W. N. ARMSTRONG.

MACHINES FOR MAKING AXE-POLLS.

No. 182,264. Patented Sept. 19, 1876.

Fig: 1

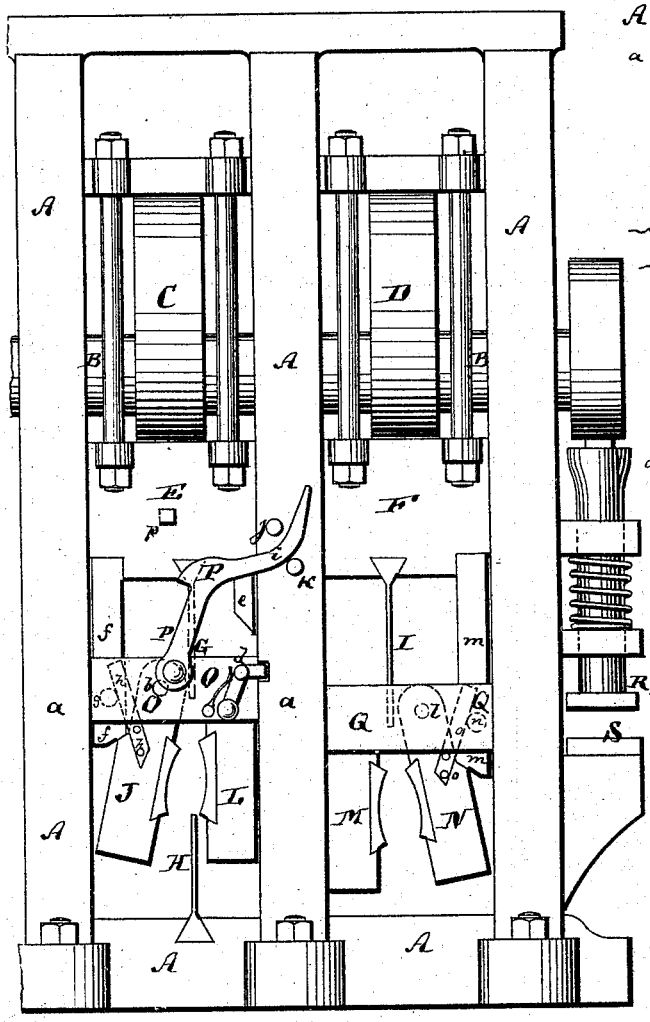


Fig: 2

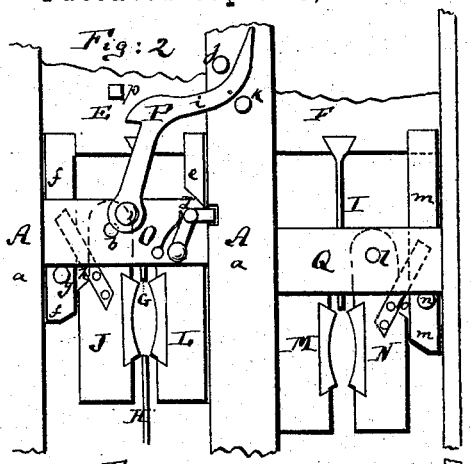


Fig: 3

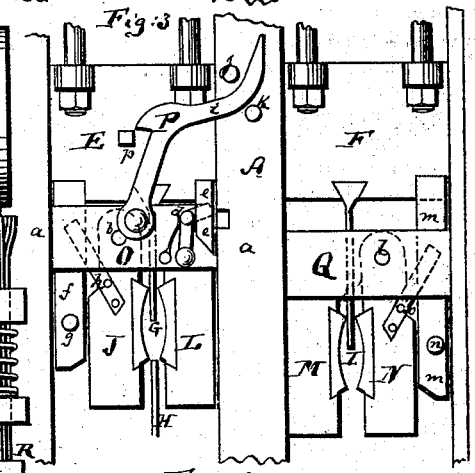
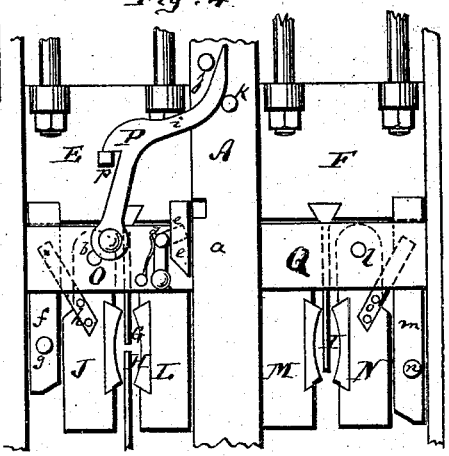


Fig: 4



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UNITED STATES PATENT OFFICE.

