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TIE ROD AND BRIDGING FOR JOISTS

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Fig. 1.

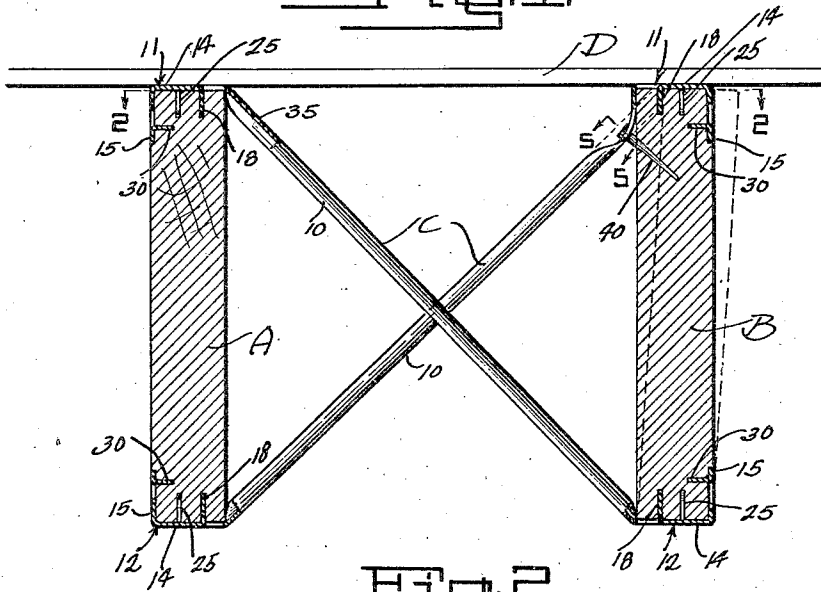


Fig. 2.

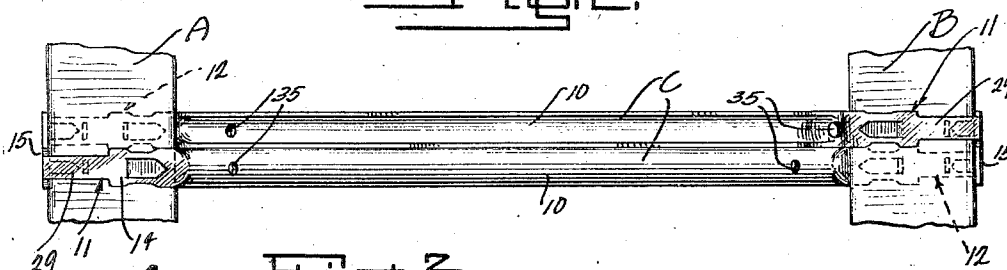


Fig. 3.

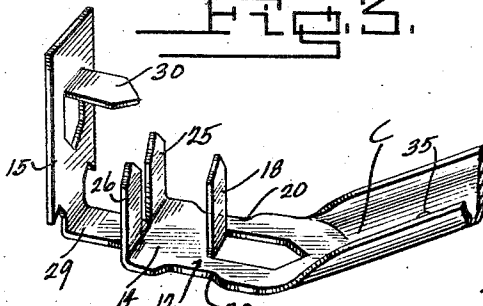


Fig. 5

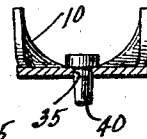
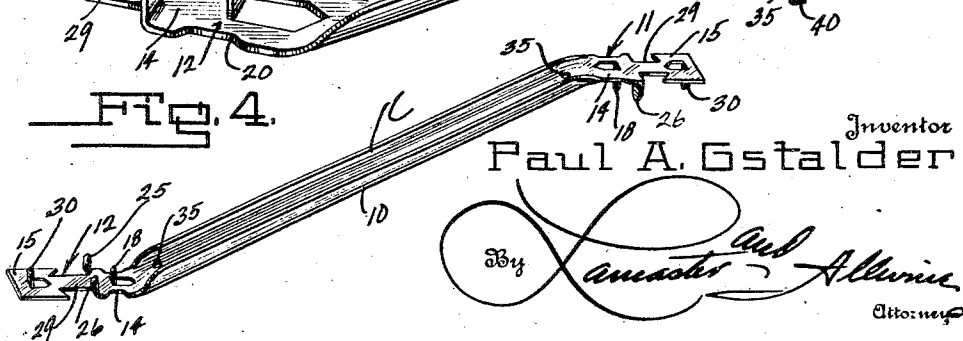


