2 Sheets—Sheet 1.

J. S. LUGG.

STOVE-PIPE ELBOW MACHINE.

No. 177,408. Patented May 16, 1876.

Fig. 1.

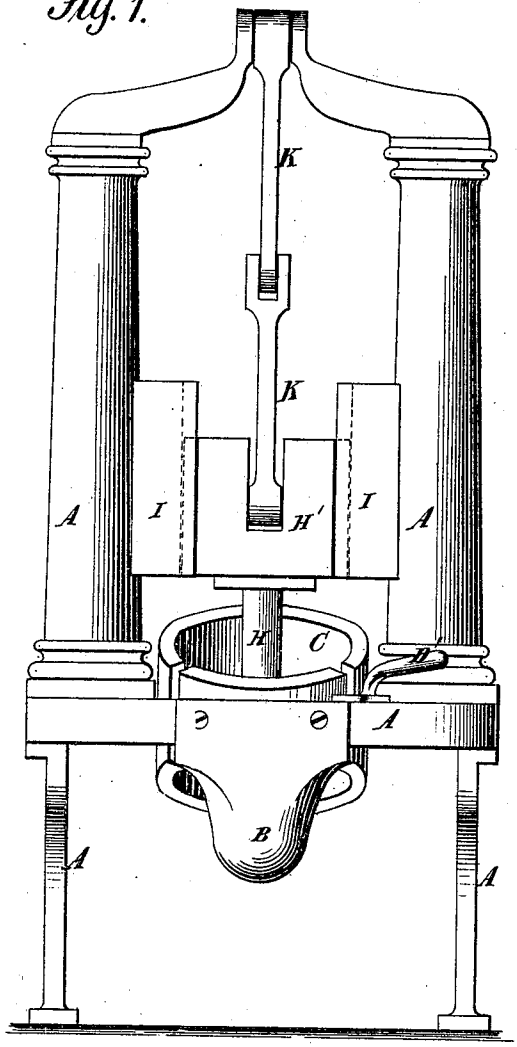


Fig. 3.

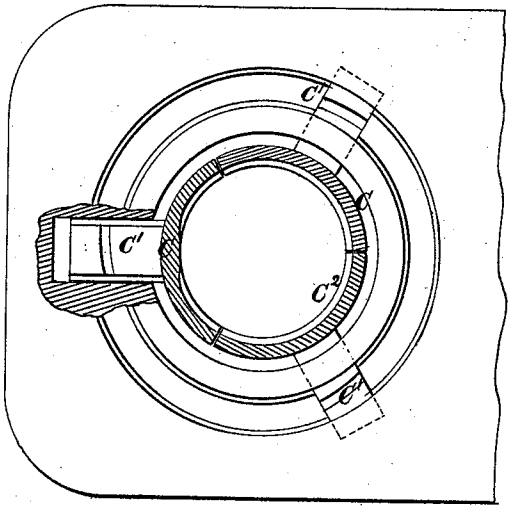
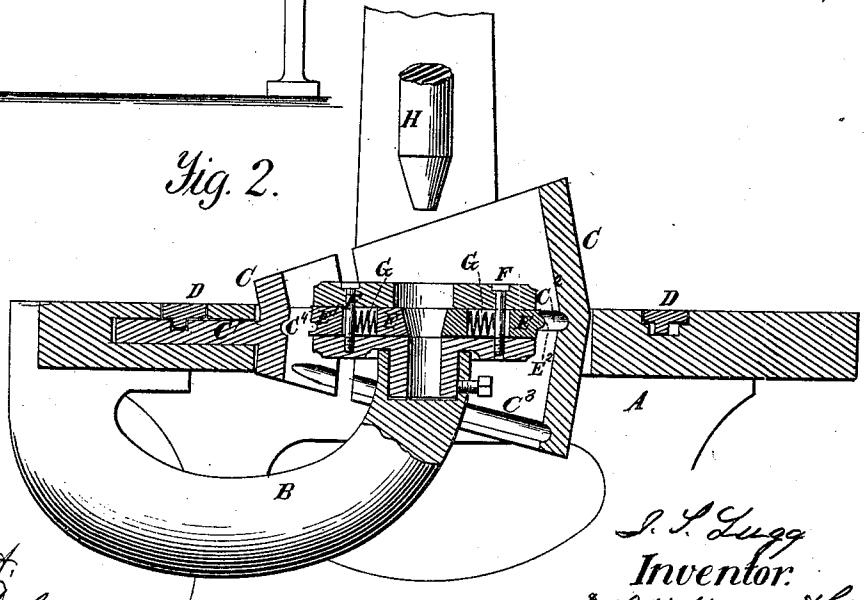


