C. L. JEFFORDS.

Machine for Making Axes.

No. 200,616. Patented Feb. 26, 1878.

Fig. 1.

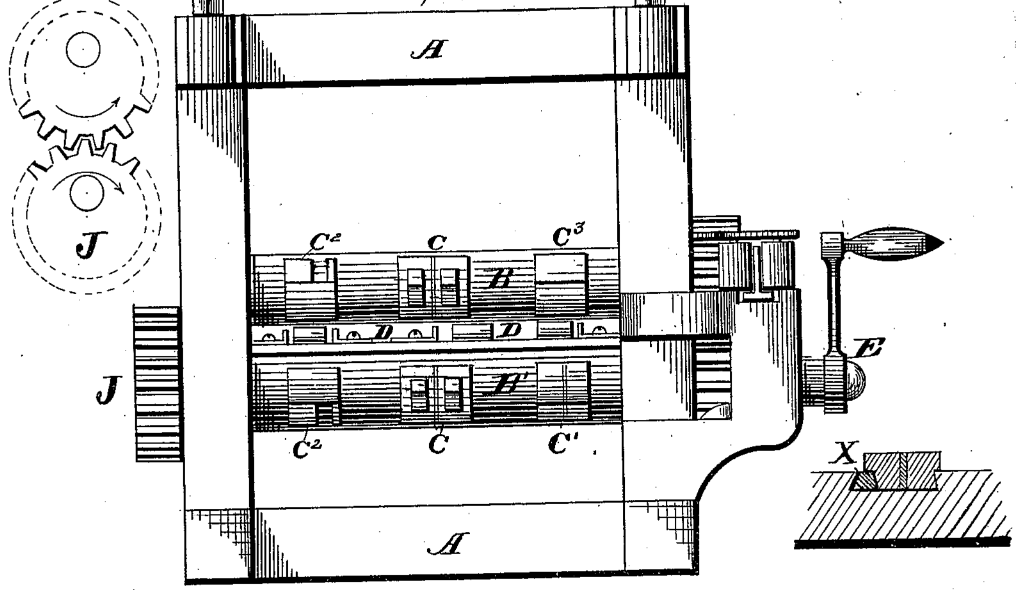
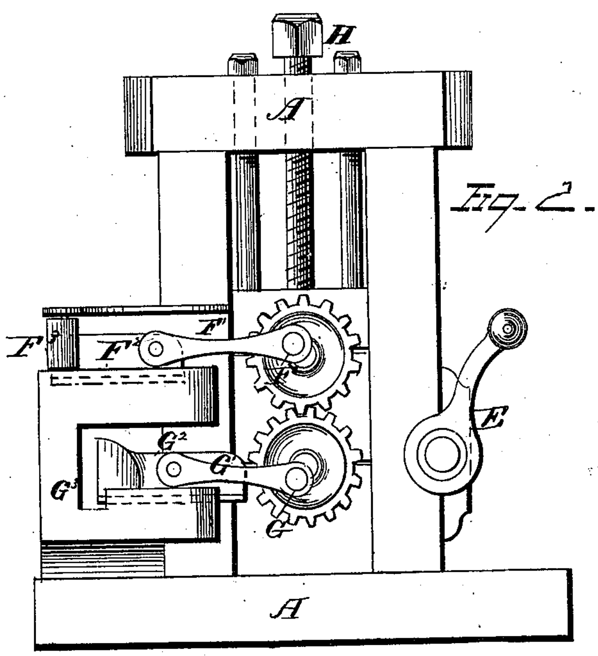


Fig. 2.



WITNESSES

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3 Sheets—Sheet 2.

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Fig. 3.

