A. SYVERSEN.

STOVE-PIPE ELBOW-MACHINES.

No. 195,674. Patented Sept. 25, 1877

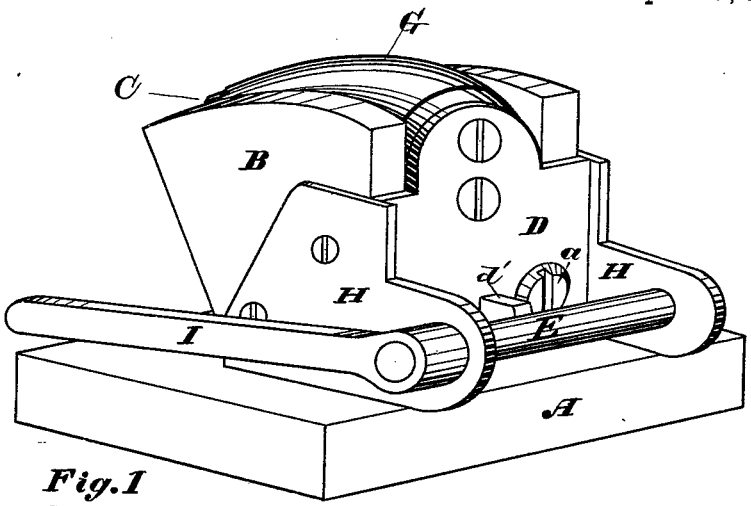

Fig. 1

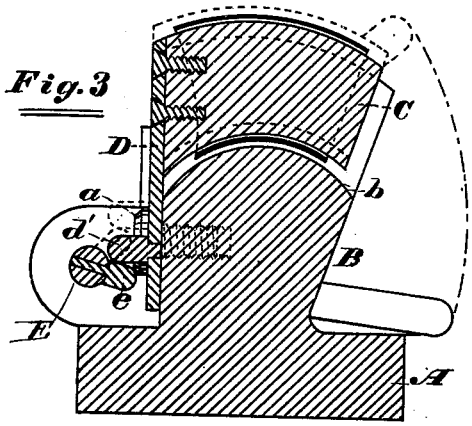

Fig. 3

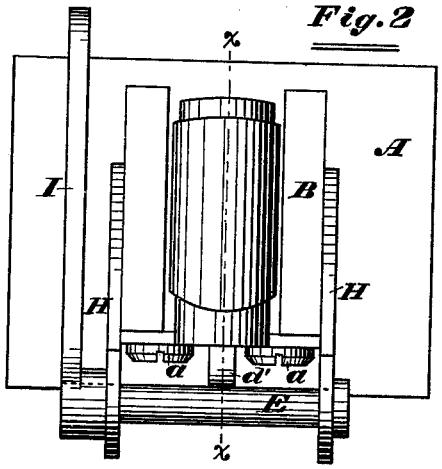

Fig. 2

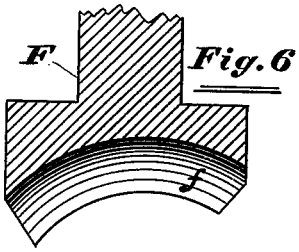

Fig. 6

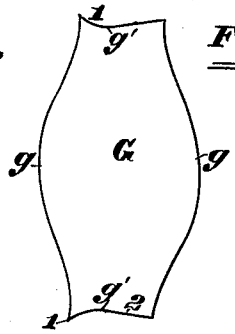

Fig. 7

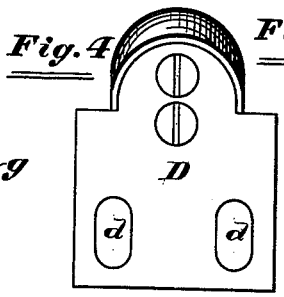

Fig. 4

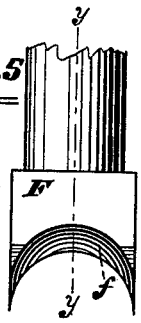

Fig. 5

Attest

W. C. Corlies

E. S. Lloyd

INVENTOR

Andreas Syversen

By Cobarn & Thacher

Attorneys.

UNITED STATES PATENT OFFICE.

ANDREAS SYVERSEN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOSEPH S. DENNIS, OF SAME PLACE.

IMPROVEMENT IN STOVE-PIPE-ELBOW MACHINES.

Specification forming part of Letters Patent No. **195,674**, dated September 25, 1877; application filed January 18, 1877.

To all whom it may concern:

Be it known that I, ANDREAS SYVERSEN, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Making Stove-Pipe Elbows, which is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective view of the bed-plate and former; Fig. 2, a plan view of the same; Fig. 3, a transverse section of the same, taken on the line *x x*, Fig. 2; Fig. 4, a rear end view of the former; Fig. 5, an end view of the drop or upper die; Fig. 6, a sectional view of the same, taken on the line *y y*, Fig. 5; and Fig. 7, a view of the blank from which the elbow is to be formed.

The object of my invention is to provide a machine by means of which a single blank may be gradually drawn and struck into the shape of a curved stove-pipe elbow.

