A. Patterson.

Making Hoes.

No. 49,649. Patented Aug. 29, 1865.

Fig. 1.

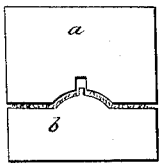


Fig. 2.

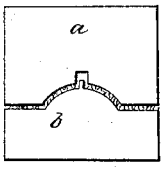


Fig. 3.

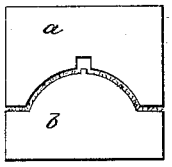


Fig. 4

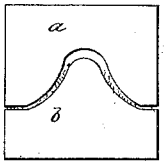


Fig. 5

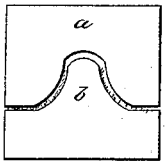


Fig. 6.

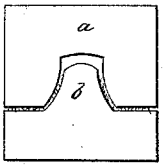


Fig. 7.

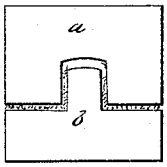


Fig. 8.

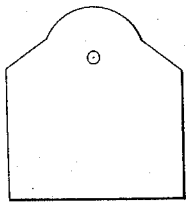
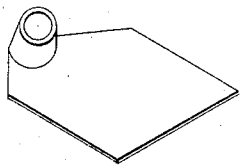


Fig. 9.



Witnesses:
E. L. Richard
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UNITED STATES PATENT OFFICE.

ANDREW PATTERSON, OF BIRMINGHAM, PENNSYLVANIA.

IMPROVEMENT IN MANUFACTURE OF HOES.

Specification forming part of Letters Patent No. **49,649**, dated August 29, 1865.

To all whom it may concern:

Be it known that I, ANDREW PATTERSON, of the borough of Birmingham, Allegheny county, State of Pennsylvania, have invented certain new and useful Improvements in the Manufacture of Hoes; and I hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, which form part of this specification, and to the letters of explanation marked thereon.

Planters' hoes have heretofore been made by various processes, as by hand-forging; by having the separately-formed eye attached to the blade by riveting or welding; by having the eye cast on a prepared blade; by having the entire hoe formed by casting of malleable iron; by having the eye or shank attached to the blade by screw-nuts, or by wedges or keys, and perhaps otherwise.

I form my hoe by a process differing from all these and, as I believe, from all other processes ever used before in making hoes.

My invention consists in making the entire hoe from a single piece of sheet-steel by raising or drawing the eye from the substance of the sheet of which the blade is formed by the gradual action of a series of properly-shaped dies.

The general principles of the operation are old and well understood by workers in sheet metal, and are illustrated in the usual mode of making spoons, dishes, basins, kettles, &c., by the process called "stamping."

In the manufacture of hoes by this process I take a plate of steel of the thickness and general shape of the intended hoe, and having made a small hole—say about one-fourth the diameter of the intended eye—through the plate at the place where the center of the eye is to be formed, I then heat the plate to about a cherry-red heat, and under the pressure of a percussion or drop press I subject the plate to the action of a pair of round dies, which stretch and raise that part of which the eye is to be formed and some of the surrounding metal as high above the general surface of the plate as can be done without too violently straining the fiber of the steel. I then reheat and pass the partly-formed hoe through another pair of similar dies, which further raise the prospective eye, and repeat the operation until the elevation is about as high above the general surface as it is intended to have the eye when finished. At this stage of the operation the small hole in the plate has been considerably enlarged and the circular elevation has had an increased surface developed, which is nearly sufficient to form the eye without any further stretching. This is accomplished (the formation of the eye) by the action of a series of dies, which gradually narrow the base, without reducing the height of the elevation produced by the first series of dies, until the hole first made has been drawn out to the full size of eye and the proper draft of eye has been obtained. An advantage of this plan of stretching and then compressing the part of which the eye is formed is that a more uniform and greater thickness of metal in the eye is obtained than would be by operating otherwise.

Figures 1, 2, and 3, 4, 5, 6, and 7 are sectional views of a series of dies which, with good steel, will succeed well; yet I do not confine myself to these precise shapes of dies, for they may be much modified in relation to each other, and doubtless with advantage in their adaptation to different qualities or thicknesses of steel or to different sizes or forms of eye desired. Such modifications will readily suggest themselves to the intelligent mechanic. *a a a a a a a* indicates the female, and *b b b b b b b* the male dies. *c* indicates the position of the plate (shown by the short oblique lines) between the dies after it has received each stroke.

Fig. 8 is plate before it has been impressed with any of the dies.

Fig. 9 is a hoe when finally shaped by the last pair of dies. It does not differ materially in appearance from a forged hoe, and may have the proper set given to it in the last pair of dies, or by heating and bending, as is done with forged hoes. It should be finally finished by grinding, tempering, and polishing, as are other hoes.

The advantages of my improvement are, chiefly, that by it, without skilled labor, a neater, lighter, stronger, and more durable hoe can be made at less cost than by any other process now known.

Having thus described my improvement, I claim as my invention—

The improvement in the manufacture of hoes herein described—that is to say, forming the eye and the blade of one sheet of metal previously rolled to the thickness of the intended blade, the eye being formed by the gradual action of a series of dies so operating on the substance of the said sheet of metal as to compress into the body of the eye a greater quantity of metal than previously lay within its circumference, the complete hoe being thus formed without further forging, substantially as described and set forth.

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