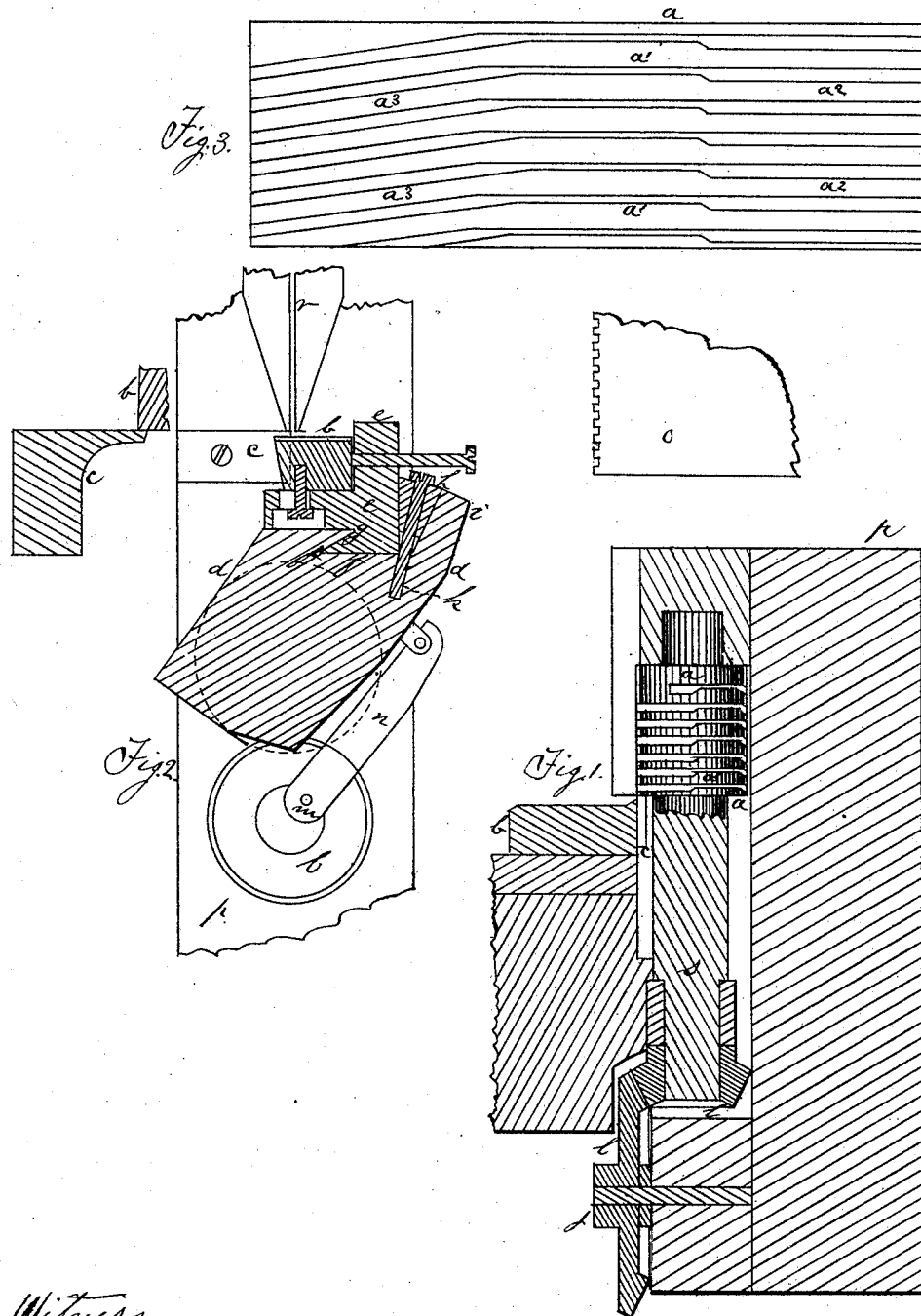


W. WICKERSHAM.
Nail-Cutting Machine.

No. 220,201.

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IMPROVEMENT IN NAIL-CUTTING MACHINES.

Specification forming part of Letters Patent No. **220,201**, dated September 30, 1879; application filed February 1, 1879.

