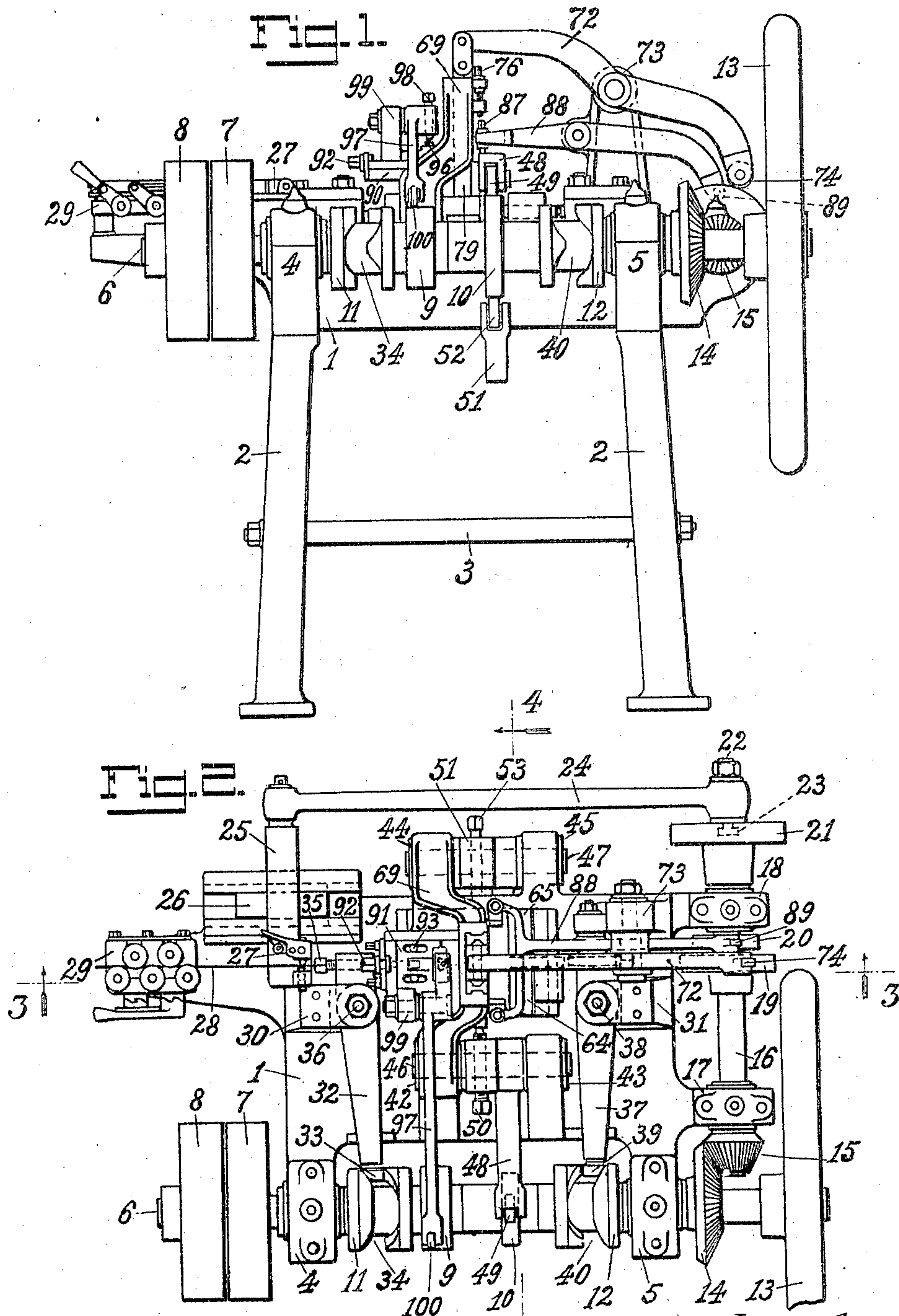


W. OFFERMANN'S.
NAIL MAKING MACHINE.
APPLICATION FILED SEPT. 3, 1908.

950,755.

