

(No Model.)

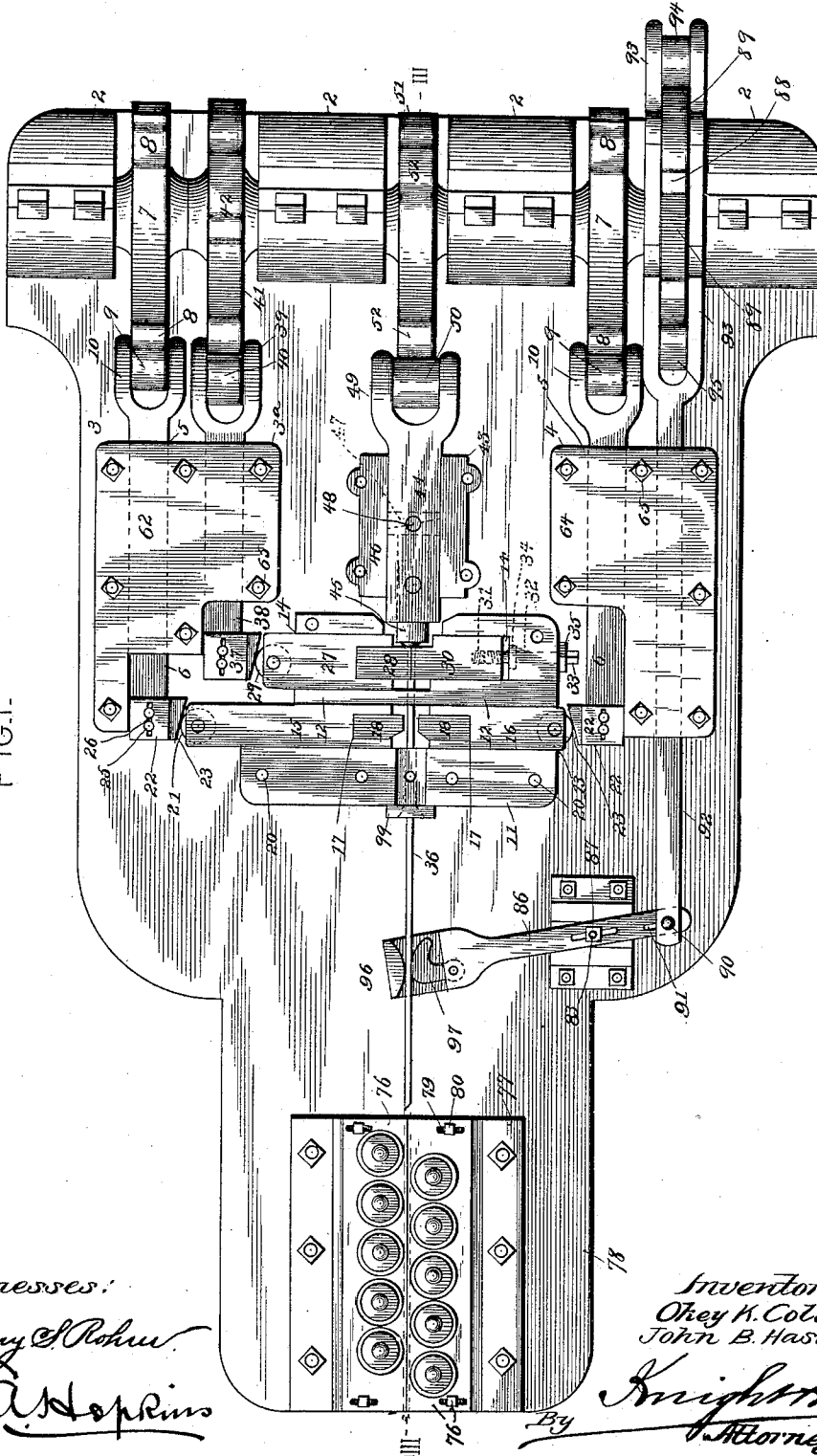
4 Sheets—Sheet 1.

O. K. COLE & J. B. HASTINGS.
MACHINE FOR MAKING NAILS.

No. 463,099.

Patented Nov. 10, 1891.

