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2,617,154

BRACING

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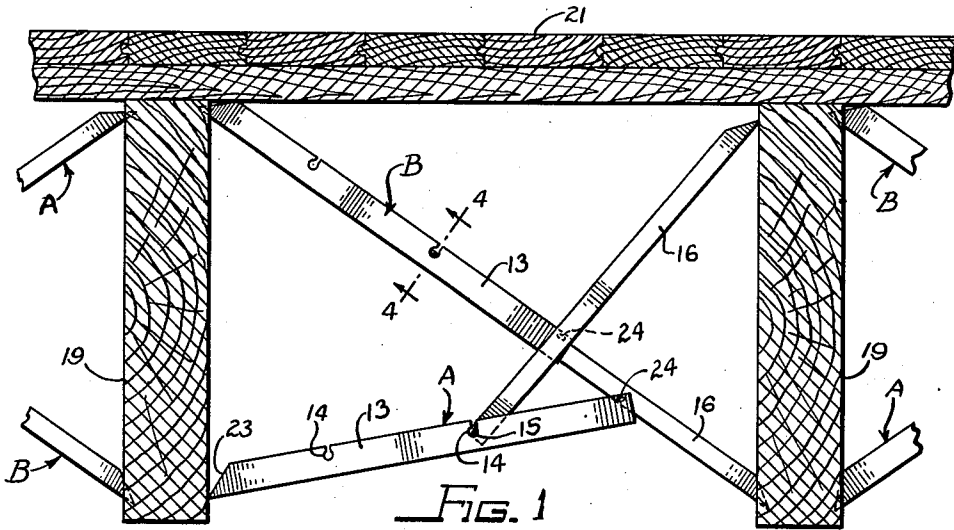


FIG. 1

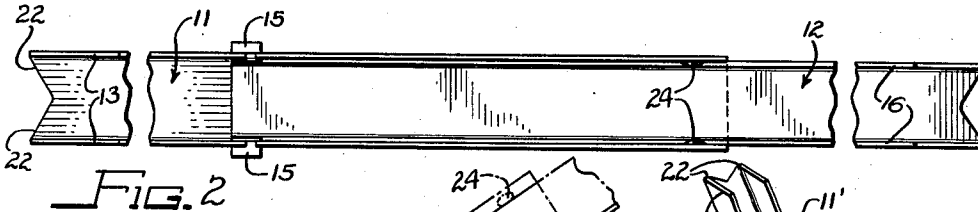


FIG. 2

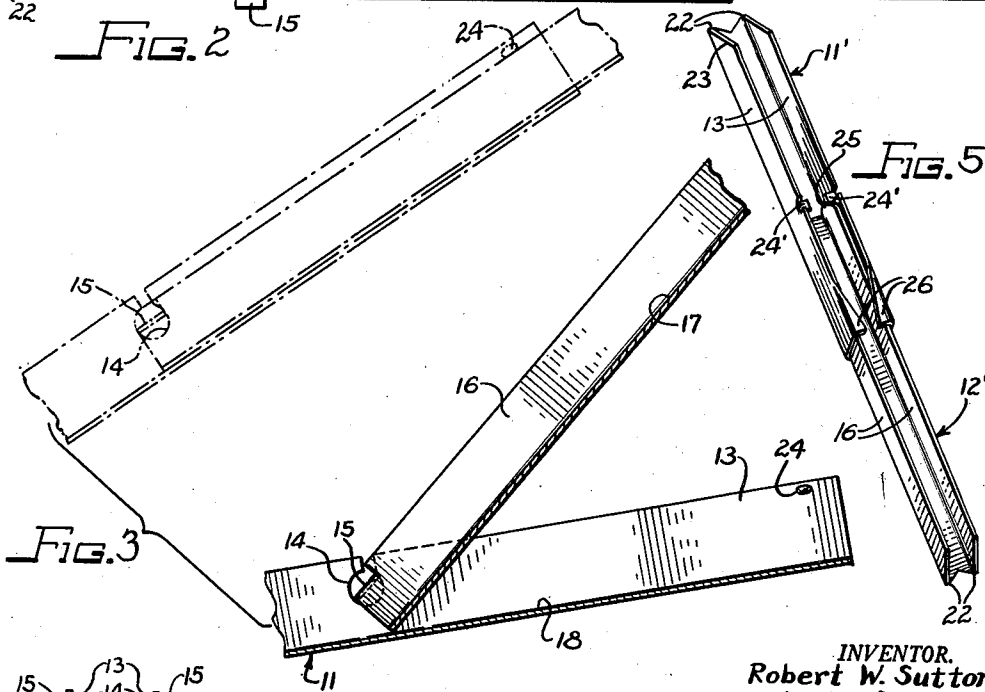


FIG. 5

FIG. 4

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BRACING

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5 Claims. (Cl. 20—9)

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The invention relates to improvements in braces and more particularly to a readily adjustable rugged brace which may be easily and quickly installed or removed.