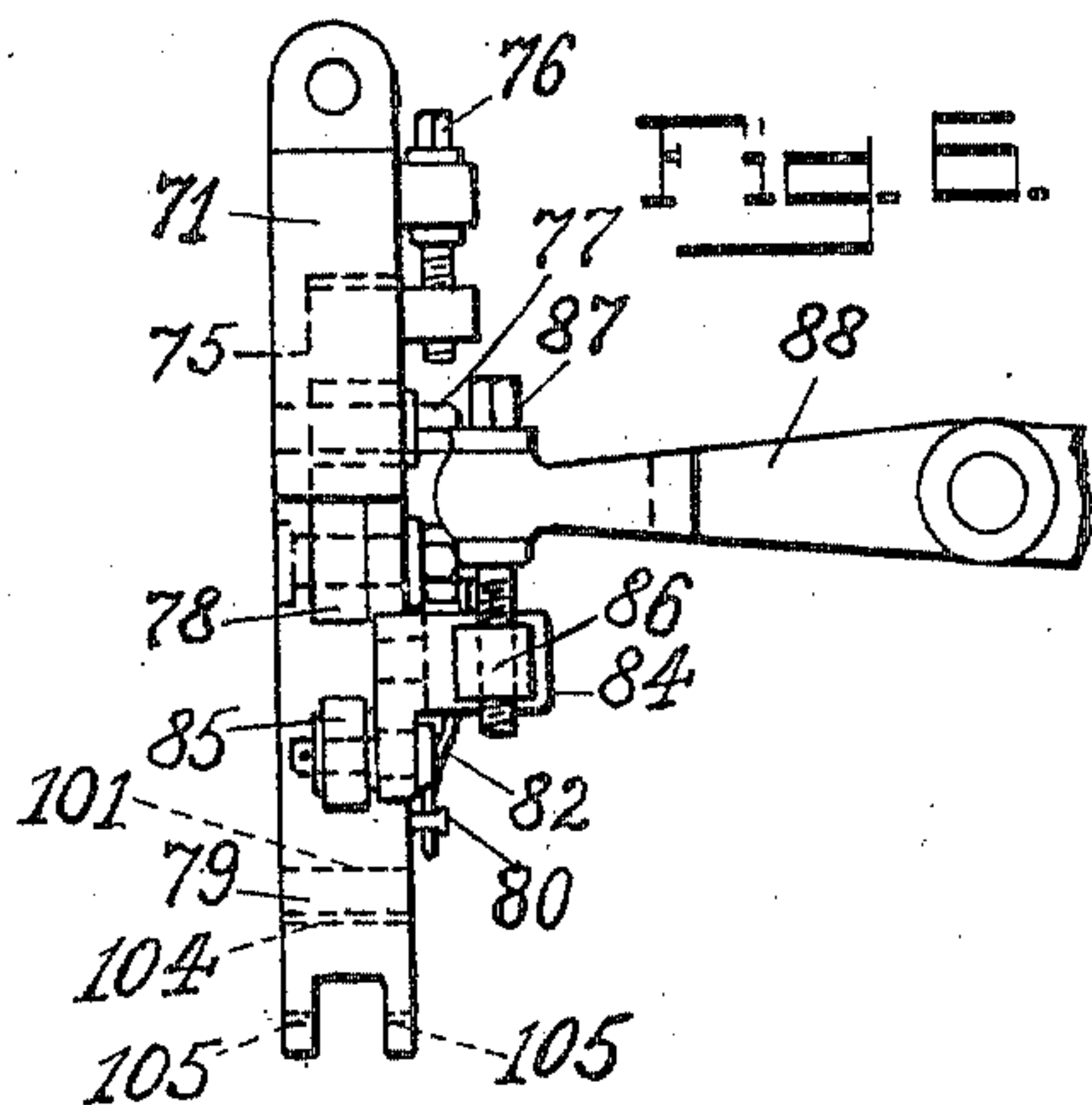
