

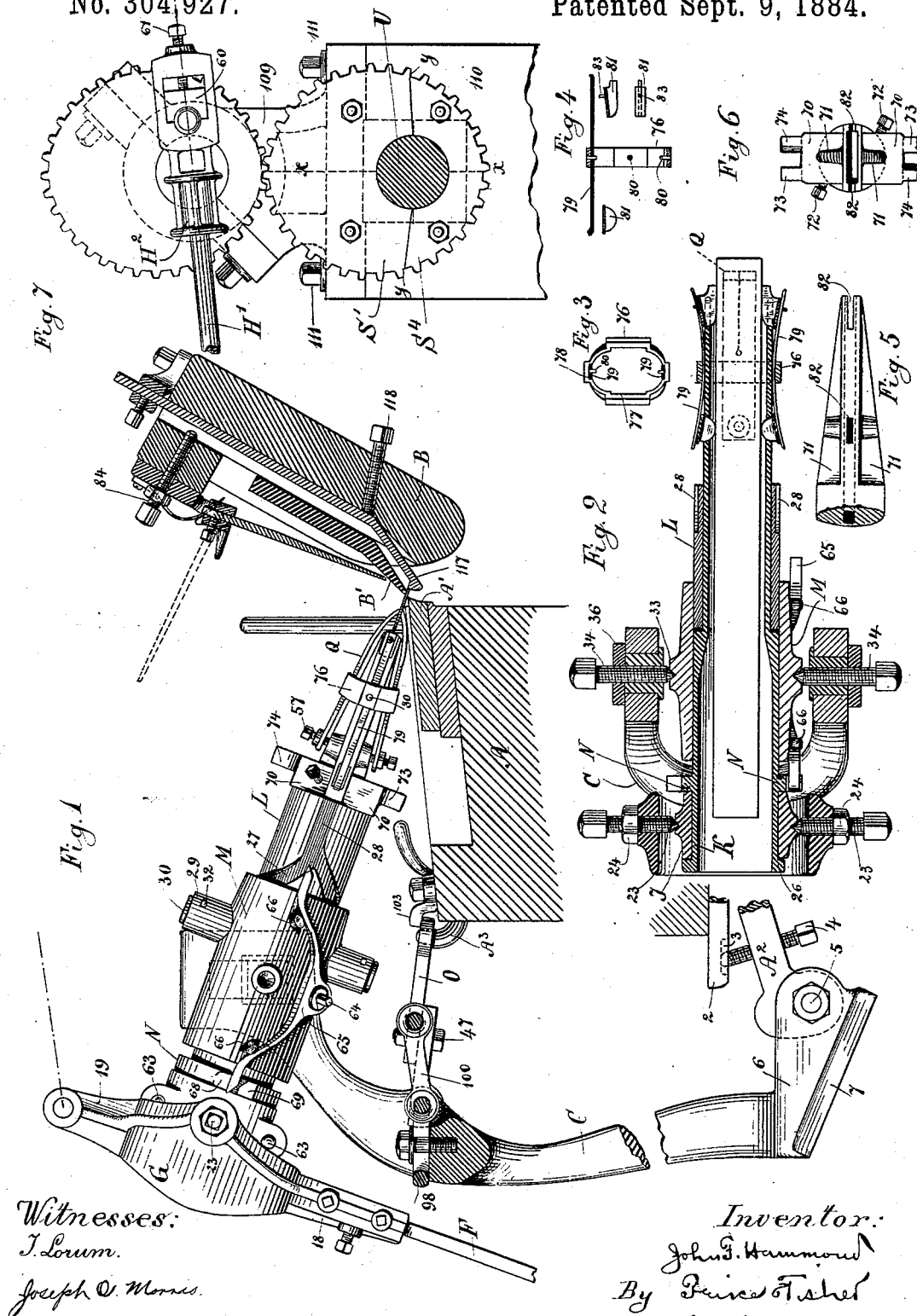
(No Model.)

3 Sheets—Sheet 1.

J. F. HAMMOND.
NAIL PLATE FEEDER.

No. 304,927.

Patented Sept. 9, 1884.



(No Model.)

