

(No Model.)

2 Sheets—Sheet 1.

J. B. HASTINGS.
WIRE NAIL MACHINE.

No. 397,426.

Patented Feb. 5, 1889.

FIG. 1.

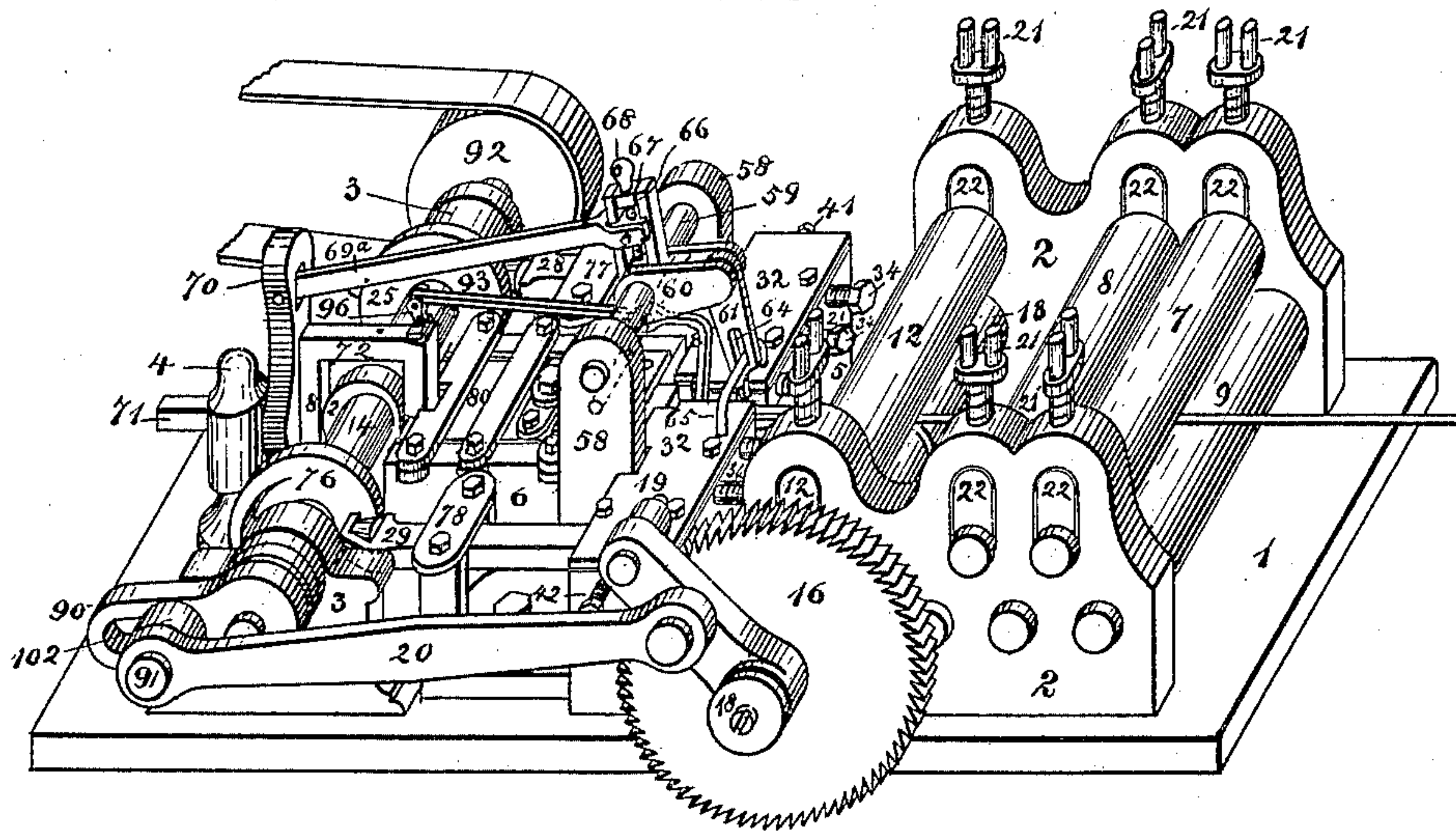


FIG. III.

