

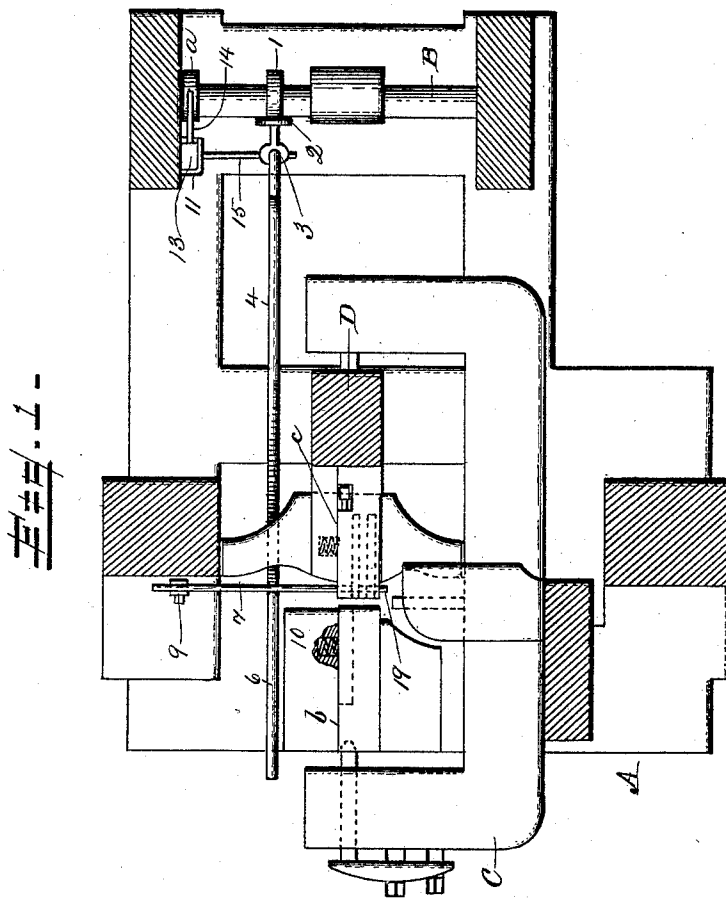
(No Model.)

5 Sheets—Sheet 1.

C. E. HOUGHTON.
NAIL MACHINE.

No. 465,762.

Patented Dec. 22, 1891.



Witnesses
C. B. Blackwood
Wm H Bates.

Inventor
 Chas. E. Naughton
 by A. G. Heylman
 Attorney

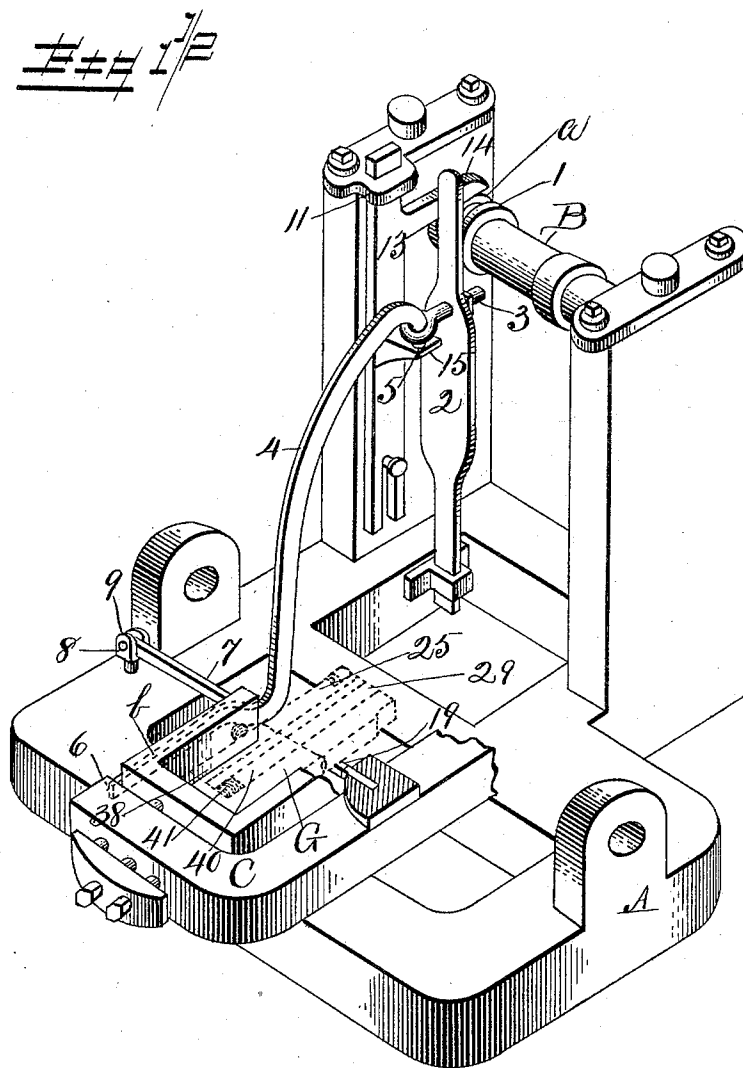
(No Model.)

