Aug. 15, 1967 E. F. TUTTLE 3,335,993

SELF-TENSIONING STUD BRACE

Filed May 10, 1966

FIG. 1

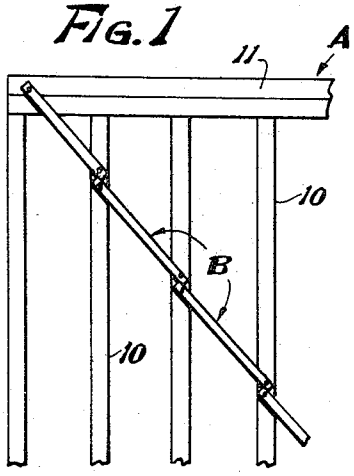


FIG. 5

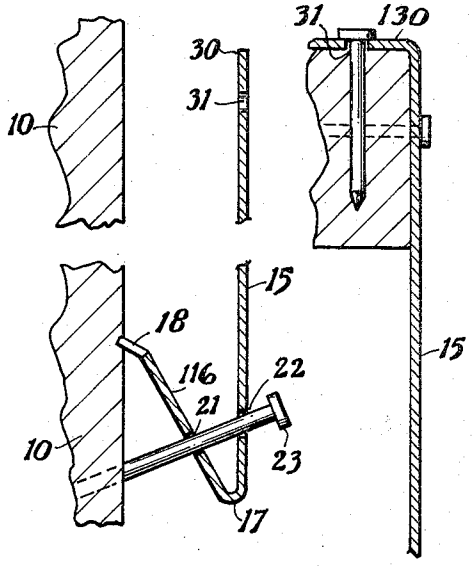


FIG. 2

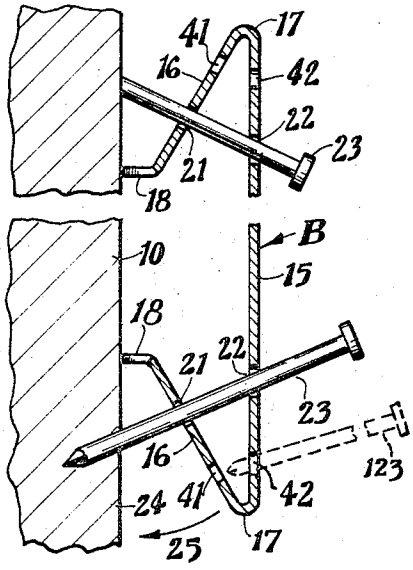
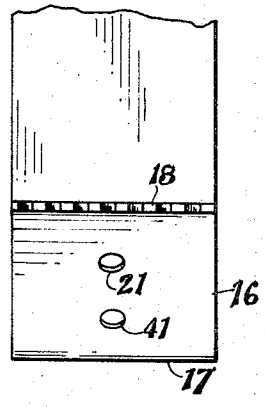


FIG. 4



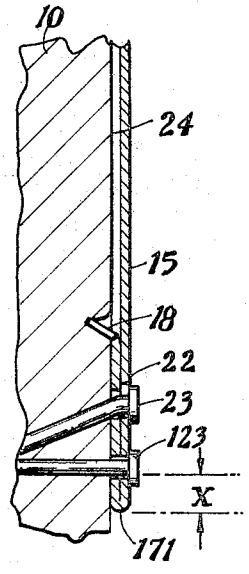
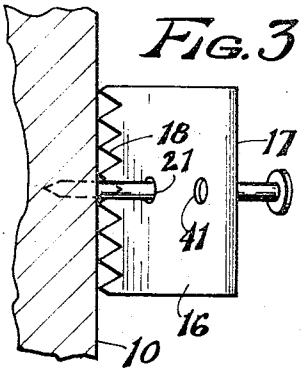


FIG. 7

FIG. 3



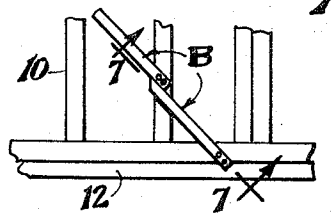


FIG. 6

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SELF-TENSIONING STUD BRACE

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7 Claims. (Cl. 248—351)

This invention relates to the bracing of wall studs of building frame construction and has as its general object to provide an improved self-tensioning stud brace of metal strap material providing the advantages of reduced cost and greatly increased speed of application as compared to the common practice of sawing from 2 x 4 lumber a series of braces having parallel-mitered ends and then nailing these braces between the studs.

