H. Mann.

Making Axes.

No. 35,480. Patented Jun. 3, 1862.

Fig. 4

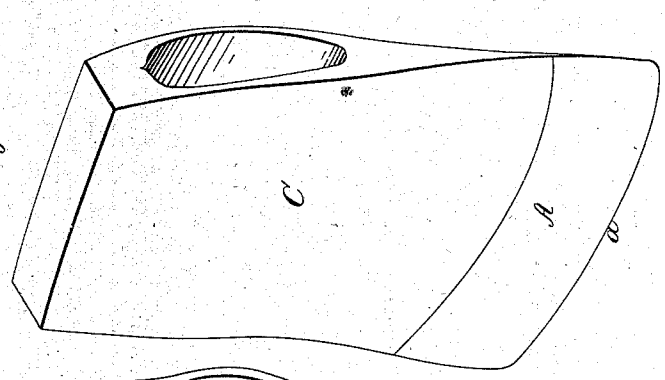


Fig. 7

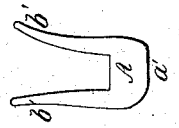


Fig. 3

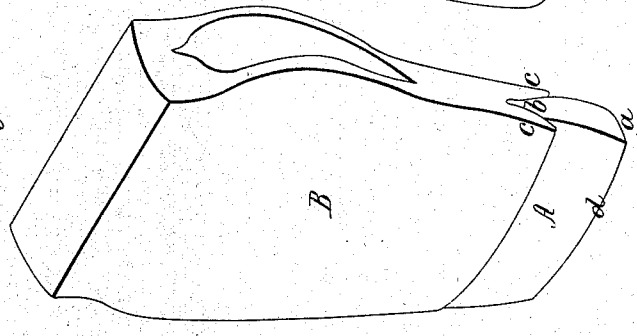


Fig. 6

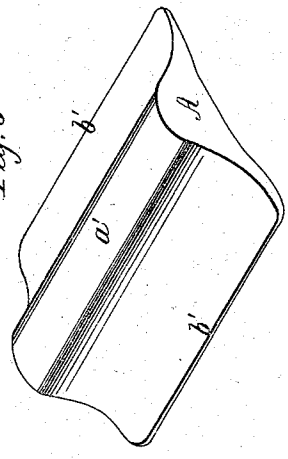


Fig. 2

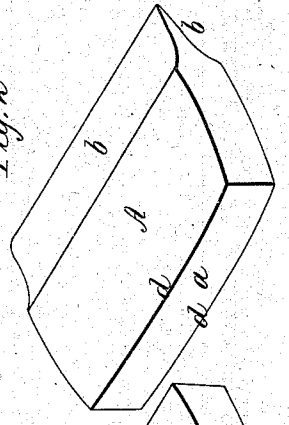


Fig. 9

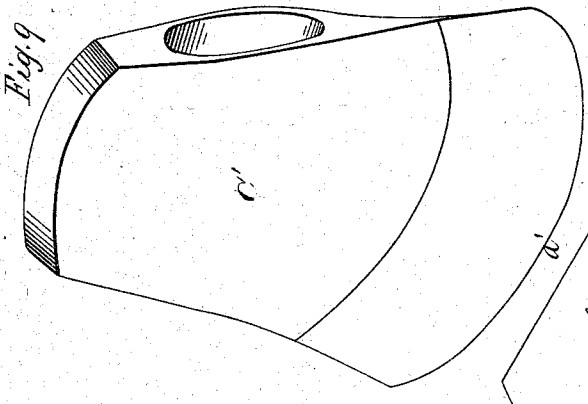


Fig. 5

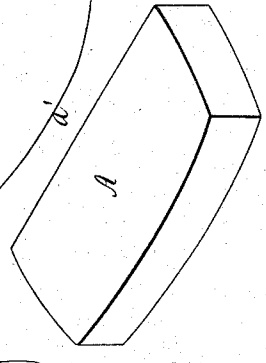


Fig. 1

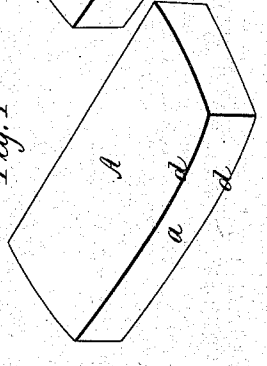
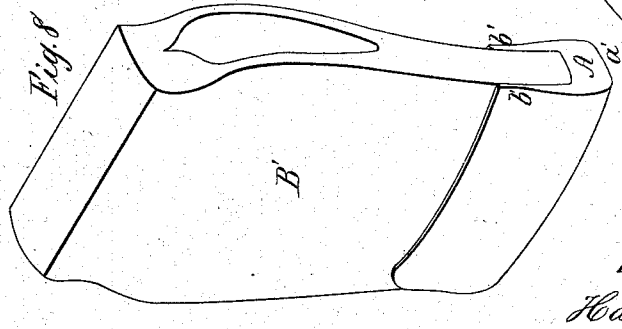


Fig. 8



Witnesses

Harry W. Price.
John Mathys.

Inventor

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By atty. A. B. Stoughton.

UNITED STATES PATENT OFFICE.

HARVEY MANN, OF BELLEFONTE, PENNSYLVANIA.

IMPROVEMENT IN AXES.

Specification forming part of Letters Patent No. **35,480**, dated June 3, 1862.