5 Sheets—Sheet 2.

C. E. HOUGHTON.
NAIL MACHINE.

No. 465,762.

Patented Dec. 22, 1891.



Witnesses

Albert B. Blackwood
Wm. B. Bates

Inventor

Chas. E. Houghton,
by A. G. Heyman
Attorney

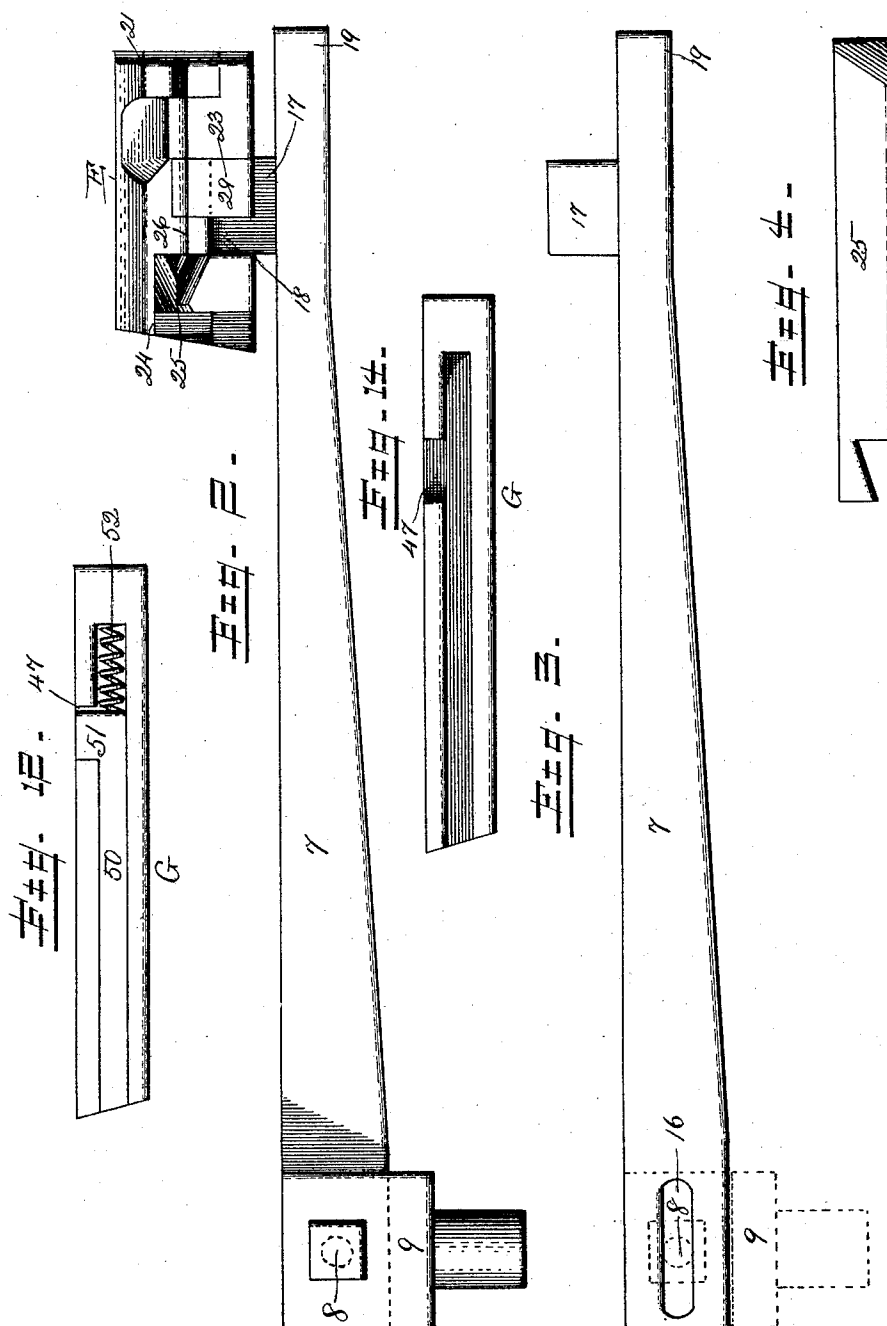
(No Model.)