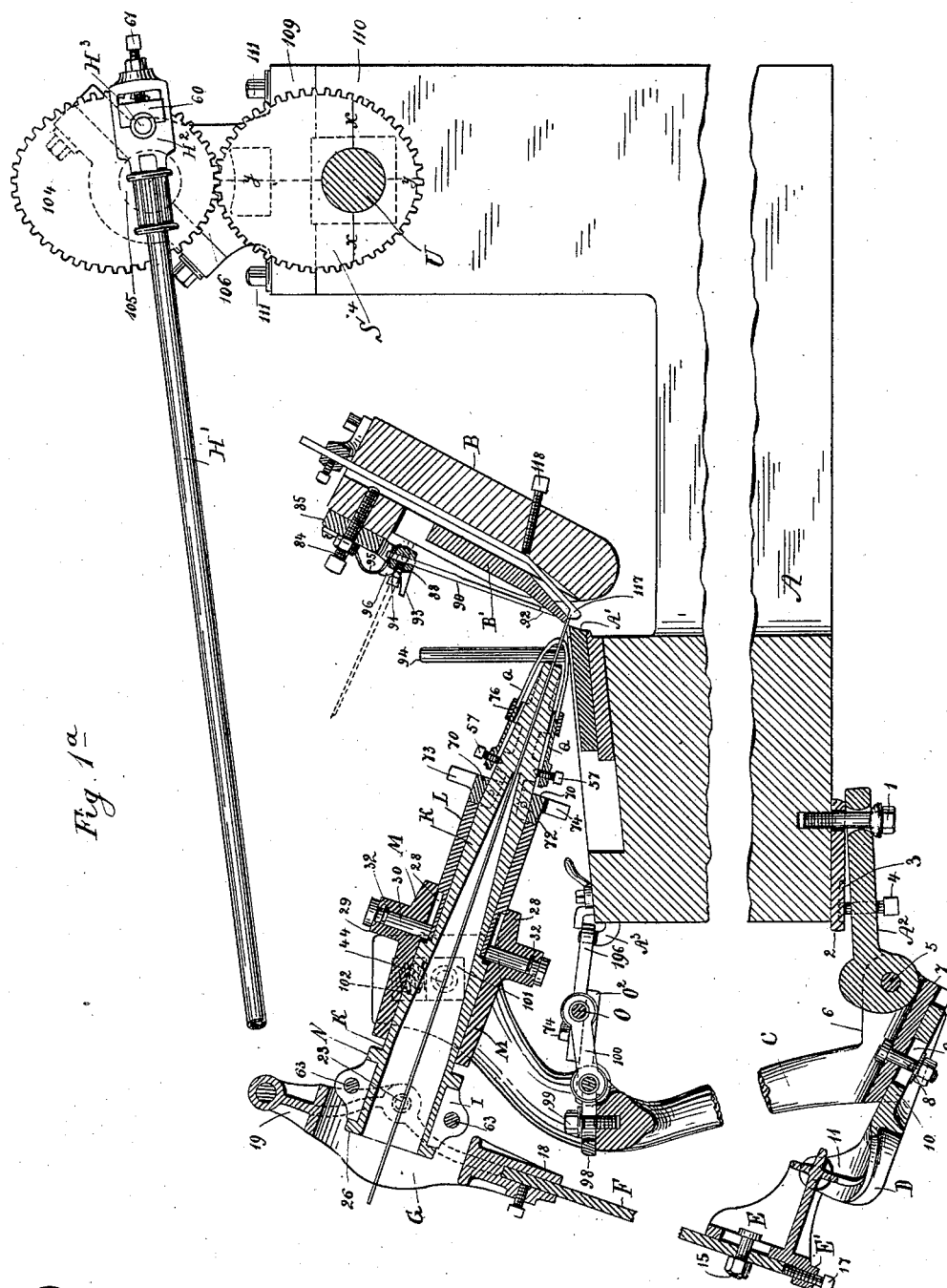
3 Sheets—Sheet 2.

J. F. HAMMOND.

NAIL PLATE FEEDER.

No. 304,927.

Patented Sept. 9, 1884.



Witnesses:
L. Holmboe
J. Lowm.

Inventor:
John F. Hammond
by Oliver Fisher
His Attorneys.

