2 Sheets—Sheet 1.

J. E. WHEELER, D. B. LORING & F. W. COY.

MACHINES FOR MAKING HORSESHOE-NAILS.

No. 192,666. Patented July 3, 1877.

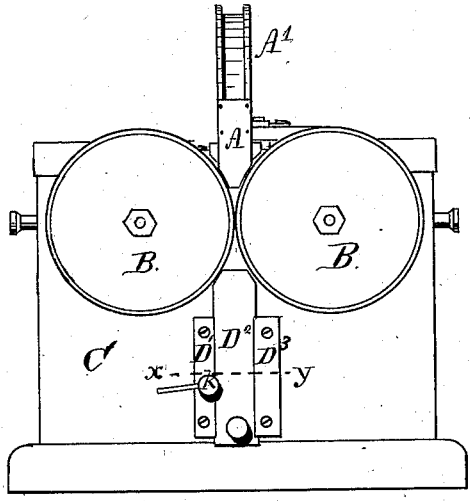

Fig. 1.

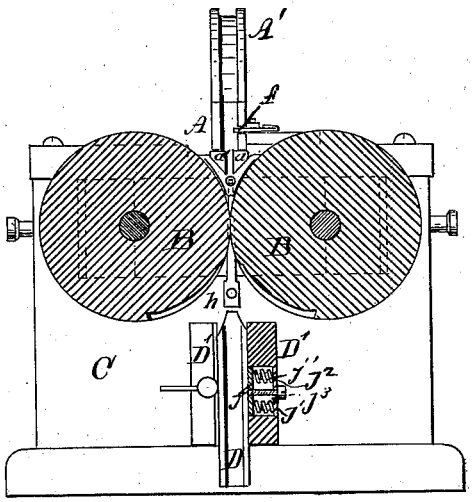

Fig. 2.

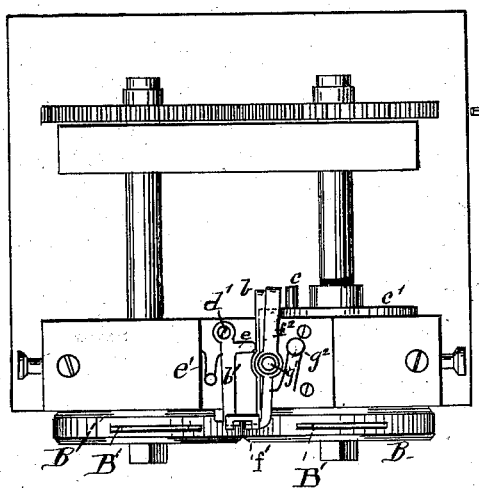

Fig. 3.

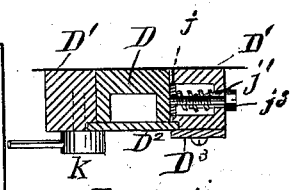

Fig. 4.

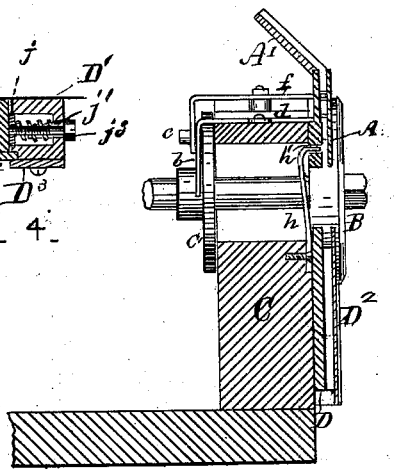

Fig. 5.

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2 Sheets—Sheet 2.

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MACHINES FOR MAKING HORSESHOE-NAILS.

No. 192,666. Patented July 3, 1877.

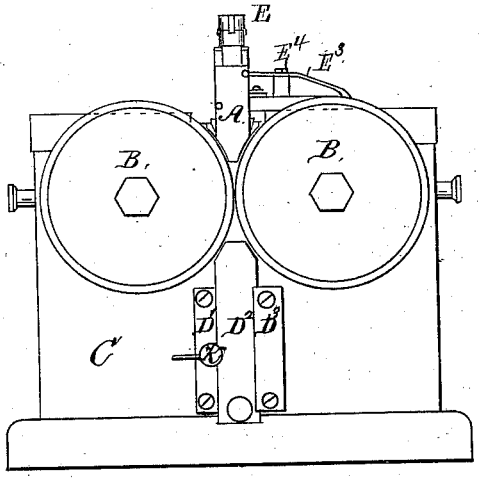

Fig. 6.

