

O. KNAPP.
DIES FOR MAKING ELBOWS.

No. 179,858.

Patented July 18, 1876.

Fig. 1.

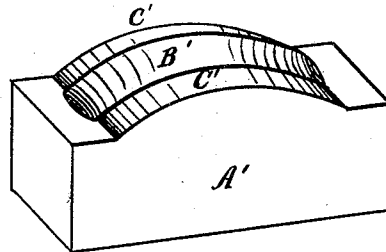
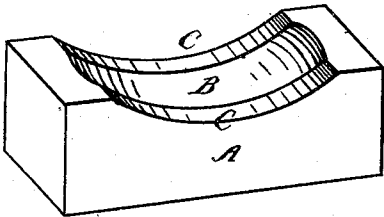


Fig. 2.

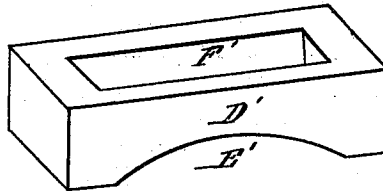
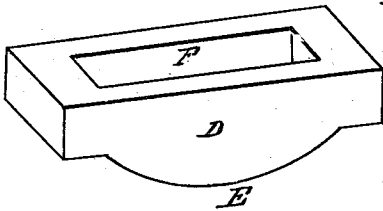


Fig. 3.

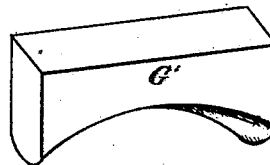


Fig. 4.

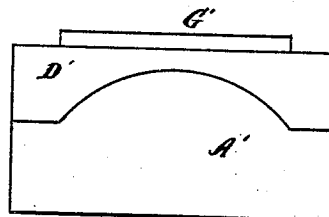
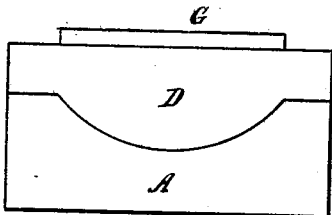


Fig. 5.

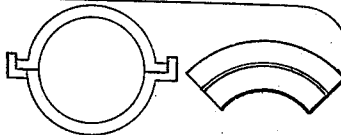
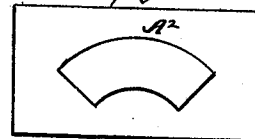


Fig. 6.



WITNESSES

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OSCAR KNAPP, OF NEW YORK, N. Y.

IMPROVEMENT IN DIES FOR MAKING ELBOWS.

Specification forming part of Letters Patent No. **179,858**, dated July 18, 1876; application filed October 4, 1875.

To all whom it may concern:

Be it known that I, OSCAR KNAPP, of the city, county, and State of New York, have invented certain new and useful Improvements in Dies for Making Curved Stove-Pipe Elbows; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to dies and punches for making the sections of curved stove-pipe elbows, and consists of a pair of holding and upsetting dies and punches, constructed in a manner to form the outer and inner curved portion of the elbow, and a flange on each of said sections, so that the finished elbow may be united on opposite sides by a lap-joint.

Figure 1 is a perspective view of a pair of dies, grooved to form opposite sections of an elbow-joint. Fig. 2 is a perspective view of portions of the punch that also serve as a holding-block; Fig. 3, a perspective view of a pair of punches shaped to form the opposite sections of an elbow of different curvatures; Fig. 4, a side elevation of the dies and punches in position for operation. Fig. 5 shows a transverse section and side view of the elbow as formed by my improved dies; Fig. 6, a modified form of dies.

A represents the die for forming the outer section of the elbow, and to that end is constructed with a grooved concave face. The groove B is longer and of less curvature than that of the opposite die in order to form the longer and outer section of the elbow. That portion of the die surrounding the groove constitutes a die and holding surface, whereby a flange corresponding to the curvature of the pipe is formed on the edges of each section of the elbow, and also the metal sheet is securely retained between said outer dies, and allows of the upsetting of the central portion of the blank or sheet. A' represents the die for forming the inner section of the elbow. This die has a grooved convex face, the groove, as above noted, being shorter and of sharper curvature to form the inner portion of the elbow. The groove B' is also bordered on op-

posite sides with convex surfaces that serve as forming and holding surfaces, and answer the purposes set forth in reference to the opposite die. The punch D, to be used with die A, has a convex working-surface, E, corresponding to the concave face C of die A. This punch is provided with a rectangular opening, F, within which the double concave punch G has free vertical movement. The face of punch G accurately fits groove B of die A, and serves to form the outer section of the elbow, while the concave faces E, of punch D, operate to give the desired form to the flange, and also to hold the flanges while the central portion of the blank is upset, as heretofore set forth. The punch D' has a concave face, E', corresponding to the concave face C' of die A', and this working face, as in the opposite punch, serves to impart the desired form to the flange of the inner section of the elbow, and also to hold said flange while punch G' upsets the central portion of the blank.

As various kinds of machinery may be adopted for operating these punches, it is not necessary to describe any particular arrangement of the same, as they are well known by those skilled in the art.

The operation of the dies and punches is as follows: Sheet-metal blanks, one for the upper and one for the lower section of the pipe, are properly registered on each of the dies A A'. Punches D D' are then forced tightly against their respective dies, and operate to impart the desired form to the flanges, and also to hold the blank securely between the dies until the grooved punches G G' are forced upon the central and unprotected portions of the blanks, and impart the proper form to the inner and outer sections of the elbows.

The article produced by the dies above described has many advantages over those wherein the sections are formed on half-dies, and thus have top and bottom flanges, as, in this case, the lap-joint is formed on the sides of the elbow, and serves to give the same great lateral strength, and also allows of smooth top and bottom sections, and thereby prevents the accumulation of soot and cinders within the elbow-joints.

Having fully described my invention, what

I claim, and desire to secure by Letters Patent, is—

The combination of dies A A', having working-faces B B' C C', with the duplex punches D G D' G', having working-faces corresponding to the dies, substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of October, 1875.

OSCAR KNAPP.

Witnesses:

JOHN F. DOHERTY,
T. G. KNAPP.