

(No Model.)

2 Sheets—Sheet 1.

C. E. HOUGHTON.  
NAIL MACHINE.

No. 463,363.

Patented Nov. 17, 1891.

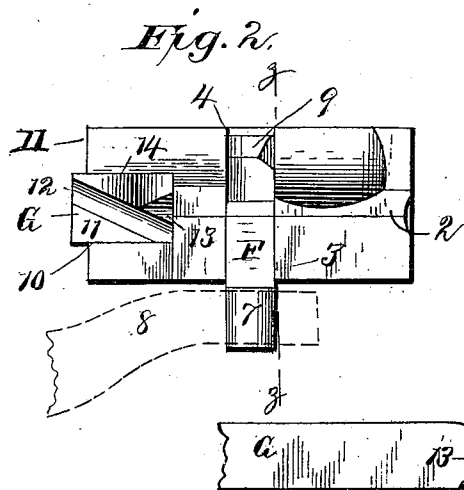
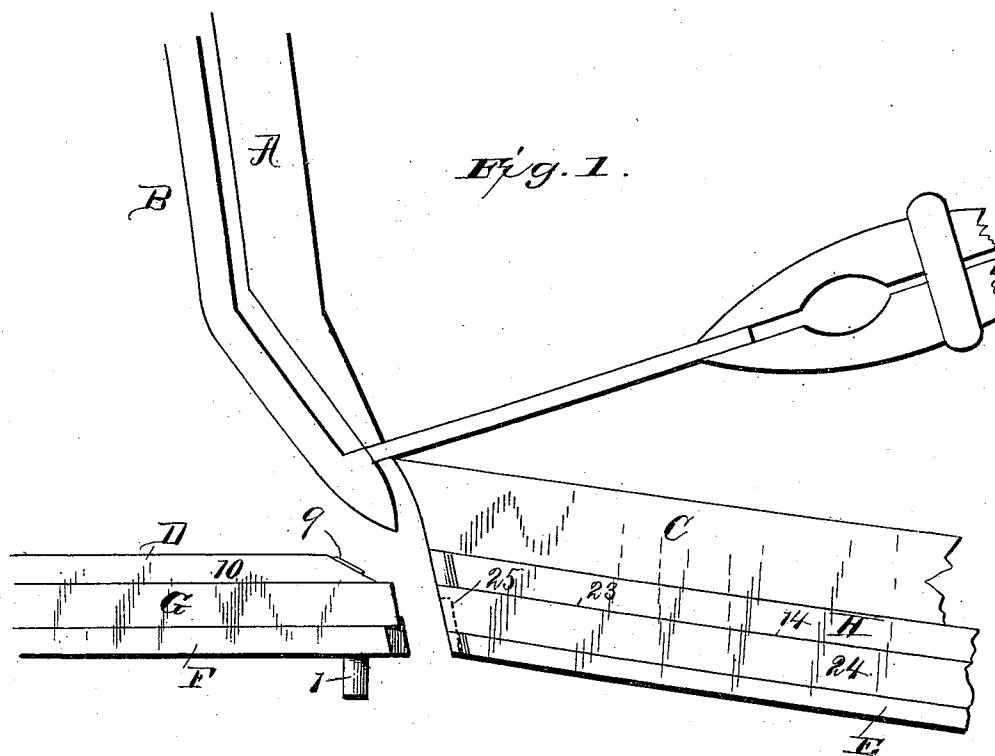


Fig. 3.

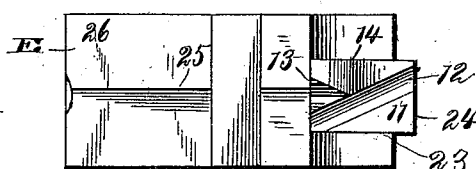


Fig. 4.

