

R. Blake,

Making Axes,

N^o 80,900.

Patented Aug. 11, 1868.

Fig. 1.

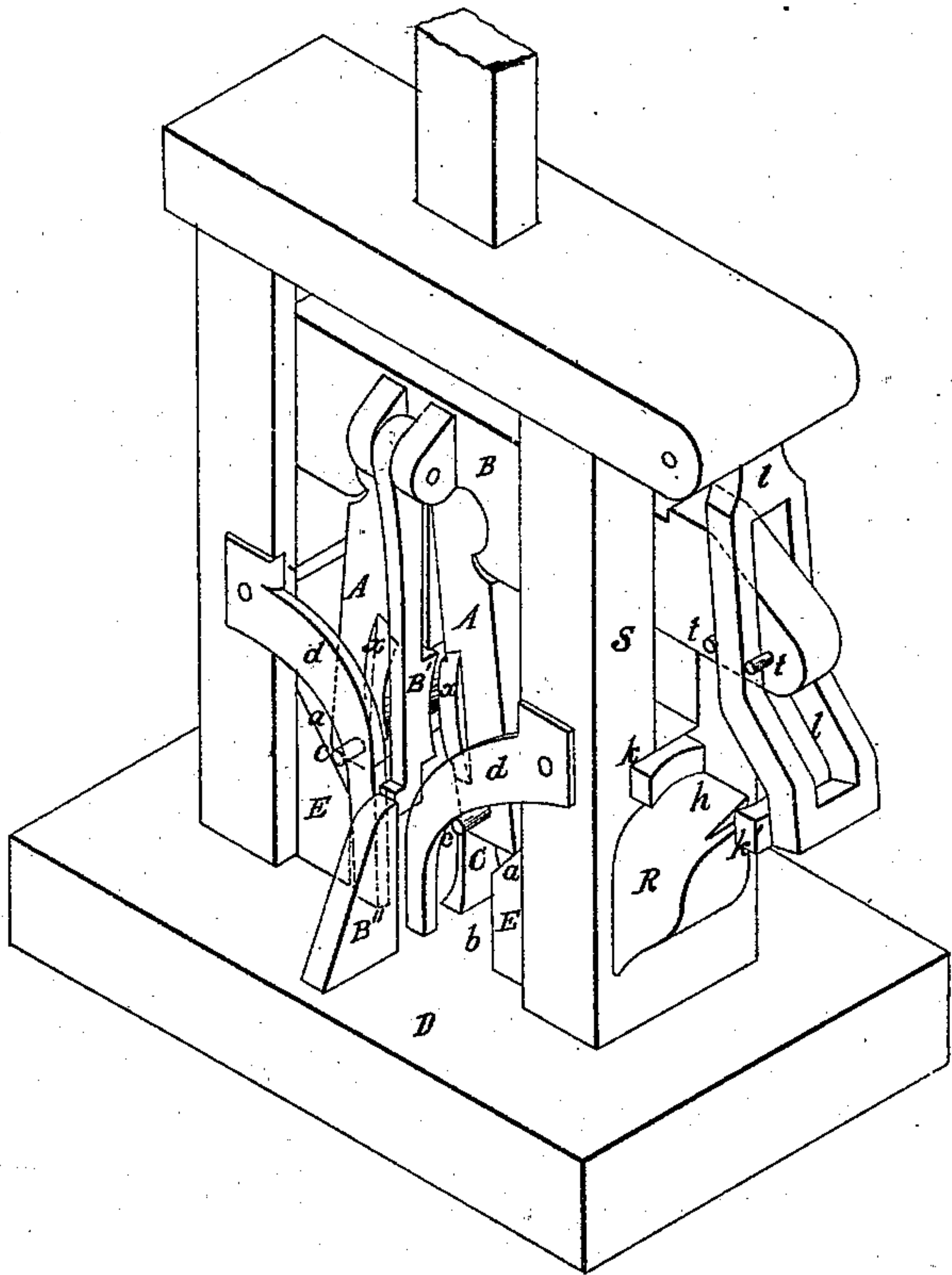


Fig. 2.

