D. Drawbaugh,

Making Cut-Nails,

No. 71,148. Patented Nov. 19, 1867.

Fig. 1.

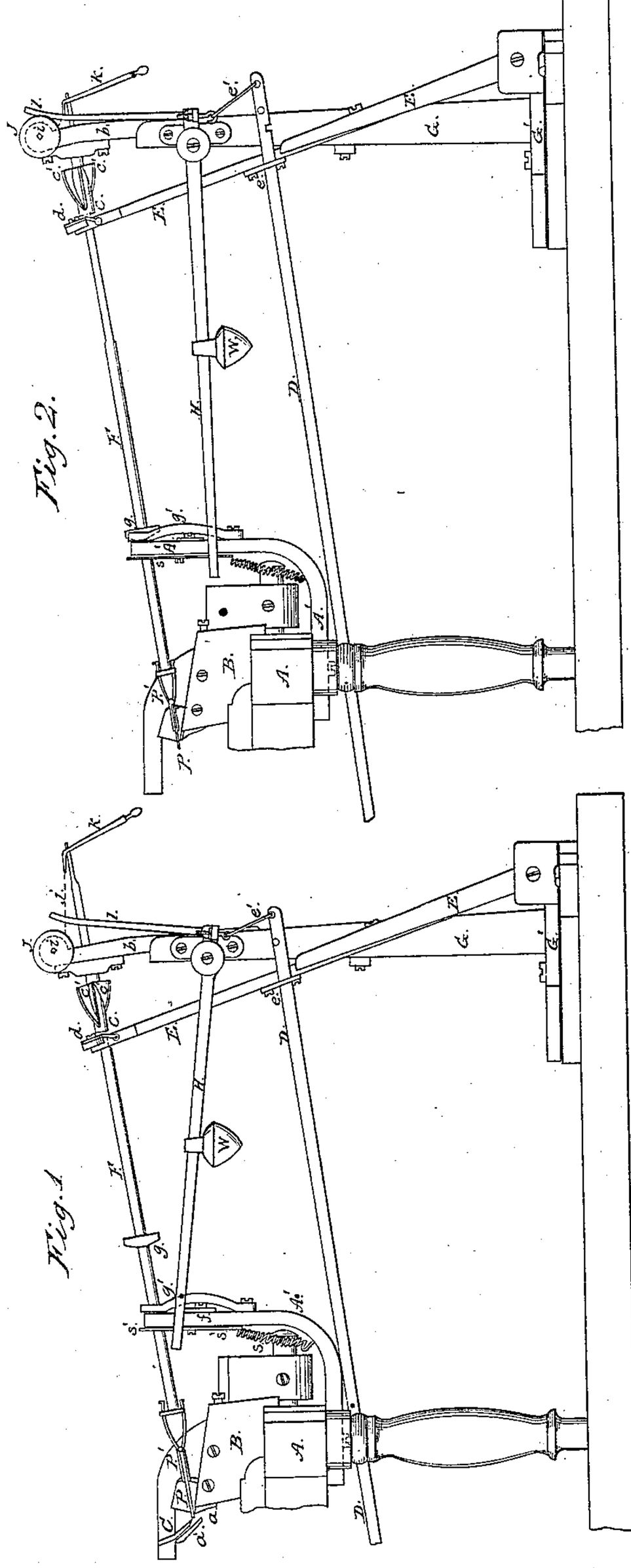

Fig. 2.

Fig. 3.