5 Sheets—Sheet 3.

C. E. HOUGHTON.
NAIL MACHINE.

No. 465,762.

Patented Dec. 22, 1891.



Witnesses

Wm. B. Blackwood
Wm. B. Bates

Chas. E. Houghton ^{Inventor}
A. G. Keyman _{Attorney}

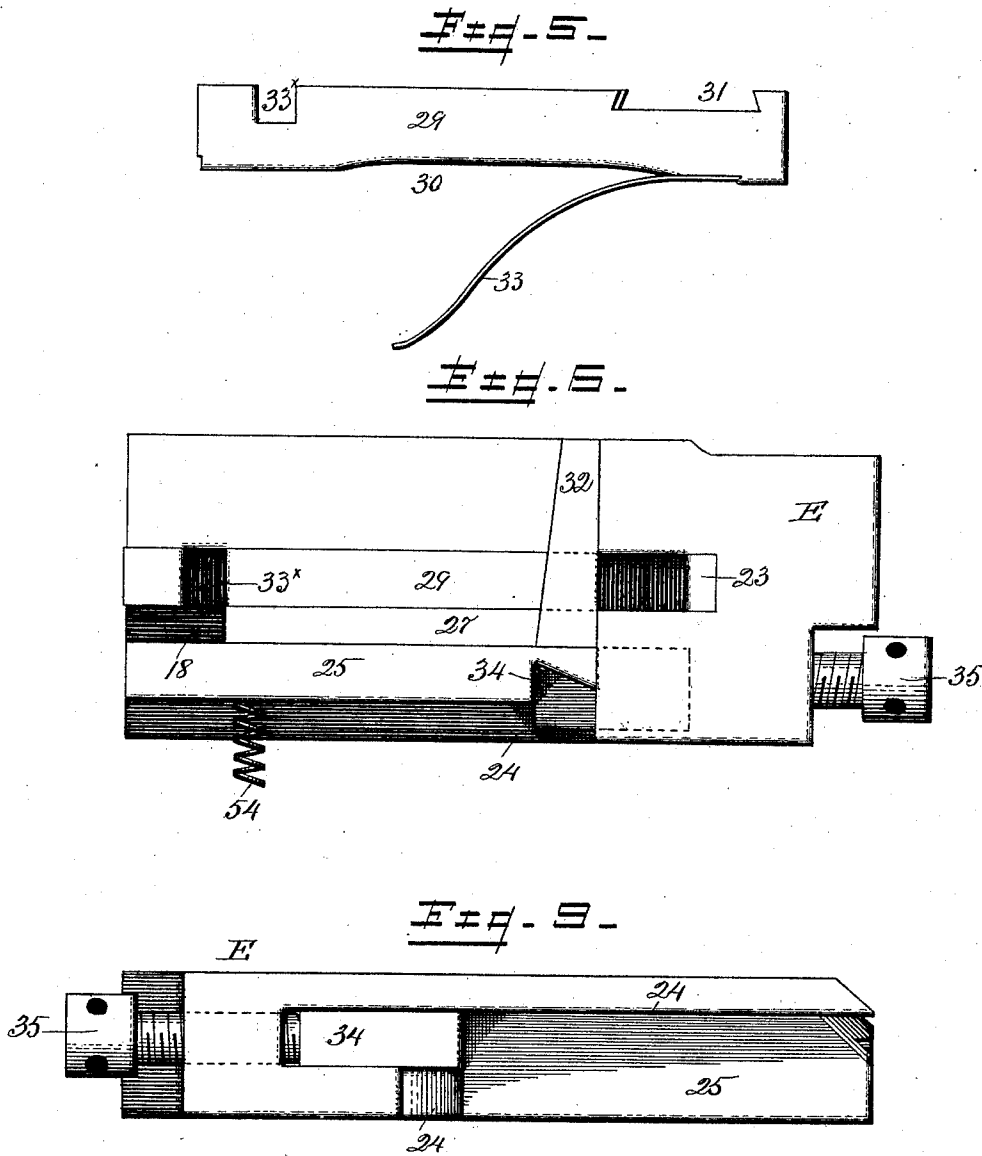
(No Model.)