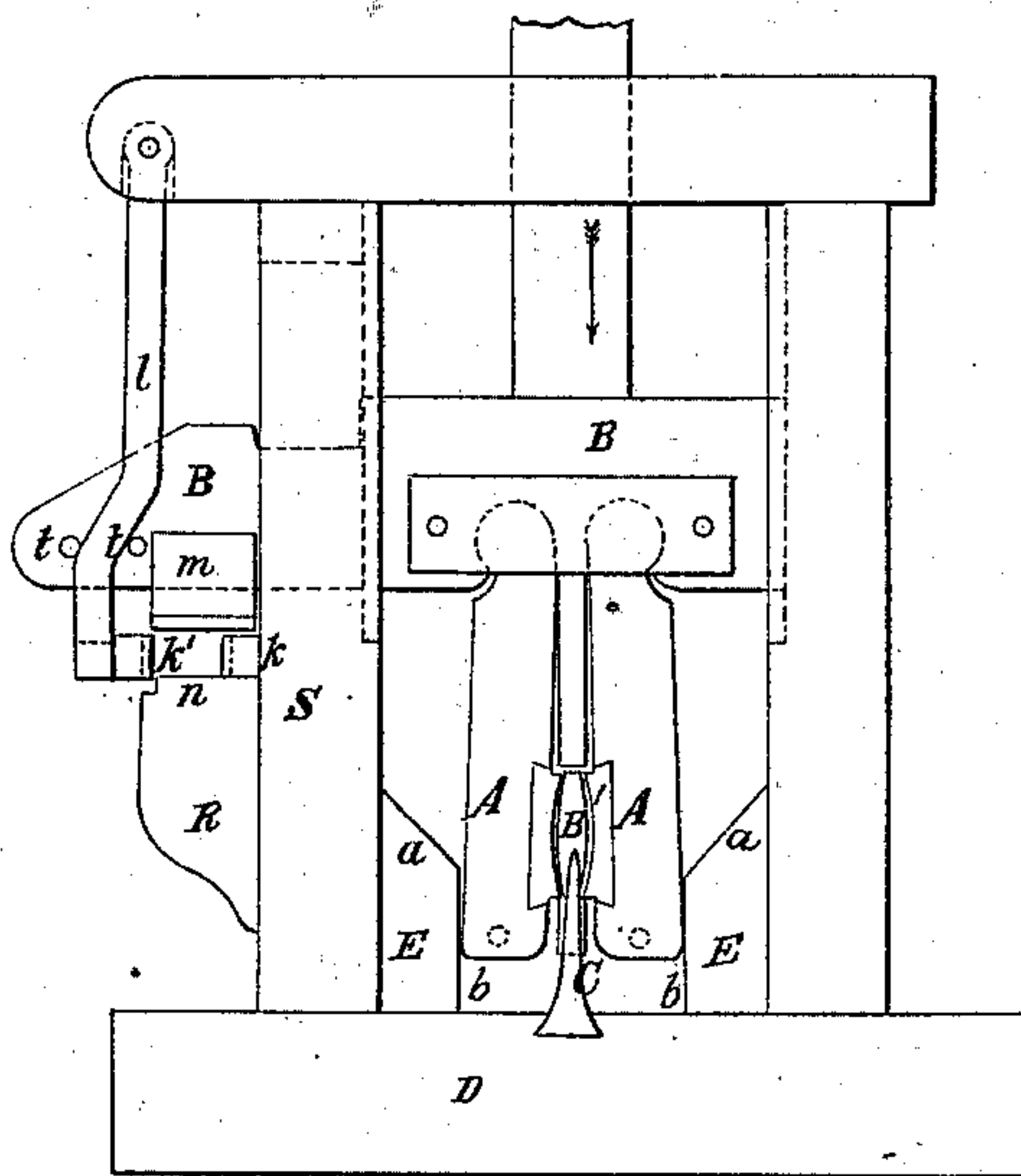


Fig. 3.

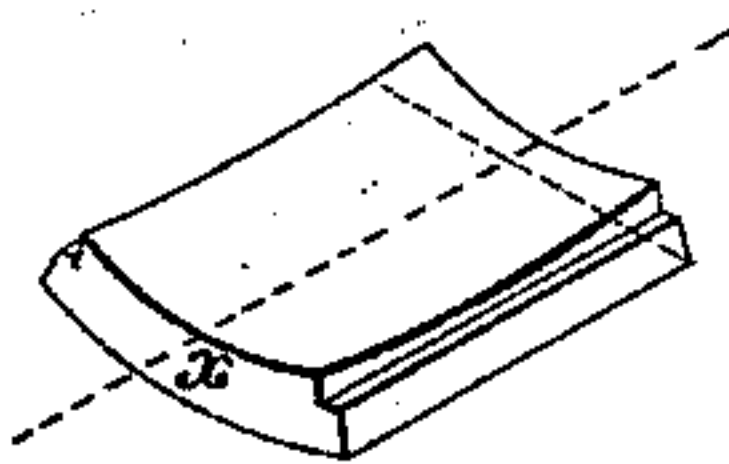


Fig. 4.



