

(No Model.)

G. W. WHITMAN.

DEVICE FOR PUNCHING METAL TUBES.

No. 295,090.

Patented Mar. 11, 1884.

Fig. 1.

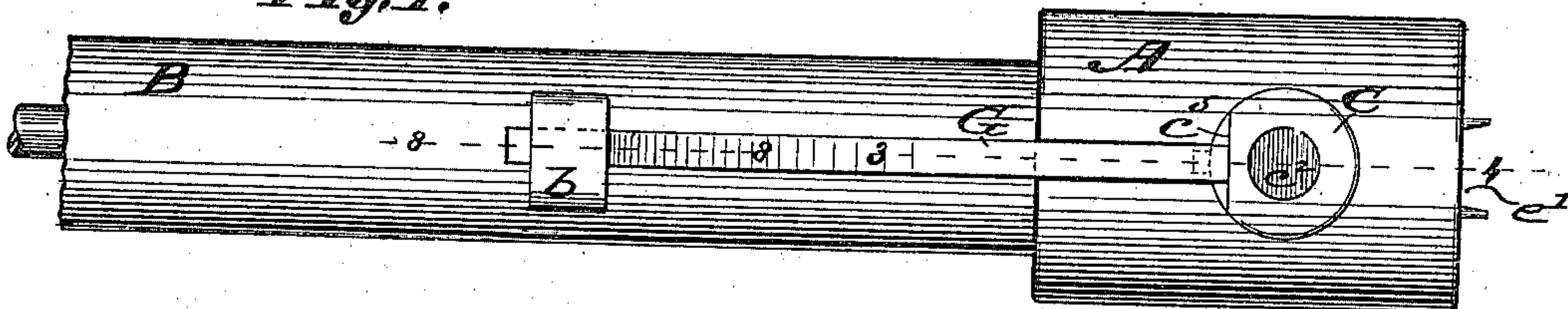


Fig. 2.

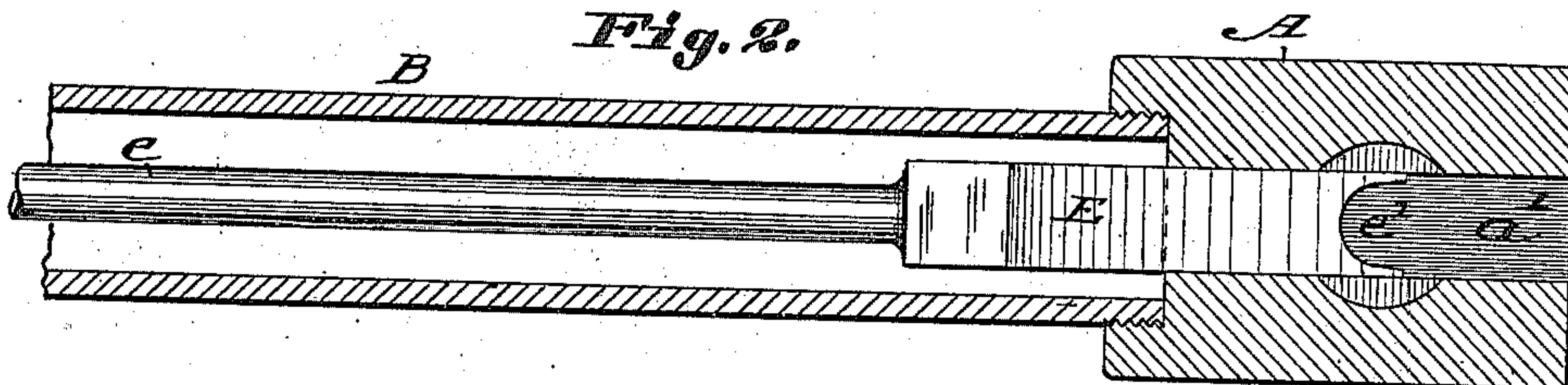


Fig. 3.

