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SHEET METAL TUBING

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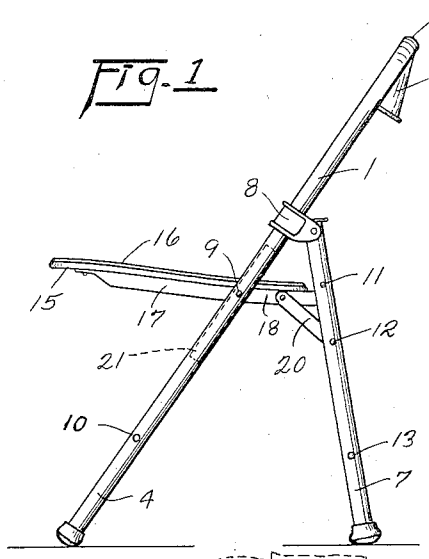


Fig. 1

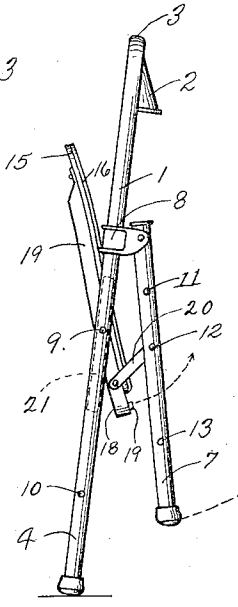


Fig. 2

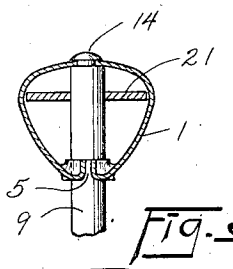


Fig. 3

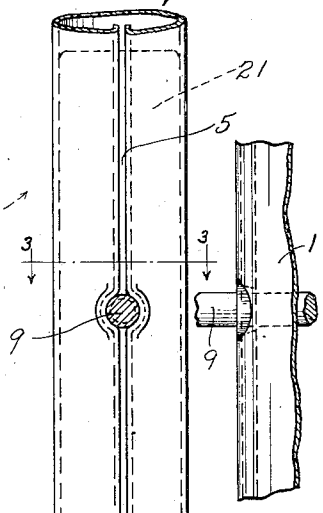


Fig. 4

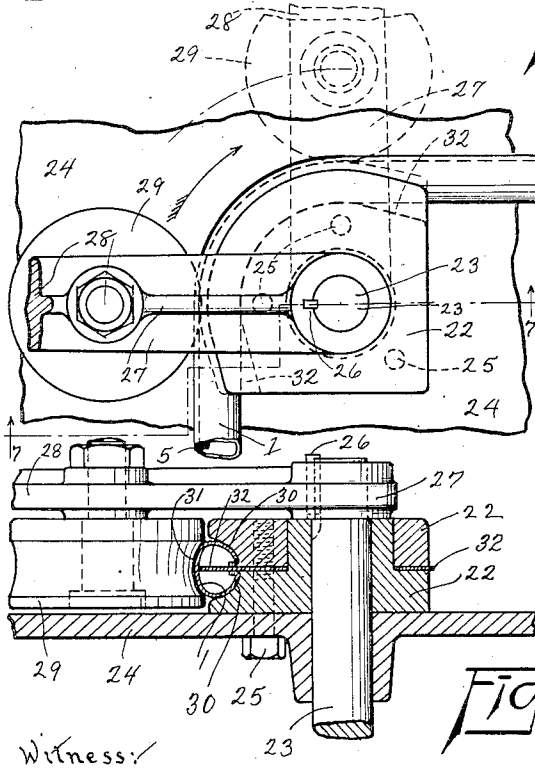


Fig. 6

Fig. 7

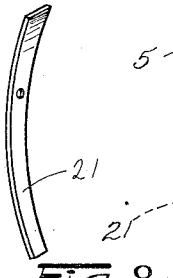


Fig. 8

Fig. 5

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SHEET METAL TUBING

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4 Claims. (Cl. 29—180)

The present invention relates to reinforced sheet metal tubing and to the method of bending sheet metal tubing without collapsing its tubular form.

The main objects of the invention are to provide a novel type of reinforced sheet metal tubing and to the method of making same.

An illustrative embodiment of the invention is shown in the accompanying drawing wherein—

Figure 1 is a view of a folding chair formed from sheet metal tubing employing the inventions hereinafter more particularly described;

Figure 2 is a view of the chair in its partly folded position;

Figure 3 is an enlarged sectional view of the reinforced sheet metal tubing on line 3—3 of Figure 5;

Figure 4 is a fragmentary view of the sheet metal tubing with a reinforcing rod or strut piercing the seam of the tubing;

Figure 5 is an elevational view of a section of the sheet metal tubing showing a rod or strut piercing the seam of the tubing;

Figure 6 is a fragmentary plan view of a machine for bending the sheet metal tubing without collapsing its tubular form;

Figure 7 is a sectional view thereof on line 7—7 of Figure 6;

Figure 8 is a perspective view of a springable strip reinforcing plate adapted to be inserted within the tubular member.

Referring to the drawing in which like parts are designated by the same numerals in the several views, a folding chair formed in part from sheet metal tubing employing the inventions herein illustrated, described and claimed, generally comprises a U-shaped tubular sheet metal frame 1 forming a support for a back 2, preferably of sheet metal, positioned below the horizontally disposed medial portion 3 of the frame and suitably secured thereto and to the opposite vertically disposed portions thereof which form spaced front legs 4. The tubular frame member is triangularly formed in cross section from sheet metal stock with its longitudinal edges bent and flanged inwardly to form a finished and reinforcing seam 5 as best shown in Figure 5.

