(No Model.) 2 Sheets—Sheet 1.

T. CROSIER.

TOOL FOR EXPANDING AND BEADING FLUES.

No. 281,346. Patented July 17, 1883.

Fig. 1.

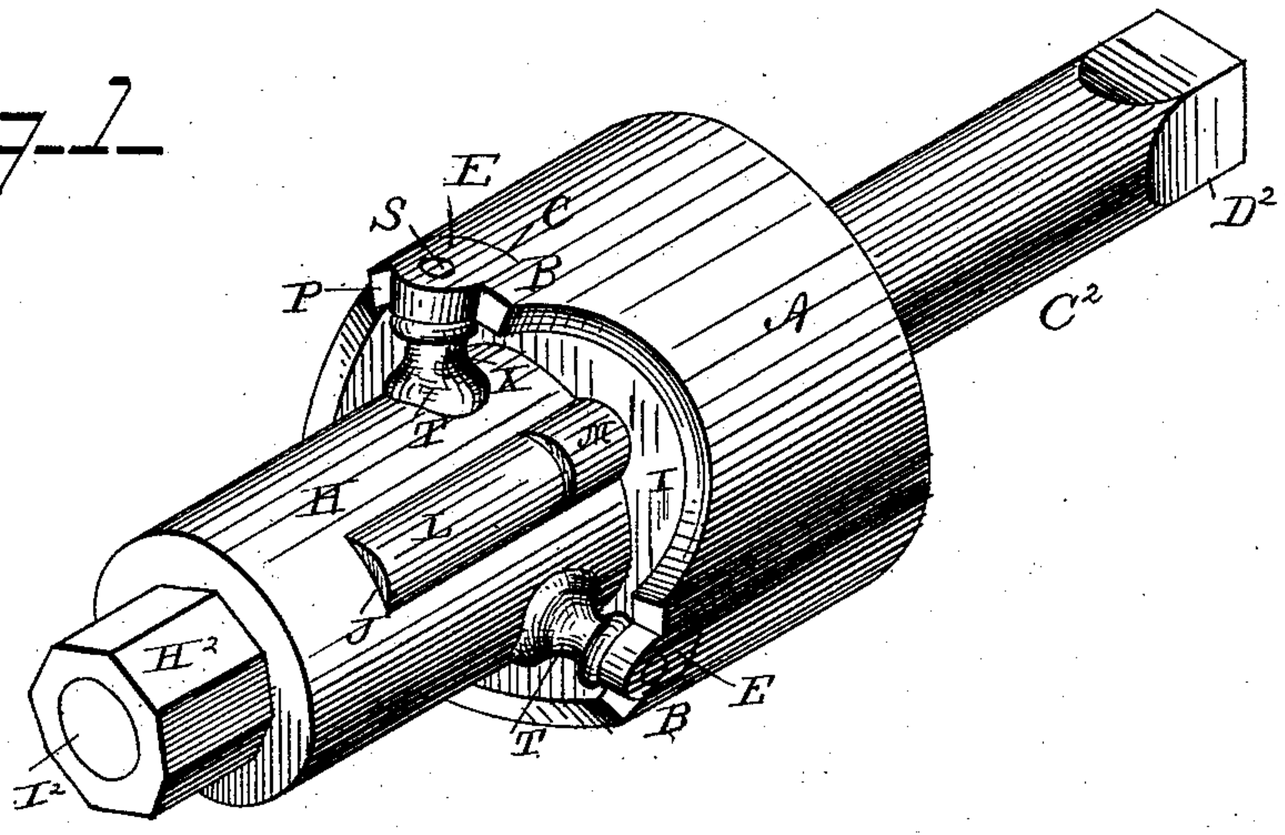


Fig. 2.