WILLIAM N. ARMSTRONG, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR MAKING AX-POLLS.

Specification forming part of Letters Patent No. **182,264**, dated September 19, 1876; application filed March 25, 1876.

To all whom it may concern:

Be it known that I, WILLIAM NEVINS ARMSTRONG, of New York city, New York, have invented an Improved Machine for Making Ax-Polls, of which the following is a specification:

Figure 1 is a front view of my improved machine. Figs. 2, 3, and 4 are detail front views of the operating mechanism of said machine, showing it in its different positions.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to a new arrangement of vibrating jaws and reciprocating jaws in a machine for making ax-polls, and to locking and unlocking mechanism of the same.

The principal object of the invention is to so arrange the action of the blank-holding jaws, with reference to the motion of the movable piercing tool or punch, and the position of the stationary piercing tool or punch, that the said tools will affect the blank alternately and not simultaneously.

Heretofore in machines of the same class the jaws were not capable of moving vertically, and therefore the blank had to be placed upon the stationary lower piercing tool, which extended to a certain distance into the cavity of the jaws, and, in consequence, the lower tool served only to hollow out that part of the metal of the blank which was crowded downwardly by the action of the upper descending punch, the two punches acting simultaneously.

By making the jaws vertically movable, I first pierce the upper part, and thereupon the lower part of the blank, and am enabled to so shape the jaws that they will be fitted to the exact form of the blank, where heretofore the cavity of the jaws had to be made nearly twice as high as the blank to be placed into the same, to allow for the downward displacement of the metal.

In the accompanying drawing, the letter A represents the frame of the machine, and B the operating-shaft of the same, said shaft turning two eccentrics, C D, which are in suitable manner connected with vertical slides E and F, respectively, so that said slides will be moved up and down by the rotation of the shaft and eccentrics. The frame A constitutes proper guides for the slides E and F. The slide E carries a suspended punch, G, and directly beneath the same is firmly secured in the bed of the frame A an upwardly projecting stationary punch, H. The slide F carries a downwardly-projecting punch, all as clearly shown in Fig. 1. J and L are the two jaws used in the first operation, in connection with the punches G and H. M and N are the two jaws used in the second operation, in connection with the punch I. The jaws J and L are suspended from and connected with a cross-head, O, which is fitted between two pillars, *a a*, of the frame A, and capable of sliding vertically between said pillars. The jaw L is rigidly secured to said cross-head O, while the jaw J is pivoted at *b* to said cross-head.

Heretofore, in machines of this kind, both jaws were pivoted to the cross-head O, and the mechanism for opening and closing such jaws had therefore to be applied to both the jaws.

By attaching the jaw L rigidly to the cross-head, I dispense with the mechanism for vibrating such jaw L. The rigid jaw L will also serve to steady the up-and-down movement of the cross-head O along one of the pillars *a*.

An additional advantage obtained by this construction is that the finished ax-polls will always be discharged on the same side of the punch H, to wit, toward the side of the pivoted jaw J, while heretofore, when both jaws were pivoted to the cross-head, the ax-polls would be discharged indiscriminately first to one and then to the other side of the punch H.

The cross-head O is provided with a spring-bolt, *d*, which locks said cross-head into a notch in one of the pillars *a*, as shown in Fig. 1. The slide E carries a wedge-shaped projection, *e*, for unlocking the bolt *d*. The slide E further carries a wedge-shaped projection, *f*, which has a projecting pin, *g*, (shown by dotted lines in Fig. 1 and by full lines in Fig. 2,) which pin *g* serves to swing the jaw J open by contact with a vertical arm, *h*, of said jaw, as clearly indicated in the drawing. The cross-head O is further provided with a piv-

oted hook, P, of which a projecting arm, *i*, is introduced between two stationary pins, *j k*, that project from the frame A. The other two jaws M and N are secured to a fixed cross-head, Q, and are therefore not capable of vertical motion.

The jaw M is rigidly affixed to the cross-head Q, whereas the jaw N is, by a pin, *l*, pivoted in said cross-head, as shown. The slide F carries a projecting wedge, *m*, which, by a pin, *n*, affects a projecting arm, *o*, of the jaw M in the same manner in which the pin *g* affects the arm *h* of the jaw J.

The operation of this machine is as follows: While the jaws J and L are in the position shown in Fig. 1—that is, the cross-head O being locked by the bolt *d* and the jaw J swung away from the jaw L—the blank can be introduced between the two jaws, being placed against the jaw L and upon the end of the punch H, which punch reaches just about to the lower end of the cavity formed between the two jaws. As the shaft B is revolved the slide E is moved downward, and causes the wedge *f* to bear against the outer side of the jaw J, and thereby to close said jaw against the blank, in the manner indicated in Fig. 2. The further downward motion of the slide E will bring the punch G nearly half-way into the cavity between the jaws, so that such punch will pierce or indent the blank to the same extent, this position of the jaws and punch being shown in Fig. 3. As the punch G has performed its operation in the manner described, the slide E has also reached contact with the cross-head O, and the wedge *e* has at the same time unlocked the catch *d*, all as indicated in Fig. 3. The further continued descent of the slide E will next cause the cross-head O, with the two jaws J and L, to descend, so that the blank will be forced nearly half-way over the stationary punch H, the final position of the parts being shown in Fig. 4. In this position the hook P is, by contact with the pin *k*, caused to catch over a projecting pin, *p*, on the slide E, as shown, so that during the subsequent ascent of the slide E the hook P will cause the cross-head O to ascend with the slide E until the parts reach the position shown in Fig. 3, when the pin *j* will release the hook P from the pin *p*, leaving the cross-head O at its normal position, in which it is relocked as soon as the wedge *e* leaves contact with the lock *d*, as in Fig. 2; and, finally, by the further ascent of the slide E, the pin *g*, striking the arm *h*, causes the jaw J to open, and to discharge the blank that was formerly held in the jaws J and L.

It will be seen that by the operation of piercing, above described, the blank is first pierced from above to nearly its middle, and then from below to nearly its middle, a small diaphragm remaining, of a thickness equal to the final shortest distance between the punches G and H, indicated in Fig. 4.

The alternate action of the punches G and H, above described, is far superior to the simultaneous action of the two piercing-punches heretofore usually required, as much less power will be needed to operate the machine; and the metal, by my process, will be less displaced externally than it will when the two punches act at the same time.

The blank jointly pierced by the punches G and H, in the manner described, is next placed between the jaws M and N while the same are in the position shown in Fig. 1, and is locked by the descent of the slide F and wedge *m*, in the manner shown in Fig. 2, and the pin or punch I is thereupon brought down into the upper cavity of the blank until it has fully pierced the entire blank and reached the position shown in Fig. 4. During the subsequent ascent of the slide F the jaw N is finally opened and the blank discharged.

R and S represent shears, for cutting the blank in the proper manner after the same has been acted upon by the jaws and punches.

I claim as my invention—

1. In a machine for shaping ax-polls, the combination of the stationary jaw M with the pivoted jaw N, and with the arm *o*, wedge *m*, and pin *n*, substantially as described.

2. The sliding cross-head O, having the lock *d* and carrying the jaws J and L, combined with the slide E and unlocking device *e*, substantially as specified.

3. The combination of the hook P with the cross-head O, which carries the jaws J and L, and with the slide E, which carries the pin *p*, all arranged to operate substantially as described.

4. In a machine for making ax-polls, the combination of a pair of vertical movable jaws, holding the blank, with a stationary punch and an upper movable punch, all arranged in such a manner that the upper punch will first indent the upper part of the blank, and thereupon the lower punch will indent the lower part of the blank, substantially as specified.

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