J. H. Silkman,

Splitting Wood.

No. 52,216. Patented Jan. 23, 1866.

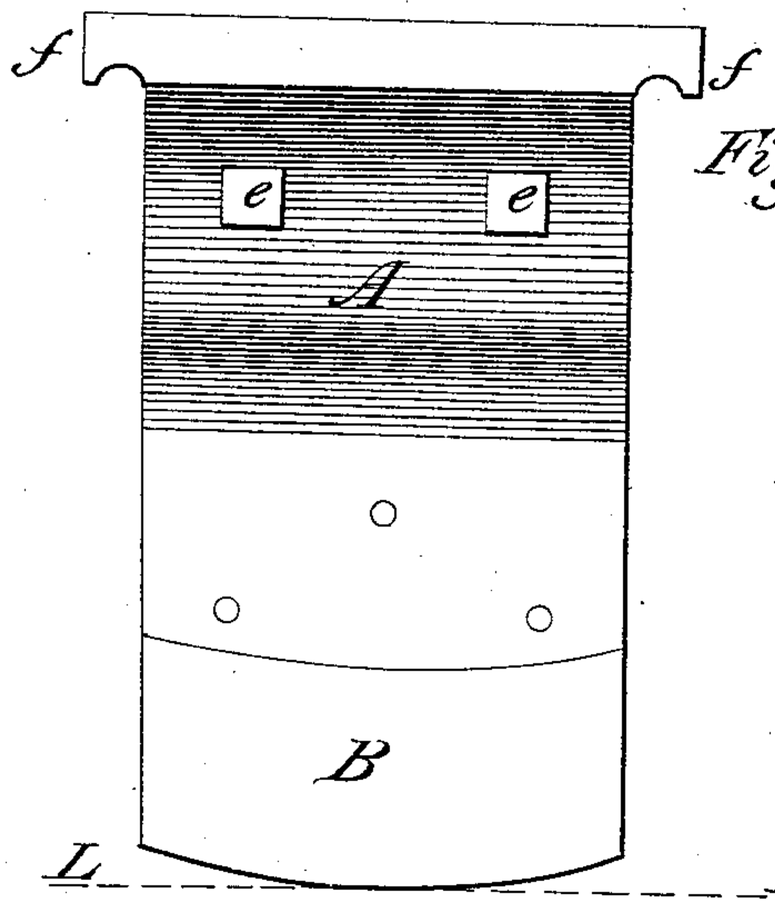


Fig. 2.