Witnesses:

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ROBERT BLAKE, OF SCRANTON, PENNSYLVANIA.

Letters Patent No. 80,900, dated August 11, 1868.

IMPROVEMENT IN MACHINES FOR PUNCHING AXE-POLLS.

The Schedule referred to in these Letters Patent and making part of the same.

TO WHOM IT MAY CONCERN:

Be it known that I, ROBERT BLAKE, of Scranton, in the county of Luzerne, and State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Punching Axe-Polls and other articles; 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 is a perspective view of a machine for punching axe-polls, constructed in accordance with my invention.

Figure 2 is a side elevation, and

Figures 3 and 4 are detached views of the same.

My invention relates to machines for punching the eye or hole for the reception of the handle in axe-polls and other like tools, and more especially to such machines in which a set of dies, for squeezing the poll or stock from which the poll is formed, is combined with a punching-pin, located between the dies, as illustrated in Letters Patent of the United States heretofore granted Levi Dodge.

For the better understanding of the nature and scope of my invention, and the advantages resulting from it, I deem it advisable to first describe the method heretofore pursued of punching axe-polls, so as to show more fully the defects which it is my object to remedy.

In a punching-machine constructed upon the general plan above mentioned, the dies have been made concave, so as to impart the desired form to the sides of the poll.

The heated bar is inserted between the dies thus constructed until it bears against a gauge at the opposite end of the dies from the workman, which prevents the bar from protruding beyond the dies.

This gauge is attached to a stiff spring, in such manner as to be enabled to yield slightly when subjected to pressure. When, therefore, the bar is punched and compressed between the dies, the gauge is pushed back a little distance by the stock, which is squeezed out, and only returns to its normal position when the dies are opened and the bars removed from between them.

In order to finish and give the proper form to the hole, the poll partially formed on the end of the bar is turned, so as to allow the punching-pin to enter the eye or hole from the opposite edge of the poll, and is again punched and compressed between the dies, after which it is cut off from the bar.

By this operation, the "bit"-end of the poll, or, in other words, the end in which the steel bit or blade is inserted, has given to it an irregular shape, which it retains throughout the other operations to which the poll is subjected, so that, before the steel can be welded in, it is indispensable to trim off enough of the end to make it regular and of the desired shape.

The poll, after coming out of the dies, is taken up by another operative, who "edges" it, that is to say, gives the desired outline to the longer lines or edges, and then trims off, by means of shears or like mechanism, the irregular-shaped end produced in the operation just above mentioned.

This trimming, however, makes what is called a "fash" edge, that is, some of the stock is pushed past the lower shear by the upper, for the reason that it is practically impossible to keep the shears in absolute contact, or the edges in perfect condition for more than a few moments at a time. The "fash" thus formed must be squeezed down into the poll by another operation, which leaves the poll for the first time in apparently fair and good condition. Nevertheless, the "fash" left in trimming has not been welded down, but is merely pushed into the bit of the poll, and, when the steel bit is welded in, it frequently leaves a "cold sheet," as it is denominated, which gives the appearance of an imperfect weld to the steel, and consequently produces an imperfect or second-quality axe or tool.

In order, therefore, to form the poll or other tool under the process above named, the following operations are necessary:

First. Squeezing and punching the poll in the dies.

Second. Cutting off the poll from the bar.

Third. Forming the edges, and trimming the bit-end of the poll.

Fourth. Squeezing down the "flash" left by the trimming operation.

Fifth. Welding in the steel bit.

The object of my invention is to prevent the formation of the "flash" so detrimental to the quality and appearance of the poll, and, furthermore, not only to produce an article superior to those made by the means heretofore used, but to lessen the number of operations required to form the poll, dispensing with much of the machinery and labor hitherto required, and thus producing the article at less expense and in less time than would otherwise be practicable.