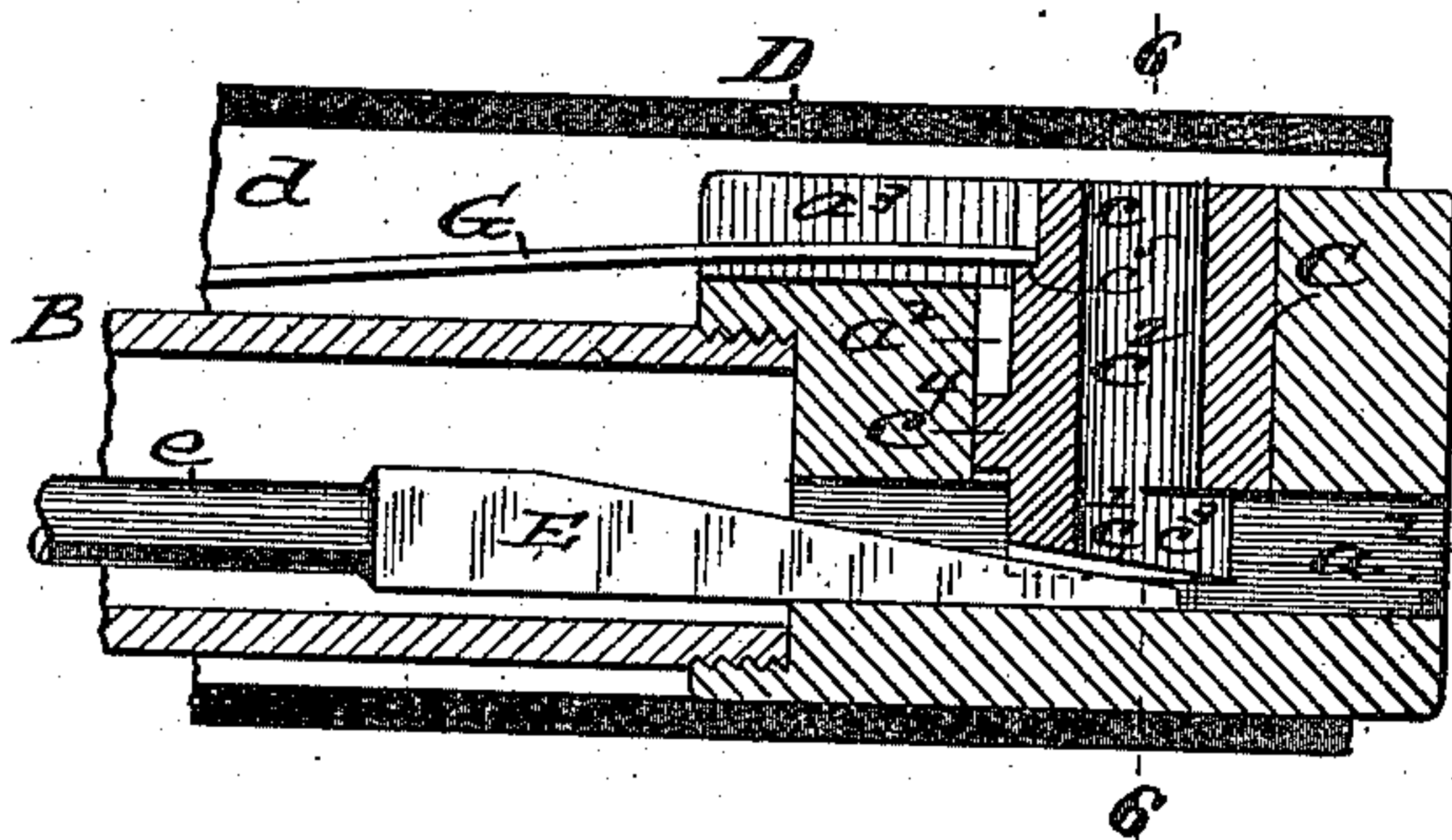


Fig. 4.

