Nov. 2, 1937. E. D. CODDINGTON 2,097,722

JOIST

Filed Sept. 3, 1935

Fig. 1.

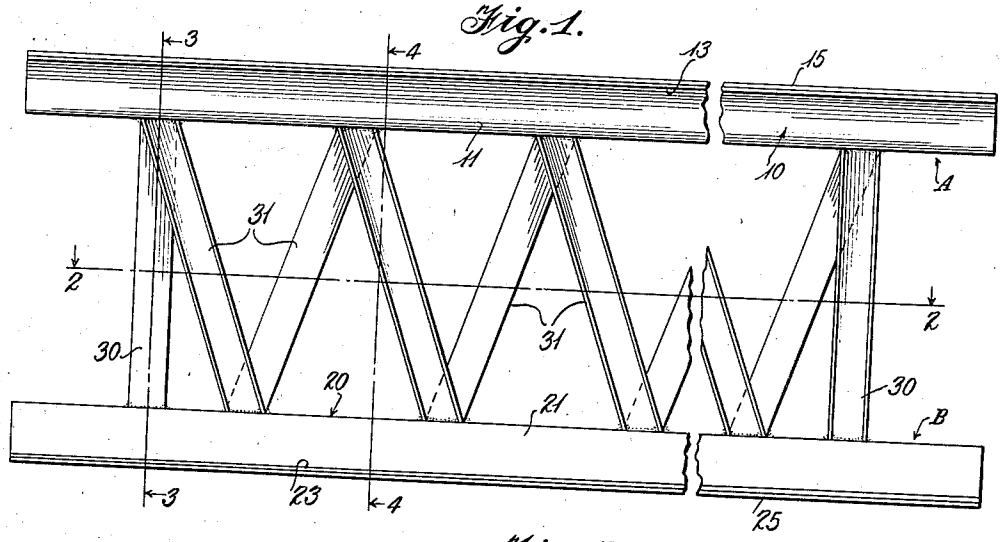


Fig. 2.

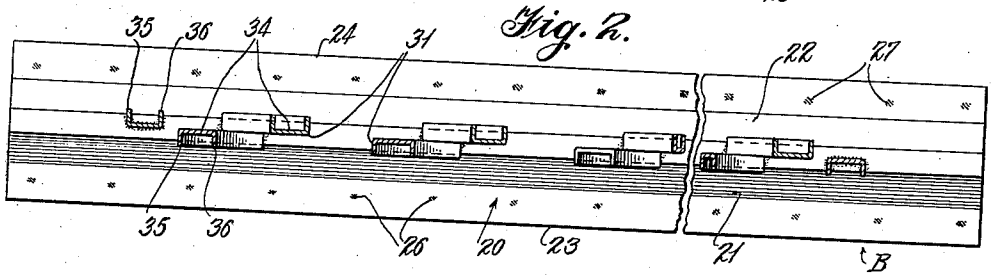


Fig. 3.

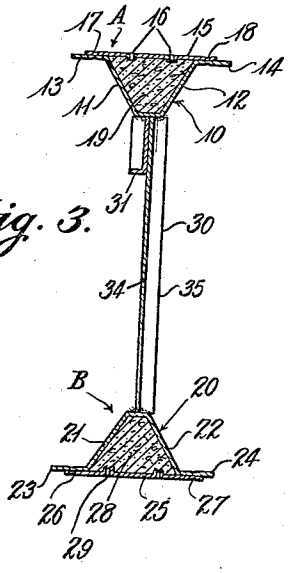
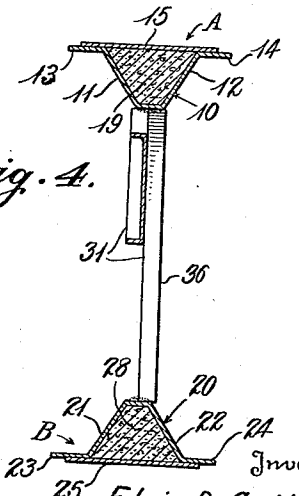


Fig. 4.



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UNITED STATES PATENT OFFICE

2,097,722

JOIST

Edwin D. Coddington, Milwaukee, Wis., assignor to Reynolds Corporation, New York, N. Y., a corporation of Delaware

Application September 3, 1935, Serial No. 39,027

2 Claims. (Cl. 189—37)

The present invention relates to a skeletonized metal joist having a cementitious fill suitable for receiving nails.

The objects of the invention include, among others, the provision of the following:

A joist comprising opposed chord members for the reception of nails and a simple and efficient web therebetween;

Improved reenforcing for a skeletonized joist;

An arrangement of channel members producing an exceptionally strong joist; and

A combination of channel members of different characteristics for the production of a joist of great strength in comparison with its weight.

