(No Model.) 3 Sheets—Sheet 1.

J. F. HAMMOND.

NAIL PLATE FEEDER.

No. 278,943. Patented June 5, 1883.

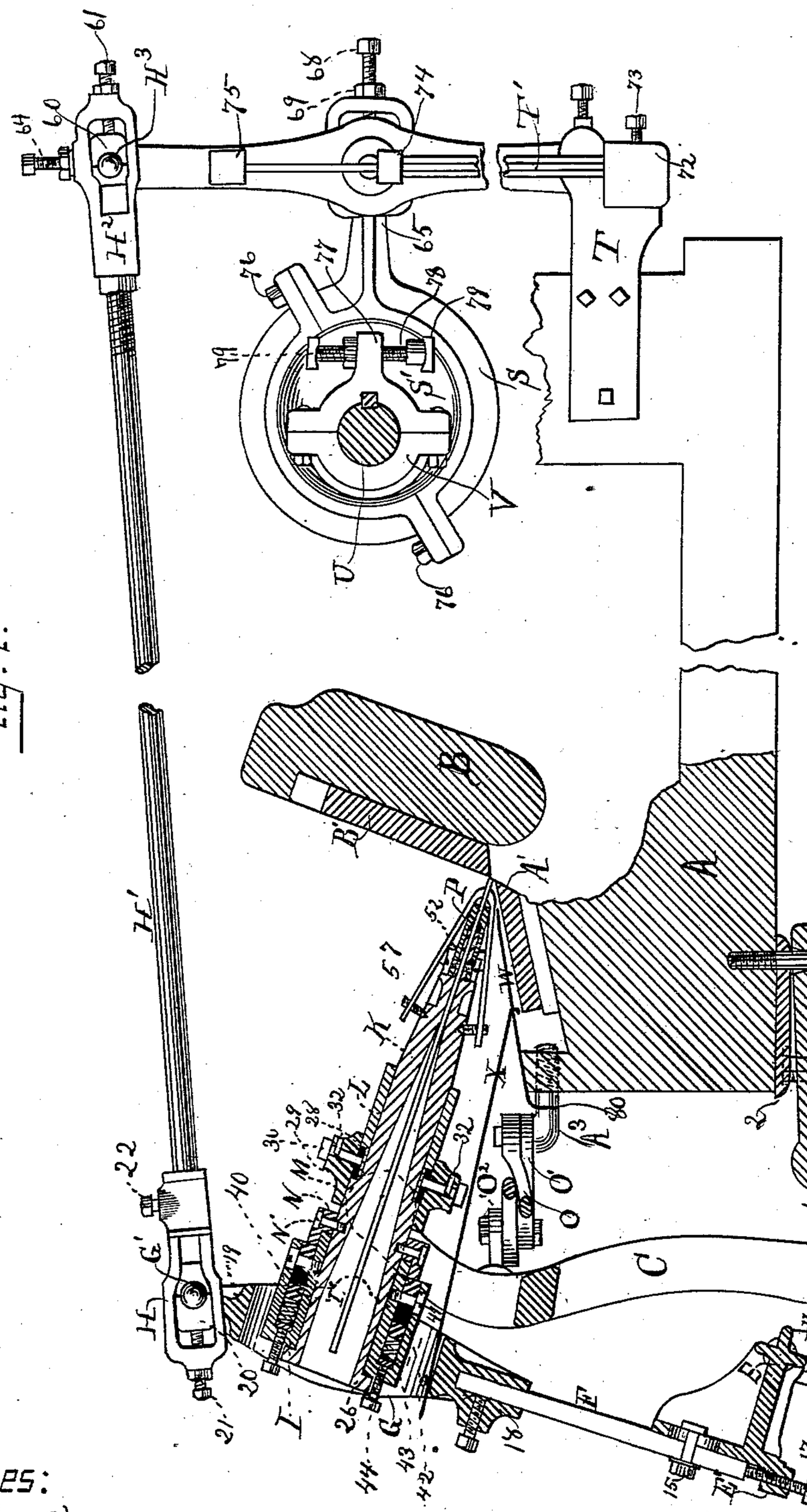

Fig. 1.

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Inventor:
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(No Model.)

