J. C. KLEIN.

MANUFACTURE OF GRUBBING-HOES.

No. 171,141. Patented Dec. 14, 1875.

Fig. 1.

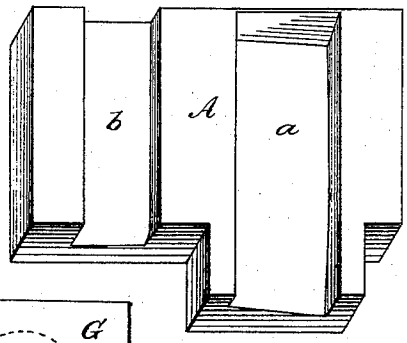
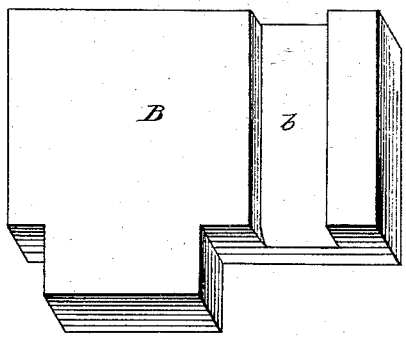


Fig. 2.



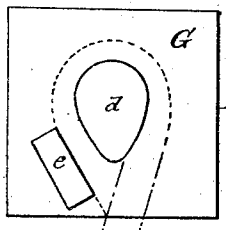


Fig. 1a

Fig. 4.

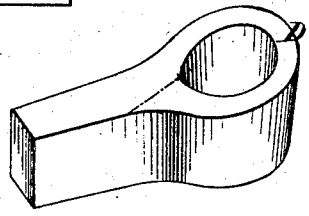


Fig. 3.

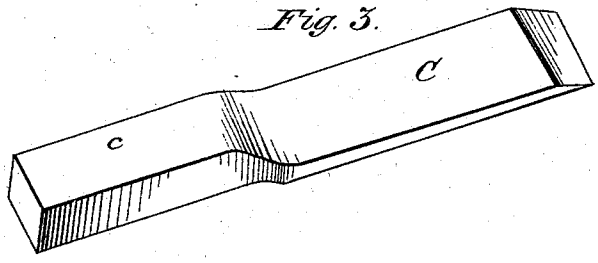


Fig. 5.

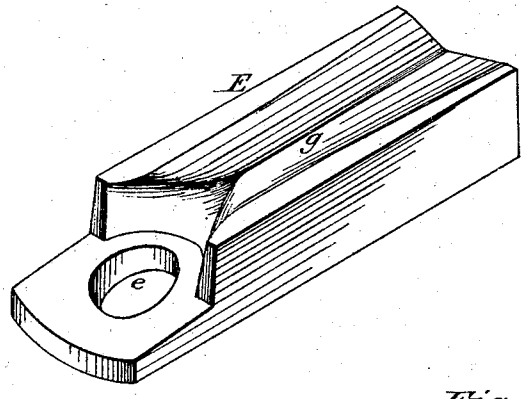


Fig. 6.

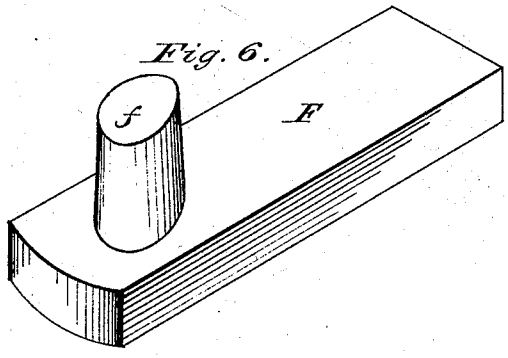
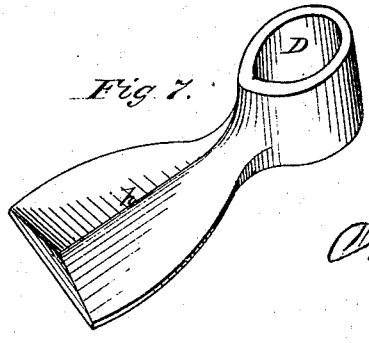


Fig. 7.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN C. KLEIN, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF GRUBBING-HOES.

Specification forming part of Letters Patent No. **171,141**, dated December 14, 1875; application filed June 24, 1875.

To all whom it may concern:

Be it known that I, JOHN CHRISTOPH KLEIN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Grub-Hoes, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

In the manufacture of grubbing-hoes it is desirable that the eye should be of sufficient length to be securely attached to the handle, and the hoe be provided with a ridge extending along the center of the blade to the top of the eye, for the purpose of stiffening it, and the blade be of sufficient width for the usual purposes. This has been done heretofore entirely by hammering or swaging, and it has been attempted to form the blanks between dies attached to rolls or presses, to give them the approximate form previous to their being finished under the hammer.

My invention consists in placing the blank between dies, bending it on a block with stud to form the eye, welding it in dies, and finishing it between a second pair of dies, and forming the eye and ridge at the same time between them by presses or other suitable power.

In order that the method herein described may be fully understood, I will describe its various steps, referring to the letters of reference in the drawing, in which—

Figure 1 represents a perspective view of the lower die for forming the blank. Fig. 1ª is a top view of plate for bending the blank to form the eye. Fig. 2 is a perspective view of the upper die for forming the blank. Fig. 3 is a perspective view of the blank before bending. Fig. 4 is a perspective view of the blank bent to form the eye. Figs. 5 and 6 represent the upper and lower finishing-dies. Fig. 7 is a perspective view of a finished grubbing-hoe.

The present application is an improvement on Patent No. 145,596, granted to me January 20, 1874, for the manufacture of mattocks.

The regular blocks of iron used for this purpose are heated to the proper degree for working, and placed in the part *a* of the lower die A, the upper die B placed over it, and together the dies are placed under the press or other suitable power, which gives it the form shown at C in Fig. 3.

This blank is then placed with its flattened end on the block G, Fig. 1ª, with its stud *d* and pin *e*, and bent to form the eye, and is welded together. The blank thus formed is then placed between the upper and lower dies E F, and together they are placed between the press, rolls, or other suitable power. The lower die E is provided with a hole, *e*, for the reception of the end of the punch *f* of the upper die F, and is, furthermore, recessed, as shown at *g*, to form the ridge *h*, Fig. 7, of the hoe and set down the eye. The outer smooth face of the hoe is formed by the flat part of the upper die F, and the hoe receives its proper shape with the eye.

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 of uniform size, besides being very expensive; whereas, by my improved method, I am enabled to form a broad blade and high solid eye, and leave a well-defined ridge along the center of the blade, extending to the top edge of the eye, and thereby strengthening the blade and eye of grubbing-hoes.

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

1. The herein-described improvement in the art of forming the plate and eye of grub-hoes, &c., consisting in, first, flattening the plate between dies A B; second, bending and welding the eye on block G; third, setting down the metal around the eye, and forming the ridge on the blade by means of dies E F, substantially as herein shown and described.

2. The dies A B, with recesses *a b*, for forming the flattened end C of the blank for grubbing-hoes, in combination with the plate D, provided with stud *d* and pin *e*, for bending and welding the eye, and the dies E F, having hole *e* and punch *f*, for finishing the grubbing-hoes, as herein described and shown.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

JOHN CHR. KLEIN.

Witnesses:

JOS. T. K. PLANT,

WM. G. NOLEN, Jr.