To this end, my invention consists principally—

First, in the combination, with the compressing-dies and jaws and punching-pin, of a machine for punching axe-polls; of a former or formers made upon the dies, or operating in connection with them, in the manner hereinafter described, so as to prevent the necessity of trimming the bit-end by giving the required shape to the bit-end at the same time the poll is punched.

Second, the combination, with the shears for cutting the poll from the bar, of "edging"-dies, operating as hereinafter described, so that the required outline shall be given to the edges of the poll at the same time that the poll is cut from the bar.

The principal advantages secured by a machine constructed in accordance with my invention may be stated as follows:

First. The bit-end is shaped and formed at the same time the axe-poll is pressed and punched.

Second. The operations of edging the poll and of cutting it from the bar are performed simultaneously.

Third. The operation of trimming is dispensed with, and the stock usually lost by this operation, (amounting to from one to four ounces per poll) is saved.

Fourth. Imperfections in the bit of the poll from "flash" are obviated.

Fifth. The operation of trimming being governed entirely by the judgment of the workman, it has been impracticable to produce polls of uniform size and shape, and not unfrequently the poll has been spoiled by having too much cut from one or the other corner, or entirely across the bit. This risk is removed.

Sixth. By dispensing with these last-named operations I am enabled to discard the separate and additional machine required for them, which has involved considerable expense to run and keep in repair.

To enable those skilled in the art to understand and use my invention, I will now proceed to describe the manner in which the same is or may be carried into effect, by reference to the accompanying drawings.

The dies A are hinged to the sliding cross-head B of the machine, in any ordinary or suitable manner, and the punching-pin C, attached to the base, D, projects upward between the dies, as is ordinarily the case. The ends of the dies A, when moved downward by means of the sliding cross-head, slide over the inclined faces *a* of the pillar-blocks E, which blocks, when the dies are depressed to the greatest extent, hold the said dies between their vertical sides or faces, *b*. When the dies are, on the contrary, elevated or lifted away from the pin, they are separated or swung apart by means of their respective studs or pins, *c*, which engage with the diverging arms *d*. Thus far the construction of the machine does not materially differ from that of others heretofore in use.

The faces of the dies are also made concave, as heretofore, but at their ends, *x*, where the bit of the poll comes, they are cut or formed, as shown in figs. 1 and 3, so as to have the shape desired for the finished poll or tool.

Placed against the end of the dies is a third die or former, B¹, of the shape required for the bit-end of the poll. The former B¹ is attached to the cross-head, and when the dies are closed upon the poll and around the punching-pin, a stop, B², in rear of the former B¹, holds the latter immovably in its place, so as to prevent the stock from being squeezed out in that direction, and to give the bit-end the shape required in the finished poll.

I may here say, that instead of making the former B¹ separate from the dies A, the latter can be so constructed as to perform not only their ordinary functions, but also to do the work of the former or stop B¹, as, for instance, upon the end *x* of either or both of the dies, there may be a former-plate or flange or stop, which, when the dies are brought together, will close upon the bit-end of the poll, and give it the finished shape desired. In all cases, however, in order to attain the object I have in view, the bit-end former or die must be so constructed and combined with the squeezing-dies as to be perfectly immovable and unyielding when the latter dies are closed upon the poll, thus completely closing the bit-end of those dies. Otherwise the heated metal will be squeezed from between the dies, and produce the "flash edge" which it is the principal object of my invention to prevent.

A poll, shaped and punched between dies thus arranged, will not have the irregular and ragged bit-end seen in polls subjected to this operation in ordinary machines, and need not, therefore, be subjected to the trimming operation, which is productive of the disadvantages above referred to.

After coming out from the dies, all that is required to complete the poll is to "edge" it and separate it from the stock. These two operations I effect simultaneously by the following means:

The cross-head B passes through one side of the stand S, and upon this end of the cross-head is mounted a shear or blade, *m*. A corresponding shear or cutting-edge, *n*, is formed on a block or bed, R, the blades *m n* and cross-head and bed being so disposed with relation to each other, that when the cross-head descends, the blades *m n* will act as shears, to sever or cut in two the bar or stock which may be interposed between them. Upon one side of the bed R, nearest the stand S, is placed, at about right angles to the shear, an edging-die, K, or former; that is to say, a die of the shape which it is desired to give the edges or longer lines of the poll. Opposite this die is a corresponding one, K¹, which, however, instead of being fixed to the bed R, is hinged by

means of a bent and forked or slotted arm, *l*, to the overhanging top or beam of the stand *S*. This forked arm slides between pins, *t t*, placed on each side of the cross-head.