FIG. 1.



Witnesses:

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Attorneys

(No Model.)

4 Sheets—Sheet 2.

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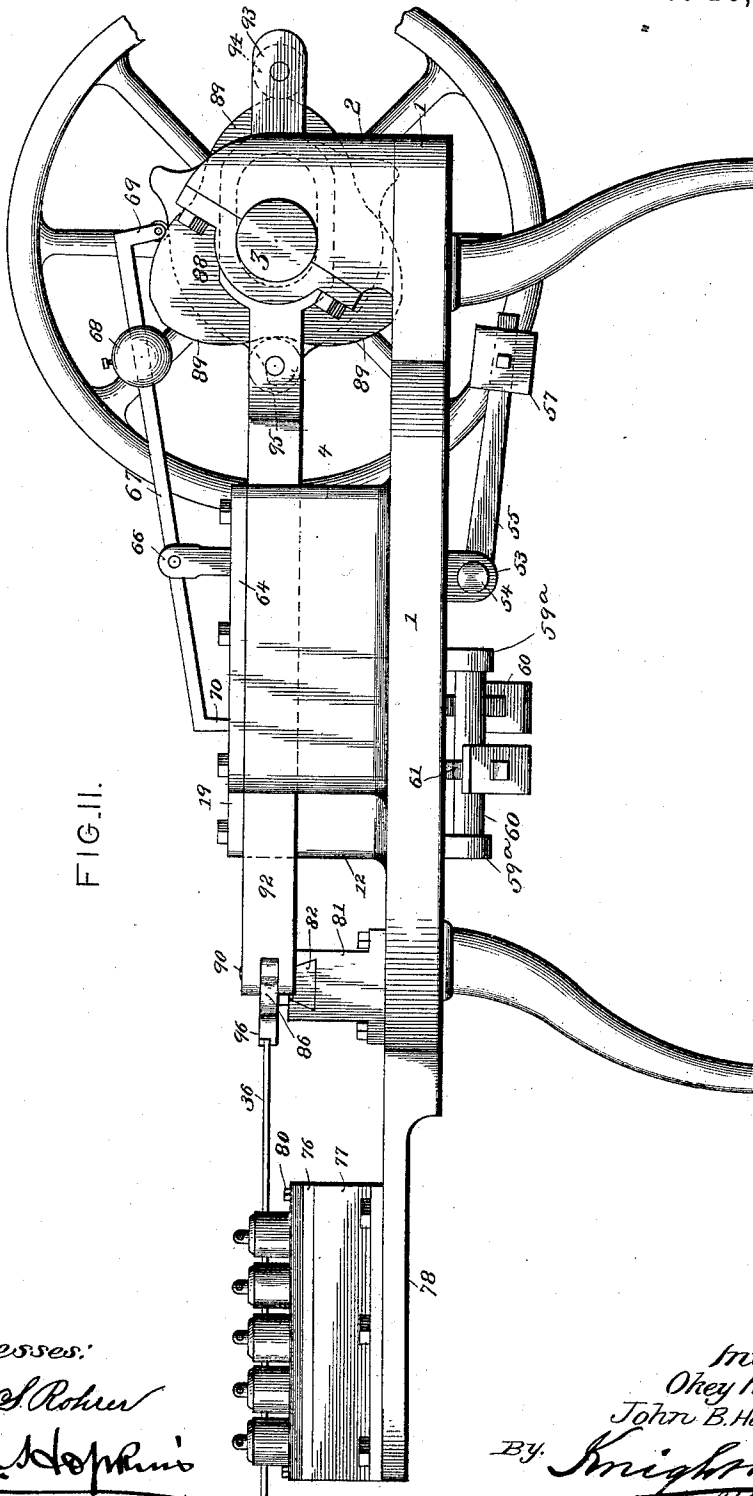


FIG. II.

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4 Sheets—Sheet 3.

