

(No Model.)

F. H. SEIBEL.
PUNCH.

No. 401,220.

Patented Apr. 9, 1889.

Fig. 2.

Fig. 3.

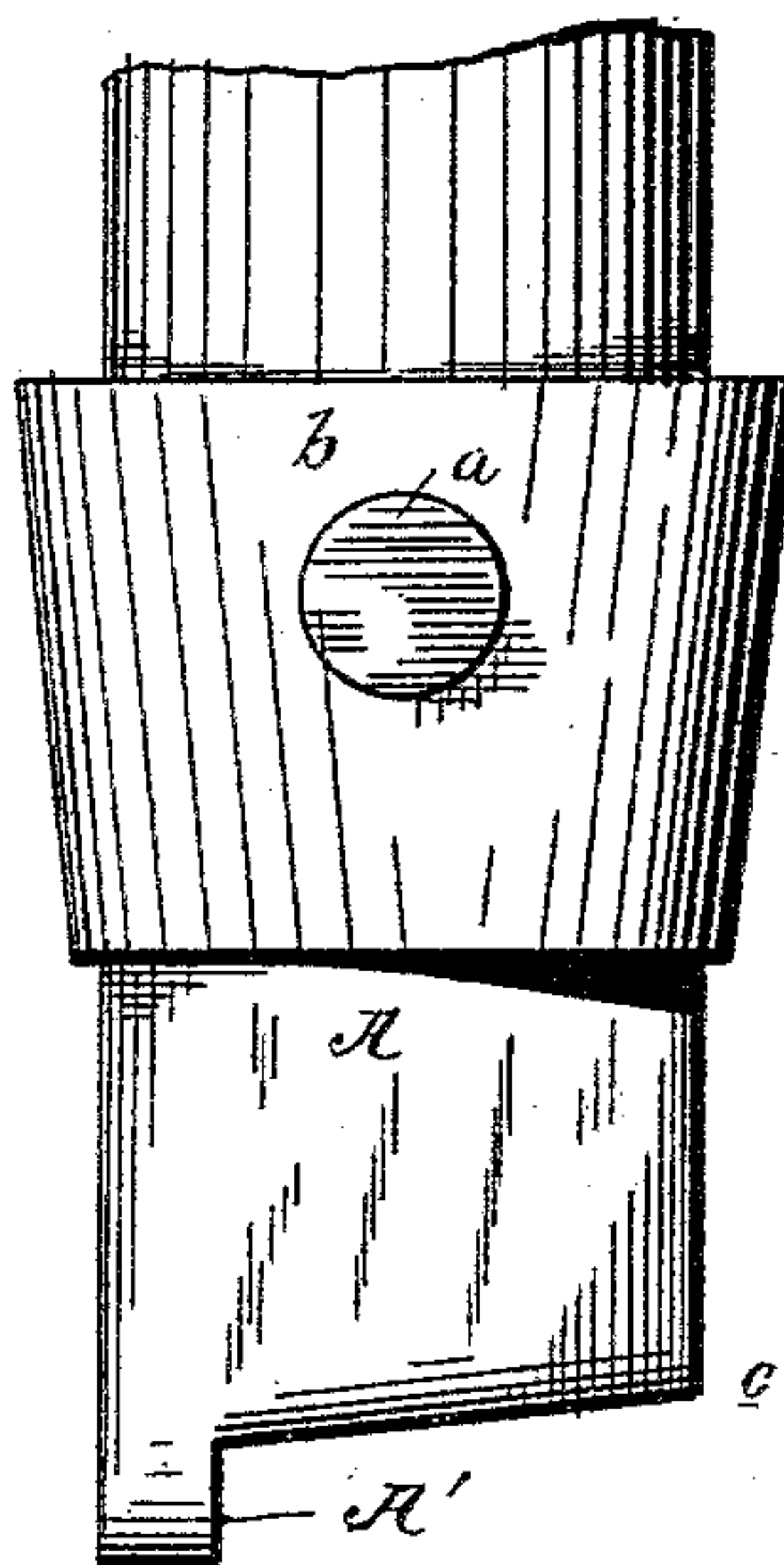