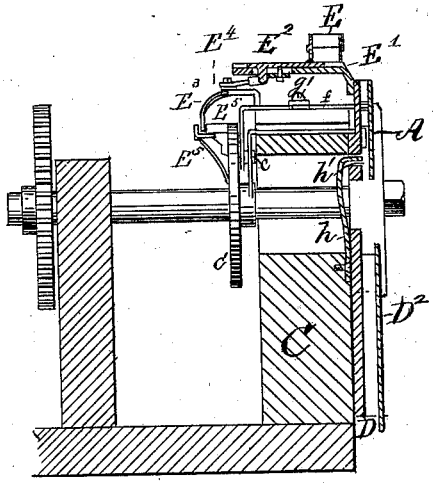

Fig. 7.

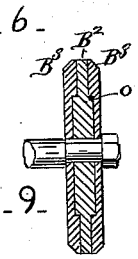

Fig. 9.

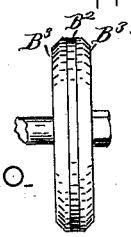

Fig. 10.

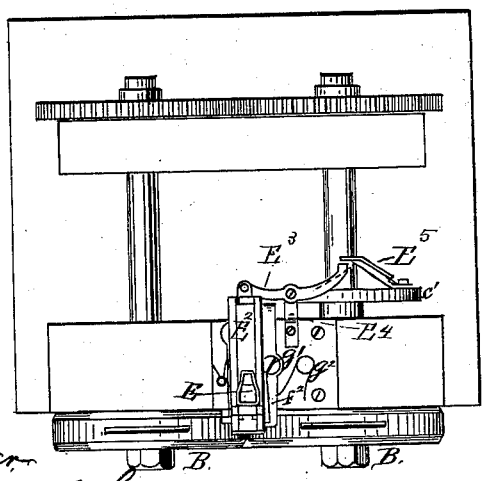

Fig. 8.

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UNITED STATES PATENT OFFICE.

JOHN E. WHEELER, OF LYNN, AND DAVID B. LORING AND FREDERICK W. COY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR MAKING HORSESHOE-NAILS.

Specification forming part of Letters Patent No. **192,666**, dated July 3, 1877; application filed March 19, 1877.

To all whom it may concern:

Be it known that we, JOHN E. WHEELER, of Lynn, in the county of Essex, and DAVID B. LORING and FREDERICK W. COY, both of Boston, in the county of Suffolk, all of the State of Massachusetts, have invented an Improvement in the Manufacture of Horse-Nails, of which the following is a specification:

This invention has for its object the following purposes: First, the feeding of blanks to the dies, which involves the invention patented to said David B. Loring November 28, 1876, and is an improvement thereon, whereby blanks may be successively fed to the dies from an elongated tunnel or inclined chute automatically. Second, a method of preventing the feeding of blanks when one has become lodged in the rolls. Third, the construction of the delivery-tunnel. Fourth, the precipitation of a blank from a stack or pile of blanks confined in a removable box into the inclined chute or into the tunnel in position for an automatic delivery to the revolving dies.

We will explain the nature, construction, and operation of our invention by the aid of the accompanying drawings forming a part of this specification, in which—

Figure 1 is an elevation of our machine. Fig. 2 is a vertical section of the same. Fig. 3 is a plan. Fig. 4 is a cross-section of the delivery-tunnel on the line *x y* of Fig. 1. Fig. 5 is a sectional view, showing the construction by which the cut-off is operated. Figs. 6, 7, and 8 are, respectively, an elevation, a vertical section, and a plan of our attachment providing a reservoir and an automatic feed from the same into the inclined chute or tunnel hereinafter explained. Figs. 9 and 10 relate to the construction of the rolls.