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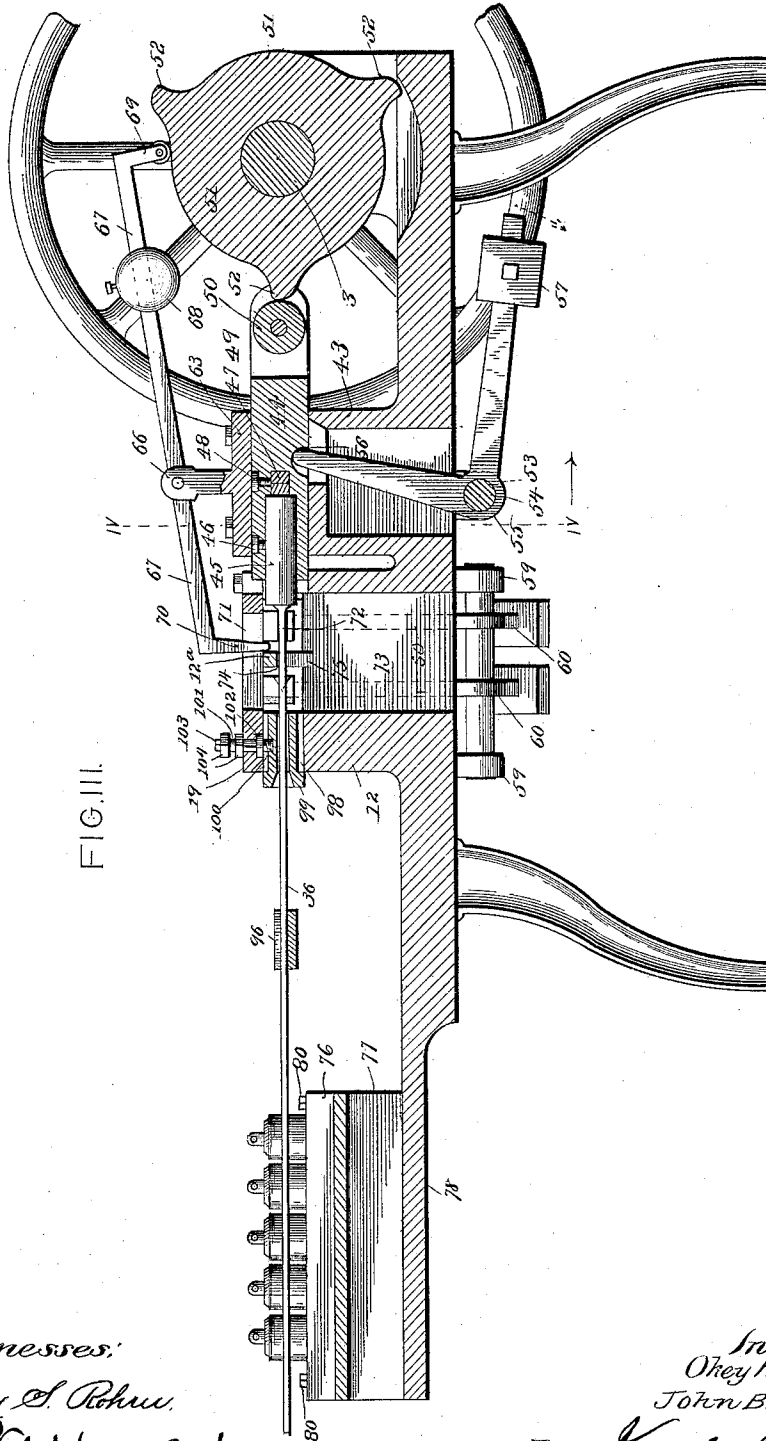


FIG. III.

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4 Sheets—Sheet 4.

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FIG. IV.

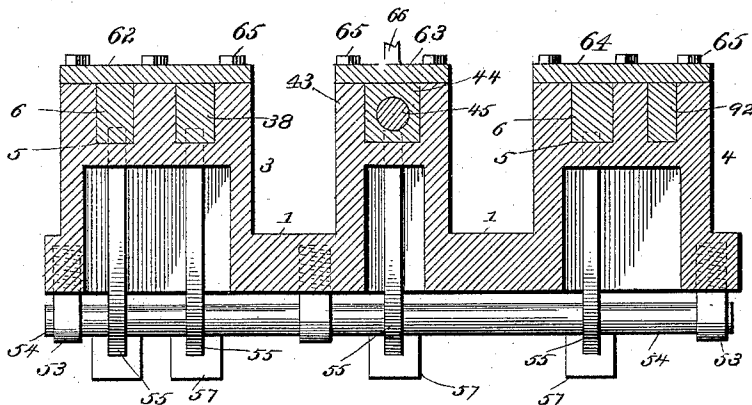


FIG. V.