C. E. HOUGHTON.
NAIL MACHINE.

5 Sheets—Sheet 4.

No. 465,762.

Patented Dec. 22, 1891.



Witnesses
Attest Blackwood
Wm J. C. Bates

Fig. 7.
34

Inventor
Chas. E. Houghton,
by A. G. Heyman
Attorney

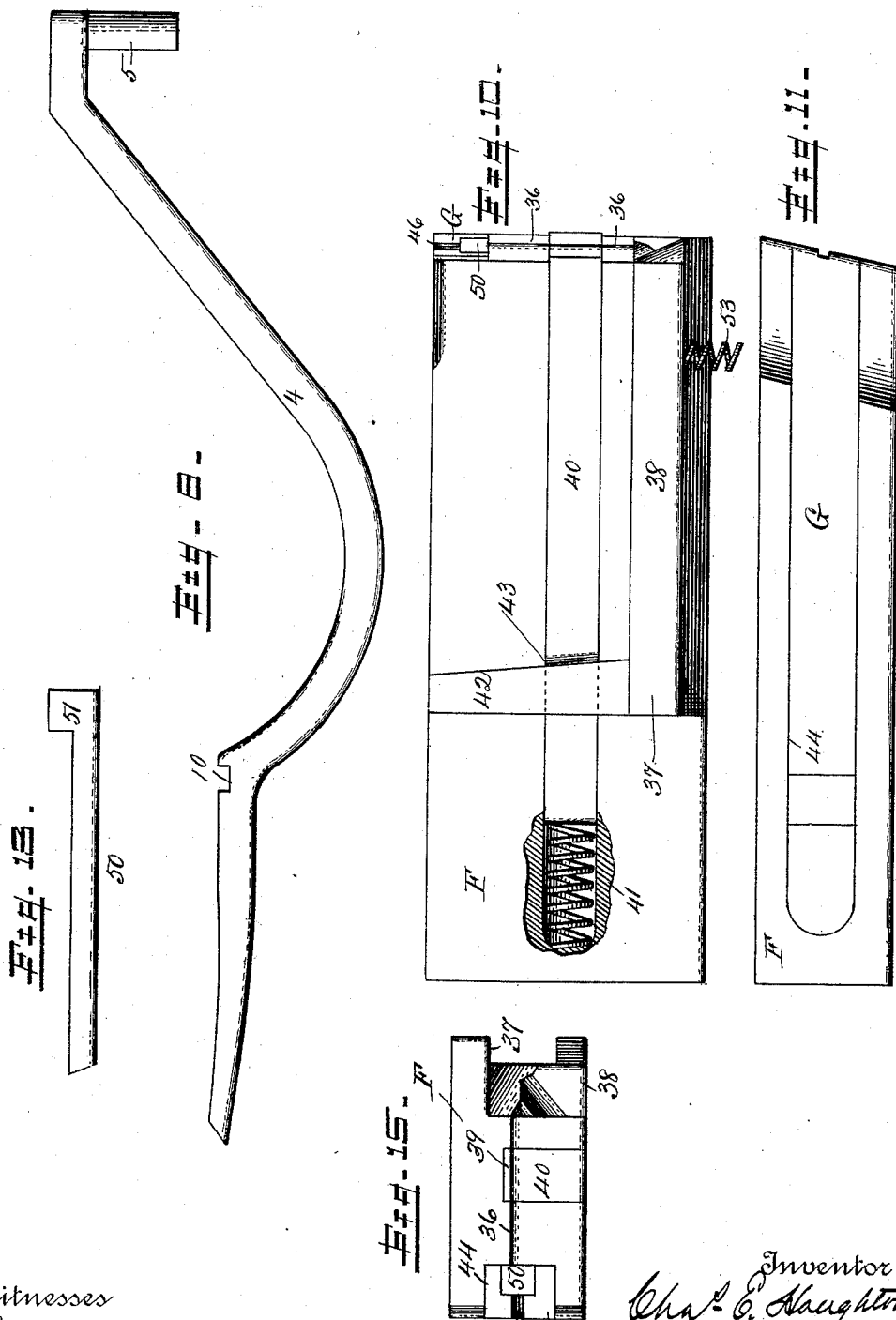
(No Model.)

