L. Dodge,

Making Axes,

No. 54,311. Patented May 1, 1866.

Fig. 3

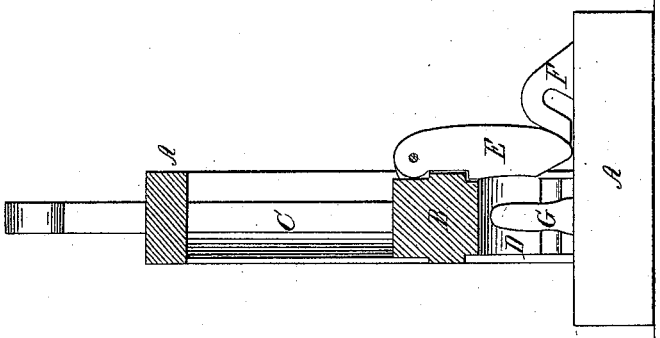


Fig. 2

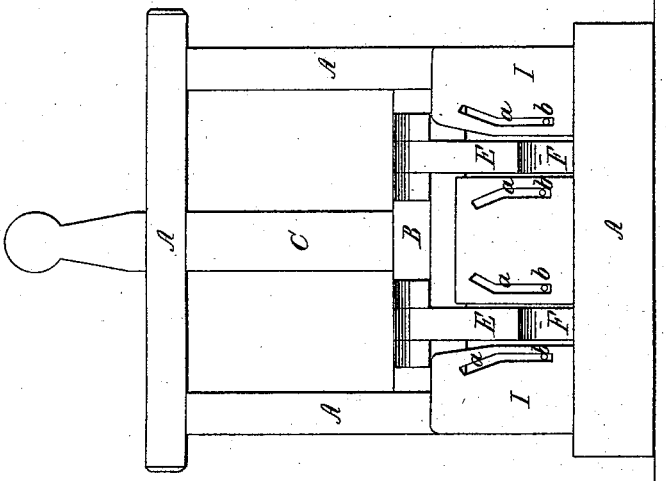
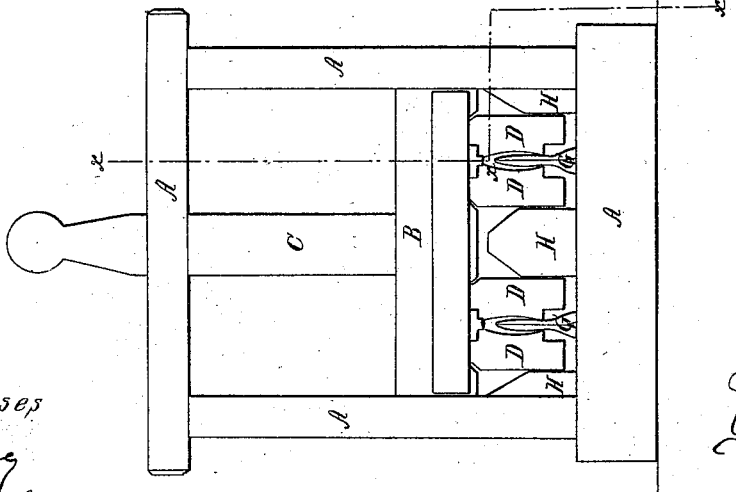


Fig. 1



Witnesses

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UNITED STATES PATENT OFFICE.

LEVI DODGE, OF WATERFORD, NEW YORK.

IMPROVEMENT IN MACHINERY FOR HAMMERING HEADS OF AXES.

Specification forming part of Letters Patent No. **54,311**, dated May 1, 1866.

To all whom it may concern:

Be it known that I, LEVI DODGE, of Waterford, in the county of Saratoga and State of New York, have invented certain new and useful Improvements in Machinery for Hammering the Heads of Axes; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of a machine constructed in accordance with my invention. Fig. 2 represents a rear elevation of the same, and Fig. 3 represents a transverse vertical section of the same on the line *x x*, as seen in Fig. 1.