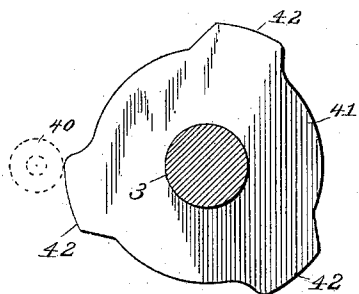


FIG. VI.

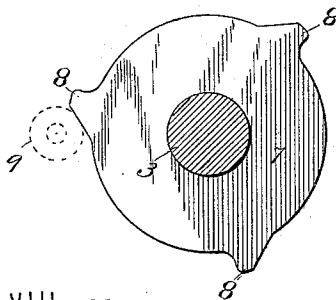


FIG. VII.

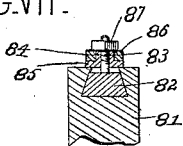
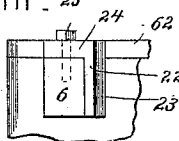


FIG. VIII.



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UNITED STATES PATENT OFFICE.

OKEY K. COLE AND JOHN B. HASTINGS, OF PARKERSBURG, WEST VIRGINIA,
ASSIGNORS TO THE TRIPLE WIRE NAIL MACHINE COMPANY, OF SAME
PLACE.

MACHINE FOR MAKING NAILS.

SPECIFICATION forming part of Letters Patent No. 463,099, dated November 10, 1891.

Application filed November 24, 1890. Serial No. 372,510. (No model.)

To all whom it may concern:

Be it known that we, OKEY K. COLE and JOHN B. HASTINGS, citizens of the United States, residing at Parkersburg, in the county of Wood and State of West Virginia, have invented certain new and useful Improvements in Machines for Making Nails, of which the following is a full, clear, and exact specification.

Our invention relates to nail-making machines in general, but more particularly to that class of such devices known as "wire-nail" machines; and it has for its object an apparatus of this character which shall be very efficient in its operation, of great durability, and yet very simple of construction.

The invention consists in certain features of novelty hereinafter described in connection with the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure I is a plan view of our machine, the knock-out and cap-plates hereinafter described being removed. Fig. II is a side elevation of the complete machine. Fig. III is a vertical longitudinal section thereof, taken on the line III III, Fig. I, showing the header advanced in the act of heading the nail. Fig. IV is a vertical transverse section taken on the line IV IV, Fig. III, looking in the direction of the arrow, the cam-disks and knock-out being omitted for the sake of clearness. Fig. V is a side elevation of the gripper-cam hereinafter described. Fig. VI is a similar view of one of the cut-off and pointer cams hereinafter described. Fig. VII is a detail sectional view of the feed-adjusting slide hereinafter described; and Fig. VIII is a detail view of the end of one of the push-bars and adjustable cam-blocks hereinafter described.

1 represents the table or bed, upon the end of which are mounted two pairs of journal-boxes 2, in which the power-shaft 3 is journaled. As shown in Fig. II, these journal-boxes are divided in an oblique, almost perpendicular, plane, so that the stress or pressure exerted on the main shaft, which is nearly entirely in a horizontal direction, will be borne by the fixed section of the journal-box and not by the removable cap.

Made integral with or securely mounted upon the bed or table 1 are two elevated beds 3^a 4, each having a groove or way 5, in which are fitted the longitudinally-sliding cut-off and pointer push-rods 6. Mounted upon and securely keyed to the power-shaft 3, directly opposite the end of each of the push-rods 6, is the cut-off and pointer cam-disk 7, having three operative projections or cams 8, which, as the disk revolves, bear successively against an anti-friction roller 9, journaled in the bifurcated end 10 of each of the push-rods 6, and thus impart to such rods a forward thrust. The cam-disks 7 being identical in shape and coincident with each other, they act upon the push-rods 6 simultaneously and push them forward the same distance.