WITNESSES  
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Wm. H. Bates

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by A. G. Keyman,  
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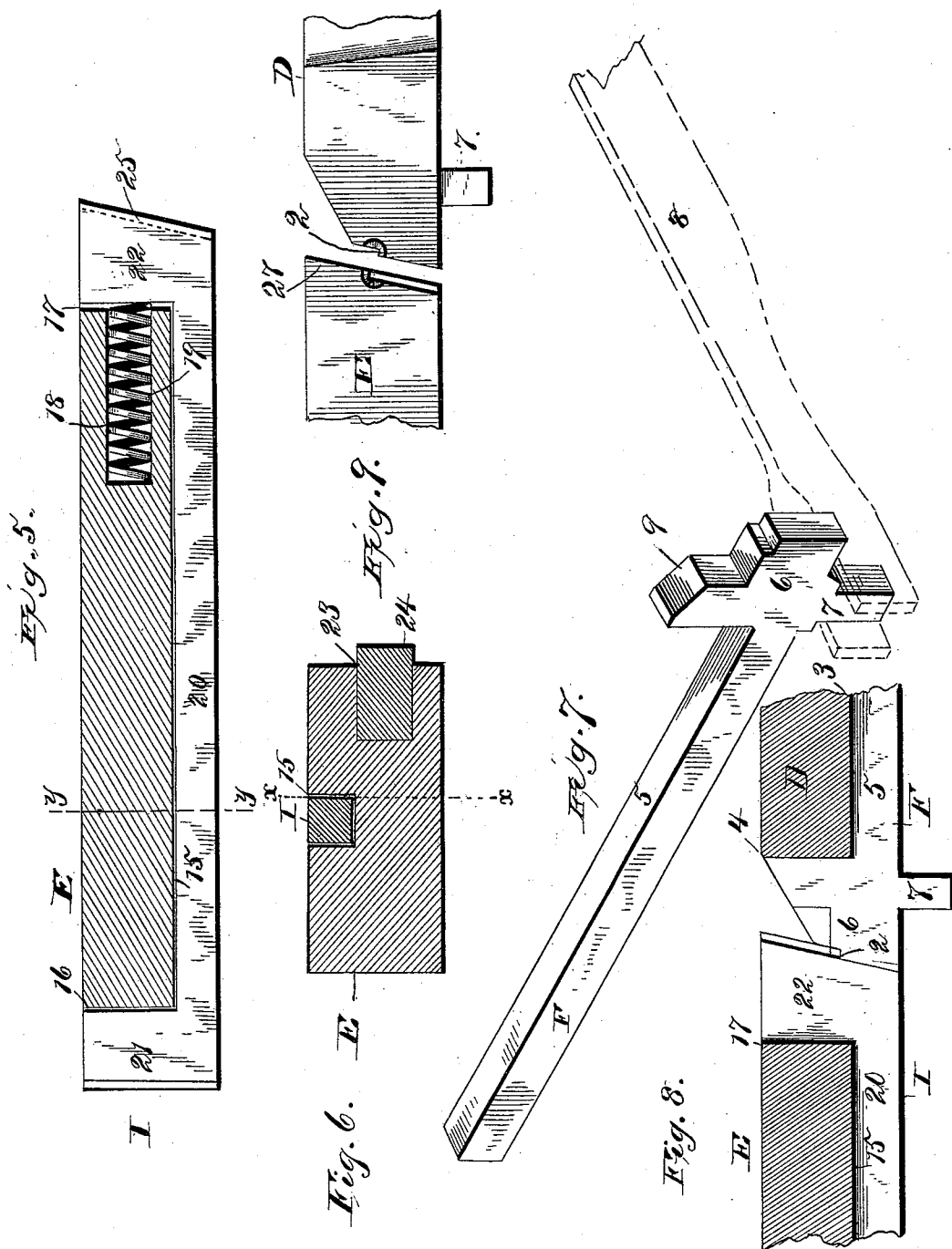
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2 Sheets—Sheet 2.

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No. 463,363.

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WITNESSES  
F. L. Ouraud.  
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INVENTOR  
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# UNITED STATES PATENT OFFICE.

CHARLES E. HOUGHTON, OF NORTHUMBERLAND, PENNSYLVANIA, ASSIGNOR  
OF ONE-HALF TO HORACE RUFUS JOHNSON, OF SAME PLACE.

## NAIL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 463,363, dated November 17, 1891.

Application filed September 16, 1890. Renewed October 22, 1891. Serial No. 409,491. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. HOUGHTON, a citizen of the United States of America, residing at Northumberland, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Nail-Cutting Machines, of which the following is a specification.

My invention has relation to improvements in nail-cutting machines of that well-known construction generally in use for making nails from a rolled plate; and the object is to improve the dies of such machines, so as to cut from a rolled plate nails having substantially a straight shank and a pointed end. Great difficulty has been encountered in the art to provide a plate-cut nail with proper points. The dies and adjuncts, which are the elements of my present invention, I believe overcome the former objections and defects, whatever they may have been, and produce a well-finished and well-pointed nail.

Having thus stated the objects and purposes of my invention, I now proceed to concisely and clearly describe the constructions of the elements and parts essential to understand the same, and therein will explain the principle and the practical application thereof, so as to distinguish it from other inventions in the art.

I have fully and clearly illustrated my invention in the accompanying drawings, wherein—

Figure 1 is a side view of the cutting-knives, the gage, and the dies, showing a plate being fed to the knives. Fig. 2 is an end face view of the moving die and nipper and the point-cutting die in the moving die. Fig. 3 is a similar view of the bed-die and central automatic holder and ejector and the point-cutting die in place. Fig. 4 is a view showing the point-cutting dies in contact. Fig. 5 is a longitudinal section of the bed-die on line *xx* of Fig. 6, showing the automatic holder and ejector and the pushing-spring to throw it outward. Fig. 6 is a transverse section on the line *yy* of Fig. 5. Fig. 7 is a detail perspective of the nipper removed from the die and the nipper connection. Fig. 8 is a longitudinal section of the dies on the line *zz* of Fig. 2. Fig. 9 is a side view of the dies.

