2 Sheets

F. Hain.

Sheet No 1

Feeding Nail-Plates.

No 72392

Patented Dec. 17, 1867.

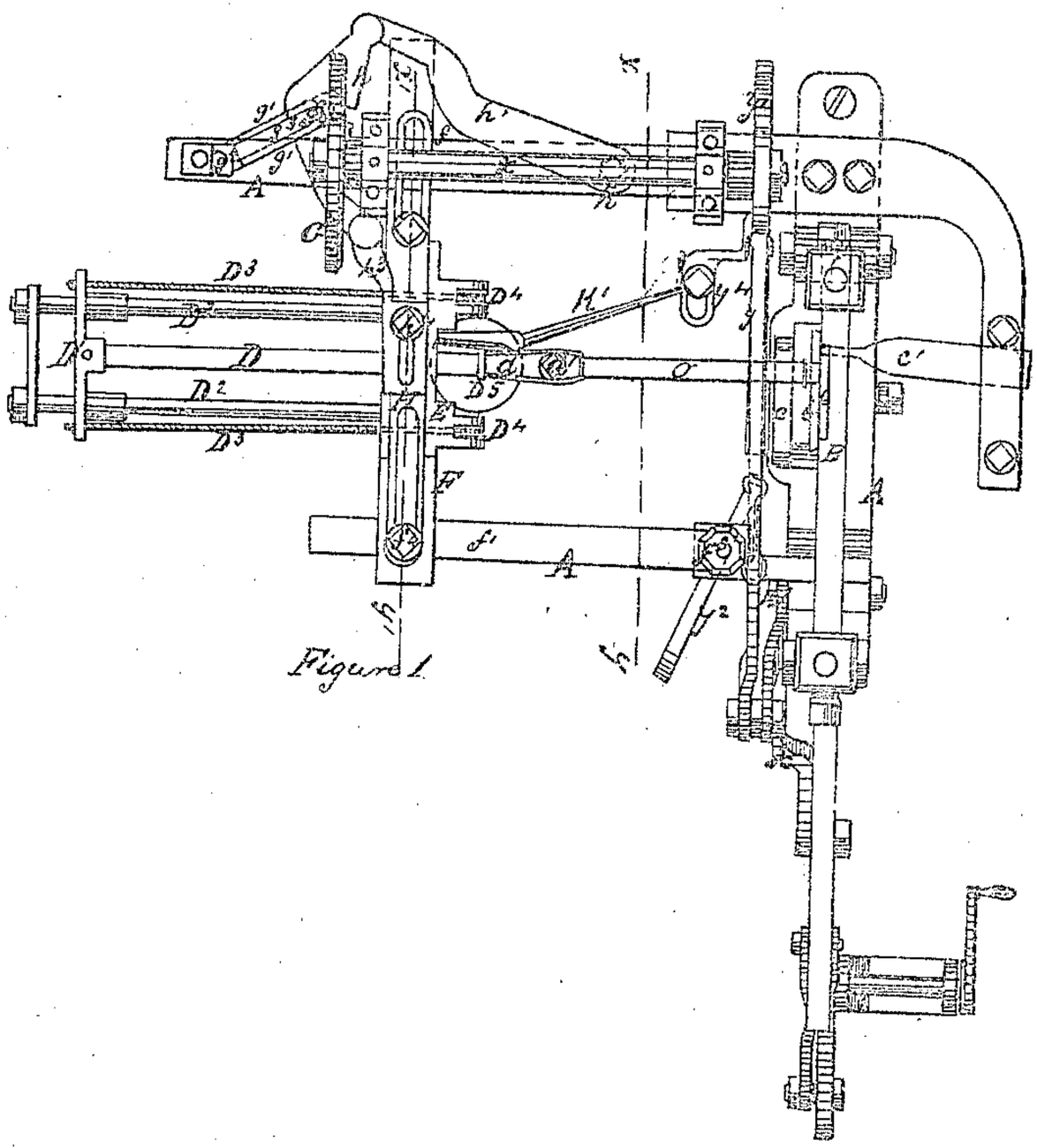

Figure 1.