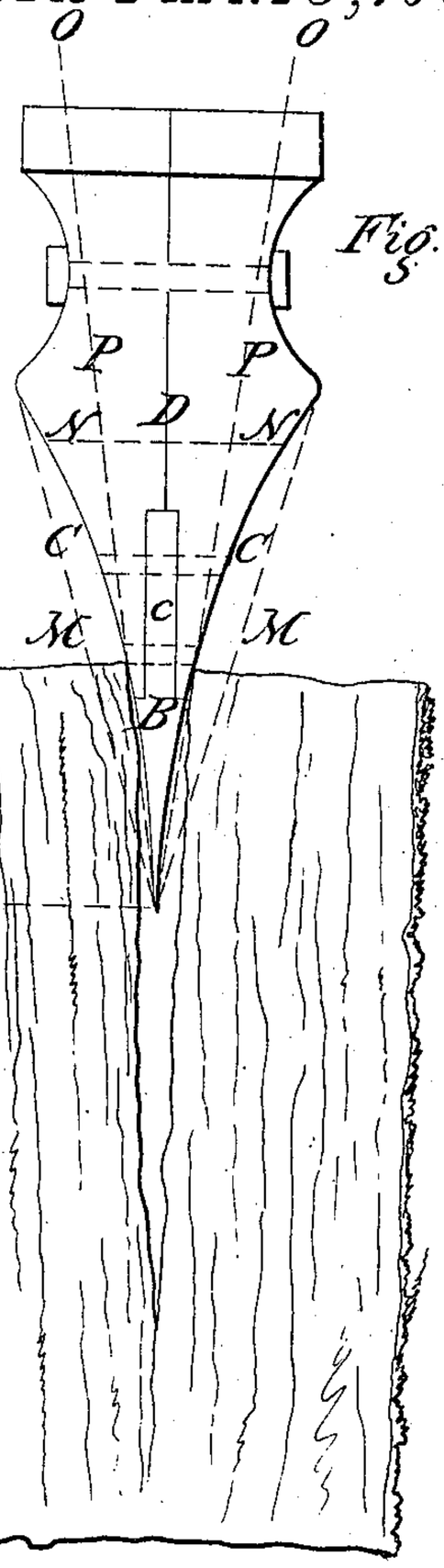
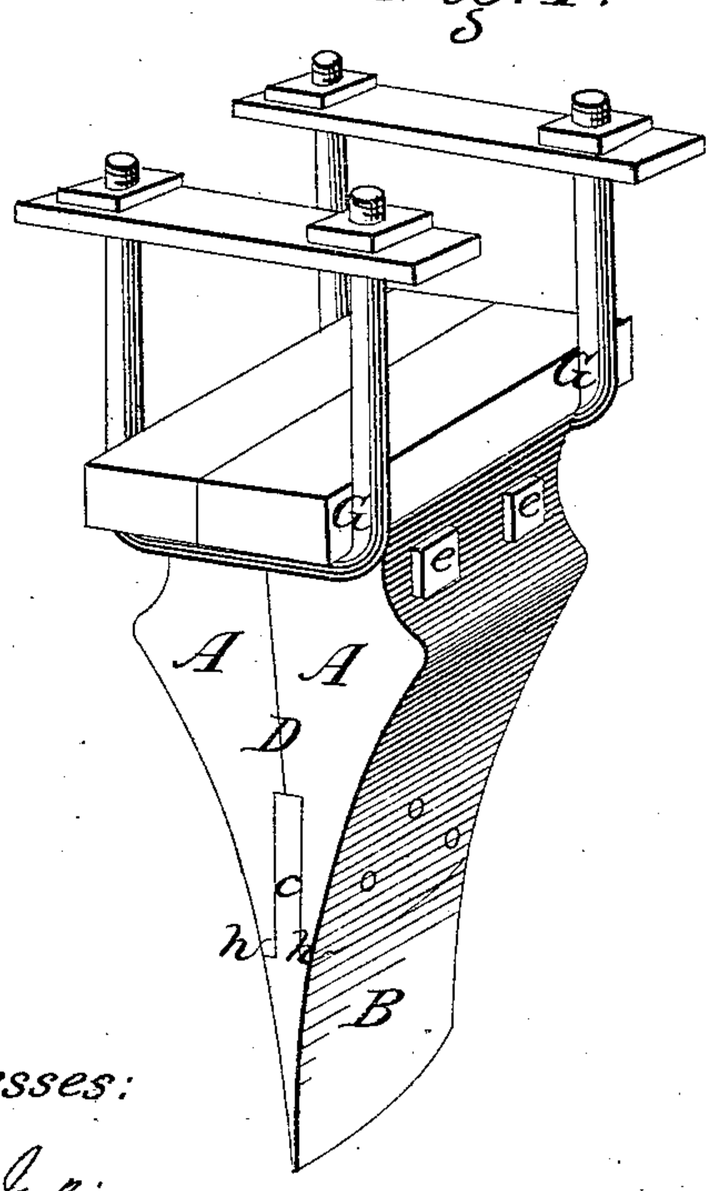


Fig. 3.

Fig. 1.



Witnesses:

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JOHN H. SILKMAN, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN AXES FOR WOOD-SPLITTING MACHINES.

Specification forming part of Letters Patent No. **52,216**, dated January 23, 1866.

To all whom it may concern:

Be it known that I, JOHN H. SILKMAN, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in the Ax Used or Employed in Wood-Splitting Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 gives a perspective view of the ax with its flanges and the clips or staple clamps or collars for attaching or appending the ax to the helve or working-beam. Fig. 2 is a plain view of the broad face or side of the ax, with its flanges extended at the ends of the head or poll; and Fig. 3 is a plain end view showing the different parts of which the ax is constructed and the action of its blade in the wood-cleft as regards self-clearance after each stroke.

A great difficulty with wood-splitting-machine axes has hitherto been their adhesion within the cleft of the wood block or bolt, unless formed so obtuse as to cause great concussion, and lifting the block or bolt with them on the reciprocating strokes.