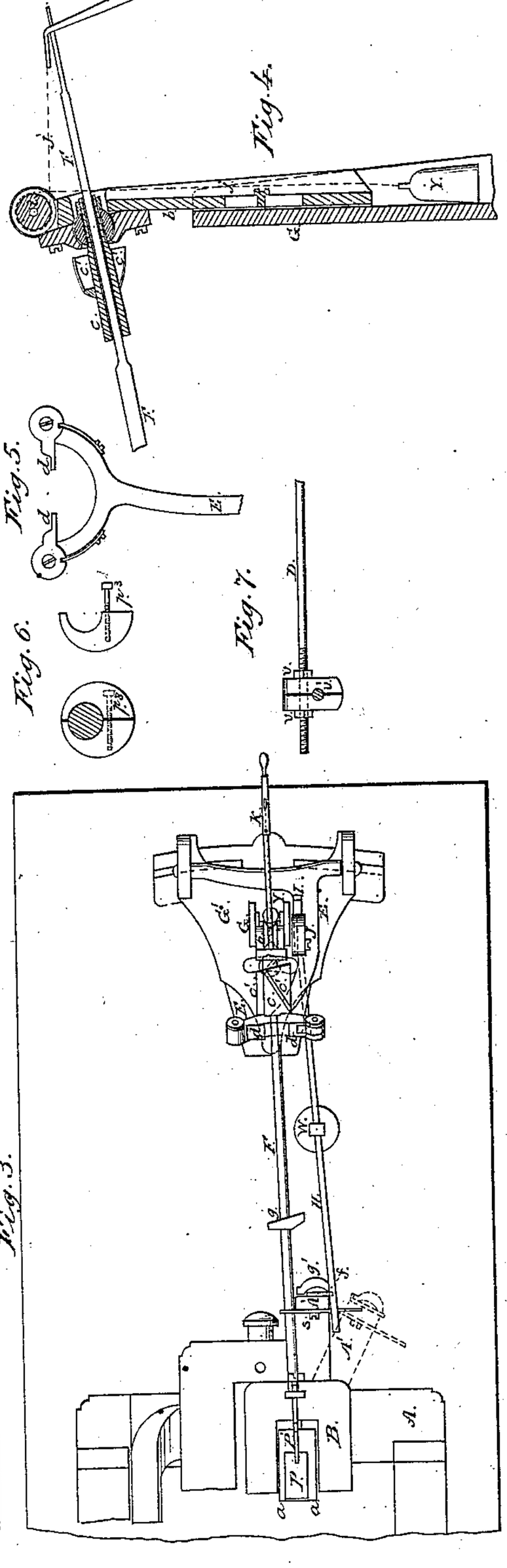

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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DANIEL DRAWBAUGH, OF EBERLY'S MILL, PENNSYLVANIA.

Letters Patent No. 71,148, *dated November* 19, 1867.

IMPROVED NAIL-PLATE FEEDING DEVICE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, DANIEL DRAWBAUGH, of Eberly's Mill, Cumberland county, State of Pennsylvania, have invented a new and improved Nail-Plate Feeder; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the improved mechanism for feeding and turning nail-plates.

Figure 2 is a similar view of the same parts when thrown out of operation.

Figure 3 is a top view of fig. 1.

Figure 4 is a sectional view in detail of the upper end of the post which supports the outer end of the nail-rod, showing the manner of pivoting the tubular support.

Figure 5 shows the spring-fingers on the upper end of the arm which rotates the nail-rod.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on machinery for feeding nail-plates to the cutters of machinery for making cut nails, wherein it is required to reverse the nail-plate after every cut, for the purpose of making tapering nails.

Previous to my invention, the work of feeding the nail-plates from which the nails are cut up to the cutting-jaws was effected automatically by a weight acting upon the nail-rod, so as to move this rod in a direction with its length, and, in conjunction with this endwise movement of the rod, it was oscillated about its longitudinal axis by devices which received their motion from the main driving-shaft of the nail-cutting machine.