11 is an elevated bed on the table 1 similar to the beds 3^a 4, but having a groove or way extending transversely of the table 1 and being divided by a partition 12 into two ways 13 14. In the way 13 are mounted at right angles to the rod 6 two longitudinally-sliding tool-boxes 15 16, having at their contiguous ends sockets or cavities 17, in which may be inserted the die or tool 18 for pointing and cutting the nail. These sockets 17 are open at top, as shown in Fig. I, so that the die or tool may be inserted from above, the tool-boxes and dies being held against upward displacement by means of a cap-plate 19, secured to the bed 11 by means of bolts engaging in the threaded sockets 20. At the outer end of each of the tool-boxes 15 16 is mounted to rotate in a longitudinal plane an anti-friction roller 21, and secured to the adjacent end of each of the push-rods 6 is a cam-block 22, whose inclined face 23 engages with said anti-friction roller when the rod is thrust forward by the cams 8, and thus the tool-boxes 15 16 are caused to approach each other and press their dies 18 firmly together and simultaneously point and cut off the nail. These cam-blocks 22, as more clearly shown in Fig. VIII, are each provided with a lateral flange 24, which fits on the top side of the push-rod 6 and is secured thereto by means of two bolts or studs 25, passing through a slot 26 in said flange and engaging in the rod, such arrangement being provided for taking up the wear

of the engaging parts and for compensating for any variation that might exist in the lengths of the tools or dies, and also for adjusting the parts so as to cause the dies to strike the wire simultaneously. The back of the inclined part 23 fits against the side of the push-rod, which affords a firm abutment for the cam-block. On the other side of this partition 12 in the way 14 is mounted a tool-box 27, which, like the tool-box 15, has at its inner end a socket like the socket 17 for the reception of a gripper die or tool 28 of any suitable construction, and at its outer end it is provided with an anti-friction roller 29. Mounted in the way 14 opposite the die 28 is a jaw 30, having at its outer end a screw-threaded socket 31, in which engages the end of an adjusting-screw 32, which is loose in the end wall of the bed 11 and is provided at its outer end with a prismatic head 33, whereby it may be turned for adjusting the jaw 30, said screw being provided with a fixed collar or flange 34, countersunk in the end wall of the bed 11, so as to hold the screw against outward movement, it being held against inward movement and being locked in position by a jam-nut 35, threaded on the outer end thereof. The tool-box 27 is forced toward the jaw 30 for gripping the wire 36 by means of a cam-block 37, similar in all respects to the cam-blocks 22, mounted on the end of a longitudinally-sliding push-rod 38, seated in a way or groove in an extension 3^a of the bed 3. The push-rod 38, like the push-rods 6, is provided with a bifurcation 39, in which is mounted an anti-friction roller 40, the latter being engaged by the gripper-cam disk 41, secured to the main shaft and having three operative projections or cams 42, which engage with the roller 40 as the disk rotates and successively force the cam-block 37 against the anti-friction roller 29 and cause the wire to be gripped between the jaw 30 and die 28. Between the beds 3 4 is located a bed 43, having a longitudinal groove or way in which is located the longitudinally-sliding header push-rod 44. The inner end of this push-rod 44 is provided with an axial socket, (shown in Fig. III,) in which the preferably cylindrical header 45 is situated and adapted to mash or upset the end of the wire where it protrudes from between the grippers. The header is held against outward movement by means of a set-screw 46, threaded in the upper side of the push-rod 44, having its head countersunk and its inner end impinging the header. The header 45 may be adjusted to protrude more or less from its socket by means of two wedges 47, situated at the rear of the header in a socket extending transversely through the push-rod 44, the wedges being so formed that their outer edges will be parallel, so that by pushing them inward the header will be pushed outward without depriving the latter of a square abutment. It is of course very obvious that instead of two wedges square or oblong blocks of different sizes

might be used. In either event a set-screw 48, having its head flush with the upper surface of the push-rod 44 and its inner end impinging against the wedges or blocks for holding them in the desired position, is provided.