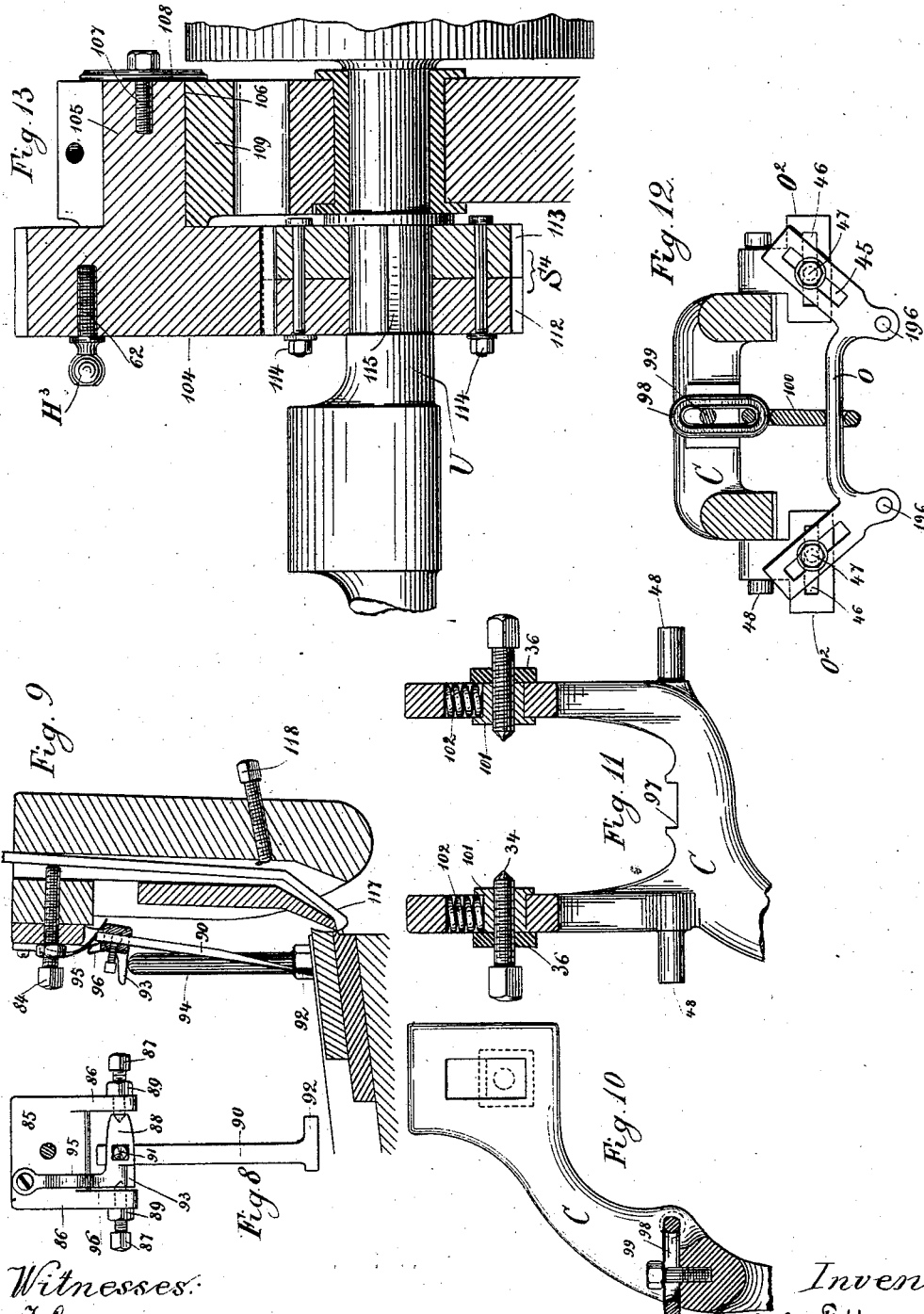
(No Model.)

3 Sheets—Sheet 3.

J. F. HAMMOND.
NAIL PLATE FEEDER.

No. 304,927.

Patented Sept. 9, 1884.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN F. HAMMOND, OF OMAHA, NEBRASKA.

NAIL-PLATE FEEDER.

SPECIFICATION forming part of Letters Patent No. 304,927, dated September 9, 1884.

Application filed September 15, 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, in the county of Douglas and State of 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.

