

(No Model.)

2 Sheets—Sheet 1.

C. W. HUBBARD.
METHOD OF MAKING AXES.

No. 338,270.

Patented Mar. 23, 1886.

Fig. 1.

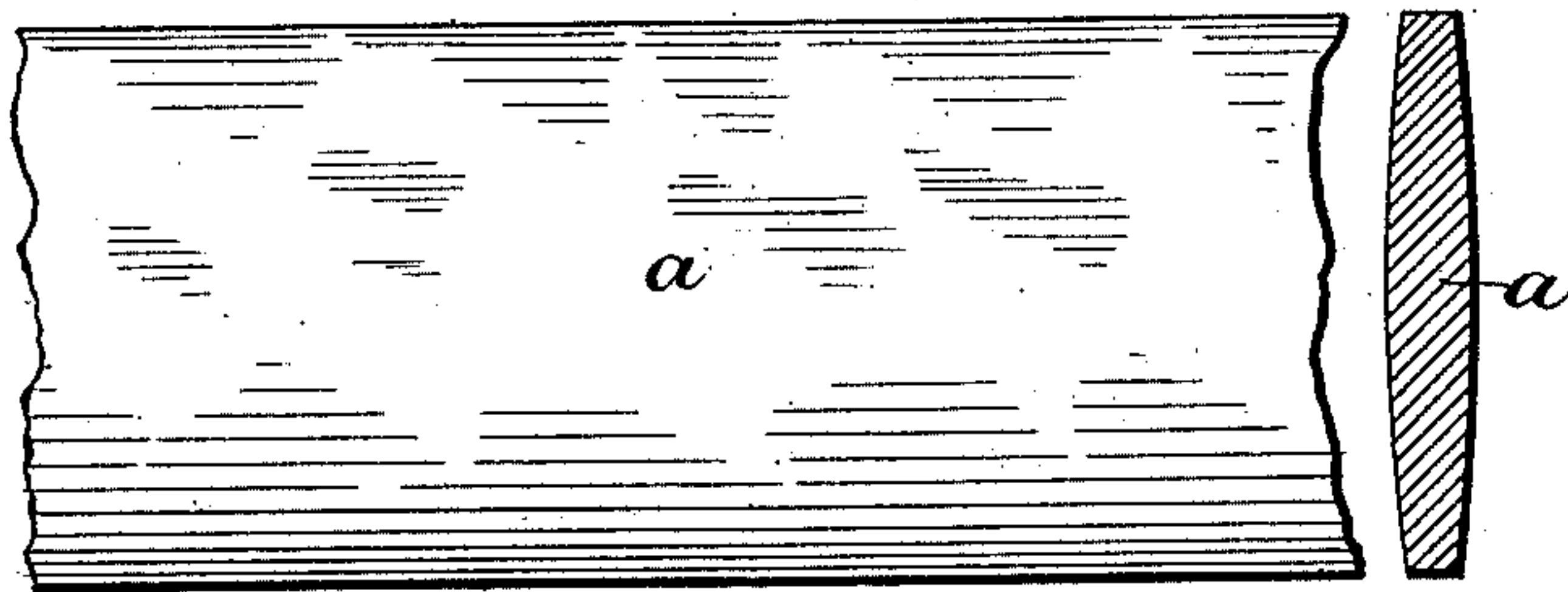


Fig. 2.

