Oct. 6, 1925. 1,555,895

J. WEBER

METHOD OF BENDING SHEET METAL BLANKS HAVING A ROLLED EDGE

Filed Nov. 3, 1924

Fig 1

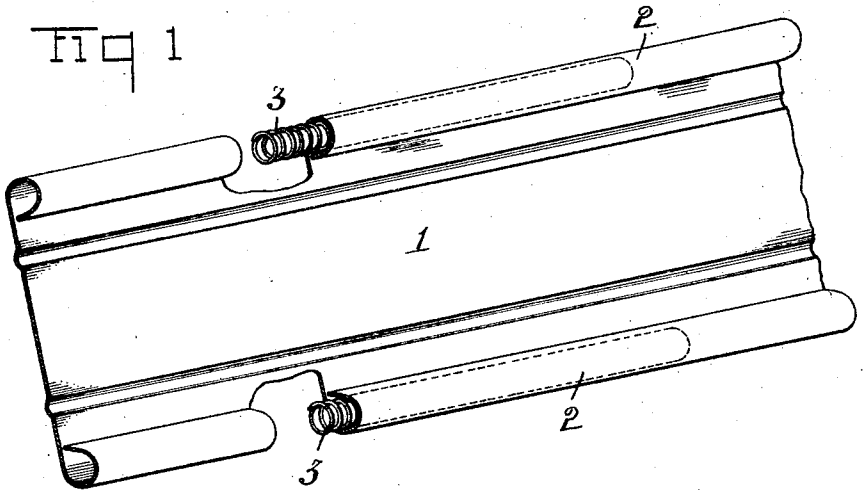


Fig 3

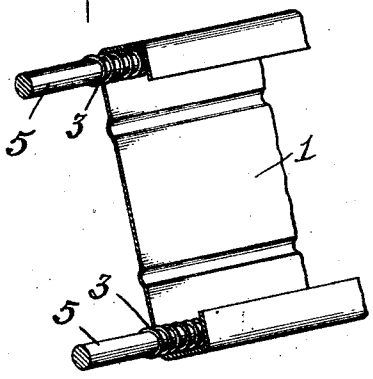
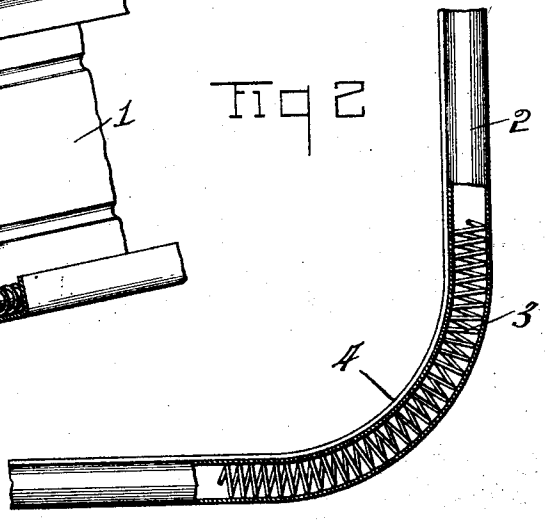


Fig 2



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UNITED STATES PATENT OFFICE.

JOHN WEBER, OF TOLEDO, OHIO, ASSIGNOR TO THE AMERICAN-NATIONAL COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

METHOD OF BENDING SHEET-METAL BLANKS HAVING A ROLLED EDGE.

Application filed November 3, 1924. Serial No. 747,413.

To all whom it may concern:

Be it known that I, JOHN WEBER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Method of Bending Sheet-Metal Blanks Having a Rolled Edge, which invention is fully set forth in the following specification.

In the manufacture of sheet metal articles it is customary and desirable in many instances to form the article with a roll at one or more edges thereof and sometimes intermediate its edges, and in the formation of the article to bend or curve the metal and roll in a direction transverse to the roll axis.

It has been found to be a comparatively simple proposition to bend metal pipes without damaging or distorting the metal and this has been accomplished, in some instances, by the use of coil-springs which are inserted inside the pipes in the region of the bend. In some instances these springs have been allowed to remain in the pipes, but generally they are removed after the pipes are bent. A much more difficult problem, however, is presented in the bending of sheet metal strips having rolled edges, because, instead of working on a circumferentially unbroken structure, a longitudinally elongate slit is provided which materially increases the difficulty in bending the metal without distortion. Numerous methods have been attempted for accomplishing this result but, so far as I am aware, no one has ever before successfully bent sheet metal strips having rolled edges without in some way injuring the roll.