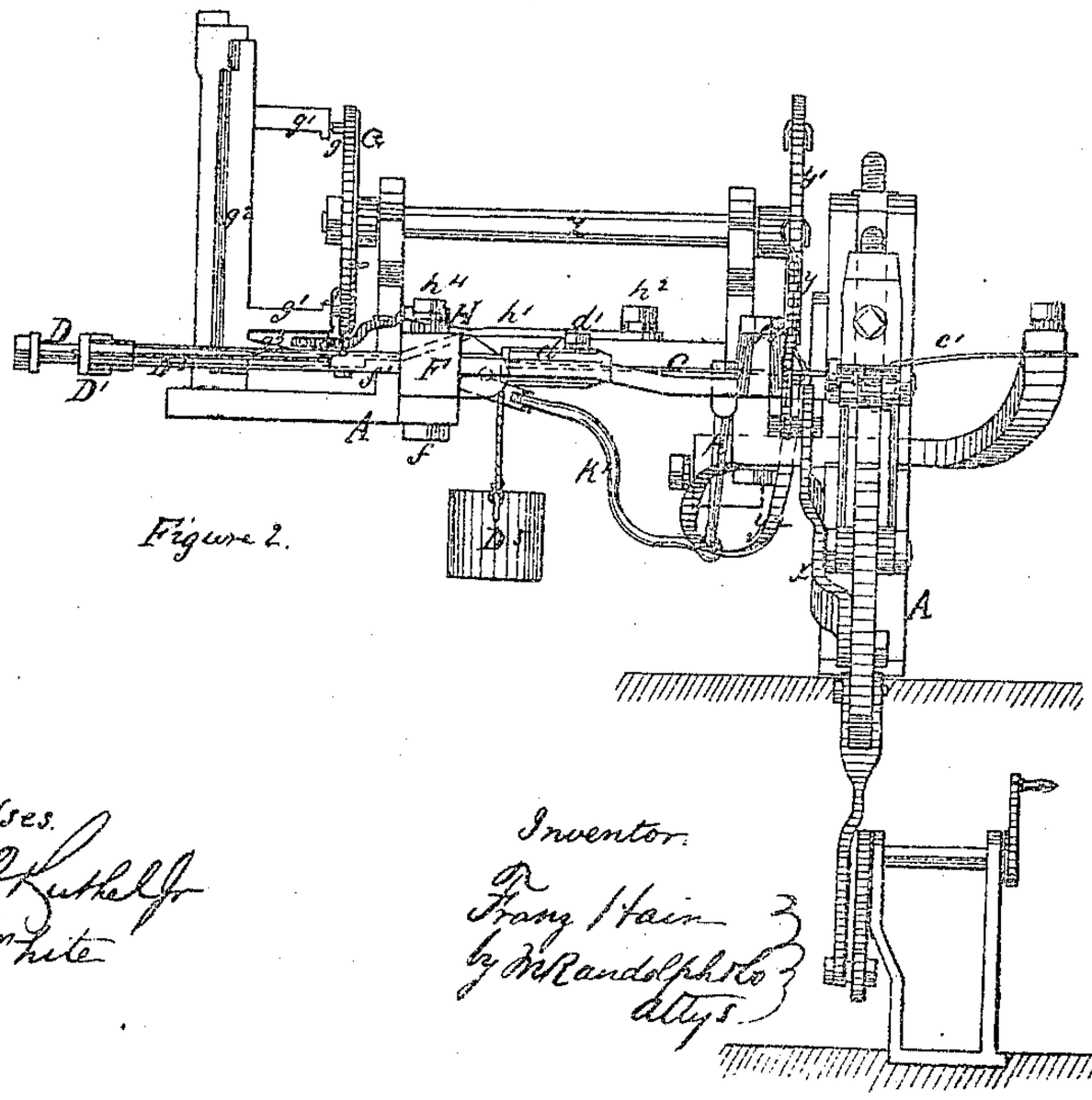

Figure 2.

Witnesses.

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Sheet 2 - 2 Sheets.

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Figure 3.

