May 9, 1933. S. G. BOLIN 1,907,720

FURNITURE BRACE

Filed July 24, 1929

Fig. 1.

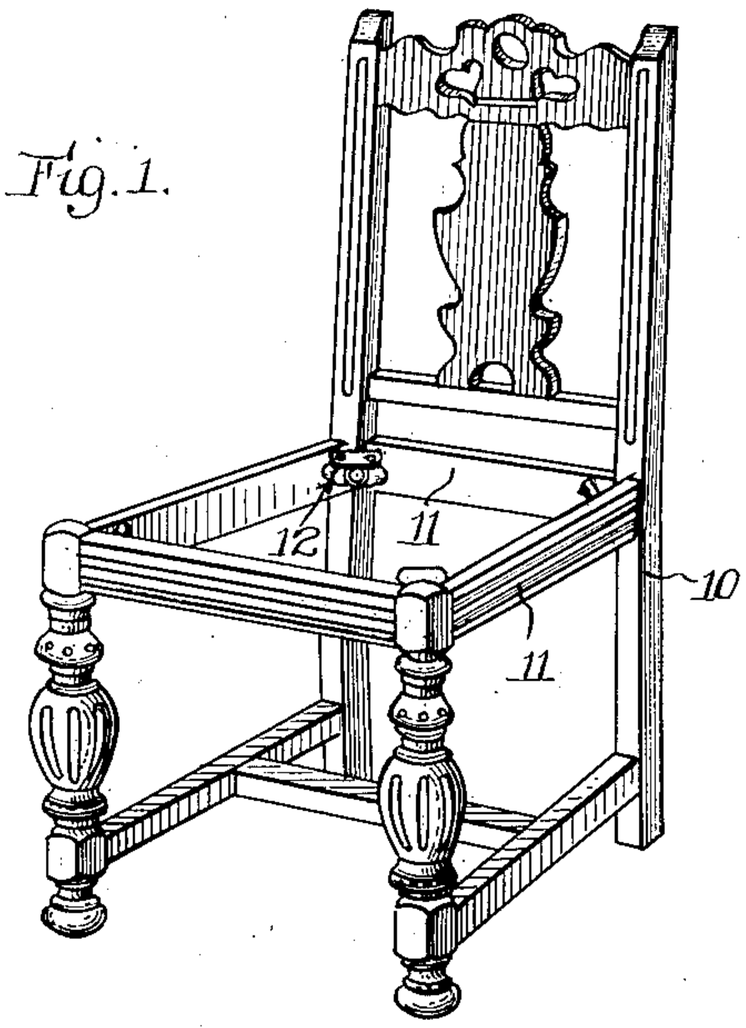

Fig. 2.

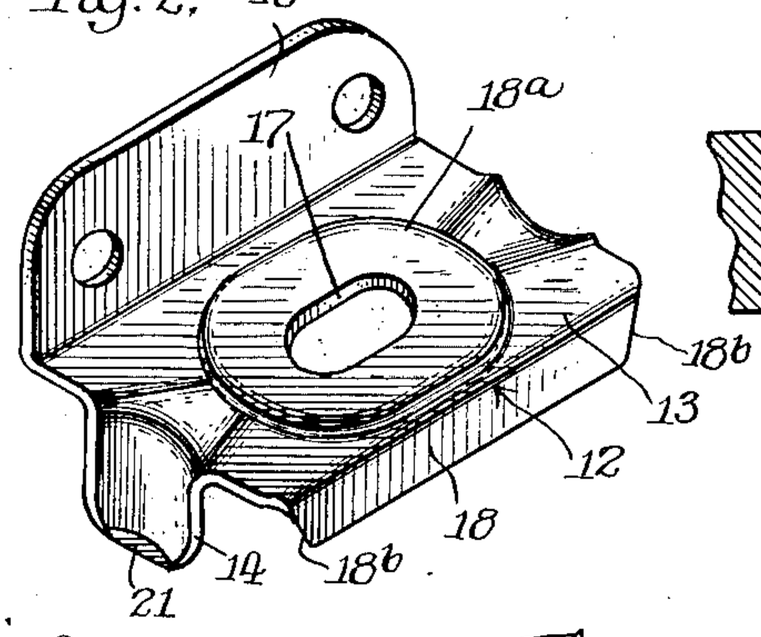

Fig. 3.

