J. P. SHERWOOD.

Nail-Plate Feeder.

No. 14,474. Patented March 18, 1856.

Fig. 2

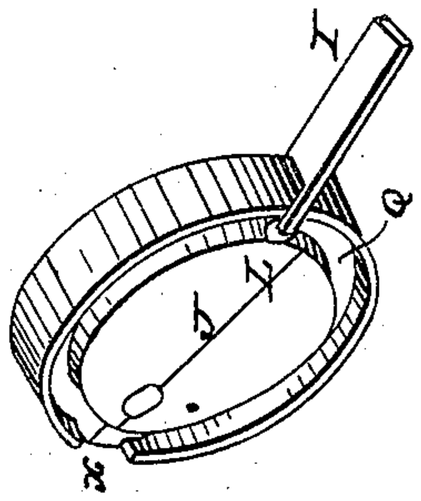

Fig. 1

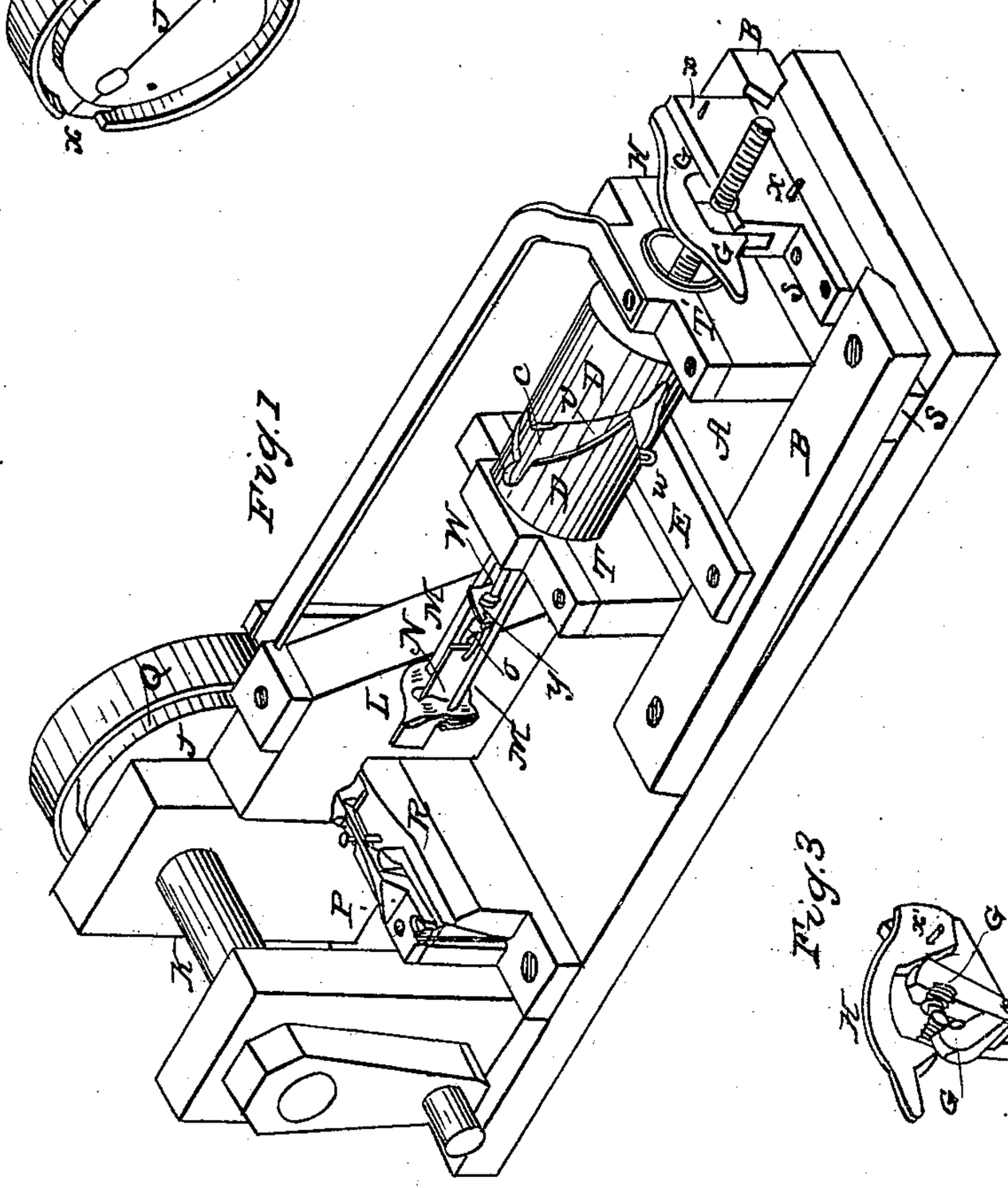

Fig. 3

UNITED STATES PATENT OFFICE.

