2 Sheets--Sheet 1.

J. C. KLEIN.

Manufacture of Mattocks.

No. 146,596. Patented Jan. 20, 1874.

Fig 1.

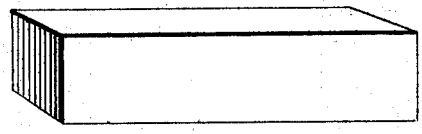


Fig 2.

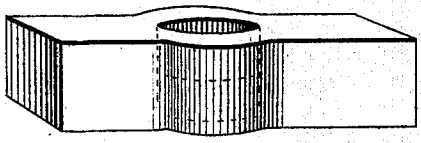


Fig 3.

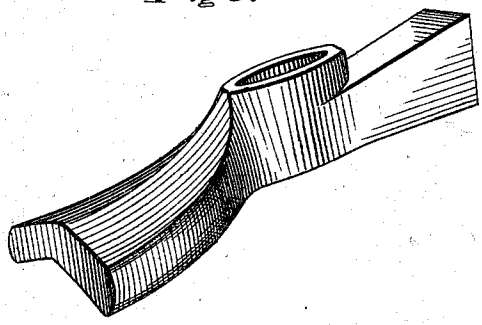


Fig 4.

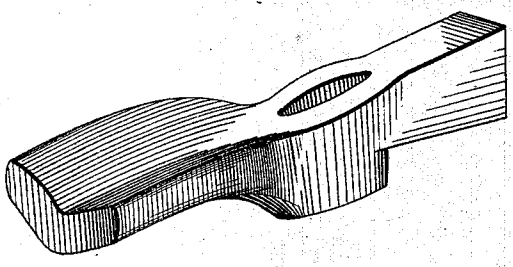


Fig 5.

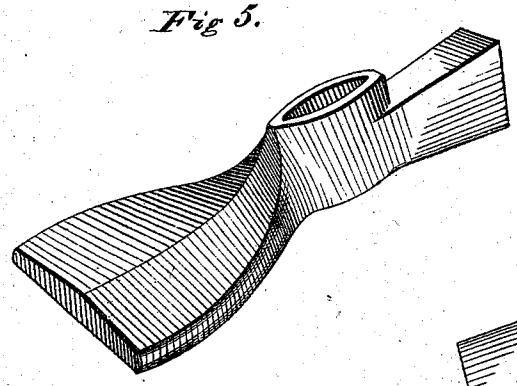
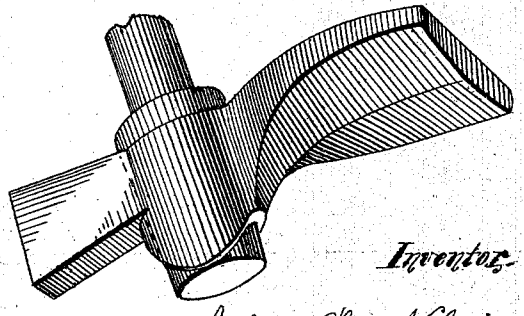


Fig 6.



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2 Sheets--Sheet 2.

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Manufacture of Mattocks.

No. 146,596. Patented Jan. 20, 1874.

Fig. 7.

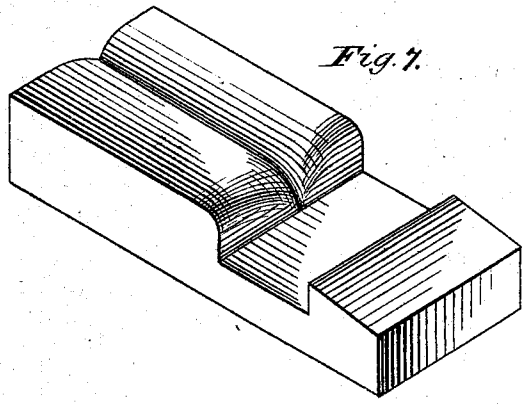


Fig. 8.

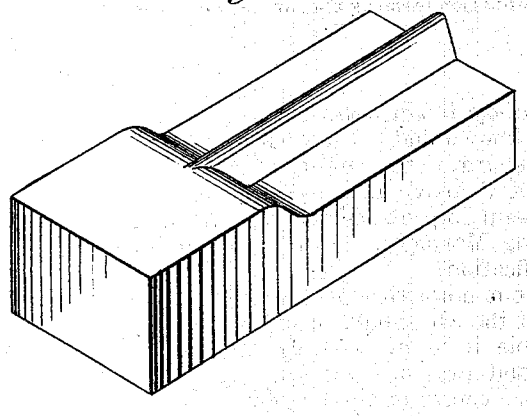


Fig. 9.