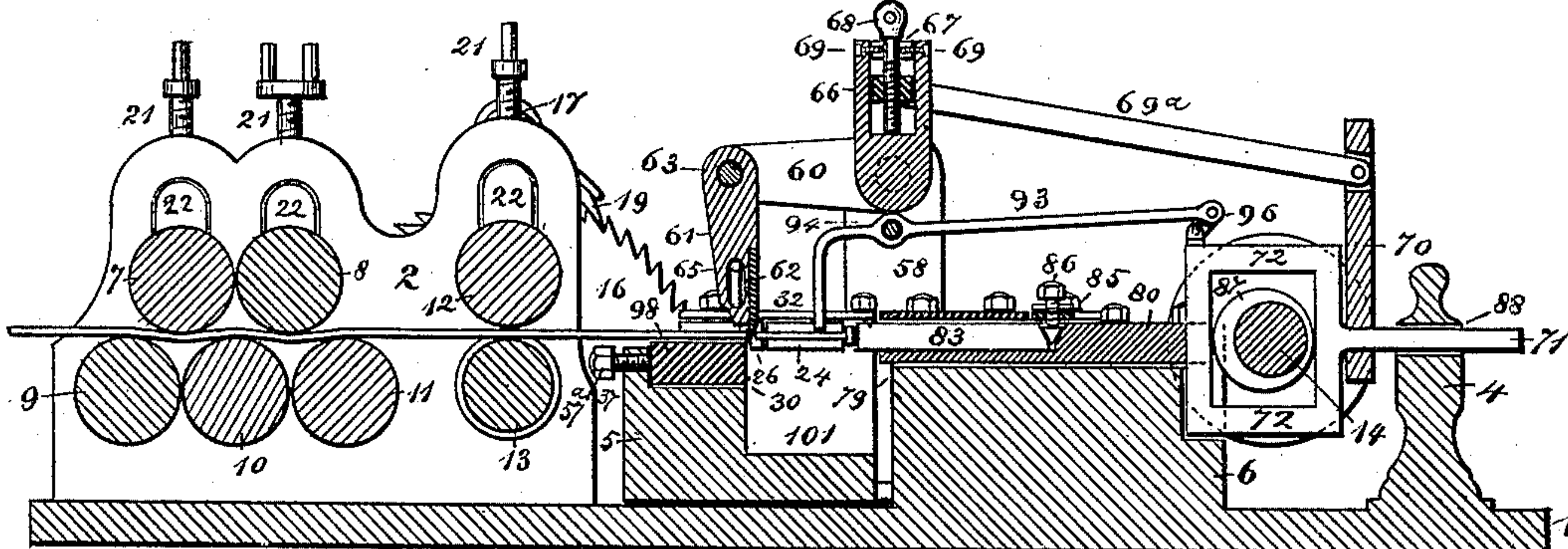