Fig. 4.



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TIE ROD AND BRIDGING FOR JOISTS.

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This invention relates to improvements in bridging for floor joists.

The primary object of this invention is the provision of metal tie rods adapted to cooperate in a novel manner with floor joists to serve as cross bridging therefor.

A further and important object of this invention is the provision of bridging for floor joists embodying means for shortening the tie rods of the bridging after they are in place to draw the joists into proper floor receiving position.

A further object of this invention is the provision of a novel type of metal tie rod for use as bridging in connection with floor joists and the like, embodying a compact assemblage of parts which will permit its assemblage upon floor joists, as a tie rod, without the necessity of using attaching nails.

A further object of this invention is the provision of improved metal bridging for floor joists embodying an economical assemblage of parts which permits of the application of the same in less time than ordinarily required for the application of conventional cross braces.

A further object of this invention is the provision of novel tie rods to serve as bridging for floor joists and the like, and which will give a better reinforced flooring support.

A further object of this invention is the provision of a novel metal tie rod for use as bridging in connection with floor joists, the same including means formed integral or fixed therewith by means of which the same may be attached to the joists.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a transverse sectional view taken through adjacent floor joists, showing the novel application of the metal bridging and tie rods.

Figure 2 is a plan view of the improved metal bridging as applied in crossed relation upon adjacent joists the view being taken on the line 2—2 of Fig. 1.

Figure 3 is an enlarged fragmentary view of the lower end of a tie rod.

Figure 4 is a perspective view of the tie rod prior to assemblage to adjacent joists.

Figure 5 is a transverse sectional view taken through the tie rod and the attaching nail for shortening the length of the same after it has been positioned, the view taken substantially on the line 5—5 of Figure 1.

In the drawing, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letters A and B may generally designate adjacently positioned floor joists, with which the tie rods C are connected in a crossed relation, in pairs, to serve as bridging for holding the joists in proper relation, in order that the flooring D may be properly placed and maintained stable.

Each of the tie rods C are of stamped metal, and in fact the tie rod may be stamped from metal at a single operation. It includes the preferably straight body portion 10, which in cross section is preferably arcuated into concavo-convex form. At the upper and lower ends of the body portion 10, attaching strips 11 and 12 are provided, which are formed with attaching tongues and attaching parts which may be bent to overlie the upper and lower surfaces of a joist and the outer sides thereof. Thus, as is illustrated in the perspective view of Figure 3, the lower attaching strip 12 of the joists C of this view is bent to provide an attaching portion 14 adapted to underlie in abutting attached relation with the lower edge of a joist, and a side attaching portion 15 adapted to overlie the outer side surface of the joist for attachment thereto; the portions 14 and 15 being bent into right angled assembled relation only after application to the joists. It is to be understood that the attaching strip 11 at the upper end of the joist 10 is similarly provided with identical attaching portions 14 and 15, and the same numerals applied to one of the attaching strips apply also to the other, in view of the fact that both upper and lower attaching strips of the tie rods C are identically formed.