To all whom it may concern:

Be it known that I, WILLIAM WICKERSHAM, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Nail-Cutting Machines, the leading features of which are as follows:

The first feature of my invention relates to the feed; and consists in so constructing the screw-thread which feeds the metallic sheet down to the cutters that it will hold the sheet firm while a series of nails are cut therefrom, yet relieve the cutters by allowing the sheet to move up a little as the cutters move back under its edge, by having that part of the screw-threads made narrower or extend up a little, which holds said sheet while the cutters are moving back under its edge, to prevent said sheet from breaking the edges of the cutters as they pass back under it.

The second feature of my invention relates to the trimming off of the notched edge of the nail-sheet which the feed-screw makes; and consists of a small cutter placed close to the one at the end of the series of the cutters which cut the nails, and co-operating with it, to trim the notched edge of the sheet.

The third feature of my invention relates to the construction of the cutter-stock; and consists in constructing it in two parts—one (the large part) to serve as a sort of matrix or receiver to hold and operate the small part, into which are fitted the series of cutters; and the two parts are so constructed and arranged that the small part, containing the cutters, can be taken out and another inserted in its place for making any desirable length of nail, enabling one machine thereby to make many sizes of nails.

In my drawings, Figure 1 is a vertical section of my machine parallel to the axis of the cutter-stock, showing the feed-screw, also a cross-section of one of the cutters for cutting nails; also a small cutter which co-operates with it in trimming off the notched edge of the nail-plate. Fig. 2 is a vertical section at right angles to that in Fig. 1, showing the manner in which the cutter-stock, which contains the cutters, is attached to and operated by the receiver. It gives, also, another view of the two cutters which co-operate in trim-

ming the edge of the nail-sheet. Fig. 3 is a plan view of the feed-screw as it would appear if the surface of the feed-screw which contains the threads were straightened out, so that all the screw-threads as they are formed around the shaft would appear in one view, showing the straight part, the inclined part, and the narrow part.

a is the feed-screw. *a*¹ is the part of the screw-threads, made narrower than the other parts by taking off part of the under side, to allow of the nail-plate (which has notches in its edge large enough for the large part of the thread to pass in) to rise up when these notches come onto the narrow part of the thread, as the notches are about twice as wide as the narrow part of the thread. *a*² is the straight part of the screw-thread. *a*³ is the inclined part, which feeds the nail-plate down to the cutters. *b* is one of the series of cutters for cutting nails, and the one at the end of the series, which co-operates with the small cutter *c* (outside of the series) in trimming the edge off of the nail-plate, which has notches cut in it by the feed-screw. *d* is the receiver of the cutter-stock *e*, which contains the cutters, and which is fitted to and secured in and receives its motion from the receiver *d*.

The cutter-stock *e* has a tongue, *f*, which passes under a projection, *g*, in *d*; and then a wedge, *h*, is placed between the back edge of the cutter-stock *e* and a projection, *i*, on the receiver, which wedge is secured in its position by screws *k*, thereby securing the cutter-stock *e* and its cutters in their position in the receiver *d* as securely as the cutters would be if fitted directly in the receiver. But this arrangement has a great advantage: it enables me to cut nails of any size on one machine, by having as many sets of cutter-stocks and cutters as the sizes of nails I wish to cut, and changing the cutters to the size of nail desired, and also changing the feed-screw.

j is the main shaft. *ll* are the gears connecting the main shaft with the feed-shafts. *m* is the crank on the main shaft, and *n* is the connection-rod, through which the crank gives motion to the receiver, and thereby to the cutter-stock therein contained and to the cutters. *p* is the frame.

My machine operates as follows: The main shaft is caused to revolve, which gives an oscillating motion to the receiver *d* through the crank *m* and connection-rod *n*, giving also an oscillating motion to the cutters *b*, which are intended to co-operate with another stationary cutter in cutting off a nail, and also with the cutter *c* in shearing off the notched edge of the nail-plate *o* as it is fed down to the cutters by the feed-screw *a*, so that the heads of the nails at the edge of nail-plate will be free from notches. The nail-plate *o* is placed in the groove *r* and passed down to the top of the feed-screw, which is revolving when the upper thread cuts a little notch in the edge of the plate, and after thus cutting a notch the straight part of the thread *a*² passes in this notch as it revolves until it comes to the inclined part *a*³, when the nail-plate is moved downward by means of the inclined part passing in said notch, and the inclined part of the thread is so contrived as to move the nail-plate just the distance of the width of one nail every revolution of the feed-screw, the straight part of this always holding the nail-plate firmly and rigidly while the nails are being cut, and the inclined part feeding the plate to the cutters at a time when the cutters are clear of the sheet.