The push-rod 44, like those heretofore described, is provided at its outer end with a bifurcation 49, in which is journaled an anti-friction roller 50, and mounted directly opposite its end, on the power-shaft 3, is the header-cam disk 51, having three operative projections or cams 52, adapted to come in contact with the roller 50 and successively thrust the header forward against the protruding end of the wire.

Having described the mechanism by which the forward thrust of the push-rods 6, 38, and 44 is accomplished, the means by which such rods are retracted or returned to their normal positions with their rollers against the smaller diameters of the cam-disks will now be described.

Mounted transversely of the table 1, journaled in the ears or brackets 53, to the under side thereof, is a rock-shaft 54, which has mounted on it a number of bell-cranks 55 equal to the number of push-rods to be retracted. The under side of each push-rod is provided with a flaring socket or cavity 56, in which engages the upright arm of one of the bell-crank levers, the horizontal arms being provided with adjustable weights 57, so that when the cams or projections 8, 42, and 52 have thrust the push-rods forward and passed their anti-friction rollers, the weighted bell-cranks acting in the sockets 56 in a direction adverse to the pressure of the cams will immediately return the push-rods to their retracted position. The sliding tool-boxes 15 and 27 are provided with similar means for throwing them outward away from the finished nail, which consists of a short shaft mounted transversely of the line of movement of said boxes, on the under side of the table independent ears or brackets 59 and bell-crank levers 60, similar in all respects to the levers 55, having their horizontal arms weighted and their upright arms engaging in sockets similar to the sockets 56 in the under sides of the boxes 15 and 27. The sliding box 16 is provided with a similar arrangement, as shown in Fig. II, the rock-shaft thereof being numbered 60, the brackets 59^a, and the bell-crank 61.

The described push-rods are preferably made flush with the upper sides or faces of the beds 3, 4, and 43, and secured upon such beds are plates 62, 63, and 64, respectively, which hold said rods securely against upward displacement, the plates themselves being held in position by means of screw-bolts 65.

Projecting upwardly from the center-plate 64 is a standard or bracket 66, in which is pivoted the knock-out lever 67. The long end of this lever is provided with an adjustable weight 68, which holds a downturned nose 69 in contact with the header-cam disk 51. The opposite end of this lever is provided

with a downturned finger 70, which, as the lever oscillates under the pressure of the cam, descends through an opening 71 in the cap-plate 19 and comes in contact with the finished nail 72, knocking it out through an opening 73 in the table and bed, the partition 12 being provided with a perforation 74 for the passage of the wire and a downwardly-opening slot 75 for the exit of the nail.

The wire as it comes from the reel (not shown) passes between the rollers of a straightener, consisting of two adjustable blocks or slides 76, mounted upon a pedestal 77 on an extension 78 of the main table, such slides being provided with slots 79, through which screw-bolts 80 pass and engage in the pedestal for locking such slides at the desired adjustment. To one side of the pedestal 77 is mounted a second pedestal 81, provided in its upper edge with a dovetail groove or socket extending transversely of the table. Situated in this socket is a dovetailed slide 82, (see Fig. VII,) provided with an upwardly-projecting pivot-pin 83, screw-threaded at its upper end. Mounted upon this pivot-pin is a sleeve 84, having at its lower end a flange 85 resting upon the face of the pedestal 81, and pivoted upon this sleeve is the feeding-lever 86. The threaded end of the pivot 83 is provided with a tap or nut 87, which bears upon the upper end of the sleeve and tends, when screwed down, to wedge the dovetail slide in its socket at any desired adjustment. Mounted near the outer end of the shaft 3 is the feed-cam disk 88, having three bold projections or cams 89, as shown in Fig. II. Secured to the outer end of the lever 86 by means of pin-and-slot connection 90 91 is a connecting-rod 92, having at its opposite end a double yoke, which fits around the shaft 3, as shown in dotted lines in Fig. II, and has two arms 93 projecting to the rear of the cam 88, and being provided at their rear ends with an anti-friction roller 94, while on the other side of said cam-disk 88 they are provided with an anti-friction roller 95, the distance between said rollers 94 95 being just sufficient to permit one of the cams 89 to pass one roller while the other roller is directly between the other two cams 89. Thus it will be seen that as the cam-disk 88 rotates the connecting-rod 92 will impart an oscillatory motion to the feed-lever 86 for feeding the wire forward. The inner end of the lever 86 is somewhat enlarged and provided with preferably a fixed jaw 96 and a pivoted jaw 97, the two being so formed and arranged as to grip the wire when moving away from the straightener and to release it when moving in the opposite direction.