I have not deemed it necessary to illustrate completely all the various and numerous parts and elements of a nail-machine, because the parts constituting my present invention are applicable to any of the well-known "high-post" machines now so generally used in nail-factories, so that any person in the trade will readily and completely understand their adaptation and location in the machine and their uses.

In Fig. 1 of the drawings, A designates the moving knife; B, the gage behind it; C, the bed-knife; D, the moving die, and E the bed-die. The last two named elements with the nipper and automatic holder and ejector form the subject of my present invention. The moving die D consists of a substantial piece of steel formed to lie in the bed of the gripping-lever of a nail-machine. The lower portion of the face end of this die is formed with a lip or shoulder 2, corresponding to the width of the nail or blank to be cut. The upper portion of the die above the lip or shoulder is beveled back to make room for the moving knife and gage, and the metal of the die immediately adjacent to the lip or shoulder constitutes the gripping-surface. In the bottom of the die is formed a longitudinal groove 3, terminating or opening into a vertical open end slot 4 in the end of the die. The groove 3 receives and guides the stem of my new nipper, and the end slot 4 takes the forward part thereof, which constitutes the nipper proper.

F designates my improved nipper. This consists of a stem 5 to fit and slide in the groove 3 of the moving die, and on the stem is formed the nipper 6, having a face end conforming precisely to the vertical contour of the face end of the die. From the forward end of the nipper is a downwardly-projecting lug 7, which is engaged by the fork or notch in the end of the nipper-bar 8, which is of the usual construction, except the absence of the common nipper end, and having the end forked instead. The connections and vibrations of the nipper-bar are made and attained as heretofore. As the nipper is necessarily moved forward to engage the nail in advance of the die and while the moving knife and gage are at their lowest limit, the top of the nipper is shouldered or recessed, as at

9, so as to not interfere with such movements. In the side of the die is a groove 10, serving as a bed for a point-cutting die. The point-cutting dies are, it will be perceived, detach-  
 5 able or removable from the main die in order that they may be readily repaired and independently dressed and sharpened.

G designates the moving point-cutting die. This die is fitted in the side groove of the  
 10 moving die and arranged with its outer edge slightly projecting from the die in order that when the main die is clamped in its seat on the gripping-lever the point-cutting die will also be clamped edgewise in its groove or  
 15 seat by the same means. The face ends of the point-cutting dies are counterparts, and therefore the description of one will be applicable to the other. Describing the face ends specifically, they are formed with an  
 20 abutting surface 11, a diagonally-arranged groove 12, extending across them, a point-cutting groove 13, and a double inclined and beveled upper part 14. The plain abutting surface 11 affords ample contacting region for  
 25 the dies. The diagonally-arranged groove 12 is not only a clearing-space for feathers and chips cut from the point of the blank, but the edge wall for a distance forms the outer part of the wall of the point-cutting groove, as shown in the drawings, and the continuation in connection with the meeting wall of the beveled part will cut any projections from the extreme end of the point, and thus leave it clean and neatly formed, and the beveled  
 35 portion 14 makes the upper wall of the cutting-edges of the die. This beveled part 14 is cut in cross-section inclined downward from both sides of the tool, the inclines meeting substantially at a point of the point-cutting groove, as shown in the drawings. The point-cutting groove 13 at the base corresponds in width to the size of the nail cut and may extend inward, as desired, the groove being angular.

45 E designates the bed-die, having a longitudinal groove 15 in the under side for its length, which opens into open end slots 16 17 at each end of the die. In the front end of the die, opening into the wall of the slot 17, is a socket 18, in which a spring 19 is arranged to bear with its end outward.

I designates my improved automatic holder and ejector, consisting of a steel bar 20, having its ends 21 22 struck up, as shown. The  
 55 bar thus formed fits into the seat made for it in the die and is given a lengthwise limited movement or play, so that the end 22 will be in alignment with the lip-face of the bed-die in position to act in conjunction with the nipper in holding the nail when carried down by the moving knife, in which position the nail is held until the moving knife recedes and the moving die advances to the face of the nipper and pushes the nail and holder and  
 60 ejector back to the rear of the lip of the bed-die, thus effecting the gripping and pointing of the nail, after which the moving die re-