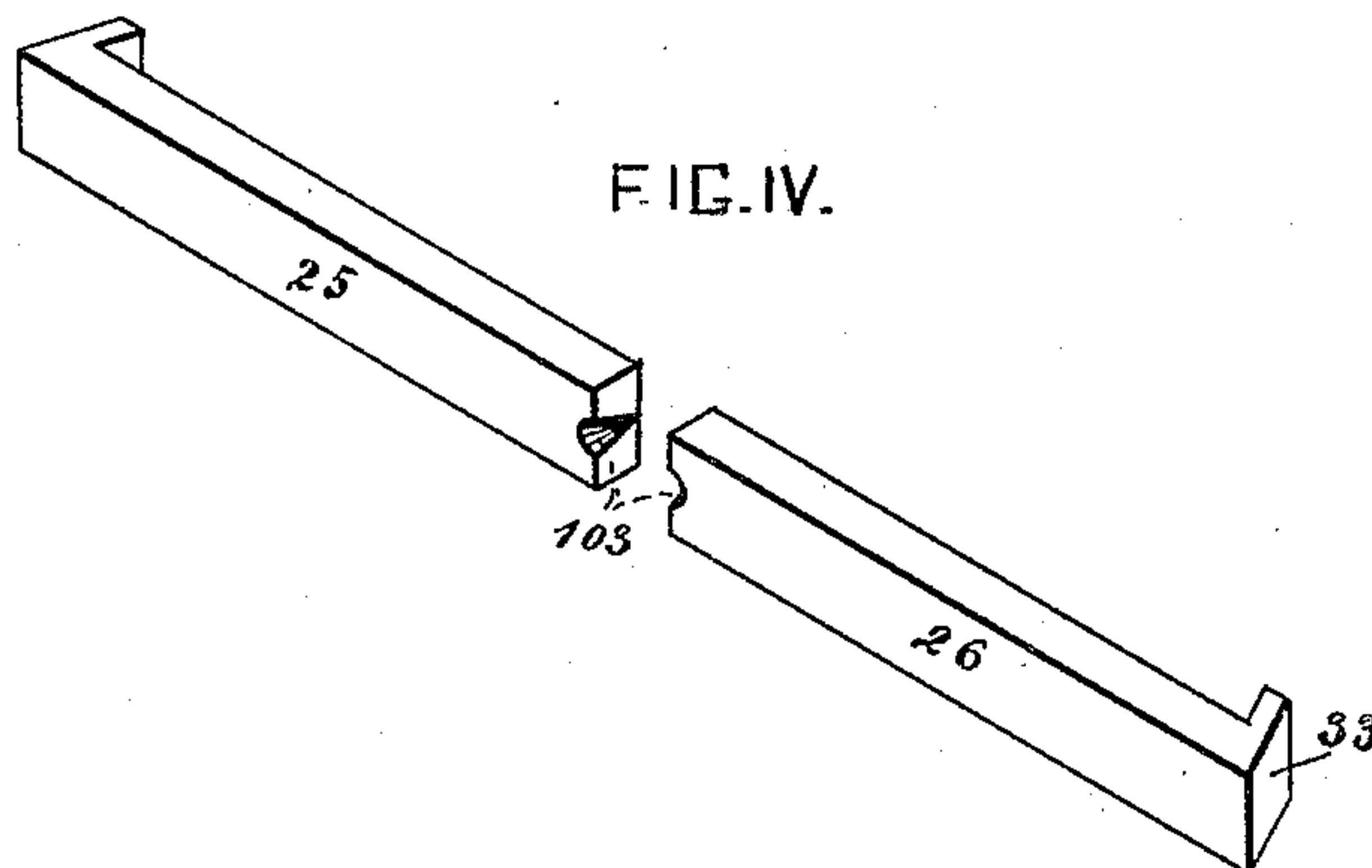