In machines of the class to which my invention relates the nail-plate is fed in successive portions sufficient to make the nail by co-operation of the cutting-knives with the plate-holding barrel, which latter, immediately that the plate is in the bite of the knives, recedes or slips backward so far as to expose enough in width of the plate to form the next nail.

The invention is designed more particularly to improve the construction of the machine set forth in Letters Patent No. 265,599, issued to me October 10, 1882, and in Letters Patent No. 278,943, issued to me June 5, 1883; and it consists of certain changes in the organization of the machine, the nature of which will be presently described, and thereafter distinctly pointed out in claims following.

In the accompanying drawings, wherein like letters of reference designate like parts, Figure 1 is a side elevation (with parts shown in section) of the improved nail-plate feeder. Fig. 1^a is a longitudinal vertical section of the machine with its operating-gear in side elevation. Fig. 2 is a view in horizontal longitudinal section through the plate-holding barrel on lines of its pivot-supports; Fig. 3, a detail view in elevation of the collar and springs to guide the nail-plate; Fig. 4, a detail sectional view of the collar, springs, and shoes to guide the nail-plate; Fig. 5, a view of the plate-holding barrel near its point; Fig. 6, an end view of said barrel, to show the position of lug-plates resting thereon; Fig. 7, a view in side elevation of the eccentric-gear mechanism to reciprocate the barrel; Fig. 8, a front elevation of the butt-clearer mechanism; Fig. 9, a sectional view of the cutter-bar and bed-knife, showing relation of butt-clearer thereto; Fig. 10, a side elevation; Fig. 11, a front elevation, and Fig. 12 a top view (all being partly in section) of the yoke-bar

detached. Fig. 13 is a sectional view of the eccentric driving mechanism.

The ordinary machine-bed, A, supports the fixed cutting-knife A', while the vibrating cutter-bar B carries the knife B', as well understood. To the under side of the machine-bed is pivotally secured the base-plate A², the enlarged end of which serves as a bearing to the long bolt 5, movable laterally thereon, and designed to sustain the lower arms, 6, of a yoke-bar, C, having in its expanded upper arms the center pins, 34, whereon turns, by its sockets 33, the collar M, encircling barrel K.

The bar F, secured to depending portion 18 of barrel-yoke G, is adjustably connected at its lower end to an enlargement, E', of a horizontal bar, E, rocking pivotally upon center pins, which laterally project from certain upright yoke-arms, 11, of a rest-plate, D, that is capable of adjustment to and fro in the expanded bottom 7 of yoke-bar C. These several features of structure last named, and located between the bar F and expanded bottom 7 of yoke-bar C, form no part of this invention, and are fully illustrated and described in said Letters Patent No. 278,943, and occupy precisely the same relation to the parts exhibited herein as to the corresponding parts in said Letters Patent. The set-screws 23 in barrel-yoke G serve as pivots to the box-bearing I, which latter consists of two semi-cylindrical sections snugly encompassing the barrel K and firmly bolted together, as at 63, so as to rest nicely between end flange, 26, of barrel K, and a raised collar, N, encircling said barrel, and cast, preferably, in piece therewith. It will be understood that box-bearing I is designed to reciprocate the barrel K through medium of rocking barrel-yoke G and other connected parts, while at the same time said barrel is free to turn within the box-bearing without impediment.

The long collar M, which slips over barrel K, and bears smoothly thereon to aid in sustaining the same, pivots about center pins 34, as has been stated. Said collar carries upon opposite sides the hollow bosses 29, within which project the steel pins 30 far enough to engage the oblique cam-grooves 27 and straight grooves 28, cut, as shown, in the face of a steel

shell, L, that surrounds and is rigidly secured to barrel K. Pins 30 may be held in place by key-pins, as at 32, which pass through the bosses 29, and bear against a circular groove or notch cut about the shank of the pins 30.

Thus far the machine (save for collar N upon barrel K) is precisely the same with that which is set forth in Letters Patent No. 278,943, to which reference is accordingly made for more detailed specification, it being deemed best, however, to enumerate the general features of structure common to both machines, as has been done, in order that the precise nature of the improvements now to be described may more clearly appear.

