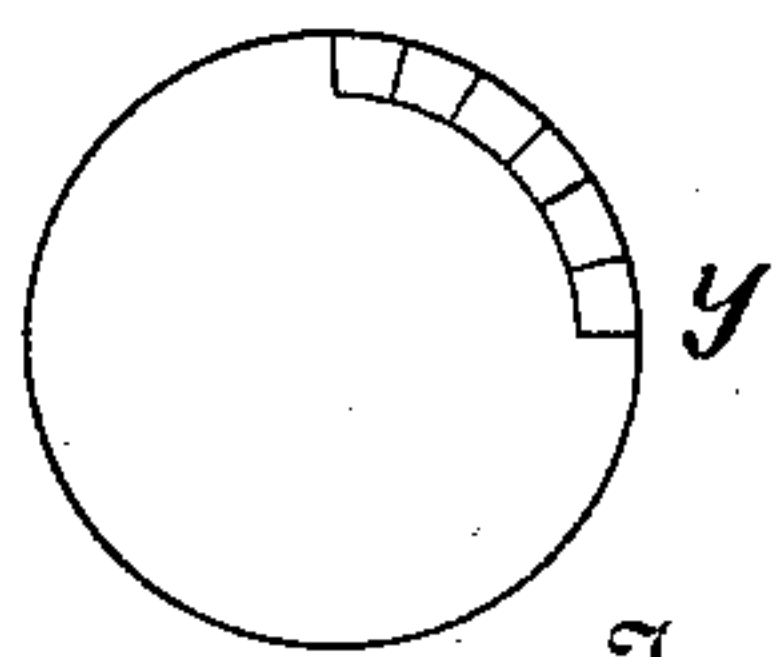
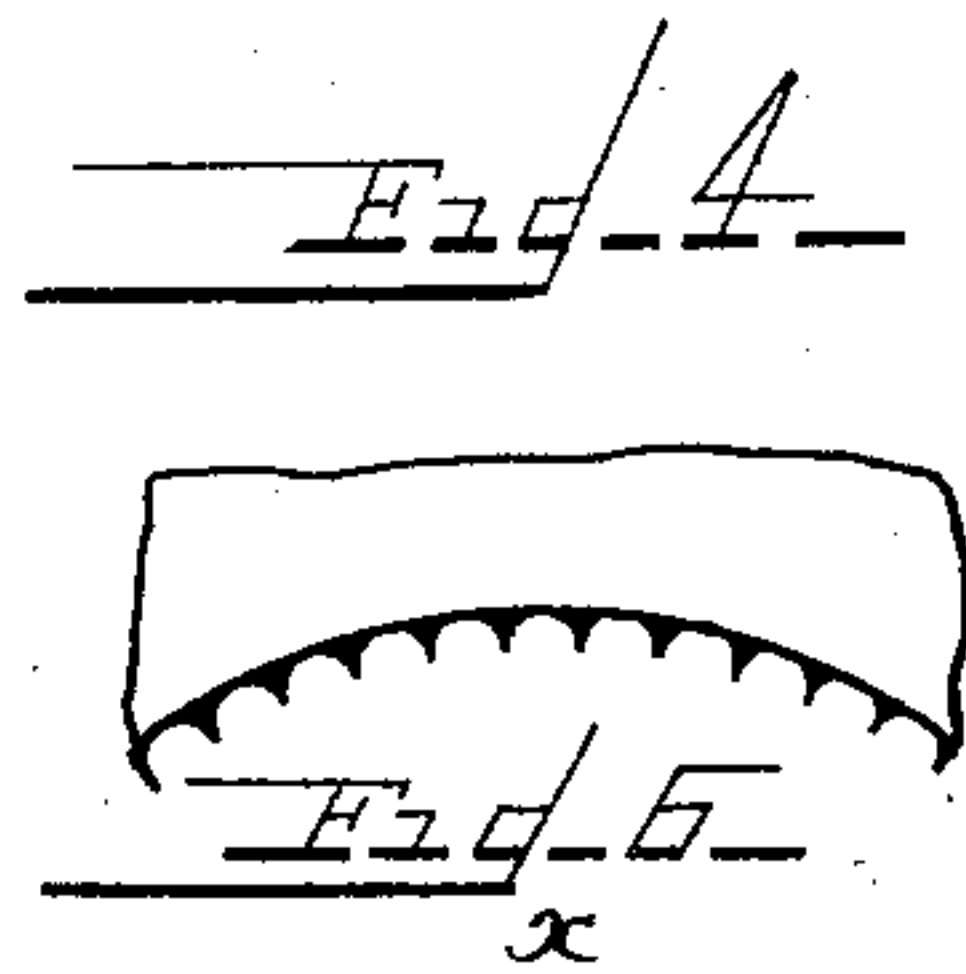