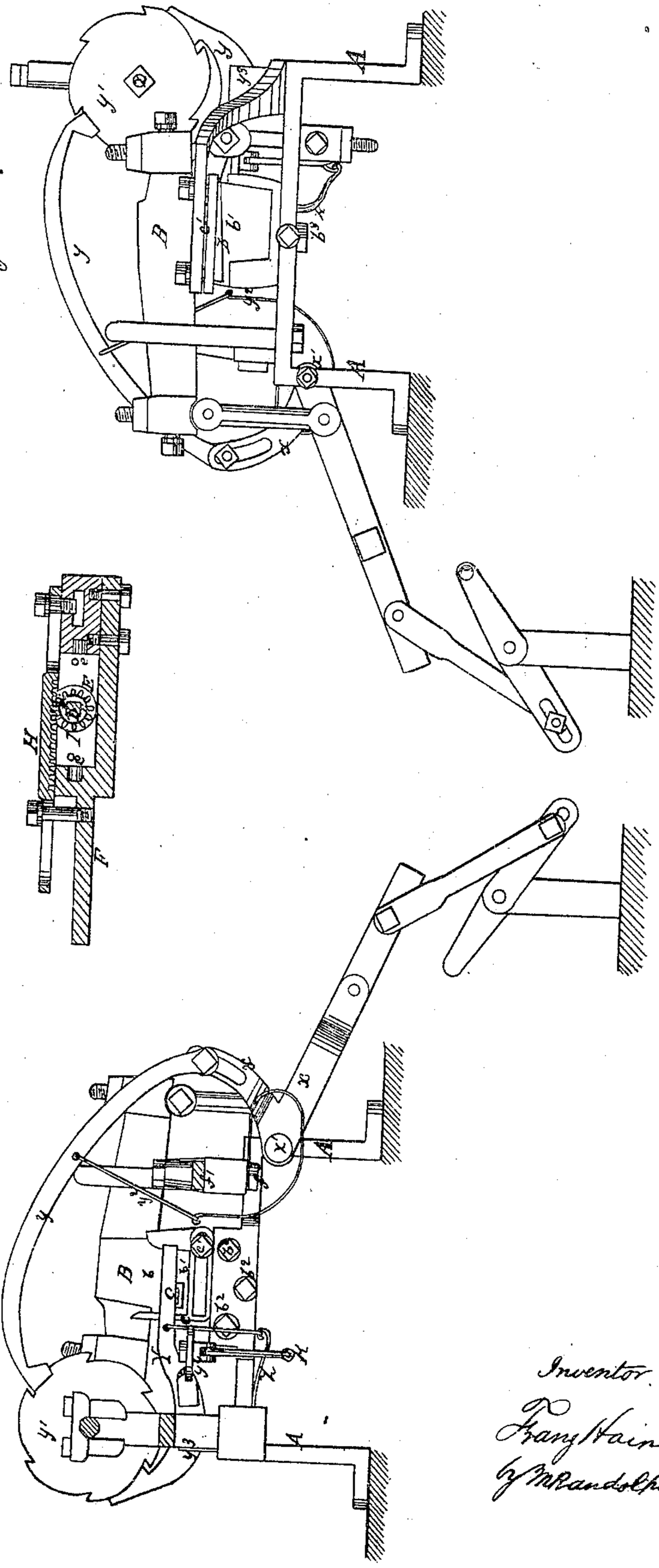

Figure 5

Figure 4.

Witnesses:
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Inventor
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United States Patent Office.

FRANZ HAIN, OF GASCONADE COUNTY, MISSOURI.

Letters Patent No. 72,392, *dated December* 17, 1867.

IMPROVED MACHINE FOR FEEDING NAIL-PLATES.

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, FRANZ HAIN, of the county of Gasconade, in the State of Missouri, have invented a new and useful Improvement in Feeding-Devices for Nail-Machines, and such other machines in which a similar feed-motion is required or useful; and I do hereby declare the following to be a full and true description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon.

It is well known that when the nail-plate is fed to a nail-machine by the hand of an operative, the plate is held in a plate-carrier or holder, which, after each cut by the shears of the nail-machine, is pressed forward to offer new metal to said shears; and which, after each feed-motion, is turned half round in the direction directly opposite to the turning in the preceding motion; and which, lastly, is slightly raised at the forward or nail-plate end, to allow the turning motion just described without bending the nail-plate. Now, the general nature of my invention is in a correct imitation of the "hand-feed" motion, by the application of mechanical devices to produce the same, and as the said hand-feed motion is a compound of three motions, to wit, a forward longitudinal, a reciprocating turning motion in an angle of one hundred and eighty (180) degrees, and a slight vertical motion, the detail nature of my invention may therefore be stated as in, firstly, the application of a falling weight to produce the horizontal forward motion of the plate-holder, carrying the nail-plate; secondly, the arrangement of a ratchet-wheel and escapement-movement, to cause the turning of the plate-holder in opposite directions in every two consecutive feed-motions; thirdly, pivoting the plate-holder in such wise that by the application of proper devices the forward end thereof may be raised sufficiently to allow the nail-plate to be turned without twisting it; and fourthly, the construction of the devices used in producing the motion just described, and the arrangement thereof in such wise that they all act properly upon the plate-holder in one interval of time, being the interval between the end of one cut by the shears and the beginning of the next cut.