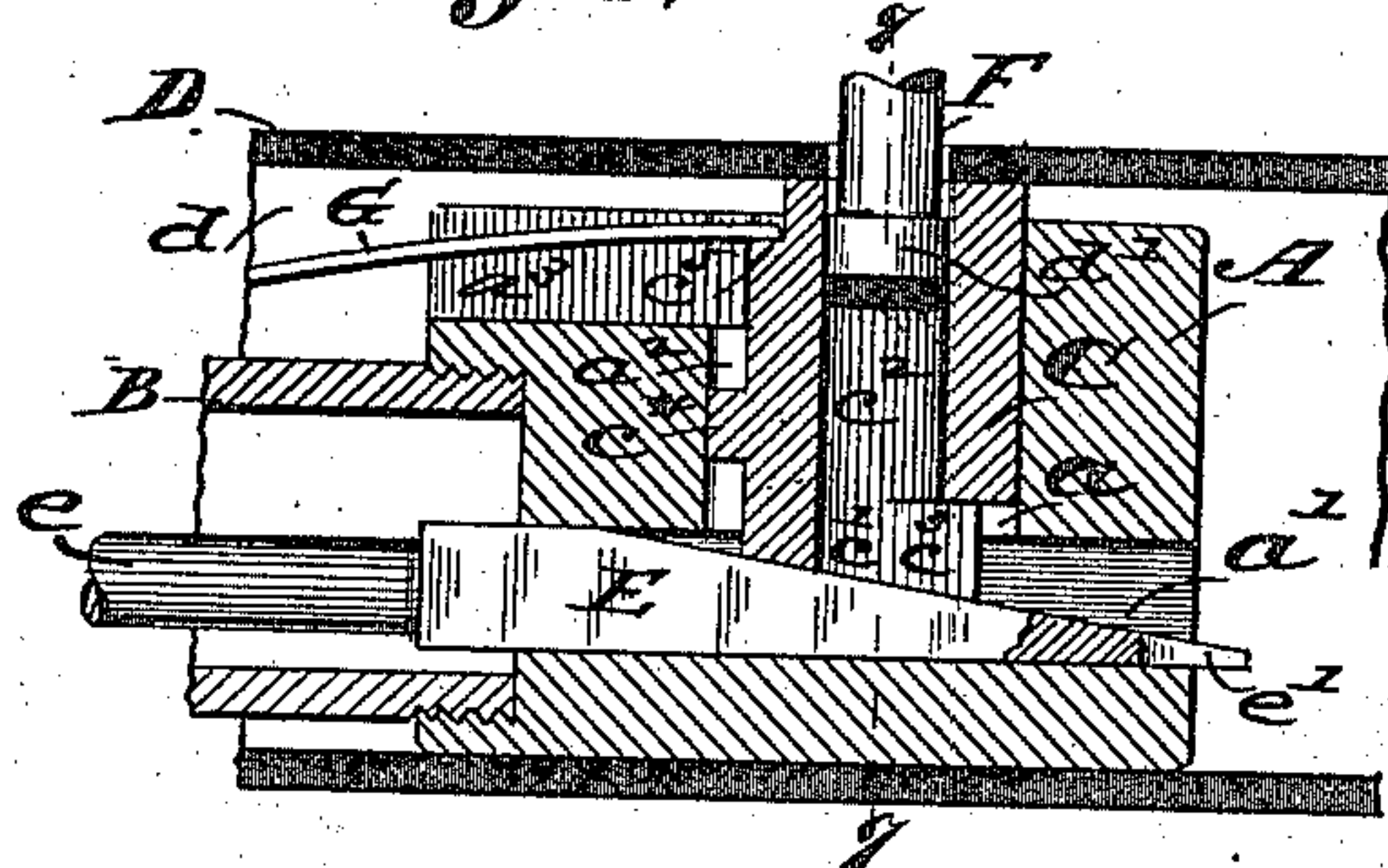


Fig. 5.