JOHN P. SHERWOOD, OF FORT EDWARD, NEW YORK.

NAIL-PLATE-FEEDING MACHINE.

Specification of Letters Patent No. 14,474, dated March 18, 1856.

To all whom it may concern:

Be it known that I, JOHN P. SHERWOOD, of Fort Edward, in the county of Washington and State of New York, have invented new and useful Improvements in Feed Apparatus for Nail-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawing, forming part of this specification, in which—

Figure 1, is a perspective view of my improved nail feeding apparatus. Fig. 2, is a representation of the eccentric cam showing the position of the friction wheel and segmental groove. Fig. 3, is a representation of the jaws of the female screw thrown open, with the closing bar raised.

In order to enable others skilled in the art to make and use my apparatus, I will proceed to describe its use, construction and operation.

My invention is designed to obviate the necessity of employing one person to tend each nail machine, by placing before it an apparatus connected with, and operated by the main shaft of the nail machine, and which in each revolution of the shaft will withdraw from the nail machine the plate of iron which is to be cut into nails, turn it, and then pass it forward again to the machine, by which a nail is cut off from the plate, and this is so adjusted that on each revolution of the shaft, and turning of the nail plate, it is fed up just the distance equal to the width of the nail to be cut off.

In the several drawings, K is the main shaft, by which the nail machine, or a series of them, is worked. Under this shaft is placed the nail machine, (not shown in the drawings) and immediately in front of the nail machine, on the top of a bench or rest.

R, is a guide P, placed in front of, and almost touching, the knives of the nail machine. This guide is beveled to such an angle that when the nail plate is protruded by the feeding apparatus, it passes under this guide P, and is not only guided to the right point exactly between the cutters of the nail machine, but is held down during the cutting of the nail, so that it cannot turn or be tilted up, until the nail is cut off and the nail plate subsequently withdrawn by the apparatus itself.

A, is a sliding carriage supported by, and working between, the parallel ways B, B. These parallel ways B, B, rest at their rear end on a crosspiece S, by means of which, that end of the ways B, B, is slightly elevated, so as to give the sliding carriage A, an inclination downward toward the nail machine. The degree of inclination is regulated to suit circumstances. Attached to this sliding carriage A, are two journal blocks T, T′, which support a hollow cylindrical shaft C, which turns on its axis in the journal blocks T, T′. The axis of this cylindrical shaft, is placed parallel to, and immediately in front of, the nail machine, at a convenient distance from it. Around this cylindrical shaft C, and between the rests or journal blocks T, T′, are placed slotted cams D, D, which are two cylindrical pieces of iron so shaped that when placed on the shaft, at a little distance (say one inch) apart, they form an irregular shaped groove, the edges of which are parallel to each other, surrounding the cylindrical shaft, and yet at the same time extending lengthwise of the shaft, up and down twice, in passing once around it. At right angles to the cylindrical shaft C, is a bar E, secured to the ways B, B, and passing under the shaft C, between the journal blocks T, T′, so as not to interfere with the backward and forward stroke of the carriage A. From the center of this bar E, under the center of the cylindrical shaft C, rises a pin U, the diameter of which is equal to the width of the groove between the cam plates D, D, on the shaft C. This pin U, works in that groove V, the consequence of which is, that whenever the sliding carriage A, is pushed backward, (the pin U, being stationary, and the carriage, together with the grooved cam shaft C, moving,) the pin U must traverse the groove between the cams, on the shaft C, which compels the shaft C to make a quarter revolution, and on the return or forward stroke, the cylindrical shaft makes another fourth revolution.

W, is the handle of the nippers, which hold the nail plate, or pieces of iron out of which the nails are to be manufactured. This handle W, is a long rod of round iron, passing through the center of the hollow cylindrical shaft C, but not touching it, and projecting beyond it for some distance at either end. On the back end of the upper handle is cut a screw for a distance on the

handle equal to, or exceeding, the length of the pieces of nail plate used in the machine. The width of the thread of the screw is fixed by the size of nail to be cut, a different nipper handle being used for each size of nail, as the thread of the screw regulates the "feed" of the apparatus, that is the length which the nail plate is pushed forward, in addition to the stroke of the apparatus, on each half revolution of the cylindrical shaft C.

The rear, or screw, end of the upper handle W, is supported between two jaws G, G, which are united at bottom by a pivot or pin x, and which when united and held together by the closing bar H, form a female screw, through which the screw of the nipper handle works, causing it to pass forward gradually as it is turned by the revolutions of the cylindrical shaft C. If the closing bar H is raised, and the jaws G, G, of the female screw opened, the handle then is supported on the block F, to which the closing bar H, and jaws G, G, are attached by the pivots x and x'.