The attaching strips 11 and 12 are bent oblique to the run of the body portion 10, and extend in opposite directions from the axis of said body portion 10. The joist edge attaching portion 14 of each of the attaching strips 11 and 12 is formed by stamping from

the material thereof adjacent the body portion 10, a pointed prong 18, in right angled relation with respect to the plane of the attaching portion 14. This part of the attaching portion 14 from which the prong 18 is struck, has the width thereof reduced by cutting the opposite sides of said portion 14, at 20, to reduce the surface area and thus facilitate the countersinking of the attaching portion 14, in the edge of the joist with which it abuts, when the same is placed. Adjacent the juncture of the attaching portions 14 and 15, the former is provided with a pair of pointed prongs or attaching elements 25 and 26, which are struck from opposite sides of the portion 14, in spaced relation, at right angles to the plane of the attaching portion 14, and in substantial parallelism with the attaching element or prong 18. The reduced portion 29 between the prongs 25 and 26 remains in the same plane as the attaching portion 14, and forms part of said attaching portion 14; the side attaching portion 15, in fact, being connected to this reduced portion 29. The cut-out from which the prongs 25 and 26 are formed really extends slightly upwardly into the attaching portion 15, as illustrated in Figure 3, although the spacing of the attaching portion 15 from the prongs 25 and 26 may vary, according to the spacing of the joists A and B, and the individual widths thereof. This is important, since the attaching portion 15 is not bent until after the tie rods have been applied to the joists and the attaching portion 14 driven into position.

The attaching portion 15 is of course formed integral with the attaching portion 14, and bent at right angles to the latter, as by connection with the reduced portion 29. The width of the attaching portion 15 may be as desired, and from the material of the attaching portion 15 an inwardly extending pointed prong or attaching element 30 is provided, extending at right angles to the plane of the attaching portion 15, facing upwardly above the points of the prongs 18, 25 and 26. The position of parts illustrated in Figure 3 designates the attaching portions 14 and 15 after placement upon a joist, but in fact these portions 14 and 15 lie in the same plane until the attachment of the tie rods C upon the joist, and this formation is illustrated in the non-assembled view of Figure 4.

Each tie rod C, on its body portion 10, preferably along the center line thereof, and immediately adjacent the attaching strips 11 and 12, is provided with nail receiving openings 35, the purpose of which will be subsequently described.

Referring to the assemblage of the tie rods to form bridging for the joists A and B, the joists are placed in crossed relation in pairs, in accordance with conventional practice,

and in the first step of the assemblage, the tie rods C are placed in their crossed relation, with the attaching strips 11 and 12 abutting against the top and bottom edges of the joists A and B, and in this position the prongs 18, 25 and 26 of the attaching portions 14 thereof, are driven into the position illustrated in Figure 1 of the drawings, and in fact, due to the shallow thickness of the attaching portions 14, the same are driven into countersunk relation in the edges of the joists A and B, or the joists A and B may be mortised in order to accommodate the attaching portions 14 in a countersunk relation therein, so that the tie rods do not interfere with the flush placing of the floor boards upon the joists. After the attaching portions 14 have been driven into place, the outwardly extending attaching portions 15 are then bent into right angled relation with the attaching portions 14, at the outer sides of the joists A and B, and the prongs 30 thereof driven into the material of the joists A and B, into a securing and attaching relation therewith; the portions 15 being also countersunk in the joists, either by hammering the same into such countersunk relation, or by mortising the joists to accommodate these attaching portions 15. After having assembled the tie rods C in crossed relation, in pairs, to the joists A and B, it may be found that notwithstanding the reinforced relation which the bridging thus provides, the joists A and B at the upper or lower ends thereof may be out of true, that is, the joists may not lean properly for receiving the floor. Provision is made for shortening the length of the body portion 10 of each tie rod C, in order to draw the joists A or B, as the case may be, into proper position, and to this end attaching nails or other elements 40 are provided, which are diagonally driven into the joists A and B, thru the openings 35 of the body portion 10, and upon hammering the same in place in the joists, the upper ends of the body portions 10 of the tie rods C are bent against the inner sides of the joists A and B, and it can readily be understood that by thus bending the body portions 10 of the tie rods, the same are tensioned and the lengths thereof are shortened, to draw the joists A and B into true alignment for receiving the floor boards D in proper relation. This shortening of the tie rod has been illustrated in Figure 1 of the drawings, where the securing element 40 is shown as positioned in attached relation in the joists B, to shorten the length of the body portion 10 of one of the tie rods C, in order to draw the joist B, at its upper end, from the dotted position into the full line sectional position illustrated.

