No. 810,155. PATENTED JAN. 16, 1906.

W. H. KLAUER.

PROCESS FOR THE MANUFACTURE OF SHEET METAL ELBOWS.

APPLICATION FILED FEB. 1, 1905.

2 SHEETS—SHEET 1.

FIG. 2

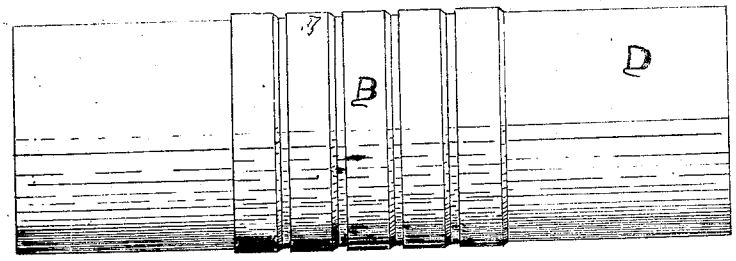
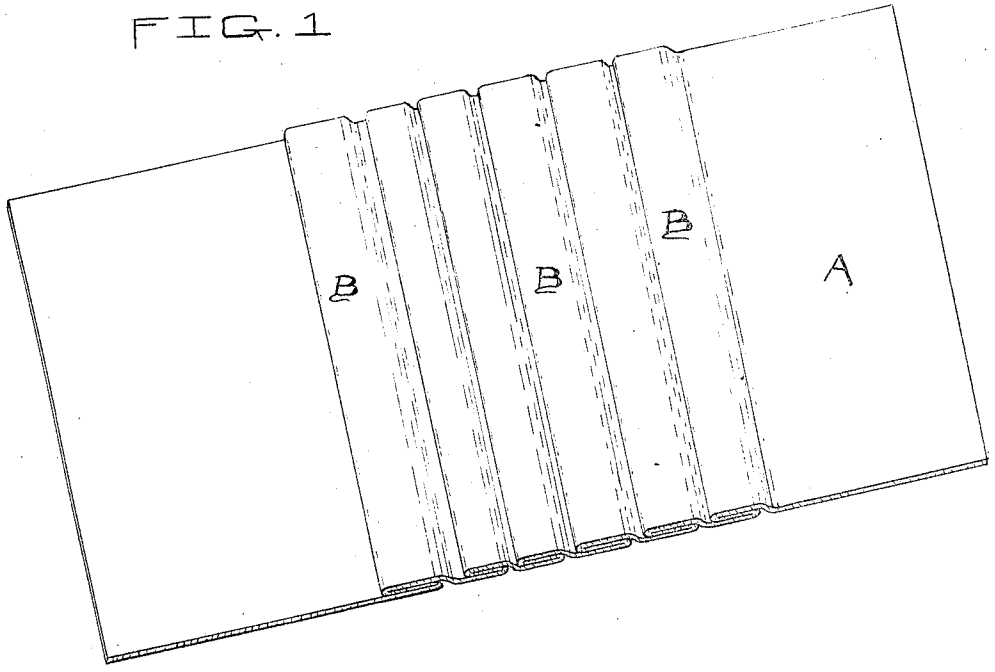


FIG. 1



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2 SHEETS—SHEET 2.