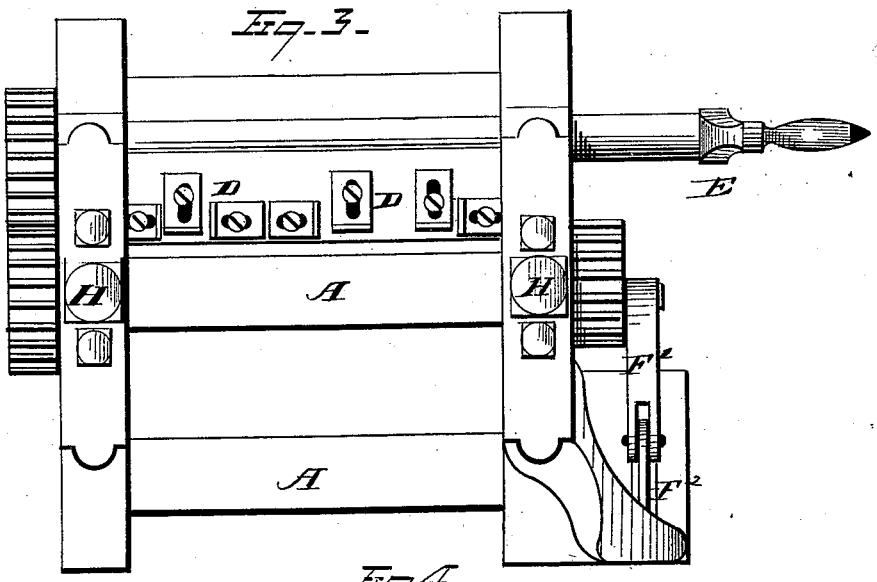
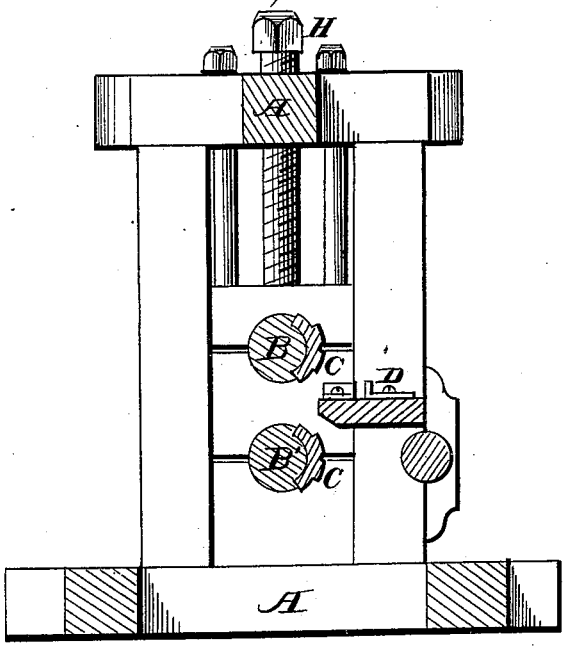


Fig. 4.



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3 Sheets—Sheet 3.

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Fig. 6.

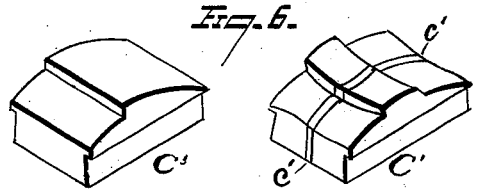


Fig. 7.

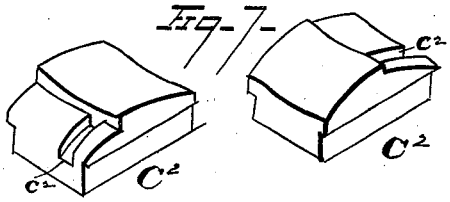


Fig. 5.