Fastened upon opposite sides of the long collar M, as at 64, are the stout bow-shaped springs 65, thickened at the center portion and reduced somewhat near the ends, so as to be semi-flexible. Lugs 66, upon collar M, bear against the inner face of bow-springs 65, as the same are strained in position to be secured by set-screws 64, and thus maintain said springs in tense condition.

The collar N, cast in one piece with barrel K, and serving as an abutment to box-bearing I, has at diametrically-opposite points two sets of raised lugs, 68 69, thereon, between which may glide the forward ends or feet of the bow-springs 65. The bearing of lug 68 with spring 65 is made straight face, but that of lug 69 with said spring is made slightly beveled or inclined at point of entrance, as shown, for purpose presently to appear. Toward the point of barrel K, and next against the steel shell L, are two plates, 70, adapted to fit over the ribs 71 of the barrel, and firmly secured in place thereon by the set-screws 72. Each of said plates 70 has projecting from it the lugs 73 74, which are in all respects similar to lugs 68 69 of collar N, though it will be observed that said lugs 73 74 occupy a position on barrel K precisely intermediate the lugs 68 69; or, in other words, it may be stated that the several sets of lugs are alternately one-fourth of a revolution apart about the circuit of barrel K. The bearings of springs 65 with lugs 73 74, between which lugs the feet of said springs enter at the end of backward movement of barrel K, are straight and beveled-faced, respectively, in like manner as the bearings of said springs with the lugs 68 69. If barrel K be reciprocated back and forth through its bearings in collar M by co-operation of box-bearing I and rocking barrel-yoke G and their adjuncts in manner well understood, said barrel constantly revolves, except when projecting pins 30, near the end of each forward or backward stroke, run out of the inclined grooves 27 into the straight grooves 28; but when this occurs at regular speed the momentum acquired by barrel K causes it to continue its rotary movement so far that pins 30 impinge upon the walls of straight grooves 28 with no little violence. To avoid this strain, the walls of grooves 28 are cut away somewhat, and the sets of lugs 68 69

and 73 74 are so positioned with respect to the feet of bow-springs 65 that at the very moment when pins 30 have cleared the inclined grooves 27 the feet of springs 65 will alternately be about opposite the entrance between the two sets of lugs. If, for example, we assume the barrel K to be nearing the end of its forward stroke, as in Fig. 1, then at this juncture its further longitudinal movement brings the feet of springs 65 sharply in contact with lugs 68, which thus receive all the shock. The springs yield slightly, arrest the rotary momentum, relieve the pins 30 from strain, and glide between lugs 68 69, so that there can be no rebound, the bearing of the springs with face of lugs 68 aiding to maintain the straight thrust of the barrel which grooves 28 are designed to establish. Upon the reverse stroke the lugs 68 draw back parallel with the face of spring 65, until when the two cease to be in contact the pins 30 have just entered the cam-grooves 27, so that no resistance is offered to the further quarter revolution of barrel K in its collar M. As the barrel nears the end of its stroke, the feet of springs 65 bear precisely the same relation to lugs 73 74 as already detailed with respect to lugs 68 69, and hence impinge upon lugs 73 and pass between said lugs 73 74 at the finish, to relieve strain upon pins 30 in exactly the same mode. When after wear the pins 30 become smaller, and the tendency of barrel K is to lag a little out of time, the bevel-face of lugs 69 74, coming in contact with like face on feet of springs 65, near the end of each stroke, causes the barrel to draw forward to place, thereby insuring the same position of the pins at commencement of each stroke. But one spring 69 need be used, although to balance strains two are preferred, as shown.

A collar, 76, in general contour conforming to barrel K, slips over said barrel, and in seats 77 78 therein receives the springs Q and the springs 79, all of which are held from endwise slip by pins 80, securing them to the collar. The ends of the springs Q, which clasp the nail-plate, are slit to insure an even pressure on the plate, while their opposite ends are secured by set-screws 57 to suitable sockets in barrel K. It is plain that said set-screws 57 not only retain collar 76 with its adjuncts in place, but also control the tension of springs Q. Near the ends of springs 79, and bearing thereon, are the small shoes 81, which enter slots 82 in the barrel and bear against the edges of the nail-plate, there being flanges on the shoes to govern penetration, and pins, as at 83, entering holes in springs 79 to retain said shoes in place. The springs 79, acting in conjunction with the shoes, keep the plate central within the barrel, thus avoiding the need of an outside guard or of a swivel-joint between the springs Q, as in my last-named patent.

