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A. RAFTER

2,092,472

STUD AND RAFTER

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Fig. 1

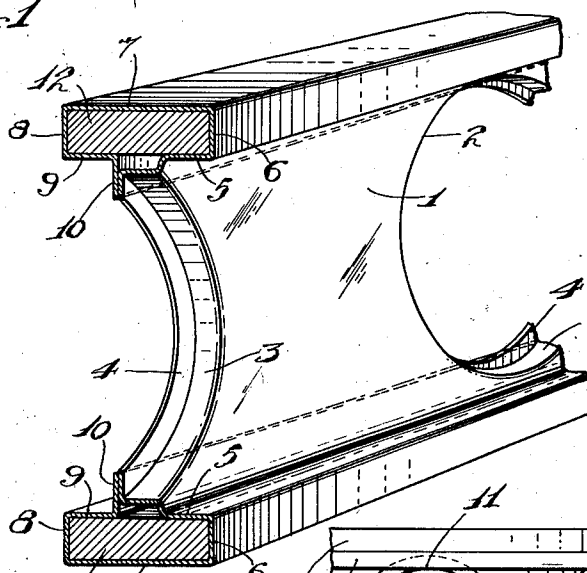


Fig. 2

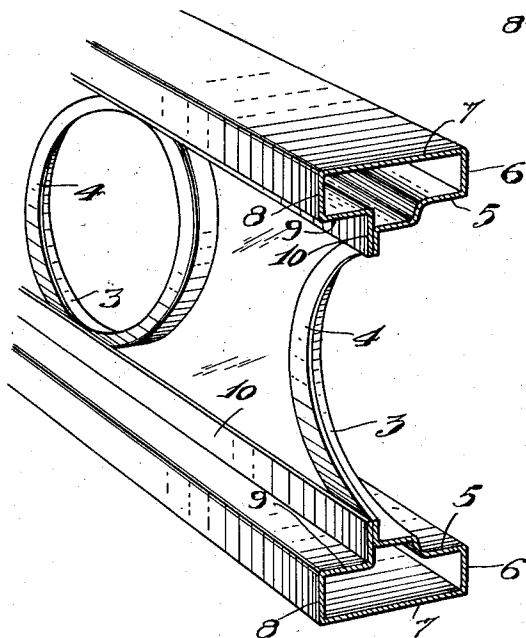


Fig. 3

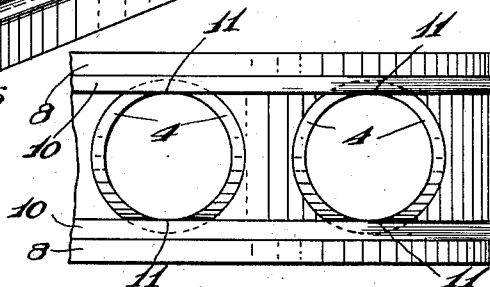
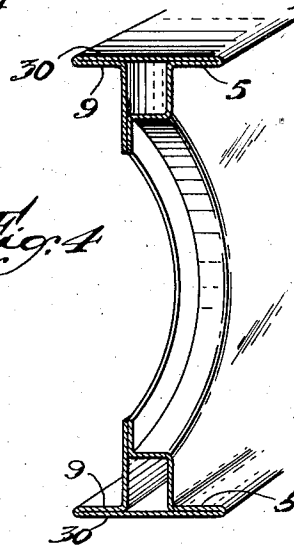


Fig. 4



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6 Claims. (Cl. 189—37)

This invention relates to improvements in metallic beams, studs, rafters and the like for use in buildings.

Heretofore, metal beams used in building construction have generally been of the I beam type, which have been found objectionable due to its weight, lack of resistance to turning forces, and cost due to the amount of metal used therein. It has also been found necessary in many instances to reinforce flanges of I beams by means of metal strips engaging the upper and lower flanges parallel to the web.

It is an object of my invention to provide structural members for building construction which have all the advantages of an I beam and none of the disadvantages thereof.

In accordance with my invention, the structural member is formed from sheet metal and is provided with a plurality of spaced apertures along the longitudinal center line thereof, thus presenting a considerable saving in metal and weight at places where the metal serves no purpose.

A further object is the provision of a structural member which can be formed from a single sheet of metal by means of suitable dies.

A further object of this invention is the provision of a metal beam for building construction which can be advantageously substituted for the usual wooden beams and rafters at present employed. The beams herein disclosed are adapted as supports for flooring, ceilings and roofs, and for all other purposes where wooden beams have heretofore been used.

These and other advantageous objects, which will later appear, are accomplished by the simple and practical construction and arrangement of parts hereinafter described and exhibited in the accompanying drawing, forming part hereof, and in which:

Fig. 1 is a perspective view, partly in section of one side of a structural member embodying my invention,

Fig. 2 is a perspective, partly in section, of the other side of the member, and

Fig. 3 is an elevational view of the structural member.