The nature of my invention consists in giving to a nail-rod, which is free to vibrate and also to move in a direction with its length, an intermittent rotary motion; and also in providing for stopping the motion of the feeding devices automatically when a nail-plate has become too short to continue cutting, as will be hereinafter described. It further consists in a novel mode of adjusting the nail-rod supports, and setting them so as to vary the obliquity of the cut, according to the degree of taper required of the nails, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In figs. 1, 2, and 3, of the accompanying drawings, I have represented my invention applied to a portion of a well-known nail-cutting machine. A represents the frame of such machine, B the stationary cutter-bed, with its cutter, *a*, arranged upon an inclined plane, C the vibrating cutter, with its spring-stop, *a'*, against which the end of the nail-plate is fed before the operation of cutting. D is a pitman-rod, which is connected at one end to the lower end of a vibrating lever, (not shown,) that receives its motions from a cam on the main driving-shaft, and at the opposite end this rod is connected to a vibrating arm, E, which rotates the nail-rod F. A bracket, A', which is secured to the bottom of the frame A, extends outward and upward, and forms the inner support for the devices which guide the inner end of the nail-rod F. This bracket can be adjusted laterally, so as to change the obliquity of cut across the nail-plate, by loosening the pivot-bolt which secures it to the bottom of the frame A, and swinging it around on said pivot. The outer part of the nail-rod F is supported upon the upper section *b* of a vertical post, G, which is secured to a laterally-adjustable base-plate, G'. The upper end of the vertically-adjustable section *b* of post G is adapted for receiving a spherical enlargement, c^5, which is formed on a tubular bearing, *c*, and allowing this bearing to have a free rotary motion about its axis, and also a free vibrating motion. This ball-and-socket connection is shown clearly in fig. 4. The tubular bearing *c* is constructed with two spiral flanges, *c' c'*, on it, which are acted upon by the spring-fingers *d d*, on the forked end of arm E, so that at every backward movement of this arm E the bearing *c* will receive a half-rotation. When arm E is moved forward, or toward the nail-machine, the fingers *d d* do not turn the tubular bearing. The opening which is through the axis of the tube *c* is adapted for receiving the square portion of the nail-rod F, and allowing this rod to receive a free endwise movement, as well as an intermittent half-rotary movement. The pitman-rod D, which communicates a vibrating motion to the upper end of arm E, has a notch cut in its lower edge, near its outer end, which notch catches over the edge of a plate, *e*, on arm E, through a vertical slot of which the pitman-rod passes. The extreme outer end of the pitman-rod is connected by a rod, *e'*, to the short arm of a lever, H, which is pivoted to post G, near its upper end, as shown in figs. 1 and 2.

When the longest arm of the lever H is supported upon the rest *f*, on bracket A', the outer end of the pitman-rod will be depressed, so as to allow its notch to engage with the lever or arm E; but when the lever H drops from the rest *f*, as shown in fig. 2, the pitman-rod will be disconnected from its arm E, and this arm will cease to vibrate. The object of this arrangement is to have the intermittent rotary motion of the nail-rod F cease when the nail-plate becomes too short, for which purpose the cam or toe-piece *g*, on the nail-rod, is so arranged with reference to the length of the nail-plates, that when the latter become too short in the nippers

