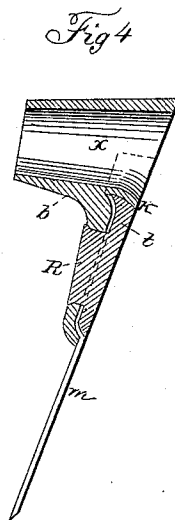
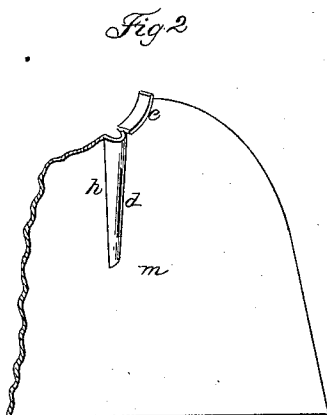
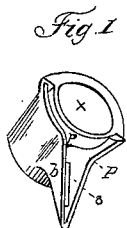


J. ELLS.

Hoe.

No. 40,826.

Patented Dec. 8, 1863.



Witnesses:
F. W. Ells
James Howell

Inventor:
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UNITED STATES PATENT OFFICE.

JOSIAH ELLS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN HOES.

Specification forming part of Letters Patent No. 40,826, dated December 8, 1863; antedated December 1, 1863.

To all whom it may concern:

Be it known that I, JOSIAH ELLS, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Construction of Hoes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification, and to the letters of reference marked thereon.

My invention relates to an improvement in that class of hoes wherein a malleable cast-iron eye is attached to a steel blade; and it consists in a novel and durable method of securing the eye to the blade in such a manner as to completely overcome the difficulties heretofore experienced in forming hoes of this character sufficiently strong to withstand the rough usage they are intended to undergo.

To enable others to understand my invention, I will proceed to describe its construction by reference to the accompanying drawings, in which—

Figure 1 represents a perspective view of a malleable cast-iron eye detached from the blade. Fig. 2 represents the blade, one portion of which is broken off the better to show the parts. Fig. 3 is a perspective view of a key or rivet, the object of which will be hereinafter explained. Fig. 4 represents a transverse vertical section of a hoe complete, showing the parts put together.

All the parts are lettered, and similar letters indicate like parts on all the figures.

In my improved hoe the eye *x* is formed with a bracket, *b*, concaved at the rear its entire length, which concavity extends around the eye the distance of half its diameter, forming a groove, *p*, leaving that part next the groove thinner than the outside portion of the eye.

The blade *m*, Fig. 2, is made of sheet-steel, of the usual form, with this exception, that in my hoe there is a small semicircular piece cut out at the top at that part intended to be attached to the eye. The edge of this semicircle is turned up so as to form a small flange, *e*, Fig. 2, while the center of the blade is "set

up" from the flange down, forming a projection, *h*, Fig. 2, corresponding in shape with the concave in the bracket on the reverse side of the blade. This setting up forms a countersink into which the head *t* of the key or rivet, Fig. 3, fits, which is of the same shape and size, and fills the concave portion of the blade. The eye being prepared as shown at Fig. 1, the flange *e* of the blade turned, the center struck up so as to form the projection *h*, Fig. 2, the parts are put together by placing the flange *e* of the blade in the groove *p* of the eye, the raised portion of the blade *h* resting in the concave of the shank *b*, the slot *d* in the raised part of the blade being opposite a corresponding slot, *s*, in the shank *b*. The stem *R* of the key is passed through both slots, the head resting in the countersink, the stem being riveted upon the crown or front of the shank. The thin portion of the eye is now turned down over the end of the head of the key and around the flanged part of the blade, securing the parts together in a most firm and durable manner.

This form and arrangement of the parts enlarges the bearing of the blade in the shank by flanging and convexing the same, while the elongated head and stem of the key prevents their cutting and consequent displacement, obviates the difficulty hitherto experienced in permanently fastening a steel blade (otherwise than by welding) to a wrought or malleable iron eye, in consequence of the edge of the steel, from its superior hardness, cutting the fastenings or rivets, which is effected by the continual jar while in use.

Having described the nature of my invention, what I claim is—

The hollow or concave bracket *b* and groove *p*, in combination with a blade, *m*, having a semicircular flange, *e*, and arched recess *h*, and the key, Fig. 3, for securing and strengthening the blade, substantially as herein set forth.

JOSIAH ELLS.

Witnesses:

J. W. ELLS,
JAMES HOWELL.