Jan. 12, 1932. F. E. KLING 1,840,512

METHOD OF MAKING CURVED METAL SECTIONS

Filed Oct. 8, 1929

Fig. 1.

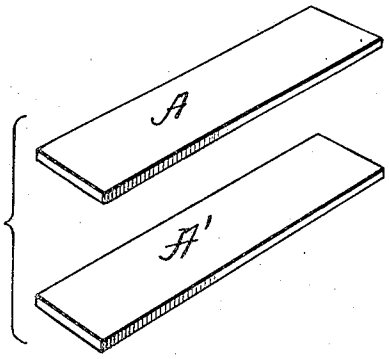


Fig. 2.

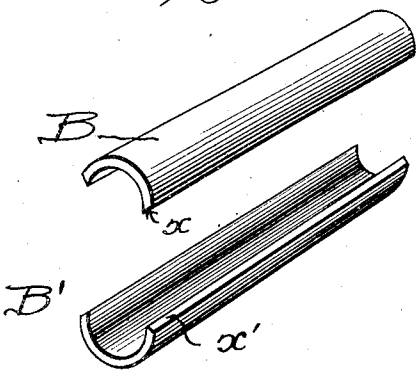


Fig. 3.

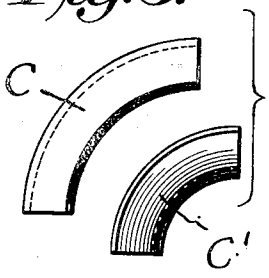


Fig. 4.

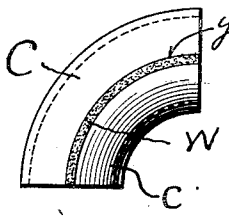


Fig. 5.

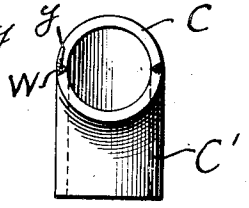


Fig. 6.

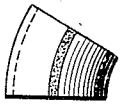


Fig. 7.

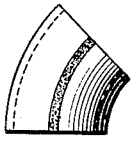
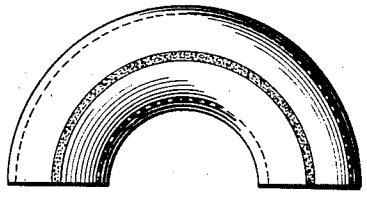


Fig. 8.



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UNITED STATES PATENT OFFICE

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METHOD OF MAKING CURVED METAL SECTIONS

Application filed October 8, 1929. Serial No. 398,243.

This invention relates to tube or pipe making and more particularly to a novel method for making curved sections such as elbows and the like.

Heretofore elbows for pipes have been made by the casting method, that is, of cast iron, malleable iron, cast steel or other materials. After they have been thus formed they have been provided, in the conventional manner, with threads or other means for the purpose of connecting the same to the ends of pipe.

It has also been heretofore proposed to make elbows or other curved sections of pipe by bending rolled or drawn sections. However, in the case of elbows having a short radius this practice is impracticable because the portion of the pipe on the inside of the bend will buckle and the wall on the outside of the bend will stretch, thereby reducing the thickness of the metal and rendering imminent the possibility of rupture.

Accordingly, a primary object of the present invention is to depart from the practice above indicated and provide curved tubular sections by a welding method. In that way the sections may be made of rolled steel with its consequent advantages not only from an economical standpoint, but also provide curved sections of increased strength and durability.

Any convenient and practical form of apparatus may be used to carry the method into effect but by way of illustrating the novel steps of the method involved herein reference may be made to the accompanying drawings, in which:—

Figure 1 illustrates perspective views of a pair of blanks arranged to form the curved section.

Figure 2 is a perspective view of the flat rectangular strips of Fig. 1 curved transversely in accordance with the second step of the invention.

Figure 3 shows the pipe sections of Fig. 2 curved longitudinally and ready for matched assembly.

Figure 4 is a view of the completely formed elbow, the sections being welded together.

Figure 5 is an end elevation of the completed elbow shown in Fig. 4.

Figures 6, 7 and 8 are detail side elevations respectively of 30°, 45° and 180° hollow sections made in accordance with the present invention.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

In carrying the invention into effect it is proposed to utilize flat rectangular strips or bars designated in Fig. 1 as A and A′ which are first bent transversely into the semi-circular cross-sectional formation indicated at B and B′ in Fig. 2.

In accordance with the next step of the method the transversely curved sections B and B′ are then bent or curved longitudinally into the form shown at C and C′ in Fig. 3. That is to say, after the flat rectangular strips or bars have been curved transversely, one of them, for example, C, is bent to the proper radius to form the outside of the pipe and the member C′ is bent on the proper radius in the direction of its longitudinal axis to form the inside member of the hollow tubular section. As will be observed from Figs. 2 and 3 the side edge portion of the two sections are preferably bevelled in opposite directions as indicated at x and x' to provide a channel y (Figs. 4 and 5) to receive welding material W. Thus, when the parts are assembled as shown in Fig. 4 and welded together by any of the well known welding methods the hollow tubular section of Fig. 5 is provided.

Clearly sections of any length or radius may be made as will be apparent from Figs. 6, 7 and 8 of the drawings.

While the drawings illustrate one form of procedure in carrying out the method, nevertheless, it will be understood that the flat rectangular strip A may be provided with its transverse curvature and then the said strip A cut into lengths such as B and B′ for example, according to whether the length of material is necessary for the inside or outside radius of the elbow. That is to say, the flat rectangular strip may be rolled in lengths into its transversely curved form and then cut into elbow forming lengths after which the latter lengths

may be bent longitudinally to the desired radius.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:—

1. A method of making hollow curved metallic sections from flat strip stock which consists in shaping two metallic blanks first transversely and then longitudinally to a desired radius, assembling said sections with their curved portions facing each other and then connecting the edges of said sections by a welded joint.

2. A method of making hollow curved metallic sections from flat strip stock which consists in first subjecting flat rectangular rolled metal strips to a bending operation which shapes them into trough forms, then bending said troughed sections to form the inside and outside of a curved hollow section of the desired radius, and subsequently uniting the meeting edges of said sections to form the completed article.

3. A method of making elbows and the like from flat strip stock which consists in bending a flat rectangular strip into transversely curved formation, then cutting the same into sections of the proper length to form complemental elbow forming sections, then bending said complemental sections in the direction of their length to the desired radius, and subsequently uniting the meeting edges of said transversely and longitudinally curved sections by a welding operation.

4. A method of making elbows and the like which consists in preliminarily forming pieces of flat strip stock material transversely into troughed formation, bending said pieces of material longitudinally according to the desired radius of the elbow, then assembling the formed and bent pieces whereby the meeting edges occur at the sides of the elbow, and subsequently welding the sections at the meeting side edges.

In testimony whereof I hereunto affix my signature.

FRED E. KLING.