

June 10, 1930.

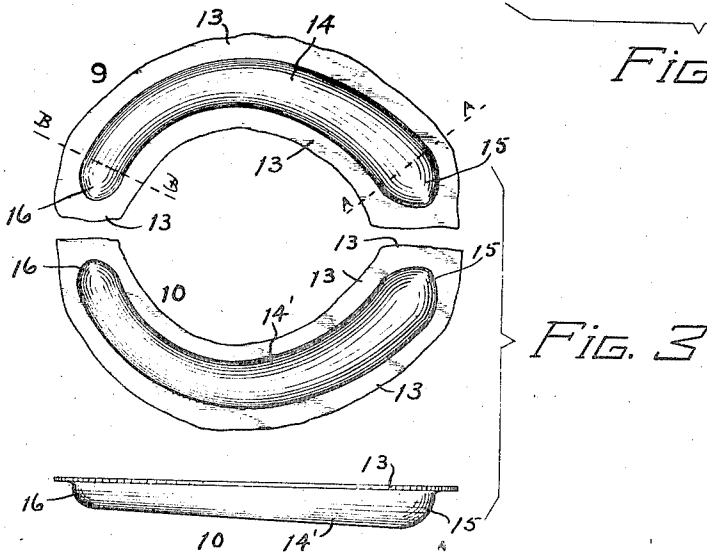
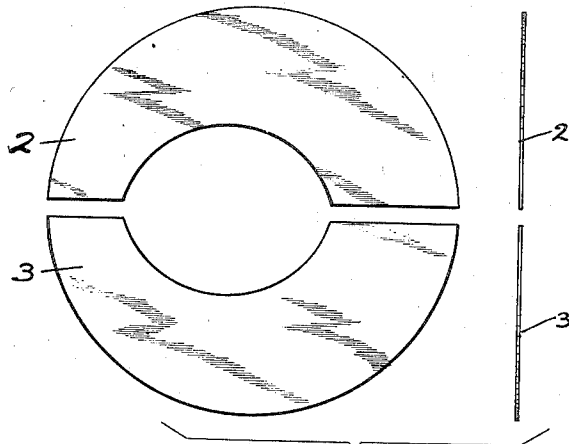
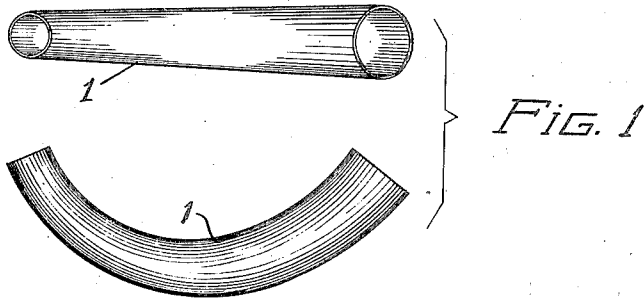
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1,763,582

METHOD FOR THE MANUFACTURE OF METAL TUBES

Filed June 29, 1928

2 Sheets-Sheet 1



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METHOD FOR THE MANUFACTURE OF METAL TUBES

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2 Sheets-Sheet 2

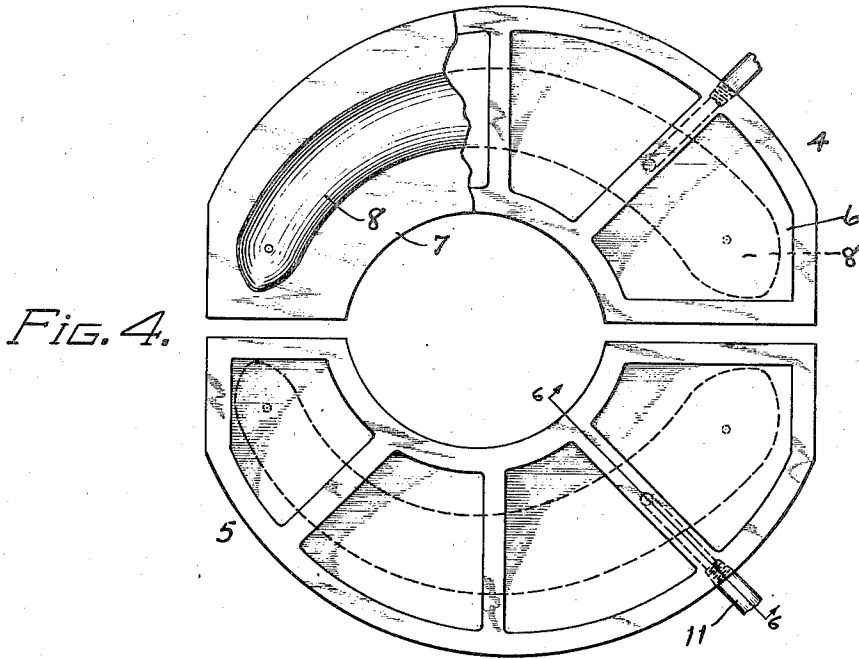


Fig. 4.

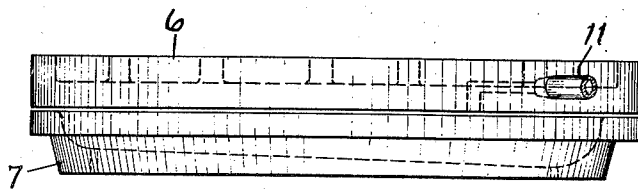


Fig. 5.

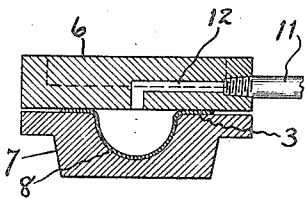


Fig. 6.