Fig. 2.



Witnesses.
A. Ruppert.
John Eiler

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Attys

2 Sheets—Sheet 2.

J. S. LUGG.

STOVE-PIPE ELBOW MACHINE.

No. 177,408. Patented May 16, 1876.

Fig. 4.

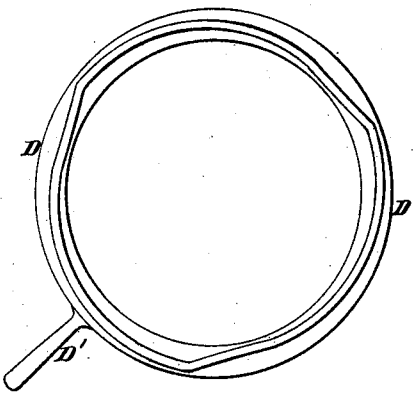


Fig. 5.

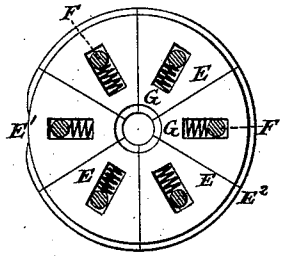


Fig. 6.

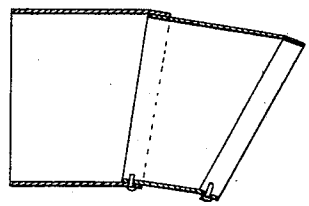
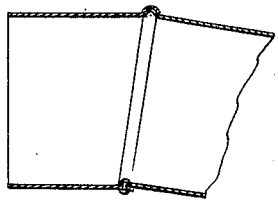


Fig. 7.



Witnesses:
A. Ruppert
John Eils

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UNITED STATES PATENT OFFICE.

JOHN S. LUGG, OF SPRINGFIELD, OHIO, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO WILSON G. BRYANT AND LAFAYETTE BANCROFT, OF SAME PLACE.

IMPROVEMENT IN STOVE-PIPE-ELBOW MACHINES.

Specification forming part of Letters Patent No. **177,408**, dated May 16, 1876; application filed March 21, 1876.

To all whom it may concern:

Be it known that I, JOHN S. LUGG, of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Machines for Making Stove-Pipe Elbows, of which the following is a specification:

On the 8th day of April, 1873, Letters Patent of the United States No. 137,525 issued to Lafayette Bancroft for an improved sheet-metal elbow for stove and other pipes, made of sections of sheet metal connected by beads which extend only partially around the pipe, and by rivets or other suitable means.

The machine which is the subject of this application is especially adapted for joining the sections of such an elbow, though I do not limit the claims to this use of the machine.

My invention consists in a die, adapted for joining the sections by forming the beads in their overlapping edges and simultaneously heading the rivet which connects them, and in the combination of mechanism connected with the die.

