

[54] **METHOD FOR BENDING A GUTTER OR EQUIVALENT INTO A CURVE**

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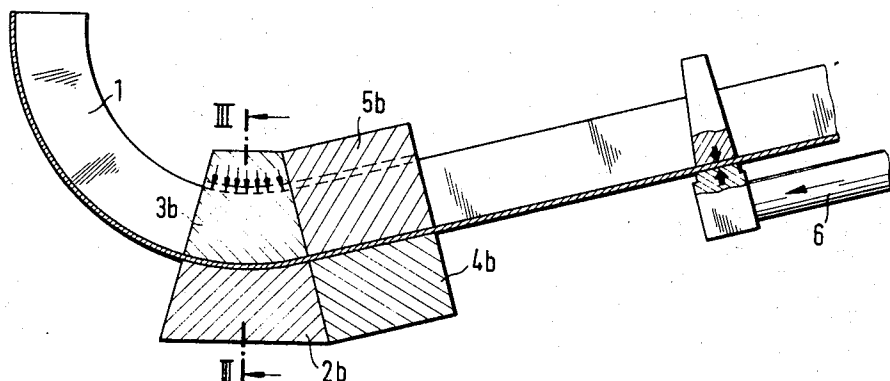
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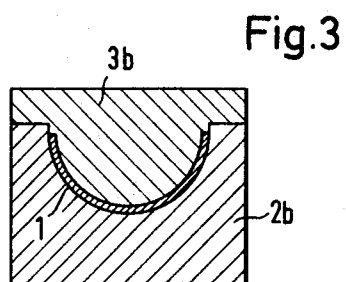
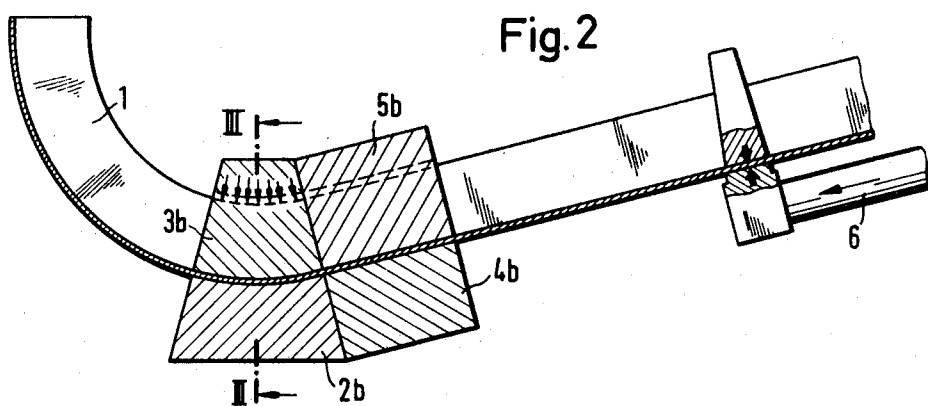
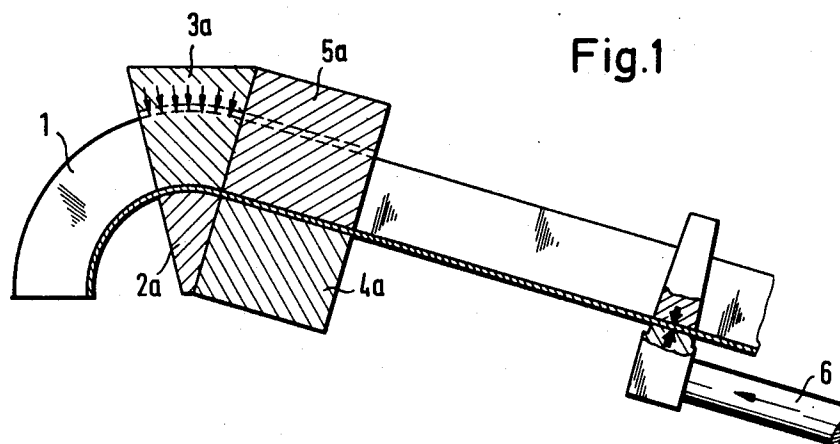
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ABSTRACT

The bending of a gutter or equivalent article of sheet metal by bending a small portion at a time between co-operating die elements which when placed in operative relationship, provide a space substantially equal to the thickness of the sheet metal, with the longitudinal and transverse cross section of the article to be bent. The edge surfaces of the article are subjected to pressure exerted by the die elements while the unbent portion of the article immediately before the die elements is supported from inside and outside by retaining means corresponding to the unbent article.

