

(No Model.)

2 Sheets—Sheet 1.

H. HAMMOND.
MANUFACTURE OF AXES.

No. 316,617.

Patented Apr. 28, 1885.

Fig. 1.

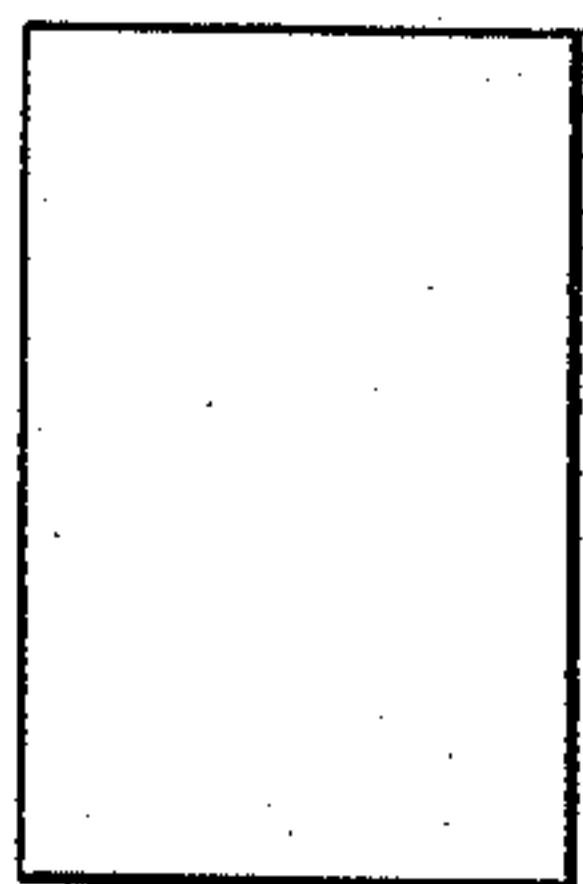


Fig. 2.