By referring to the drawings, it will be seen that owing to the peculiar bend of the arm *l* it will, when the cross-head descends, be moved by means of the guide-pins *t t* so as to cause the die *K*¹ to approach the stationary die *K*. When, on the contrary, the cross-head is elevated, the arm, together with its die, will be swung outwardly or away from the stationary "edger."

Now, let it be supposed that the axe-poll has been taken from the dies *B*, and it is desired to complete and finish it. The poll is laid upon the bed *R* (while the cross-head is elevated) so as to bring the shear *n* in proper position with relation to the poll. The cross-head, together with its blade, *m*, now descends, and by the action of the shears the poll is severed from the stock. Simultaneously with this operation the swinging die *K* has been forced toward the stationary die *K*, in the manner above explained, so that the poll is compressed between the dies, which impart to its edges the outline desired. As soon as the cross-head moves upward, the hold of the edging-dies upon the poll is released, and the latter drops from the machine finished and complete.

The edgers, in combination with the shears, may be operated and arranged differently from the manner herein described. I prefer, however, the method described of operating them by means of the sliding cross-head, which, for this purpose, as above stated, passes through and projects from one side of the stand *S*.

In conclusion, I would observe that it has never been attempted to shape the bit-end of the poll simultaneously with the cheeks by means of dies, as described. For instance, in the machine of Levi Dodge, patented May 1, 1866, known as the "head-hammering machine," the axe is introduced between the dies head-foremost, and it is the head, therefore, and not the bit, that bears against the "former" in rear. In that case, as the head of the axe is very near the finished size when inserted between the dies, it would not receive adequate pressure without the "former" moving up against it, and in Dodge's machine, therefore, the "former" has this movement; and I may also add, that the Dodge machine is not intended, as is the case with the present invention, to shape and squeeze the poll from the iron, but only to finish and complete or polish the poll after it has been shaped and squeezed, and the bit has been inserted.

In the present machine, on the contrary, it is the bit of the poll which strikes the "former," and if this bit, or the iron from which it is formed, should protrude from the dies, the "former" coming up against it, (even were there no spring,) would necessarily create a "fash." Unless there be a close contact between the "former" and the dies, as described and illustrated in the preceding portion of this specification, "fash" will inevitably be formed. It must, therefore, be obvious that for the carrying out of this invention, it is necessary that while the squeezing-dies are pressing the axe-poll there shall be no advancing or receding of the bit-end former, which must snugly fit in with or against the dies so as to prevent the extension of metal from the bit-end. The iron bar from which the polls are made is not usually more than three inches wide. When squeezed by the dies, the excess of metal from the bit, which, as above stated, is prevented from protruding from the rear of the dies by the bit-end former, goes to make up the width required for the bit, and fills the bit-end of the dies. This squeezing takes place and is completed before the iron reaches the punch. The metal displaced by the punch then completes that part of the poll around the eye, and makes up the width required across the eye, and if there be any surplus or excess of metal, it can find an outlet on the side where the bar is inserted in the dies, these being open to the extent of the thickness of the head of the poll. In this operation of squeezing and punching the poll there is usually from one-eighth to three-eighths of an inch of the bar forced out from the dies towards the workman.

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

1. In a machine for punching axe-polls and other tools, the combination, with the punching-pin and squeezing-dies, of a bit-end former or die, constructed as herein specified, and applied to the end of the dies in which the bit-end of the poll is received or shaped in the manner described; that is to say, so that when the squeezing-dies are brought together, the said "former" shall completely close the said end of the dies, substantially as herein shown and set forth.

2. The combination, with the shears, of the edging-dies or formers operating in connection therewith, in the manner described, so that the poll shall simultaneously be "edged" and severed from the stock, substantially as herein shown and set forth.

3. The combination of the shears and edging-dies with the single cross-head, which carries the squeezing-dies, under the arrangement and for operation as herein shown and specified.

4. The combination, in a machine such as described, of the squeezing-dies, "bit-end" former, shears, and edging-dies, when the same are operated simultaneously from a single cross-head, substantially in the manner and for the purposes shown and set forth.

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

ROBT. BLAKE.

Witnesses:

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EDWARD JUDSON.