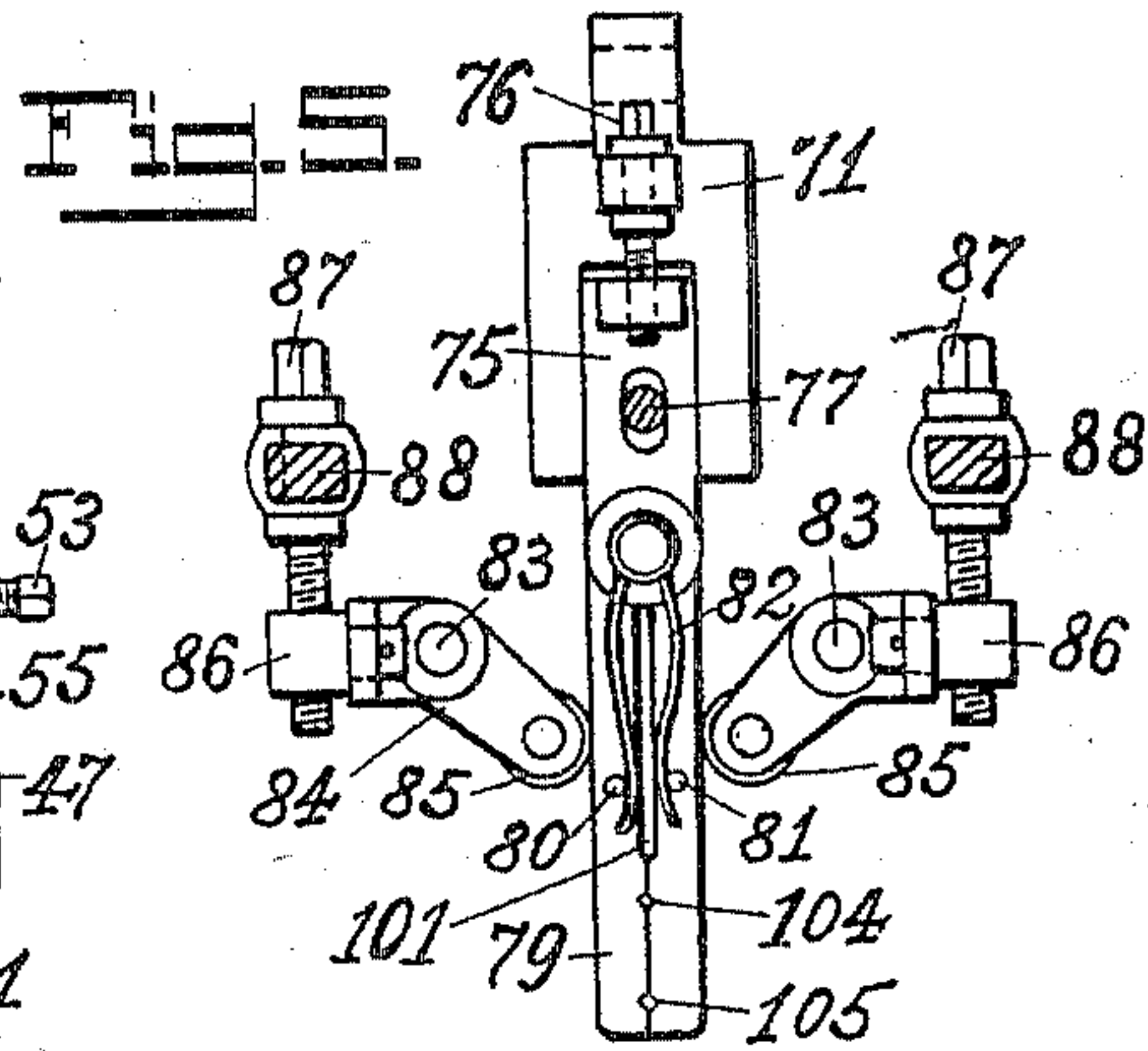
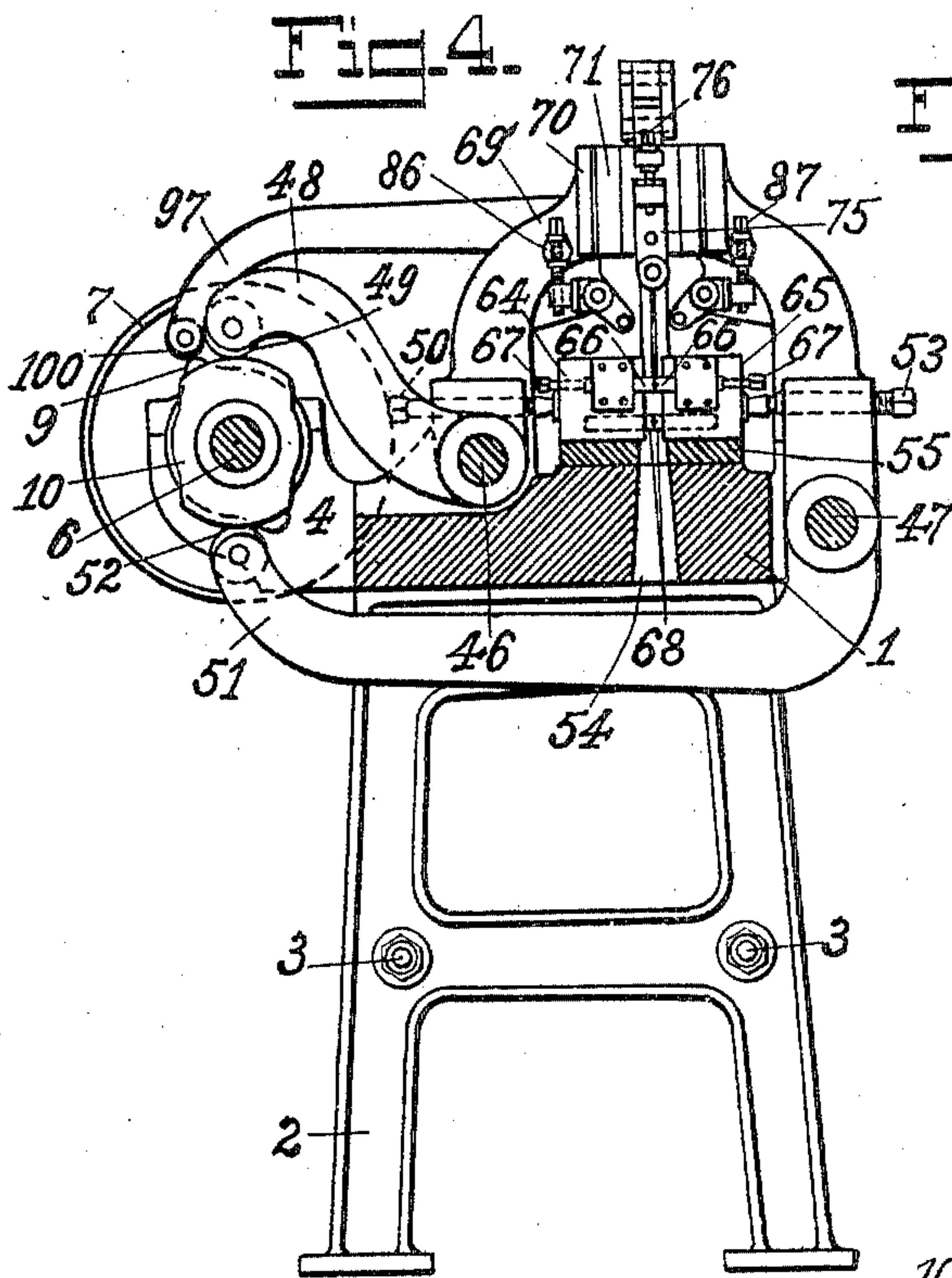
Patented Mar. 1, 1910.
2 SHEETS—SHEET 1.



