March 20, 1928. 1,663,487

E. F. SMITH ET AL

BRACE STRUT

Filed Oct. 22, 1926

Fig. 1.

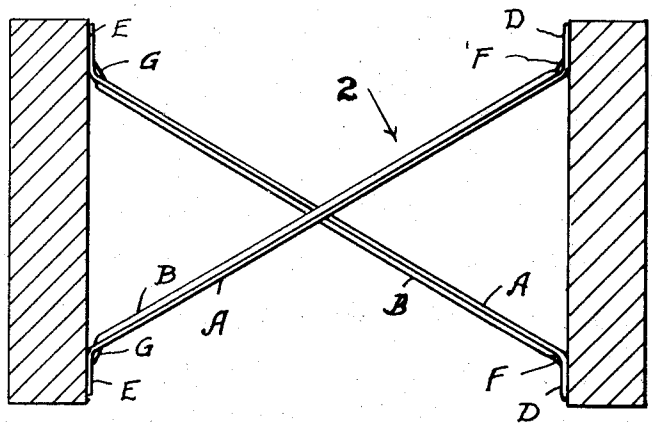


Fig. 5.

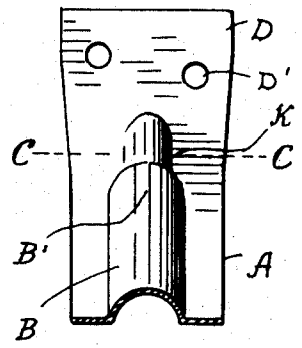


Fig. 3.

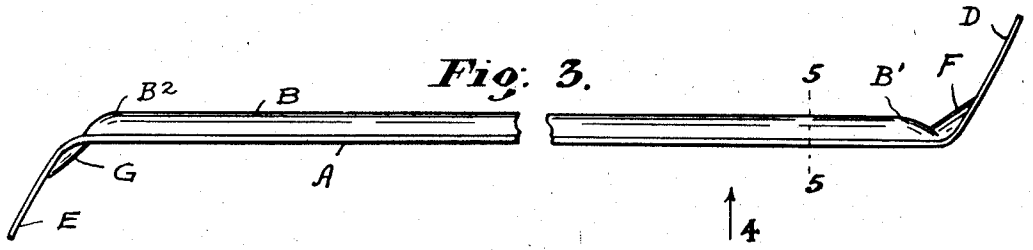


Fig. 2.

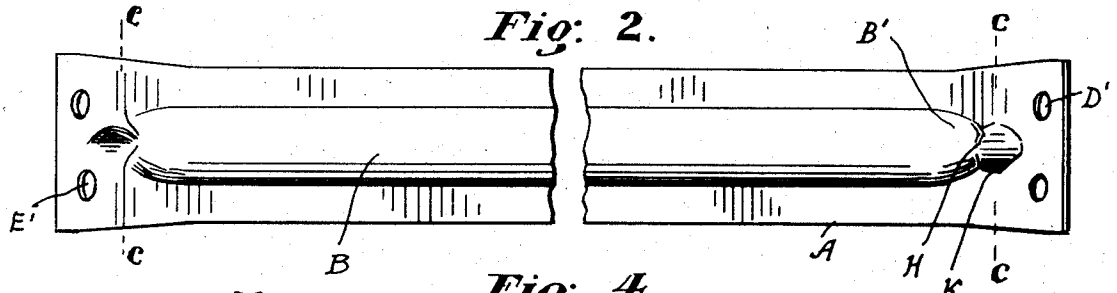
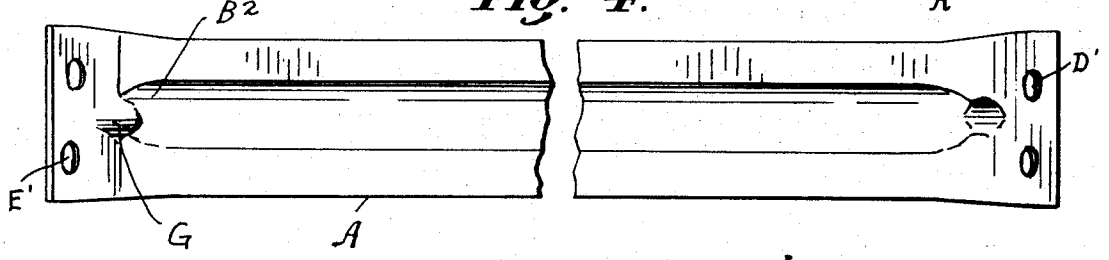


Fig. 4.



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UNITED STATES PATENT OFFICE.

EARL F. SMITH AND GUY KENNETH WILSON, OF MUNCIE, INDIANA, ASSIGNORS TO MID-WEST METAL PRODUCTS COMPANY, OF MUNCIE, INDIANA, A CORPORATION.

BRACE STRUT.

Application filed October 22, 1926. Serial No. 143,350.

This invention relates to improvements in brace or stay devices of that type used for the bracing or staying of joists or of similar girder or support elements common in architectural construction; such a brace device consisting essentially of a sheet metal bar of suitable length and having its ends bent at angles to register with the sides of the joists.

Advantages desired in a device of this kind, are that it should be strong and durable, capable of economical production and handling in quantity, relatively light in weight, easy to place in position, and which said device when secured at operative position should be capable of retaining its tight and secure position, thereby serving as a firm and dependable bracing or "bridging" for the entire structure between whose joists or structural support members it may be installed.