In doing this it is recognized by sheet metal workers that it is extremely difficult to impart a bend of small radius in a roll formed of sheet metal of light gage without injury to the roll, either by reason of its breaking where the stretching occurs at the outer side of the bend or by reason of buckling of the metal at the inner side of the bend.

The object of this invention is the provision of a simple and efficient method for accomplishing such bending or curving of the rolled portion of a light gage sheet metal article as not to perceptibly damage the roll or the metal thereof during the bending or curving operation.

In the drawings, Fig. 1 is a fragmentary perspective view of a straight sheet of metal with an edge roll formed on each side edge thereof and with suitable reinforcing members disposed in the rolls at the points where a subsequent transverse bending is to take place, portions of the metal being broken away; Fig. 2 is an edge view of the metal strip after bending, with a portion of the upper edge roll broken away to show the reinforcing means therein; and Fig. 3 is a fragmentary perspective view of the metal strip at a stage in the roll forming operation at which the reinforcing means may be introduced, and illustrating one manner of such introduction.

In the transverse bending or curving of a roll of the character described, it is apparent that the outer side of the roll with respect to the axis of the bend or curve must stretch, and that there may be some compressing of the metal at the inner side, although it is probable that most, if not all, of the change in form is taken care of by a stretching of the metal.

This invention contemplates the use in the roll of some means which offers sufficient resistance crosswise thereof to prevent collapsing of the roll when transversely bent or curved and which is sufficiently yielding longitudinally thereof as to freely follow the longitudinal stretching or compressing movements of the contracting metal of the roll, and is also easily pliant so as not to offer any material resistance to the bending action of the roll. It is also desirable, if the reinforcing means is to remain in the roll, to have such means of light construction so as not to add any material weight to the article.

I have found that the most satisfactory results in this respect are obtained by employing a helical wire, the coils of which are preferably though not necessarily open or spaced apart to allow for free inward and outward relative movements thereof lengthwise of the helix and are of a diameter to substantially fill the interior or hollow of the roll. The helix may be introduced into the roll after forming or at an intermediate stage in the forming so that in the latter

case the forming takes place around the helix. It is apparent that upon a transverse bending or curving of the portion of a roll containing a helix, the helix will stretch and the different coils thereof will move to accommodate themselves to the movements of the different portions of the rolled metal contacting therewith, and at the same time will prevent the roll from collapsing and will maintain it substantially in its original cross-sectional form throughout the length of the bend. A means of this character is extremely light and it does not, therefore, add materially to the weight of the article in which used.

In the drawings, 1 designates a strip of sheet metal which may be a portion or length of a side-wall of a sheet metal juvenile wagon, which is usually made of light gage metal, and 2, 2 are the edge rolls thereof which are employed to give strength to the article and for other purposes, such for instance as forming a hand grip on the upper edge of the body wall and a broadened lower edge portion for seating on the edge of the bottom or platform member of the wagon body. A helix 3 is introduced into each roll 2 either during or after the forming of such rolls and before the strip 1 and rolls have been given a transverse bend or curve 4 required in the forming of the corner portions of the wagon box, wall, or in forming bends in the rolls of other sheet metal articles, each helix being disposed in its roll at the point where subsequent transverse bending is to take place. The subsequent bending may be accomplished in any suitable manner.

In Fig. 3 the edges of the sheet metal strip 1 are shown as being bent to partially form an edge roll, and before completing the forming of the rolls each helix 3 is held in position by a mandrel 5 while the roll is being formed around the helix. The mandrel is then withdrawn.

It is apparent that the member 3 remains in the bent portion of a roll as the article is formed and provides a light and efficient means for reinforcing the roll to strengthen it against denting or other injury. This is an important feature, as denting of the rolls of articles is most likely to occur at the corner portions thereof; and this not only mars the appearance of the articles but the dents are practically impossible to remove.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, or to the particular method specified of forming an article embodying the same, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method substantially as described which consists in providing a sheet metal blank having a roll at its edge, inserting a helically coiled wire core into the roll, and transversely bending the sheet metal blank with its roll and core.

2. The method substantially as described which consists in providing a sheet metal blank having a roll at its edge, inserting into the roll a flexible core of annular cross section of a diameter substantially the same as the interior diameter of the roll, and transversely bending the sheet metal blank with its roll and core.

In testimony whereof I have hereunto signed my name to this specification.

JOHN WEBER.