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WILHELM OFFERMANN, OF AIX-LA-CHAPELLE, GERMANY.

NAIL-MAKING MACHINE.

950,755.

Specification of Letters Patent.

Patented Mar. 1, 1910.

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To all whom it may concern:

Be it known that I, WILHELM OFFERMANN, engineer, a subject of the King of Prussia, residing at No. 8 Rehmsplatz, Aix-la-Chapelle, in the Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Nail-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to a new and useful improvement in nail making machines and more particularly to that class thereof, wherein work-pieces of sufficient length for two nails are cut from a coil of wire, headed at both ends, and then cut and pointed at the middle. The known machines of this class show this drawback, that during the time the wire is fed into the machine, and during the time a work-piece of sufficient length for two nails is cut off, the devices for the formation of the heads and the points of the nails must remain idle, so that during each revolution of the main shaft of the machine only two nails can be made.

The object of my present invention now is to produce a nail making machine, wherein by means of peculiar arrangements of the several mechanisms, and without complicating the machine any more than those of the known and less effective machines of this class, it is made possible to produce at each revolution of the main shaft of the machine four nails from a single wire, without multiplying the cutting, heading, and pointing devices. This is accomplished by arranging and operating these devices independently of each other, so that during the time the wire is fed into the machine the heads are formed on the last cut work-piece, and the points formed on the previously headed work-piece.

In the accompanying drawings:—Figure 1 is a side-elevation of my new machine. Fig. 2 is a plan view of my machine. Fig. 3 is a sectional view taken on line 3—3 of Fig. 2. Fig. 4 is a similar view taken on line 4—4 of Fig. 2. Fig. 5 is a front-elevation of the tongs employed for transporting the work-piece and the means for opening and closing said tongs. Fig. 6 is a side-view of the tongs and the means for opening and closing them.

The table 1 upon which the operating

mechanisms are arranged is supported by the standards 2 braced by the stay-rods 3. In the bearings 4 and 5 the main shaft 6 of the machine is journaled, which carries the fast and loose pulleys 7 and 8, the cams 9 and 10, the cam-wheels 11 and 12, the fly-wheel 13, and the bevel-wheel 14, which meshes with the smaller bevel-wheel 15 seated upon the shaft 16, which is journaled in the bearings 17 and 18. Upon this shaft 16 are also seated the cams 19 and 20 and the crank-disk 21. Since the bevel-wheel 14 is twice as large in diameter as the bevel-wheel 15, the shaft 16 makes twice as many revolutions as the shaft 6. In the crank-disk 21 a crank-pin 22 is radially adjustably seated in a slot 23 as customary and carries the one end of the connecting-rod 24, whose other end is connected with the arm 25 of the slide 26, upon which a gripper 27 of any suitable form is arranged. The wire 28, unwound from a coil of wire (not shown) is led through the straightening-device 29 of any known construction, grasped by the gripper 27 when the latter is in its outer position, and forwarded when the slide 26 is drawn forward at the proper moment. Upon the table 1 are also arranged opposite each other the two brackets 30 and 31. In the bracket 30 is pivotally arranged the powerful lever 32, the longer arm of which carries a friction-roller 33 guided in slot 34 of the double-throw cam-wheel 11, whereas the shorter arm of said lever carries a set-screw 35. By means of this arrangement the lever 32 must swing twice back and forth around its pivot-pin 36 when the main shaft 6 makes one revolution. In a similar manner the lever 37 is arranged in the bracket 31, wherein it swings on the pivot-pin 38. The longer arm of this lever is likewise provided with a friction-roller 39 guided in the slot 40 of the double-throw cam-wheel 12. The shorter arm of this lever is provided with a set-screw 41. The table 1 is also provided with lugs 42, 43, 44 and 45, of which the first two lugs serve for the reception of the shaft 46, and the last-named two lugs for the reception of the shaft 47. As shown in Fig. 4 a peculiarly shaped lever 48 is seated upon the shaft 46, and carries in its longer arm a friction-roller 49 which contacts with the top-face of the cam 10, whereas its shorter arm bears a set-screw 50. Upon the shaft 47 there is seated an L-shaped lever 51, whose longer arm carries a