In the manufacture of axes or similar tools, after the ax-poll is made and the eye—*i. e.*, the hole formed in the ax-head for the reception of the helve—punched out, which may be done by means of dies and a punch operating simultaneously, as described in the patent granted me March 12, 1861, and reissued October 10, 1865, for improvement in axes, &c., the poll is prepared to receive the steel blade or bit by notching that portion of it to which the steel is to be welded. This operation of fitting the steel, or "bit drawing," as it is called, causes the cheeks of the ax to bulge out and become misshapen, thus upsetting and altering the shape of the eye. After the bit-drawing operation is finished, in order to bring the ax-poll—especially the eye—back to its proper shape, it is necessary to pin out the eye—that is, to drive forcibly through the eye a pin or punch of the proper form and size—and at the same time to hammer the head and cheeks of the ax until they have assumed the desired proportions. This operation, called "head-hammering," is done entirely by hand, and is very laborious, and consequently expensive.

The object of my invention is to save nearly, if not all, the labor of head-hammering and punching; and I accomplish this by the employment of mechanism working automatically, whereby the eye is re-shaped by a punch or pin, and at the same time the cheeks and head are pressed and squeezed between dies of suitable form. Under this pressure a smooth finish is given to the ax, which, at the same time, receives its ultimate form.

To enable others skilled in the art to understand and use my invention I will now proceed to describe its nature and operation.

In the accompanying drawings, A is the frame of the machine. B is the head-block, midway between whose ends is secured the rod C, by means of which motion is communicated to the machine. When actuated by the rod C the block B slides up and down in guideways in the sides of the frame.

D D are forming-dies or matrices, pivoted to the head-block. On the lower part of the rear faces of these dies are pins *b*, which work in slots *a*, made in plates attached to the rear faces of the pillar-blocks I I. By this arrangement the dies, when raised by the head-block, open automatically.

E is the heading-die, also pivoted to the head-block B, which shapes the head of the ax. F is a spring-cam, by which the heading-die E is firmly held against the ax-head.

It is desirable to provide for the variation there may be in many instances in the amount of stock or metal in the head and sides of the ax, for it may often happen, when the same dies are used to shape many ax-heads supposed to be of the same size, that some of the ax-heads may be composed of a greater quantity of metal than others, and in this case there will be danger of breaking the machine. To avoid this I use springs in connection with the dies or the parts to which the dies are attached, so as to hold the dies firmly and preserve the form of the ax-head, but at the same time to allow for any variation in the amount of stock or metal. In the present instance the spring is combined with and forms part of a cam, F, as shown in Fig. 3, which, while it presses the die E against the head of the ax, will yield, as explained above, so as to prevent injury to the machine.

G is the eye-pin inside the dies, which is inserted in the eye of the ax to give it proper shape.

H H are pillar-blocks for supporting the cheek-dies in their pressure against the sides of the ax. They are constructed with inclined faces, so as to permit the dies to open, as above explained, when raised.

I I are plates secured to the hind faces of the blocks H H, in which are cut the slots *a*, for regulating the opening or shutting of the dies.

From the foregoing description it will be easy to understand the operation of this invention. The ax-head being placed in a proper position to be operated on, the dies, which have

been raised, are now lowered and embrace the cheeks and head of the ax, closing in upon the sides and pressing them into proper shape. At the same time the eye-pin is forced through the eye, and gives it the desired form and size. Having forced the pin through from one end of the eye, it is necessary, in order to make the eye true, to turn the ax, so as to force the pin through from the other end also. The spring-cam supporting the heading-die yields to the pressure if there be more metal in the ax-poll than the dies can contain. After this operation is completed the ax-head is finished and is ready, or nearly so, to go to the grinding without the tedious and costly operation of hand-hammering.

These improvements may be used with advantage in the manufacture, not only of axes and hatchets, but of picks, hammers, and all similar tools.

Having thus fully described my invention, I shall state my claims as follows:

1. The finishing of axes by the use of dies closing upon the cheeks and heads, in combination with a pin, the whole being constructed as described and operating simultaneously, to give the ax its ultimate form and smooth finish, substantially as set forth.

2. The combination, with the dies constructed and arranged as described, of a yielding support or spring applied in the manner substantially as herein shown and set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

LEVI DODGE.

Witnesses:
A. POLLOK,
EDM. F. BROWN.