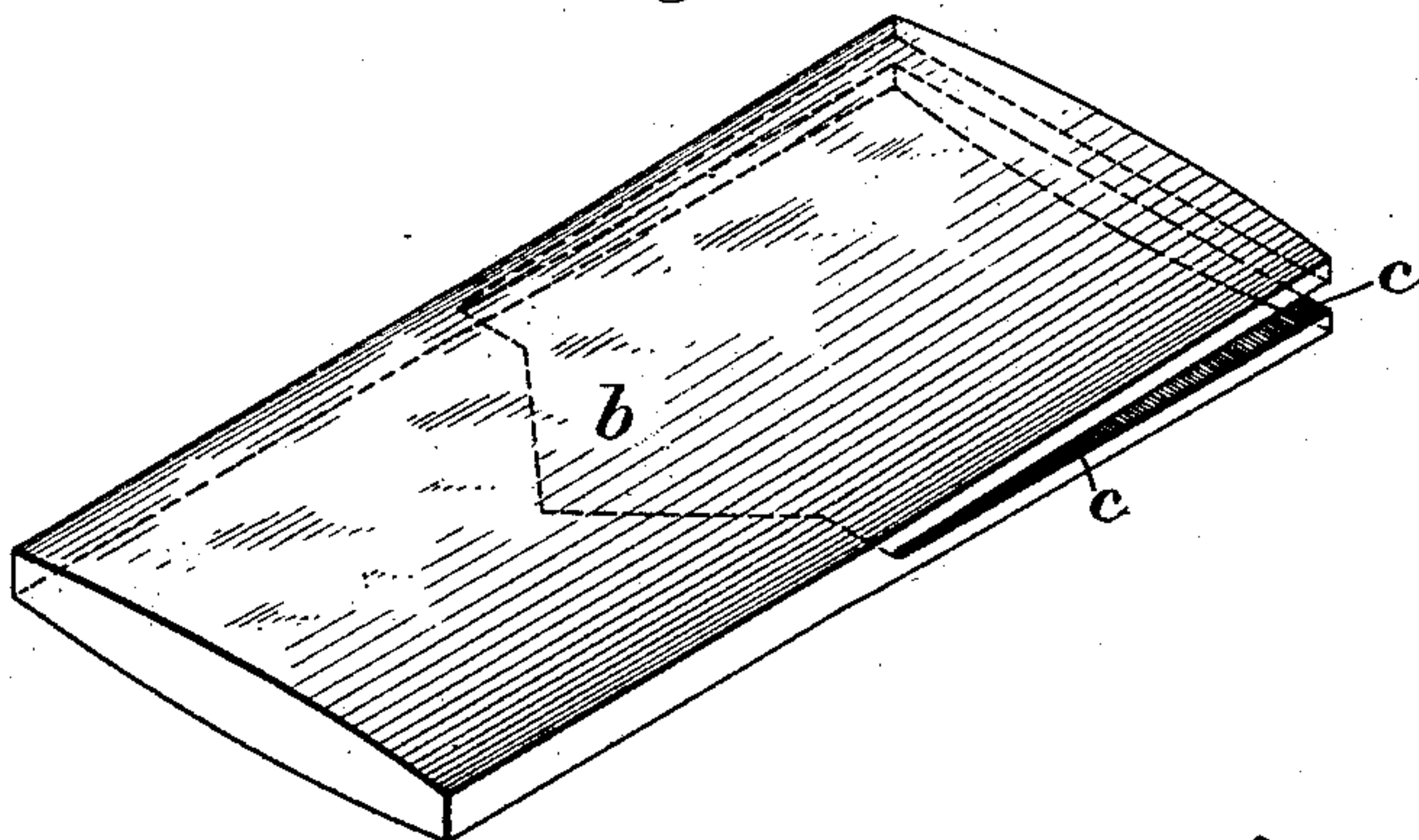
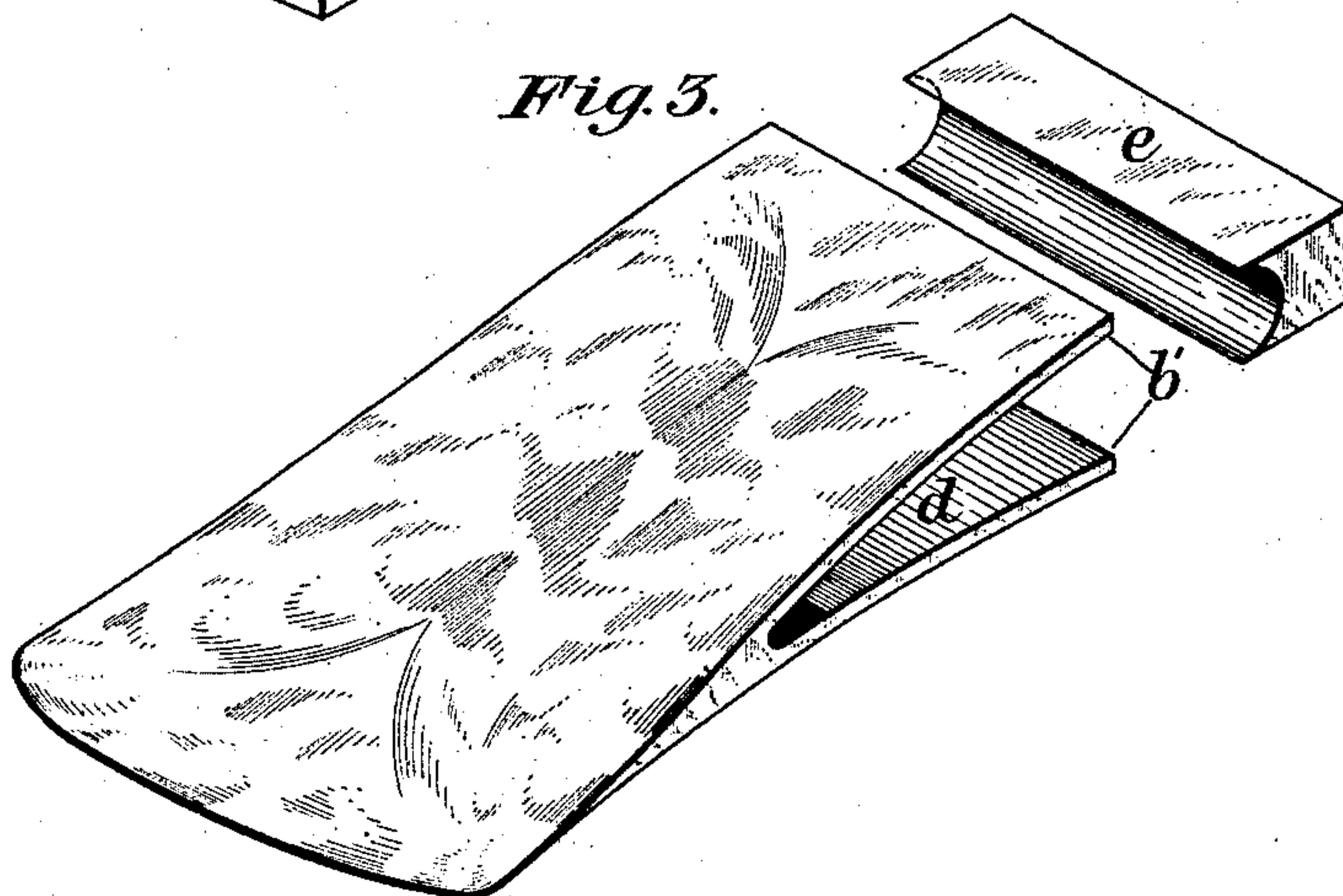