friction-roller 52, which contacts with the under-face of the cam 10, whereas its shorter arm carries a set-screw 53. Between the shorter arms of the levers 48 and 51 the table 1 is provided with a slot 54, a continuation of which is found in the flanged plate 55 held against lateral displacement by the ribs 56 and 57 and securely held in place by the heavy side-bars 58 and 59, wherein the headers 60 and 61 are guided, as best shown in Fig. 3. Between the vertical flanges of the plate 55 the dove-tail guide-bars 62 and 63 are arranged, which guide the die-holders 64 and 65 pushed toward each other twice during each revolution of the main-shaft 6 by the levers 48 and 51. In the sides of the die-holders 64 and 65 the halves of the head-forming dies 66 are arranged opposite each other in such a manner, that when the die-holders approach each other the die-halves on the one die-holder 64 will stand exactly opposite the die-halves carried by the die-holder 65 (Fig. 4). The halves of the dies 66 are made adjustable by means of the screws 67, whereas the point-forming dies 68 are simply held within recesses of said die-holders 64 and 65.

From the lugs 42 and 44 a frame 69 projects whose upper end forms a guide-way 70 for the slide 71, which is arranged vertically above the point-forming dies 68. The slide 71 is hinged to the lever 72 which is pivoted to the standard 73 and carries in its outer end a friction-roller 74 which engages the cam 19. Within the slide 71 a block 75 is adjustably held by the adjusting-screw 76 (Figs. 1, 3, 4, 5, 6) and capable of being securely connected to the slide 71 by means of the stud-screw 77 (Figs. 3, 5, 6). Through the pendent lug 78 of the slide 71 the halves of the transporting tongs 79 are hinged, which are provided on their outer faces with pins 80 and 81. To open the halves of the tongs 79 a spring 82 is provided, and to close them stub-shafts 83 are secured to the frame 69, upon which the two armed levers 84 are pivotally seated. One end of each of these levers 84 presses by means of a friction-roller 85 against one side of the tongs, whereas the other end carries a swivel-nut 86. Through these nuts the adjusting-screws 87 held in the forked ends of the lever 88 pass, which lever is likewise pivoted to the standard 73. The outer end of the lever 88 contacts by means of the friction-roller 89 with the cam 20 in such a manner, that when the forked end of the lever 88 is pressed down the halves of the tongs 79 are pressed against each other, and when said forked end is raised, the spring 82 forces them apart again.

The frame 69 carries a guide-plate 90 whereon a slide 91 is adjustably held by means of the adjusting-screw 92 and the studs 93. In a pendent lug 94 of this slide

a bushing 95 is seated through which the wire 28 passes and is held therein during the cutting operation. For the cutting of the wire a knife 96 is guided in a dove-tailed guide-slot of the slide 91 and adjustably connected with the shorter arm of the lever 97 by means of the set-screw 98. The lever 97 is pivoted to a lug 99 of the slide 91 and bears in its longer arm a friction-roller 100 which runs on the double-throw cam 9.

The operation of the machine is as follows:—The wire 28 is passed through the straightening-device 29 in the usual manner and straightened, then passed through the bushing 95 and pushed inward by the gripper 27 through the recess 101 formed by the halves of the tongs 79 until the free end of the wire 28 abuts against the adjustable stop 102 secured to the slide-bar 59. The knife 96 is now pushed down by the lever 97 to cut off a piece sufficiently long for two nails. This piece of wire rests by friction between the stop 102 and the adjustable bearing 103 secured to the slide-bar 58 and is caught by the tongs 79 when the latter have been sufficiently raised to bring the recesses 104 opposite the newly cut work-piece whereupon the tongs are closed by the lever 88. Slide 71 and tongs 79 are now lowered by the lever 72 until the work-piece stands opposite the head-forming dies 66, whereupon the die-holders 64 and 65 are closed by the levers 48 and 51. In this position the work-piece is headed at both ends by the headers 60 and 61 operated by the levers 32 and 37 respectively. Simultaneously herewith the tongs 79 are opened and raised until its lower recesses 105 take up a position opposite the headed work-piece and the upper recesses 104 are placed opposite the previously cut work-piece. The tongs 79 are now closed again by means of the lever 88 and the die-holders 64 and 65 sufficiently opened to release the headed work-piece, whereupon the tongs 79 are lowered by means of the lever 72 until the newly cut work-piece stands opposite the head-forming dies 66 and the previously headed work-piece opposite the point-forming dies 68. The die-holders 64 and 65 are now closed, the upper work-piece headed in the manner described, and the previously headed work-piece cut in two and simultaneously herewith pointed by the dies 68, during which operation the wire 28 is pushed through the recess 101 formed in the tongs 79 and cut off by the knife 96. The tongs are now opened, the finished nails drop through the slot 54 out of the machine, and the tongs raised to take hold of the last cut work-piece and of the previously headed work-piece and thus begin a new cycle of operation.

