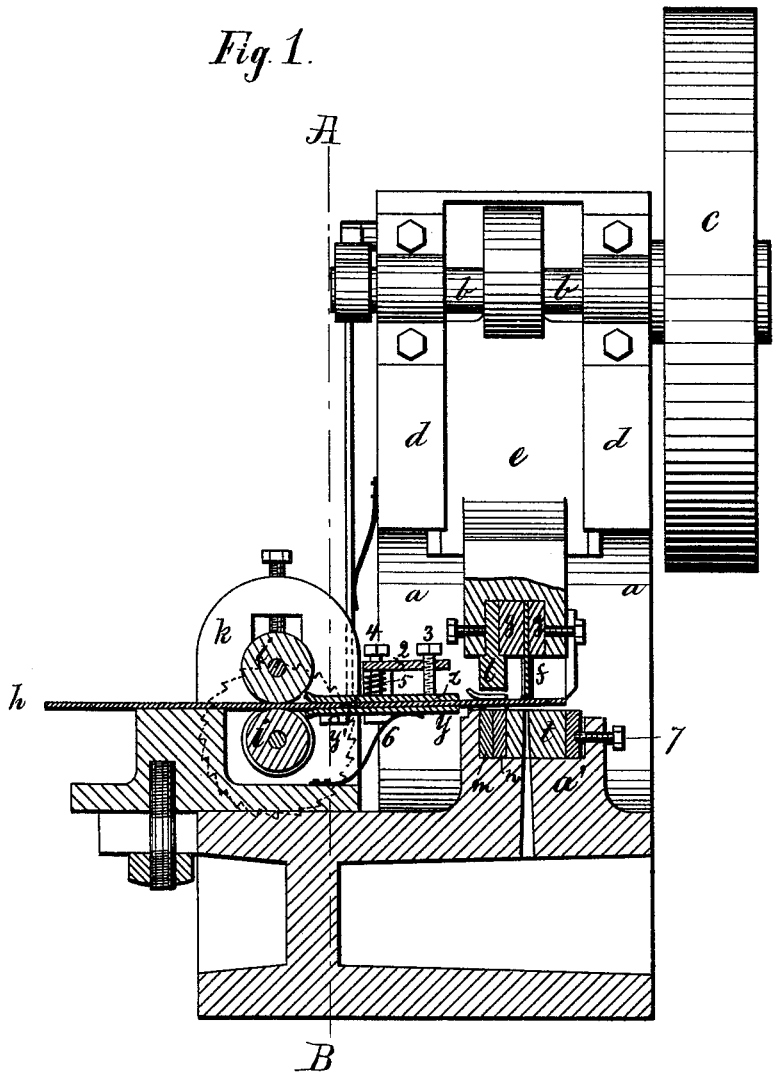
3 Sheets—Sheet 1.

J. D. SUMNER.

Horseshoe Nail-Machine.

No. 206,907. Patented Aug. 13, 1878.

Fig. 1.



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by

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3 Sheets—Sheet 2.

J. D. SUMNER.

Horseshoe Nail-Machine.

No. 206,907. **Patented Aug. 13, 1878.**

Fig. 2.