A pair of tubular metal, spaced rear legs 7, formed in the same manner as is the frame member formed, are each pivotally connected to a yoke or saddle 8 which embraces and is secured to each side of the frame member as shown in Figures 1 and 2.

The lower ends of frame member which form the front legs 4 of the chair and the rear legs 7 thereof are provided with horizontally disposed reinforcing or strengthening rods 9, 10, 11, 12 and 13 whose outer ends pierce the seams of said legs on their inner sides, as best seen in Figure 5, and extend through to the outsides of the legs where their respective ends are riveted to form heads 14.

A seat 15 having a cushion 16 is mounted upon supporting members 17 which are pivotally secured to the rod 9 interjacent the front legs of the chair and rearwardly extending integrally formed arms 18 of the members 17 project under the rod 11, when the chair is in its unfolded position as shown in Figure 2 for maintaining the seat in a substantially horizontal plane when occupied.

Caps or stops 19, preferably of rubber, rawhide or some other sound deadening material, are secured at the ends of said arms on their respective upper sides in any suitable manner and bear against the under side of the rod 11 for preventing noisy operation of the chair when it is unfolded for use.

A pair of links 20 pivotally secured on opposite sides of the seat supporting members and to the rod 12 are provided whereby the chair may be unfolded to open position as shown in Figure 1, or folded to closed position as indicated in Figure 2.

The sheet metal tubing thus formed as above described may be reinforced at any point by a strip reinforcing plate 21 which is inserted within the tube from either end thereof, preferably substantially transversely of the reinforcing seam wherein it is tensionally embraced within the tube as best shown in Figure 3. This strip reinforcing plate 21 is preferably, though not necessarily, initially formed in arcuate shape as shown in Figure 8 and when inserted within the sheet metal tubing is caused to be sprung to prevent its rattling. The rod or strut as shown in Figure 3 not only pierces the seam 5 of the tube but likewise pierces the strip reinforcing plate 21 and extends through the other side of the tube to form the rivet head 14 as heretofore described.

A machine for bending the sheet metal tubing without collapsing the tubular form thereof is shown in Figures 6 and 7 whereby the medial portion 3 of the chair or any bent tubular portion of other structures may be formed. The machine generally comprises a stationary member 22 encircling a shaft 23 and rigidly mounted upon a flat plate 24 in any suitable manner as by the machine screws 25.

Keyed to the shaft 23 as by the spline 26 is a laterally projecting swingable member 27 whose outer end 28 forms a manually operable lever and a wheel 29 whose periphery is adjacent one face of the stationary member 22 forms with the adjacent face of the stationary member complementary surfaces 30, 31 conforming to the shape of the tube. An arcuate web 32 here shown as projecting laterally from the stationary member and longitudinally centrally of the tube conforming surface thereof is adapted to be slid into the seam 5 of the tubular member and into contact with the opposite inner surface thereof as best shown in Figure 7. By revolving the swinging member 27 and its rotating wheel 29 from the position shown in full lines in Figure 6 to the position shown in dotted lines of the same figure, the tubular member is thus bent into the form shown without collapsing its tubular form.

It will thus be seen that a novel type of reinforced sheet metal tubing and method of forming it together with a machine for and method of bending tubular stock has been herein shown and described, and while but one specific embodiment of the reinforced tubing and method of forming it has been herein shown and described and while but one embodiment of a machine and method of bending tubular stock has been herein shown and described, it will be understood that numerous details thereof may be altered or omitted and that the tubular stock may be used in connection with tubular structures other than folding chairs without departing from the spirit of these inventions as the same are defined in the following claims.

We claim:

1. In a stock of the character described, flat strip sheet metal formed into a tubular member with the longitudinal edges of the flat strip having inwardly turned flanges to form a finished reinforced construction the tubular member being open between the flanges, a strip reinforcing plate inserted within the tube substantially transversely of the opening between the flanges, and tensionally embraced within said tube, and a laterally disposed rod engaging said longitudinal edges and the reinforcing plate.

2. In a stock of the character described, flat strip sheet metal formed into a tubular member with the longitudinal edges of the flat strip having inwardly turned flanges to form a finished reinforced construction the tubular member being open between the flanges, a strip reinforcing plate inserted within the tube substantially transversely of the opening between the flanges and tensionally embraced therein, and a laterally disposed rod engaging said longitudinal edges and extending through the reinforcing plate and extending through to the opposite side of the tube to provide a rivet head.

3. In a stock of the character described, flat sheet metal formed into a tubular member open between the adjacent longitudinal edges of said tubular sheet member, a reinforcing plate in said member transaxial thereof and tightly embraced thereby, and a laterally disposed rod extending tightly between said longitudinal edges and tightly through said reinforcing plate and the tubular member's side opposite the opening between said edges.

4. In a stock of the character described, flat sheet metal formed into a tubular member with the adjacent longitudinal edges of the tubular sheet member having inwardly turned flanges to form a finished reinforced construction the tubular member being open between the flanges and said flanges having at one point in their length mutually registering oppositely concave portions, a reinforcing plate in said member transaxial thereof and tightly embraced thereby, and a laterally disposed rod extending tightly between said concave portions of the flanges and tightly through the reinforcing plate and the tubular member's side opposite the opening between the flanges.

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