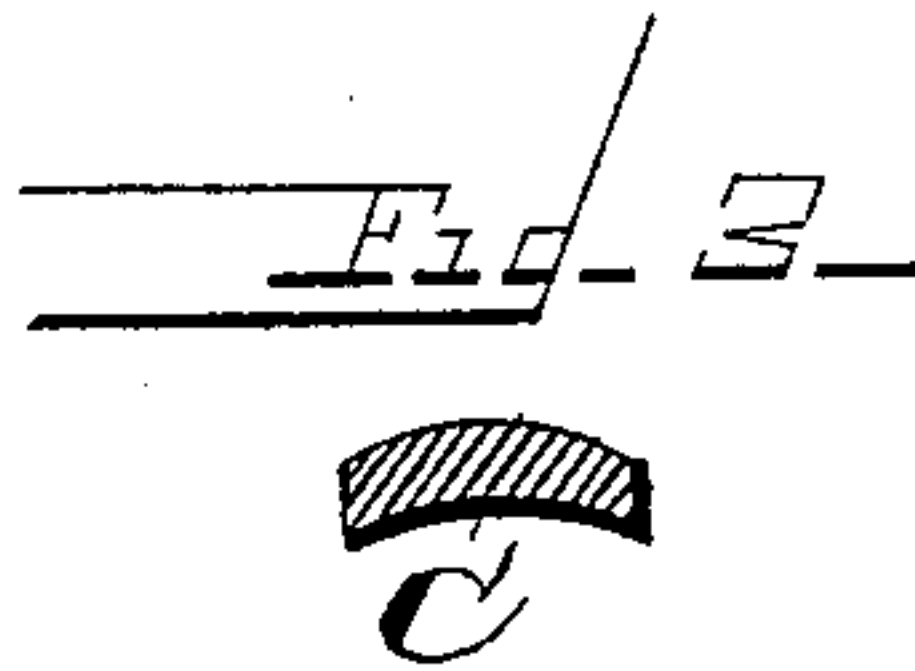