FIG. 4

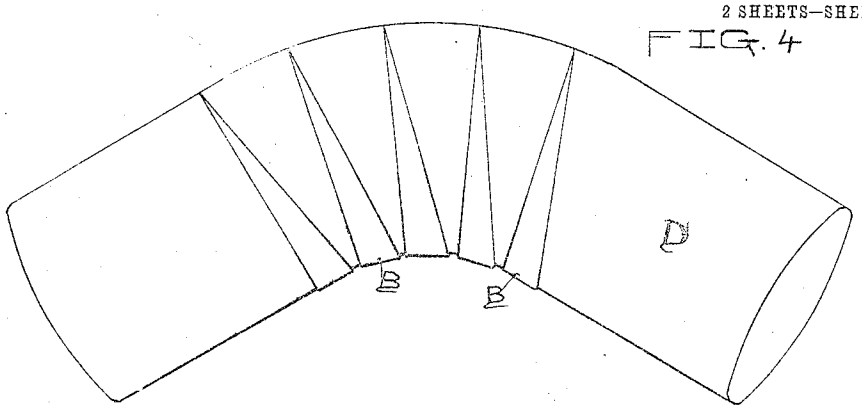


FIG. 5

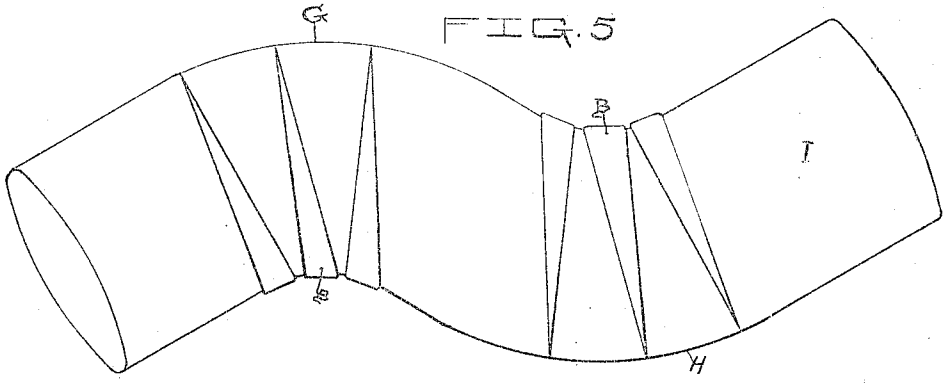
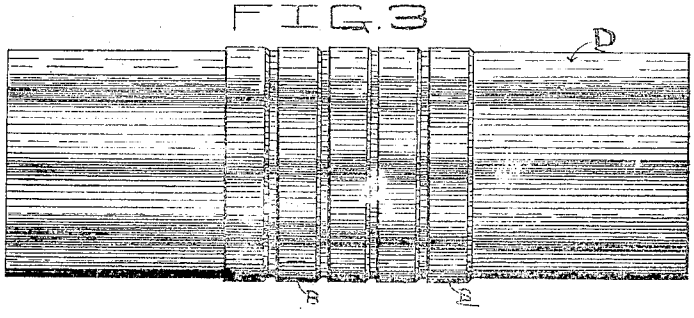


FIG. 3



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PROCESS FOR THE MANUFACTURE OF SHEET-METAL ELBOWS.

No. 810,155. Specification of Letters Patent. Patented Jan. 16, 1906.

Application filed February 1, 1905. Serial No. 243,644.

To all whom it may concern:

Be it known that I, WILLIAM H. KLAUER, a citizen of the United States, residing in the city and county of Dubuque and State of Iowa, have invented certain new and useful Improvements in Processes for the Manufacture of Sheet-Metal Elbows; and I do hereby declare the following specification to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the process or method of manufacturing sheet-metal elbows; and one of the objects is to provide a simple method whereby sheet-metal elbows may be easily manufactured at little expense and still provide against any weakening or thinning of the metal at any part of the elbow, and especially at the bulge.

A further object is to provide a process whereby not only an elbow with a single bend or bulge therein may be produced, but also a series of elbows or curves in the same pipe.

It consists, essentially, in first cutting out the blank from the sheet, then plaiting the blank with plaits, each of which is of uniform width throughout its entire length and each parallel with the other, then forming the blank with the plaits thereon into a tube, and then drawing out the plaits at certain portions to form the curve or bulge of the elbow and always maintaining all the folds of each plait flat and in contact with each other with one sheet of the fold outside and one inside of the central sheet.

The following specification will fully explain my method, when read in connection with the drawings accompanying the same and forming a part hereof.