3 Sheets—Sheet 2.

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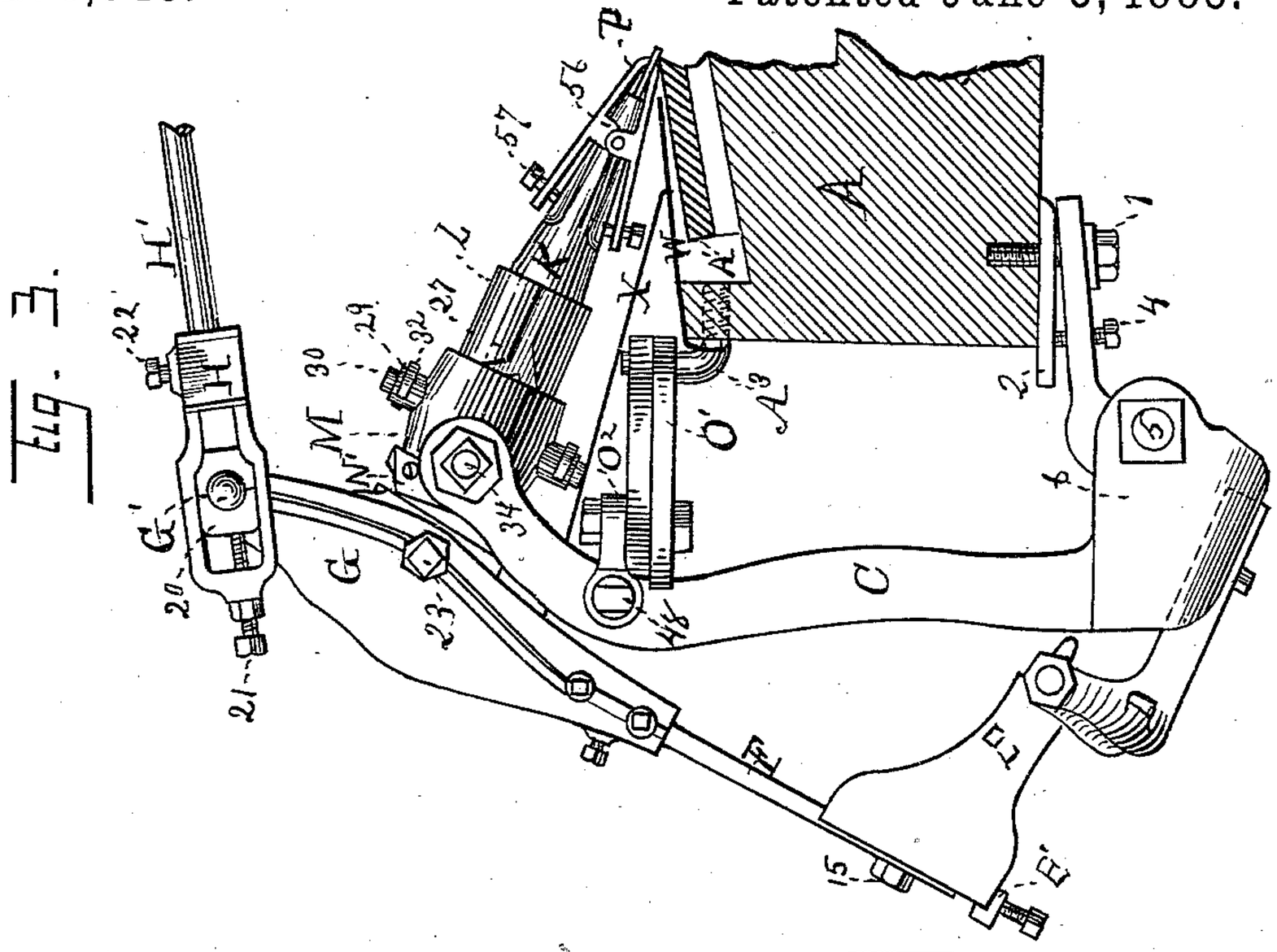

Fig. 1.

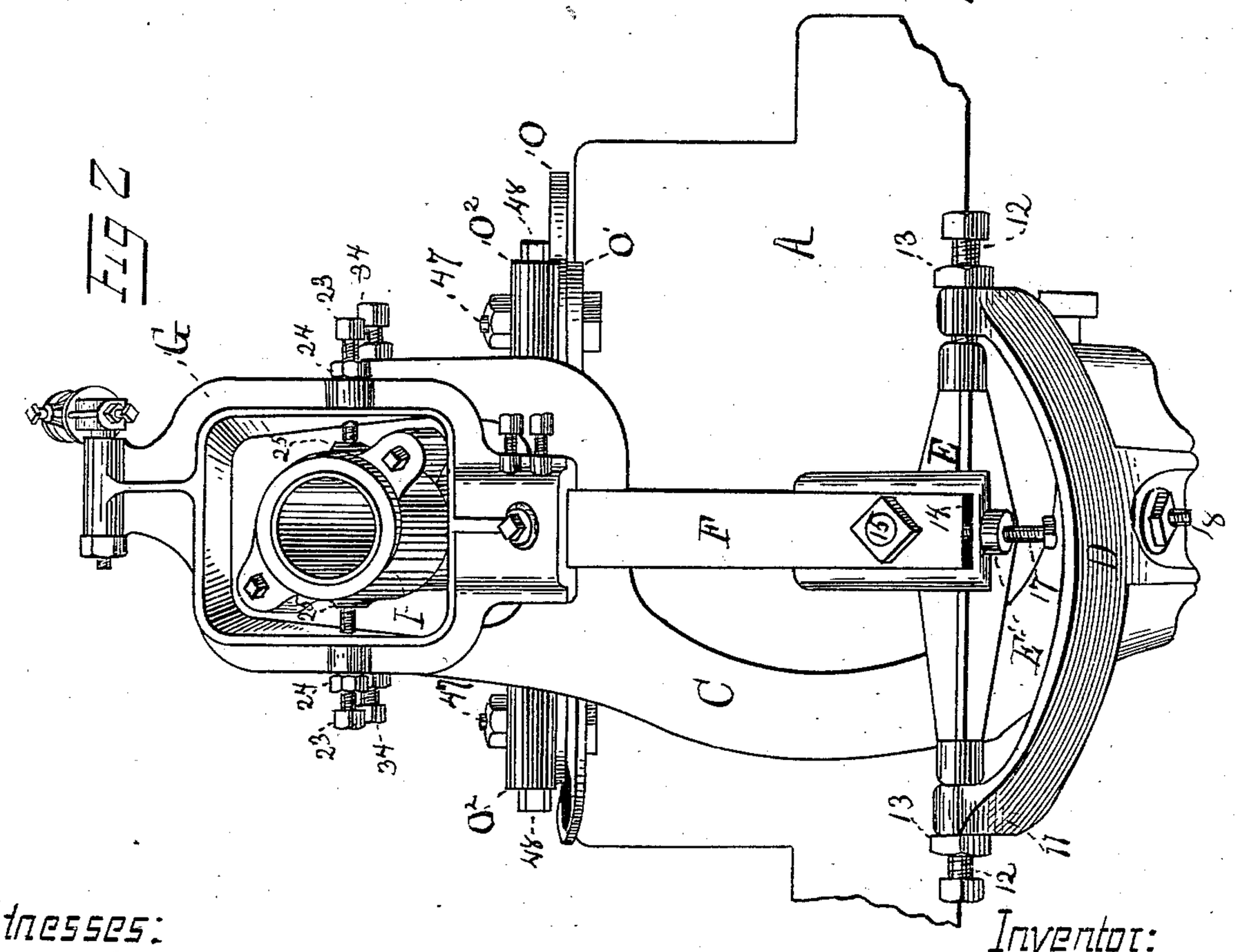

Fig. 2.

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(No Model.)

3 Sheets—Sheet 3.

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NAIL PLATE FEEDER.