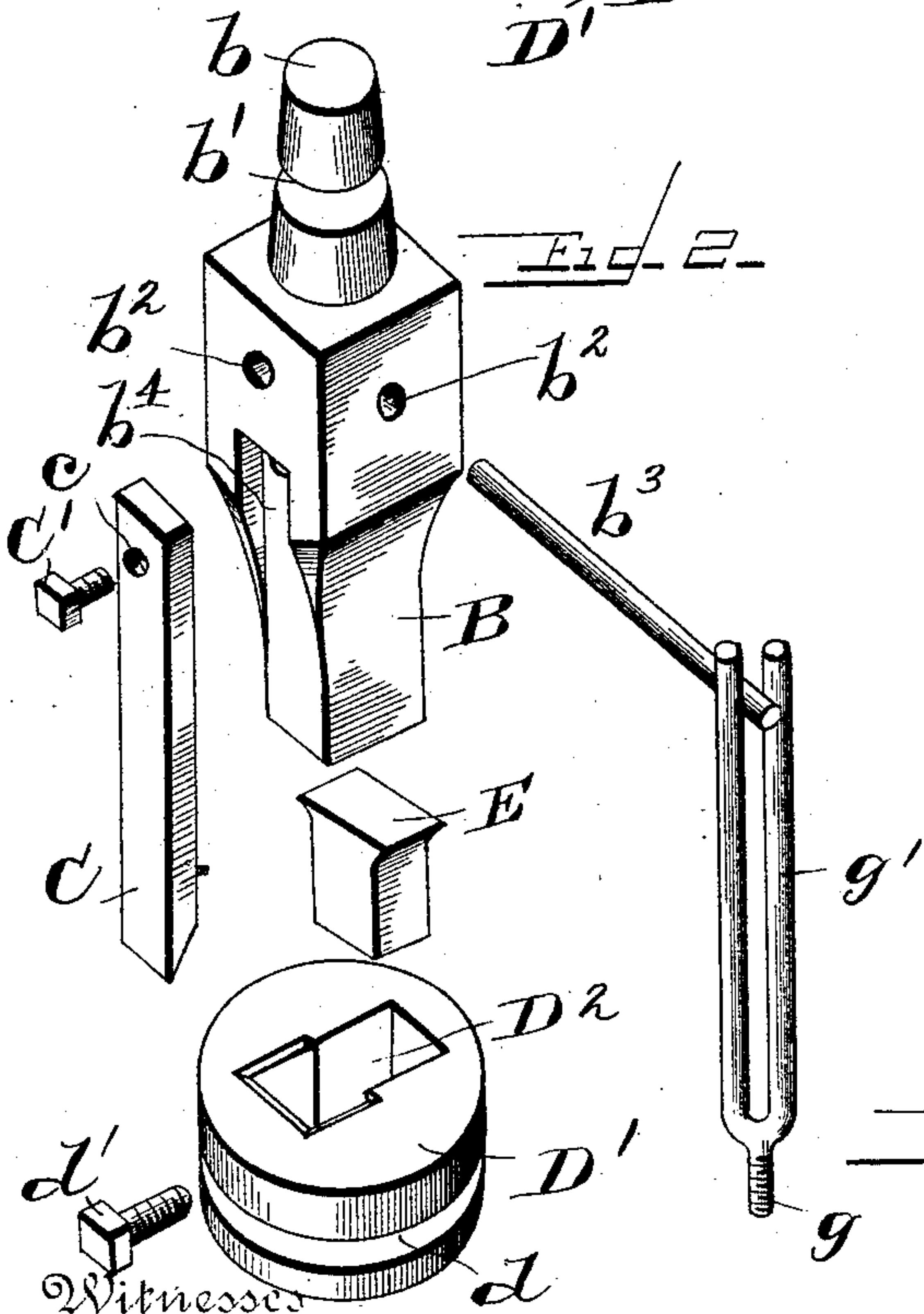
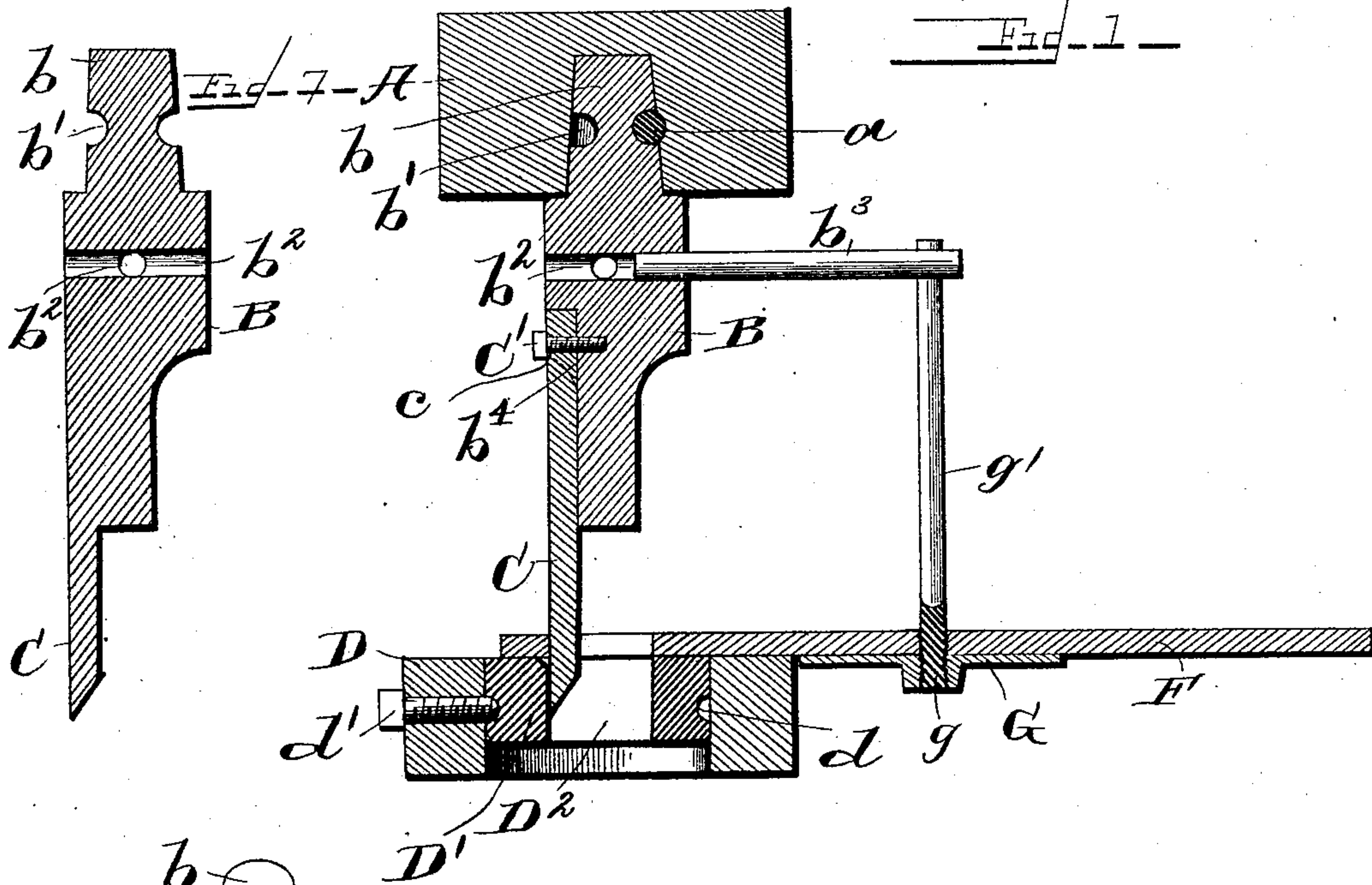