2 Claims, 3 Drawing Figures





METHOD FOR BENDING A GUTTER OR EQUIVALENT INTO A CURVE

BACKGROUND OF THE INVENTION

The present invention relates to a method and a device for bending a gutter or the equivalent into a curve. When gutter or pipe curves are being manufactured, the difficulty is that in the inner bend of the curve folds and other departures from smooth condition are formed. In a curve of this kind the material thickness in the outer bend is considerably less than that in the inner bend, and material stresses are moreover produced in the outer bend. These circumstances detract considerably from the strength of the structure.

OBJECTS AND SUMMARY OF THE INVENTION

By means of a method and device according to the present invention these drawbacks are avoided. Accordingly, in a gutter or the equivalent, a continuous curve can be produced which has a smooth inner surface. This is accomplished in that of the object to be bent, a small portion at a time is bent so that a continuous curve is formed, with this bending taking place in bending elements which have been shaped in accordance with the bending radius and the transverse section of the object to be bent, at which operation also the edges of the object are subjected to a pressure depending on the dimensioning of the gutter.

The invention further relates to a device comprising forming jaws, the forming surfaces of which have been shaped in accordance with the bending radius and the transverse cross section of the object to be bent, and retention jaws.

The device is further characterized in that the forming elements can be displaced along the object to be bent or that the device has been provided with an element displacing the object through an appropriate distance, whereby a continuous gutter curve is obtained.

By appropriate shaping of the forming elements, a so-called outer-bend gutter or inner-bend gutter is obtained. By a combination of such gutter sections, a pipe is obtained which has a smooth pipe curve and in which the joining seams are located on the sides.

It is, moreover, possible with the same tools to provide the gutters with curves having arcs of different length. It is also possible to place the bends at desired points on the object to be bent.

By synchronizing the forming phase and the displacement of the forming element or of the object to be bent, a continuous manufacturing process is achieved. By discontinuing the operation at a given point, pipe curves of a desired length are obtained.

The invention is described in more detail with reference to the attached drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view partly in elevation and partly in sec-

tion of a device in which the bottom of the gutter forms the inner bend of the curve,

FIG. 2 is a view similar to FIG. 1 of a device in which the bottom of the gutter forms the outer bend of the curve, and

FIG. 3 is a view taken along the line III—III in FIG. 2, the view looking in the direction of the arrows.

DETAILED DESCRIPTION OF THE INVENTION

In an embodiment shown in the drawing, the anvil body 2a and pressing body 3a defining forming elements bend a gutter 1 into a curve, in which the bottom of the gutter forms the inner bend of the curve. Retaining means such as jaws 4a, 5a press the gutter at the forming phase, in order to preclude malformations. After the bending phase has been completed, an element 6 moves the gutter 1 forward through the distance that has been bent or through a fraction thereof, whereby a new, unbent portion of the gutter is positioned at the forming elements 2a, 3a. This operation continues until the desired length of curve has been produced. FIG. 2 shows an embodiment in which the bottom of the gutter forms the outer bend. The device differs in no other respect from that according to FIG. 1. FIG. 3 shows the shape of the forming elements in cross section. It is thus understood that the pressing element 3b has been shaped so that also the edges of the gutter are subjected to a pressing force from above.

I claim:

1. A method for bending a gutter and like article of sheet metal a small portion at a time, comprising the steps of placing together die elements defining therebetween a space substantially equal to the thickness of the sheet metal introduced therein, the space having longitudinal and transverse cross sections corresponding to the bending radius and the cross section of the article to be bent, and supporting the unbent portion of the article from inside and outside by retaining means immediately before the die elements while subjecting the edge surfaces of the article to be bent by pressure exerted by the die elements.

2. A device for bending a gutter and like article of sheet metal a small portion at a time, comprising cooperating die elements, said die elements having surfaces corresponding to the bending radius and cross section of the article to be bent when positioned in operative relationship, the surface of the die element supporting the inside surface of the article being provided with projecting parts pressing against the side surfaces of the article to be bent, the projecting parts having a width corresponding to the thickness of the sheet metal to be bent, and retaining means located immediately before the cooperating die elements, the retaining means being provided with supporting surfaces corresponding to the unbent profile of the article.

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