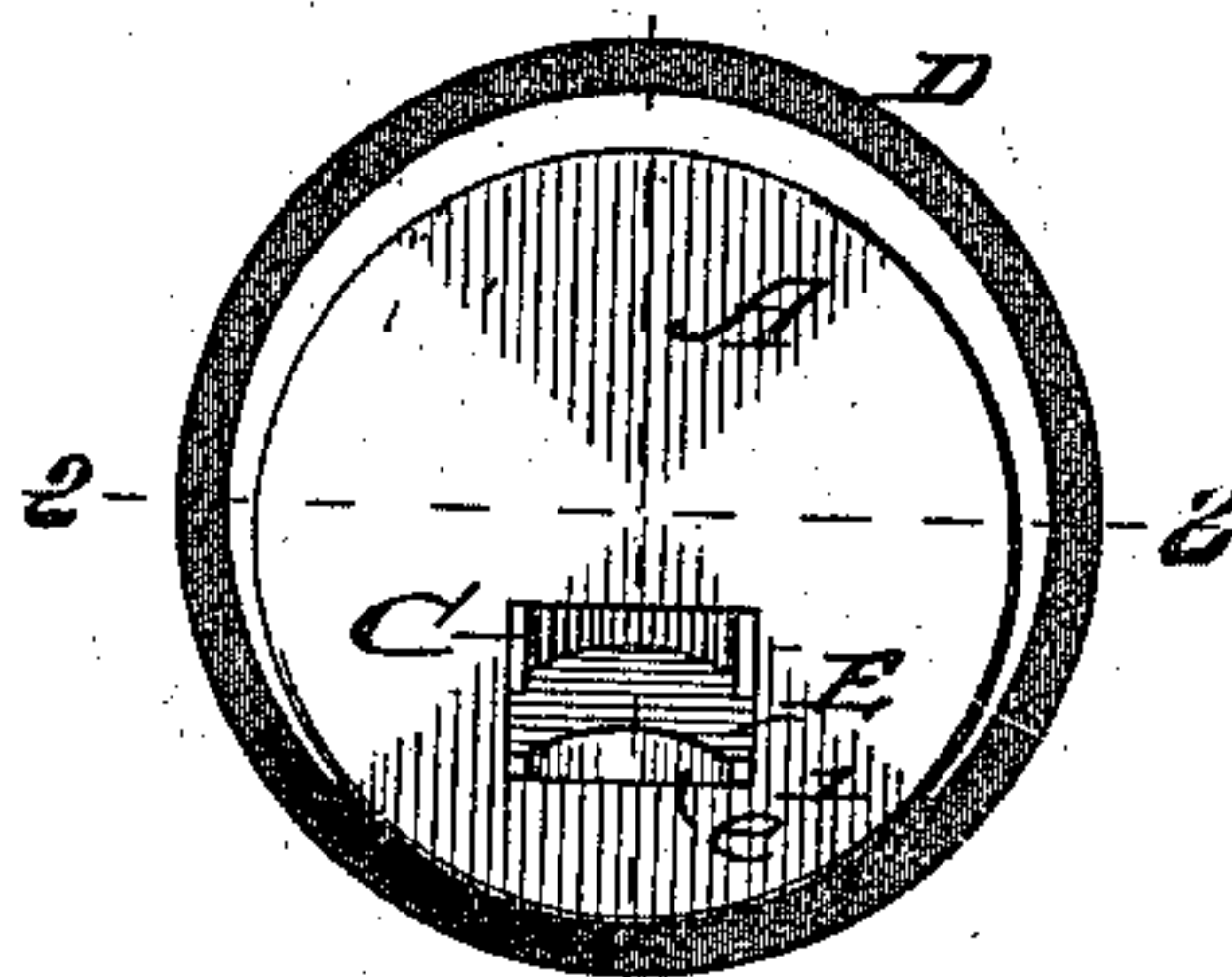


Fig. 6.