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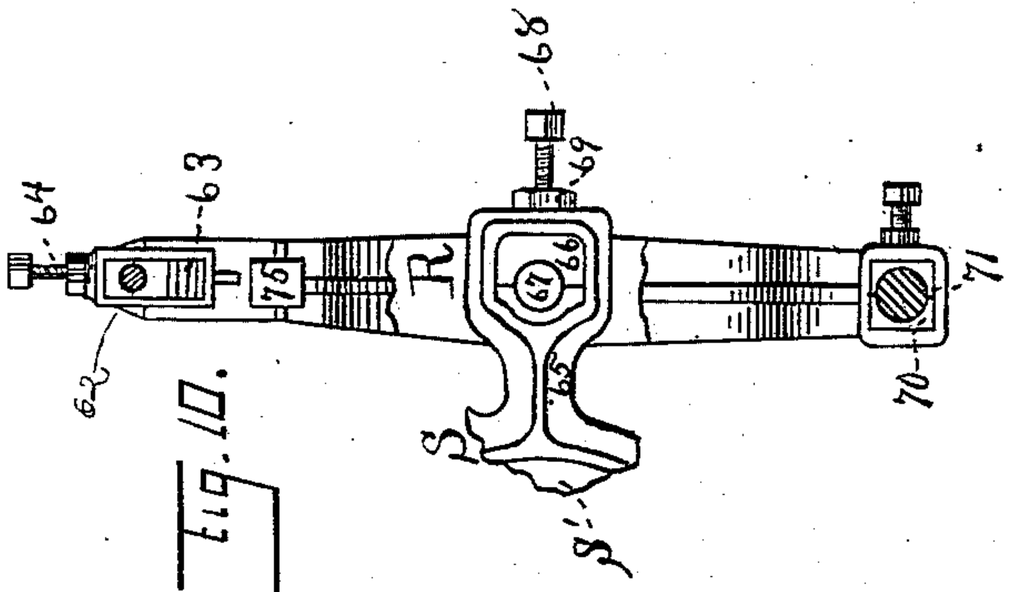

Fig. 10.

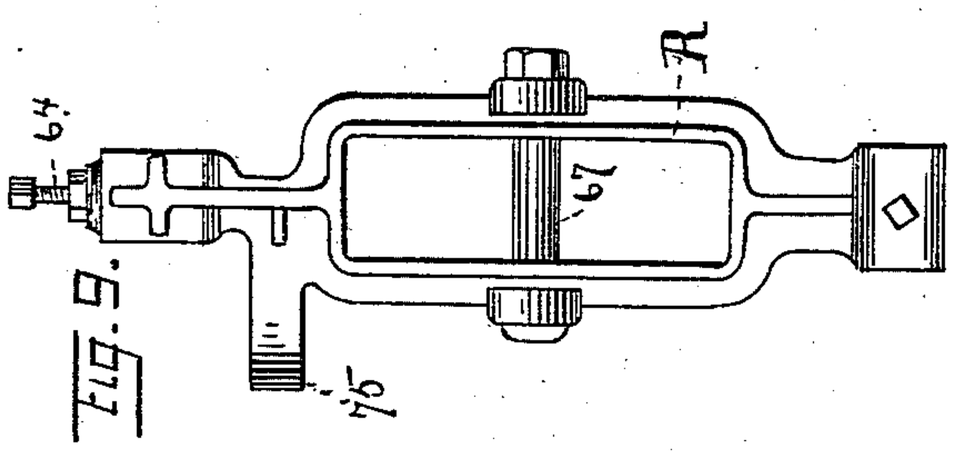

Fig. 9.

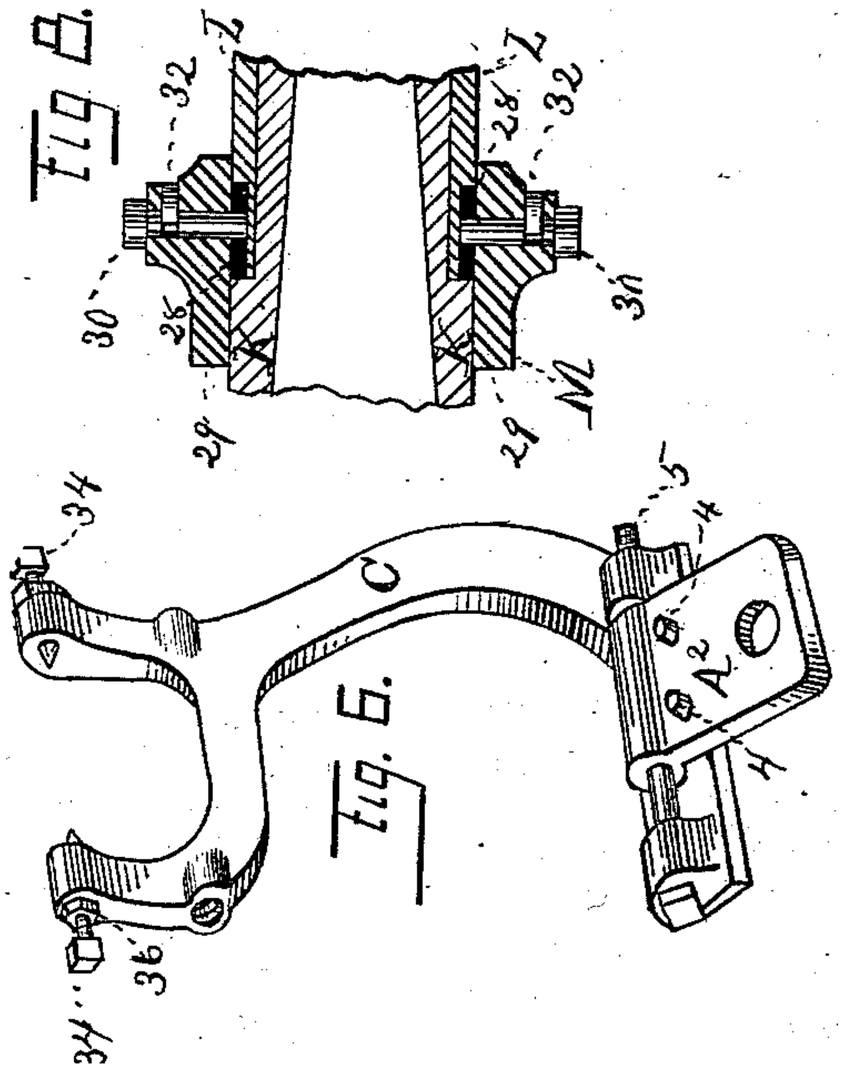

Fig. 6.

