

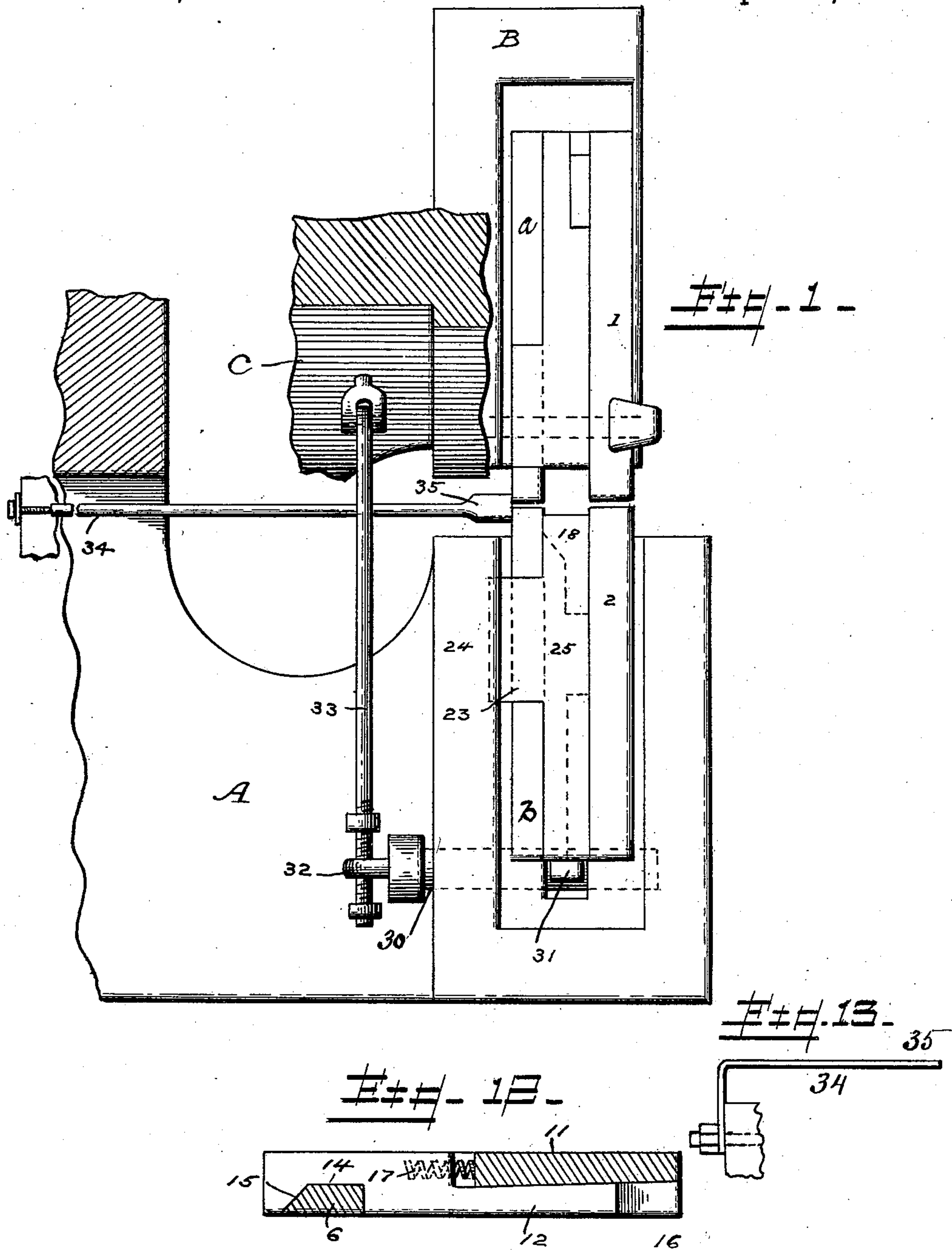
(No Model.)

2 Sheets—Sheet 1.

C. E. HOUGHTON.  
NAIL MACHINE.

No. 472,882.

Patented Apr. 12, 1892.



Witnesses  
Albert B. Blackwood  
Mrs. Mueser.

