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V. MAUCK,
PROCESS OF WELDING.
FILED JAN. 5, 1921.

FIG. I.

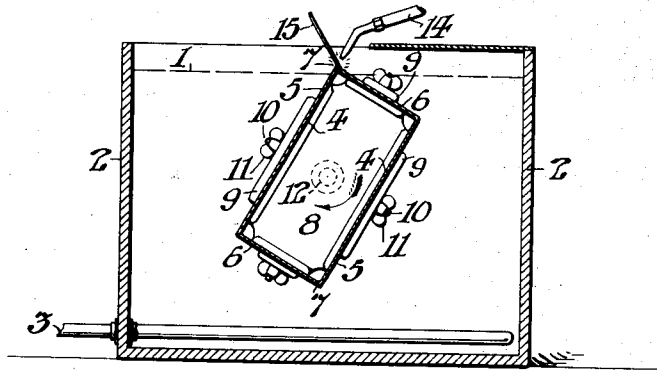
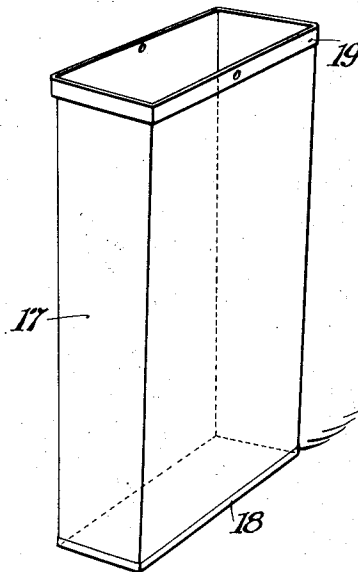


FIG. II.



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Att.

UNITED STATES PATENT OFFICE.

VICTOR MAUCK, OF NORRISTOWN, PENNSYLVANIA.

PROCESS OF WELDING.

Application filed January 5, 1921. Serial No. 435,170.

To all whom it may concern:

Be it known that I, VICTOR MAUCK, a citizen of the United States, residing at Norristown, in the county of Montgomery and State of Pennsylvania, have invented a certain new and useful Improvement in Processes of Welding, whereof the following is a specification, reference being had to the accompanying drawing.

10 It is the general object of my invention to facilitate the formation of rectangular cans of thin sheet metal by welding the edges of primarily flat sheets of such metal, for instance, mild steel, without distorting
15 the metal from its normal plane, and without subjecting it to internal strains which may ultimately cause such distortion when the can is submerged in a molten bath of spelter to galvanize it.

20 The present invention was developed in the manufacture of what are known as "ice cans," to wit, rectangular boxes of sheet metal in which water is frozen by chemical refrigerating means to produce cakes of ice.
25 To permit the discharge of the ice cakes from such cans, the walls of the latter must be substantially plane as, otherwise, they are imbedded in the ice and the latter must be melted and a considerable percentage
30 thereof wasted to free the ice cake from its can.

At first, I attempted to form such cans by ordinary welding means, such as an oxy-acetylene blast torch applied to the meeting
35 edges of the can walls while the latter were exposed to the atmosphere. However, the metal of such cans is necessarily so thin that the intense heat necessary for the welding operation is absorbed by an extensive area
40 of the can walls upon both sides of the welded seam with consequent irregular changes in the molecular structure of the metal due to the fluctuations in temperature of the torch flame incident to its movement,
45 variations in its distance from the welded joint, atmospheric currents, etc., and with the effect of not only primarily distorting said walls adjoining the welded seam, but creating irregularities in the metal which
50 develop into further distortions when the can is submerged in a molten bath to coat it with spelter or other metal adapted to resist corrosion.

Therefore, an object of my invention is
55 to localize the heat necessary for the welding operation directly at the region of the

can walls which is being welded, while maintaining the remainder of said walls at a predetermined uniform temperature. To that end, I submerge all of the can except the
60 edges which are to be welded, in a liquid, which fills the hollow of the can and the temperature of which is controlled, conveniently as hereinafter described.

My invention includes the various novel
65 features of procedure hereinafter more definitely specified.

In said drawings: Fig. I is a diagrammatic sectional view of a simple form of apparatus whereby my improved process may
70 be effected.

Fig. II is a perspective view of an ice can formed in accordance with my invention.

In Fig. I; the body of liquid 1 is conveniently contained in the tank 2, and its temperature controlled by means introduced to the tank through the pipe 3.