5 Sheets—Sheet 5.

C. E. HOUGHTON.
NAIL MACHINE.

No. 465,762.

Patented Dec. 22, 1891.



Witnesses

A. B. Blackwood
Wm. H. Bates

Inventor
Chas. E. Houghton
by A. G. Heyman,
Attorney

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. 465,762, dated December 22, 1891.

Application filed July 16, 1891. Serial No. 399,740. (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-Machines, of which the following is a specification.

My invention has relation to machines for cutting nails from a rolled plate of metal; and the object is to simplify and improve nail-machines designed or intended to make pointed nails from a blank cut from a common rolled plate.

The invention consists in the improved means hereinafter fully described, and the same is specifically distinguished in the claims hereinbelow made.

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

Figure 1 is a plan view of a nail-machine with the cutting-jaw and lever removed and other parts partly in section and having my present improvements connected thereto. Fig. 1½ is a perspective of a nail-machine, showing the assemblage of the dies in dotted lines, certain parts of the machine being omitted in order that the parts may be better illustrated. Fig. 2 is a side view of the nipper-bar and end view of the bed-piece, holder, or die-case of the moving point-cutting die, the moving gripping-die, and the sliding nipper assembled or arranged in the bed-piece. Fig. 3 is a side view of the nipper-bar. Fig. 4 is a view of the point-cutting die. Fig. 5 is a view of the sliding nipper. Fig. 6 is a bottom view of the moving bed-piece, with the gripping-die, the nipper, and point-cutting die arranged therein. Fig. 7 is a view of the abutting block at the end of the point-cutting die. Fig. 8 is a view of the nipper pushing and lifting bar of the nipper-bar. Fig. 9 is a side view of the moving bed-piece, holder, or die-case, with the point-cutting die in position. Fig. 10 is a bottom view of the stationary bed-piece or die-case with the central ejector and point-cutting die therein, the spring at the end of the central ejector being shown in dotted lines and also the gripping-die. Fig. 11 is a side view of the bed-piece or die-casing, showing the seat for the gripping-die. Fig. 12 is a

side view of the bed-gripping die, showing the ejector arranged therein. Fig. 13 is a view of the central ejector, which operates in the bed-gripping die. Fig. 14 is a detail side view of the bed-gripping die with the ejector removed, and Fig. 15 is an end view of the stationary bed-piece with the dies and ejectors arranged therein.

In Fig. 1 of the drawings I have illustrated the well-known "high-post" nail-machine, and reference being made thereto, A designates the bed or frame of the machine; B, the driving-shaft; C, the heading-lever, and D the gripping-lever. These elements are of the usual constructions, excepting that the driving-shaft has an extra cam *a*, formed thereon, to operate the vertically-moving lifting-post of the push-bar of the nipper-bar, as hereinafter more fully specified.

My present invention includes and embraces improvements of this push-bar in combination with a longitudinally-reciprocating nipper-bar for laterally moving the point-cutting moving die, as well as having the usual reciprocations for partially moving the nipper.