FIG. IV.



Attest,
George H. Knight, Jr.
Emma Arthur.

Inventor:
John B. Hastings
by Knight Bros.
Att'ys

(No Model.)

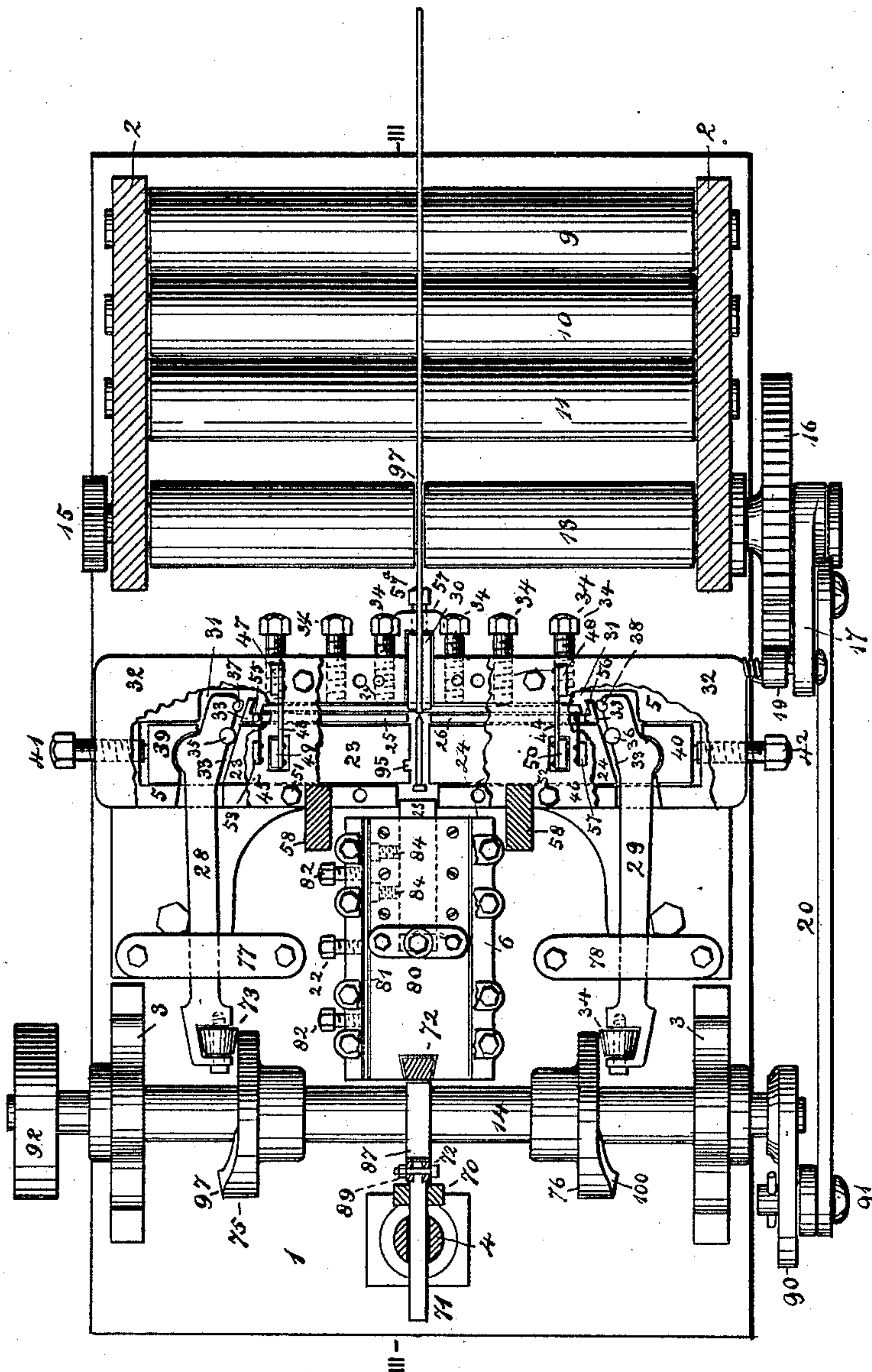
2 Sheets—Sheet 2.

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WIRE NAIL MACHINE.

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FIG. II.



Attest
George H. Knight, Jr.
Emma Arthur,

Inventor:
John B. Hastings
by Knight Bros.
Attest

UNITED STATES PATENT OFFICE.

JOHN B. HASTINGS, OF JACKSON, OHIO, ASSIGNOR OF TWO-THIRDS TO JAMES M. TRIPP AND JAMES M. LIVELY, OF SAME PLACE.

WIRE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 397,426, dated February 5, 1889.

Application filed October 31, 1888. Serial No. 289,624. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. HASTINGS, of Jackson, Jackson county, Ohio, have invented a new and useful Wire-Nail Machine, of which the following is a specification.

My machine is so constructed as to enable it, by means of suitable adjustments, (hereinafter more fully specified,) to make wire nails of various sizes. Said machine is also so constructed as to simultaneously form the head and the point of the nail.

Referring to the accompanying drawings, Figure I is a perspective view of my machine, showing all the parts (with the exception of the "feed" and the "cleaner") in their retracted or inoperative condition. Fig. II is a horizontal section on the line II II, showing the finished nail. Fig. III is a longitudinal vertical section of my machine, showing the cutters, grippers, pointers, and header as having just acted and the cleaner and feed about to act. Fig. IV is a perspective view of the "pointers."