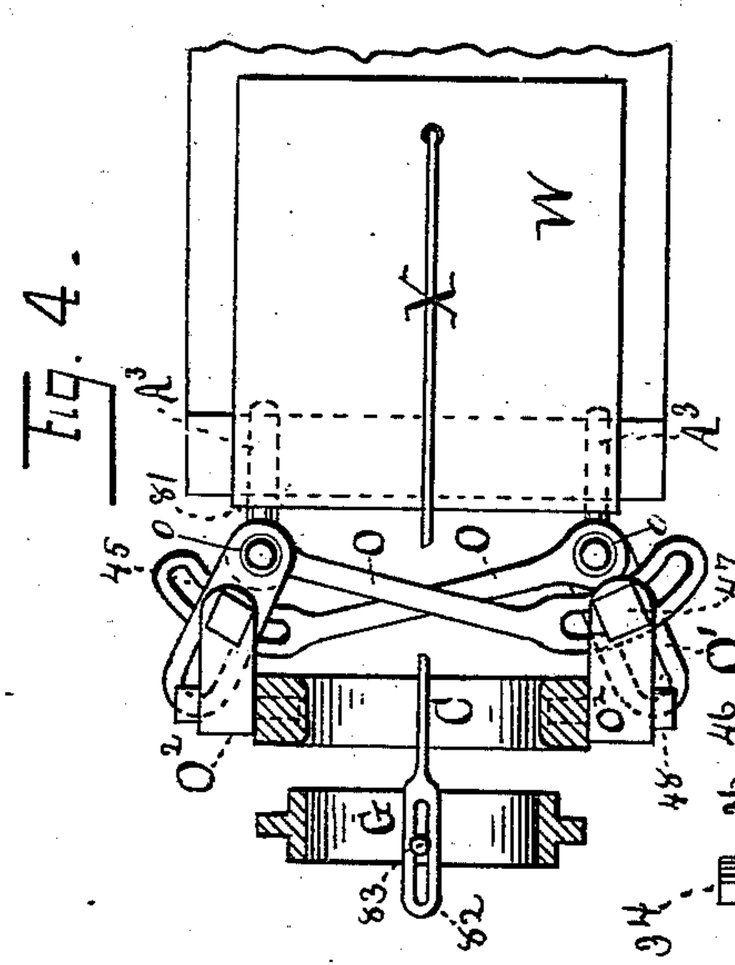

Fig. 4.

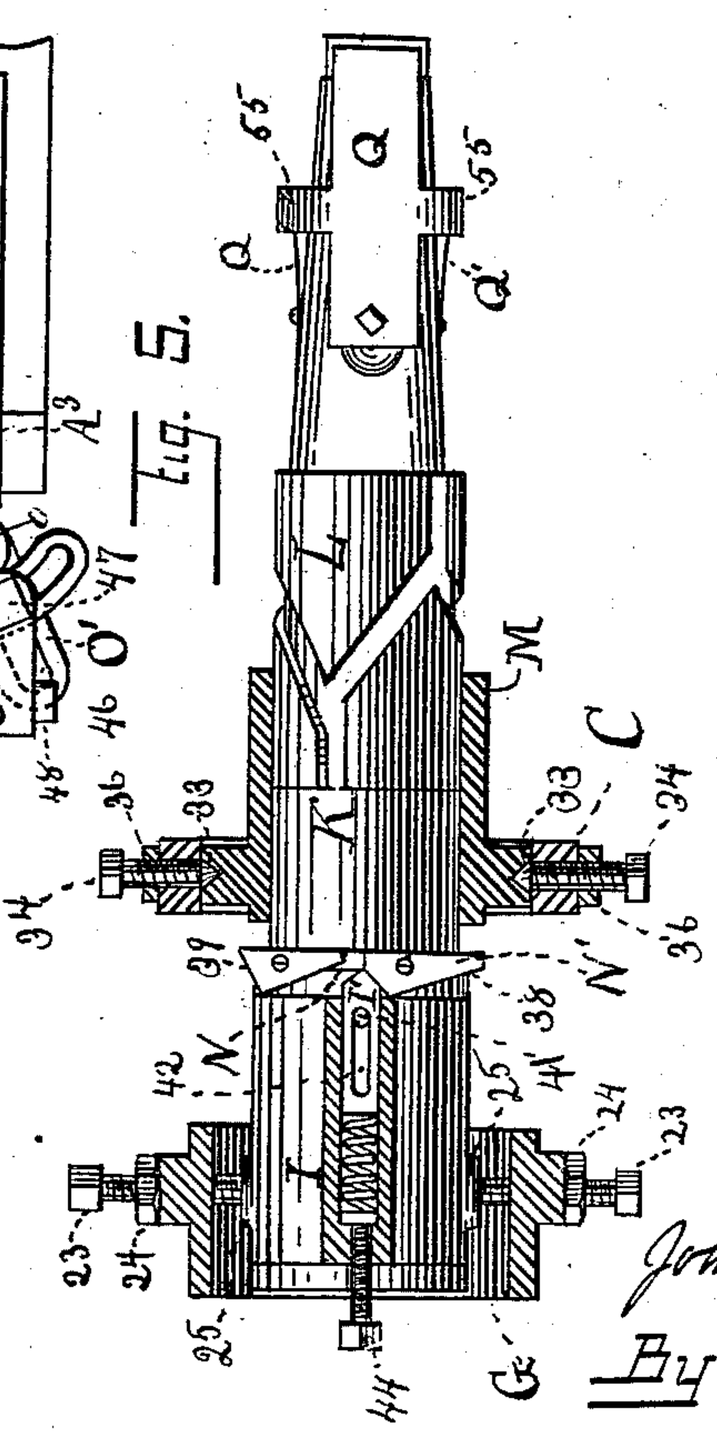

Fig. 5.