cedes and the nail is thrown free by the ejector. The rear wall of the end 22 abuts against the metal of the die behind it, and when in that  
 70 position the lower face part of the die and the face of the holder and ejector are on a plane and in alignment and become part of the gripping-surface. This position of the parts prevents the nail from being bent dur-  
 75 ing the operation of gripping and heading, which occurs when the die is formed with a recess and the spring as the abutting surface and clearer, and when the holder and ejector is pushed out the face stands in alignment  
 80 with the shoulder or lip-face of the bed-die. In the side wall of the bed-die is a groove 23, in which is lodged the stationary cutting-die 24. As heretofore stated, the face of this point cutting die is the counterpart of  
 85 the one in the moving die, and its description need not be duplicated. The end face of the bed-die is formed with a lip or shoulder  
 25 higher than the lip or shoulder in the moving die and connecting two parallel abutting sur-  
 90 faces 26 27, as shown. The lip or shoulder 25 is at a greater elevation than the lip or shoulder in the moving die in order that a space may be formed between the dies and lips or  
 95 shoulders when in contact, in which space the nail is confined, held, and compressed while the point is being made.

The operation is as follows: The nail being cut from the plate is carried down by the moving knife to the edge of the lip on the bed-  
 100 die, when it is engaged by the nipper against the holder and ejector and held until the moving die advances on the nipper and pushes the nail and holder and ejector back under the lip of the bed-die, in which position they  
 105 are gripped and pointed. When the moving die recedes, the automatic holder and ejector throws the nail out.

Having thus described the construction and operation of my invention, I now particularly  
 110 point out and distinctly claim the following:

1. In a nail-machine, the combination, with a moving die formed with a recess in its side which opens into the face end of the die, of a removable point-cutting die arranged in said  
 115 recess and extending outwardly to the face end of the die, substantially as set forth.

2. A moving die for a nail-machine, consisting of a body part having a gripping-face, an open end vertical nipper slot or recess in its  
 120 end face, and a groove in its side face adapted to take and hold a point-cutting die, substantially as described.

3. In a gripping moving die for a nail-machine, the combination of a die-body having  
 125 a seat for a reciprocating nipper and a seat for a point-cutting die, a nipper located in the nipper-seat in the die-body, and a point-cutting die detachably disposed in the seat thereof, substantially as and for the purpose speci-  
 130 fied.

4. In a gripping moving die for a nail-machine, the combination of a die-body formed with a gripping-surface, consisting of parallel

upper and lower sections having a lip or shoulder between them, a vertical open end slot in its gripping-face, a longitudinal groove in its under face to receive and hold the nipper, and a groove in its side to receive a point-cutting die, a nipper having a stem and nose to set in the groove and open end slot of the die, means to reciprocate the nipper, and a point-cutting die in the side groove of the die-body, substantially as described.

5. A nipper for a nail-cutting machine, consisting of a stem to set in a guideway under the moving die and parallel therewith, and a nipper-head on the stem to fit in a recess in the gripping end of the die, substantially as described.

6. A point-cutting die for a nail-machine, consisting of a body having a die formed with an abutting surface, a diagonally-arranged groove across its face, the upper edge of which constitutes one side of the point-cutting groove, a point-cutting groove, and a double-incline beveled upper face constituting the upper edge of the point-cutting die and the edge of the diagonal groove, substantially as and for the purposes set forth.

7. A bed-die for a nail-cutting machine, consisting of a body having a gripping end face, open end slots at each end, and a longitudinal groove in the under face opening into the end slots, a spring in the front slot, a holder and ejector having a limited movement in the groove and slots, a point-cutting die-groove in the side, and a detachable point-cutting die in the side groove of the body, substantially as described.

8. In a nail-machine, the combination of a moving die having parallel upper and lower abutting surfaces connected by a holder or ejector, a nipper-groove in its under face,

a recess in the end face, and a point-cutting die-groove in its side face, a nipper arranged in the recess having a stem to set in the groove of the die, a point-cutting die in the side groove of the main die, a bed-die having a longitudinal groove in its bottom opening into vertical open end slots at the ends of the die and a side groove to take a point-cutting die, a spring-actuated holder and ejector arranged to have a limited reciprocating movement in the groove and slots of the die-body, and a point-cutting die in the side groove thereof, substantially as described.

9. In a nail-machine, the combination of a moving die having an upper abutting surface and a lower abutting surface extending in advance of the upper, with a shoulder between them, and a bed-die having a lower abutting surface and an upper abutting surface extending in advance of the lower, with a shoulder between arranged at a greater height than the shoulder of the moving die, whereby a gripping-space is formed between the shoulders and surfaces of the dies, as specified.

10. In a nail-cutting machine, the combination of a bed-die formed with a projecting lip or shoulder extending across its end face and a moving die formed with a projecting lip or shoulder extending across its end face, said lip being arranged at a lower parallel plane than the lip of the bed-die, whereby a space is formed between the dies for gripping and holding the nail, substantially as described.

In testimony whereof I hereunto set my hand in the presence of two attesting witnesses.

CHARLES E. HOUGHTON.

Attest:

EML. WILVERT,  
REUBEN JOHNSON.