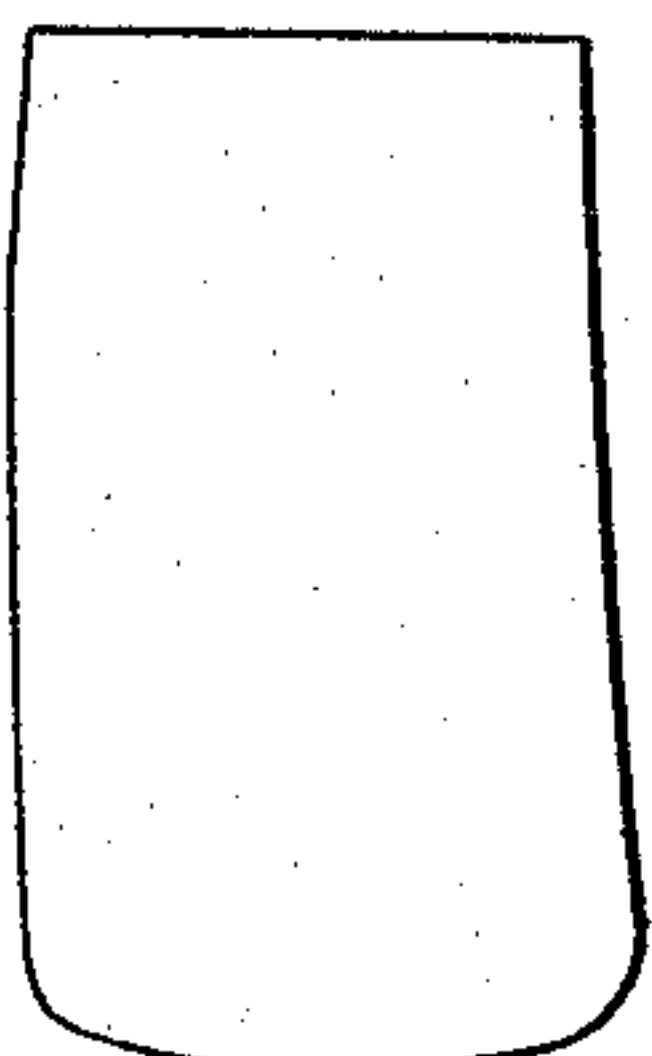
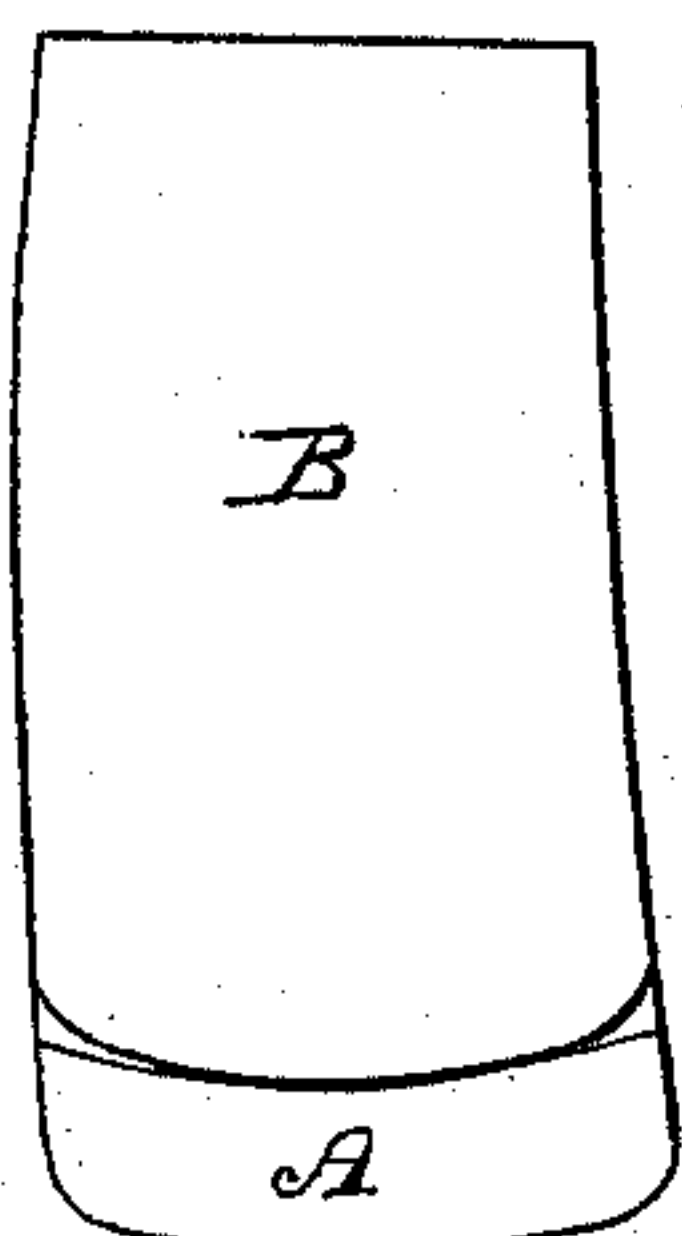


Fig. 3.



Witnesses

Edwin F. Dimock.

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Inventor.

Henry Hammond

by Theo. G. Ellis, Attorney

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Fig. 4.