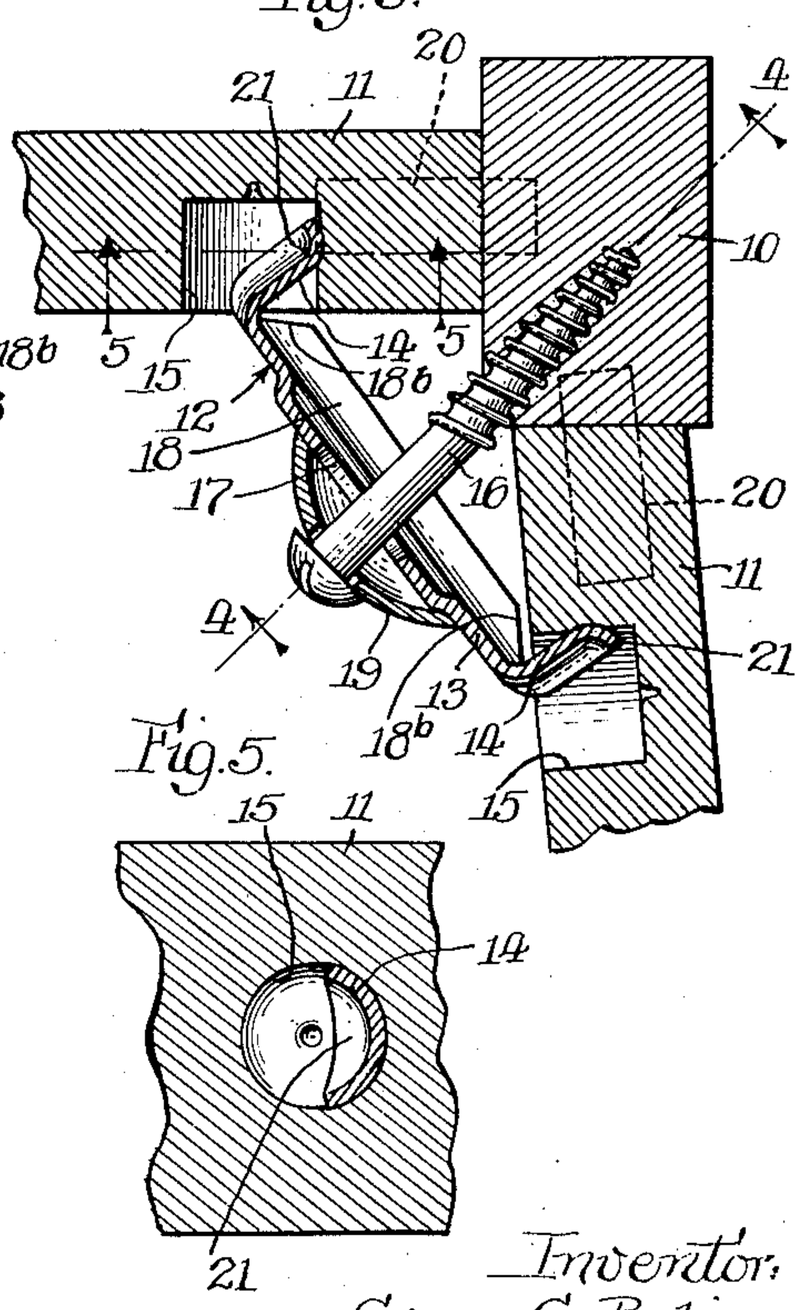

Fig. 4.

