Dec. 27, 1938. L. W. CROSS 2,141,642

STRUCTURAL MEMBER AND MANUFACTURE THEREOF

Filed Oct. 28, 1935

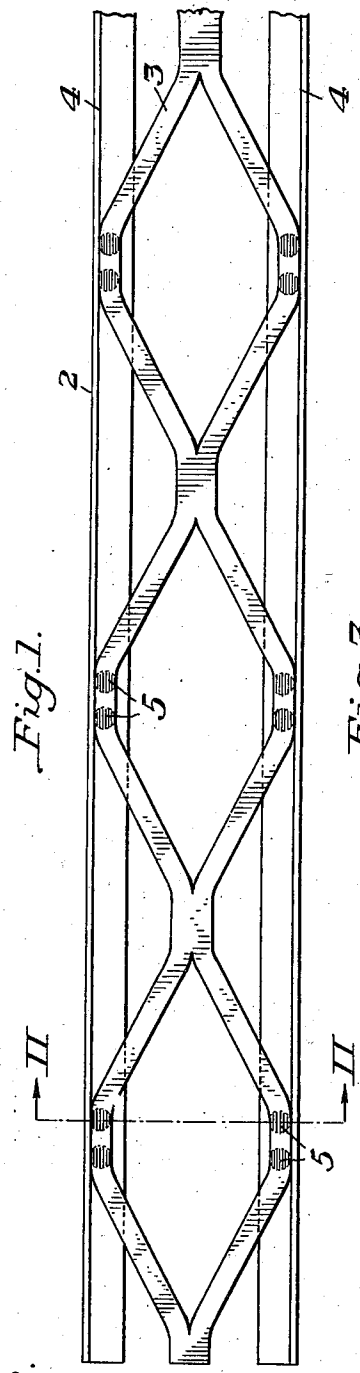


Fig. 1.

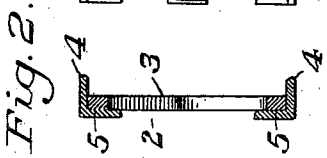


Fig. 2.

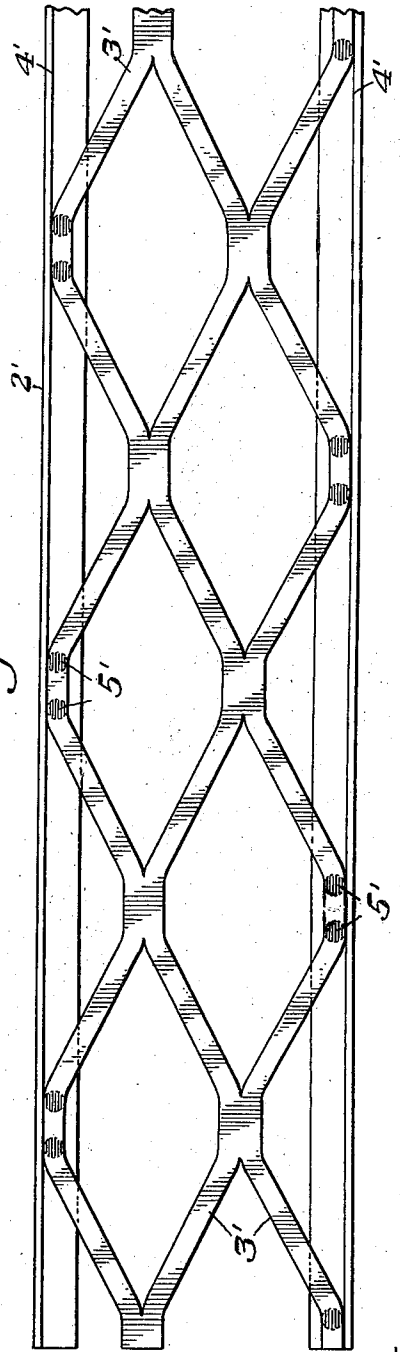


Fig. 3.

INVENTOR

Leonard W. Cross

by Fulbright, Stevenson & Lemke

his attorneys

Patented Dec. 27, 1938 2,141,642

UNITED STATES PATENT OFFICE

2,141,642

STRUCTURAL MEMBER AND MANUFACTURE THEREOF

Leonard W. Cross, Warwood, W. Va., assignor to The Consolidated Expanded Metal Companies, Wheeling, W. Va., a corporation of West Virginia

Application October 28, 1935, Serial No. 47,063

2 Claims. (Cl. 29—155)

This invention relates to structural members and the manufacture thereof, and more particularly to structural members adapted for use in building constructions and the like. Still more particularly the invention relates to structural members comprising expanded metal and the manufacture thereof.

One of the objects of the invention is the provision at low cost of a structural member such as a truss or stud in which the web or body portion is made of expanded metal. Structural members of this general character have heretofore been proposed, but such structural members have been attended with numerous disadvantages both as to manufacture and in use.

