Sept. 12, 1950 F. H. WOLFF, JR 2,522,329

METHOD OF BONDING THREE OR MORE METAL UNITS

Filed May 9, 1945

Fig. 1.

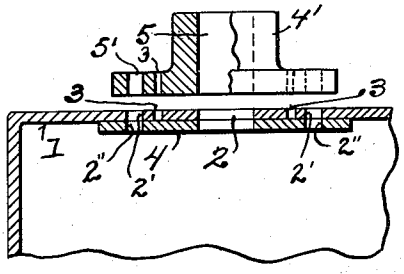


Fig. 2.

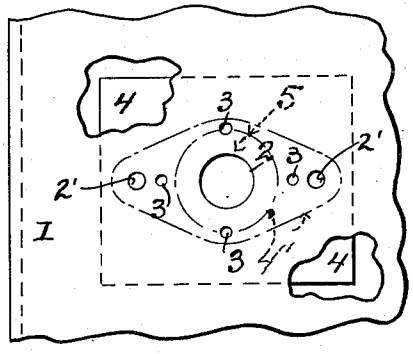
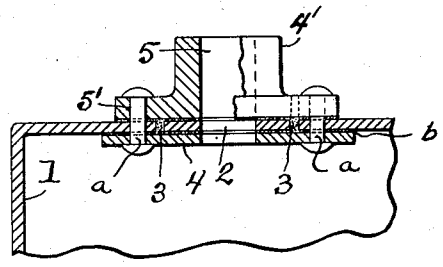


Fig. 3.



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METHOD OF BONDING THREE OR MORE METAL UNITS

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1 Claim. (Cl. 29—148.2)

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My invention refers to a type of joint construction that allows an improved method of bonding three or more metal units in a single operation, whereas under the usual practice, the method requires two separate operations. Thus, a material saving of time results by my method and the binding of the units is uniform throughout the surfaces, whereby strength of the joint is insured to produce a hermetic seal between the surfaces.

With the above and other minor objects in view, the invention consists in certain peculiarities of construction and arrangement of steps in the art of soldering, as will be hereinafter fully set forth with reference to the accompanying drawings and subsequently claimed.

In the drawings:

Figure 1 represents a sectional elevation of three metallic associated members, assembled for a bonding operation, the outer member of which is slightly spaced from the base member.

Figure 2, a plan view of the base member, provided with perforations, with parts broken away to more clearly show a patch member fitted thereunder, the base member and patch member, in this instance, being formed with a circular feed opening, and

Figure 3, a sectional elevation of a completed bonded or soldered joint between the three members.

Referring by characters to the drawings, 1 indicates a fragment of a metallic base member provided with a feed opening 2, rivet apertures 2', and a group of conducting apertures 3.

Fitted to the bottom surface of the base member is a patch member or unit 4, having rivet apertures 2'', and slightly spaced from the upper surface of the base member, is a metallic unit 4' in the form of an eared pipe coupling casting, the same being provided with a simple feed opening 5 and bolt receiving apertures 5' in the ears thereof.

The outer metallic pipe coupling casting unit 4' is fitted to the outer face of the perforated and apertured base member 1 and, as indicated in Figure 1, the patch member 4 is also placed against the inner surface of the base member. The three parts having their rivet apertures aligned are then secured by rivets *a*.

In the next step, the operator simply distributes the heated molten solder, or other bonding agent, between the juxtaposed surfaces of the casting 4' and top face of the base 1. The lower face of the metallic unit 4' is then pressed against the upper face of the base member and due to the fact that the surface upon which it is pressed is hot and coated with solder or other suitable binding material, all of the members would be sealed when the molten fluid is cooled. The heated surfaces

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will then cause the fluid bonding agent to travel throughout the engaged surfaces of the casting 4' and top surfaces of the base member, and from thence the fluid bonding substance will travel through the group of apertures 3, upon the juxtaposed surface of the patch 4 to thoroughly coat the same, as indicated at *b*, whereby the three members, when cooled, will be hermetically sealed together.

As indicated in Figure 3, the finished method shows members secured by rivets, through the aligned apertures, and the solder or other bonding agent will also seal the joints between the rivets and said apertures.

The drawing illustrates my method applied to the pipe couplings of an automobile radiator. It should be understood, however, that three or more metallic members of any character may be employed in the method described.

I have shown the flow perforations as four in number, two of the flow perforations being adjacent the rivets. Obviously these perforations may be differently postioned.

I claim:

The method of securing an inlet and outlet bracket to the panel of a tank, consisting of forming openings for rivets and bonding material in the bracket and in said panel of said tank, assembling the bracket on said panel, positioning a reinforcing plate on the opposite side of said panel, riveting the bracket and reinforcing plate to the panel through the rivet openings, applying heat to the riveted bracket, panel and reinforcing plate, applying bonding material to the flow openings and flowing the bonding material into the flow openings and then between the contact surfaces of the bracket, panel and reinforcing plate and around the rivets at the circumferential portions between said contact surfaces.

FRED H. WOLFF, JR.

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