To all whom it may concern:

Be it known that I, HARVEY MANN, of Bellefonte, in the county of Centre and State of Pennsylvania, have invented or discovered a new and useful Improvement in the Manner of Working and Welding on the Steel in the Manufacture of Axes; and I do hereby declare the following to be a full, clear, and exact description of the same and of the distinguishing characteristics between my invention and what has been previously known or done in this manufacture, reference being had to the accompanying drawings, making a part of this specification, in which—

Figures 1, 2, 3, and 4 illustrate the present plan of working and welding on the steel in the manufacture of axes, and Figs. 5, 6, 7, 8, and 9 illustrate my new and improved mode of accomplishing the same object, and by which mode I am enabled to make a much better ax in all respects than by the mode or plan heretofore practiced.

The almost if not universal plan of putting on the steel onto axes is that of making the edge of the steel bar the cutting-edge of the ax. It is well known that that portion of a steel bar is not the strongest—that is to say, not the most capable of resisting weight or force. The sides of the bar, being either more refined, more worked, or more tenacious, has more endurance or more resisting properties than the edge has, and hence I make the cutting-edge of the ax from the side of the steel bar instead of from the edge. When the cutting-edge of the ax is drawn down and formed from the edge of the steel bar, a flaw in the bar may be continued down to and be a flaw in the ax without being detected or exposed. By my plan of making the cutting-edge of the ax from the side of the bar, this could not happen, because the metal is folded over by my plan, and if there be a flaw in the bar it will be exposed and the drawing down of the metal to form the cutting-edge would weld the flaw shut or so expose itself as to be detected and thrown aside if imperfect; and when the cutting-edge of the ax is formed from the edge of the steel bar, the corners of the bar are drawn down over the center portion, and thus the edge is made from these corners, as it were, which have not the compact fibrous strength of the more solid portion of the bar. By my method of making the cutting-edge of the ax from the side of the steel bar, the center of the bar is forced along, in drawing down, in advance of the corners or outside, and thus I get the cutting-edge from the very firmest and most tenacious portion of the steel bar.

In the plan now practiced the iron of the pole or body of the ax is outside of the steel at the weld. This often causes the ax "to eat the wood," as it is termed by wood-choppers, as it tends to throw the cutting-edge into or out of the wood, particularly so after using the ax a short time, as the iron wears faster than the steel and leaves an uneven surface at the weld. I so put on the steel as that it shall be on the outside of the iron at the weld and extend up on the iron above the weld, so that the wear comes upon the steel and prevents the unevenness at the weld, and thus also prevents the ax from "eating the wood."

It may be said that the steel bar could be split on the edge and the iron of the ax inserted into the split, and that when welded the steel would be on the outside of the iron. This is true; but the expense, in the first place, is too great for any advantage gained by such plan, while it would make the cutting-edge of the ax from the edge of the bar, which I have above shown to be objectionable and what I aim to avoid.

To enable others skilled in the art to make and use my invention, I will proceed to describe, first, the mode practiced at present in welding on the steel, and, secondly, my improved plan of putting on the steel, so that the difference between the two plans will be readily seen.

A, Fig. 1, represents a piece of steel cut from a bar, to be shaped, welded, and drawn down to form the cutting-edge of an ax. A in Fig. 2 represents the same piece of steel scarfed off at the edge *b* previous to its being inserted in the split of the pole or body of the ax to be welded.

B, Fig. 3, represents the ax-blank roughly forged out, with the steel inserted in the split, ready to be welded, and C, Fig. 4, represents the finished ax.

The edge *a* of the original piece of steel is the portion of which the cutting-edge of the ax is formed, and the lips *c c* of the split or gash of the iron B cover or are outside of the

steel, and when welded and drawn down the steel will show on the ax at about the red line drawn in Fig. 4.

In drawing down the piece of steel A the corners *d* are bent over and forward, and when it arrives at its wedge or tapered form these corners, which are forced from the body of the metal, and whose fibrous or tenacious properties are impaired thereby, become the part of which the edge of the ax is to be made, and thus an inferior portion or quality of metal is put in the place where the very best should be, and this cannot be avoided so long as the cutting-edge of the ax is formed out of the edge of the bar of steel.

In my process I may start with the same piece of steel as that shown in Fig. 1, A. The first operation is to scarf down the two edges *b' b'*, as shown in Fig. 6, leaving the center portion, *a'*, of the bar comparatively untouched and considerably raised up above the scarfed edges. This piece A', so wrought, is then placed on a die or former and bent up into a U or bow shaped form, as shown in Fig. 7, and is slipped over the ax-blank B', as shown in Fig. 8, the lips or scarfed edges *b'* of the steel extending some distance up and outside of the iron. The steel thus placed is then welded to the iron and drawn down to the proper taper or wedge form, as represented at *c'* in Fig. 9, where the line of the steel will show at about the red line in said figure, so that with the same amount of steel as in the old plan a much greater portion of it is on the sides of the ax, while there is abundant to form the cutting-edge as long as the ax will last.

The cutting-edge of the ax (shown at *c'*) is made from the portion *a'* of the original piece of steel, and from that portion of it which is from its tenacious or refined nature the very best for that purpose, while the sides of the ax are protected by steel much higher up, and the shoulder at the union of the iron and steel, instead of resisting the penetration of the ax in the wood, is turned the other way, and of course thus offers no resistance to the penetration of the ax into the wood. The result of this mode of working and welding the steel onto axes in their manufacture is that a very superior ax is produced, which has upon trial withstood tests that the axes made in the usual way will not stand.

Having thus fully described the nature and object of my invention and shown wherein it differs from the mode as at present practiced in the manufacture of axes, what I claim therein as new, and desire to secure by Letters Patent, is—

Scarfing the steel at its edges and bending it into a U or bow shape, so as to slip over the end of the blank or iron part of the ax to be welded thereon, substantially in the manner and for the purpose herein represented.

HARVEY MANN.

Witnesses:
A. B. STOUGHTON,
HARRY W. PRICE.