Fig. 3.



Witnesses.

Harry L. Gill

M. J. Corwin

Inventor.

Charles W. Hubbard

by his attys

Bakerwell & Kern

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Fig. 4.

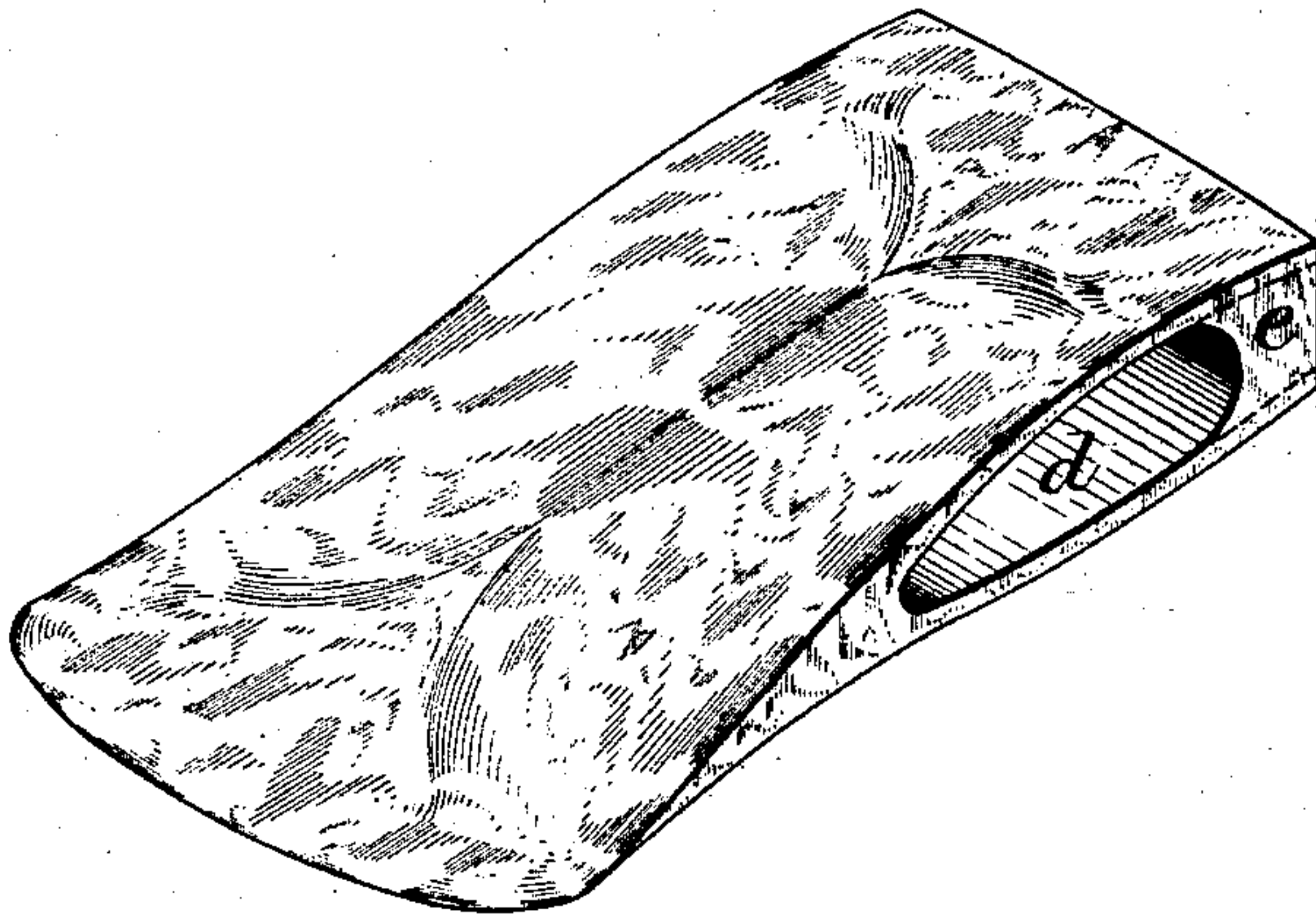


Fig. 5.



