of channel cross section, as they are shown in Fig. 3. The flattened portions are spot welded as at 18 to the webs 15 of members 10 and 11, and in addition the flanges 14 of members 10 and 11 are clinched inwardly over upon the flattened portions 17 to hold them additionally to the spot welds 18.

Both ends 12 having been connected together as shown in Fig. 3 and all the points

of contact through the flattened portions 17 having been spot welded and clinched, the girder is complete. It will be observed that in completion the lower longitudinal 11 has its opposite ends 20 bent upwardly and outwardly to meet the upper longitudinal at the ends 12 and the bent end 20 becomes then a part of the Warren trussing 13 the bend being made from the endmost flat 17 of the trussing 13. The completed beam is utilized in building structures by seating its ends 12 on beams or girders 21 as shown in Fig. 4 and securing it in place by means passed through openings 22 in the ends 12.

Obviously, there may be considerable modification, my invention depending upon the particular embodiment which is to be given it. The longitudinals 10 and 11 are illustrated of channel cross section but they may be of other cross section, as for example, angle cross section. The same is true of the Warren truss members 13. Moreover, these members 13 are in this structure of less channel width than the channel width of members 10 and 11 whereby the flattened points of contacts 17 are of a width including the outer side walls 19 which can be accommodated within the width of the channels 10 and 11 and flatly seated upon the webs of those channels and secured in place by the welding and clinching. But greater or less width may be used with or without change of section. So too, the order of assembly may be varied. I have described it as consisting first in making joints of the ends 12 of members 10 and 11. I may first make joinder of the points of contact 17 of the truss 13 with the members 10 and 11 and then join together the ends. So too, the end portions 20 of members 11 may be bent upwardly as shown before or after the joinder of the longitudinal and transverse members.

Likewise points of supports of the girder and connections may be in regions more or less remote from the ends 12.

It is clearly apparent that adjustment of size and securement of the beam is very readily carried out as manufactured from channel or other angle section stock of a standard form which comes from the mills in great lengths, and one has only to cut them to the lengths desired and bend them as shown. Moreover, given the fabricated girder of the form shown, one can cut it to shorter lengths merely by taking off one or more of the units of the truss with a metal saw and re-making the ends 12 with a metal saw and a hammer.

An addition to the general structure bordering on modification are the reinforcing channels 23 which may, if desired, be nested snugly within the channel section portions of the diagonals 13 and welded thereto.

The annexed claims should protect to me all modifications of my invention which fall within its generic spirit.

What I claim as new and useful and desire to protect by Letters Patent is:

1. A girder comprising strip stock longitudinal and interconnecting transverse members of channel cross section of different widths, which intermediate transverse members are of lesser width but are flattened to widen them laterally to substantially the width of the bases of the longitudinal members and spot welded to the bases of the longitudinal members at their points of contact.

2. A girder comprising strip stock longitudinal members of channel cross section and strip stock transverse channel members of less width than the longitudinal members flattened at the points of contact with the longitudinal members to widen them laterally to substantially the width of the longitudinal members and having at those points of contact the sides of the channel section of the longitudinal member clinched over the flattened portion.

3. A girder comprising longitudinal and interconnecting members, the longitudinal members being of channel cross section and having their ends flattened, the flattened portion of one being wider than the other and having its edges clinched over the narrow portion.

In testimony whereof he hereunto affixes his signature.

EARL J. W. RAGSDALE.