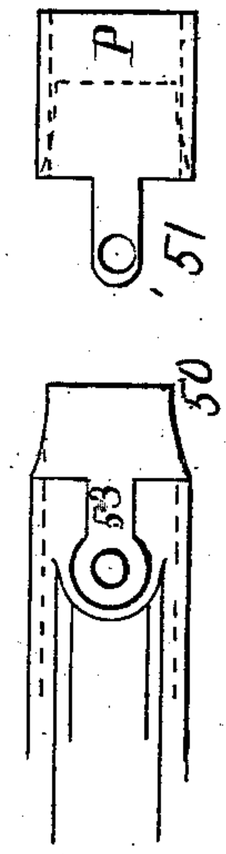

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN F. HAMMOND, OF OMAHA, NEBRASKA.

NAIL-PLATE FEEDER.

SPECIFICATION forming part of Letters Patent No. 278,943, dated June 5, 1883.

Application filed January 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. HAMMOND, a citizen of the United States, residing at Omaha, Nebraska, have invented certain new and useful Improvements in Nail-Plate Feeders, of which the following is a full, clear, and exact description, sufficient to enable any one skilled in the art to construct and use the same.

My present invention has reference to the improvement of the apparatus for feeding nail plates or blanks to the cutting-knives in machines wherein both a reciprocating and rotary motion is imparted to the plate-holding barrel, in order that the opposite sides of the blank may be successively subjected to the action of the cutters; and especially does it relate to the improvement of the machine for which Letters Patent of the United States were issued to me on the 10th day of October, 1882. In such patented machine the several parts are so constructed and relatively arranged that the plate-holding barrel shall be receded or withdrawn a short distance while the plate is still held by the bits of the cutting-knives, whereby a sufficient surface of the blank is automatically exposed to form the next succeeding nail. In the present form of machine a like result is accomplished; but the mechanism therefor has been improved in various essential particulars which practice has demonstrated of value.

These improvements are illustrated in the accompanying drawings, are hereinafter described, and are particularly pointed out in the claims at the end of the specification.

Figure 1 represents a view of the machine, partly in side elevation and partly in vertical longitudinal section. Fig. 2 is a view in front elevation. Fig. 3 is a view in side elevation of the plate-holding barrel and connections, the bed of the machine being shown in section. Fig. 4 is a plan view of the link mechanism, the barrel-yoke and yoke-bar being in section. Fig. 5 is a view, partly in plan and partly in section, of the plate-holding barrel and its connections. Fig. 6 is a detail view, showing in perspective the base-plate and the yoke-bar connected thereto. Fig. 7 is a plan view of the end of the barrel and of the nose-piece removed. Fig. 8 is a view in longitudinal vertical section of a portion of the plate-holding barrel, showing the box-bearing and the detachable grooved shell in position thereon. Fig. 9 is a detail view, in rear elevation, of the rocking standard for connection with the eccentric mechanism. Fig. 10 is a detail view, in side elevation, of the rocking standard, a portion of the same being shown as broken away for the purpose of better illustrating the position within the rocking standard of the arm extending from the eccentric yoke.

A designates the bed of the machine, upon which is sustained in the usual manner the fixed cutting-knife A′; and B designates the cutting-bar of ordinary construction, by which the movable knife B′ is carried. To the under side of this bed A is attached, by means of the headed screw-bolt 1, the base-plate A^2 and the intermediate bearing-plate, 2, provided upon its under side with the grooves 3, adapted to receive the ends of the adjusting-screws 4, which fit in suitable threaded sockets in the base-plate.

It will be noticed that the perforation of the base-plate through which passes the bolt 1 is double concaved, as shown in Fig. 1, so as to permit said plate (which sustains the plate-holding barrel, as will hereinafter appear) to be moved vertically for the purpose of adjusting said barrel to knife-beds of varying heights, and this adjustment can be readily effected by the operation of the screw 4.

Through the enlarged forward end of the base-plate A^2 passes the bolt 5, upon the outer portions of which are supported the lower arms, 6, of the yoke-bar C, which fit over the bolt 5 at such distance from the sides of the plate as to permit a slight lateral adjustment of the yoke-bar and its connected mechanism, as shown in Fig. 6.

To the expanded bottom 7 of the yoke-bar C is attached what I designate the "rest-plate" D by means of the clamping-bolt 8, which passes through a perforation in the bottom 7, and through a long slot, 9, in the extension 10 of the rest-plate. This rest-plate D has at its front two lateral yoke arms or lugs, 11, which are perforated to receive the adjustable center screws 12, provided with the set-nuts 13. Within these yoke-arms 11 and upon the

center screws 12 is sustained the rocking bar E, the ends of which are bored out to admit the ends of the center screws 12, the front portion of the rocking bar being formed of the enlargement E′, having a recess, 14, therein to receive the end of the bar F. The bar F is held within the recess of the rocking bar by means of the bolt 15, which passes through a slot in the rocking bar and a perforation in the bar F, and the vertical adjustment of the bar F and the mechanism sustained thereby can be readily effected with relation to the rocking bar by means of the adjusting-screw 17, which passes through a threaded perforation in the enlargement E′ and bears against the end of the bar. The upper end of the bar F is secured within a suitable socket in the depending portion 18 of the barrel-yoke G, by which the plate-holding barrel is carried.

To a standard or lug, 19, on the top of the yoke G is bolted the chilled ball G′, upon which is held the clamp H, having a movable section, 20, controlled by the set-screw 21, and this clamp is further provided with a socket, within which is held by the set-screw 22 the end of the rod H′, by which a back-and-forth motion is imparted to the barrel from the driving mechanism in a manner to be hereinafter described.