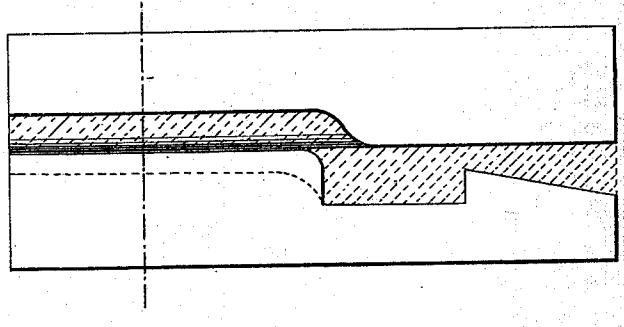
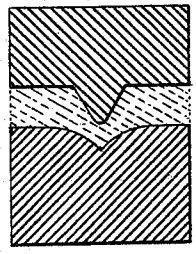


Fig. 10.



Witnesses:
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E. F. Hodges.

Inventor:
John Chr. Klein

UNITED STATES PATENT OFFICE.

JOHN C. KLEIN, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF MATTOCKS.

Specification forming part of Letters Patent No. **146,596**, dated January 20, 1874; application filed August 5, 1873.

To all whom it may concern:

Be it known that I, JOHN CHRISTIAN KLEIN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Art of Manufacturing Mattocks, of which the following is a specification:

In the manufacture of mattocks it is desirable that the eye should be of sufficient length to enable it to be securely attached to the helve, and provided with a ridge extending along the center of the blade to the top of the eye, and also that the blade should be of sufficient width to serve the ordinary purposes of a hoe.

Heretofore the blanks have been worked into shape entirely by hammering or swaging, and attempts have been made to form the blank between dies in a press or between rolls, to give to it an approximate form previously to its being finished under the hammer.

My invention consists in first punching the eye in the usual way, then placing the blank between dies that will form the enlargement for the eye, and crease the blade end of the blank in such manner that it may be subsequently flattened out to the required width, and then passed between or formed by other dies to finish the eye in a simple and effectual manner.

In the accompanying drawings, Figure 1 is a perspective view of a rectangular block or bar of iron of suitable dimensions to form the body of the mattock by the method hereinafter described; Fig. 2, a similar view of the blank, after the eye has been punched edgewise through it; Fig. 3, a similar view of the blank, looking upon one side thereof after the eye has been struck up, and the crease formed for the blade end; Fig. 4, a similar view of the blank shown in Fig. 3, but looking upon its opposite side; Fig 5, a similar view of the blank when flattened out at its blade end; and Fig. 6, a like representation of the blank with the mandrel inserted for enlarging and finishing the eye, as hereinafter described. Figs. 7 and 8 are perspective views of the upper and lower dies. Fig. 9 is a side elevation of the same. Fig. 10 is a cross-section on the line *x x* of Fig. 9.

In order that the method herein described may be fully understood, I will describe its various steps from the beginning to the end of the operation.

I first take a rectangular block of iron (as shown in Fig. 1,) and heat it to the required degree to enable it to be easily worked. The blank is then placed under a press, and the eye punched through it edgewise, from both sides, in the usual way. It is then placed directly between dies that give to it the peculiar shape, (shown in Figs. 3 and 4,) the metal being struck upon its edge, and the eye thus formed will equal in height the width of the blank. The ax-shank is set down a suitable distance, and leaves the projecting part of the eye solid. As it is desirable to form a "high eye," the blank is much higher but not so wide as that ordinarily used, and consequently it will be more difficult to flatten the hoe end sufficiently by the means heretofore used, and furthermore to leave a high ridge through the center of the blade of the mattock that shall extend to the top of the eye.

In order that these objects may be thoroughly accomplished, one of the dies is formed with a V-shaped concavity at its blade end, and the other die has a V-shaped ridge that is arranged directly above the corresponding concavity, so that the metal will be creased or bent along the center of the blade end to form a crease or corrugation, and also a high ridge extending to the top of the eye. The blank when thus formed is next reheated and placed between other dies that flatten out the corrugation to complete the blade, as shown in Fig. 5, without mutilating or destroying the ridge. The mandrel is then driven into the eye to enlarge it, and also serves to hold and manipulate it, (as shown in Fig. 6,) while the projection for the eye is partly drawn out and rounded, and the outer surface of the eye is finished by swaging or rolling between suitable dies, as fully described in the application filed simultaneously with this. The blade of the hoe is then plated, and the ax finished under the hammer in the usual way.

The present method of hammering or swaging out the blade is a slow and tedious operation, and requires great skill to form the blade into the required shape, and the dies and methods heretofore used for partly perform-

ing the operation between rolls or other mechanical devices have been defective, inasmuch as the metal will be rolled or pressed to a greater extent longitudinally than it will laterally, and the blade thus formed will not be of the required width.

By my improved method of first bending the metal longitudinally, and then rolling or stamping it, I am enabled to form a very broad blade in a simple and effectual manner, and, furthermore, form a high solid eye, and leave a sharp and well-defined ridge along the center of the blade that will extend to the top edge of the eye, and materially strengthen the blade and eye of the mattock at these parts.

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

The method herein described of forming the plate and eye of mattocks, &c., consisting in first punching the eye; second, setting down the metal around the eye; third, creasing the blade longitudinally, as shown and described; and, finally, finishing in dies, substantially as explained.

JOHN CHR. KLEIN.

Witnesses:
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JOS. I. PEYTON.