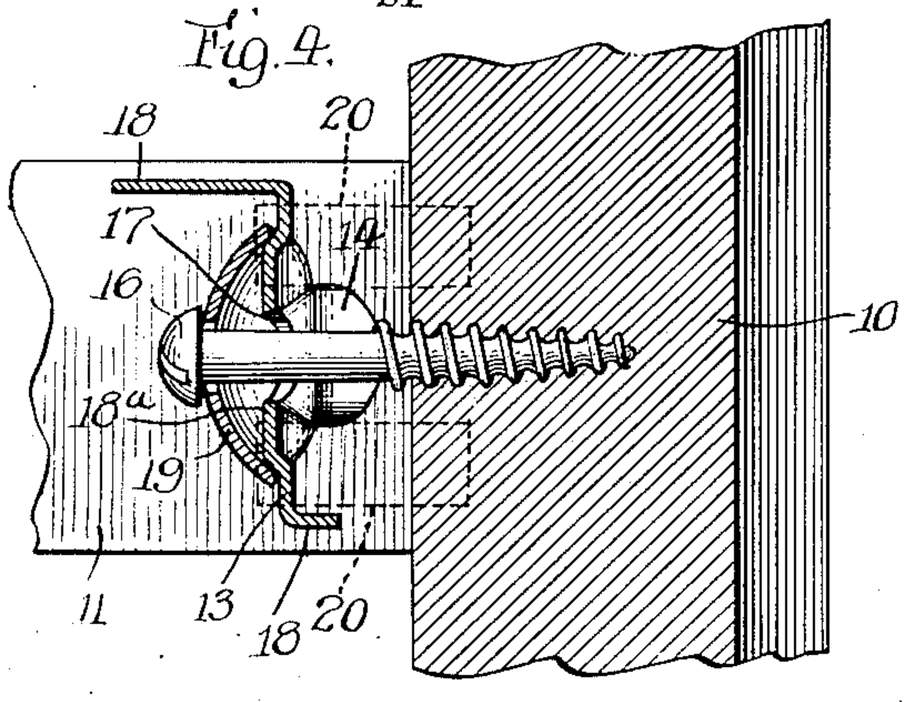

Fig. 5.

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Patented May 9, 1933 1,907,720

UNITED STATES PATENT OFFICE

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FURNITURE BRACE

Application filed July 24, 1929. Serial No. 380,675.

The invention relates generally to braces for clamping the rails of chairs or similar articles to the legs thereof or the sides of cabinets to the corner posts and more particularly it relates to such braces which are formed from sheet metal.

In many of the articles of furniture in which this type of brace is used, the rails or side walls may be disposed either at an acute or an obtuse angle to each other. With the furniture braces heretofore used this has necessitated the use of specially formed braces or the formation of specially positioned recesses in the side members to be engaged by the brace. It has also necessitated the use of several different forms of brace in the same article of furniture in case the side members at the different corners were disposed at different angles to each other.

The primary object of the present invention is to provide a new and improved brace of this character arranged so that the same form and size of brace may be used to clamp the adjacent side members to the corner post when the members are disposed at varying angles to each other within the range of variation encountered in ordinary furniture construction.

Another object is to provide such a universally adaptable clamp arranged to apply endwise clamping pressure to the side members which abut the adjacent sides of a corner post substantially midway between the inner and outer faces of the members when the angle between the two members is either greater or less than ninety degrees.

Another object is to provide a brace of this character having applying means arranged to exert a minimum bending effort upon the diagonally positioned body of the brace.

Another object is to provide such a brace arranged so that slight variations in the angle of the clamping screw will not materially affect the efficiency of the brace.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing in which:

Figure 1 shows a perspective view of a chair wherein the rails and legs are secured in assembled relation by means of braces embodying the preferred form of the invention.

Fig. 2 is a perspective view of the brace.

Fig. 3 is a horizontal sectional view taken through the right hand rear leg of the chair and the side rails clamped thereto.

Fig. 4 is a vertical sectional view taken along the line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 3.

For purposes of disclosure the invention is illustrated in the drawing and will hereinafter be described in detail as applied to a chair but it is to be understood that this disclosure is not intended as a limitation of the invention to this particular article of furniture, it being contemplated that those skilled in the art may adapt the brace to other types of furniture without departing from the spirit and scope of the invention as defined by the appended claims.