Through suitable apertures in the sides of the barrel-yoke G pass the center screws 23, provided with the jam-nuts 24, and upon these center screws is pivotally hung the box-bearing I, furnished with suitable pivot-seats, 25, and encircling and supporting the long casting K, designated the "barrel." This box-bearing I is to be slipped in place over the small end of the barrel, which is provided at its larger end with the flange 26, to guard against displacement.

To the barrel K is screwed the steel shell or sleeve L, the outer surface of which is furnished with four oblique cam-grooves, 27, which intersect at the straight grooves 28. The function of these cam-grooves is to impart to the barrel the rotation necessary to present successively the opposite faces of the nail-plate to the action of the cutting-knives, as will hereinafter appear.

Around the barrel K, over the shell L, fits the collar M, which has upon opposite sides the hollow bosses 29, through which project the steel pins 30, the ends of which enter the cam-grooves of the shell. These pins 30 have each a circumferential groove, and are held securely in place by means of the keys 32, which are bent springs clasping around the sides of the enlargements 29, and having free ends which project through slots in these enlargements and enter the grooves of the steel pins 30.

In the sides of the collar M are formed the recesses or sockets 33, which receive the ends of the center pins 34, passing through the upper portion of the expanded arms of the yoke-bar C and provided with the set-nuts 36. From this construction it will be seen that as the barrel K, with its attached shell L, is moved backward through the collar M the pins 30 bear against the walls of the cam-grooves, and thus impart a quarter-revolution to the barrel, and when the motion is reversed and the barrel is moved forward a further quarter-revolution is given thereto by the action of the pins 30 against the walls of the adjoining cam-grooves.

It will be noticed that the points of intersection of the cam-grooves of the steel shell are at one side of the center of each of the short straight grooves, the object of this arrangement being to cause the pins 30 to travel with certainty into the proper groove as the movements are reversed, and thus insure a constant and uniform revolution of the barrel. In my former patent of October 10, 1882, the cam-grooves for the rotation of the barrel were formed directly upon the surface of the barrel; but practice has demonstrated that it is more advantageous to form these grooves upon a detachable shell, as in the present instance, for the reason that the shell can be readily replaced when worn, while the service of the barrel, which is subjected to much less wear, will be greatly extended.

In order to guard against the wear of the steel shell as much as possible, especially when the machine is running at a very high rate of speed, I secure to the plate-holding barrel a ring, N, which abuts against the bearing-box I, and has formed integral therewith the inclined planes N′, (four in number,) having each the long and short sides 38 and 39. These inclined planes overlap the end of the bearing-box I, and in the hollow enlargements 40 of the upper and lower sides of such box are held the plungers I′ by means of the screws 41, which pass through the long slots 42 of the plungers.

Behind the plungers, within the compartments, are the spiral compression-springs 43, the tension of which is regulated by means of the adjusting-screws 44, which pass through the ends of the enlargements of the box-bearing. The inclined planes N′ are placed upon the barrel in such relation to the cam-grooves of the shell that when the barrel is in its extreme forward or backward position the plungers will be forced back by the inclined planes, and the spiral springs will be so compressed that they will exert such pressure upon the plungers as to cause them, by the action of the inclined ends on the short sides of the planes, to slightly start the rotation of the barrel, and thus avoid in great measure the wear which would otherwise occur to the pins 30 and the shell L. Thus when the pins 30 are in the straight grooves at the end of a backward or forward stroke the plungers I′ are in position to travel down the short sides of the inclined planes, and their pressure thereon tends to start the rotation of the barrel, which begins as soon as the pins 30 pass from the straight grooves. The revolution of the barrel thus begun by the plungers is continued by the action of the pins in the cam-grooves, and the

plungers now cease to act until near the end of the stroke, when, in order to prevent the checking of the barrel with a sudden shock, the opposite sides of the plungers begin to travel up the long sides of the inclined planes, and thus offer resistance to the barrel's rotation.

To the front of the machine-bed two hooks, A^3, are secured, and over the upturned ends of each of these hooks fits the end of a long link, O, and the end of a short link, O'.

The ends of the lower links, which fit over the hook A^3, are provided with the hollow lugs *o*, integral therewith, on which the perforated ends of the upper links are securely held in a manner free to turn. As clearly shown in Fig. 4 of the drawings, these long and short links are provided, respectively, with the slots 45 and 46, and, as will be seen, the long links cross each other and overlap the short links in such manner that the clamping-bolts 47, passed through the slightly-curved slots of the long links, will also pass through the slots of the short links and enter the short bars O^2. These short bars O^2 are each provided at their ends with the center pins 48, the ends of which are screw-threaded and fit correspondingly-threaded perforations in the sides of the upper part of the yoke-bar C, so that the link mechanism can swing freely on the center pins 48 when it is desired to lift it from off the hooks A^3.

One advantage of connecting the yoke-bar to the bed of the machine by pivotal connections with the base-plate and by the hook-and-link mechanism described is that it enables the operator, when it becomes necessary to change or sharpen the knives, to readily get at the same by simply lifting the link mechanism off the hooks A^3, so that the barrel, the yoke-bar, and all connected parts will turn upon the bolt 5 downward and forward out of the way, and this, too, without danger of disarranging the parts. A further advantage of attaching the yoke-bar to the machine-bed in the manner shown is that it enables the barrel-supporting mechanism to be readily adjusted laterally or obliquely sidewise, according as it is required to give to the nails larger or smaller heads or sharper or more blunt points. The first of these movements, it will be noticed, is effected by simply sliding the yoke-bar upon the bolt 5, and the motion obliquely sidewise to increase or diminish the points of the nails is accomplished by loosening the bolts 47 and swinging sidewise the yoke-bar C, the bolt 1 acting as a pivot. When the desired adjustment is obtained, the parts will be fixed rigidly in place by tightening the bolts 47.