Secured to upper part of cutter-bar B by bolt 84 is a plate, 85, having ears, as at 86, through which pass center screws, 87, pivotal-

ly sustaining the rocker 88. Jam-nuts 89 keep center screws, 87, in adjustment. Through a slot in rocker 88 passes the shank of butt-kicker 90, held adjustably therein by set-screw 91 in such position that foot 92 of said kicker shall be some distance above the cutting-edge of knife B'.

As more fully explained in my former patents, hereinbefore referred to, the organization of the machine and the operation of its parts is such that, when cutter-knife B' in course of its descent to cut the nail first contacts with the projecting end of the nail-plate, said plate will thereby be firmly held in the grip of the two cutters A' B'. Immediately thereafter the barrel K recedes or is withdrawn from the plate a sufficient distance to expose enough in length of said plate to form the next nail. By this time the further continuous descent of cutter B' will have completely severed the projecting end of the nail-plate, so that said plate, being freed, will at once partake of the backward movement of its retaining-barrel K, and will retreat with it from the edge of the bed-knife A'; but the descent of cutter-bar B and knife B' at this stage will have brought the foot 92 of butt-kicker 90 about even with the face of bed-knife A', whereupon the lug 93 on rocker S S will contact with the post 94 at one side of machine-bed A, thereby turning said rocker about its pivots 87 and against tension of spring 95 bearing thereon, and causing the kicker 90, which necessarily partakes both of the descent of the cutter-bar B' and of the pivotal movement of rocker 88, to sweep closely across the face of knife A in lines of the retreating nail-plate, to clear said bed-knife of any butt or other obstacle lodged thereon. As cutter-bar rises, the lug 93 passes from post 94 and spring 95 returns kicker 90 to face of cutting-knife B'. When the latter is to be ground or adjusted, the kicker may be turned up out of the way, as shown by dotted lines, Fig. 1, and so held by end of spring 95 catching against the lug 96 of rocker 88.

To simplify construction of parts which hold yoke-bar C in place either after lateral adjustment of same on long bolt 5 or pivotal adjustment thereof, together with base A², about screw-bolt 1, as provided in my last patent, there is a single cross-bar, O, the eyes 196 of which fit over the hooks A³ on face of machine-bed. The branching and expanded ends of said bar O have slots 45, through which and through slots 46 in short bars O² pass the clamping-bolts 47. Bars O² pivot upon the center pins, 48, projecting from yoke-bar C, and in a seat, 97, of said yoke-bar rests a slide-plate, 98, held in adjustment thereon by clamp-bolt 99. A connecting-link, 100, the eyes of which fit loosely over cross-bar O and over slide-plate 98, respectively, joins said bar and plate together, and serves to hold yoke-bar C rigidly at unvarying distance from the source of motion. This rigidity in position is important, for should said yoke-bar C shift about its pivot-bolt 5 and to or from the machine-bed A dur-

ing reciprocation of barrel K, it is plain that pins 30 will likewise change their place in grooves 27 28 and barrel K be made to turn either too early or too late. Yoke-bar C having been adjusted, therefore, once for all with reference to the full stroke of barrel K, the clamp-bolt 99 is screwed down on slide-plate 98 to hold said yoke-bar immovably in place. It will be understood, however, that upon loosening the nuts on bolts 47 yoke-bar C is free to move laterally on long bolt 5, the shank of bar O sliding easily through eye of link 100; or, again, that said yoke-bar may be swung at side angles to the machine-bed about headed bolt 1 as a pivot, the link 100 then turning upon its bearing with slide-plate 98 as a center. In either event, after the adjustment is effected the clamp-bolts 47, which have shifted to new position in slots 45 46, are tightened, and yoke-bar C is then held rigidly to its work. The lips of swivel-catches 103 retain cross-bar O in place on hooks A³ of the machine-bed.