Figure 1 is a part-perspective view and part-sectional view of the blank after it is plaited and showing the mode in which the plaits are folded. Fig. 2 is a side elevation of the blank shown in Fig. 1 after it has been formed into a tube. Fig. 3 is a side elevation of a tube corrugated after it is plaited. Fig. 4 is a perspective view of the completed elbow, showing the plaits drawn out to form the curve of the elbow. Fig. 5 is a perspective view of the pipe having a compound curve therein formed by the same process.

Like letters of reference denote corresponding parts in each of the figures.

The manner in which I carry out my process is by first cutting out from the sheet of metal a rectangular blank A. This blank is then placed in a plaiting-machine, which plaits or folds over flat the metal crosswise of the blank and forms the plaits B of three thicknesses of the metal. It will be observed that each plait is flat and of uniform width from end to end; but it is not essential or necessary that all of the plaits shall be of the same width, but may vary in width, as shown in Fig. 1. When the requisite number of plaits are formed, then the blank with the plaits thereon is placed in a tube-forming machine, where it is bent into a tube D. The tube is then placed in a machine provided for the purpose of drawing out the plaits, and the plaits are there sufficiently drawn out at certain parts to form the desired curve in the elbow and in such manner as to leave the plaits flat after they are drawn out without stretching or weakening in any manner the material, and when completed there will be one thickness of the metal of each plait on the outside and one on the inside of the central sheet of the plait.

In Fig. 5 is shown a tube I, in which is a combined elbow or a series of elbows or curves. The manner of forming this is practically the same as that previously described, except that one or more plaits are first drawn out at such portions of the plait as to form the elbow with the desired curve, as shown at G. Then other plaits are drawn out at different relative parts of the plaits to form the elbow H, and so on. The only change or difference of construction is in the portions of the plaits that are drawn out.

It will be seen by this mode of construction that there will be no thinning or weakening of the metal at any part of the elbow, and also it will be seen that out of a single piece of metal a series of elbows may be formed to adapt it for use in rain-pipes where there are projections on the building to which the pipes are to be attached and the curves in the tubes can be easily adapted to those projections.

This method will obtain as well in forming corrugated elbows in tubes as those that are plain. The preferable mode in the construction of corrugated elbows is to place the corrugations thereon after the elbows are complete; but by this process the sheet metal may be corrugated after it is plaited and formed into a tube and before it is formed into an elbow, as shown in Fig. 3.

Having now described my invention and the mode of operating, what I claim, and desire to secure by Letters Patent, is—

1. The process of manufacturing sheet-metal elbows which consists of first forming flat plaits in a sheet-metal blank, forming the blank thus plaited into a tube, and then drawing out certain portions of the flat plaits to form the curve of the elbow leaving the undrawn-out portions of the plaits flat when the elbow is finished.

2. The process of making sheet-metal elbows which consists in cutting out a rectangular blank from the sheet of metal, plaiting or folding the blank crosswise with each plait of uniform width throughout its length, bending the plaited blank into a tube and then drawing out the plaits at such portions as desired to form the curve of the elbow and leaving the folds of the plaits flat and in contact with each other, the one outside and the other inside of the central sheet of the plait.

3. The process of manufacturing sheet-metal elbows, which consists of cutting out the blank, then forming flat plaits or folds crosswise of the blank, turning the blank into a tube with the plaits therein, and then drawing out part of the plaits at certain portions of the plaits and other plaits at different portions to form different elbows in the same tube.

4. The process of manufacturing sheet-metal elbows, which consists in cutting out a blank, plaiting the blank with flat plaits of threefold thicknesses or sheets, forming the blank into a tube with one thickness or sheet of the metal upon the outside and one upon the inside of the central sheet of the plait, then partially drawing out certain portions of the plaits to form the curve of the elbow.

5. The process of manufacturing corrugated sheet-metal elbows, which consists in cutting out a blank, forming threefold flat plaits therein, forming the plaited blank into a corrugated tube, and then drawing out certain portions of the flat plaits to form the curve of the elbow.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. KLAUER.

Witnesses:
M. M. CADY,
M. L. HEMKER.