Witnesses.

Harry L. Gill

W. B. Corwin

Inventor.

Charles W. Hubbard

by his attys

Bakewell & Kerr

UNITED STATES PATENT OFFICE.

CHARLES W. HUBBARD, OF PITTSBURG, PENNSYLVANIA.

METHOD OF MAKING AXES.

SPECIFICATION forming part of Letters Patent No. 332,270, dated March 23, 1886.

Application filed January 13, 1886 Serial No. 188,388. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HUBBARD, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Axes; and I do hereby declare the following to be a full, clear and exact description thereof.

The purpose of this invention is to obviate the frequent reheating which is necessary in the manufacture of axes and similar tools, owing to the different steps required in drawing down the bit, punching and opening the eye, and finishing the ax. These various steps not only require the blank to be frequently reheated, which, in the manufacture of steel axes, is very injurious to the stock, but also necessitates the employment of skilled and consequently expensive labor. Any means of getting rid of any of these steps effects a reduction of the cost, and consequently enables the ax to be produced more cheaply.

To enable others skilled in the art to make and use my invention, I will now describe it by reference to the accompanying drawings, in which—

Figure 1 is a view of a rolled steel bar from which the ax-blanks are cut. Fig. 2 illustrates an ax-blank after having been put through the first operation of my improved process. Fig. 3 illustrates the same blank after being put through the second operation. Fig. 4 is a view of the finished ax. Fig. 5 is a like view illustrating a somewhat different construction.

Like letters of reference indicate like parts in each.

The ax-blanks are made from a bar, *a*, of steel, which is produced by rolling in the ordinary way of making rolled bars, and has a cross-section such as is shown, the same being thicker at the middle than at the edges, so as to approximate somewhat to the form of the completed ax. This bar *a* is cut in lengths suitable for making axes or other desired articles, one of which blanks is shown at *b*, Fig. 2. The blank *b* is split from the rear end toward the front by means of a thin flat splitter, such as is used in forming the eyes of axes, the splitter in this instance having a pointed shape. (Shown in dotted lines in Fig.

2.) After this step, the blank *b* is next submitted to the operation of an opener or wedge, which, being inserted into the slit *c*, opens out the blank and shapes it, as shown in Fig. 3. Then the bit is drawn in the usual way, or it may be drawn before the blank is opened out. A piece of metal of suitable shape to fill the rear end of the eye-opening *d* (shown in Fig. 3) is welded between the ends *b'* of the bifurcated blank, the shape of said piece being shown by that portion of the ax marked *e* in Fig. 3, and between the dotted lines back of the eye in Fig. 4. Then the eye is pinned or shaped in the usual way by inserting a suitable pin or former. These operations do not require the cutting-edge of the blank to be exposed to an injurious heat, while the welding-heat necessary in putting in the piece *e* is not objectionable, for the reason that a welding-heat at that point does not injure the ax for any purpose, as would be the case where a welding-heat is used at the front edge or bit of the ax.

By the use of a steel bar, which is made possible from the fact that the stock is not exposed to severe welding-heats, I am enabled to dispense with the operation of welding on the bit, and as such operation involves the exercise of more skill than all the other steps of making the ax I avoid the most expensive step in the operation. I also effect a large saving in the fact that the blank being made by rolling is very much cheaper than a blank prepared in the ordinary way, and, moreover, I am enabled to get a more uniform product.

Instead of welding in the piece *e*, it may, if desired, be secured in place by means of screws *e'*. This will avoid the necessity for the welding operation; but the construction is not as good as that having a welded-in piece.

Another advantage of my improvement consists in the fact that the eye is much more easily formed than by the old way, where the punches forced out from the edge of the eye a ragged tubular projection, which required to be removed, thereby necessitating another operation and increasing the cost of the ax. By my present method the eye is made without the formation of any ragged edges and loss of material.

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

The method of making axes herein described, which consists in slitting the blank
5 from its rear end, opening up the eye part, and then closing the open rear end by inserting a bit of metal, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 31st day of December, A. D. 1885.

CHARLES W. HUBBARD.

Witnesses:

W. B. CORWIN,

THOMAS B. KERR.