(No Model.)

T. BARROW.
PUNCHING MACHINE.

No. 483,095.

Patented Sept. 20, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS BARROW, OF CHESTER, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO ROBERT L. COURSEN, OF NEW YORK, N. Y.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 483,095, dated September 20, 1892.

Application filed December 19, 1891. Serial No. 415,655. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BARROW, a citizen of the United States, residing at Chester, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Punching-Machines; 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 appertains to make and use the same.

My invention relates to the punch and die of a punching-machine.

It consists, broadly, in so constructing the punch and die that they may be revolved, when desired, in order to cut out special shapes more effectively, thus saving time and labor.

In the drawings, Figure 1 is a central section through the head of the machine, stock, punch, die, and die-bed, the work operated upon, and a guide. Fig. 2 is a perspective view of my invention, the parts being ground ready to be placed in position. Fig. 3 is a section through a punch. Fig. 4 is a partial view of the work as it would appear after a circle has been cut by the stationary or fixed punch. Fig. 5 is a descriptive view. Fig. 6 is also a descriptive view. Fig. 7 is a view of a punch having the tongue or guide made integral.

In order to more clearly set out my invention, I will compare it with the usual style of punch.

A punch as usually made is of substantially the form illustrated in the drawings, the stock thereof being firmly held in the cross-head or sliding part of the machine, so that it cannot revolve. The punch is of a circular section, and must therefore cut a round hole. The usual die being so well known, it is needless to explain it in this connection. As now used the die and punch are in no manner connected. Now work a punch like this to cut a hole of circular shape, for example. The nearest we can cut such a hole is by punching a series of round holes so that their outside edge just touches the guide-line drawn on the work. This will give us a shape like unto that partially shown in Fig. 4. To make this opening smooth or regular, it is necessary for a workman to cut off by hand all the edges left

between successive holes, as shown by the black points in Fig. 4, this being a very slow and expensive method, but one that is at present practiced.

By my invention, instead of a circular stationary punch, I use a revoluble punch rectangular in cross-section and a die having the same-shaped hole or opening. Thus the holes cut in the work would be rectangular. The punch, instead of being fixed, is free to be rotated, so that a hole can be cut in a plate to appear at any angle, as in Fig. 5. The projection or guide passing through the die never leaves it at any point of the stroke. Thus, no matter when the punch is turned, the die will follow and the hole be fair for the punch to work in.