Fig. 4 is a perspective view, partly in section, of a modified form of the invention.

Referring to the drawing, in Fig. 1 a member is shown to comprise a single sheet of metal which is bent to form a plate 1 having a plurality of spaced apertures 2 along the longitudinal center line thereof, each of said apertures being surrounded by an inwardly directed flange 3

which flange has a right angularly directed portion 4.

The plate is bent outwardly at 5 and then up at 6, and then back upon itself at 7 which is then bent down at 8 providing a side parallel to the portion 6. The side 8 is then bent inwardly at 9 and then downwardly, providing a flange 10 abutting the flange 4, the flange 10 extending the length of the beam.

The flanges 4 and 10 are then rigidly secured together by means of welding or similar expedients, at the portions 11 as shown in Fig. 3.

From the above description it will be seen that there has been provided a simple and effective structural member for building construction which is light in weight, and relatively inexpensive when compared with conventional I-beam structures or other structural building members heretofore employed. The provision of apertures along the longitudinal center line of a beam obviously eliminates the metal which serves no purpose. It will be noted that the walls 1 and 10 are spaced except where the flange 4 engages the portion 10. This structure resists torsional strains and no reinforcements are needed for the portions 5 and 9. In order that the beam will satisfactorily receive nails, a strip of wood 11 is inserted in the hollow portion of the beam producing cover 7.

In Fig. 4 is shown a modified form of the invention in which the portion 5 shown in Fig. 1 is bent back upon itself providing a top 30, the vertical portion 6 shown in Fig. 1 being eliminated. The top 7 is then bent back upon itself to provide a portion 9, thus eliminating the vertical portion 8 shown in Fig. 1.

The bottom of the beam is formed in the same manner, and except for the changes herein noted, the construction shown in Fig. 4 is substantially the same as that shown in Fig. 1.

The beam shown in Fig. 4 is compact and rigid and is very desirable in circumstances where it is not necessary to nail or screw other members on to the beam.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as restrictive or limitative of the invention of which embodiments may be constructed including many modifications, without departing from the spirit and scope of the invention herein denoted in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a metal structural member for building

construction, a plate having a plurality of spaced apertures therein, inwardly directed flanges surrounding the apertures, each of said flanges having a right angularly directed portion, said plate
 5 being bent outwardly and upwardly and bent back upon itself to provide a cover, then back to provide a portion parallel to said cover, said last mentioned portion being bent to provide a flange at right angles thereto extending the length of
 10 the beam, said right angular directed portion being secured to said last mentioned flange by welding.

2. In a metal structural member for building construction, a plate having a plurality of spaced
 15 apertures therein, inwardly directed flanges surrounding said apertures, each of said flanges having a right angular directed portion, said plate being bent outwardly and then back upon itself to
 20 provide a top, said plate being bent back upon itself parallel to said top and then bent downwardly to provide a flange extending the length of the member, said right angular directed portion being secured to the last mentioned flange by means of welding.

3. In a metal structural member for building construction, a plate having a plurality of spaced apertures therein, inwardly directed flanges surrounding the apertures, each of said flanges having a right angularly directed portion, said plates
 30 being bent outwardly and upwardly and bent back upon itself to provide a cover, then back to provide a portion parallel to said cover, said last mentioned portion being bent to provide a flange at right angles thereto extending the length of the
 35 beam, said right angularly directed portion being secured to said last mentioned flange.

4. In a metal structural member for building construction, a plate having a plurality of spaced apertures therein, inwardly directed flanges surrounding said apertures, each of said flanges having a right angular directed portion, said plate
 5 being bent outwardly and then back upon itself to provide a top, said plate being bent back upon itself parallel to said top and then bent downwardly to provide a flange extending the length of the member, said right angular directed portions being secured to the last mentioned flange.
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5. In a metal structural member for building construction, a plate having a plurality of spaced apertures therein, inwardly directed flanges surrounding said apertures, each of said flanges having an angularly directed portion, the upper and lower portions of said plate being bent over to provide respectively a top and a bottom for said member, said top and bottom being bent to provide spaced flanges extending the length of the member and abutting said angularly directed portions.
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6. In a metal structural member for building construction, a plate having a plurality of spaced apertures therein, inwardly directed flanges surrounding said apertures, each of said flanges having an angularly directed portion, the upper and lower portions of said plate being bent over to provide respectively a top and a bottom for said member, said top and bottom being bent to provide spaced flanges extending the length of the member and abutting said angularly directed portions, said spaced flanges being secured to said angularly directed flanges by welding.
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