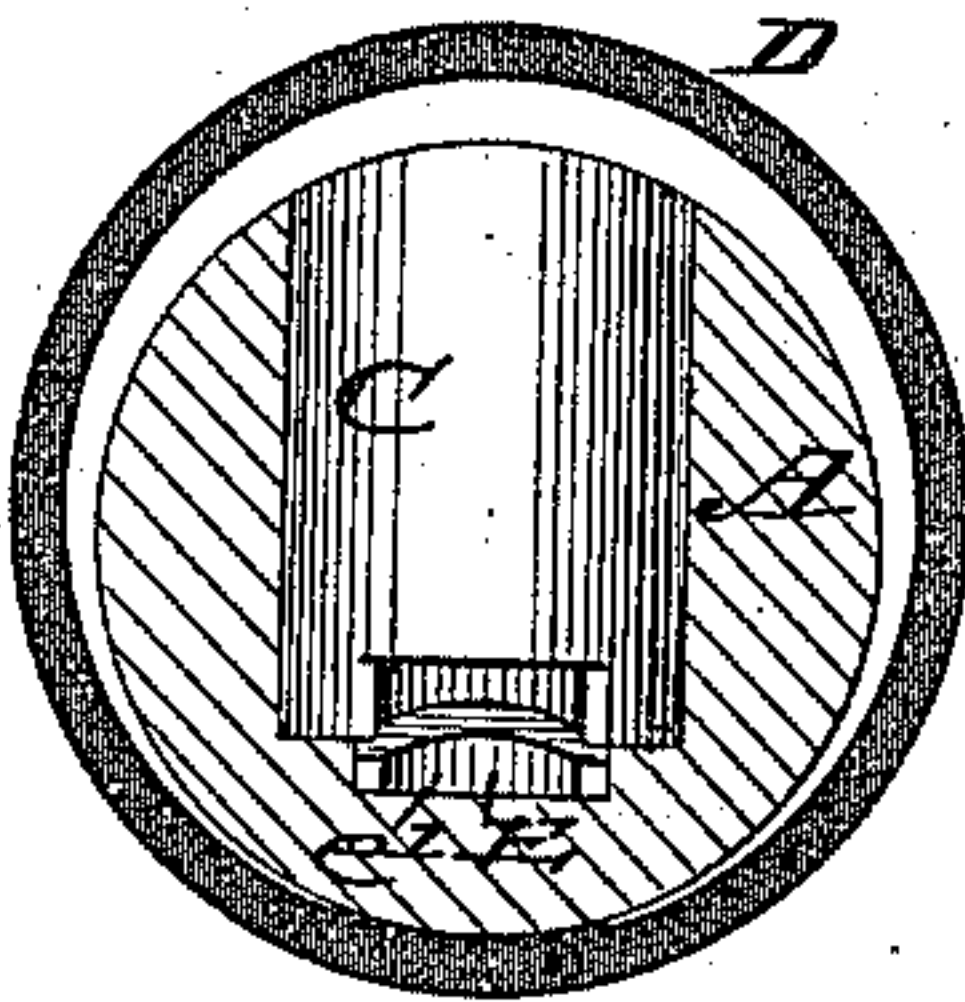


Fig. 7.