These objects, and such other objects as may appear hereinafter, are obtained by the novel construction, unique combination, and improved arrangement of the several elements which constitute the invention, a single embodiment of which is illustrated in the accompanying sheet of drawings, hereby made a part of this application, and in which:

Figure 1 is a side elevation of a joist embodying one form of the invention;

Figure 2 is a longitudinal section on the line 2—2 of Figure 1;

Figure 3 is a transverse section on the line 3—3 of Figure 1; and

Figure 4 is a transverse section on the line 4—4 of Figure 1.

Like reference characters are used to designate similar parts in the drawing and in the description of the invention which follows:

The illustrated embodiment of the invention comprises opposed nail receiving chords and an intermediate web. End members of any suitable construction and adapted to receive nails may be supplied at the ends of and between the top and bottom chords of the joist.

The structure of the top and bottom chords of the joist is the same, the position of the two chords being reversed. The top chord, designated A, as shown in the drawing, comprises a channel 10, opposed sides 11 and 12 flaring outwardly, a horizontal flange 13 on side 11, and a similar flange 14 on side 12.

The channel member is closed to make a tube by a strip of material 15 which may be of the same width as the channel member and its flanges, or of slightly less width. Spot welding 17 and 18 unites the flanges 13 and 14, respectively, to the top 15. The channel 10 is closed by the strip metal member 15 and perforations 16 are provided through the latter in a plurality of rows coextensive with the length of this member. Enclosed within the channel-shaped base member 10 is a nailable core 19 composed of a mixture of gypsum, Portland cement and sawdust represented approximately in the proportions, by weight, 55:20:9. This mixture may be packed into the tubular casing in a dry state and moisture then introduced through the perforations 16 to supply the necessary water of crystallization to the mixture, which thereupon hardens. This process of fabrication is more particularly described in my copending application Serial No. 39,022, filed September 3, 1935.

The bottom chord B comprises a base 20 having sides 21 and 22, the sides 21 and 22 having horizontal flanges 23 and 24. There is a sheet metal strip 25 secured to the flanges 23 and 24 by spot welding 26 and 27. A cementitious fill 28 provides a suitable nail receiving body enclosed by the channel 20 and the metal strip. The cover strip 25 may similarly be provided with perforations 29 throughout its length corresponding to the perforations 16 of the top strip 15.

The two chords are spaced apart by a web composed of individual channel members, the end members 30 of which are perpendicular to the base members and the intermediate members of which are alternately oppositely diagonal in respect thereto. The intermediate members are designated 31. Each channel section comprises a central flat portion 34 and sides or flanges 35 and 36. The ends of each of members 31 are secured to the base members 10 and 20 by arc welding or by any other suitable means. The arrangement of the intermediate members is as follows:

Each end member 30 is spaced a predetermined distance from the end of the base members and is secured in position by spot welding. The end member 30 is so positioned that a nail-receiving part may be secured between the two base members 10 and 20 in alinement with the ends thereof. Partly overlapping one end of a channel member 30 is a diagonally disposed member 31 and partly overlapping the opposite end of the member 31 is a second diagonal member. The members 30 and 31 have their backs 34 in abutment at the overlapping sections. A plurality of diagonal members 31 partially overlapping extend to the opposite end of the joist where the last diagonal member partly overlaps a second end member 30. All of the members 30 and 31 are secured in position, as previously indicated, by spot welding or by other suitable means.

The structure illustrated and described is extremely simple. The chords receiving the ce-

mentitious fill are economical to manufacture and the strips 15 and 25 are also inexpensive, easily attached and readily penetrable by suitable nails.

The alternate arrangement of the channel sections 31 gives strength to overcome all normal torsional stresses and the same members are equally effective to maintain the chords A and B in horizontal alinement and to prevent distortion under compression stresses.

I claim:

1. A composite joist comprising a pair of tubular chords each constituting a casing of nail-penetrable sheet metal having flat upper and lower faces and a nailable cementitious core enclosed by the casing and a web supporting said chords in spaced relation, said web comprising a series of diagonally disposed channel sections, alternate channel sections being reversely inclined and the ends only of contiguous channel sections being overlapped and united back to back and bonded along their terminal edges to the opposed flat faces of the chords.

2. A composite joist comprising a pair of reversely disposed tubular chords each constituting a nail-penetrable sheet metal casing of generally trapezoidal-shaped transverse cross-section and a nailable cementitious core enclosed by the casing and a web supporting said chords in spaced relation, said web comprising a series of diagonally disposed channel sections, alternate channel sections being reversely inclined and the ends only of contiguous channel sections being overlapped and united back-to-back and being bonded along their terminal edges to the flat faces of the trapezoidal-shaped casings.

EDWIN D. CODDINGTON.