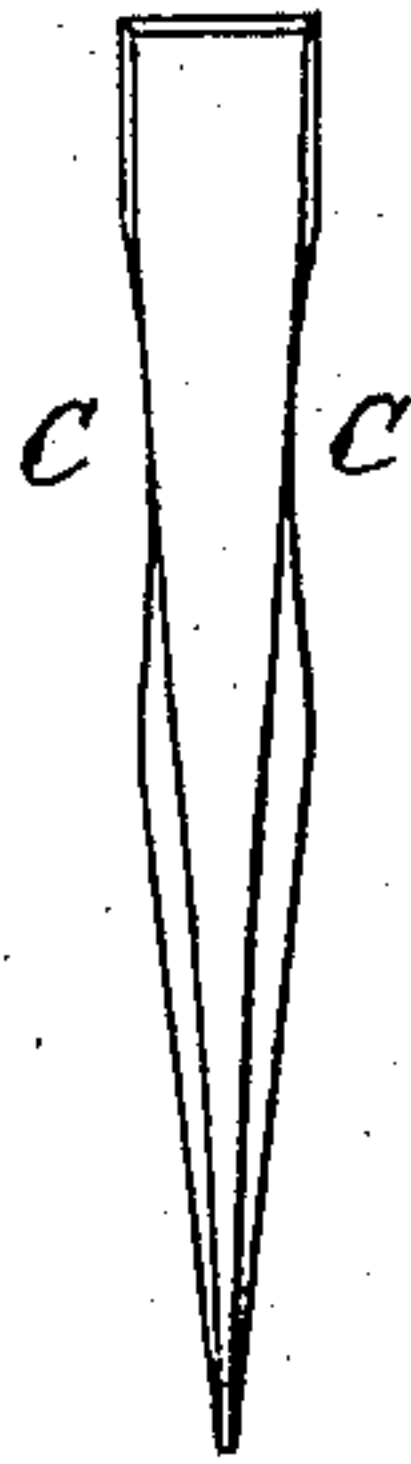
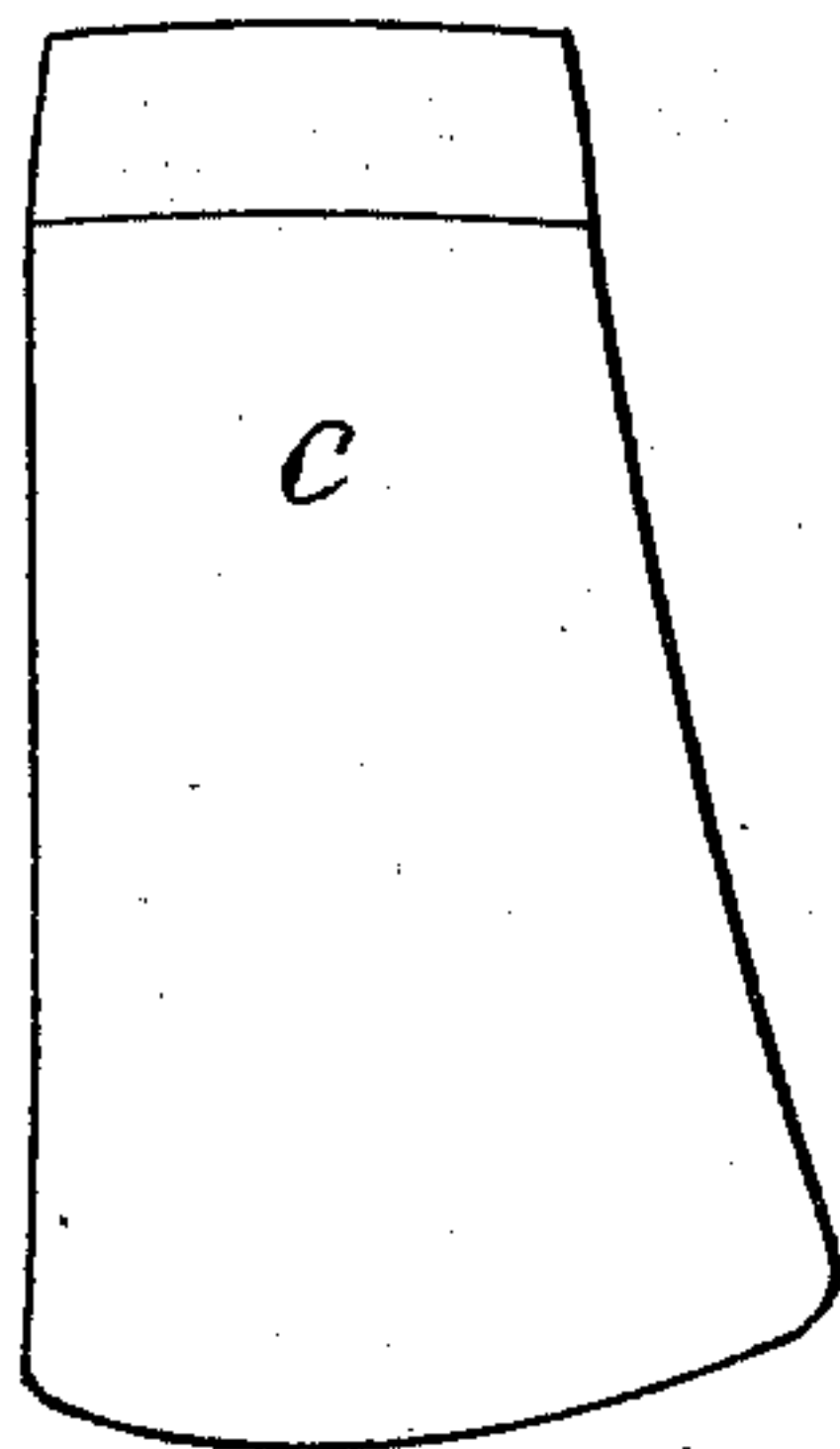