In the front of the bed-frame of the machine is formed the usual chamber or seat *b* for taking the bed-piece, dies, and bed-knife of the machine, and on the top face of the gripping-lever is formed the usual seat *c* for the moving die-case and its contained dies.

The means or mechanism for imparting the vertical and horizontal reciprocations to the nipper-bar and correspondingly affecting the nipper are the same as those described and shown in my pending application for Letters Patent, Serial No. 378,958, and hence no claim is made herein for these means except as they form legitimate combinations with my present invention. These means for operating the nipper are as follows: On the driving-shaft B is a cam 1, against which the nipper-spring 2 bears. In the spring 2 is fixed an eyebolt 3, in which the push-bar 4 of the nipper-bar is connected by means of a pin or lug 5, the end of which projects below its bearing. The free end of the push-bar 4 is extended and rests on the bed of the machine alongside of the knife-bed, as shown at 6. The nipper-bar 7 is loosely supported on a pin 8 at its end in a bearing 9, so as to give

the requisite play, and has its inner end connected to the sliding nipper. In the push-bar is notch 10, in which the nipper-bar engages and is held. On the post of the machine adjacent to the nipper-spring are keepers 11, in which a post 13 is arranged to have vertical movement. This post 13 is formed with an arm 14, which bears on the cam *a* on the driving-shaft, and operates to lift the post. The post is also provided with an inwardly-projecting arm 15, which engages the projecting end of the lug of the push-bar under the eyebolt, as shown, so that when the vertical post is raised the push-bar is tilted, and the nipper-bar is thereby raised and the nail-blank carried under the lip of the back piece.

In my present invention I give the nipper-bar an additional and important function—that is, I make it longitudinally movable to operate a point-cutting die on the gripping-lever, and to effect this change the construction differs from that described as follows: The rear end of the nipper-bar is formed with an elongated slot 16, in which the pin 8 is projected as a bearing, and on which the nipper-bar has longitudinal movement. Near the outer or free end of the nipper-bar is a vertical lug 17, made wide enough to set in a recess in the sliding nipper and extend across a recess 18 in the die case or piece and bear with its edge against the inner face of the moving point-cutting die and serve to pull that element outward and give it a shearing movement in the operation of cutting the point on the nail. The end 19 of the nipper-bar extends a short distance beyond the side of the die, as seen in Figs. 1 $\frac{1}{2}$ and 2 of the drawings, and is engaged by the "header" just as it comes up to form the head on the nail when held between the dies.

E designates the moving bed-die holder or die-case adapted to be secured on a seat *c* in the gripping-lever. This die-case has formed in one of its sides a seat 21, in which is arranged the gripping-die. In the under central portion of the die-case is formed a seat 23 for the sliding nipper and in the other side is a seat 24 for the point-cutting die 25. The seat 24 is made wider than the point-cutting die, so that it may have a limited lateral movement in the seat. The face end of the die-case is formed with a lip 26, formed by the lower portion being extended beyond the upper, substantially as shown. The standing metal or wall 27 of the die-case between the nipper-seat and the point-cutting die chamber or seat is recessed or cut away, as at 18, for a distance of its height to permit the lug on the nipper-bar to slide back and forth in its horizontal reciprocations when moved by the header. The nipper 29 consists of a bar of steel arranged in the die-case and having an end face to conform with the contour of the end face of the die-case, and also having its under face formed with a shoulder 30 and a recess 31 at its rear portion, as shown. Across the bottom of the die-case is secured a stop-

piece 32, which permits the nipper to have a longitudinal movement limited by the recess 31, and to the back of the nipper is a spring 33, which bears down on the nipper when in its seat and serves to move the nipper downward when carried outward beyond the shoulder. This construction of the nipper is the same as that seen in my pending application, Serial No. 378,958, heretofore mentioned. The difference of construction being that in the said cited application the nipper is formed with a lug on its lower face engaged by the nipper-bar, while in the present invention, necessarily so, in view of the longitudinal movement of the nipper-bar, a transverse groove or recess 33^x is formed in the nipper, in which the lug on the nipper-bar engages. The point-cutting die 25 is of the same construction as that shown in my said application, Serial No. 378,958, and consists of a steel bar having a point-cutting groove in its face end and being made narrower than the seat in the die-case to give it room for lateral movement therein. The rear end of this die has a dovetail connection or joint in a short block 34, to have a limited play in the joint, and the forward position of the die is adjusted and fixed by means of an adjusting-screw 35, substantially as shown.