The feed-tunnel A has the automatic guide *a* and *a'* arranged to open and close horizontally between it and the rolls B. These guides are operated by levers *b* and *b'*, one of which (the operating-lever *b*) contacts with the pin *c* projecting from the disk *c'*, which is actuated by either of the driving-shafts operating the rolls. The lever *b* is pivoted at *d* to the frame C of the machine, and the lever *b'* is pivoted to the frame at *d'*. The arm *e* projecting from lever *b'* and spring *e'*, in connection with each other and with the operating-lever *b*, against which the end of arm *e* contacts, cause lever *b'* to move the guide *a'* the same relative distance to and from the center of the tunnel that is provided its accompanying guide *a* on the end of lever *b*, which moves in exactly the opposite direction.

Arranged above the guides *a a'* in the tunnel, a distance somewhat greater than the length of the blank to be rolled, is an automatic regulator, *f*, which consists of the bent end of a lever that is operated to and fro across, or nearly across, the feedway of the tunnel through hole f^1 in the tunnel. The lever f^2, upon which the regulator is formed, is pivoted to block *g* at g^1, and it is operated by pin *c* and the spring g^2, the contact of the pin with the end of the lever opening the passage in the tunnel, and the spring closing the same by constantly bearing upon the lever, as shown.

At the top of feed-tunnel A, and inclined sufficiently in relation to the same to permit blanks to fall into the tunnel by their own gravity, is a feeding-chute, A'. This chute has arranged above and behind it a detachable box, E, designed to hold a large number of blanks arranged to lie therein on their sides one upon the other. The box stands upon and is at the end of a platform, E^1, in which a flat plate, E^2, is operated horizontally back and forth, to successively throw the blanks which drop in the box into its path into the inclined chute A', the box being open at its lower end and resting upon the sides of the platform, and the way in the platform into which the blanks drop being somewhat deeper than one blank, but not as deep as the thickness of two. The bent lever E^3, pivoted to the bracket E^4, and the cam-projections E^5 upon the side of disk *c*, operate the plate E^2, which is held in place by the upwardly-projecting sides of the platform.

Immediately below the point where the rolls diverge is the spring *h*, which is fastened to the frame of the machine, and projects outward into the path of the delivery-tunnel D, then inward and upward, and is bent at its end to project through hole *h'* into the feed-tunnel A beneath the guides *a a'*. The deliv-

ery-tunnel D is movable in the frame or ways D^1 to and from the rolls, and is kept in position by means of spring-pressure exerted upon the side of the tunnel, which produces sufficient friction to hold the tunnel when it is placed.

The spring pressure or friction which we employ is represented in Fig. 4, and consists of a plate, *j*, which forms part of the inner side of one of the ways D^1, which is recessed to receive it, and also the springs j^1, which surround the pins j^2, which project into the recess from its end, for the purpose of holding the springs in position. A bolt, j^3, passing through a hole in the way D^1, in which it may freely move, screws into plate *j*, and holds it in position against the pressure of the springs, which constantly act to force the plate outward from the way. Of course, it will readily be seen that the degree of its projection beyond the inner side of the way may be regulated by the bolt j^3, and that it is intended to project the plate *j* sufficiently to get friction enough to hold the delivery-tunnel in any desired position when the same is in contact with the plate.

The face D^2 of the tunnel we make removable, and hold the same in position by means of the recess between the plate D^3 and the way D^1 and the screw-pin and lever *k*. This construction insures a ready removal of the front plate from the tunnel, and it is desirable that the plate may be removed and replaced quickly, as the tunnel is sometimes clogged by an imperfect blank.

The rolls B are made, preferably, in three disk-like parts, and the central one B^2 is provided with the projection *o*, which increases the bearing-surface of the disk on the shaft. The outer ones, B^3, are recessed, as shown, to fit the projections. The shaft is provided with a shoulder, against which the inner disk bears, and with a screw-thread at its end. The three disks are keyed to the shaft and held in position by a nut screwed on the end of the shaft and the shoulder on the shaft.

By this construction die-grooves and recesses can more readily be made, and when a narrow central disk is used it is necessary to provide it with a greater bearing on the shaft, proportionally, than that given the outer disks, so that the great strain which it receives may be distributed on a larger section of the shaft than would be the case were the disk of one thickness throughout. A flat thin disk cuts into the shaft unless it is provided with a sufficient bearing-surface.