1 may represent the bed-plate, which has standards 2 2, 3 3, and 4, "die-seat" 5, and the "sliding-block seat" 6. The standards 2 2 and the die-seat 5 are attached rigidly to the bed-plate, while the standards 3 3 and 4 and the sliding-block seat 6 are cast integrally with said bed-plate. The standards 2 2 carry rollers 7, 8, 9, 10, 11, 12, and 13, the first five being for the purpose of straightening and the last two for the purpose of feeding the wire, while the standards 3 3 receive the main shaft 14. One journal of the roller 13 is produced beyond the standard (in which it journals) a sufficient distance to admit of its carrying a cog-wheel, 15, which cog-wheel gears with a similar cog-wheel on the roller 12, while the other journal of said roller 12 is produced considerably farther than the aforementioned journal and carries the ratchet-wheel 16 and the vibrating arm 17. The said ratchet-wheel is shrunk upon the journal, while the arm 17 is capable of vibrating thereon, said arm being prevented from sliding off the journal by the washer 18. To the upper end of the said vibrating arm is pivoted a ratchet or pawl, 19, which engages in the teeth of the said ratchet-wheel. A rod or shaft, 20, communicates power from the main shaft

14 to the said vibrating arm. Standards 2 2 receive ordinary set-screws, 21, which control ordinary journal-boxes, 22.

The die-seat 5 supports nearly all the features of improvement in my machine—namely, the "grippers" 23 and 24, pointers 25 and 26, steel liner 27, "cam-levers" 28 and 29, and steel die or anvil 30. The parts enumerated (with the exception of the steel die) are so constructed and arranged in an excavation, 31 31, on the die-seat that the upper surfaces are flush with the upper surface of the die-seat, so that the plates 32 32 (shown partially broken away in Fig. II) may be bolted or screwed to said die-seat, thereby preventing said parts from escaping from the said excavations. The aforesaid grippers 23 and 24 and the pointers 25 and 26 are capable of sliding freely in the said excavation, and have their surfaces 33 33 slightly inclined to a vertical longitudinal plane. The "steel liner" 27 is for taking up any wear on the said gripper and pointer, and is controlled by the set-screws 34. Levers 28 and 29 carry steel-tempered pins 35 and 36, and also steel-tempered cam-pins 37 and 38. These take up the wear by the grippers and pointers for the levers, and are so inserted into said levers that they may be readily detached for the insertion of new and unworn pins. The cam-pins 37 and 38 are so arranged upon the levers that they will operate to force the pointers together subsequently to the pins 35 and 36, forcing the grippers together, but with a more rapid movement, for reasons to be hereinafter stated. The levers fulcrum in sockets in steel blocks 39 and 40, which are capable of sliding freely in the excavations 31 31. The wear of these blocks and levers is taken up by set-screws 41 and 42. The grippers and pointers are caused to bear against pins 35, 36, 37, and 38 by the springs 43, 44, 45, and 46. The springs 43 and 44 are each fastened at one end to the lugs 47 and 48, respectively, which project from the plates 31 31, while their other ends are fastened to lugs 49 and 50, which project from the grippers 23 and 24 and play in the slots 51 and 52 in the said plates. The springs 45 and 46 are attached to the lugs 53, 54, 55, and 56 in a similar manner. The die-seat has a projection, 57, which has an excavation