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

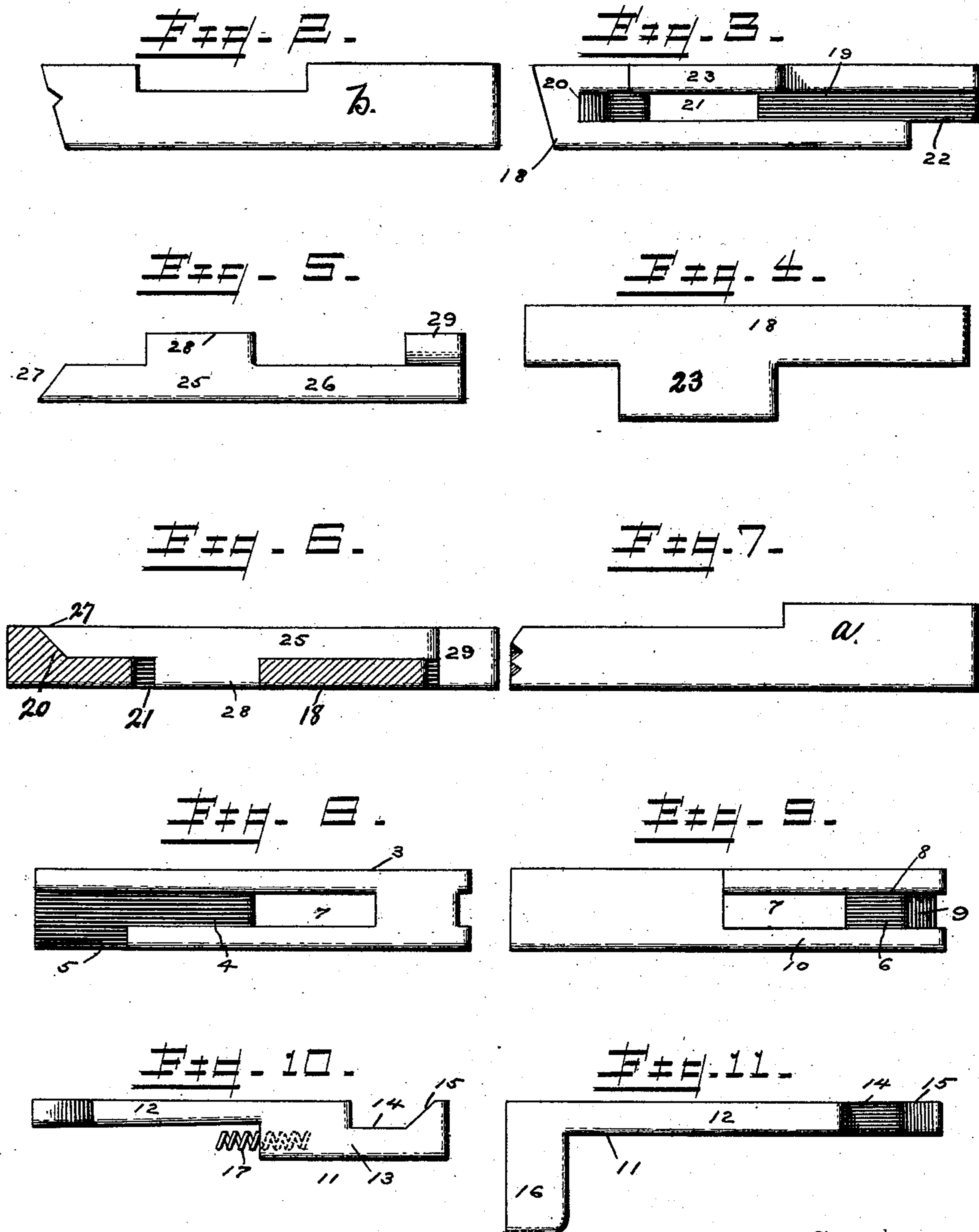
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Wm. Musser.

Inventor

Chas. E. Houghton  
by A. G. Hayman  
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. 472,882, dated April 12, 1892.

Application filed December 1, 1891. Serial No. 413,717. (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 in 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 improvements in machines for making pointed nails from a common rolled plate; and the object is to provide improved means for laterally moving the point-cutting dies to shear and clean the point on the nail after the direct contact of the dies.

The invention consists in details of construction, as hereinafter specified, and particularly pointed out in the claims.

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

Figure 1 is a plan view of a nail-machine having my invention applied, certain parts of the machine being removed and others shown sectionized. Fig. 2 is a side view of the point-cutting bed-die. Fig. 3 is a side view of the stationary part of the liner on the bed of the machine. Fig. 4 is a top plan view of the same. Fig. 5 is a plan view of the expanding part of the liner for the point-cutting bed-die. Fig. 6 is a view of these parts united, partly in section. Fig. 7 is a side view of the point-cutting moving die. Fig. 8 is a side view of the stationary part of the expanding liner. Fig. 9 is a view from the reverse side shown in Fig. 8. Fig. 10 is a top view of the movable part of the expanding liner for the moving point-cutting die. Fig. 11 is a side view of the same; and Fig. 12 is a view showing the parts illustrated in Figs. 8 and 10 in operative relation, the stationary part being shown in section. Fig. 13 is a detail side view of the returning-spring.

In the drawings, A designates the bed of the machine, B the gripping-lever, and C the cutting-jaw, which is broken off to disclose the relation of the respective dies. The respective gripping-dies 1 2 are of the usual construction and arranged and secured in position by the usual means, substantially as shown, and the opposing point-cutting dies are designated by *a* and *b*.

The primary element of my present invention is an expanding liner interposed between the gripping-dies and the laterally-movable point-cutting dies for the purpose of moving the latter elements outward when in operative union on the nail-blank while that is held by the gripping-dies. With this in view I make the liners in two parts, formed so that when one part is moved longitudinally it will be moved laterally to push the point-cutting die outward.