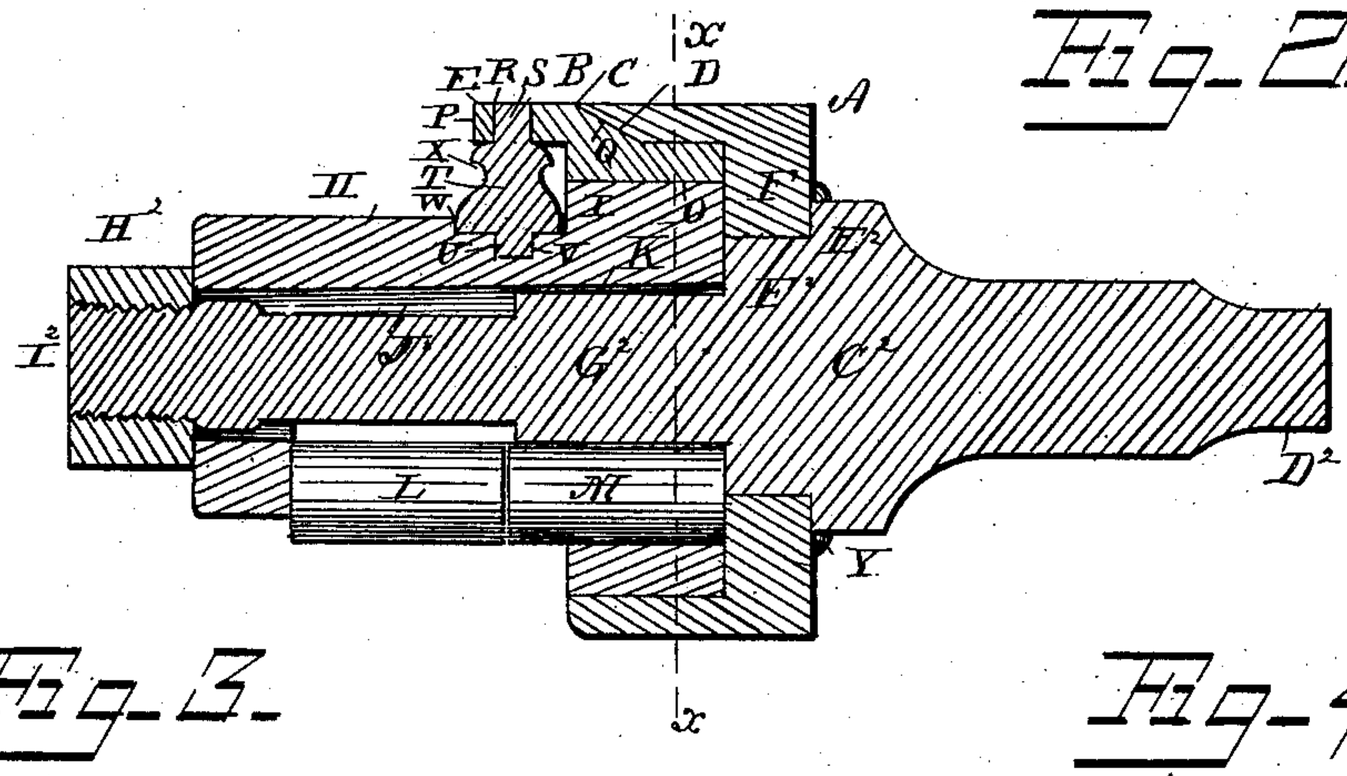


Fig. 3.

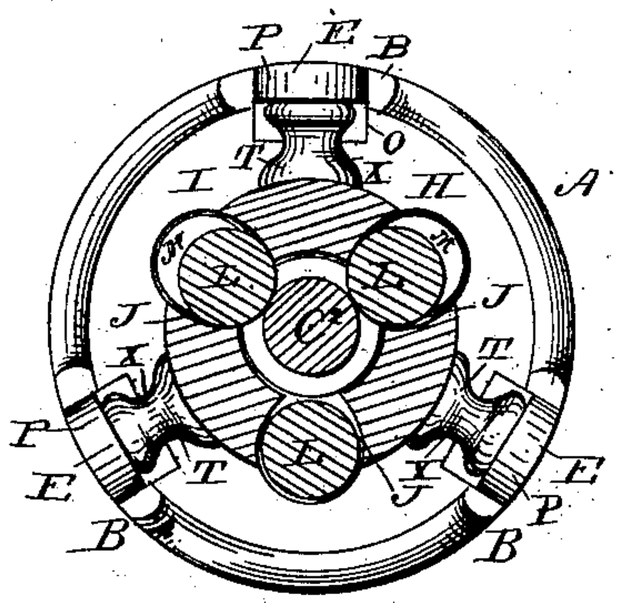
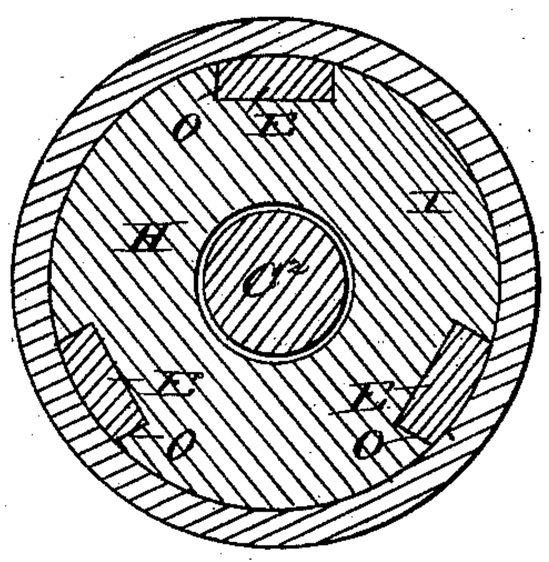