In the drawing, the preferred form of the invention is illustrated as applied to a chair having legs or corner posts 10 with side members in the form of rails 11 extending between the legs, the ends of the adjacent rails abutting the adjacent sides of the legs 11. As is customary in chairs of this type the two forward legs 10 are spaced at a greater distance from each other than the two rear legs so that the two rails 11 at the sides of the chair are disposed at an angle of more than ninety degrees with relation to the rear rail 11, this relation being clearly shown in Fig. 3. Since the front and rear rails 11 are parallel to each other it will be apparent that the angle between the front rail 11 and the two rails at the sides of the chair will be less than ninety degrees.

In pursuance of the objects above stated, the invention contemplates the provision of a metallic brace arranged so that the same form and size of brace may be used to clamp the rails 11 to the legs at both the front and rear corners of the chair. To this end a metallic brace 12 is provided which for the sake of economy is formed from sheet metal to provide a body portion 13 adapted to extend diagonally between two adjacent rails 11 and across the inner corner of the leg 10.

At the ends of the body portion 13 a pair of lugs 14 are formed extending in the same direction from the opposite ends of the body portion and adapted to project into suitable bores 15 formed in the rails 11 and opening from the inner sides of the rails. The body portion of the brace is drawn toward the leg 10 so as to apply endwise clamping pressure to the rails by means of a screw 16 extending through a centrally positioned aperture 17 formed in the body portion 13 of the brace, the threaded end of the screw engaging the leg 10 so as to position the screw substantially along the bisector of the angle between the two rails 11.

In order that the body portion 13 may act as a beam to transmit the clamping force applied by the screw 16 to the lugs 14 the body portion is stiffened against bending by means of flanges 18 at its two side edges and a raised portion 18^a extending longitudinally of the brace. As shown in Figs. 2 and 3, the corners of the lower flange 18 are cut off at an angle as at 18^b so as to be out of contact with the rails 11. As an additional safeguard against bending of the body portion 13 a convex washer 19 is interposed between the head of the screw 16 and the body portion 13 so that the clamping force exerted by the screw is applied to the body portion 13 adjacent the ends thereof.

In applying the brace to an article of furniture the operation is performed quite rapidly and to allow the workman to further reduce the time required the aperture 17 is elongated longitudinally of the body portion 13 and is made of considerably greater width than the screw 16, as shown in Figs. 2 and 3. Thus less care is required in positioning the screw 16 and if it happens that the screw is started at the wrong angle the washer 19 may slide along the body portion 13 and a uniform clamping action may be obtained without restarting the screw. This is highly desirable since it will be apparent that such a second starting of the screw 16 would weaken the leg 10 and the engagement of the screw therewith.

In manufacturing articles of furniture of the type hereindisclosed, it is desirable to reduce to a minimum the amount of manually performed work and to this end suitable dowel pins 20 are positioned at the joints between the rails 11 and the chair legs 10 so that the parts of the chair may be assembled and held in position for the application of the braces 12 without the use of forms for positioning and supporting the various members. It will be seen that the holes for the dowel pins may be quickly formed by machinery so that the cost of the various members will not be materially increased through their use. It should be noted, however, that due to the great clamping force which may be exerted by the brace herein disclosed the dowel pins 20 extend only a short distance into the chair legs 10 so that the legs are not weakened to the same extent as in prior art furniture construction wherein the dowel pins were relied upon, at least in part, to hold the rails 11 against endwise displacement. Since the clamping action is obtained gradually by movement of the screw 16, a great clamping force may be obtained without the exertion of unusual effort upon the part of the operator.

It will be seen that the form of brace herein shown is particularly adapted for application by means of a power driven screw driver since the screw need not be started with the accuracy heretofore required and hence the brace will serve to materially reduce the time required to assemble a particular article of furniture.

Thus the rails 11 may be placed in substantial abutment with the adjacent sides of the leg 10 and the dowel pins 20 will maintain the various parts in this relation while the workman positions the clamp 12 and starts the screw 16 into the leg 10. In case the rails have not been pressed tightly against the leg 11 the tightening of the screw 16 will cause endwise movement of the rails 11 during which movement the rails will be guided to their proper position by the dowel pins 20.