F designates the stationary bed-piece or die-case having a lip 36, formed across its end face, arranged at a higher plane than the lip of the moving die-case. This bed-piece also has a side recess or chamber 37, in which is lodged the point-cutting die 38. This die is narrower than the recess, in order that it may have a limited lateral movement in its seat in connection with the opposing moving die. In the under central part of the bed-piece is a groove 39, in which is lodged the central ejector 40, forced outward by a spring 41, and stayed in its outward movement by a cross-piece 42 bridging the groove and engaging in a recess 43 in the ejector.

The foregoing described constructions are substantially identical with those shown and described in my said pending application, Serial No. 378,958, and no special claim is made to them herein.

G designates the bed-gripping die. This die is lodged in the recess 44 and is formed with a score 46 across its face, as shown, and in the side of the die is a groove extending well back, as shown, and having an opening 47 through the wall of the groove to take the lug on the end of the auxiliary ejector arranged to have a limited movement in the groove or seat.

50 designates the auxiliary ejector consisting of a bar fitted in the groove of the die and formed with a lug 51, arranged in the opening 47 in the die. A spring 52 in the rear end of the groove of the die forces the auxiliary ejector to stand normally out with its face flush with the end of the die. This auxiliary ejector serves the purpose of freeing the nail from the die after the head has

been struck thereon, the blank having a tendency to stick in the score of the die because of the force of the grip when in the dies. A spring 53 returns the die 38 to its normal or straight position after being moved out in the operation of cutting the point, and a spring 54 serves the same purpose in the moving point-cutting die.

The operation of the improved mechanism is as follows: The nail, being cut from the plate and carried down by the cutting-knife, (not shown,) is engaged by the nipper, which in its forward and upward movement carries the cut blank against and up and under the lip of the bed-piece, where it is engaged by the moving dies and held until the header comes up to form the head, which, just before reaching the head and while the cutting-dies are making the point, the header engages the end of the nipper-bar and pushes that endwise, sliding it on the slot at its bearing and moving the point-cutting die, and thus gives the dies a lateral shearing or pinching movement and cutting and cleaning the point. The nipper is reciprocated vertically longitudinally by means of the push-bar. After the nipper-bar has been moved endwise by the header it is carried back by the die when the spring returns that element to its normal position.

Having thus described my invention, explained its principle, and stated its operation, so as to distinguish it from other inventions in the art, as required by the statute, I now proceed to particularly point out and distinctly claim the parts, improvements, and combinations I claim as my invention, as follows:

1. In a nail-machine, the combination of a moving point-cutting die having a lateral

movement in its seat, a nipper-bar provided with a lug to engage the point-cutting die, and means, substantially as described, to engage the bar and move the lug, whereby the point-cutting die is moved laterally outward, substantially as specified.

2. In a nail-machine, the combination of a moving point-cutting die arranged in its seat to have a lateral movement therein, a longitudinally-movable nipper-bar having a lug to engage the point-cutting die, and the header to engage the end of the nipper-bar and move it longitudinally, substantially as and for the purposes specified.

3. In a nail-machine, the combination of a point-cutting die adapted to have a lateral movement in its seat, a nipper-bar supported on a slotted bearing and having a lug to engage the point-cutting die, and the heading-lever provided with a header to engage the end of the nipper-bar, whereby the die is moved outward, substantially as described.

4. In a nail-machine, the combination of a point-cutting die adapted to have a limited lateral movement in its seat, a sliding nipper arranged adjacent to the point-cutting die, a nipper-bar having a vertical, horizontal, and longitudinal movement and arranged to engage the nipper and the point-cutting die, mechanism to lift the nipper vertically and swing it horizontally, and means to move it longitudinally, substantially as and for the purpose specified.

In witness whereof I have hereto set my hand in the presence of two attesting witnesses.

CHARLES E. HOUGHTON.

Attest:

GEO. H. NEFF,
REUBEN JOHNSON.