Nov. 27, 1928. 1,693,045

T. E. MURRAY

MAKING FLANGED TUBES AND OTHER PRODUCTS

Filed June 8, 1923 2 Sheets-Sheet 1

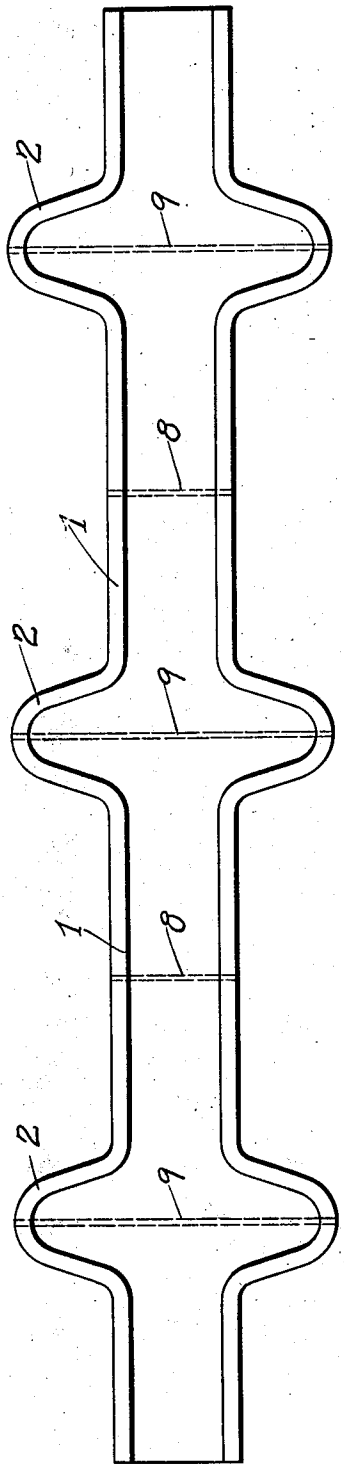


Fig. 1.

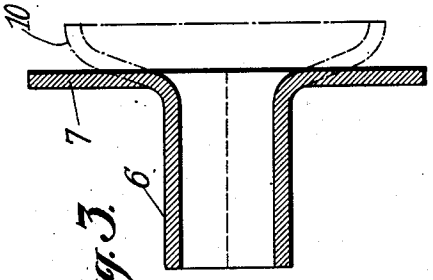


Fig. 3.

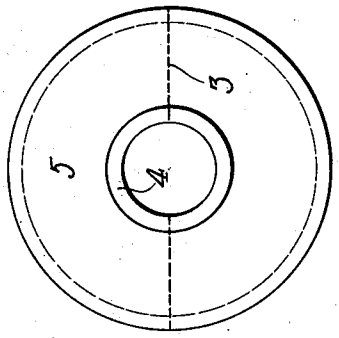


Fig. 2.

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Fig. 4.

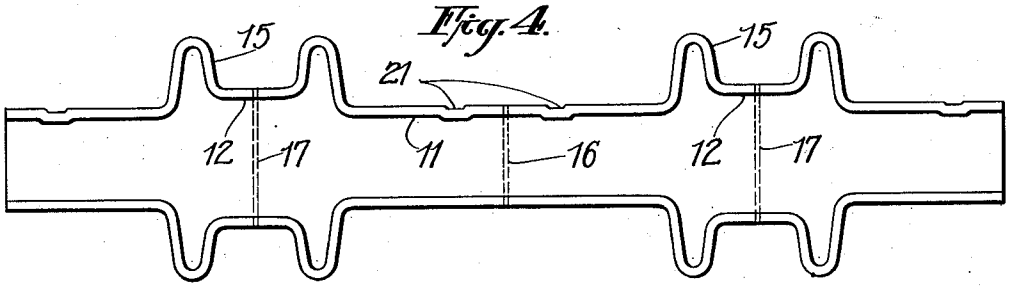


Fig. 5.

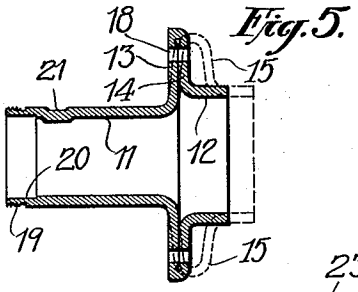


Fig. 6.

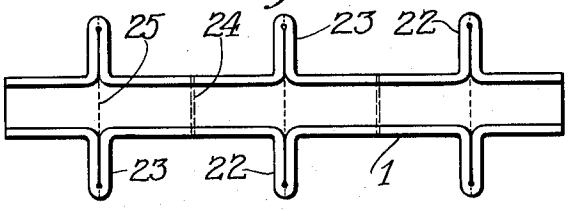


Fig. 7.

