

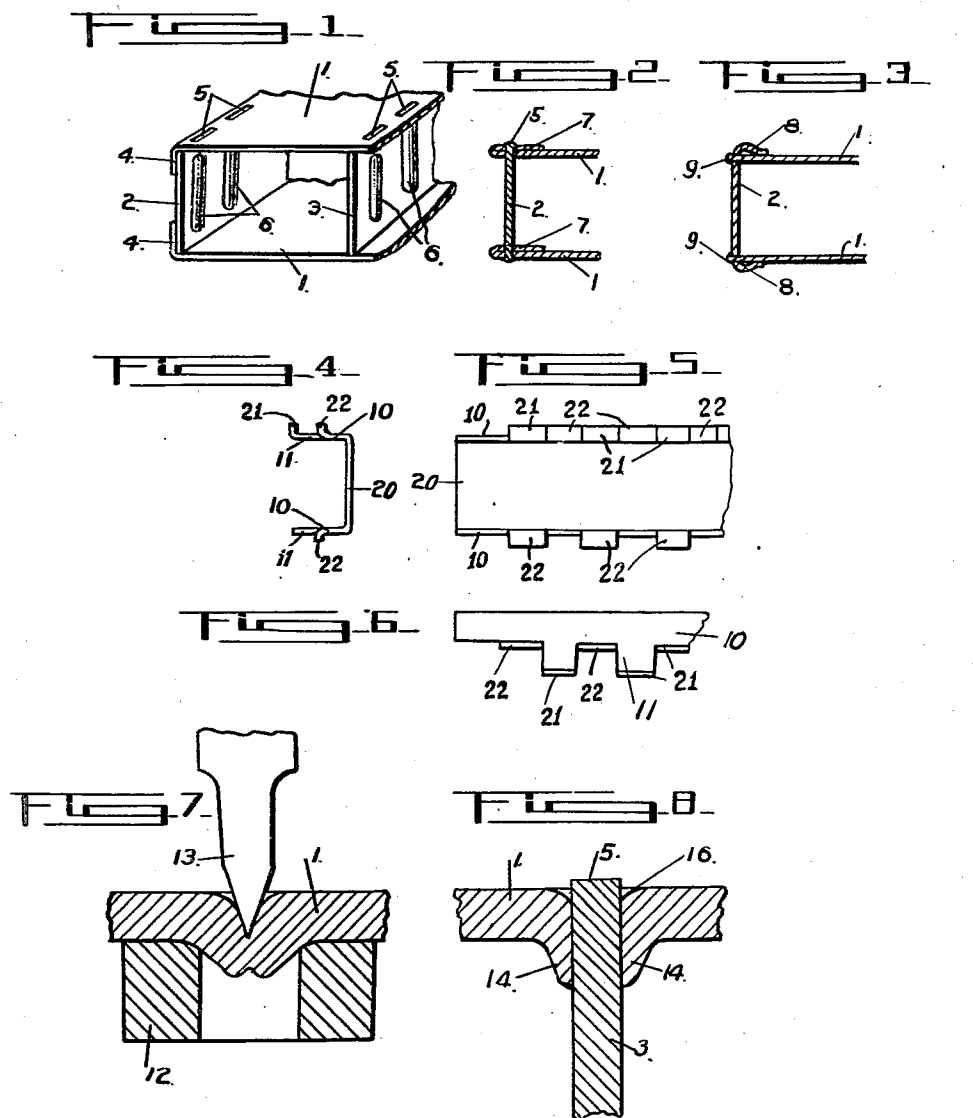
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METHOD FOR SHEET METAL CONSTRUCTION

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METHOD FOR SHEET METAL
CONSTRUCTIONEmil Becker, Munich, Germany, and John Edward
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2 Claims. (Cl. 29—148.2)

This invention relates to a method of uniting the walls of a sheet metal structure, especially hollow metal structures, which has advantages that have not heretofore been obtainable.

Hollow sheet metal structures such as doors, wall slabs, and the like are usually fabricated by means of welding or riveting. However, welding cannot be employed in structures of very thin metal on account of heat warpage, and riveting is difficult on account of the necessity for interior tools.

The present invention consists in providing one of the walls, preferably the perpendicular wall, with a plurality of lugs which fit into slots formed in the horizontal wall and then bonding the two walls together by hammering the exterior surface of the lugs to form a head. The exterior surface of the slots may be countersunk so that the heads will be flush with the exterior surface of the structure. The walls may be made resistant to buckling by swaging, or by any of the other well known manners so that the lugs can be riveted in the slots without the necessity of interior tools. Another feature of this invention is that the slots are punched out so that a burr is formed from the material removed in the forming of the slots to provide a sleeve which will embrace the wall carrying the lugs and thus provide a rigid connection between the two walls.

For an understanding of the invention and the method in which it is carried out, reference is to be had to the following description and the accompanying drawing, in which:

Figure 1 is a fragmentary view of a sheet metal structure constructed in accordance with this invention.