F′, this piece *g* will strike the spring *g′*, and push lever H from its rest *f*, when the weight W will cause this lever to drop, as shown in fig. 2. By having the toe-piece *g* adjustable longitudinally upon the nail-rod, it may be adjusted for nail-plates of different lengths. That edge of the nail-plate P which is nearest the cutters is held down in place upon the surface of the stationary cutter *a* by means of a light spring, S, which acts upon a hooked plate, S′. This plate S′ is pivoted to the inner face of the vertical portion of the bracket A′ by means which will allow it to rise and fall vertically, and at the same time to vibrate. The hook on one part of this plate is intended for receiving under it the round part of the nail-rod F, and thus allowing spring S to hold this rod down in place with an elastic pressure when lever H is upon its rest *f* and pitman-rod D is connected to its arm E, as shown in fig. 1. On the opposite edge of plate S′ to the hook are projections, one of which is acted upon, when lever H drops from its rest *f*, by this lever, so as to throw up the hook which keeps down the nail-rod. The other projection allows lever H to move the hook over the nail-rod when this lever is lifted upon its rest. The hook on plate S′ serves as a guide for the nail-rod, as well as a means for allowing the spring S to act upon it. To the rear end or shortest arm of lever H a long spring-brake, I, is secured, the upper end of which is forcibly pressed by the weight W against the periphery of a friction-wheel, J, when the lever H drops from the rest *f*. The wheel J is fast on a transverse shaft, *i*, which has its bearings upon the upper end of the adjustable section *b* of post G, as shown in figs. 3 and 4. Between the crotched end of section *b*, and fast upon the shaft *i*, is a grooved pulley, over which passes a cord, *j*, that is connected to a loaded lever, *k*, on the rear end of the nail-rod. The other end of the cord *j* hangs down, and has a weight, Y, attached to it. The weight Y should be sufficiently heavy to feed the nail-ron toward the cutters, and to keep the nail-plate up to the work, when lever H is upon its rest *f*. When this lever H drops from its rest, and thus brings the arm I in contact with the friction-wheel J, the friction or resistance will be greater than can be overcome by the weight Y, and hence this weight will not move the nail-rod forward. The nail-rod may be moved backward or forward by hand at any time for the purpose of adjusting a nail-plate between the nippers P′, or removing the pieces left after the operation of cutting. The cord *j* is attached to the shortest arm of the lever *k*, and the weight to its longest arm. This lever *k* is attached loosely to the rear end of the nail-rod, so as to allow this rod to rotate freely, and by its vibration the nail-rod is held up to the work by a slightly-yielding pressure during its entire forward movement. By having the cord J attached to the weighted lever, which is hung on the feed-rod F, there is also a slight start given to the feed-rod, as soon as a nail-piece is cut off from the plate; this start forward being produced by reason of the back movement of the feed-rod when the nail-piece is severed from the plate, giving a vibrating movement to the weighted lever *k*. The movement of the feed-rod is also kept in a sort of balance between the feed-weight proper and the auxiliary weight on lever *k*, and thus a great deal of the binding action between the rod F and its bearing or guide is obviated. The auxiliary weight of lever *k* also acts as a sort of check upon the feed-weight proper, and thus relieves the parts of the machine from sudden jars when a new feed of the nail-plate takes place.

The tube *c* is reduced in diameter, where it passes through the ball, and receives on its end a nut or sleeve-screw. This will allow the tube *c*, with its flanges *c′*, to rotate freely without turning its ball.

In order to readily apply the feeding devices to any of the well-known nail machines, a divided eccentric, shown in fig. 6, is used, which is secured to the main driving-shaft by the clamp-screw p^3, thus avoiding the necessity of changing the construction of such driving-shaft, or removing it from its bearings when it is desired to apply the eccentric to it.

The rear end of the pitman-rod D is connected to a vibrating arm, which is acted upon by the eccentric above mentioned, by means of a divided bearing-box, shown in fig. 7. The rod D passes through this box and receives upon it two clamping nuts *v v*, by means of which the two parts of the box can be set up snugly to the wrist-pin *v′*, which pivots the box to its vibrating arm, and thus the wearing of the pin and box can be compensated for, and "lost-motion" prevented. The nuts *v v* are also used for adjusting the box, so that the rod D will give the proper movements to arm E.

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

1. The combination of the spring-fingers on the vibrating yoke-arm E, and the spiral flanges upon the tubular bearing *c*, through which the nail-plate feeding-rod passes, for the purpose and in the manner substantially as described.

2. The combination of the tubular bearing *c*, nail-feeder F, and universal joint c^5, arranged substantially as and for the purpose described.

3. The combination of the loaded lever *k*, arranged upon the outer end of the nail-feeding rod F, with the cord, weight, and pulley, for feeding the nail-rod with the nail-plate up to the cutters, substantially as and for the purposes described.

4. The hooked plate S′ and spring S applied to the bracket A′, substantially as described.

5. Providing for automatically stopping the rotary motion of the nail-rod, and at the same time releasing this rod from the hooked plate S′, by means substantially as described.

6. The combination of brake-rod I, on lever H, with a friction-wheel on the shaft *i* of the pulley J, substantially as described.

7. The adjustable post G *b*, in combination with the laterally-adjustable bracket A′, substantially as described.

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Witnesses.

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