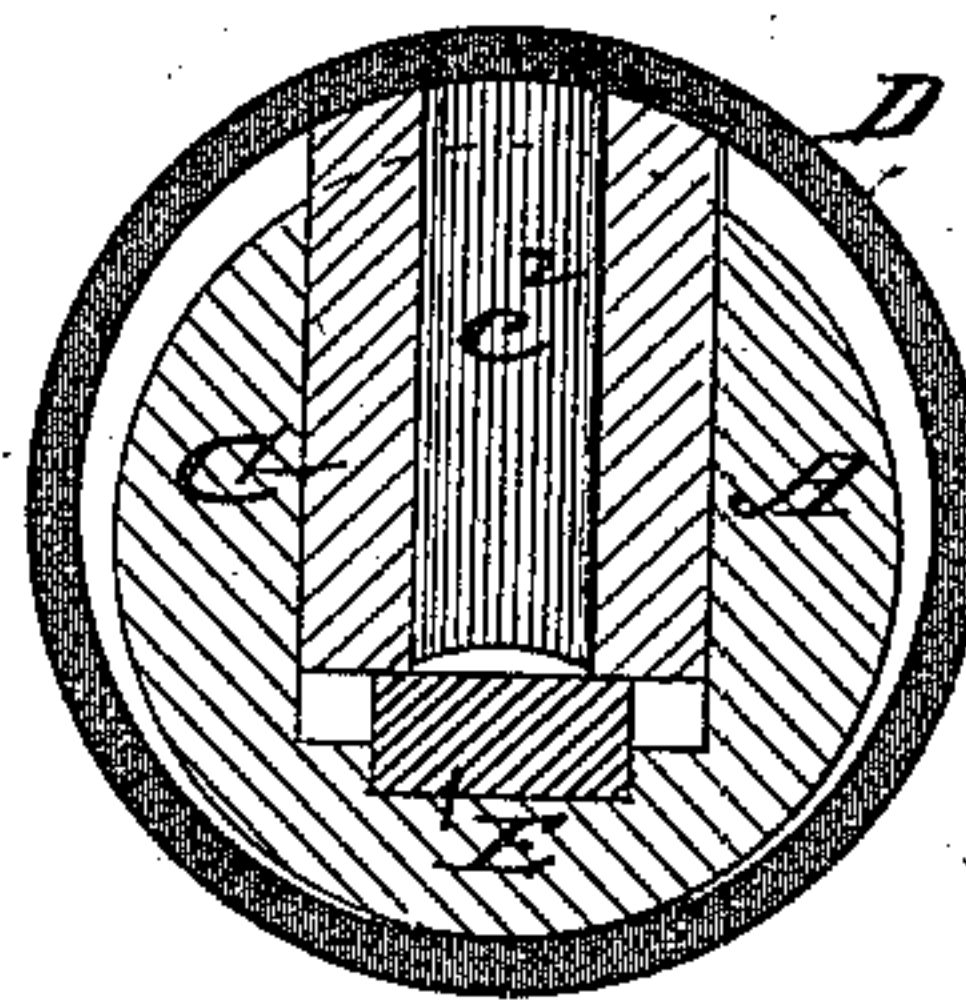
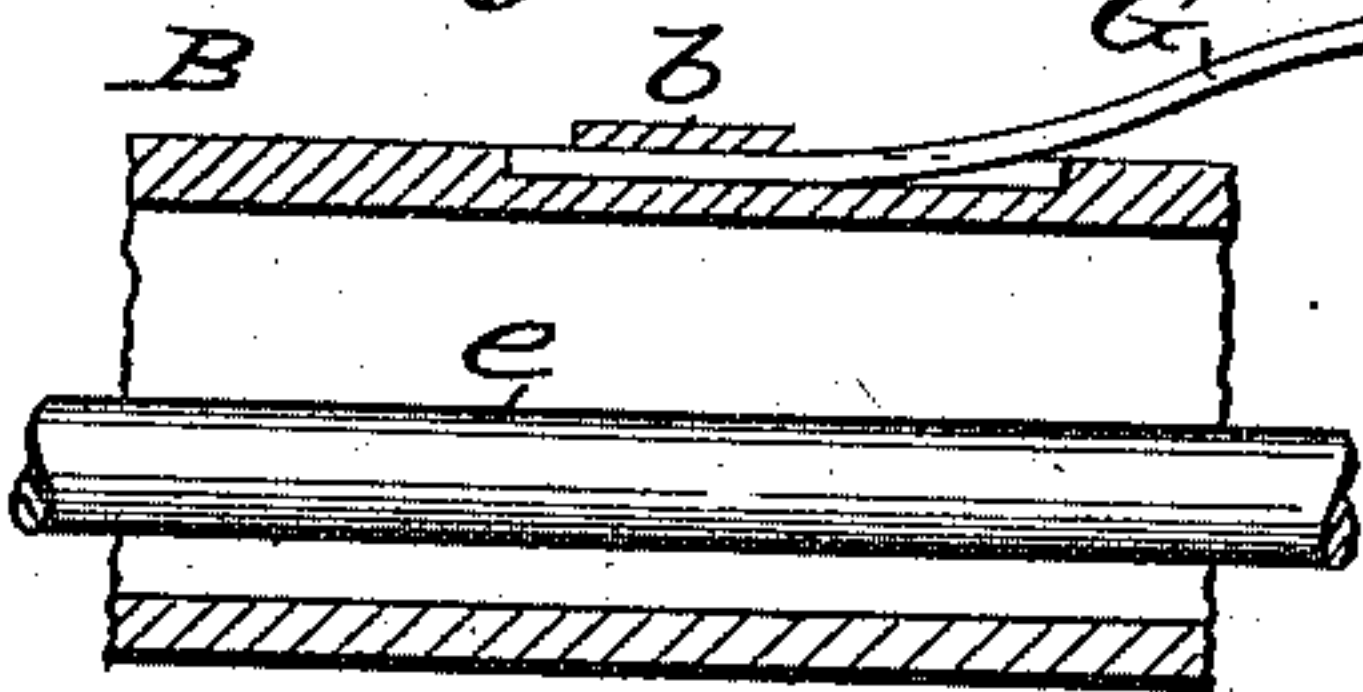


Fig. 8.