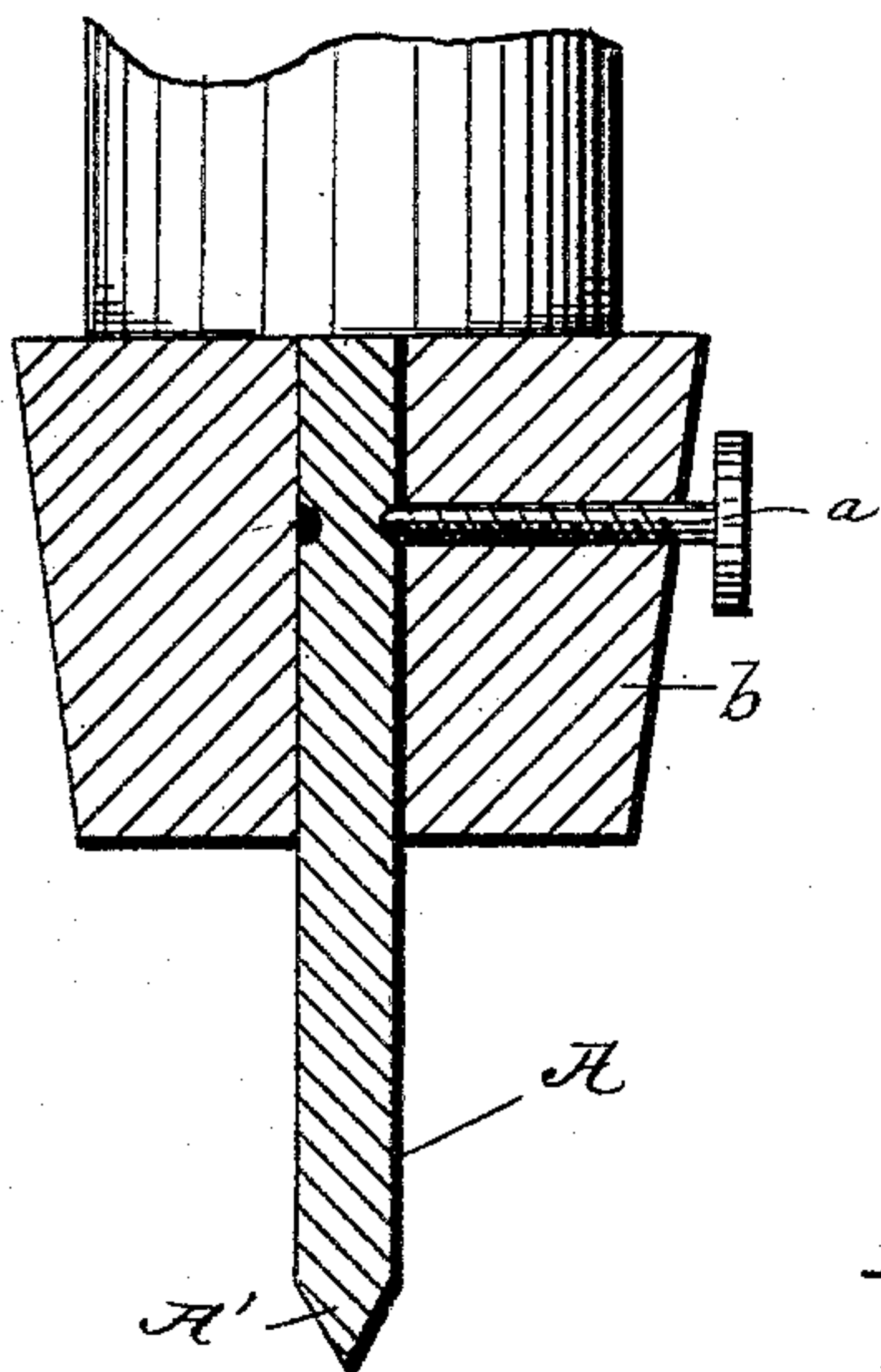
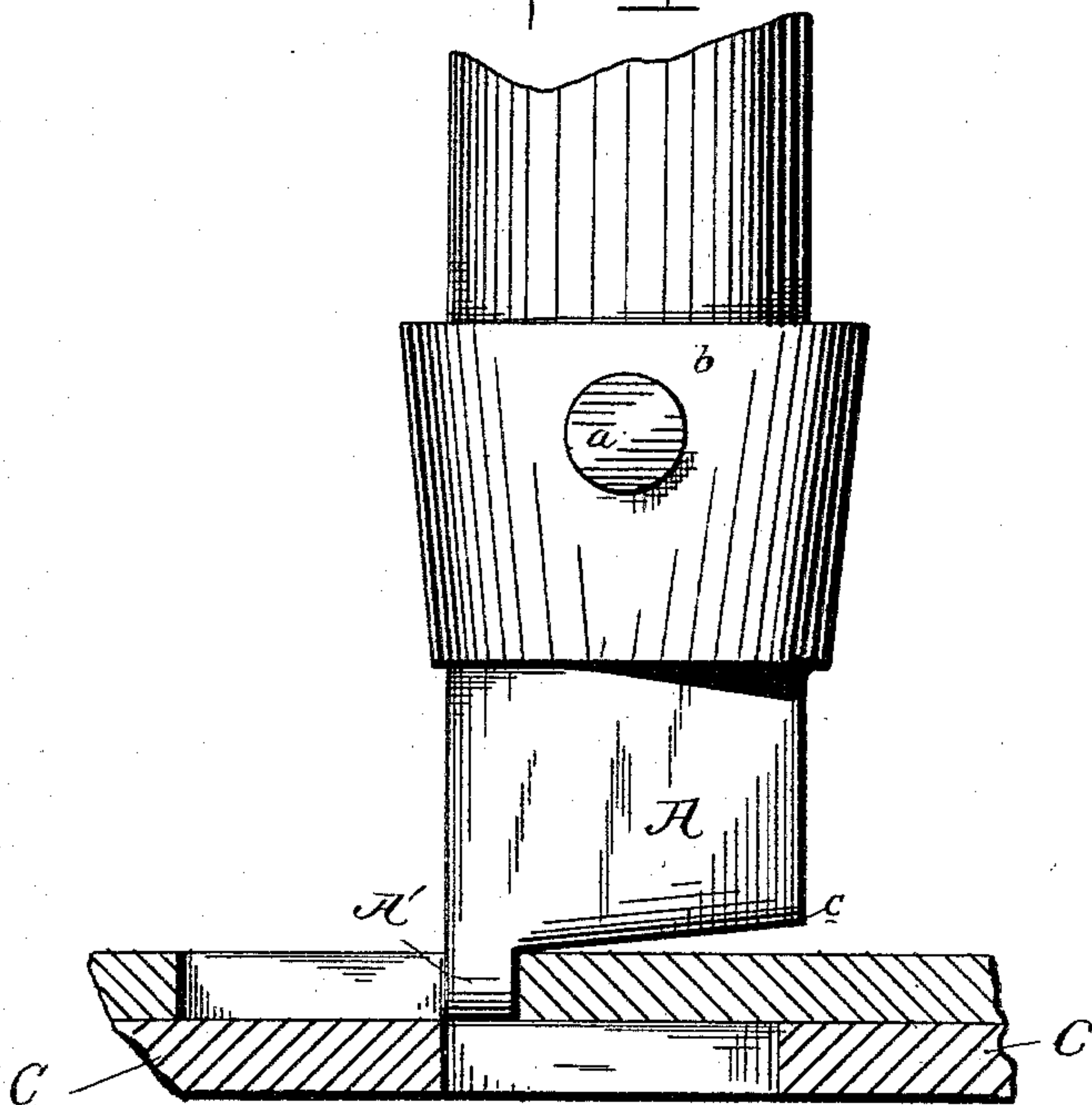