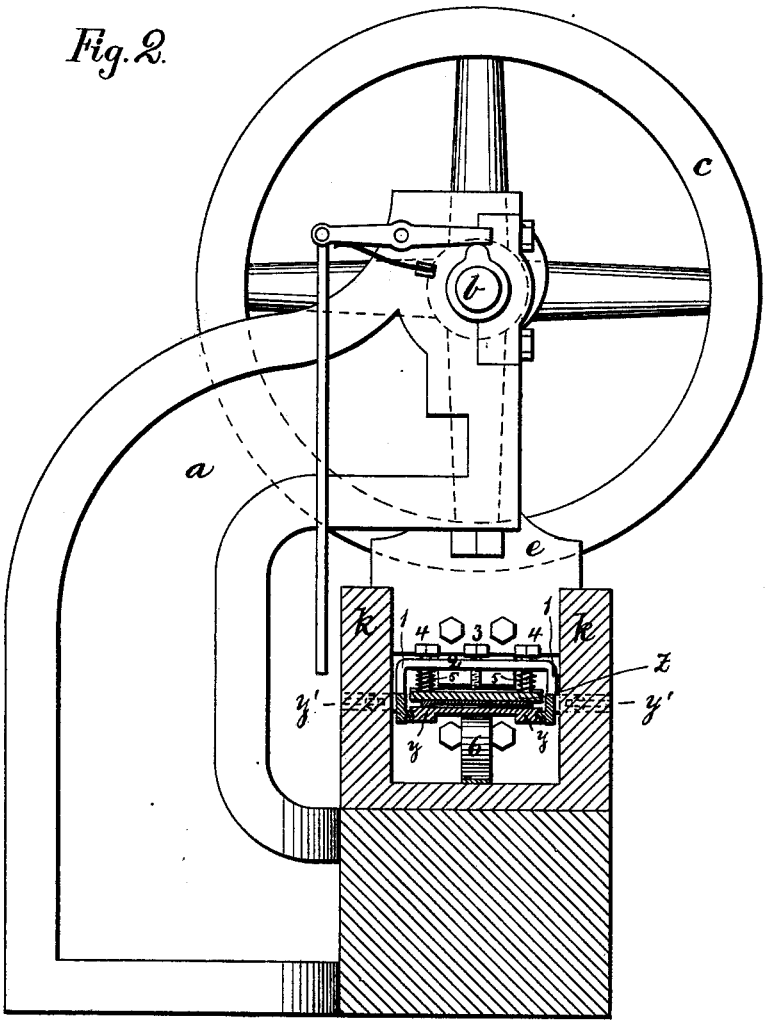

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Fig. 3.

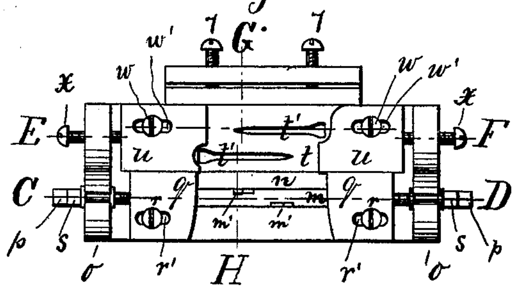


Fig. 5.

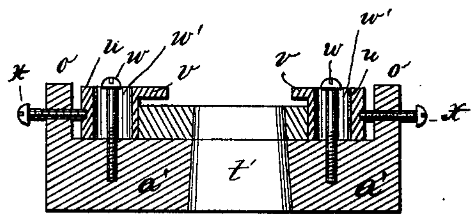


Fig. 4.

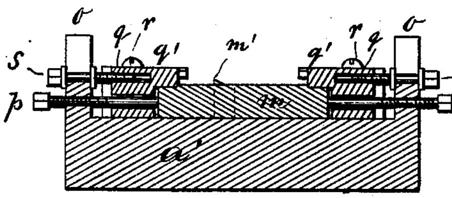


Fig. 6.

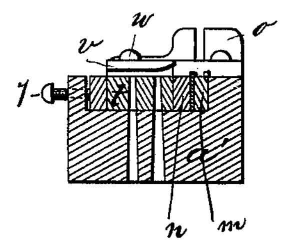
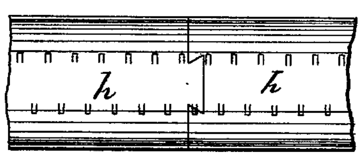


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES D. SUMNER, OF LEXINGTON, ASSIGNOR TO JOSEPH MICHAEL LAUGHLIN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN HORSESHOE-NAIL MACHINES.

Specification forming part of Letters Patent No. **206,907**, dated August 13, 1878; application filed June 14, 1877; patented in England, August 21, 1877.

To all whom it may concern:

Be it known that I, JAMES D. SUMNER, of Lexington, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for making Horseshoe-Nails; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines for making horseshoe-nails; and consists of the combination of a feeding mechanism for the purpose of properly feeding the nail-plate to the punching-machine, and an oscillating tunnel located between such feeding and punching mechanism, through which the plate passes and by which it is directed to the punching-machine.