For instance, said liquid 1 may be water, and said pipe conduct a refrigerating
80 gas, or said liquid may be oil, and the temperature controlling medium be water or steam, or any other suitable means may be provided to predetermine and maintain the temperature of the liquid 1 employed.
85 As indicated in Fig. I, a rectangular can body may be formed by oppositely counterpart plates 4, 4, each comprising a side wall 5 and an end wall 6; the edges of adjacent walls 5 and 6 being brought into contact
90 for welding at the diagonally opposite corner joints 7. I find it convenient to support said plates 4, 4 in the assembled relation shown in Fig. I by means of opposite end spider frames 8 having clamping plates
95 9, bolts 10 and nuts 11; said spider frames 8 having respective trunnions 12 mounted in coaxial relation in said tank 2, so that the can body may be turned in the liquid 1, to alternately present said joints 7 above
10 the surface of said liquid 1, to be welded. As shown in Fig. I, said frames 8 are recessed at the corners; so that the liquid 1 is allowed to flow freely into and out of the hollows of the can bodies.

As above contemplated; I may employ for the welding operation an oxy-acetylene torch 14, of which only the nozzle is indicated in Fig. I, and may employ a fusible wire 15 to be melted by the flame of said torch as
11 the latter is shifted along said joint 7. However, it is to be understood that the

welding operation may be effected autogenously, or electrically.

Of course, as the temperature of said liquid 1, in which the can structure above described is continuously submerged, and with which it is filled during the welding operation, is predetermined and maintained during such operation, the high temperature necessary for the welding operation is limited in its application to the narrow edges of said plates 4 which are abutted just above the surface of the liquid, as indicated in Fig. 1; so that there is no distortion whatever of the submerged area of the walls 5 and 6. Moreover, upon the completion of the welding operation, the metal which has been welded may be uniformly quenched by turning said spider frames 8 to submerge that joint and simultaneously present the opposite joint 7 above the surface of said liquid 1; in the welding position shown in Fig. 1.

When both seams 7 aforesaid are welded, the can body 17 thus formed from said oppositely counterpart plates 4 may be removed from said spider frame 8, by releasing the nut 11 and axially separating said frames. Thereupon, a bottom 18 may be welded in said can body 17 and the reinforcing top 19 be welded thereon in accordance with my invention, to wit, by limiting the area of the metal exposed to the action of the welding heat, by submerging the structure in a liquid, the temperature of which is controllable and which fills the hollow of said structure.

As said can body 17 is tapered from the bottom to the top thereof, as indicated in Fig. II, it is necessary to so mount said spider frames 8 that the common axis of their rotation is correspondingly inclined with respect to the surface of the liquid 1 so as to uniformly expose the joint 7, from end to end thereof, above the surface of said liquid. However, such common axis of rotation may be parallel with the top surface of the liquid, if the sheet metal structure being formed has parallel sides.

Of course, the apparatus for effecting my process with respect to the opposite ends of said can body 17 as above contemplated, is specifically different from that illustrated in Fig. I. Moreover, it may be observed that it is unnecessary to so mount said spider frames 8 as to permit them to rotate, if the can body 17 is formed of a single plate of metal.

As it is desirable to pickle or otherwise chemically clean and prepare the metal for an ice can before galvanizing it; the liquid 1 may constitute a pickling bath, or may be an electroplating or other chemical solution. In other words; any suitable refrig-

erant may be retained within the hollow of any structure while it is being welded in accordance with my invention.

Therefore, it is to be understood that I do not desire to limit myself to the specific construction and arrangement of the apparatus herein set forth, as it is obvious that various modifications may be made therein, without departing from the essential features of my invention, as defined in the appended claims.

I claim:

1. An improvement in processes of welding a hollow rectangular structure of primarily plane sheet metal, which consists in limiting the area of such metal exposed to welding heat by secluding the other portions of said metal in a liquid, which is in contact with both the inner and outer surfaces of the metal, controlling the temperature of said liquid, and thereby preventing distortion of said metal, while subjecting the contiguous edges thereof to welding heat; then quenching the welded portions of said structure by submerging the same in said liquid.

2. An improvement in processes of welding a hollow rectangular structure of primarily plane sheet metal, which consists in limiting the area of such metal exposed to welding heat by secluding the other portions of said metal in a liquid, which extends within the hollow of said structure, and controlling the temperature of said liquid, and thereby preventing distortion of said metal, while subjecting the contiguous edges thereof to welding heat.

3. The step in a process of welding a hollow structure of sheet metal, which consists in limiting the area of such metal exposed to welding heat, by filling the hollow of said structure with water.

4. The step in a process of welding a hollow structure, which consists in limiting the area thereof exposed to welding heat, by retaining a refrigerant liquid within the hollow of said structure during the welding operation.

5. The step in a process of welding a hollow structure, which consists in limiting the area thereof exposed to welding heat, by retaining a refrigerant within the hollow of said structure during the welding operation.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this fourth day of January, 1921.

VICTOR MAUCK.

Witnesses:

ARTHUR E. PAIGE,
CAROLYN E. REUTER.