Fig. 1.



WITNESSES.

Will E. Aughinbaugh
George H. Dick

INVENTOR.

F. H. Seibel
by Wm. A. Dick
his Attorney.

UNITED STATES PATENT OFFICE.

FREDERICK H. SEIBEL, OF EASTON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO HENRY C. BARNET AND FRANK FRAUNFELTER, OF SAME PLACE.

PUNCH.

SPECIFICATION forming part of Letters Patent No. 401,220, dated April 9, 1889.

Application filed January 2, 1889. Serial No. 295,167. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK H. SEIBEL, of Easton, in the county of Northampton, State of Pennsylvania, have invented certain
5 new and useful Improvements in Punches, of which the following is a specification.

In the class of machines or devices to which belongs the improvement or invention forming the subject-matter of this application the
10 process or operation of cutting or punching the work or plate as heretofore conducted is very imperfectly and slowly performed. Waste of metal is experienced in getting up the
15 punch, owing to the requirements of increased thickness in making the punch or tool effective for the work to be done, also involving consequent waste in the production of the
20 product; and the manipulation or adjustment of the plate or work with relation to the punch and die is unsatisfactory and tedious, requiring careful eyeing of the same, if not
predetermined steps or measurements. All these disadvantages are avoided by my improvement or invention.

25 To these ends the nature of my invention or improvement consists, primarily, of a punch having a guide or projection at a corner edge of its cutting-surface, which guide or projection is provided with a central beveled and
30 pointed cutting edge; also, of a punch with shear cutting-edge. If, however, the cut or perforation is made distantly or inward from the edge of the plate or work, the entire cutting-edge of the punch, the guide or projection included (the same having a cutting-edge
35 also) makes the initial cut or perforation; but for each subsequent cut or perforation the inner end of the previously-cut perforation rests against the guide or projection of the
40 cutting-edge of the punch.

In the accompanying drawings, Figure 1 is a side elevation of a socket-head of a punching-machine, illustrating the application of my
45 improvement and the punch made according to the latter, together with a die and previously perforated or cut plate also in position therewith, the punch being shown in the act of about to cut a second perforation in the plate. Fig. 2 is a partly side elevation and

partly sectional elevation of the same with 50 the die and plate removed. Fig. 3 is a side elevation taken at right angles to the plane of Fig. 2.

In the organization of my invention I provide a punch, A, which consists of a plate of 55 the requisite resistance or strength and adapted to be suitably held, preferably by a holding-screw, *a*, as shown, in the lower part of the socket-head *b*. The latter is of the form usually employed in cutting-machines. 60

The punch or plate A is transversely beveled to a point, or provided with a lower cutting-edge. Upon the same edge and at its lower left-hand corner the punch or plate A is provided or formed with a projection or 65 guide, A', which is also transversely beveled to a point, providing it with a cutting-edge corresponding to the cutting-edge proper of the punch A.

The cutting-edge proper of the punch or 70 plate A is slightly inclined or deflected from the projection or guide A' outward and upward, and to the opposite or right-hand side edge of the plate, as at *c*, thus imparting there-
75 to a shear cutting-edge, the action of which will be explained farther on.

With the die C in position (the left-hand end of its slot or opening being just a little out of alignment with the same edge of the punch, or so related thereto as to permit the 80 latter in its descent to pass into said slot or opening of the die) the plate or work is placed upon the die and under the punch, with its edge (if it be desired to begin the cutting or perforating operation thereat) placed or dis- 85 posed against the guide or projection A' of the punch A. By means of this guide or projection a positive and reliable means or stop is furnished for arresting the movement of the plate or work at the required point with 90 relation to the die and punch as it is adjusted to its place by the workman. The same principle obtains here, as if one of the blades of a pair of scissors or shears were fastened or fixed by its rivet or pivot to a table and a 95 piece of paper or fabric were fed to the moving blade. The paper or fabric could not be fed faster thereto than the moving shear or

blade would permit it, nor beyond the pivot or rivet. Consequently no careful eyeing of the adjustment of the plate or work (if not predetermined measurements) is required for that purpose. Therefore no defective cutting or perforating of the metal will be experienced, but a continuous unbroken clean cut is obtained.