Fig. 5.

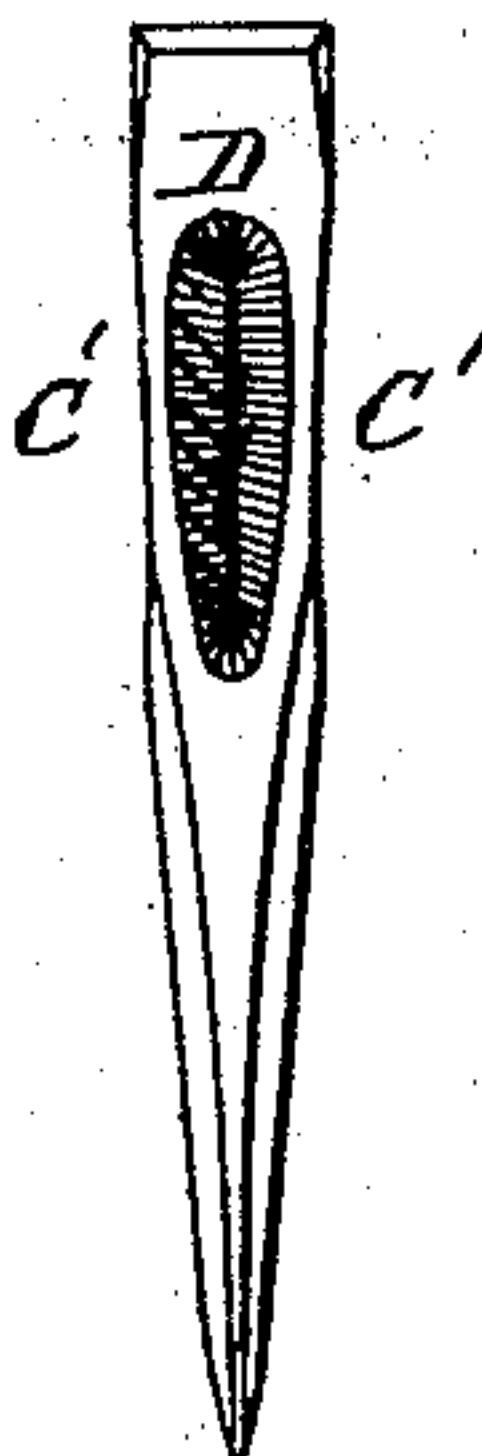