The bed 11 is provided with a socket or passage 98, in which is situated an adjustable guide-sleeve 99, having a bore for the passage of the wire. The upper side of this sleeve is provided with a screw-threaded socket 100, in which engages the end of an adjusting-screw 101, such screw being passed loosely

through the cap-plate 19 and having a fixed flange 102 countersunk in the lower side of said plate for preventing its upward displacement. 103 is a prismatic head for turning the screw, and 104 are lock-nuts for fixing it in position. By this arrangement it will be seen that the guide-sleeve may be raised or lowered to accommodate itself to the other parts of the machine.

Although we find it preferable to employ the weighted bell-cranks for retracting the push-rods, as hereinbefore described, yet we desire it to be understood that such rods might be provided with double yokes like that described in connection with the feeding mechanism, so as to be returned by the action of the cam-disks themselves without materially departing from the spirit of our invention.

It will of course be understood that all of the cam-disks are so formed as that the feeding mechanism will be caused to feed the wire forward at a time when the grippers and pointers are withdrawn, and the grippers will firmly hold the nail until it has been cut and headed.

Having thus described our invention, the following is what we claim as new and desire to secure by Letters Patent:

1. In a nail-machine, the combination, with the sliding tool-boxes, the push-rods, and anti-friction rollers mounted in the ends of said boxes, of cam-blocks adapted to engage said rollers, having slots extending lengthwise of the push-rods, and bolts passing through said slots and securing said blocks to the push-rods, whereby the said blocks may be adjusted transversely of the tool-boxes, substantially as set forth.

2. In a nail-machine, the combination, with the sliding tool-boxes having anti-friction rollers and the push-rods, of the cam-blocks adapted to engage said rollers, having slotted flanges, and bolts passing through said blocks and securing said blocks to said push-rods, said cam-blocks being adjustable transversely of the tool-boxes, substantially as set forth.

3. In a nail-machine, the combination, with the push-rods and the tool-boxes mounted at an angle thereto and having anti-friction rollers, of the cam-blocks adjustable lengthwise of the push-rods and having the lateral flanges 24 fitting on the tops and the backs of the inclined portions 23 fitting against the sides of the said push-rods, substantially as set forth.

4. In a nail-machine, the combination, with the bed 11, having ways, of the sliding tool-boxes located in said ways and having open top cavities or sockets, the tools or dies fitting in said sockets and being flush with the upper faces of said boxes, and the cap-plate secured to said bed and fitting down upon said boxes and tools for holding the boxes in the ways and the tools in their sockets, substantially as set forth.

5. In a nail-machine, the combination, with a pedestal having a socket, of a slide fitting in

said socket and having a pivot pin or bolt, a sleeve on said pivot having a flange resting on the pedestal, the feed-lever pivoted on said sleeve and having a slot in its outer end, 5 a tap for locking the slide in its socket, the bed 4, having a guideway, the connecting-rod 92, fitting in said guideway, and a bolt passing through said rod and the slot in the end of the feed-lever, substantially as set forth.

6. In a nail-machine, the combination of the bed 11, having the socket 98, the guide-sleeve 99, fitting snugly in said socket so as to be capable of vertical movement only, and 15 having a flange on its outer end resting against the side of said bed, and a set-screw threaded in said sleeve, said screw having a flange or

collar for locking it against movement in one direction and jam-nuts for locking it against movement in opposite direction, substantially as set forth. 20

7. In a nail-machine, the combination, with the pointers and grippers and a cam 51, of the partition 12, arranged between said pointers and grippers and having a passage for the 25 wire, and the slot 75 for the exit of the nail, the pivoted knock-out lever having the finger 70 and the nose 69 resting on the cam, substantially as set forth.

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