To the front end of the cylindrical shaft C (which projects slightly beyond the journal block T,) are attached two rods M, M, which terminate in the nose piece L, which is of the shape shown in Fig. 1, and which is designed to support and steady the nail plate N. This nose piece L, and rods M, M, may be attached to the cylindrical shaft C, by screws, or in any convenient way, but must be movable, inasmuch as a nose piece of different size will be reqired for each different width of nail plate, from the size for making tacks to that size necessary for the manufacture of eighteen inch spikes. Between these rods M, M, which are round, smooth and polished, slides the guide Y, which is attached to the head of the nipper handle W, at the extremity of which are the forked spring nippers O, which hold the nail plate. The guide Y, sliding between the rods M, M, serves as the support of the front end of the nipper handle W, prevents its coming in contact with the inner surface of the bottom cylindrical shaft C, through which it passes and keeps it firm and steady.

The reciprocating motion is communicated to the sliding carriage A, (which supports and carries with it the cylindrical shaft C, nipper handle and nippers, nose piece, nail rod, &c.) by means of an eccentric cam J, attached to the main shaft of the nail machine K. This eccentric cam J, is circular and is made in two pieces which are afterward bolted together, being divided through the center, the object of which is that in case of a series of nail machines driven by one shaft K, the eccentric cam J, may be attached for each machine at any desired point on the main shaft, without disturbing the other parts of the machinery, and so that it may be attached to machinery already in use. On the inner surface of this circular cam J, is a concentric groove Q as near to the edge of the cam as it can safely be made, in which works a pinion or friction wheel L, see Fig. 2, at one extremity of the bar I, the other extremity of which is bolted to the journal block T', over the axis of the cylindrical shaft C. The shaft K, passes through the eccentric cam J, immediately inside of the groove Q in which the friction wheel L plays, which is as far as possible from the center of the cam.

As the main shaft K, revolves, carrying with it the eccentric cam J, the friction wheel L travels around in the concentric groove of the cam, which communicates a reciprocating motion to the sliding carriage A, through the intervention of the bar I. This reciprocating motion instead of being of a jerking kind is very slow at each of the strokes, gradually accelerating during the first half of the stroke and decreasing again in velocity during the latter half of the stroke. It is necessary in order to give time at the termination of each forward stroke of the sliding carriage for the nail machine to cut the nail from the nail plate, not only that the stroke should be slow at that point, but that it should entirely cease for a period of time sufficient to cut off the nail from the nail plate, and to effect this without either stopping or even diminishing the speed of the main shaft which would be impossible, as the nail machine (driven by the same shaft) is then in full operation. I simply remove a small segment of the outer edge of the groove in which the friction wheel L plays, at X, Fig. 2, so that it, having nothing to press against on the outer side, stands still during the time that the open space in the cam is passing around in front of the wheel. This open segment X in the groove, see Fig. 2, is at the point in the eccentric nearest to the main shaft, which point being nearest to the center of motion moves, of course, much more slowly than any other point in the circumference of the circular cam, farther from the point of attachment to the driving shaft. By this arrangement, the nail rod when it enters the nail machine, is held in its place, perfectly still until the nail is cut off, when it is drawn back, the nail plate turned over (that is half around), and is then again advanced to the cutters of the nail machine; the entrance of the nail plate into the exact place between the cutters of the nail machine and its retention there without the possibility of its being turned or tilted, being secured, as before stated, by the beveled guide S.

By means of the open segment X in the eccentric cam J, the whole nail feeding ap-

paratus may be stopped in an instant, if anything should render it necessary, without stopping the working of the nail machines, by simply drawing back, by hand, the sliding carriage A, and with it the slotted cam shaft C, nippers, and in fact all the feeding apparatus except the eccentric cam (which continues revolving as before), so that if the feeding apparatus should need repair, the nail machine need not be stopped, but may be fed by hand until the apparatus is set to rights or replaced.

It will be observed that as the groove V, on the cylindrical shaft C, passes twice up and down that each revolution of the driving shaft K, and eccentric cam J, causing the sliding carriage A, &c., to advance and recede, only effects a half revolution of the cylindrical shaft C, and nail plate N, because the nail plate has to be turned over and not completely around for every stroke of the machine.

When the nail plate is used up, and it is desired to put a fresh plate in the machine, the revolutions of the nipper are stopped by throwing up the closing bar H, and opening the jaws G, G, of the female screw, then the nippers and handle are pushed back, and a new nail plate is inserted through the nose piece L between the nippers O. The closing bar is then lowered and the apparatus continues to operate as before.

Having thus described my improved feeding apparatus for nail machines, what I claim as my invention and desire to secure by Letters Patent is—

The use of the grooved eccentric cam with its friction roller and bar, in combination with the slotted cylindrical cam, nipper handle and female screw, constructed and arranged as described, and operating to produce the peculiar movements necessary for feeding the nail plate in nail machines in the manner and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 17th day of December 1855.

JOHN P. SHERWOOD.

Witnesses:
H. P. Hamblin,
W. F. Gunn.