My invention further consists in the combination of pointing-dies for the purpose of making indentures or depressions in the nail-plate for the formation of the points or bevels of the nails with nail-dies and punches for punching out the nails from the plate, and smoothing-dies located between the pointing and nail dies, for the purpose of compressing the nail-plate after the indentures are produced, so as to reduce the burrs or irregularities around the depressions made by the said pointing-dies; also, in the combination, with a pointing or beveling die for making the aforesaid depressions or indentures on the nail-plate, of regulating-screws for the purpose of regulating and adjusting the said die, with its projections laterally across the nail-plate, to its exact position in its relation to the nail-dies; also, in the combination of a movable stamper, with pointing and smoothing dies, of an intermittent feeding mechanism to feed the nail-plate through an oscillating tunnel, having a movable cover, with adjusting-screws and springs, to the nail-dies; also, in the combination, with stationary pointing and smoothing dies, of laterally adjustable guide-pieces, with holding and regulating screws to adjust and secure such guide-pieces in their proper position for guiding the nail-plate to the stationary pointing and smoothing dies; and, finally, in the combination, with one or more punches, of stationary nail-dies, with laterally-adjustable guide-pieces located on two opposite sides of the nail-die, and provided with lips and holding and regulating screws, by which the said guide-pieces are adjusted and secured in their proper position in relation to the nail-dies during the punching of the nail-plate that is fed forward between them.

On the accompanying drawings, Figure represents a sectional front elevation of my improved horseshoe-nail machine. Fig. 2 represents a cross-section on the line A B shown on Fig. 1. Fig. 3 represents a plan view of the dies and punch-holders, and Fig. 4 represents a cross-section on the line C D shown on Fig. 3. Fig. 5 represents a cross-section on the line E F, and Fig. 6 represents a cross-section on the line G H shown in Fig. 3. Fig. 7 represents a plan view of two nail-plates joined together.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a represents the frame of an ordinary punching-machine, on which *b* is the driving-shaft. *c* is the balance-wheel. *d d* are the guides for the up-and-down movable head *e*, and *f* is the punch, (one or more,) secured between the punch-holders *g g* in the lower part of the head *e*, in the usual manner.

h represents the nail-plate, that is fed toward the punches by means of the rollers *i i*, movable in bearings in the frames *k k*, and set in an intermittent rotary motion by means of suitable connecting mechanism from the driving-shaft *b*, in the usual manner. The rollers *i i* remain stationary during the operation of punching the nail-plate. Said rollers may be made as smooth or corrugated feed-rollers in the ordinary way without departing from the spirit of my invention.

l represents the stamper, secured in the lower end of the head *e*, on one side of the punch *f*, and in near proximity to the latter, as shown in Fig. 1.

m n represent the stamp-dies, firmly secured

in the frame of the punching-machine beneath the stamper *l*, as shown in Fig. 1.

The die *m* is provided with hardened projections *m' m'*, as shown in Figs. 3 and 4, by means of which indentures for the formation of the points and bevels of the nails are made on the under side of the plate by the stamper *l* being forced down with great pressure upon the top of the nail-plate.

The die *n* is smooth, without any projections, and is located nearer to the punch than the die *m*, so that, when the stamper descends upon the nail-plate, the burrs or projecting edges around the depressions made by the die *m* shall be pressed and smoothed out, so as to present the plate in a proper condition for the action of the punches.

The dies *m* and *n* may be made in two or more separate pieces, or may be made in one and the same piece, without departing from the spirit of my invention.

The said dies are supported directly upon the base *a'* of the punching-machine frame, which base *a'* is provided with upward-projecting ears *o o*, through which are screwed the set-screws *p p*, the inner ends of which are resting against the ends of said dies *m n*, and by means of which the said dies can be adjusted and secured in their proper positions relative to the punches and the punching-dies.

Movable guides *q q* are arranged in the two opposite ends of the aforesaid dies, which guides are provided with projecting lips *q' q'*, by which the dies *m n* are held downward in their places, being for this purpose provided with set-screws *r r*, passing through slotted holes *r' r'* in the said guides, and screwed into the support. The said guide-pieces are furthermore provided with the adjusting set-screws *s s*, by which they can easily be adjusted to and from each other, so as to gage them for different widths of nail-plates.