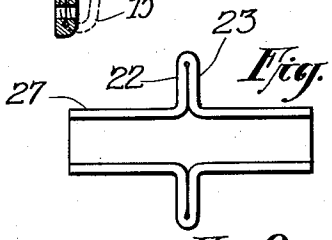


Fig. 8.

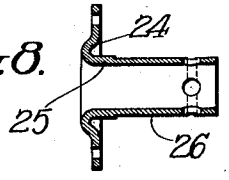


Fig. 9.

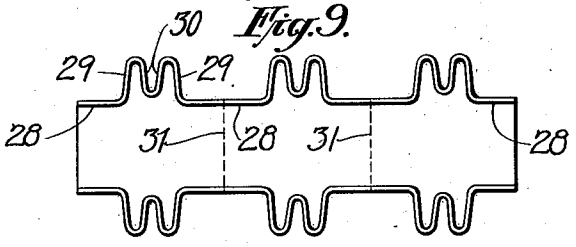


Fig. 10.

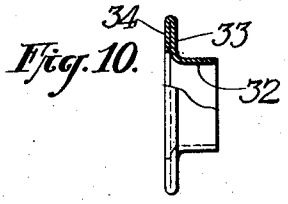


Fig. 11.

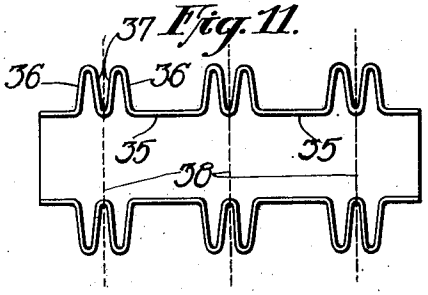
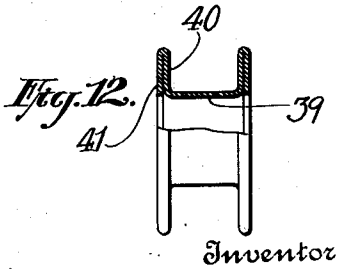


Fig. 12.



Inventor

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UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF BROOKLYN, NEW YORK.

MAKING FLANGED TUBES AND OTHER PRODUCTS.

Application filed June 8, 1923. Serial No 644,138.

In an application of myself and Williams, No. 572,394 for patent for flanged tubes and other products and method of manufacture, we have described the making of such products from sheet metal shaped so as to yield to endwise pressure at a desired point, and thus to form the flange.

The present invention is based on a method in which the same principle is extended and modified.

The accompanying drawings illustrate the invention utilized in several alternative ways.

Figure 1 is a plan of a segment formed up from sheet metal;

Fig. 2 is an end view of a tube formed of such segments; and Fig. 3 illustrates a further step in converting a section of such a tube into a short flanged tube;

Figs. 4 and 5 illustrate successive stages of a second process embodying the invention;

Figs. 6, 7 and 8 illustrate successive steps in a third method embodying the invention;

Figs. 9 and 10 illustrate successive steps in a fourth method; and Figs. 11 and 12 successive steps in a fifth method embodying the invention.

Referring to the embodiments of the invention illustrated, Fig. 1 shows a segment of sheet metal bent or drawn into the form of a semi-circle in cross-section with smaller tubular parts 1 between which are enlargements 2 formed by giving to the metal in longitudinal section outward bends of approximately V or U shape.

The purpose of these bends is to cause the metal when subjected to endwise pressure to yield at such points so that it will bend further and form the desired flange.

Assuming that the segments are first united, Fig. 2 is an end view of two such segments butt-welded together along longitudinal edges 3 to form complete tubular portions 4 with outwardly bent portions 5.

Assuming that we wish to form tubes with flat end flanges such, for example, as tubes 6, Fig. 3, with flanges 7, we first saw or cut through the tube at the sections of smaller diameter, for example at the lines 8 of Fig. 1. We then divide the pieces thus formed into two pieces by sawing or cutting through the enlargements 2 as indicated by the dotted lines 9, Fig. 1. This produces a tube such as 6, Fig. 3, with a curved flange 10. This flange is then bent to the flat shape 7 desired; or it may be to any other desired shape by an ordinary swaging operation.