The work or plate, as above stated, having been properly disposed, the punch A is now caused to descend and act upon the plate or work. The lowermost portion of the cutting-edge c of the punch A, that immediately adjacent to the guide or stop A', will begin the cutting of the metal, which will be supplemented by the higher-up portion of the said cutting-edge, the entire cutting-surface finally uniting to effect the cutting or perforation of the plate or work. Thus it will be seen that a shear cutting action is exerted by the punch upon the plate or work, whereby manifold advantages are obtained. The edge of the punch or cutter near its re-enforced portion, (the guide or stop A',) that part capable of sustaining the greatest resistance, does the initial or first cutting. Besides, the concentration of a maximum pressure (a ton or more) in a minimum compass is obtained, thereby giving the punch or cutter an augmented cutting or penetrating capacity, and thus, while expediting the initial cutting action of the punch, it also prepares the way or entrance for the subsequently or supplementally acting higher-up portion of the cutting-edge of the punch or cutter.

From this construction it will be seen that the increased or great width or thickness required to be given to the punch or cutter where it strikes the work squarely, as is the case with the horizontal-faced punches or those of the type as heretofore constructed, is unnecessary. Furthermore, this latter referred-to type of punch necessarily involves the displacement and consequent waste of an unnecessary amount of metal of the plate or work, the saving of which is a desideratum and is effected by my invention; also, by means of my invention the cutting or punching of the plate can be effected in the arc of a circle, a complete circle, and in a zigzag or proximately serpentine or undulatory form of which the ordinary or horizontal-faced type of punch is not capable of performing.

If instead of producing the cut or perforation from the edge of the plate or work it could be made inward or distantly from the edge thereof, then the entire cutting-edge of the punch, that of the guide or stop A' in-

cluded, makes the initial or first cut or perforation; but for each subsequent cut or perforation the inner end of the previously-cut perforation rests against the said guide or stop of the cutting-edge of the punch.

Of course in adjusting the work or plate to be operated upon, a line is stretched for guidance in imparting the required cut or perforation to the plate or work.

I am aware that it is not new to provide a punch with an inclined shearing-surface, and said shearing-surface with a concavity or hollow, producing parallel cutting-edges thereon to effect the cutting or shearing of the metal in a parallel line. In my punch, however, as before stated, the inclined shearing-surface has a central or single tapering edge or point by means or the effect of which is to more readily effect the penetration of the metal and the starting of the severing or punching operation. This is apparent from the fact that from the very first a minimum portion of the edge of the punch is presented to the metal and such maintained until the completion of the severing or punching operation, since with the descent of the punch or tool only the extreme inner edge of the punch will first act upon the metal, and this being still further narrowed or restricted in its limits by the tapering central portion or point. Thus it will be seen that the resistance to the entrance of the punch or shear is reduced to the last degree, while the metal will give way under the action of the incline surface of the tool in incline lines, and thus avoid any tendency to crowd or wedge the punch in its action upon the metal.

Having thus fully described my invention, what I claim as new and of my own invention is as follows:

1. The punch having at lower corner edge of its inclined shear cutting-edge a combined guide projection and cutter having a central beveled and pointed cutting-edge, substantially as shown and described, and for the purposes set forth.

2. The punch having a central beveled and pointed inclined shear cutting-edge, and having at the lower corner edge of said cutter a combined guide projection and cutter having a central beveled and pointed cutting-edge, substantially as set forth.

In testimony whereof I have hereunto set my hand this 29th day of December, 1888.

FREDERICK H. SEIBEL.

Witnesses:

JNO. STOTZER,
ELIJAH WARNE.