Fig. 4.



WITNESSES
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(No Model.) 2 Sheets—Sheet 2.

T. CROSIER.

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Fig. 5.

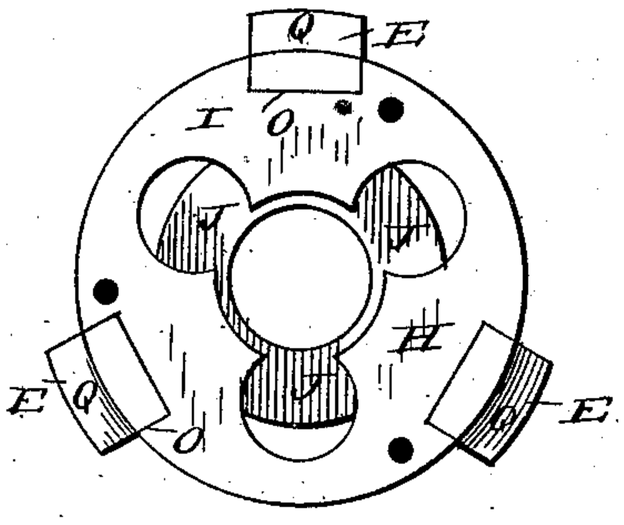

Fig. 6.

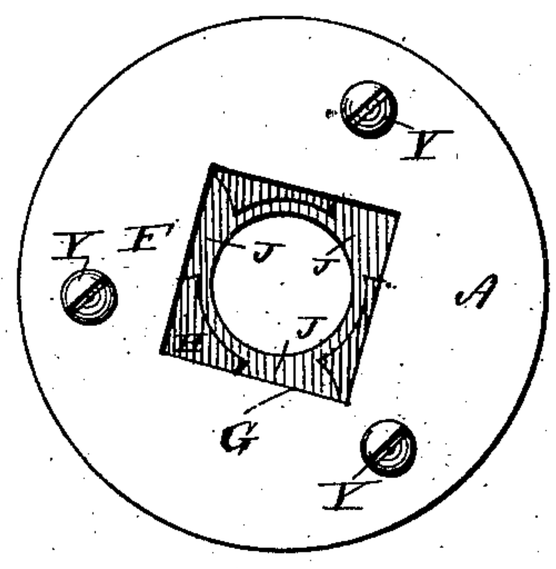

Fig. 7.