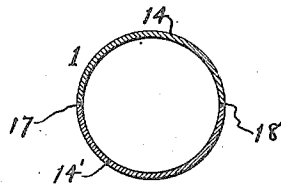


Fig. 7.

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# UNITED STATES PATENT OFFICE

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## METHOD FOR THE MANUFACTURE OF METAL TUBES

Application filed June 29, 1928. Serial No. 289,245.

This invention relates to the manufacture of sheet metal tubes, and especially curved or bent tubes.

The principal object of my invention is to provide a method for the manufacture of tubular sheet elbows or curved tubes by forming two half tube sections by fluid pressure and welding the joints together.

Another object of the invention is to provide a method for the manufacture of a tapered two piece longitudinally jointed sheet metal elbow or bend by forming the two half sections thereof in a mould by fluid pressure.

Other and more specific objects of the invention are mentioned and described herein.

The preferred embodiment of my invention is illustrated in the accompanying drawings, wherein,

Fig. 1 illustrates two views of a tapered sheet metal elbow made according to my improved method;

Fig. 2 illustrates two views of a right and left hand rudimentary sheet metal blank from which the elbow is made;

Fig. 3 illustrates three views of the condition of the two rudimentary sheets after the first mould operation thereon;

Fig. 4 illustrates a top plan view of the right and left hand mould units;

Fig. 5 is a side elevation of one of the mould units;

Fig. 6 is a section taken on line 6—6 of the lower mould illustrated in Fig. 4; and

Fig. 7 is a transverse section through the tube illustrated in Fig. 1.

Similar numerals of reference indicate like parts throughout the several views on the drawing.

Referring to the details of the drawings the numeral 1 indicates a tapered two piece sheet metal elbow or bend made in halves under my improved method, and numerals 2 and 3 indicate, respectively, a right and left hand rudimentary ductile sheet metal blank from which each half section of the tube is formed by hydraulic or fluid pressure. While the blanks 2 and 3 are shown as right and left hand elements it is obvious that a reversal of either blank will produce

the other form, except as each blank may have been specially finished on one side.

The numerals 4 and 5 indicate generally the curved left and right hand mould units, each of which may comprise the top and bottom sections 6 and 7, the bottom section of mould unit 4 being formed with the curved left hand recess, or chamber, 8 which is semi-circular in cross-section, Fig. 6. As illustrated, the recess 8 in the mould section 4 is tapered longitudinally to produce the tube half section 9 shown in Fig. 3, as hereinafter described.

The mould unit 5 has its lower section formed with a recess 8 to correspond in dimension with that of unit 4, but of right hand formation, and the rough tube half section 10 (Fig. 3) is formed therein, as hereinafter described. Each top section 6 of the mould units 4 and 5 has a pipe 11 connected with a conduit 12 therein for the introduction of water, or other fluid, under pressure to the recess or chamber 8 to operate upon either of the blanks 2 or 3.

Inasmuch as the method of forming both the right and left hand tube half sections is the same the description of the operation of one of the mould units will suffice for both, it is believed. In the practical application of my improved method a curved blank 2 is placed between the top and bottom sections 6 and 7 of the mould 4 to completely cover the recess 8. The mould is then locked together by a suitable clamp or press—not shown—to clamp the blank 2 therebetween. Thereupon, fluid pressure, preferably hydraulic, is applied to through pipe 11 to the upper surface of said blank, causing the latter to be bulged and pressed into the recess 8 and to assume the contour thereof, as represented by the condition of said blank in Figures 3 and 6. As indicated in Fig. 6 the blank 2 is now semi-circular in cross-section and carries excess stock in the form of a continuous fin 13 which is co-extensive with both ends and sides of the curved trough-like tube half section 14, carrying also the converging end sections 15 and 16.

The next step in the method of manufac-

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ture is to remove the end sections 15 and 16 on approximately lines A—A and B—B, respectively, and the fin 13. The right hand half section 10 of the tube is produced in the mould 5 in the same manner and its end sections 15 and 16 and fin 13 are removed, as described for the left hand section. Thereupon, the two tube half sections 14 and 14' are welded or brazed together at their longitudinal joints 17 and 18 (Fig. 7) and the tube is then ready for plating and polishing.

I claim:

1. In the method of making a tube in halves, the steps consisting of forming a pair of rudimentary blanks of flat ductile sheet metal, then forming cooperating tube half sections of said blanks by applying fluid under pressure to said blanks, then removing the excess stock from the sides and ends of said half sections, and then welding said half sections together at their longitudinal joints.

2. In the method of making a tube in halves, the steps consisting of forming a pair of rudimentary blanks of flat ductile sheet metal, then forming right and left hand cooperating half tube sections of said blanks by applying fluid under pressure on one side thereof, then removing the fins and end portions of said half sections, and then welding said half sections together at their longitudinal joints.

3. The method of making a tubular elbow in halves which comprises the formation of a pair of rudimentary blanks of flat ductile sheet metal, then forming right and left hand cooperating curved half tube sections of said blanks by the application of fluid under pressure on one side thereof, then removing the excess stock from the sides and ends of said half sections, and then welding said half sections together at their longitudinal joints.

4. The method of making a tapered tubular elbow in halves which comprises the formation of a pair of curved, tapered rudimentary blanks of flat ductile sheet metal, then forming right and left hand cooperating curved half tube sections of said blanks by the application of fluid under pressure on one side thereof, then removing the excess stock from the sides and ends of said half sections, and then welding said half sections together at their longitudinal joints.

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