The principal object of the invention is to provide such a strap type stud brace which, as it is nailed between spaced studs, will be automatically stretched and tensioned so as to establish a firm tying connection between the studs to which it is nailed. Additional objects are to provide stud bracing means:

(1) Utilizing thin strap metal adapted to be nailed diagonally between spaced studs and against the co-planar narrow faces of the studs;

(2) Particularly adapted for use in the form of relatively short individual braces each adapted to span between two adjacent studs;

(3) Including integral means for positioning an end of each brace initially spaced away from the face of the stud to which it is to be nailed and for locating a fastener nail in a canted position such as to apply tension to the brace as the end thereof is drawn against the stud;

(4) Having at one or both ends thereof, integral fulcrum struts having ends spaced from the body of the brace so as to provide the aforesaid initial outward spacing, and adapted to establish non-slipping engagement with the stud so as to function as a tilting tensioning strut as the brace is nailed against the stud.

Other objects and advantages will become apparent in the ensuing specification and the appended drawing in which:

FIG. 1 is an elevational view of a portion of the framing of a building wall, illustrating the application of the brace of my invention thereto;

FIG. 2 is a fragmentary longitudinal sectional view of one of the braces in an initial stage of attachment to a pair of spaced studs;

FIG. 3 is a plan view of the brace and a horizontal sectional view of the stud to which it is being attached;

FIG. 4 is an inward face view of one end portion of the brace;

FIG. 5 is a fragmentary longitudinal sectional view of a modified form of the brace;

FIG. 6 is a fragmentary elevational view of an installation of another modified form of the invention; and

FIG. 7 is a fragmentary longitudinal sectional view of the same, taken on line 7—7 of FIG. 6.

Referring now to the drawings in detail and in particular to FIGS. 1 and 6, I have shown therein how the invention may be applied to the bracing of a building wall frame comprising vertical studs **10**, a header plate **11** and a floor plate **12**, among other parts; and have shown as an example of one form in which the invention may be embodied, a series of braces B of unit length each adapted to bridge between a single pair of adjacent studs in a diagonal position as shown.

Referring now to FIG. 2, the brace of my invention comprises a body strap **15** having at one or both ends thereof, an integral fulcrum strut **16** joined thereto by a bend **17** and subtending therewith an acute dihedral angle such that the respective struts **16** converge toward the center of the body strap **15**.

Each of the fulcrum struts **16** has at its end a row of pointed fulcrum teeth **18** adapted to become embedded in a respective part of frame A so as to provide a non-slipping fulcruming connection with the wall stud. The teeth are preferably bent at an obtuse angle to the respective strut **16** so as to be directed transversely to the face of the frame in the position shown in FIG. 2.

Each fulcrum strut **16** and the opposed portion of body strap **15** are provided with respective nailing apertures **21**, **22**, **41** and **42** through which securing nails **23**, **123** can be passed. The apertures **21** and **22** are of larger diameter than the nail **23**, sufficiently so that the nail **23** can be easily inserted through the apertures, but are sufficiently small so that they will provide a means to position the nail **23** at a selected angle to the face **24** of the part of frame A to which the respective end of the brace B is to be secured. The aperture **22** is positioned farther from the end of the strap than the aperture **21**, as measured along the body strap **15** from the bend **17**, and thus the nail **23** when inserted through the apertures **21**, **22**, is disposed in a position canted with reference to the stud face **24** along an axis subtending an obtuse angle to the central portion of body strap **15**, and thereby canted away from the center of the brace toward the frame A. Accordingly, as the nail **23** is driven home, when it engages the body strap **15** of the brace it commences to exert a pull against the respective end of the brace tending to draw it away from the opposite end and thus placing the body strap **15** under tension, provided that the opposite end of the brace is anchored against yielding in the direction of the pull thus applied. The fulcrum strut **16** cooperates in the application of tension to the brace, in that the anchor teeth **18** will indent the face **24** of frame A increasingly as pressure is applied to the fulcrum strut **16** through the bend **17** and the nail **23** commences to collapse the body strap **15** against the strut **16**. When the collapsing movement has progressed to the point where the body strap **15** makes contact with the strut **16**, such pressure will be greatly intensified and the teeth **18** will be driven into the frame A and finally embedded therein as shown in FIG. 7. With the fulcrum end of the strut **16** engaged fixedly against the frame A, the collapsing movement will involve a drawing movement of the bend **17** diagonally toward the stud as indicated approximately by the arrow **25**, in a direction generally parallel to the axis of nail **23**, so that the two tensioning forces (the pull of the nail and the levering action of the tilting fulcrum strut **16**) will act cooperatively to apply tension to the body strap **15**. As the bend **19** is drawn toward the frame face **24**, it will be closed to a tight fold **171** as shown in FIG. 7, and the strut **16** will be collapsed against the inner face of body strap **15**. When the bend **171** engages the frame A, it is anchored by a second nail **123** driven through apertures **41** and **42**, normal to the frame face **24**, as shown in FIG. 7.