At the upper end of yoke-bar C are the center screws, 34, upon which pivots the collar M. Instead of having these center screws to pass directly through the solid head of the yoke-bar, as heretofore, the flanged boxes 101 are provided, which fit in vertical ways or slots cut on the arms of yoke-bar C, and are drilled and tapped to receive said center screws, 34. The jam-nuts 36 hold said screws in place and boxes 101 snugly in their ways, as well understood. Stout spiral springs 102 bear upon boxes 101 and ordinarily keep the same at bottom of slots in yoke-bar C; but should any unusual obstruction be met with by barrel K on bed-knife, which must tend to greatly strain or to break the machine parts, then boxes 101 with pivot-screws 34 rise in bearings of yoke-bar C against tension of springs 102 and enable barrel K to clear the obstacle, dropping down thereafter to original position.

Projecting above barrel-yoke G is the usual extension or standard, 19, adapted to receive the spindle of a chilled ball, over which ball sets the yoke at end of connecting-rod H'. Said rod at its opposite end is socketed to a yoke or clamp, H², in all respects similar to the former, and, like it, provided with a movable section or half-box, as at 60, designed to be adjusted by set-screws 61 snugly about the chilled ball H³. The ball H³ is formed on the end of a bolt, 62, screwed into the elliptic gear-wheel 104, and the position of said bolt thereon with reference to the eccentric axis of the gear is ascertained at the outset, since it determines the extent of throw or stroke of the barrel K. Gear-wheel 104 is made solid and its axis 105 rests within a journal-bearing, as at 106, the endwise play of said gear therein being prevented, as usual, by screw-bolt 107 and washer 108, bearing against face of journal-box 109. The base of journal-pedestal 110, and is bolted thereto, as at 111, thus serving in lieu of the usual cap or cover to the

bearing of main driving-shaft U journaled in said pedestal 110. The box 109 may be made of any convenient height to correspond with the distance between the center of gear-wheel 104 and of its companion elliptic gear S⁴, meshing therewith and mounted eccentrically upon main shaft U, to which it is keyed, as at 115. The gear-wheel S⁴ consists of two sections, 112 113, secured firmly and accurately together upon the shaft U by the turned bolts 114, fitted in reamed holes. Each section 112 113 of the gear-wheel is in turn divided into two parts, as on lines *xx* and *yy*, respectively, to enable said sections to be conveniently set up or taken down without dismantling the heavy parts of the machine. It will be noticed that the division-lines of the two sections are arranged so that they break joint with each other, thus contributing to the rigidity of the wheel. Constructed as defined, and as illustrated by the drawings, the elliptic gear-wheels are intended to give a quick motion to the barrel K when the nail-plate is first within the bite of the cutting-knives.

It will be observed that the full part of gear-wheel S⁴ engages the slack part of gear-wheel 104, carrying connecting-rod H in such wise that the major axes of the two wheels are in alignment at about the time when barrel K has completed its forward stroke. Immediately thereafter the wrist-pin or bolt 62 rises above its dead-point, and the parts of the gear-wheels then in mesh move the connecting-rod and barrel K backward with a quick stroke, so that while yet retained in the bite of the knives enough of the nail-plate is drawn to insure sufficient width to make the next nail.

The elliptic gear-wheels may be replaced by the ordinary circular gear-wheels mounted centrally, instead of eccentrically, but otherwise connected up in manner already described, and as shown by the drawings, for the elliptic gear. It is plain, however, that the motion of the barrel K, derived from such circular driving-gear, will be uniform, rather than variable and accelerated, as in the case of the elliptic gear; but to insure proper feed of the nail-plate it is then merely necessary to place wrist-pin H³ slightly ahead of the center, or in such manner that connecting-rod H' will begin its return-stroke and barrel K begin to recede from the edge of the bed-knife before cutter-bar descends far enough to bite the nail-plate. Thus when the nail-plate is placed for the cut, instead of coming against the gage-spring 117 with just enough of said plate projecting beyond the bite to form the next nail, said gage-spring is set back a certain distance by slackening up screw 118, so that when the plate evens up against the gage it starts to go back before the knives commence to cut. When these do cut, it will be at a point on the backward stroke when just enough of the plate is projecting over the edge of bed-knife A' to form the nail. It is manifest that the proper position of gage-

spring 117 to accomplish this end may be easily ascertained by test. If the nail width be too small, slacken set-screw 118; if too great, tighten said screw.

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

1. The combination, with the rocking barrel-yoke, and with the box-bearing sustained thereon, of the plate-holding barrel, the pivotally-mounted collar having projecting pins to engage said barrel, and means, substantially as described, secured to said barrel and collar, respectively, whereby the rotation of the barrel is arrested near the finish of the stroke, substantially as set forth.