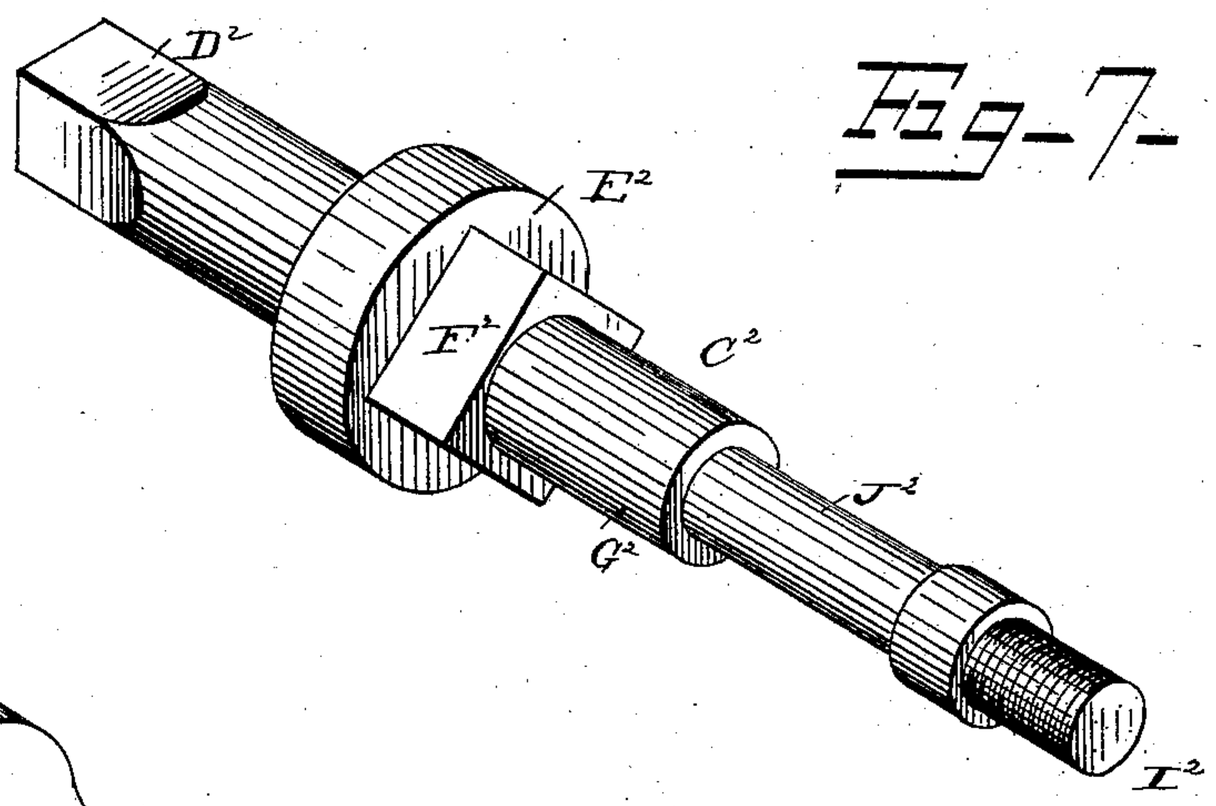

Fig. 8.

Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS CROSIER, OF COLUMBUS, OHIO.

TOOL FOR EXPANDING AND BEADING FLUES.

SPECIFICATION forming part of Letters Patent No. 281,346, dated July 17, 1883.

Application filed June 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CROSIER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Tool for Expanding and Beading Flues, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to tools for expanding and beading boiler and other flues; and its object is to provide a simple, inexpensive, durable, and efficient tool by which both the expansion and beading can be effected with superior convenience and with great economy in time.

In the drawings, Figure 1 is a perspective view of my device. Fig. 2 is a longitudinal sectional view of the same, taken on the plane of the beading-rolls. Fig. 3 is a longitudinal sectional view taken on the plane of the expanding-rolls. Fig. 4 is a transverse sectional view taken through the front expanding-rolls and looking rearwardly. Fig. 5 is a transverse sectional view taken through the shell, the brackets, and the stock, on the line *x x*, Fig. 2. Fig. 6 is a rear end view of the stock with the casing and mandrel removed. Fig. 7 is a rear end view of the casing in position on the stock. Fig. 8 is a perspective view of the expanding-mandrel. Fig. 9 is a detail perspective view of the beading-mandrel.

Referring to the drawings, A designates the cylindrical shell or casing, having projecting portions B from its front edge, in which projections are formed recesses C, having beveled rear walls, D, these recesses being adapted to receive bracket-plates E, which will be hereinafter described. The rear end of this cylindrical shell A is closed by a wall, F, in which is provided a central rectangular opening, G, as shown.

H is a hollow cylindrical stock, which is provided with an annular flange or enlargement, I, at its inner end, and is provided with a series of longitudinally-disposed slots, J, which extend under the flange, as shown at K, and open at the rear end of the stock. These slots are circular in cross-section, so that the expanding-rolls will not be displaced laterally, but can be inserted or removed at the rear end of the stock.

In each slot is preferably arranged a pair of rolls, L M, the rear rolls, M, of which serve to retain the front rolls, L, in position, and can be substituted for the latter in case of breakage.

In the flange I are formed grooves or recesses O, disposed longitudinally in relation to the stock and arranged between the rolls. These recesses receive bracket-plates E, which have an extension, P, that projects from the flange forwardly, and is provided with a beveled rear edge, Q, that corresponds to the beveled walls D when the shell is placed in position over the stock. In these extensions P are provided bearings R, for the end gudgeons, S, of the beading-rolls T, the gudgeons U, at the bottom of said rolls, having their bearings in the stock, as shown at V. The beading-rolls are disposed at right angles to the stock, and their inner or bottom ends enter corresponding recesses, W, formed in the said stock. These rolls are thus held securely in position and have their surface concaved, as shown at X. The casing A is adjusted over the rear flanged end of the stock, as shown, so that the rear wall, F, serves to retain the rolls L and M in position, and the casing is secured in this position on the stock by screws Y, that pass through the rear wall, F, of the casing and into the stock.