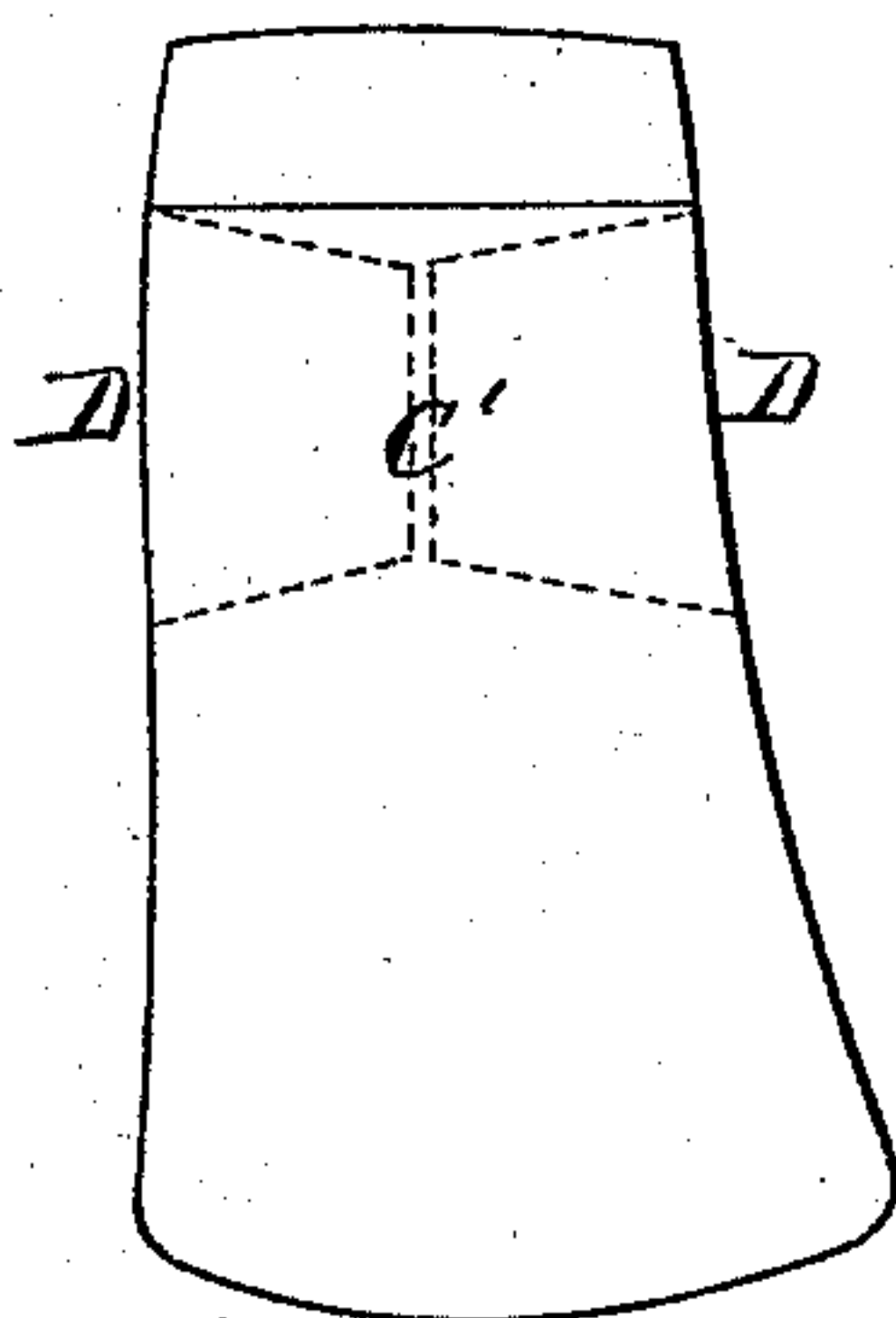