The securing elements 40, of course, do not have to be positioned in each of the cross tie rods, for after the application of

the cross tie rods to the joists, the operator may walk across the joists on a plank placed thereon and note those joists which are out of true, and the attaching elements may be placed on the desired tie rods in order to bring the joists back into the position from which they have been turned askew or warped.

From the foregoing description of this invention it is apparent that a novel type of metal bridging has been provided for floor joists, which may be economically die-stamped, and which may be applied quicker, and with greater facility than conventional cross bracing for joists. No nails are necessary for securing the attaching portions 14 and 15 of the tie rods, and the only securing elements which are detachable from the tie rods are the elements 40 which may or may not be used for adjusting the lengths of the tie rods, in order to straighten the alignment of the joists A or B. The improved bridging provides a better reinforced floor than is possible with conventional cross wood bracing.

Various changes in the shape, size, and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

I claim:

1. As an article of manufacture a one piece metal tie rod for joist bridging comprising a body portion having end attaching strips thereon, each of said end attaching strips including a joist edge attaching portion and transverse joist side attaching portion, said joist edge and joist side attaching portions of each attaching strip having attaching prongs integrally struck from the material thereof.

2. As an article of manufacture a metal tie rod for joist bridging comprising a body portion adapted to lie between and be spaced from the joists and having an attaching portion at an end thereof for securing against the joists, said body portion immediately adjacent said attaching portion having a transverse opening therein in inwardly spaced relation from the attaching portion.

3. As an article of manufacture a metal tie rod for joist bridging including a body portion adapted to lie between joists and end attaching strips, said body portion immediately adjacent said attaching strip and spaced inwardly from each of said attaching strips having transverse openings therein.

4. As an article of manufacture a metal tie rod for joist bridging comprising a straight body portion having obliquely dis-

posed attaching strips at the ends thereof, said straight body portion inwardly of and immediately adjacent to said attaching strips having transverse openings there-through.

5. In a tie rod construction for securing a pair of adjacently positioned joists, a diagonal tie rod extending between said joists and attached thereto to relatively position said joists, said tie rod including a body portion extending between the joists having a transverse opening therein, and an attaching element for insertion through the opening of the body portion of the tie rod into driven relation in a joist in order to bend the body portion of the tie rod to shorten the length thereof and draw the joists into proper position.

6. In metal joist bridging for securing together a pair of adjacently spaced joists, a pair of cross metal tie rods having attaching portions thereon, means for connecting the attaching portions of each tie rod to the upper end of one joist and the lower end of the other joist whereby said tie rods each provide a body portion extending diagonally between the joists, said body portions of the tie rods having transverse openings therein at the ends thereof adjacent the upper and lower ends of said joists into such relation that a securing element may be driven through said openings into the joists for shortening the lengths of the body portions of said tie rods.

7. As an article of manufacture a metal tie rod for joists which comprises a body portion having end joist attaching portions, each of the joist attaching portions having a plurality of rigidly secured spaced projections thereon, positioned so that some of them may be driven into the edge of a joist, and other projections driven into the side of the joist.

8. In metal bridging for bracing and staying a plurality of joists, a metal tie having suitable engagement at its ends with the joists, and means for shortening the effective length of the tie after being placed, by the driving of said means into the joists and against the tie.

9. In metal bridging for bracing and staying a plurality of joists, a metal tie including a body having ends for suitable connection with the joists, and an attaching element adapted to be driven into the joists and to engage the body of the tie intermediate its ends during such driving to shorten the effective length of the tie.

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