The nature of my invention obviates this difficulty; and it consists, mainly, in securing reversely the two broad or lateral surfaces of the ax-blade, so that each will be regularly concave from the edge toward the head or poll of the ax, and so that while the ax will enter easily between the wood fiber, and with the least possible shock or concussion, the initial margins only of the cleft can come in contact with the blade at any instant in the process of cleaving or spliting, thereby securing a free clearance of the ax from the block or bolt of wood after every stroke and avoiding shock.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct my ax of two different materials, one of cast-iron, the other of steel. The part made of cast-iron I style the "body," and it includes not only that portion above the blade curves, but the poll or head flanges, and that portion of the entire blade between the shoulders of the edge-blade and the upper terminal of the blade curves. (It is shown at A, Figs. 1 and 2.) The part made of steel I call the "edge-blade," (it is shown at B, Figs. 1 and 2,) and includes what I call the "blade-shank." (Shown at *c*, Figs. 1 and 3.)

I cast the body of my ax in one or two parts, at my option. If cast in one piece, it should be with a deep groove in the lower edge to receive the blade-shank, as shown at *c*. If cast in two pieces, one-half of this groove should be cast in each piece, so as to form the entire groove when the two parts or halves of the body are united. These are united, as shown at D, Figs. 1 and 3, and are attached and secured firmly together by means of strong bolts, as shown at *e e*, Figs. 1 and 2. The poll or head of the ax is made broad and level, and is extended or projected over at the ends, so as to form strong flanges, as shown at *f f*, Fig. 2, by means of which, and of clips or staple-clamps, the ax is attached and secured to the helve or working-beam of the machine, as shown at G G, Fig. 1. After the main body of the ax is cast the groove *c* must be planed out true and rectangular, and its pendent margins brought straight and level with each other. These margins should have good thickness of substance. I next forge out roughly the edge-blade B, with the blade-shank *c* as nearly of the proper size and shape as practicable, after which the shank is to be planed or dressed, so as to fit groove *c* perfectly and tightly, and the edge-blade shoulders, so as to form a perfect joint with the groove-margins at *h h*, Fig. 1. The edge-blade is then to be secured in place by means of rivets. The end surfaces of the entire ax, except the poll or head flanges, are then planed smooth and level and parallel with each other, when the blade curves are struck upon the smooth ends of the ax. The appropriate curves are the reverse segments of equal circles sprung from the same initial point—the edge of the ax—the radial points or centers of which circles are found, of course, on the line I, drawn transversely across the edge of the blade at right angles to its vertical axis when resting on its point. For instance, the radial or center points of the curves C C, Fig. 3, are found at L, and its corresponding point on line I produced beyond the point of the ax, Fig. 3. The radius of the circles, of which the curves are segments, will,

of course, be greater for a longer blade vertically, and less for a shorter or more obtuse blade, as may be desired.

When the lines of the blade curves have been struck, as indicated, both broad or lateral surfaces of the ax-blade are to be shaped to these curves. These surfaces should be left slightly and correspondingly convex, which will, of necessity, produce an edge somewhat elliptical, as in Figs. 1 and 2, and which, when operated, should be kept at reasonable cutting sharpness.

It has already been remarked herein that the operation of my ax in splitting wood is to enter between the wood fiber easily and with the least possible shock or concussion. Its facility and ease of entrance, compared with a blade of equal length and head expansion with straight divergent surfaces, as shown by dotted lines M M, Fig. 3, may be appreciated upon mere inspection. It will be readily seen that if an ax or wedge blade of an angle so obtuse as the latter were forced into the solid wood by either a blow or a continuous force, a greatly-increased power must be employed, and a severe strain, jar, or shock be experienced, both by the machine and its feeder, by the latter to such an extent that the block or bolt of wood must be dashed or sprung from his hand; or if, to avoid these difficulties, the blade be lengthened and its angle lessened, then still greater difficulties are encountered. In order, then, to bring within the cleft the same extent of head expansion as that found on my blade at transverse dotted line N N, the length of stroke must be doubled or extended to O O through dotted lines P P, Fig. 3, when, of course, the blade will not clear, but will adhere within the cleft.

The principle of operation in my ax, therefore, is this, that the angle of incision is increased as the point of union in the cleft is removed and its adhesion or resistance diminished.

I do not claim as any part of my invention an ax or wedge of itself; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

The splitting ax or wedge, when constructed, as described, of parts A, A, and B, and having the form substantially as described.

JOHN H. SILKMAN.

Witnesses:

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