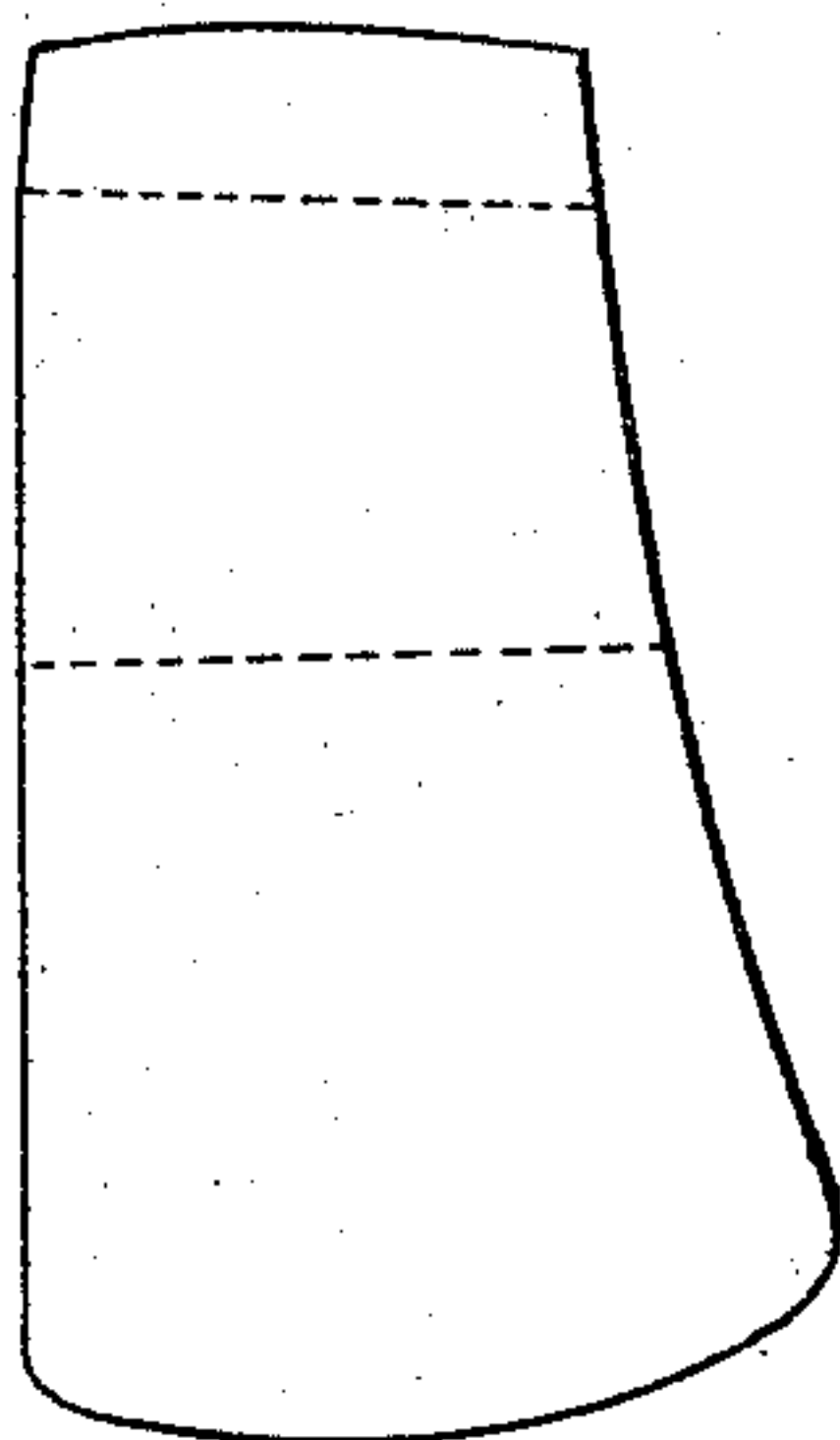


