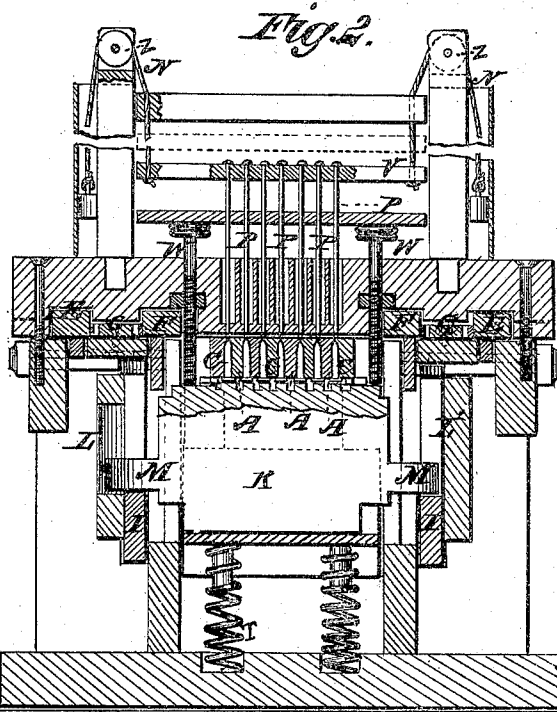
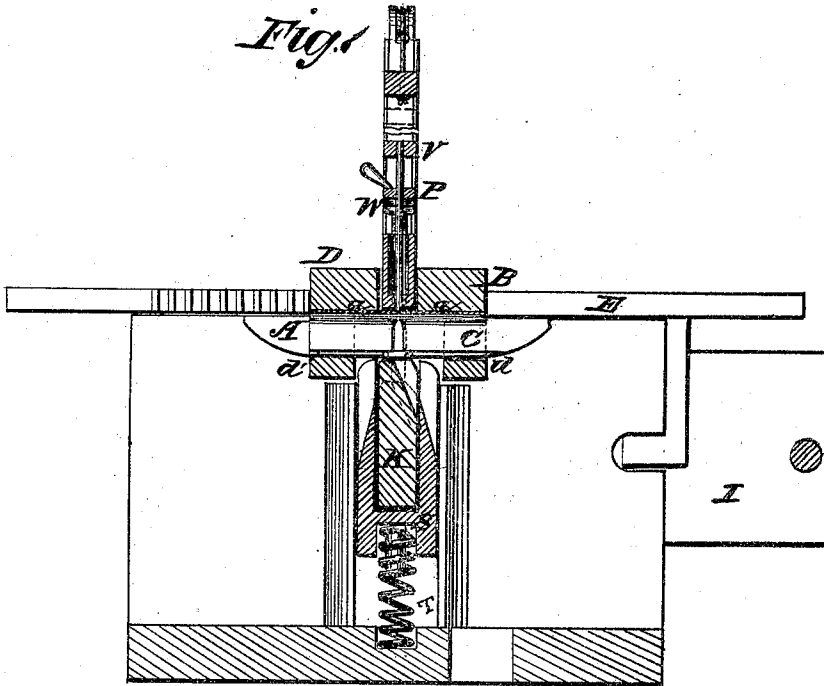


S. BUTTERFIELD.
NAIL-MACHINE.

No. 172,700.

Patented Jan. 25, 1876.



WITNESSES:

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INVENTOR:

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BY

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Fig. 3

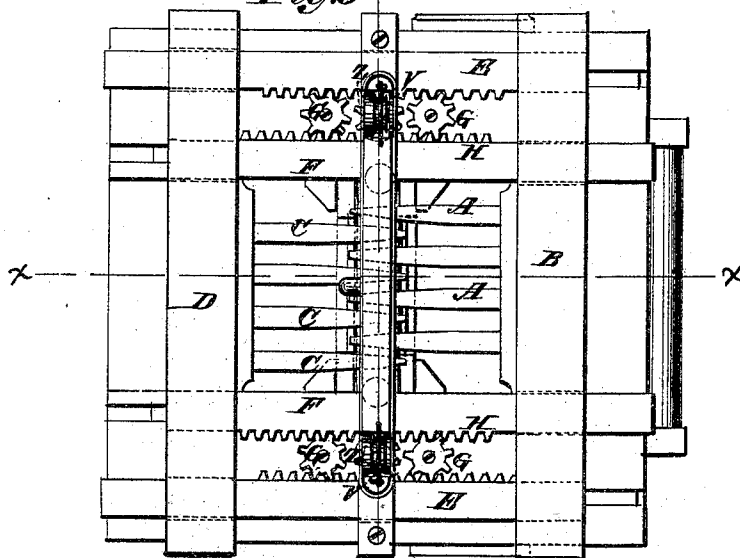


Fig. 4

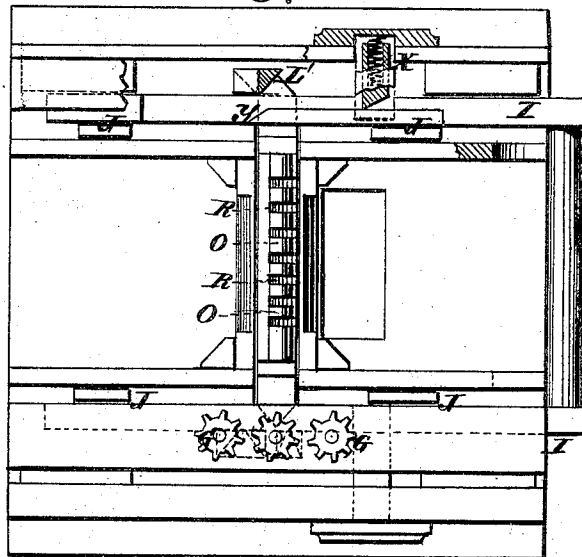
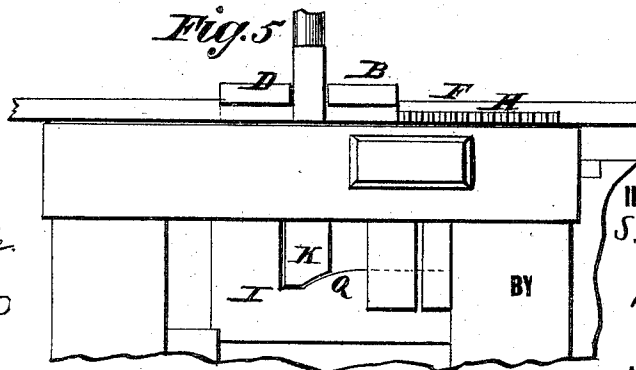


Fig. 5



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UNITED STATES PATENT OFFICE.

STEPHEN BUTTERFIELD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN NAIL-MACHINES.

Specification forming part of Letters Patent No. **172,700**, dated January 25, 1876; application filed July 17, 1875.

To all whom it may concern :

Be it known that I, STEPHEN BUTTERFIELD, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Nail-Machine, of which the following is a specification:

This invention consists of two sets of formers or dies, arranged like comb teeth and fixed on slides, which are caused to move the teeth of one set into the spaces of the other set, in which condition they form dies, which shape rods hanging down from a feeder, so that they are caught between the fingers and shaped into nails by them. Below these fingers the projecting ends of the rods are upset, to form heads, by a header forced up nearly against the dies by the slide which works the dies. The points are formed by the upper margins of the dies, and by cutters immediately above the dies the points of the nails are separated from the rods. The header then moves laterally a little, and opens passages for the escape of the nails when freed by the opening of the dies.

Figure 1 is a longitudinal sectional elevation of my improved machine, taken on the line *x x* of Fig. 3. Fig. 2 is a transverse section taken on the line *y y* of Fig. 3. Fig. 3 is a plan view. Fig. 4 is partly a plan view and partly horizontal section, and Fig. 5 is a side elevation.

Similar letters of reference indicate corresponding parts.

A represents one set of the finger-dies, which are attached to the sliding stock B. C represents the other set, which are attached to the sliding stock D. The stock B is attached to slides E, and the stock D is attached to the slides F. The slides E and F of each side are geared together by the wheels G and toothed racks H, so that the stocks and dies move toward and from each other alike, for moving the dies of one set into the spaces of the other and out again, motion being communicated to them by the slides I, to which the power is applied, and which have studs J, which engage the slides F, to push them forward and backward.

When the driving-slides are shifted back or to the left as far as they will go, the dies are

forced apart—that is, opened—and the header is lifted up by the springs T and box S to the adjusting-screws W. The nail-rods are then shifted down till they touch the header, which thus gages the length to be admitted between the dies. Then, by pulling the slides I forward to the right, the dies are forced together, wedging the rods between them, and forming the nails, the rods being at the same time elongated to some extent. While this occurs the header drops down the cams Q in the notches, out of the way of the elongating nail-rods. The spring-stop X then locks and holds the dies in their closed condition, while the slides I are permitted by the studs J, and parts of slides F, on which they act, to slide back a little and raise the header by cams Q, to head the nails before the dies begin to open. Then, as soon as the header has been forced up, and the dies begin to open, the header is shifted to one side by one of the cams L acting on one of the beveled heads M of the cam, to bring the discharge-passages R under the nails, to let them fall. The nails having been separated from the rods by the dies and by the cutters *a*, another cam, L', pushes the header back to gage the nails again.

Besides the cutters *a* on the top, to separate the nails from the rods in case they are not entirely separated by the dies in reducing the points, they may have cutters at the bottom to trim off any excess there may be of metal on the heads.

For making ordinary nails the dies will have a groove, *d*, along the lower margin, in which to form the heads; but for horseshoe-nails they will only be tapered a little to produce the swells of the two wide sides of the nail-heads, while the corresponding sides of the body portions will be produced between the sliding of the dies along the rods.

The incline Y forces back the spring-stop X after the header has operated, to allow the dies to open by the backward movement of the driving-slides I.

The nail-rods are suspended from the vertically-adjustable holder U, which rises and falls on the counterbalanced cords K, working over pulleys Z.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of two sets of comb-shaped dies, A C, substantially as specified.
2. The combination, with two sets of sliding dies, A C, of a header, K, substantially as specified.
3. The header having notches R for discharge-passages, and also having motion laterally to the dies, in combination with said dies, to present the heading-surfaces and the discharge-passages, substantially as specified.
4. The combination of cutters *a* with dies A C, substantially as specified.
5. The combination of driving-slides I, having cams Q, with the die-slides E F and the header, substantially as specified.

6. The combination of cams L and L' with the driving-slides I, also having connection with the die-slides E F, substantially as specified.

7. The header K, having connection with the lifting-springs T by a box, S; allowing both vertical and lateral movement independent of said springs, substantially as specified.

8. The feeding-holder U and counterbalance-weights, in combination with dies A C and header K, substantially as specified.

STEPHEN BUTTERFIELD.

Witnesses:

JOHN T. OGDEN,
CLEMENT DREW.