adapted for receiving the steel die or anvil 30. A set-screw, 57^a, takes up any wear of the said die or anvil. Cast integrally with the die-seat are the standards 58 58, in which
 5 journals the shaft 59 of the crank 60. This crank carries upon the end of one of its arms the cutter-stock 61, in whose lower end is inserted a cutting-blade, 62. This cutter-stock revolves freely upon the shaft 63, and is provided in its lower portion with an elongated
 10 slot, 64, which receives the guiding-bar 65. The other arm of the crank is bifurcated, and has (capable of sliding between the said bifurcations) a sliding block, 66. After the
 15 sliding block is inserted between said bifurcations another block, 67, (which has a screw-threaded orifice that receives a set-screw, 68,) is inserted between said bifurcations, and secured between the upper extremities of said
 20 bifurcations by means of screws 69 69. Sliding block 66 also has a screw-threaded orifice that receives the set-screw 68, whereby the said sliding block may be raised or lowered, thereby giving the crank a longer or shorter
 25 vibration, in order to cut the wire into greater or less lengths. To the sliding block is attached a rod or pitman, 69^a, which connects the said sliding block with the standard 70, which standard is shrunk upon the tongue 71
 30 of the "cam-yoke" 72. The cam-levers 28 and 29 have excavations in their rear ends, in which journal rollers 73 and 74. These rollers are caused to bear continually against the trippers 75 and 76 by pressure of the grippers
 35 and pointers against the forward ends of the levers. Bearing-plates 77 and 78 assist in confining the levers to a horizontal motion. The sliding-block seat 6 carries (in an excavation or channel, 79, provided for their reception) the
 40 sliding or header block 80, and the steel liner 81 for taking up the wear of the said header-block. This liner is controlled by the set-screws 82. The header-block carries (in an excavation provided for its reception in the forward
 45 end of the said header-block) the steel-header 83. Lateral wear of the said header is taken up by the set-screws 84, here shown in dotted lines. A wedge, 85, inserted between the rear surface of the header and the rear surface
 50 of the said excavation and controlled by the set-screw 86, takes up all the longitudinal wear of the header. Dovetailed into the rear end of the header-block is the aforementioned cam-yoke 72. A cam, 87, upon the main shaft
 55 revolves within said yoke, thereby operating to move the header-block forward and backward. The tongue 71 slides in a tunnel, 88, in the standard 4 of the bed-plate. The said tongue is secured to the cam-yoke by bolt 89.
 60 The main shaft 14 carries upon one end a crank, 90, to which is attached, by means of a pin, 91, the aforementioned arm or rod 20. The other end of the main shaft carries the driving-pulley 92. A cleaner, 93, fulcrums
 65 upon a rod, 94, which is capable of rotating in the standards 58 58. One end of the cleaner

(in the closed state of the grippers) rests partially upon the nail, while the remaining part of said end is in the groove 95 in the gripper
 23. To the other end of said cleaner is attached a knuckle-joint, 96, which is also attached to the cam-yoke. 70

The operation of the machine is as follows: As the wire comes from the reel it is, as aforesaid, passed beneath the rollers 7 and 8 and
 75 over the rollers 9, 10, and 11, for the purpose of straightening the said wire. The end of the wire is then inserted into the annular groove 97 in the roller 13. The object of this groove is to enable the rollers 12 and 13 to
 80 bite the wire with more certainty, and thus to feed equal lengths of the said wire at each vibration of the arm 17. The wire is then fed along in a groove, 98, in the upper surface of the die or anvil 30. When the wire is fed
 85 along sufficiently to project slightly beyond the rear surfaces of the grippers, the said grippers will (by the pressing of the trippers 75 and 76 upon the levers 28 and 29) operate
 90 to grip or grasp the wire, immediately after which the wire will be severed by the cutting-blade or shears 62. After gripping and severing the wire by the above-described means, the header 83 and the pointers 25 and 26 will
 95 operate at the same instant to head and point, respectively, the severed portion of the wire. The conical wheels or rollers 73 and 74 have by this time passed the "crown" 99 and 100
 100 of the trippers, when the springs 43, 44, 45, and 46 will, as aforesaid, operate to throw the grippers and pointers back into their original position, and at the same instant the cam 87 will operate to draw back the header, and at the same
 105 time will (by means of the knuckle-joint 96) raise the rear end, and consequently depress the forward end, of the cleaner 93, thereby instantly and surely ejecting the thus finished nail from between the grippers down into a
 110 box or keg placed in the excavation 101. Instantly upon the completion of the nail the continued movement of the main shaft will operate to draw the vibrating arm 17 rearward, which, by the engagement of the pawl
 115 or ratchet 19 in the teeth of the ratchet-wheel 16, will revolve the rollers 12 and 13, thereby feeding along an amount of wire sufficient to make another nail. The crank 90 has a slot, 102, for adjusting the feed mechanism for feeding greater or less lengths of wire, so
 120 as to make longer or shorter nails. The pointers have cone-shaped notches 103, for giving the required form to the nail at the point.

I claim as new and of my invention and desire to secure by Letters Patent— 125

1. A wire-nail machine having the combination of the following elements, to wit: straightening-rollers 8, 9, 10, and 11, feeding-rollers 12 and 13, grippers 23 and 24, pointers 25 and 26, cleaner 93 and the header 83, and
 130 the cutting mechanism consisting of the crank 60, cutter-stock 61, cutting-blade 62, and rod

or pitman 69^a, all constructed and operating substantially as described, and for the purposes set forth.