As shown in FIG. 2, fulcrum strut **16** and the nail positioning apertures **21** and **22** may be provided at both ends of the brace B.

However, for many installations, a preferred form of the invention is that shown in FIGS. 6 and 7, wherein only one end of the brace is provided with a strut **16**, and wherein the other end is plain and straight, as shown in FIG. 5, with one or more nail apertures **31** therein. Where a short brace is required, the plain end can be bent around the edge of a frame part (e.g. stud **10**) as at **130** in FIG. 7, and nailed to the side of the stud as shown, thus disposing of excess length of the brace for the shortened span. For example, if a series of braces have been nailed diagonally across a section of wall frame, beginning as in FIG. 1 and ending as in FIG. 6, the last brace of the series may be required to span a lesser distance than the other braces, as in FIG. 6. The

bendable plain end of the brace can be bent around the side of a steel or other frame part, so as to utilize only a portion of the length of the brace in spanning the shortened distance. If the excess portion that is bent around the side of the stud is of such extent as to project the nail hole **31** beyond a point where it can be used for nailing, a nail can be driven through any selected point along the length of strap **15**, piercing the strap before entering the frame A.

Referring again to FIG. 1, it may be noted that each of the braces B is attached between respective pairs of adjacent studs **10** with one end attached to one stud and an opposite end attached to an adjacent stud. By arranging the braces B diagonally in approximate alignment as shown in FIG. 1, the composite effect of the series of braces is substantially equivalent to that of a single brace extending diagonally and nailed to each of the studs **10** which it crosses.

FIG. 5 illustrates a modified form of the invention wherein a strut **116** has a single nail hole **21**, and the opposed portion of strap **15**, a single nail hole **22**, the holes being located sufficiently close to bend **17** so that nail **23** may function not only for tensioning the brace while collapsing the bend **17**, but also to anchor the collapsed end of the brace to the frame A.

The strap metal of the braces B can be sufficiently thin and soft to be pierceable by a nail. The material is a relatively soft metal, readily bendable so that the bends **17** can be folded into tight bends as indicated at **171** in FIG. 5.

I claim:

1. A building wall frame brace of metal strap material comprising a body strap and a fulcrum strut joined to at least one end thereof by an integral bend, said fulcrum strut subtending an acute angle to an opposed portion of said body strap and having a free end adapted to establish fixed fulcruming engagement with a wall frame, said strut and said opposed portion of the body strap having respective nail apertures aligned with one another on an axis that is canted away from the center of the brace toward the stud surface engaged by the end of said strut, whereby to position a securing nail in said canted relation such that the driving of the nail home into the frame, with the end of said strut fulcrumed against the frame, will exert a tensioning pull against said body strap tending to draw the respective end of the brace away from its opposite end.

2. A stud brace as defined in claim **1**, wherein said fulcrum strut has a free end provided with means to indent said wall frame so as to establish a fixed fulcruming connection between the strut and the frame, whereby as the securing nail is driven home said strut will be flattened beneath said body strap and thereby tilted so as to cause the end of said body strap to swing diagonally away from the opposite end of the brace in a direction approximately parallel to the nail axis so as to cooperate with the nail in effecting said tensioning operation.

3. A stud as defined in claim **2**, wherein said frame-indenting means comprises a plurality of pointed teeth extending transversely along the free end of said strut.

4. A brace as defined in claim **1**, wherein said strut and opposed portion of the body strap are provided with a second set of opposed nail apertures, adjacent to said bend, through which a second nail can be driven into the frame to anchor said bend securely to the frame.

5. A stud brace as defined in claim **1**, wherein both ends of said brace are provided with said fulcrum strut and with said nailing apertures, arranged on respective axes which diverge in the direction extending from said body strap toward the frame surface engaged by said struts.

6. A stud brace as defined in claim **1**, wherein only one end of said brace is provided with said fulcrum strut, the opposite end of the brace being a plain, unbent end provided with a nailing aperture for anchoring said plain end to the frame prior to anchoring the opposite end of the brace to the frame with a tensioning effect.

7. A brace as defined in claim **1**, of relatively thin, soft strap metal, pierceable by a nail and easily bent around an edge and against a side face of a stud when longer than required to span the distance between the frame parts to which it is to be secured.

References Cited

UNITED STATES PATENTS

1,609,784	12/1926	Springab	52—673
2,121,302	6/1938	Robertson	248—351 XR
2,699,315	1/1955	Appleton	248—57 XR
2,963,127	12/1960	Manville	52—693
2,964,807	12/1960	Kennedy	52—696

JOHN PETO, *Primary Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,335,993

August 15, 1967

Eugene F. Tuttle

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 32, "frame brace" should read -- stud brace --.
Column 4, line 11, "stud" should read -- stud brace --.

Signed and sealed this 5th day of August 1969.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents