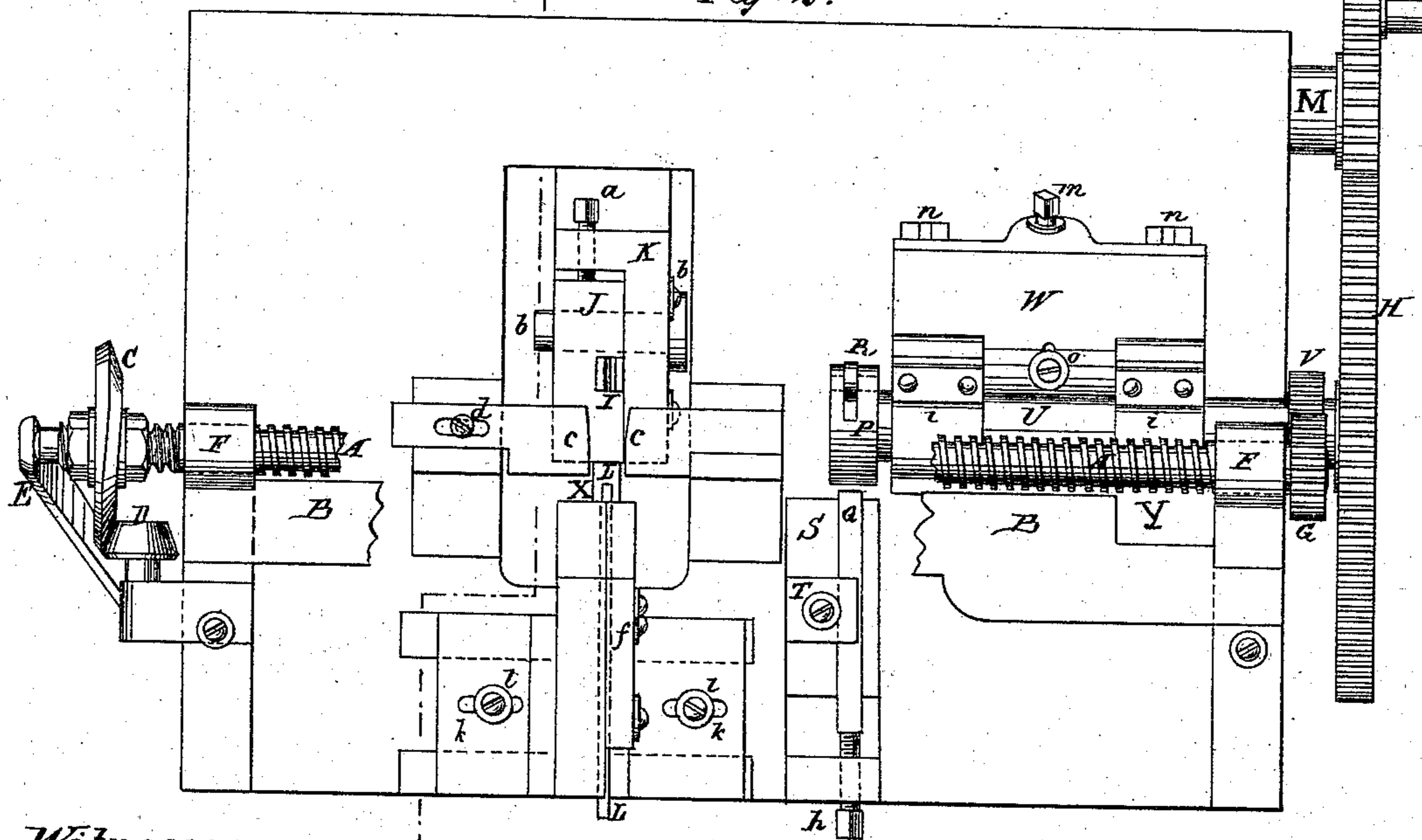
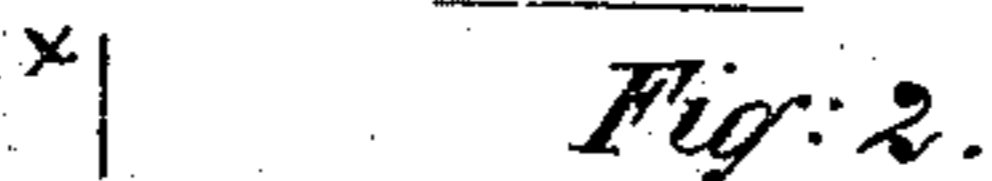


Machines for Finishing Horseshoe-Nails.

Patented Nov. 10, 1874.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINES FOR FINISHING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. 156,675, dated November 10, 1874; application filed April 13, 1874.

To all whom it may concern:

Be it known that I, ROBERT ROSS, of Vergennes, in the county of Addison and State of Vermont, have invented a new and useful Improvement in Horse-Nail Machines, of which the following is a specification:

This invention relates to certain improvements upon my machine for finishing horseshoe-nails, for which Letters Patent were granted September 2, 1873; and consists, first, of such an arrangement of the threads of the feed-screw that a card of nail-blanks—that is, several nails-blanks attached by the metal which forms the sides of their heads—can be carried along the feed-screw and operated upon by the shearing devices while they are thus united; second, of such a combination of mechanism that the movement of the shearing-die immediately after it has sheared the nail-blank is downward and backward, by means of which it results that the die-punch can be supported much nearer its cutting end; third, of stationary supports, between which the shearing-die bears while shearing the nail-blanks, and thus prevents the die from being sprung sidewise.

In the accompanying drawings, Figure 1 represents a transverse section through the plane of the line *x x* of Fig. 2, to show the mechanism by means of which the backward and downward movement is imparted to the shearing-die, and also the beveling device and geared wheels in elevation beyond the section. Fig. 2 represents a plan view of the machine, in which the feed-screw A and the guide-bar B are broken away to show the shearing and beveling mechanism.

The principal features of the machine are the feeding, shearing, and beveling devices.

The feeding device comprises the following parts: The feed-screw A, the journal-boxes F F, the pinions G V, connected by wheels to the driving-shaft M, the beveled disk C, the friction-roller D, the spring E, and the guide-bar B.

The shearing device consists of the reciprocating shearing-die I, the clamping-piece J, the die-stock K, attached to the crank N on the driving-shaft M, the adjusting-screw *a*, the

stationary die-supports *c c*, the stationary die-punch L, the clamping-piece *f*, the adjusting-screws *l l*, the supporting movable base *k k*, the connecting-rod X, and the stationary bracket O.

The beveling mechanism includes the small roller R, mounted in the periphery of the wheel P, the nail-support Q, its stock S, clamping-piece T, adjusting-screw *h*, the shaft U, journal-boxes *i i*, the pinions G V, and inclined table W, with its adjusting-screw *m* and sliding ways *n n*.

The feed-screw A is revolved by the pinion G, geared into the pinion V, and connected by wheels to the driving-shaft M. The threads of the feed-screw are the same distance apart throughout its entire length, their distance from each other being such that a card of nail-blanks will hang perpendicularly between the threads of the screw, the threads of the screw passing into the respective spaces between the nail-blanks. The screw-shaft has a longitudinal play, which is governed by the beveled disk C, pressed against the friction-roller D by means of the spring E.

The face of the beveled disk C is so cam-shaped with relation to the threads of the feed-screw, and so adjusted, as to give the screw during the time that the shearing-die is acting upon the nail-blanks a longitudinal movement equal to the pitch of the screw, but in a reverse direction to that in which the card is moving. This movement of the screw causes the card of blanks to remain stationary while it is being acted on by the shearing-die. After the die has passed the blank the screw is returned to its former position by means of the spring E bearing against the end of the shaft.

The shearing-die I is mortised into the adjustable block J, which, by means of the screw *a*, can be moved forward as the face of the die is worn away. The block J is firmly attached to the die-stock K, which is connected with the crank N on the driving-shaft M.

The movement of the shearing-die is directed and limited by means of the connecting-rod X, which is attached at its upper end, by the pin *b'*, to the die-stock in an open mortise

below the shearing-die, while its other end is attached by the pin *e* to the stationary bracket *O*.

When the driving-shaft is revolved, the crank being near its lower dead-center, the shearing-die, by reason of its connection with the crank and connecting-rod, is carried upward to the level with the die-punch, and then forward in nearly a horizontal line between the die-supports, and shears the nail-blank, the operation being completed the instant the crank reaches its upper dead-center, when the shearing-die is immediately drawn downward and backward from the die-punch. This immediate withdrawal of the shearing-die from the die-punch when the operation of shearing the nail-blank is completed enables the die-punch to be supported much nearer its cutting end, and thus prevented from springing sidewise, than is possible when the shearing-die is released from the die-punch by a circular movement.

The shearing-die is constructed thin enough to pass into the spaces between three nail-blanks of the card, and shears the middle blank of the three.

The die-punch *L* is mounted on the supporting-base *k k*, which admits of lateral adjustment by means of the screws *ll* acting in their respective slots, and the die-punch can be easily removed and readjusted by means of the clamping-piece *f*.

The wheel *P* is attached to one end of the shaft *U*, which is revolved by means of the geared wheels *H H'*, connected with the driving-shaft. The shaft *U* rests upon the table *W*, which is inclined toward the main table of the machine, so that it can be moved forward and backward, and not change the mesh of the gears on the pinions *V* and *G*. The small roller *R*, mounted in the periphery of the wheel *P*, bevels the point of the nail-blank on its face, by rolling over the point in the direction of the nail, while the point of the nail-blank bears firmly against the nail-support *Q* upon its opposite face. The bevel upon the point of the nail can be varied by varying the diameter of the roller *R*, as the greater the diameter of the beveling-roller, the more acute will be the bevel given the point of the nail.

When the circumference of the small roller *R* is brought in contact with the nail-blank near its point, the roller will be revolved upon its arbor in an opposite direction to that in which the carrying-wheel is moving, thereby compressing and compacting the point upon the body of the nail. The roller *R* will also have the same forward movement as its carrying-wheel, and will be drawn forward with a sliding motion over the point of the nail, and thus smooth, slick, and finish it, while it gives it only a slight lateral spread. By this operation the proper degree of hardness and smoothness is given to the point of the nail, and the desired bevel obtained.

The wheel *P*, with the roller *R* in place, is so adjusted to the shaft *U* that the roller *R* will be directly opposite the nail-support *Q*, and bevel the nail-point at the same instant the die *I* and the die-punch *L* are in contact, and the nail-blank is sheared, and all the blanks in the feed-screw are held stationary at the instant of the operation of the shearing and beveling devices. The inclined table *W* is adjusted by the screw *m*, and the nail-support by the screw *h*.

In operating this machine, the card of nail-blanks is inserted between the feed-screw and the guide-bar, and is advanced by the revolution of the screw till the first blank of the card is directly opposite the shearing device, when the advancing movement of the card is arrested by the movement in the reverse direction of the screw-shaft by means of the cam-shaped disk acting upon the friction-roller, and the card is held stationary while the blank is sheared. As the screw-shaft is again revolved, another blank is operated upon in the same way, and so the operation is continued as long as the machine is supplied with cards of blanks. After the cards of blanks have been sheared, they are advanced by the revolution of the screw-shaft to the beveling device, where the point of each blank of each card is beveled, one point being operated upon at each revolution of the screw-shaft. The cards, after being beveled, fall through the opening in the guide-bar upon the main table of the machine.

The cards of blanks can be inserted anywhere on the line of the feed-screw between the shearing mechanism and the journal-box next the beveled disk *C*, and this entire space may be filled at once with cards of blanks, and no more need be inserted until these are advanced, and the last blank, or the last but one, of the last card is being operated upon by the shearing-dies, when the entire space may be resupplied, and the machine kept in constant operation.

It will readily be perceived that, in machines for finishing nails organized as above described, in which the feed-screws are so threaded that cards of nails can be carried throughout their entire length, and operated upon in their passage by the shearing and beveling mechanism, there will be a great saving of labor, inasmuch as a single person is enabled to feed the cards of blanks into several machines successively, and keep them constantly supplied.

What is claimed as new is—

1. The combination, in a nail-finishing machine, of a feed-screw having a uniform pitch of thread, for receiving and carrying forward a card of nail-blanks, and a shearing die and punch, constructed and arranged to shear or trim the blanks before they pass off from the screw.

2. In combination with the stationary shearing-punch of a nail-machine, the die-stock *K*,

the crank N, and the pivoted rod X, or their equivalents, by means of which the shearing-die is withdrawn from contact with the punch immediately upon shearing the blank, substantially as and for the purpose stated.

3. The die-supports *c c*, or their equivalents, by means of which the jaws of the shearing-

die are supported and prevented from springing while shearing the blanks, substantially as and for the purpose described.

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Witnesses:

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