Figs. 4 and 5 illustrate the making of short tubular pieces with parts 11 and 12 of different diameters and an intermediate flange of two thicknesses 13 and 14. To make these economically in quantities, segments are first bent up from sheet metal to the form of Fig. 4 with intermediate tubular portions 11 of smaller diameter and 12 of larger diameter between which, as shown, are V or U-shaped enlargements 15. Two such segments are butt-welded together as explained in connection with Fig. 2 and are then divided along the lines indicated at 16 and 17; after which they are subjected to endwise compression to produce the double flanges 13, 14 of Fig. 5. This figure shows in dotted lines the bends of the metal before such compression.

The article here represented is provided with bolt holes 18 through the flange and with an external thread 19 at the smaller end. This smaller end is also turned on the inside to provide a truly cylindrical bore 20 and is formed with a small flat 21 for a wrench hold, the latter being preferably formed in the original operation on a sheet of metal, as indicated in Fig. 4.

Fig. 6 illustrates the operation of forming a double flange 22, 23, by subjecting to endwise pressure a segment such as is shown in Fig. 1. This is then divided along the lines 24 and 25 producing segments which when welded along their longitudinal edges give a product like Fig. 3; which may be further shaped as shown in Fig. 8 to give a backwardly curved flange 24 and a tubular body 25 which is turned down on the outside as at 26, the flange and also the tube being punched out to provide holes for bolts or other purposes as shown. Or the blank formed in the manner of Fig. 6 may be divided only along the lines 24, giving the product of Fig. 7, which represents a tube 27 of uniform diameter with the double flange 22, 23 at an intermediate point in its length. The tubular and flange portions of this may be turned, threaded, punched and otherwise manipulated according to the article desired.

It will be understood that in this set of figures 6, 7 and 8, the welding and the bending operations may take place in various or-

ders, other than that particularly illustrated and described. The same is true of the other methods and products illustrated.

According to Fig. 9, the blank is bent into segments comprising tubular portions 28 and intermediate enlargements of double U or V form, having wide portions 29 and narrower portions 30 extending inward from the edges of the portions 29. The bent blank is divided along lines indicated at 31, and by endwise pressure the pieces are converted to the shape of Fig. 10, which is a tube 32 with a wide outward flange 33 reinforced along the outer portion of its width by an inward flange 34.

Fig. 11 illustrates a blank bent to provide tubular portions 35 between which are double U or V portions, the outer and inner parts, 36 and 37 of which are of equal width. The division in this case is effected along the lines 38, producing a tubular section with a V at each end. This is then bent up into the form shown in Fig. 12 producing a short tube 39 with a flange at each end, each flange being composed of a double thickness of metal 40 and 41. These flanges and this tube may be subsequently punched, turned or otherwise manipulated as stated in connection with the products illustrated in the other figures.

There is a substantial advantage in welding the segments together in the condition of Figs. 1 and 4, that is, before the completion of the bend by bringing the two thicknesses together as in Fig. 6.

Where the bend is completed and a flange of double thickness formed it is difficult to secure a good and uniform weld throughout the meeting edges of the segments. The welding current flowing across the joint fuses the portions of single thickness more quickly than those of double thickness; so that at the instant of pressing the parts together, one portion of the edges is overheated and burned or at least too greatly softened, or the other portion is not sufficiently heated.

The shape also of Fig. 6 presents difficulties in applying the electrodes at the flanged portions with good contact close to the joint faces. With the partial bends of Fig. 4, both these disadvantages are obviated and a better and more uniform weld can be secured.

Though I have described with great particularity of detail certain embodiments of my invention, yet it is not to be understood therefrom that the invention is restricted to the particular embodiments described. Various modifications thereof in detail may be made by those skilled in the art without departure from the invention as defined in the following claims.

What I claim is:

1. The method of making tubular articles with flanges of double thickness which consists in forming segments of sheet metal bent to V-shape at a plurality of determined points in their length, uniting such segments by butt-welding their edges together to form a tubular blank with said bent portions of the opposite segments in register so as to form hollow V-shaped flanges, dividing said tubular blank transversely at points between one such V-shaped flange and the next and bending such V-shaped flanges to bring the opposite sides together and form ninety-degree flanges of double thickness.

2. The method of making tubular articles of different diameters with an intermediate flange which consists in forming segments of sheet metal with parts 11 and 12 of different diameters and with V-shaped enlargements 15 between such parts, uniting such segments with their enlargements 15 in register by butt-welding their edges together to form a tubular blank, dividing said tubular blank transversely at points between such enlargements to form a number of shorter blanks and subjecting such shorter blanks to endwise compression to bring the opposite sides of such enlargements together and form flanges of double thickness.

In witness whereof, I have hereunto signed my name.

THOMAS E. MURRAY.