But by this arrangement, though the nail-plate was fed to the cutters with great accuracy and precision by my machine patented September 7, 1875, No. 167,420, there was one difficulty, which was this: The cutters, having cut a series of nails, moved back under the edge of the nail-plate while the straight part of the screw-threads *a*² were in the notches, and the plate, being held rigidly in its position, would sometimes break nicks in the edges of the cutters, thereby interfering with the successful working of the machine; but this defect I have remedied in this invention by cutting a portion of the straight part of the thread away on the under side, so that the plate can rise up a little when the cutters are moving back under the edge of the plate.

In this manner the screw of the feed-screw performs several functions: First, it cuts the notches in the nail-plate, by which the feed acts on the plate in feeding it to the cutters; second, the feed-screw feeds the nail-plate to the cutters by means of the inclined part *a*³; third, the feed-screw holds the plate firmly while the nails are being cut; and, fourthly, it permits the nail-plate to rise up by means of the under side of one-half (or nearly so) of the straight part of the thread (or that part which passes through the notch in the nail-plate while the cutters are passing back under it) being cut away or being a little elevated above the other portion of the straight part of the thread, thereby relieving the cutters of strain or rigid pressure of the nail-plate on their edges when they are moving back under the plate.

Although I have accomplished this by cut-

ting off one-half of the under side of the screw-thread, yet the same thing may be done by having the whole thread extend up a little, so that it performs the same function of relieving the cutters *a* from the pressure of the nail-plate as they pass back under its edge. I say it is functionally the same as it would be if the thread in its entire thickness were a little elevated—that is, it has the function of relieving the cutters from the pressure of the nail-plate as they move back under it, which sometimes breaks them. I would elevate the thread in its full thickness for this purpose; but it costs less in the way I have described, and answers the same or a better purpose, as it is not desirable to give the nail-plate a positive upward motion.

My machine patented September 7, 1875, No. 167,420, had an oscillating cutter-stock made of one piece of metal, and the cutters were placed into it so that only one size of nail could be made on one machine, which was a very objectionable feature, as they are costly, and it requires too much capital to build a factory for making all sizes of nails. To obviate this difficulty I have invented the device of constructing the cutter-stock in two or more parts. One of these parts, *d*, I call a "receiver," which receives and gives motion to the cutter-stock proper, *e*, thus enabling me to cut any number of sizes of nails on one machine.

I have invented a peculiar and efficient method of securing the cutter-stock into the receiver by having a V-shaped tongue, *f*, on the under side of the cutter-stock, which passes under a projection, *g*, and there kept secure in its position by a wedge, *h*, making it as firm and strong as it would be if the cutter-stock and the receiver were one piece of metal.

In my drawings I have represented only so much of my machine as shows fully and clearly the novel parts, or those parts on which my claims are based.

Having thus described my invention, I will state my claim as follows:

1. In nail-cutting machines, a feed-screw for feeding the nail-plate toward the cutters, having its threads part of the way round inclined, to feed the nail-plate toward the cutters, and having said threads straight or without inclination the other portion of the way round, (to hold the nail-plate in a fixed position while the nails are being cut,) and a portion of the straight part of the thread cut away on the under surface, making said under surface have a higher position than the other portion of said straight part, to admit of the nail-plate rising up a little while the cutters are moving back under it, to prevent the rigid pressure which the lower edge of said nail-plate would otherwise make on them as they are moving back to their first position, substantially as described, and for the purpose set forth.

2. In nail-cutting machines, the cutter *C*, in

combination with the cutter *b* and the feed-screw *a*, co-operating to trim the edge of the nail-plate, substantially as described, and for the purpose set forth.

3. In nail-cutting machines, the cutter-stock in two parts—the part *e*, into which the cutters are fitted, in combination with the larger part

or receiver *d*, into which the small part *e* is secured, and by which it is operated, in the manner and for the purpose set forth.

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