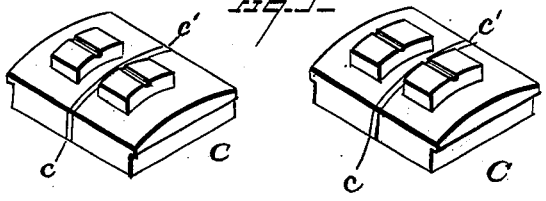
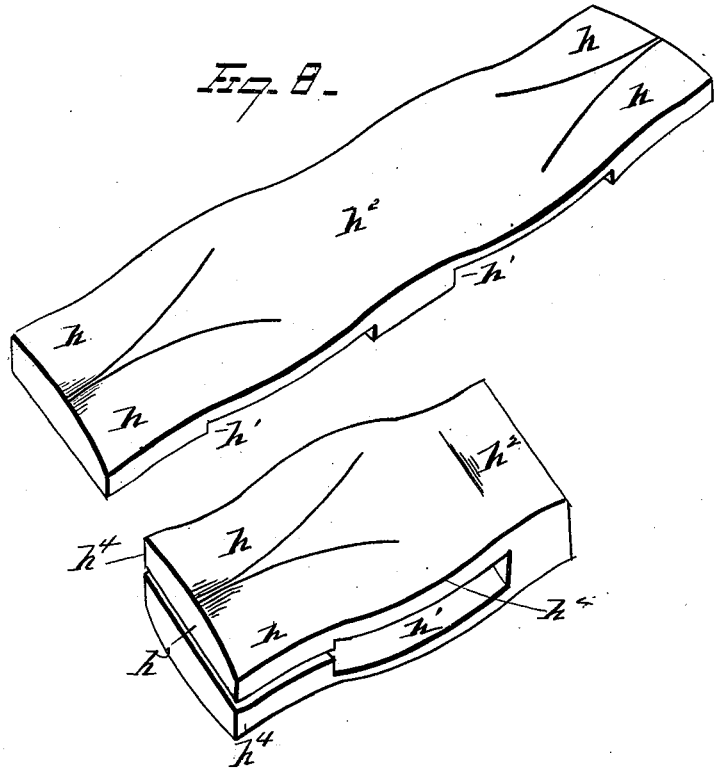


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES L. JEFFORDS, OF JAMESTOWN, NEW YORK.

IMPROVEMENT IN MACHINES FOR MAKING AXES.

Specification forming part of Letters Patent No. **200,616**, dated February 26, 1878; application filed January 11, 1877.

To all whom it may concern:

Be it known that I, CHARLES L. JEFFORDS, of Jamestown, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Machinery for Making Ax-Polls; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to new and improved machinery for making ax-polls; and consists, first, in combining, in a single machine, the mechanism necessary for taking a piece of iron and transforming it to a completed ax-poll; second, in making the swaging-dies of pieces that can be adjusted longitudinally of the shaft by inserting pieces between them, so as to be suited to a larger or smaller blank; third, in combining the final swaging and edging dies into a single set of dies.

In the drawing, Figure 1 is a front view, in elevation, of the said machine. Fig. 2 is a side elevation on the side where the power is applied. Fig. 3 is a plan view, showing the gages. Fig. 4 is a cross-section through the rolls and the gages. Fig. 5 is a separate view of the first pair of dies; Fig. 6, a separate view of the second pair of dies; Fig. 7, a separate view of the last pair of dies for welding and edging. Fig. 8 is a poll-blank before and after bending.

A is the frame of the machine. B B′ are rolls, to which are attached swaging-dies. C C^1 C^2 are the swaging-dies. The dies C are split at their centers, at *c*, as indicated. The object of thus splitting them is to render them capable of longitudinal adjustment on the rollers by inserting pieces of metal *c′* having the same surface conformation between them, so that the same dies may suit a larger or smaller ax-poll. The die C^1 is likewise split at *c*, for insertion of pieces c^1, for a like purpose. The other dies, C^2, are shown as solid; but they may be split, if desired. So, also, with the die C^3.

These split dies, made longitudinally adjustable on the rolls, are fastened thereto by wedges, as shown in the detail view at the right hand of Fig. 1 in the drawings, in which X represents a wedge introduced between the lower incut side of a die and the wall of the slot in which the die seats. By using a thicker or a thinner wedge the split dies are adjusted toward or away from one another correspondingly, and to accord with the size of the ax-poll.

D are stops or gages arranged in front of the opening between the two rolls. These gages adjust the metal both longitudinally and laterally, as shown.

