April 5, 1927. W. J. COOK 1,623,618

METHOD OF PRODUCING GALVANIZED CORRUGATED METAL PIPE

Filed May 5, 1924

Fig 1



Fig 2

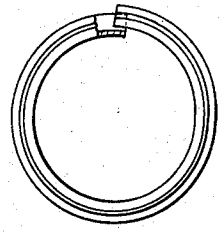


Fig 3

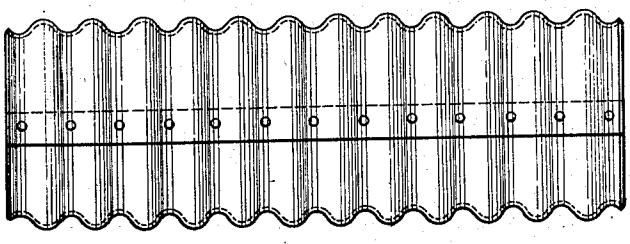
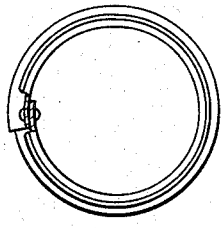


Fig 4



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UNITED STATES PATENT OFFICE.

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METHOD OF PRODUCING GALVANIZED CORRUGATED METAL PIPE.

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This invention relates to processes of manufacturing galvanized corrugated sheet metal pipe, and it has for its primary object to provide a process or method of producing galvanized corrugated steel or iron culvert pipe which shall possess greatly superior resistance to rust and corrosion over pipe made by preexisting methods, and which, consequently, shall have much longer life than that of pipe made by the methods in general use.

The method heretofore universally followed in the production of galvanized corrugated pipe has been, first, to pickle the sheet in its flat form, then to galvanize the sheet in the flat, then to corrugate the sheet, then to bend the galvanized corrugated sheet into pipe form, and, finally, to rivet the overlapping edges.

The present method differs from that heretofore followed, as above described, mainly in that the step of galvanizing follows the corrugating and the shaping of the corrugated sheet in tubular form.

In describing the invention in detail, reference is herein had to the accompanying drawings, in which—

Figure 1 is an edge view of the sheet following the preliminary steps of pickling and liming and following corrugating;

Figure 2 is an end elevation of the corrugated sheet as it appears after it has been curved into tubular form preparatory to galvanizing;

Figure 3 is a side elevation of the pipe following galvanizing and riveting; and—

Figure 4 is an end view of the same.

The invention consists in the performance of certain essential steps in the production of galvanized corrugated sheet metal pipe in the following order:

First: pickling the metal sheet in the flat;

Second: corrugating the sheet;

Third: shearing the sheet to size;

Fourth: curving the corrugated sheet into approximately tubular form;

Fifth: galvanizing the tubular sheet; and—

Sixth: closing the edges of the sheet upon each other and riveting them together.

In the curving operation, the corrugated sheet shown in Fig. 1 is bent into approximately the form shown in Fig. 2 in which the edge portions to be overlapped and riveted lie out of contact with each other, or are separated to such extent that, when the pre-curved sheet is dipped in the zinc galvanizing bath, the material of the latter may unobstructedly reach, or flow into contact with, every particle of the surfaces of said edge portions. Or, if said edge portions directly be made to come in contact with each other, they may be suitably wedged apart preliminary to introduction of the tube in the galvanizing bath. The life of galvanized corrugated pipe is very largely dependent upon the thickness and density of the coating metal carried by the pipe—that is, upon the quantity of coating borne per unit of area.

Employing galvanized steel and iron sheets carrying in excess of 1.75 ounces of coating material to each square foot of surface area, it is a physical impossibility to corrugate the sheets and bend them into tubular form in the usual culvert diameters without resultant cracking, or fracture, and peeling of the coating. And, due to this fact, pipe carrying a coating of two ounces per square foot of surface area, which is the minimum coating called for by governmental specifications for galvanized and corrugated culvert pipes, is necessarily defective, numerous cracks and peels being produced as a result of the deflection in the forming process. The coating on the inner surfaces of the bends produced in forming the pipe, being subject to compression, becomes buckled, while that on the outer surfaces of said bends develops numerous distinct cracks, or fractures, due to the tension placed on the coating. Thus, to obviate the objections noted, the application of the coating in the galvanizing process is made to follow the steps of corrugating the sheet and shaping thereof into substantially tubular form, as hereinbefore stated. So coated, it is entirely practicable to apply three or more ounces of coating to the square foot with absolute assurance that the coating will not show cracks or peels in the finished product. In other words, since the product is not subjected to severe bending strains following galvanizing, it may have a very heavy coating of galvanizing material, and such coating will possess great density and be free from fractures or other imperfections developed in the manufacture of the pipe. Additionally,

due to the application of the coating subsequent to shearing to size, the edges, as well as the faces, of the sheets are coated.

What is claimed is—

1. The method of making galvanized corrugated sheet metal pipe, which consists in galvanizing the metal subsequent to the steps of corrugating the sheet and curving the same into tubular form and prior to closing the overlapping edges upon each other.

2. The method of making galvanized corrugated sheet metal pipe, which consists in corrugating the sheet in the flat, then curving the sheet into approximately tubular form, then galvanizing the pre-curved sheet, and finally closing the meeting edges upon each other.

3. The method of making galvanized corrugated sheet metal pipe, which consists in corrugating the sheet in the flat, then curving the sheet into an approximately tubular form wherein the meeting edges lie out of contact with each other, then dipping the pre-curved sheet in the galvanizing bath, and finally riveting said meeting edges.

4. The method of making galvanized corrugated sheet metal pipe, which consists in corrugating the sheet in the flat, then curving the sheet into an approximately tubular form wherein the edges to be attached together are slightly separated, then dipping the pre-curved sheet in the galvanizing bath, and finally attaching said edges one to the other,

In testimony whereof, I affix my signature.

WILLIAM J. COOK.