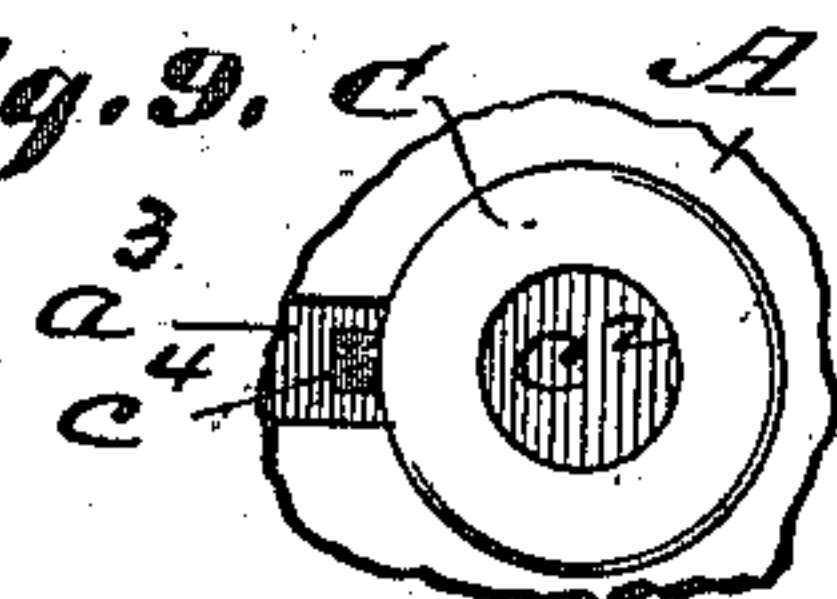


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Fig. 9.



UNITED STATES PATENT OFFICE.

GEORGE W. WHITMAN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO M. C. BIGNALL, OF SAME PLACE.

DEVICE FOR PUNCHING METAL TUBES.

SPECIFICATION forming part of Letters Patent No. 295,090, dated March 11, 1884.

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

To all whom it may concern:

Be it known that I, GEORGE W. WHITMAN, of St. Louis, Missouri, have made a new and useful Improvement in Devices for Punching Metal Tubes, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a plan of the device; Fig. 2, a horizontal section taken on the line 2 2 of Fig. 5, the tube not being shown; Fig. 3, a vertical longitudinal section taken on the line 3 4 of Fig. 1, the parts being as when the die is lowered; Fig. 4, a similar section on the line 3 4 of Fig. 1, the parts being as when the punch is in operation; Fig. 5, an end view of the device in the tube; Fig. 6, a cross-section on the line 6 6 of Fig. 3; Fig. 7, a cross-section on the line 7 7 of Fig. 4; Fig. 8, a detail, being a longitudinal section on the line 8 8 of Fig. 1; and Fig. 9, a view of the die in position, the spring being detached.

The same letters of reference denote the same parts.

This invention is an improvement in that class of devices for punching tubes wherein a die and mandrel within the tube are used in connection with a punch operated from without the tube.

The improvement has relation to the mode of constructing and operating the mandrel and die.

A represents the mandrel. It is cylindrical in form, and in diameter somewhat smaller than the tube being punched, and it is provided with a handle, preferably the tube B. The handle might be made in one piece with the mandrel, but is preferably made separately and attached thereto, and preferably as shown in Figs. 3, 4.