The operation of our machine is as follows: The box E, filled with blanks, is placed in position on the platform E^1, and the blanks are permitted to escape therefrom, successively, into the path of the reciprocating plate E^2 by gravity. As one blank is forced from under the pile by the advance of the plate another falls into its place. From the box the blanks feed or drop into the tunnel head first, and their delivery to the rolls is regulated by the regulator *f* and the guides *a a'*. The blank next above the regulator is dropped on the guides *a a'* by the opening of the regulator, and the regulator is quickly closed to prevent the descent of the following blank, the guides *a a'* then open just before the dies B^1 in the rolls B converge, and the head of the blank is dropped upon the rolls in position to be seized by the head-forming portion of the dies as they come together. Meanwhile the guides *a a'* have closed upon the shank of the blank, and the same is drawn vertically into the dies, being prevented from canting by the guides. The regulator above them then opens, and another blank is dropped on the guides in a position to be fed.

If the blank is perfectly rolled it drops through the delivery-tunnel. If, however, it is lodged in the die, it is necessary to stop the further feeding of blanks, and in operation the blank lodged in the die contacts with the top of the delivery-tunnel, (which should be immediately below, and almost touching, the rolls when the machine is in operation,) and the same is forced downward, thereby liberating the spring *h*, which prevents any blanks from being delivered to the dies by the projection of its end into the tunnel below the guides *a a'*. Upon the removal of the blank from the die the tunnel D is pushed upward toward the rolls, its upper inner corner contacting with the spring *h*, pushing it back, and opening the tunnel for continued feeding.

The advantages of our invention consist in the uniform and regular feed produced by the combination and operation of the regulator and guides, in connection with the tunnel, as set forth, in the method of operating a cut-off by the descent of the tunnel, in the employment of friction in holding the delivery-tunnel to the rolls, in the method of holding the front plate of the lower tunnel in position, and in providing for a continuous supply of blanks automatically from the box, whereby the machine is self-feeding.

We are aware that a divided detent has heretofore been used, and we do not specifically claim it; neither do we claim, in terms, the forked detent, as that is shown and claimed in the pending application of Wheeler and Loring, who are also applicants in this case.

Having thus fully described our invention, we claim and desire to secure by Letters Patent of the United States—

1. In a horse-nail machine, the combination of the feed-tunnel A, provided with the guides *a a'* and regulator *f*, with the revolving dies B^1, substantially as shown, and for the purpose set forth.

2. The combination of a delivery-tunnel, held in relation to the revolving dies B^1 by friction, with the spring *h*, arranged to project upward from the frame, and whose end operates as a cut-off in preventing the feeding of blanks to the rolls, substantially as shown and described.

3. The combination of the movable delivery-

tunnel D, ways D^1, one of which is recessed, as shown, with plate j, spring j^1, and bolt j^2, inclosed in said recess, all arranged to operate as described.

4. In a horse-nail machine, the combination of a movable delivery-tunnel, provided with a removable front plate, with the ways D^1 D^2, where one of which is provided with a groove and the other with a screw-pin and lever, for the purpose of fastening the front plate in position, substantially as and for the purpose described.

5. The combination of the feed-tunnel A, automatic guides a a', regulator f, and inclined chute A', substantially as and for the purpose described.

6. In a horse nail machine, the combination of a feed-tunnel provided with the guides a a' and regulator f, the revolving dies B^1, and the movable delivery-tunnel D, and the spring h, all arranged in relation to each other and operating substantially as described.

7. In a horse-nail machine, the combination of the disk c', provided with pin c, with the lever f^2, pivoted as shown, spring g^2, and lever b', arranged in relation to each other as set forth, whereby the regulator f and guides a a' are successively operated, substantially as described.

8. In a horse-nail machine, the combination of a removable box for holding blanks, provided with means for successively ejecting the undermost blank, a tunnel for conveying and guiding said blank to the rolls, and the revolving dies B^1, all arranged substantially as and for the purpose described.

9. The combination of the automatic feeding device described, the revolving dies B^1, and the movable delivery-tunnel, substantially as and for the purpose described.

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