In the annexed drawings, which are made part of this specification, Figure 1 is an elevation of the machine. Fig. 2 is an elevation, showing the horn and a vertical section of the die and operative mechanism. Fig. 3 is a plan and horizontal section. Fig. 4 is a plan, showing the eccentric cam which operates the sections of the clamp. Fig. 5 is a plan view of the sectional die. Fig. 6 is a section, showing two of the sections of the pipe when prepared for the action of the die; and Fig. 7 is a similar section of the pipe, showing the bead and rivet after the action of the cam.

The same letters are employed in all the figures in the indication of identical parts.

A is the frame of the machine, which carries the operative parts, and consisting of legs, a bed, and columns, supporting the press mechanism. A horn, B, is bolted to the bed, and supports the expanding-die, having such curvature as adapts it for supporting the elbow as the sections are successively attached. The clamp C is also sustained by the bed by means of stems C^1 attached to the respective sections of the clamp, which enter recesses in the bed formed to receive them. A groove, C^2, is cut in the inner faces of the sectional clamp at the angle in the middle intended to receive the convex bead, when it is formed in the sections of the elbow, when they are joined. Another similar concavity, C^3, is formed near the lower edge of the sections of the clamp at a distance from the concavity C^2 corresponding precisely to the spaces between the beads on the completed elbow. Another concavity is formed at C^4, to receive the head of the rivet which joins the sections at the ends of the respective sheets or strips. D is an annular cam with eccentric faces embedded in the upper face of the bed, and having an eccentric flange engaging inclined grooves across the stem C^1 of the sectional clamp. It is turned by a lever, D^1, by means of which the clamp may be expanded or contracted to permit the introduction or withdrawal of the elbow. Within the sectional clamp, and supported on the end of the horn B, is the expansible sectional die E. It is made in sections with radial edges, as shown in Fig. 5, and has a hole in the center, where the sections converge. On the periphery of the die is a flat place, E^1, having a concavity to form the head on the inner end of the rivet, and a convexity on the remainder, to form the bead on the elbow. Radial slots cut in the sections of the die receive pins F, which serve as guides and stops, and also containing spiral springs G, to retract the sections when released after being expanded. The die is expanded by means of a conical-pointed plunger, H, on a cross-head, H′, hung between the ways I I, and actuated by a toggle-joint, K, operated by a treadle or other convenient power. The length of the clamp is that of two sections of the pipe, and its upper and lower edges conform in inclination to the bevel of the sections of the elbow.

The machine is operated as follows: The strips, having been cut to the proper shape, are bent and connected by punching the overlapping ends of the sections. The end section and the second section are then connected by hand, and pushed down through the clamp until the upper edge of the second section is opposite the edge of the clamp, and the joint is between the fillet on the die and the recess in the middle of the clamp, the rivet being in place to be

linched. The plunger H is then forced down, xpanding the die, and forming the bead in he joint of the elbow, and compressing the ivet to form the head on the inner end. The lamp is then released, another section at- ached, and let down until the bead formed be- ween the first two sections enters the lower ecess C^3, which thus forms a gage to fix the roper position of the succeeding section to re- eive the bead. When all the sections have een completed the clamp is opened, and the lbow taken off the horn.

What I claim as my invention, and desire o secure by Letters Patent, is—

1. The horn B, supporting the expanding- ie and the elbow as the sections are succes- vely attached, substantially as set forth.

2. The sectional clamp with grooves C^2 C^3 ranged in relation to one another, substan- ally as set forth.

3. In combination, the sectional clamp with roove C^2 and sectional expanding-die E, with peripheral convexity E^2, for forming the bead, and intermediate space E^1, with recess for forming the head on the rivet, substantially as set forth.

4. In combination, the recessed sectional clamp, ribbed sectional die, and plunger, for expanding the die to form the head and unite the sections of the elbow, substantially as set forth.

5. The combination of the horn and the sectional die with the sectional clamp and plunger, substantially as set forth.

6. The clamp C, having its upper edges beveled to correspond with the angle of the sections of the elbow, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN S. LUGG.

Witnesses:

D. P. HOLLOWAY,

A. RUPPERT.