To enable those skilled in the arts to make and use my improved feeding-machine, I will now describe its detail construction and operation, referring to the drawings, of which—

Figure 1 is a general plan.

Figure 2, a side elevation.

Figure 3, a front end elevation.

Figure 4 is a sectional elevation from the line $x\ y$ of plan in fig. 1.

Figure 5 is a section at line $x^1\ y^1$ of plan.

As my said invention may apply to sundry and various forms of nail-machines, and other similarly-acting machines, I will not describe the construction thereof, and in the following refer only to such parts thereof as are necessary to fully understand the invention here claimed.

My said feeder is arranged in front of the cutting-shears of a nail-machine, so that the plate-holder occupies the position as usual in the hand-feed. To sustain the parts, I arrange a frame, A, which, however, may be part of the nail-machine. As shown in the drawings, B are the cutting-shears of the nail-machine, operated in the usual manner, and arranged as usual. The said shears B have the cutter b, and act upon the nail-plate C, when the same lies flat upon the base-block b^1. The base-block b^1 is adjusted with reference to the shears B by the several screws b^2 and b^3. To properly guide the nail-plate, it may be convenient to arrange a standard, c, adjusted laterally by the slot in the horizontal shank and the set-screw c^1. From the same power-source which operates the nail-machine and its cutter-shears B, I drive the devices producing the feed-motion of the nail-plate holder, D. Said holder D is made of metal, usually wrought or cast iron, in the form of the usual plate-holder, having the jaws d, which by the usual screw d^1 (or a clamping-ring) hold the nail-plate C. The holder D is held in the support-block, E which is pivoted by its pins, e, in the adjusting-pins F of the frame. The said piece F is pivoted on a part of the main frame A at f, and its position is maintained at the other end by the guide-bar f^1 and set-screw f^2. f^1 is attached to the main frame by a pivot-bolt at f^3. By moving the end of F along its guide-bar f^1, and then securing F in position by f^2, the direction of the plate-holder is changed in such wise that the nail-plate is cut to a proper slant by the cutting-shears B. Then, by the reciprocating rotary motion imparted to D, (yet to be detailed,) the shears B cut first one side and then the other of each bit of nail-plate to the proper slant, forming the wedge-shaped chip needed in the nail-machine for a proper forming of the nail. At the rear end of the holder D, I connect the same with the cross-head D^1, however, in