The brace of the present invention is of a kind that is especially adapted for use in bracing or bridging the joists of a floor in a building construction. Common practice is to set the joists in spaced relation with their ends suitably supported on the building walls or beams and to then reinforce the joists at spaced intervals through their lengths as by nailing or otherwise securing therebetween strips of wood suitably cut to fit snugly therebetween in a criss-cross relationship. Such bracing or bridging is not entirely satisfactory primarily because settling of the building or warping or twisting of the joists or shrinkage of the strips renders the braces ineffective for the purpose intended. It, therefore, becomes necessary in many instances to tear out the original bracing and install new bracing. This obviously is an expensive procedure and very often is not done, with the result that the joists are not rigidly and firmly supported in their intended positions.

It is, therefore, an object of the present invention to provide a brace of the character referred to which may be easily and quickly installed or adjusted and locked in place so as to fit in a specific installation.

Another object is to provide a brace of the character referred to which is light in weight and which may be shipped in a knocked-down or disassembled condition to thereby occupy a minimum amount of shipping space.

Another object is to provide a brace for the purpose intended which may be economically produced and installed by unskilled workmen.

Other objects of the invention will appear from the following description and accompanying drawing and will be pointed out in the annexed claims.

In the accompanying drawing there has been disclosed selected structures designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawing:

Fig. 1 is a fragmentary sectional view of a floor supported by joists having braces embodying the features of the present invention installed therein, one of the braces being shown in a partially installed position.

Fig. 2 is a plan view of one of the braces showing portions thereof broken away.

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Fig. 3 is a fragmentary detail longitudinal sectional view showing a partially installed brace in full lines and illustrating said brace fully installed in broken lines.

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a perspective view of a modified form of brace.

Referring to the accompanying drawing, and particularly to Fig. 2, the embodiment of the brace there illustrated consists of a pair of channels 11 and 12, each of which preferably is formed from sheet steel. The channel 11 is wider and deeper than the channel 12 so as to telescopically receive the channel 12 between its side walls 13 in the manner shown. The side walls 13 are provided with at least one pair of slotted recesses 14, the recesses of each pair being in transverse alignment with each other. These recesses are intended to provide bearings to selectively receive transversely projecting lips 15 struck out of the side walls 16 of the channel 12 adjacent one end. In the present disclosure, the two pairs of recesses 14 are spaced to adapt the brace to installations between joists having twelve and sixteen inch centers.

Upon referring to Figs. 3 and 4, it will be observed that the lips 15 are adapted to have free rotation within the enlarged inner ends of the recesses 14 so as to thereby permit the channel 12 to be moved during assembly from the full line position of Fig. 3 into the broken line position there illustrated. When the channels are in the broken line position shown in Fig. 3, the bottom wall 17 of the channel 12 lies flat against the bottom wall 18 of the channel 11, thus preventing relative movement of the channels beyond the broken line position illustrated.

This construction affords means whereby a brace may be located initially between the joists 19 supporting the floor 21 in the manner illustrated by the brace A in Fig. 1. When in this position, the outer free ends of the channels 11 and 12 are in bearing engagement with the opposed faces of the joists 19. Upon moving the brace A from the position illustrated in Fig. 1 into the broken line position shown in Fig. 3, the outer ends of the channels are urged into tight abutment with the joist faces.

Means is provided, however, on the outer free ends of the channels to enable the ends to engage firmly in the joists and thereby be retained in the desired position. To this end, each channel 11 and 12 is provided at its outer end with at least one pair of barbs 22. Each barb 22 preferably is located at the juncture of one of the channel side

walls with the channel bottom wall. This affords means whereby the barbs 22 are reinforced by the side walls to thereby prevent their distortion upon the application of the necessary force, longitudinally of the assembled brace, to cause them to penetrate the joist surface.

