S. G. WARNER.

DIES FOR CUTTING SHEET-METAL FOR PIPE ELBOWS.

No. 182,728. Patented Sept. 26, 1876.

Fig. 1.

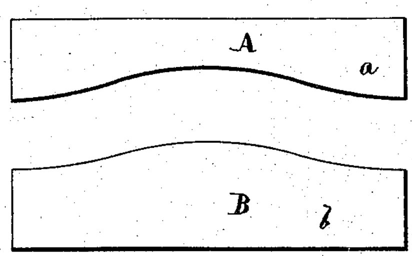


Fig. 2.

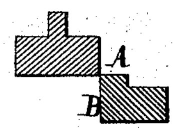


Fig. 3.

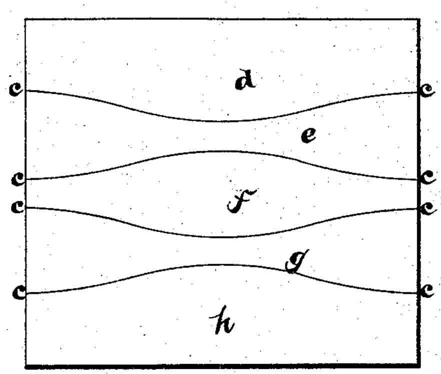
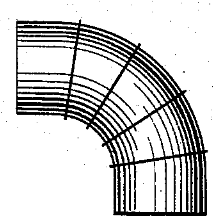


Fig. 4.



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IMPROVEMENT IN DIES FOR CUTTING SHEET METAL FOR PIPE-ELBOWS.

Specification forming part of Letters Patent No. **182,728**, dated September 26, 1876; application filed March 8, 1876.

To all whom it may concern:

Be it known that I, SAMUEL G. WARNER, of the city of Brooklyn, county of Kings and State of New York, have invented a certain new and useful Improvement in Dies for Cutting Sheet-Metal Blanks for Forming Curved Elbow-Joints for Stove and other Sheet-Metal Pipes, of which the following is a full description, reference being had to the accompanying drawing, which forms a part of this specification.

The object of my invention is to simplify the cutting of sheet-metal blanks for forming curved elbow-joints for sheet-metal pipes used for stoves and other purposes, and to reduce the cost of dies for cutting the same.

As these sheet-metal blanks have hitherto been made, the use of two or more dies was necessary to form a sufficient number of blanks to make a complete curved elbow. I propose by the use of one complete die, composed of two parts, to cut these metal blanks, each part of the die having but one cutting side.

In the drawing, Figure 1 represents my improved die, composed of the two parts *a* and *b*, for cutting the blank to form the curved elbow. Fig. 2 is a sectional view of the die, showing the die in position to cut blanks. Fig. 3 represents the sheet of metal from which the blanks *d e f g h* are cut for forming the curved elbow when cut at the lines *c c c c*. Fig. 4 represents the sheet-metal blanks put together to form the curved elbow.

In Figs. 1 and 2, A represents the base of the die, and B the cutting portion of the same, or these can be reversed, using A for the cutting portion of the die and B for the face of the die, as preferred. This die can be connected with and worked by any suitable machinery adapted for the purpose.

To cut sheet-metal blanks for curved elbow-joints for pipes by the use of my improved die, I proceed as follows: I take the sheet of metal, as represented in Fig. 3, and by the use of my improved die, having the two parts or faces A and B, as shown in Figs. 1 and 2, cut therefrom the blank *d*. This leaves the impinging side of the blanks *e* of the conformation desired in the complete blank *e*. By merely reversing the sheet of metal shown in Fig. 3, and subjecting the same to the action of my said improved die, the complete blanks *d*, *e*, *f*, *g*, and *h* are cut, and are ready to be put together to form the curved elbow shown in Fig. 4.

It will thus be seen that by the use of my improved die I cut a blank at each blow, and at the same time leave the edge of the sheet of metal of such a shape as to form a side of the next adjacent blank. By the use of no other dies than mine, as above described, can sheet-metal blanks for forming a curved elbow be formed without a waste of metal between the blanks, as those now in use cut each blank separate and distinct, leaving a wastage of metal between, while my improved die, in cutting one blank, also forms a portion of the contour of the next adjacent one, by which means the waste of metal is avoided.

I do not claim either a curved elbow for pipes or blanks for forming the same; but

What I claim as my invention is—

A single die composed of two parts, *a* and *b*, having corresponding curved cutting-edges, substantially as shown and described, whereby all of the blanks necessary to form the curved elbows of stove-pipes and similar articles may be cut from the sheet of metal without waste by a single set of dies, each stroke of the moving portion of the die cutting out one blank, and at the same time forming one side of another, as set forth.

SAML. G. WARNER.

Witnesses:

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LOUIS W. FROST.