In the present machine, as in that heretofore patented to me, it is necessary that the initial backward movement of the barrel shall be substantially a straight one, so as to permit the barrel to be slipped back upon the nail-plate, while the latter is still held firmly by the bite of the cutting-knives, a sufficient distance to expose enough of the plate to form the next succeeding nail. An initial backward movement sufficiently straight for all practical purposes is obtained in this machine by simply adjusting the rest-plate D and rocking bar E to the machine until the centers of the rocking bar are in such position that a plane passed through them and the centers 23 will make a right angle with a line drawn through the center of the plate-holding barrel. From this construction it will appear that when motion is imparted to the barrel-yoke G, the latter, as it rocks upon the centers 12, tends to move the barrel at first in an approximately straight line.

For the purpose of increasing the wearing capacity of the barrel, and for the further purpose of enabling the various sizes of nails which the machine is capable of cutting to be made in the same barrel, I have provided the barrel with the false nose piece or end P shown in detail in Fig. 7 of the drawings. This nose-piece P is formed in one piece, hollowed out, as shown, to permit the passage of the nail-plate, and is provided with the expanded recess shown in dotted lines, Fig. 7, adapted to fit over the contracted end 50 of the barrel. Two lugs, 51, having perforations therein to receive set-screws 52, project from the nose-piece and lie in the recesses 53 on the sides of the barrel. The base of each of the recesses 53 is enlarged, and the space thus formed is filled by the large head of the set-screw 52, so that a perfectly-rigid connection of the nose-piece and the barrel is effected. The nose-piece P is preferably formed of hardened steel, and a separate nose-piece can be readily substituted to accommodate the different sizes of nail-plates.

Around the small end of the barrel fits the clamping mechanism adapted to firmly bite the end of the nail-plate during the operation of the machine. This clamping mechanism consists of the springs Q, having integral therewith the arms 55, which are bent partially around the barrel, and are hinged together at 56. The lower ends of the springs Q bear upon the nail-plate, and their upper ends have threaded perforations to receive the screws 57, which serve to hold the clamping mechanism on the barrel, and at the same time to regulate the pressure of the springs upon the plate. These screws 57 also serve as pivots, upon which a slight swinging movement is allowed to the clamping-springs, so that the nail-plate may always be fed properly against the guard. Two springs, Q', screwed to the side of the barrel and having their free ends under the bent arms 55, serve to keep the clamping mechanism central when not forced to one side by the guard.

I shall now proceed to describe the mechanism whereby the back-and-forth motion is imparted to the plate-holding barrel.

The rod H', connected, as heretofore described, to the barrel-yoke G, is screwed into the end of the clamp H^2, which is connected to a chilled ball, H^3, fitting within a socket

formed in the housing of the clamp, and in the movable seat-block 60, operated by means of the screw 61. The chilled ball H^3 is carried by a shank, 62, held by suitable boxes resting upon the removable adjusting-strips 63 in the recess in the upper portion of the rocking standard R, and the position of the shank 62 in the standard is varied by changing the adjusting-strips, and when adjusted the bolt is held by the screw 64. The rocking standard R is bowed to form a long central opening adapted to receive the arm 65 of the eccentric yoke S. This arm 65 is provided with a recess, within which is held the block 66, and is connected to the rocking standard by means of the journal-bolt 67, which passes through suitable perforations in the sides of said standard. The block 66 is clamped securely to the center bolt by means of the set-screw 68, having thereon a jam-nut, 69. At its base the rocking standard R is provided with a recess adapted to receive a sleeve, 70, which fits over a journal-stud, 71, projecting from the side of block T, which is securely bolted to the bed of the machine. Upon the side of this block T is formed a lug, 72, through which pass the flat steel springs T', held therein by means of the set-screw 73. The springs T' are connected together by the sleeve 74; but the central spring passes through the sleeve and extends to and connects with the lug 75 upon the side of the rocking standard. By means of these flat springs, attached in the manner shown, a more uniform and steady action of the rocking standard and connected mechanism is secured than would be possible otherwise.

The eccentric yoke S is made of separable sections connected together by bolts 76, and the eccentric S', around which this yoke fits, is loosely journaled upon the main driving-shaft U, but derives motion therefrom through the medium of the shaft-collar V, formed of sections bolted together and keyed to the shaft. The shaft-collar V is provided upon one side with the lug 77, which has a threaded perforation to receive the screw-bolt 78, the ends of which bear against the lugs 79, formed upon the side of the eccentric. By this means the eccentric can be readily adjusted on the driving-shaft, and as this shaft imparts motion to the cutting mechanism it is obvious that the action of the eccentric, which gives movement to the plate-holding barrel, can be accurately timed with relation to the action of the cutters. This feature is one of importance, as it is necessary that the eccentric shall operate in such manner that it will place the nail-plate between the cutters the instant the jaws are open, and will start the backward movement of the plate-holding mechanism as soon as the plate is held by the bite of the knives. During the time that the knives hold the plate in making the cut the barrel will recede a sufficient distance to expose enough of the plate to form the next succeeding nail.

An important advantage arising from the use of the rocking standard attached to the connecting-rod in the manner shown is that it enables a variation in the length of stroke of the rod H' to be readily effected after this rod has been approximately adjusted, and thus allows a most accurate co-operation of the cutters and plate-holding barrel to be secured. This is accomplished by simply changing the adjusting-strips in such way as to cause the chilled ball H^3 to approach or recede from the pin 67, according as it is desired to shorten or lengthen the stroke of the rod H'.

In order to discharge automatically the "butts" or ends of the nail-plates not large enough to form nails, I have provided the mechanism illustrated in Figs. 1, 3, and 4 of the drawings. This butt-discharging mechanism consists, essentially, of a plate, W, which rests above the bed-knife, and has a bent end, 80, with shoulders 81, adapted to bear upon the tops of the hooks A^3, while the main portion of the bent end lies between the hooks and prevents the lateral displacement of the plate. In a central perforation near the top of the plate W is hooked the end of a wire rod, X, which rod is provided with a loop, 82, at its opposite end, adapted to fit over the pin 83, connected beneath the barrel to the barrel-yoke G. From this construction it will appear that at each backward movement of the barrel-yoke the end of the plate W next the cutters is lifted slightly, and this jarring action serves to discharge over the front of the machine the butts as they fall upon the plate.