Z is the expanding-mandrel, which is formed tapering, and is provided with perforations A^2, extending radially through its head B^2, in which a lever can be inserted to turn the mandrel. After the flue is inserted in the flue-sheet, the tool is inserted in the end of the flue, and this expanding-mandrel is inserted through the central bore of the device and is driven lightly, so that it will force the expanding-rolls L and M outward, when, as the mandrel is turned, friction causes the said rolls to revolve and set out the end of the flue in the flue-sheet to make a tight joint. The tool is then removed from the flue and the beading-mandrel C^2 is inserted in lieu of the expanding-mandrel, when, by turning the device, the beading-rolls are forced against the end of the flue and cause the latter to turn outward, and thus form a perfect bead without the use of a hammer. The beading-mandrel C^2 is provided with a squared outer end, D^2, by which it can be connected with a suitable operating device,

and with a shoulder, E^2, arranged to come against the wall F of the casing A, in front of this shoulder being formed a rectangular portion, F^2, corresponding to the rectangular opening G, and received thereby. The portion G^2 of the mandrel extending from this rectangular portion F^2 is cylindrical in form, and passes through the bore of the device, and is retained in position by a clamping-nut, H^2, screwed on its front projecting end, I^2. The cylindrical portion G^2 is formed with a peripheral depression, J^2, which will permit the rolls to drop when the device is in use for forming the bead.

I claim as my invention—

1. The combination, with a hollow cylindrical stock having a series of longitudinally-disposed slots formed cylindrical in cross-section, of corresponding rolls arranged loosely in the said slots, and a cylindrical shell or casing fitted over the end of the stock, and provided with an end wall to retain the rolls in position, and provided with a central opening, as set forth.

2. The combination of a hollow cylindrical stock having the longitudinally-disposed slots, and provided with the projecting flange at one end, corresponding rolls arranged in the slots, brackets projecting from the said flange, the concaved beading-rolls having their end bearings in these brackets and in the stock, and the cylindrical shell or casing fitted over the flange, and having the end wall, in which is provided a central perforation, as set forth.

3. The combination of the cylindrical hollow stock having the series of cylindrical longitudinally-disposed slots, and provided with the recesses W and bearings V, the rolls arranged in the said slots, the flanged portion at the end of the stock, having the recesses O, the bracket-plates fitted in these recesses and projecting from the flange, the beading-rolls having the concaved peripheries, and provided with bearings in the brackets and in the recesses W, the shell or casing fitted over the flange of the stock, and provided with the rear wall having the opening, and also formed with the recesses C, and a mandrel passing through the bore of the device, as and for the purpose set forth.

4. The combination of a cylindrical hollow stock having the longitudinally-disposed slots formed cylindrical in cross-section and opening at the rear end of the stock, the rolls arranged loosely in the said slots and adapted to be readily removed therefrom, a cylindrical shell or casing fitted over the rear end of the stock, and provided with a rear wall having a central opening, and an expanding-mandrel passing through this opening and through the stock, as and for the purpose set forth.

5. The combination of a cylindrical hollow stock having a raised flange at its end, and provided with bracket-plates projecting from this flange, beading-rolls having concaved peripheries, and provided with bearings in the plates and in the stock, a shell or casing fitted over the flange, and provided with a rear wall having a rectangular opening, and a mandrel having a shoulder abutting against the wall, and formed with a corresponding rectangular portion that passes through the said opening, as and for the purpose set forth.

6. The combination of a cylindrical hollow stock having the end flange in which are formed the recesses O, the bracket-plates fitted in these recesses and projecting from the flange, the beading-rolls having the concaved peripheries, and having their bearings in the projecting portions of the brackets and in recesses W, formed in the surface of the stock, the shell or casing having the end wall formed with the rectangular central opening, and provided also with the recesses C in its front edge, and the mandrel having the shoulder, the rectangular portion, and the main cylindrical portion, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

THOMAS CROSIER.

Witnesses:
R. T. KING,
W. B. FRANCIS.