E is the power-shaft; but I do not limit myself to any particular means of applying the power to the rolls B B′, that shown in the drawing being simply a convenient mechanism, which I find to answer all practicable purposes.

F is a crank, to which is attached a pitman, F^1, which operates a plunger, F^2. This plunger is designed to drive the poll-blank, after it is properly formed, forward between the anti-friction rollers F^3, thereby giving to the poll-blank its proper bend or fold.

G is another crank; G^1, a pitman, and G^2 a plunger driven by the pitman. This plunger is for the purpose of swaging the sides of the poll-head after the poll is bent, so as to bring the poll-head to the proper thickness.

These cranks F and G are represented as separate; but it is apparent that these two plungers F^2 G^2 might be placed at such a point as to be both operated by the same crank. So, also, the plungers are represented as both being on the same side of the machine. This, of course, is likewise immaterial; but it is a convenient arrangement.

G^3 is an abutment, which serves the purpose of an anvil, between which and the plunger G^2 the blank is swaged.

H are set-screws for adjusting the swaging-rolls nearer to or farther from each other, thus adapting them to different sizes of ax-polls.

The operation of the machine is as follows: Motion having been imparted to the rolls, the blank or piece of iron from which the ax-poll is to be made is inserted between the rolls in line with the dies C, and, as the latter come opposite each other, they will operate to swage the blank at the points *h h*, as shown

in Fig. 7. After the blank has been properly swaged at h h it is inserted between the dies C^1 C^3, which operate to swage the blank at h^1, as represented in Fig. 8. The gages D serve to limit the movement of the blank as it passes between the dies. When these are properly formed, the metal is introduced between the rollers F^3 and the plunger F^2. This plunger F^2 then drives the blank through between the anti-friction rollers F^3, thus bending or folding the blank upon itself. It is then introduced between the anvil G^3 and the plunger G^2, when the plunger G^2 labors upon the sides at h^2, giving to the poll-head its proper thickness. The blank is then taken and, if necessary, reheated and introduced between the dies C^2. The flat portions of these dies weld the ends together at h^3, while the grooves c^2 serve to edge up the blank at h^4 when the blank is turned up on its edge.

The action of the dies C^2 serves to flatten out and spread the metal, and it becomes necessary to keep it within proper limits by turning it up on its edge occasionally, and permit the grooves c^2 to upset the metal, while they retain the poll on its edge and prevent the metal from spreading at the edges. This is the operation I denominate as "edging."

In using these dies, it will be observed that the operator waits until the dies have opened; then, while they are passing around, he introduces the blank through between the rolls until it is stopped by its proper gages D, these gages D being adjusted to give the exact required longitudinal and lateral position to the blank.

I would have it understood that, when I employ the longitudinal and lateral gages D, I do not limit myself to any particular style of dies, nor do I limit myself to splitting the dies; but, in connection with these double gages, I may employ solid dies as well as split dies; but I prefer, generally, to employ the split dies, for the reasons hereinbefore explained.

The pinions J are eccentric, being so adjusted that the power is applied with greatest leverage just at the time when the dies are doing the work.

I do not broadly claim the combination of concentric and eccentric gearing-rolls and forming-die above set forth, as the same is not new with me, and is not my invention.

What I claim is—

1. The combination, in an ax-poll machine, of dies for giving shape to the blank, bending mechanism for folding the blank, pressing mechanism for giving the proper thickness to the poll, and dies for welding and edging the bent blank, substantially as and for the purpose described.

2. The combination of the die-rollers B B′, bearing-dies C C^1 C^2 C^3, the plunger F^2 and rollers F^3, plunger G^2, and anvil G^3, substantially as and for the purpose described.

3. In an ax-poll machine, the split dies and intermediate adjusting-pieces, substantially as and for the purpose described.

4. The combined welding and edging dies C^2, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES L. JEFFORDS.

Witnesses:
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WELLS W. LEGGETT.