C represents the die. It is held in a recess, *a*, in the mandrel, the recess extending from the top side of the mandrel crosswise thereinto, and at its inner end connecting with the perforation *a'*, which extends longitudinally in and preferably entirely through the mandrel. The die is capable of adjustment in the recess *a*—that is to say, when it is desired to adjust the device the die can be drawn or moved into

the mandrel, so as to withdraw the outer end, *c*, of the die away from contact with the inner surface, *d*, of the tube D, and when it is desired to punch the tube the die can be set out from the mandrel, so that the outer end of the die shall bear against the inner surface of the tube. The first-named position is shown in Fig. 3 and the last-named in Fig. 4. The inner end, *c'*, of the die is beveled. A wedge, E, is adapted to be moved forward and backward in the recess *a'* in the mandrel beneath the die. The handle *e* of the wedge extends within the mandrel-handle, and suitably to be within reach of the operator. On moving the wedge forward in the recess *a'* in the mandrel, it operates to force the die outward therefrom against the inner surface of the tube and opposite the point where it is desired to make the perforation. The punch F, by any suitable means, (not shown,) is then operated in connection with the die, as indicated in Fig. 4, causing the tube to be perforated and the piece *d'*, punched from the tube, to be carried downward through the die. The piece drops onto the forward end of the wedge, E. The wedge is then withdrawn from beneath the die. A spring, G, then acts to force the die downward into the mandrel, as shown in Fig. 3. The punch meanwhile is withdrawn from the die and tube, and the device is readjusted in the tube. The wedge is then again forced beneath the die, causing it to move again against the tube, whereupon a second perforation is made, and so on. As the wedge moves forward, it not only operates the die, but also serves to remove the piece *d'* punched from the tube. The forward end of the wedge forces these pieces forward through the recess *a'* in the mandrel, so that no difficulty can arise from the pieces accumulating in the vicinity of the die. The pieces, after passing through the mandrel, drop into the tube, and by the action of the mandrel are moved farther along in the tube. The wedge at its forward end is preferably shaped out as shown at *e'*, Figs. 1, 2, 4, 5, 6, to hold the piece *d'* as it drops through the die, and thereby with more certainty removing it from the mandrel. The opening *c'* in the die at its lower end is extended side-

wise through the die, as shown at c^3 , to enable the piece d' to be discharged in a sidewise direction through the die as the wedge is being withdrawn from beneath the die. The wedge is somewhat wider than the opening in the die, and its under side is flattened, as shown more distinctly in Figs. 3, 4, 5, 6, 7. This insures the proper working of the wedge with relation to the die. The die in its movement is guided by means of the projection c^4 , which extends laterally from the die into a slot, a^2 , in the mandrel, Figs. 3, 4. The spring G at its inner end is conveniently attached to the mandrel-handle by tucking the end of the spring under the holder b , which is attached to the mandrel-handle. The outer end of the spring bears upon the shoulder c^5 of the die. The mandrel is grooved at a^3 to admit the spring G.

It will be noticed that the entire device, the mandrel, the die, and the wedge, can be adjusted as one piece in the tube. This greatly facilitates the operation of the device. The die can always be readily, positively, and accurately set out against the inner surface of the tube, and when the wedge is withdrawn the spring insures the withdrawal of the die into the mandrel. The pieces punched from the tube are promptly removed from the vicinity of the die and from the mandrel, and nothing, in consequence, interferes with the proper working of the die or of the wedge.

I claim—

1. The combination of the mandrel A, the tube B, the die C, the wedge E, and handle e , substantially as described.
2. The combination of the mandrel A, the tube B, the die C, the wedge E, the handle e , and the spring G, substantially as described.
3. The combination of the mandrel A, having the perforations a and a' , as described, the die C, having the perforations c^2 c^3 , as described, and the wedge E, substantially as described.
4. The mandrel having the perforations a and a' and the slot a^2 , the die C, having the projection c^4 , the wedge E, and the spring G, substantially as described.
5. The combination of the mandrel A, the die C, and wedge E, said wedge being flattened on the under side, and moving in a groove of corresponding shape in the mandrel, and said die being guided in its movement in the mandrel, as and for the purposes set forth.
6. The combination of the mandrel A, having the groove a^3 , the tube B, having the holder b , the die C, having the shoulder c^5 , and the spring G, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 23d day of August, 1883.

GEO. W. WHITMAN.

Witnesses:

M. C. BIGNALL,
ERNEST BIGNALL.