The invention consists in a curved former, which is mounted upon a bed-plate so that it may be adjusted vertically at will.

It also consists in the combination, with this former, of a bed-block provided with a curved recess, in which the former moves.

It also consists in the combination of the bed-block and former, constructed as described, and a drop-die, constructed so as to conform to the former; and it further consists in various special devices and combinations of devices, all of which will be hereinafter more fully set forth.

In the drawings, A represents a bed-plate, which supports a thick bed-block, B. The block B is constructed with a curved recess, *b*, in its upper end, the bed of which is convex, as shown in Fig. 3 of the drawings.

A cylindrical bar, C, corresponding in size to that of the elbow which it is desired to construct, is attached to a plate, D, which is provided with slots *d* at its lower end, and attached to the bed-block by screws *a*, which pass through the slots into suitable holes in the block.

The circular piece C is curved, and arranged with reference to the block B in such a manner that the band in its lower side shall correspond to the curve in the recess of the bed-block within which it is placed. This piece C, constructed as described, constitutes a former, upon which the elbow is to be made. As stated above, it is attached to the block B, so as to enter the recess *b* in the upper end thereof.

A rock-shaft, E, is mounted in supports H, attached to or made in the form of lugs, in one piece with the block B, and is provided with a projecting pin or lug, *e*, on its inner side, which extends under a corresponding pin or lug, *d'*, on the plate D. A lever, I, is fixed to one end of this shaft, by means of which it is rocked to raise the plate D and former C, as shown in dotted lines in Fig. 3 of the drawings.

An upper die or drop, F, is constructed with its lower edge provided with a curved recess, *f*, corresponding in shape to the contour of the upper side of the former C.

The blank G, from which the elbow is formed, is cut from sheet metal of the peculiar form shown in Fig. 7 of the drawings.

In forming up a stove-pipe elbow from the blank G, I employ a set or series of machines or formers. In the first one the former C is curved but slightly. The blank G is bent around this former, so that its two sides will project down on each side of it within the recess *b*, the former being in the elevated position shown in dotted lines in Fig. 3 of the drawings. The stiffness of the plate-blank is sufficient to hold the former up in this position, the edges of the blank resting on the bottom of the recess *b*, bent slightly under, until the die F is dropped upon the former, which is carried down by the force of the blow against the curved surface of the bed-block within the recess *b*.

It is obvious from the conformation and arrangement of the parts heretofore described that the edges of the blank G will at first be forced around the former C, following the bottom of the recess *b*, and then struck into shape between the bed-block, former, and drop. The drop being raised, the former is

lifted slightly from its seat by the lever I, when the blank G may be slipped off from the front or free end of the former. This partially-formed blank is then forced upon a former in a second machine, which has a greater curvature than the former from which it has just been taken, and the operation above described is repeated, thus bringing the blank into a shape more nearly resembling a completed elbow.

This operation is repeated upon successive formers, the curvature of each being gradually increased, until finally the blank is brought into the form of a complete elbow, when the edges are fastened together in the usual manner, and it is trimmed and properly beaded, so as to be ready for use.

The width of the recess in the bed-block must be but little greater than that of the former, so that when the blank is placed on the latter there will not be much room for play, and the former should fit accurately in the lower part of the recess, so as to prevent all crimping of the blank.

The blank is of such shape that, notwithstanding it is drawn as the elbow is gradually formed, the latter, when finished, will have sufficient thickness for all practical purposes.

If desired, the lever I may be connected to the drop mechanism, so as to be operated thereby.

This machine is especially adapted to the forming up of the two parts of jointed elbows in which the bend or curvature is principally at one end of each section, the bent ends being afterward joined in any suitable manner. But, if the pipe is not too large, the elbow may also be made in one piece by the series of operations above described.

For the construction of the two sections of jointed elbows, I make the blank G of peculiar form. The two sides *g* are convex, the convexity of the side in which the bend is to be made being greater than that of the other. The other two sides, *g'*, are of irregular contour. At one end, for a short distance, there is a concavity, 1, extending about a fourth of the way across, and the remaining portion, 2, is on a straight line, inclining outward, so as to gradually widen the blank.

From a blank of this shape the elbow-section may be formed up with the two edges brought close together, ready to be joined, the corners marked 1 being brought together on the bent end for this purpose, while that portion having straight edges 2 forms the straight portion of the section. This peculiar blank, however, forms no part of the invention herein claimed. The former C should be nearly straight at its front end when elbow-sections of this kind are to be made.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The bed-block B, provided with a curved recess, *b*, in combination with a curved former, C, arranged on an independent support, to reciprocate bodily in straight lines, substantially as and for the purpose set forth.

2. The bed-block B, having a curved recess, *b*, in combination with the curved former C, attached to an independent reciprocating support, and upper die F, substantially as and for the purpose set forth.

3. The bed-block B, in combination with the former C, slotted plate D, and lifting rock-shaft E, substantially as and for the purpose set forth.

ANDREAS SYVERSEN.

Witnesses:
L. M. HARRIS,
L. A. BUNTING.