2. In a wire-nail machine, a bed-plate having standards 2 2, and the die-seat 5, attached rigidly to the said bed-plate, and the standards 3 3 and 4 and sliding-block seat 6, cast integrally with said bed-plate, as set forth.

3. In a wire-nail machine, a feeding mechanism consisting of the rollers 12 and 13, to one end of one of which rollers is attached a cog-wheel, the roller being provided with a cog-wheel, 15, gearing with the aforesaid cog-wheel, a ratchet-wheel, 16, a vibrating arm, 17, loosely fulcruming upon said roller and carrying at its upper end the ratchet 19, and the annular groove 89 upon the roller, for the purposes set forth.

4. In a wire-nail machine, a die-seat, 5, having in its upper surface excavations 31 31, in which rest and operate the grippers 23 and 24, the pointers 25 and 26, the steel blocks 39 and 40, the levers 28 and 29, and the liner 27, the excavated projection 57, in which is inserted the steel anvil or die 30, standards 49 49, cast integrally with the bed-plate, and the set-screws 34, 41, 42, and 48, for taking up the wear of the steel liner, the grippers and the pointer, respectively, and the steel blocks 39 and 40, and the steel die 30, substantially as described, and for the purposes set forth.

5. In a wire-nail machine, the grippers 23 and 24, both having the surfaces 33 33 inclined slightly to a vertical longitudinal plane of the machine, and the lugs 49 and 50, to which are attached the springs 43 and 44, while the gripper 23 is provided with the groove 95, for the purposes set forth.

6. In a wire-nail machine, the pointers 25 and 26, having the inclined surfaces 33 33 parallel with the inclined surfaces of the grippers, and the lugs 55 and 56, to which are attached the springs 45 and 46, said springs being secured to lugs 53 and 54 on the plates 32 32 and operating to keep the pointers within near proximity to the cam-pins upon the levers 28 and 29, for the purposes set forth.

7. In a wire-nail machine, the levers 28 and 29, fulcruming in sockets in the steel blocks 39 and 40, having at one end the friction or wearing pins 35 and 36 and the friction or cam pins 37 and 38, and in the other end the cone-shaped wheels, for the purposes set forth.

8. In a wire-nail machine, the combination of the following elements, to wit: the header-block 80, sliding in a channel, 79, provided for it in the upper surface of the said sliding-block seat 6, a steel header, 83, in an excavation in the forward part of the said header-block, a plate placed over the header and screwed to the header-block, set-screws 82, 84, and 86, a wedge, 85, liner 81, and the cam-yoke 72, operated by the cam 87 and having the tongue or projection 74, adapted for playing in a tunnel, 88, in the standard 4, and the standard 70, projecting from said tongue, for the purposes set forth.

9. In a wire-nail machine, a cutting or shearing mechanism consisting of a crank, 60, the cutter-stock 61, with the cutting knife or blade 62, the standard 70 of the tongue 71, and the rod or pitman 69^a, connecting the said standard with the said crank, all operating as described, and for the purposes set forth.

10. In a wire-nail machine, a cutting mechanism having the following means of adjustment: the crank 60, fulcruming upon the shaft 59, (which journals in the standards 58 58,) having the identically-similar arms, (bifurcations,) between whose upper ends is secured a block, 67, which receives a set-screw, 68, and between which arms also slides a movable block, 66, said movable block having the rod or pitman 69 attached thereto, and also receiving the set-screw 68, whereby said sliding block may be raised or lowered, for the purposes set forth.

11. In a wire-nail machine, a cleaner, 93, fulcruming upon a rod, 94, which journals in the standards 58 58, and whose forward end is adapted for playing in the groove 95 in the gripper 23, and to whose rear end is attached the knuckle-joint 96, which is also attached to the cam-yoke 72, so that when the cam-yoke travels rearward the said knuckle-joint will operate to force the rear end of the said cleaner up, thereby causing the forward end to be depressed, and thereby forcing out the nail, as set forth.

In testimony of which invention I hereunto set my hand.

JOHN B. HASTINGS.

Attest:

EMMETT L. DUNGAN,
C. A. MILLER.