Figure 2 is a fragmentary cross-sectional view showing a modification of the structure in Figure 1.

Figure 3 is a modification of the structures shown in Figures 1 and 2.

Figures 4, 5 and 6 show the interior stiffeners wherein more than one row of lugs is provided.

Figure 7 shows the method of producing the slots, and

Figure 8 is a fragmentary enlarged view in cross-section showing the lug positioned in the slot before being riveted.

Like characters of reference refer to like parts throughout the specification and drawing.

The sheet metal structure illustrated in the drawing consists of horizontal walls 1, vertical marginal walls 2, and inner stiffeners 3. In order to provide additional rigidity to the walls 2 and stiffeners 3, ribs 6 are formed in these walls by

any of the well known methods, such as by swaging. The first step is to cut slots 16 in the walls 1 which is preferably done by a pointed tool similar to that shown in Figure 7 and indicated by the numeral 13. This shape of tool cuts the slot so that it is countersunk at the outside face of the wall 1 and a burr 14 is produced at the opposite side. The edge of the sheet 1 is bent over as indicated at 4. The slots 16 are formed in rows in the sheets 1, these rows being located where the walls 2 and stiffeners 3 will be located.

The walls 2 and stiffeners 3 are formed with a plurality of lugs 5 corresponding in number to slots 16. The length of each lug 5 is slightly more than the thickness of the sheet 1.

As illustrated in Figure 8, the lugs are inserted in the slots and are riveted down with a riveting tool of chisel-like shape arranged at right angles to the extension of the lugs. The burrs 14 tightly embrace the wall 2 and stiffeners 3 adjacent the lugs.

According to Figure 2, which is an alternative construction to that shown in Figure 1, the sheets 1 are folded over at the edges as indicated at 7 and the slot 16 is formed through both thicknesses of material. The lugs go through both thicknesses of metal which results in a particularly strong joint.

In the structure shown in Figure 3 the lugs are formed on the sheets 1 and the walls 2 are provided with the slots. The ends of the walls 2 are bent over on to the walls 1 to form beads 8 resulting in a reinforced edge around the edge of the structure.

Figures 4 to 6 illustrate a method of carrying out our invention wherein we form an end wall or inner stiffener 20 with bent-over portions 10 which are substantially at right-angles to the end wall or stiffener and are adapted to underlie the inner faces of the side walls which are attached thereto. The edges of the turned-over portions 10 are cut in castellated form and the outer ends of the protrusions 11 are up-turned to form the lugs 21. The recessed portions of the castellated edges are slitted back slightly so that another row of lugs 22 can be up-turned. In this way the lugs 21 and 22 alternate and are staggered in relation to each other, as illustrated. It is to be noted in Figures 4 and 5 that the lower bent-over portion 10 is only formed with a single row of lugs 22 and that the outer ends of the protrusions 11 are not turned to form lugs.

The fabricating procedure is as follows:

First: The sheet metal is swaged and the lugs

are formed. The slots may be punched out in the same operation. To insure resistance against weather and water of condensation all parts are then covered with a corrosion-resistant coating. It is an outstanding advantage of this method that this corrosion-resistant coating will not be injured by the fabrication so that the interior of hollow metal structures of complicated shape is perfectly protected against corrosion. As already stated, the slots are produced by a tool similar to that shown in Figure 7 which may be made in the form of a gang punch or in the form of rollers so that a plurality of slots may be made simultaneously. It is important to produce the burrs 14 as shown in Figure 8 and simultaneously the countersink at the upper face of the sheets. The main sheets and marginal walls and inner stiffeners are then put together and the lugs 5 riveted over, preferably until they are flush with the surface.

This method of constructing a sheet metal structure results in a structure which is very simple to fabricate and of great strength.

What we claim as our invention is:

1. A method of uniting the walls of a sheet metal structure which comprises bending the edge portion of one side wall so that it is adapted to underlie the inner face of another side wall, forming lugs upon the edge of said bent-over portion, said lugs being turned at right angles to the bent-over portion and so positioned that they

are staggered in relation to one another, punching an equal number of slots in the side wall overlying the bent-over portion, said slots being positioned to receive the lugs, and hammering the exterior projections of the lugs to widen the same and form heads whereby the lugs are riveted within the slots.

2. A method of uniting the walls of a sheet metal structure which comprises bending the edge portion of one side wall so that it is adapted to underlie the inner face of another side wall, forming lugs upon the edge of said bent-over portion, said lugs being turned at right angles to the bent-over portion and so positioned that they are staggered in relation to one another, the lugs being of substantially rectangular cross-section and of greater length than thickness, punching an equal number of slots in the side wall overlying the bent-over portion, the slots being of substantially the same size as the cross-section of the tongues, punching the slots in such a way that they are counter-sunk at the outer face of the sheet metal and formed with burrs along their longitudinal edges in the inner face of the sheet metal, inserting the lugs between the burrs and through the slots, hammering the exterior projections of the lugs to widen the same and form heads thereon whereby the lugs are riveted in the slots and tightly embraced by the burrs.

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