An example of a prior structural member in which the web portion is made of expanded metal is a beam of the web portion of which comprises a specially fabricated integral member of expanded metal in which the long dimension of the diamonds extends transversely of the beam, special end portions being provided for welding to angle members extending longitudinally of the beam. Such beam has numerous disadvantages, among which are relatively very high cost due to the necessity of using a special expanded metal member, low strength in the longitudinal direction, and other disadvantages which will be pointed out hereinafter.

My structural member is fabricated with the use of expanded metal manufactured in the usual manner and which can be taken from stock. I preferably flatten the expanded metal prior to fabricating the structural member, as this renders the expanded metal very much stronger than the unflattened expanded metal and also adapts it more readily for assembly with flange means which extend along the longitudinal edges of the web portion of the member. The structural member is preferably formed by severing a sheet of expanded metal lengthwise of the diamonds through bonds thereof and connecting the flange means with severed bonds. The connection is preferably effected by spot-welding.

Other details, objects and advantages of the invention will become apparent as the following description of certain present preferred embodiments thereof and certain present preferred methods of practicing the same proceeds.

In the accompanying drawing I have shown certain present preferred embodiments of the invention in which

Figure 1 is a plan view of a portion of a structural member;

Figure 2 is a transverse cross-sectional view taken on the line II—II of Figure 1; and

Figure 3 is a plan view of a portion of a structural member of modified design.

Referring now more particularly to the drawing, reference numeral 2 designates generally a structural member comprising a body or web portion 3 and oppositely disposed flange members 4 extending along the opposed longitudinal edges thereof. The web portion 3 is made of expanded metal. I preferably utilize a sheet of expanded metal taken from stock and sever such sheet in a direction parallel to the long dimension of the diamonds through bonds of the expanded metal, thus producing the web portion of the structural member of uniform width between the severed edges of the bonds. I preferably also flatten the expanded metal either before or after severing, although the flattening is ordinarily done when the expanded metal is in the unsevered sheet, and flattened sheets are ordinarily carried in stock and can be used to form the web portions of my structural members. The flattening is preferably done by cold rolling the expanded metal between large rolls, applying sufficient pressure to turn the strands and bonds into a common plane and to reduce their thickness. This results in very great increase in the strength of the expanded metal, as well as rendering it more suitable for the manufacture of a structural member of the type disclosed. As the expanded metal lies flat against one flange of each of the flange means, which are preferably in the nature of angle members, as shown in Figure 2, a provision is made for a very strong connection therebetween. The connection is preferably effected by spot-welding, as shown at 5.

The flange means preferably lie directly against and in contact with the outer edges of the severed bonds, which outer edges are substantially straight and parallel to the axis of the structural member and of sufficient length to transmit substantial stress therethrough to the flange means. This feature, coupled with the flattening of the expanded metal, results in the production of an extremely strong structural member.

My structural member may be fabricated without any waste whatever. Strips serving as web portions of my structural members may be cut out of a sheet of expanded metal side by side and the entire sheet may thus be used.

In the form of Figure 1 the web portion is one diamond wide. This has the advantage that the full width between the flange members is made available for passing pipes and other structural

members through the openings in the structural member, and, as will be seen from Figure 1, it is possible to pass therethrough a pipe whose external diameter is substantially the same as the distance between the flange means of the structural member.

My structural member has exceptional strength in the longitudinal direction and is particularly well suited for use as a stud, although by reason of the features above mentioned it is also quite strong in the transverse direction and may be used as a joist or beam. The flange means lend sufficient stiffness perpendicular to the web portion and the web portion is preferably thicker than the flange means,—that is to say, the metal of the flange means is of lighter gauge than the metal of the web portion, as shown in Figure 2. This is an advantage not obtainable with structural members fabricated of a unitary metal plate or sheet.

The structural member shown in Figure 3 is to all intents and purposes the same as that shown in Figure 1 except that instead of being only one diamond wide it is one and one-half diamonds wide. The web portion may be still wider, its width preferably being a multiple of half the width of a diamond. In Figure 3 reference numerals corresponding to those used in Figure 1 but having a prime affixed are applied and represent like parts.

While I have shown and described certain present preferred embodiments of the invention and certain present preferred methods of practicing the same, it is to be understood that the invention is not so limited but may be otherwise variously embodied and practiced within the scope of the following claims.

I claim:

1. In the manufacture of a building structural member, the steps comprising cold flattening a sheet of expanded metal, severing the same lengthwise of the diamonds of the expanded metal through bonds thereof to form an elongated web member, assembling said web member with opposed edge members each having a broad faced portion lying generally in the plane of the structural member and a flange portion extending generally transversely of such plane and with the severed bonds of the web member lying against the broad faces of the edge members which lie generally in the plane of the structural member, and, without bending the web member, welding said severed bonds thereof to said broad faces of the edge members which lie generally in the plane of the structural member.

2. A building structural member comprising angle shape edge members and a separate cold worked flattened expanded metal web member, said web member comprising strands connected by bonds and arranged generally in diamond shape, bonds of the expanded metal being welded to the inner faces of the webs of the edge members while the flanges of the edge members extend at right angles to the plane of the expanded metal web member.

LEONARD W. CROSS.