In the drawings, especially Figs. 8 to 10, inclusive, 3 designates the stationary part of an expanding-liner adapted for the point-cutting die on the gripping-lever. This part has a channel 4 formed in its side extending for the greater part of its length, and in the upper wall of this channel has a recess or cut-away portion 5. On the opposite side of the part leading from the other end is a channel 6, an opening 7 being made through the part between the inner terminations of the channels, in which an extension on the other part projects, substantially as shown. The standing part 8 has the outer end 9, inclined outward to engage with a corresponding incline on the other part. On the inner portion is a flange 10, serving as a keeper and abutting piece for the point-cutting die and also as an abutting flange to hold the liner in position and so that the gripping-die can be firmly clamped against the liner in its seat. 11 designates the movable part of this expanding liner, having a stem 12 to fit the channel 4 of the other part and a side-extended piece 13 to engage through the opening 7 and channel 6. In the side of this part is a recess 14, having an inclined end 15, which engages the incline 9 on the other part. This part 11 is given limited longitudinal movement in its seat in the other part, in order that when moved the contact of the inclines will throw the opposite face or side beyond the face of the other part, and since it has its bearing against the face of the point-cutting die, that element will be moved also. The part 11 is moved positively in the direction to expand the liner by means of a projecting stud 16, contacting with the rear face of the cutting-jaw or properly connected to some other moving part of the machine. The part 11 is returned to its normal



position by means of a spring 17, arranged at the rear of the portion B, substantially as shown.

The same principle of expansion of the liner is carried into effect in respect to the operation of moving the point-cutting bed-die, the construction being specially illustrated in detail in Figs. 4, 5, and 6, and wherein 18 designates the stationary part of the liner, having a channel 19 in one side terminating in an inclined end 20 and formed with an opening 21. At the rear end the metal is cut away, as at 22, to form a seat for the abutting piece on the movable portion of the liner, and from the side of the liner is a flange 23, which rests in a recess in the point-cutting die and extends into and rests in a recess 24, formed in the inner face of the side wall of the bed. 25 designates the expanding portion of the liner, consisting of a stem 26, terminating in an inclined end 27 to engage the incline of the other part and having a broad side extension 28 to engage in the opening of the other part. At the rear end is an abutting piece 29 to engage in the recess or seat 22 of the other part, as in the other-described construction for the point-cutting moving die. This part 25 is thrown outward when pushed against the incline of the other part and at the same time moves the point-cutting die outward. Any proper leverage may be employed to expand this liner. I have shown a bar journaled in the bed and provided with a lug 31, projecting up through the floor of the bed and engaging against the rear end of the movable portion of the liner. At the outer end of the bar 30 is an arm 32, having its end connected to some reciprocating part of the machine. I have shown it as being connected to the cutting-jaw by a rod 33.

To return the point-cutting dies to their inner and normal relation after being moved out by the liners, I provide a spring 34, bent at right angles, having its vertical arm secured to the frame of the machine (see Figs. 1 and 13) and its horizontal arm broadened at the end, as at 35, and arranged to bear and push against the point-cutting dies, as shown in the drawings.

The operation is as follows: The nail-blank being severed and pushed down to the dies, it is there gripped, and while so held the cutting-jaw moves upward and through the connections eventually moves the expanding liners by moving the parts in opposite directions, and thus moving the point-cutting dies outward while the dies are still gripping the nail, thus cleaning and shearing the point.

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

1. In a nail-cutting machine, the combination, with laterally-movable point-cutting dies, of expanding liners arranged adjacent

to the dies and means for expanding the liners to move the dies outward, substantially as described.

2. In a nail-cutting machine, the combination, with laterally-movable point-cutting dies, of expanding liners arranged adjacent to the dies, said expanding liners consisting of a stationary part and a part having limited and longitudinal and lateral movement, and means for moving the movable part, substantially as described.

3. In a nail-cutting machine, the combination of laterally-movable point-cutting dies and two-part liners adjacent to the dies, said parts having inclined contacting surfaces, whereby when one of the parts is moved longitudinally it is also moved laterally, substantially as and for the purposes specified.

4. The combination, with the laterally-movable point-cutting dies, of expanding liners to push the dies outward, means to expand the liners, and a spring to return the dies inward, substantially as described.

5. The expanding liner for a nail-cutting machine, consisting of the part having a channel in its side and an inclined end piece at the end of the channel and the part formed to fit the channel of the other part and having a notch having an inclined end to engage the incline of the other part, and a projection to engage a moving part of the machine, substantially as and for the purpose specified.

6. The expanding liner for a nail-machine, consisting of the part having a channel terminating in an inclined end and formed with a side-abutting flange and keeper and an opening, and the part formed to fit the channel and opening of the other part and having an inclined end to engage the incline of the other part, substantially as described.

7. The combination, with the gripping-die and the point-cutting die of a nail-machine, of a liner interposed between the dies and formed with a side-extending flange to set over the point-cutting die and against an abutting surface, whereby the pressure of the gripping-die is against the liner and not against the point-cutting die, substantially as described.

8. The combination, with a laterally-movable point-cutting die of a nail-machine, of a stationary liner adjacent to the die and a movable piece between the liner and the die, whereby the die may be moved outward, and means for moving the movable piece, substantially as described.

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

CHARLES E. HOUGHTON.

Attest:

WM. H. BATES,  
WM. MUSSER.