The projection or guide is fastened to the punch proper by a set-screw, so that for internal work the guide can be taken off until a hole is punched to admit the guide. For outside work or shapes the punch and guide may be made in one piece. For small circular holes, larger than can be punched at a single stroke of a round punch, the punch is made to a radius, as in Fig. 3. The projection or guide on the punch is of such dimensions that it can be turned completely around in the hole made in the work by the punch.

A is the cross-head or sliding part of a punching-machine, having a hole formed entirely through the same, in which a pin *a* is secured.

B is the stock or punch, having a head *b*, provided with a groove *b'*, running entirely around the said head.

*b*² are holes formed in the stock, in which fits the handle *b*³. The stock has a recess *b*⁴ in one side, in which is secured the guide or projection C, which is provided with a threaded opening *c* for the reception of a set-screw C', said screw extending into a threaded hole in the recess *b*⁴. In the bed D of the machine (which may be of any desirable pattern) is secured the die D', provided with a groove extending entirely around the same. *d*² is a set-screw, which extends through the bed D and projects into the groove *d*.

E is the nib, shaped as shown, which fits into one end of the opening D² in the die.

F is the "work" or "plate" being operated upon.

G is a plate having a hole in its center, into which is fastened the shank *g* of the forked guide *g'*.

The operation is as follows: For purposes of illustration we will suppose that a circular opening is to be cut in a plate. I first take the heel or guide C off the punch and place the nib E in the die and punch a hole in the center of the shape to be cut and secure the guide *g'* in such hole. Another hole is then punched on the guide-line of the pattern, after which the nib E is taken out of the die and the tongue C secured to the punch and works in the last-mentioned hole. One end of the handle *b*³ is inserted in one of the holes *b*² in the stock B, while the other end is placed between the forked guide *g'*. This guide is made forked, so that the handle *b*³ may move with the punch in its stroke. By putting the handle *b*³ in one of the holes *b*² and passing it through the swivel-guide *g'* the longer edge of the punch must always be tangent to the circle; or if the punch be made to a radius, as in Fig. 3, it will follow the circular line.

To make the circular opening, the first cut of the tool would be like *x* in Fig. 6. The plate being fed along and the punch turned slightly until at Y, the position of the tool would be at right angles to its position at *x*, the punch being rotated one-fourth turn in the distance X Y, Fig. 6.

It is impossible to notice the difference in shape between the cord and the arc except for very small circular holes larger than can be punched at a single stroke of a round punch, and for this purpose I provide a punch of the general form illustrated in Fig. 3. Thus it will be seen that after the shape is punched out it is finished, there being no fragments of metal around the line of the opening, as in Fig. 4. Consequently a very costly and tedious job is done away with.

It is obvious, of course, that the swivel-guide *g'* is not necessary to the successful operation of the rest of my invention, it being used simply to facilitate the working of the

punch in cutting out special shapes—such as, for instance, a circle.

It is evident that many slight changes and alterations may be made in the relative construction, and hence I would have it understood that I do not confine myself strictly to the constructions shown.

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

1. A revoluble punch provided with a guide projecting into and constantly engaging a die of a punching-machine during its operation.

2. A revoluble punch provided with a guide projecting into and constantly engaging a die of a punching-machine during its operation and a handle for turning said punch.

3. The combination, with the revoluble punch provided with a depending guide, of a die having a recess and a removable nib adapted to fit into said recess, substantially as described.

4. The combination, with a revoluble punch provided with a depending guide, of a revoluble die having a removable nib, said depending guide engaging the said die.

5. The combination, with a revoluble punch provided with a handle, of the guide *g'*, engaged by said handle, and the revoluble die, substantially as described.

6. The combination, with the cross-head or sliding part of a punching-machine, of a revoluble punch having a groove around its head, a recess, and a guide secured in said recess, and a handle adapted to enter openings in said punch.

7. The combination, with the bed-plate of a punching-machine and a set-screw therein, of a revoluble die having a groove extending entirely around its periphery and a removable nib adapted to be placed in the opening in said die.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS BARROW.

Witnesses:

GEO. T. BUTLER,
JOS. H. HINKSON.