The above advantages are accomplished by our present invention which is shown in the preferred form of embodiment illustrated in the accompanying drawings, and described in the following specification. The invention is defined in the appended claims.

Figure 1 shows two of our improved brace struts at installed position in use as "bridging" between joists of the usual kind.

Figure 2 is an enlarged plan view, taken in the direction of arrow 2 in Figure 1, the central portion of the strut being broken away.

Figure 3 is a side view of Figure 2, and Figure 4 is an enlarged plan view taken in the direction of the arrow 4 in Figure 3.

Figure 5 is a cross section view taken on line 5—5 in direction of arrow 5 in Figure 3.

Our improved brace strut is made of sheet steel about one twentieth of an inch thick and may be formed by stamping, and consists of a bar shaped body A, in which is impressed a central longitudinal rib B about one half inch wide, and about one quarter of an inch in depth, the bar thus formed being about one and one eighth inches in width. This rib B, at its ends is tapered to decreased width and depth as it flows to the locations designated as the bending lines C and C. The end portions D and E of the bar are of width slightly greater than the width of the body of the bar, and are flattened, and are bent at angles to the axis of the bar, in directions opposite to each other, as plainly shown in Figure 3.

Coincidently with the above named bending operation there are formed neck ribs F and G. These neck ribs are of width and depth substantially less than the width and depth of the main rib B at its ends, the neck rib F flowing from the convex face of head B′ of the main rib, to the rear face of the end portion D; and the neck rib G flowing from the concave face of the head B^2 of the main rib, to the rear face of the end portion E of the brace strut.

By the foregoing peculiar construction, there is constituted a rigid stiffening at a right angle across the bending line C—C, and at the same time there is the stiffening longitudinally and transversely of the end portions D and E. Holes D′ and E′ are provided in these end portions, and through which screws or nails may be passed into the object to which the brace strut is secured. The said neck ribs, while imparting rugged stiffness to the bent portions of the strut, and to the end portions thereof, occupy relatively small space, so that with the end portions of relatively short dimensions, there is ample area for the holes D′ and E′, to be arranged in the staggered order as shown. Besides the stiffening across the said bending lines, and across the end portions of the strut, there is also a stiffening of the bar body structure immediately adjacent to the said bending lines, by the peculiar merging of the neck ribs, and the ends B′ and B^2 of the main rib, constituting ridges H and K.

By reason of the peculiar stiffening functions of the several parts just described, our improved brace strut, though relatively light in weight, is of the desired strength, and is possessed of a stiffness at its end portions peculiarly suitable and essential to a structural device of the kind described, intended as a bracing or staying member. The end portions D and E, as plainly shown in Figure 3 are slightly curvilinear longitudinally, thus facilitating the contacting of the body portions of the ends D and E with the surfaces of the joists.

The brace struts shown in Figure 1 are about twelve inches in length, and illustrate the bracing between joists eight inches in depth, and spaced twelve inches center to center. It is contemplated that our improved brace strut is to be made in various lengths, widths and weights, to accommodate requirements incident to the use of

joists of various dimensions, and spaced at various distances apart.

Our improved brace strut, while having all of the advantages hereinbefore described, is capable of being manufactured on a production basis extremely economically, and also is capable of being economically handled in transportation and shipment.

To install same it is placed at position between the joists, and one end is secured by nails driven through the end portion and into the joist, thereby drawing the said end portion to secure engagement with said joist. The other end is then similarly secured to the opposite joist. The brace strut being of sufficient and proper stiffness in the neck portions and across the end portions, it will when secured to place as above described, withstand all tendency to yield when the securing means effect the drawing up of the end portions to the joists, so that when secured as aforesaid, it acts as a compressive, and immovable, stay between the joists. The tendency of the neck rib connection to resist constantly, such strain as is imposed thereon, incident to securing the ends D and E to the joists, has the effect to obviate any possibility of the brace strut ever becoming loose or inefficient.

We are aware that minor changes may be made in the relative dimensions and forms of the several features of our invention, within the scope of same as defined by the appended claims, without departing from the principle of the invention or sacrificing any of its advantages.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A brace strut of the kind described, consisting of a sheet metal bar having its ends bent in opposed directions from the axis of the bar, there being a rib across the line of the bend of each of said ends.

2. A brace strut of the kind described, consisting of a sheet metal bar having a central longitudinal rib and its ends being bent in directions opposite to each other and at similar angles to the axis of the bar, there being a neck rib across the line of the bend of each of said ends, said neck ribs being merged into the end portions of the rib of the bar.

3. A brace strut of the kind described, consisting of a sheet metal bar having a central longitudinal rib impressed therein, the ends of said bar being flattened and bent in directions opposite to each other and at angles to the axis of said bar, there being a neck rib flowing from the convex face of one end of the main rib, to the front face of one of the end portions of the bar, and there being a neck rib flowing from the concave face of the other end of the main rib, to the rear face of the other end portion of the bar.

4. A brace strut of the kind described, consisting of a sheet metal bar having a longitudinal rib impressed therein, the heads of said rib being of width less than the width of the body portion of the rib, the ends of said bar being slightly curvilinear and bent in directions opposed to each other and at similar angles to the axis of the bar, there being a neck rib flowing from each head of said main rib and into the body portion of the end of the bar.

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