such wise that D may freely turn in the joint with D^1. D^1 is guided at its ends on the guide-rods D^2, which are secured in the support-block E. To D^1 I attach the ropes or chains D^3, which pass over pulleys D^4, (also secured on E,) and to which is hung the weight D^5. It will now be seen that the several parts D, D^1, D^2, D^3, and D^4, being sustained on or in E, may be freely subjected to the motion imparted to E, (and yet to be explained,) without interfering to disturb the same. As the holder D is permitted to pass through E in such wise as to allow a longitudinal motion of D, whenever, then, the spring-devices yet to be described permit, the action of the weight D^5 pushes D, and with it the nail-plate C, forward, until the nail-plate reaches the usual feed-stop C′, and thus the first elementary motion described in the nature of invention is performed. From the rotary motion of the power-source I have arranged the reciprocating motion of the bell-crank levers x, (pivoted in the frame A at x^1.) To one of said levers, h, I connect the pawl y. This operates the wheel y^1. (It may be useful to guide the pawl y by the spring y^2, connecting therewith, and with the frame A.) The wheel-teeth of y^1 operate upon the regulating-lever Y, (which is pivoted to the frame A at y^3,) raising the end thereof, which overlies the nail-plate C, the spring Z acting whenever Y is released by the operating-tooth of y^1, to draw the lever Y down on the nail-plate. Thus the lever Y, in rising, permits the feed-motion of the nail-plate, and after said feed-motion has been made acts with the stop C′ and the guide-standard C to properly place the nail-plate on the base-block b^1, and permit the cutting-action by the shears B. The toothed wheel y^1 is supported on the shaft z, resting in proper bearings on the frame A. At the other end of the shaft z I place the disk G. To this is imparted an intermittent rotary motion by the action of the pawl y, wheel y^1, and shaft z. On the disk G are the pins g. These operate the arms g^1 on the vertical shaft g^2. The faces of the pins g are cut so as to pass the inclined edge of one lever-arm, g^1, when either one pin is operating the other lever g^1; then, owing to the position of the two arms g^1, by the action of one pin one of said levers is carried forward, (the other lever being inactive,) and in the next movement the pin preceding the one just acting will carry the other lever back, (the first lever being inactive,[1]) thus imparting to the shaft g^2 a reciprocating rotary or a simple pendulous motion. On the shaft g^2, which is supported by a proper standard on the frame A, I arrange the lever g^3, which by its pin produces a reciprocating transverse motion in the link h, this being guided by the pendulum-lever h^1, pivoted at h^2 on the frame A. The link h acts on the adjustable slide h^3, which is connecting by the tap-bolt h^4, and with the rack H causes a reciprocating motion thereof. In order that this reciprocating motion of H may cause a proper reciprocating rotary motion of the plate-holder D, the link h^3 has a slot, in which, by changing its relative point of attachment to H by the bolt h^4, proper allowance is had for the relative motion of the parts. The rack H is properly guided on the adjusting-piece F in its reciprocating motion aforesaid. The rack H acts to turn the pinion I, which is on the cylindrical boss i, fig. 5, surrounding the plate-holder D, and resting in the support-block E. Now, as by the rack H and pinion I the plate-holder D receives its reciprocating rotary motion, (secondly described as in the nature of this invention,) the holder D is squared or arranged with a slot and feather-key, so that the pinion I may turn the same, at the same time allowing the plate-holder to move longitudinally at the impulse of the weight D^5. Thus, therefore, by the action of the ratchet-toothed wheel y^1, shaft z, and escapement-devices G, g, g^1, the shaft g^2 and lever g^3, link h, rack H, and pinion I, the second elementary motion is imparted to the holder D, as heretofore stated. To the lever Y, I attach the arm y^4. This acts to raise and lower the link K, in accordance with the motion of the lever Y, before explained. The link k, by the joint-link k^1, and its connection with the support-block E, acts to turn said support-block about its pin-axles e in F. Hereby, owing to the cylindrical boss i around the plate-holder D, the plate-holder is turned in a small angle in a vertical plane, thereby imparting the third elementary motion recited as in the nature of this invention, whereby the front end of the plate-holder and the nail-plate is raised sufficiently to allow the plate to be turned without hoisting the same.

Now, as the forward feed of the holder D, owing to the impulse of the weight D, is regulated by the stop c' and the spring z and lever Y, and as the turning-motion and tipping-motion of the plate-holder are derived from the same power-source as is the shearing-motion of the shears B, the action of the parts, and the resulting feed-motion, must be in accord with the requirements of the nail-machine; and lastly, the said elementary motions, combining to form the compound or feed-motion, must occur in one and the same interval of time, as stated to be in the nature of this invention.

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

1. The support-block E and adjusting-piece F, constructed and combined substantially as and for the purposes set forth.

2. The holder D, its boss i, combined with the block E, links K^1 K, arm y, and lever Y, when acting substantially as and for the purposes set forth.

3. The combination of the adjusting-piece F with the main frame at f, and with the guide-bar f^1 and set-screw f^2, when acting substantially as and for the purposes set forth.

4. The combination of the pawl y, the wheel y^1, and lever Y, substantially as and for the purposes set forth.

5. The combination of the disk G, pins g, and arms g^1, and vertical shaft g^2, substantially as set forth.

In witness of said invention I have hereunto set my hand and seal, this 22d day of April, 1867, in the presence of—

FRANZ HAIN. [L. S.]

Witnesses:

GEO. P. HERTHEL, Jr.,

T. E. WHITE.