As hereinbefore mentioned, the brace is intended for use on joints having varying angles between the two side members thereof and the two lugs 14 are therefore formed so as to extend from the body portion 13 substantially at right angles thereto so that they may extend into the bores 15 at various angles to the axes of the bores. The lugs 14 are rendered substantially rigid by making them of arcuate cross section as shown in Figs. 2 and 5, with their side edges substantially parallel to each other and the arcs being centered at points which lie beyond the ends of the body portion 13. As shown in Fig. 5 the lugs 14 comprise, in cross section, slightly less than one hundred eighty degrees of arc and the largest radius of the arcuate cross section is equal substantially to the radius of the bores 15. Thus when the lugs are positioned in the recesses 15 the ends of the lugs will engage the walls of the recess over a substantial area and yet the lugs may be positioned at an angle to the axis of the bores since the width of each lug is less than the diameter of the bores 15.

When the brace is applied and before the final clamping force is exerted there may be a slight endwise movement of the rails 11 which will result in a slight movement of the lugs 14 inwardly of the bores 15 and to insure that the ends of the lugs will slide along the bore, the ends of the lugs are rounded as shown in Fig. 3 so as to form a web 21 across the end of the arcuate lugs. Thus while the pressure of the lugs 14 on the side of the bore

is still comparatively small, the parts are moved substantially to their final positions, whereupon the continued turning of the screw 16 causes a slight embedment of the ends of the lugs 21 into the rails 11.

It will be seen by a comparison of the positions of the two lugs 14 in Fig. 3 that the lugs may extend into the bores 15 at various angles relatively to the axes of the bores so that the same brace may be used whether the angle between the two side members is ninety degrees or is greater or less than ninety degrees.

From the foregoing it will be apparent that the invention provides an unusually economical sheet metal brace which may be rapidly and economically applied to clamp side members which meet the corner post at various different angles. It will also be apparent that the provision of an enlarged aperture in the body portion of the brace enables the workman to apply the brace more rapidly than has heretofore been possible without affecting the efficiency of the brace. It will also be seen that the use of a convex washer between the screw head and the brace materially reduces the bending effect of the screw upon the body portion of the brace.

I claim as my invention:—

1. A furniture brace for clamping in assembled relation a corner post and a pair of side members abutting the adjacent sides of the post, said members having bores therein adjacent to said post and opening on the inner sides of said members, said brace being formed from sheet metal and comprising a rigid body portion extending between said bores across the inner corner of said post, an anchor engaging said post and occupying a position substantially bisecting the angle between said side members, said anchor engaging the body portion of the brace to clamp and hold the same in position, and a rigid lug on each end of said body portion extending into the bore in the adjacent side member at an angle to the axis of the bore, the end of each of said lugs being formed to engage and slide along the walls of the bores without penetrating said walls as the anchor is tightened, and the side edges of the lug being formed so as to extend into the bores out of contact with the outermost portion of the walls thereof.

2. A furniture brace formed from sheet metal and comprising a centrally apertured substantially rigid body portion having lugs projecting in the same direction from its ends and substantially perpendicular to said body portion, said lugs being of arcuate cross section centered beyond the ends of the body portion and comprising slightly less than one half of a circle, said lugs also having substantially parallel side edges and the ends thereof being rounded to form a web extending across the arcuate ends of the lugs.

3. A furniture brace for securing in assembled relation a corner post and a pair of side members abutting the adjacent sides of said post, said members having recesses formed in their inner sides adjacent the ends of the members, said brace having a substantially rigid body portion extending between said recesses, means on the ends of said body portion adapted to extend into said recesses and to apply endwise pressure to said members toward said post, said body portion having an enlarged aperture midway between the two ends thereof, a screw extending through said aperture and engaging said post and a convex washer interposed between the head of said screw and said body portion, the side edges of said washer serving to transmit the clamping force from said screw to the body portion of said brace.

In testimony whereof, I have hereunto affixed my signature.

SVEN G. BOLIN.