I do not wish to be understood as claiming in the present case features or combinations of features shown in my former patent. Upon careful comparison of the machine embraced in such patent with the construction above described it will be seen that they differ in various particulars which practice has demonstrated to be of value. Thus in the patent the plate-holding barrel was supported by a single rocking yoke-bar, and the collar through which the barrel was moved in receiving revolution was sustained upon the bed of the machine, which was provided with means whereby an initial straight backward movement could be given to the barrel. In the present case I have provided the separate yoke-bar for supporting the barrel, and the separate rocking-bar for moving the same, and have supported these bars in a manner different from that shown of supporting the yoke-bar of the patent, whereby an initial backward movement of the barrel may be obtained and an adjustment of the barrel may be effected. Moreover, the link mechanism for connecting the yoke-bar to the machine-bed is a novel feature of importance, as also are the nose-piece and removable grooved shell, constructed as described. In my former patent the plate-holding barrel was driven from an eccentric held loosely upon the driving-shaft and receiving motion therefrom by means of a collar keyed to the shaft, and having a lug that projected

between threaded lugs upon the side of the eccentric which were provided with two adjusting-screws, and the eccentric yoke in the patent was connected directly to the connecting-rod leading to the plate-holding barrel. In the present construction, as has been seen, the connecting-rod is adjustably attached to the top of a separate rocking standard that receives motion from the eccentric yoke, and the eccentric is held adjustably with relation to the fixed collar by means of the single screw-bolt passing through the threaded lug of the collar and bearing against the lugs on the side of the eccentric. The several novel features of my present invention have been embraced in the following claims, in combination with the parts with which they coact, and constitute the distinctive elements of such combinations.

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

1. The combination, with the machine-bed, of the vertically-adjustable base-plate, the yoke-bar C, link mechanism connected to the machine-bed and pivoted to said yoke-bar, and the plate-holding barrel and operating mechanism, substantially as described.

2. The combination, with the base-plate, of the laterally-adjustable yoke-bar C, the link mechanism, constructed substantially as described, connecting said yoke-bar to the machine-bed, the plate-holding barrel, and operating mechanism, substantially as set forth.

3. The combination, with the machine-bed, of the base-plate A^2, pivotally connected thereto, the yoke-bar C, the link mechanism, constructed substantially as described, connecting the yoke-bar to the machine-bed, the plate-holding barrel, and operating mechanism, substantially as set forth.

4. The combination, with the machine-bed, of the base-plate, the yoke-bar C, hinged to said base-plate, and mechanism to detachably connect said yoke-bar to the machine-bed, substantially as described.

5. The combination, with the machine-bed having the hooks thereon, of the base-plate A^2, the yoke-bar C, and the link mechanism, constructed substantially as described, connected to said yoke-bar and detachably connected by the hooks to the machine-bed, substantially as set forth.

6. The combination, with the machine-bed, of the base-plate A^2, pivotally connected thereto, the laterally-adjustable yoke-bar C, pivoted to said base-plate, the link mechanism connecting said yoke-bar to the machine-bed, the plate-holding barrel, and mechanism for operating the same, substantially as described.

7. The combination, with the yoke-bar C, of the rest-plate adjustably connected to said yoke-bar, the rocking bar pivotally sustained on said rest-plate, and mechanism for connecting said rocking bar with the plate-holding barrel, substantially as described.

8. The combination, with the plate-holding barrel, of a yoke-bar, C, for sustaining said barrel, a rocking bar, and means for adjusting said rocking bar with relation to the yoke-bar, substantially as described.

9. The combination, with the plate-holding barrel K, of the collar M, the yoke-bar C, pivotally connected to said collar, and the barrel-yoke G, in pivotal connection with the plate-holding barrel and supported upon a rocking bar, E, substantially as described.

10. The combination, with the base-plate, of the yoke-bar C, the plate-holding barrel K, the barrel-yoke, and the rocking bar pivotally connecting said barrel-yoke with the yoke-bar, substantially as described.

11. The combination, with the plate-holding barrel, of the detachable shell having intersecting grooves arranged relatively to each other, substantially as described.

12. The combination, with the plate-holding barrel and mechanism for rotating the same, of the inclined planes and the collar carrying the spring-seated plungers, substantially as described.

13. The combination, with the plate-holding barrel and mechanism for imparting thereto a back-and-forward motion, of the grooved shell, the box-bearing, and the pins held in said box-bearing, substantially as described,

14. The combination of the plate-holding barrel with the nose-piece P, constructed substantially as described, and detachably connected to the barrel, substantially as set forth.

15. The combination, with the plate-holding barrel having a reduced and recessed end, of the nose-piece P, having the lugs 51, adapted to fit into the recesses in the end of said barrel, substantially as described.

16. The combination, with the plate-holding barrel, of the clamping-springs Q, having the arms 55, hinged together, and adjusting-screws for said springs, substantially as described.

17. The combination, with the plate-holding barrel, of the clamping-springs connected together, and the side springs for centering said clamping-springs, substantially as described.

18. The combination, with the cutting-knives, of the plate of the butt-discharging mechanism, the barrel-yoke, and the rod connecting the two, substantially as described.

19. The combination, with the driving-shaft, of the eccentric loosely journaled on said shaft and having lugs upon its side, the shaft-collar carrying an adjusting-bolt to operate said eccentric, the eccentric yoke, and mechanism for communicating motion from the eccentric yoke to the plate-holding barrel, substantially as described.

20. The combination, with the driving-shaft, of the eccentric, the eccentric yoke, the shaft-collar, the rocking standard, and mechanism for communicating motion therefrom to the plate-holding barrel, substantially as described.

21. The combination, with the driving-shaft, of the eccentric, the eccentric yoke, the shaft-

collar, the rocking standard, the springs connected with the rocking standard, and mechanism for communicating motion therefrom to the plate-holding barrel, substantially as described.

22. The combination, with the eccentric mechanism, of the rocking standard R, the clamp H^2, adjustably connected to the rocking standard, the rod H′, and the plate-holding barrel, substantially as described.

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