When the brace is moved into the straight line position indicated by brace B in Fig. 1, the barbs 22 on the outer ends thereof are securely embedded in the joists 19. The free edges of the side walls 13 and 16, adjacent each barb 22, are suitably cut at an angle, as at 23, so as to afford a flat surface which may bear firmly against the bottom face of the floor 21 to increase the rigidity of the brace. The brace is held in its straight line position preferably by means provided on the side walls 13 of the channel 11 to resiliently coact with the side walls 16 of the channel 12. Said means are best shown in Figs. 2 and 3. As there illustrated, each side wall 13 of the brace 11 is provided, adjacent its telescoped end, with an inwardly extending protuberance or the like 24 which is adapted to engage over the edge of one of the side walls 16 of the channel 12 when the latter is moved into its straight line position. It should be quite evident that the brace may be installed and secured in place easily and quickly and that it may be removed readily for repositioning, should it become necessary, by the simple expedient by grasping or otherwise engaging the brace midway between its length and drawing the same downwardly to cause the channel 12 to disengage itself from the protuberance 24.

The embodiment of the invention illustrated in Fig. 5 is substantially like that described hereinabove. In this instance, however, structurally different means are provided to afford a hinge connection between the two channels 11' and 12'. As illustrated, the channel side walls 13 are provided with inwardly struck aligned lips 24' inwardly of the channel ends. The telescoped end of the channel 12' has its side wall ends suitably rounded so as to have a free rocking motion against the lips 24' when the two channels 11' and 12' are in telescoped association.

The manner for installing the brace illustrated in Fig. 5 is the same as the manner for installing the brace illustrated in Fig. 1. When positioned with its barbs 22 against the opposed faces of the joists 19 the brace is moved into straight line position to thereby embed the barbs in the joists. During the movement of the brace into straight line position the channel 12' engages a pair of keepers 26 formed on the upper edges of the side walls 13 of channel 11'. The keepers are cammed outwardly owing to the tapered edges thereof sufficiently to enable the channel 12' to move into a straight line position with the channel 11'. The keepers 26 then spring back into their original position to overlie the free edges of the walls 16 of channel 12'. This affords means whereby the brace is firmly retained in place until such time as its removal may be desired.

Although exemplary forms of the present invention have been disclosed in the accompanying drawing and discussed in detail in the foregoing specification, it should be understood that the invention is capable of embodying a wide variety of modifications in detail without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. A toggle brace comprising a first and a second channel, said first channel having one of its ends telescoped over one end of said second channel with their side and back walls in substantially over-lapping relation, a plurality of pairs of substantially circular holes with one of each pair in a different side of said one end of said first channel, each of said holes having a throat opening into the free edge of its respective side, a pair of lugs struck out of and each extending from a different side of said one end of said second channel and removably insertable in a different one of said pairs of holes through its associated throat, said lugs and said holes providing a separable hinge connection, whereby as said second channel is moved about said hinge connection to enter and to be in alignment with said first channel the over-all length of said channels is increased, and releasable means for resisting movement of said second channel out of said first channel.

2. The toggle brace defined in claim 1, in which said means for resisting movement of said second channel out of said first channel comprises a pair of protuberances each on a different one of said side walls of said first channel and spaced from said hinge connection, said protuberances extending inwardly and positioned to snap over the free edges of said second channel.

3. A brace constructed as described in claim 1 and in which means is provided on the projecting ends of the telescoped channels to engage members between which the brace is mounted.

4. A brace constructed as described in claim 1 and in which a reinforced barb is provided at each corner of the projecting channel ends to engage members between which the brace is mounted.

5. As an article of manufacture, a brace comprising a pair of channels, one of said channels having one of its ends telescoped into one end of the other channel, a separable hinge connection joining the fitted channels, said separable hinge connection comprising a plurality of pairs of substantially circular holes with one of each pair in opposite sides of the outer channel, each of said holes opening onto the adjacent free edge through a throat aligned substantially perpendicular to the bottom of said outer channel, and a pair of lugs at the end of the other channel, each lug extending from a different side of said other channel and aligned substantially parallel to the bottom of said other channel, said lugs being insertable into a selected pair of said holes for rotatable pairing therewith, through said throats, whereby said channels can be disengaged from each other only upon being aligned substantially perpendicular to each other.

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