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY HAMMOND, OF NEW HAVEN, CONNECTICUT.

MANUFACTURE OF AXES.

SPECIFICATION forming part of Letters Patent No. 316,617, dated April 28, 1885.

Application filed March 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY HAMMOND, of New Haven, in the county of New Haven and State of Connecticut, have invented certain
5 new and useful Improvements in the Manufacture of Axes; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in
10 the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My improvement relates to the art or process
15 of making axes; and it has for its object the making of a more perfect implement, and also making it in a more systematic and economical manner than has heretofore been done.

In the accompanying drawings on two sheets,
20 illustrating my invention, Figure 1 shows a side and edge view of the rectangular block out of which the ax is formed. Figs. 2 to 6 show side and edge views of the ax in successive stages in the process of manufacture, as
25 will be described.

In the common method of making axes the first operation is to punch out the hole for the eye, and then to forge the ax into shape, splitting the edge for the purpose of putting in the
30 steel part, and then forging and finishing, doing all of this work after the hole for the eye is made, so that there is a constant necessity of protecting the eye from being crushed in, and a resulting irregularity of shape, even
35 when the eye is originally well formed.

The reason of the eye having been made first has been because it has not been deemed possible to punch out the hole after the ax is formed into shape without destroying it, and
40 if cut and wedged open the bulging on the sides would necessitate an entire reforging.

By means of my improvements in the process of manufacture I am enabled to make the eye last, after the form is given to the ax and
45 the steel edge set in.

In my improved process the block shown in Fig. 1 is first forged into the general shape shown in Fig. 2, giving a rough form to the ax. The edge is then split, and the steel piece

A, forming the edge, is inserted into the block 50 B, and the whole welded solidly together.

The next step in my improved process of manufacture is to forge the edge part of the ax into its proper and final shape, and to give to the part of the poll on opposite sides of the
55 position for the eye a concave shape, (shown at C C in Fig. 4,) the concavity being of just such a form and position that when the eye is cut and formed, as will be described, the metal proceeding from it will fill out the concavities 60 in the sides and leave the poll of the proper shape.

After the ax has been forged into the shape shown in Fig. 4, the eye is cut and the sides partially forged out, as shown in Fig. 5. The
65 cutters, entering from opposite sides or ends of the hole, cut and spread the metal without punching out or removing any of the material. They merely cut in from each side, so as to meet near the middle and to wedge or press out
70 the sides. This gives the eye the appearance and form shown at D in Fig. 5, and leaves part of the concavities upon the surface at C' C' still unfilled.

The next and final step in my improved process of manufacture is to press or force a punch
75 or former entirely through the ax, thus giving the final form to the interior of the eye, and pressing out the metal to entirely fill the concavities C and give the exterior of the ax its
80 finished form.

The finished ax is shown in Fig. 6.

By means of my improved process a much more perfect implement is produced than by the methods heretofore in use, and the manu-
85 facture is made more simple and much cheaper, as the parts first formed are not liable to distortion and injury from the subsequent operations.

In my improved process no material is
90 wasted. The metal coming from the eye is not punched out, but goes to form part of the finished ax.

It is obvious that while, by means of my improvements in the process of manufacture, I
95 am enabled to make the eye last, after the form is given to the ax and the steel edge is set in, I am also enabled to make the eye before the

steel edge is set in, and thus to produce an ax-poll forged with concavities C C, which are filled out by the material proceeding from the formation of the eye, substantially as described; but I do not herein claim such an ax-poll as an article of manufacture; nor do I herein claim a blank for an ax-poll formed with concavities C C, because such an ax-poll is described and claimed in another application of mine for Letters Patent of the United States of America.

What I claim as my invention is—

1. The process of making ax-polls from a single piece of metal by forming the blank to quite or near the form it is to have, except at its sides opposite to where the eye is to be located, and by displacing from each of those

sides an amount of metal about equal in bulk to half the eye, and then by forming the eye with a punch or punches, which as it penetrates the metal forces those sides apart, and thus expands the blank at the eye portion to the ultimate shape desired.

2. The art or process of making axes wherein they are first roughly forged from a bar or block, then split for the insertion of the steel edge, then finished with the exception of the eye, and having the concavities C C upon the sides, and finally finished by cutting and forming the eye, substantially as described.

HENRY HAMMOND.

Witnesses:

THEO. G. ELLIS,
EDWIN F. DIMOCK.