2. The combination, with the collar M, having the arrest-spring thereon, of the reciprocating barrel carrying lugs which contact with said spring near the end of the forward and backward movement of said barrel, substantially as described.

3. The combination, with the collar M, having lugs 66 thereon, of the bow-springs 65, secured to said collar, and bearing upon said lugs, substantially as described.

4. The combination, with the collar M, and with the barrel K, reciprocating therethrough, of the bow-springs 65, and the sets of lugs 68 69 and 73 74, with which said springs contact alternately, substantially as described.

5. The combination, with the pivotally-suspended collar M, having projecting steel pins 30, and bow-springs 65, of the reciprocating barrel provided with grooves 27 28, to engage said pins, and with double sets of lugs 68 69 and 73 74, to contact with said bow-springs, the bearings of lugs 69 and 74 with the bow-springs being slightly beveled, substantially as described.

6. The combination, with the pivoted collar M, having spring 65 thereon, of the reciprocating barrel K, and the plates 70, carrying the lugs 73 74, substantially as set forth.

7. The combination, with the barrel K, of the collar 76 and the springs Q, substantially as described.

8. The combination, with the plate-holding barrel K, having slots 82 therein, of the springs 79 and projecting shoes 81, substantially as described.

9. The combination, with the barrel K, having slots 82 therein, of the collar 76, springs 79, and shoes 81, substantially as described.

10. The combination, with the barrel K, having slots 82 therein, of the collar 76, springs 79, projecting shoes 81, the springs 80, and set-screws 57, substantially as described.

11. The combination, with the cutter-bar, of the pivoted butt-clearer, and a post which engages a lug on said butt-clearer, causing the same to sweep across the bed-knife as the cutter-bar descends, substantially as described.

12. The combination, with the cutter-bar, of the rocker 88, mounted thereon, and the butt-kicker 90, adjustable in said rocker, substantially as described.

13. The combination, with the cutter-bar, of the pivoted rocker, having lugs 93 and 96 thereon, and a butt-kicker, 90, secured thereto, the spring 95, and the upright post 94, substantially as described.

14. The combination, with the yoke-bar C, and the short bars O², pivoted thereto, of the cross-bar O, secured to said short bars and to the machine-bed, substantially as described.

15. The combination, with the yoke-bar C, and the slotted short bars O², pivoted thereto, of the slotted cross-bar O, secured adjustably to said short bars, and fitted to hooks A³, projecting from the bed of the machine, substantially as described.

16. The combination, with the cross-bar O, having eyes 196, of the machine-bed A, having hooks A³, to engage said eyes, and swivel-catches 103, to retain said cross-bar, substantially as specified.

17. The combination, with the yoke-bar C of the slide-plate 98, the link 100, and the cross-bar O, substantially as described.

18. The combination, with the yoke-bar C and reciprocating barrel K, of the collar M, encompassing said barrel, and sustained in yielding bearings by said yoke-bar, whereby when obstruction is met said reciprocating barrel and other machine parts may be relieved from strain, substantially as described.

19. The combination, with the yoke-bar C,

of the sliding boxes 101, the springs 102, the pivot-pins 34, and the collar M, sustained by said pins, substantially as described.

20. The combination, with the plate-holding barrel, and with the journaled collar encompassing said barrel, of the rocking barrel-yoke, the connecting-rod, and the cog-gear mechanism, the several parts being relatively arranged, substantially as described, to effect the desired rotation of the barrel in conjunction with its reciprocating movement, substantially as set forth.

21. The combination, with the plate-holding barrel, the cutting-knives, and the journaled collar encompassing said barrel, of the pivoted yoke-bar to sustain said collar, the rocking barrel-yoke, the connecting-rod, and the cog-gear mechanism, substantially as described.

22. The combination, with the drive-shaft, of the removable gear-wheel S⁴, the same consisting of the sections 112 113, united substantially as described, each of said sections being divided, as at *x y y*, substantially as set forth.

In testimony whereof I have hereunto set my hand this 12th day of September, A. D. 1883.

JOHN F. HAMMOND.

Witnesses:

GEO. SAVAGE,
A. MCFADDEN.