Beneath the punch *f* is firmly secured the die *t*, having one or more perforations, *t' t'*, corresponding in shape and size with the punch or punches *f*, as shown in Fig. 3. This die is provided on two opposite sides with the guide-pieces *u u*, that are provided with projecting lips *v v*, for the purpose of preventing the nail-plate from being lifted up with the punches as they ascend above the die after the punching of the nail-plate is performed. These guide-pieces are adjustable to and from each other by means of the set-screws *w w*, passing through the slot-holes *w' w'*, and screwed into the stationary support below. The said guide-pieces *u u* are furthermore held in their proper places by means of the set-screws *x x*, screwed through the ears *o o*, as shown in Figs. 3 and 5.

The oscillating tunnel, through which the nail-plate is conducted from the feed-rollers to the stamper and punch, is composed of a lower plate, *y*, hinged at *y' y'* to the frames for the rollers, and provided above the nail-plate with an adjustable cover, *z*, as shown in Fig. 1. The lower plate, *y*, is provided with uprights 1 1, terminating above the movable plate or cover *z* as a bridge, 2, through which the regulating-screws 3 4 4 are screwed, as shown in Figs. 1 and 2.

Flexible springs 5 5 are arranged around the screws 4 4, by which arrangement the cover *z* is made to yield when the nail-plate is fed between the upper and under plates, *y* and *z*.

The object of the set-screw 3 is to keep the upper and under plates, *y z*, just far enough from each other to allow the nail-plate to pass freely through at that place without disconnecting the fish-tail joints of the continuous nail-plate, which joint is fully shown in a plan view in Fig. 7.

In Figs. 1 and 2 is shown a flexible spring, 6, secured in its lower end to the frame of the punching-machine, or in a similar manner, and having its upper free end resting against the under side of the oscillating plate *y*, for the purpose of automatically raising the nail-plate above the projections *m' m'* on the die *m*, so as to allow the said nail-plate to be fed freely to the punches.

The lips *v v* on the guide-pieces *u u* are at such a distance from the dies *t t* as to allow the nail-plate to be automatically raised above the said dies by the force of the spring 6 acting on the under side of the aforesaid oscillating tunnel, and to be forced against the under side of said lips *v v*, so that the projections *m' m'* shall not impede the unobstructed feeding of the nail-plate to the punching-machine.

7 7 in Figs. 1 and 3 represent set-screws, by means of which the dies *t*, *m*, and *n* are firmly secured in the support after being properly adjusted.

I am aware of the patents granted to I. C. Tate, April 17, 1877, No. 189,586, and H. D. Cowles, December 9, 1873, No. 145,336, for improvements in horseshoe-nail machines; and I desire to state that I do not claim anything as therein set forth as my invention.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. In a nail-machine, the combination, with a feeding mechanism and a punching mechanism, as herein set forth, of an oscillating tunnel, *y z*, interposed between them, substantially as and for the purpose set forth.

2. In a nail-machine, the combination of pointing-dies *m' m'*, stamper *l*, nail-dies *t' t'*, and punches *f f*, with a smoothing die or dies, *n*, located between them, substantially as and for the purpose set forth.

3. In combination with the pointing-dies *m' m'*, stamper *l*, and smoothing die or dies *n*, the adjustable guide-pieces *q q*, with their regulating-screws *p p s s*, substantially as and for the purpose set forth.

4. In combination with the movable punch or punches *f*, the stationary nail-die *t*, guide-pieces *u u*, with their lips or projections *v v*,

and holding and regulating screws *w x w x*, as and for the purpose set forth and described.

5. In combination, the movable stamper *l* and dies *m n*, with the intermittent feeding mechanism and the oscillating tunnel *y z*, with its adjusting-screws 3 4 4, movable cover *z*, and springs 5 5 6, as herein set forth and described.

In testimony that I claim the foregoing as my own invention I have affixed my signature in presence of two witnesses.

JAMES D. SUMNER. [L. S.]

Witnesses:
ALBAN ANDRÉN,
HENRY CHADBOURN.