From the foregoing it will be seen, that

the whole cycle of operation is repeated twice during one revolution of the main shaft 6, for which reason two work-pieces, each sufficiently long for two nails, are cut off from the wire 28, headed at both ends, and cut at the middle and pointed, so that four nails are formed during each revolution of the main-shaft of the machine.

I claim:—

1. A nail making machine comprising a wire-feeding device, a cutting device for cutting-off a work-piece of a length sufficient for two nails, means for receiving and transiently retaining the severed work-piece, head-forming dies arranged below said work-piece receiving and retaining device, headers adapted to be slidingly operated on a line with said head-forming dies, point-forming dies arranged at one side of the axis of said head-forming dies, and vertically movable tongs adapted to grasp said work-piece to present it to said head-forming dies, change its hold on said work-piece to transfer it to said point-forming dies, and subsequently open to drop the finished product.

2. A nail making machine comprising a wire-feeding device, an adjustably arranged and reciprocally operated knife for cutting off a work-piece sufficiently long for two nails, adjustable means adapted to receive and transiently retain severed work-pieces of different lengths, adjustable head-forming dies arranged below said adjustable means for receiving and transiently retaining said work-pieces, headers arranged adjacent to and adapted to be longitudinally operated on a line with said head-forming dies, point-forming dies arranged at one side of the axis of said head-forming dies, vertically movable tongs adapted to grasp the work-piece and present it in succession to said head-forming dies and to said point-forming dies, means for opening said tongs when in their lowest position, and means for closing said tongs when in their highest position.

3. In a nail-making machine of the class described the means forming the heads and points of the nails, comprising in combination a guide-way, die-holders intermittently operated in said guide-way, elements of the head-forming dies adjustably arranged in pairs and opposite each other in said die-holders, elements of the point-forming dies arranged in said die-holders opposite each other and at one side of the axis of the head forming dies, headers cooperating with said elements of the head-forming dies, and means for transferring the work-pieces from the head-forming dies to the point-forming dies.

4. In a nail making machine of the class described, the means for successively presenting the work-piece to the head-forming dies and to the point-forming dies which are located at different points in the machine, comprising in combination a frame, a guide-way in the upper end of said frame, a slide guided in said guide-way, means for operating said slide, an adjustable block on said slide, tongs hinged to said block and provided with recesses in the opposing faces of its halves for the passage of the wire when the tongs are closed and recesses arranged at different heights for grasping the work-pieces, means for opening said halves of said tongs, and means for closing said tongs for grasping said work-pieces.

5. In a nail making machine of the class described the means for closing the tongs employed for presenting the work-piece in succession to the head-forming dies and to the point-forming dies which are located at different elevations in the machine, comprising in combination, a two-armed lever arranged at each side of said tongs, a friction-roller journaled in the arm of each of said levers adjacent to said tongs, swivel-nuts arranged in the other ends of said levers, a forked cam-operated lever, and adjusting screws rotatably held in the forked end of said cam-operated lever and screwed into the swivel-nuts.

6. A nail making machine of the class described comprising in combination, a table, a wire-feeding device, a wire-cutting device, means for holding the severed work-piece in a position on a line with the path of the wire feed, head-forming dies arranged below said work-piece holding means, longitudinally operated headers, point-forming dies arranged at one side of the axis of said head-forming dies, vertically movable tongs for grasping said work-piece and presenting it in succession to said head-forming dies and to said point-forming dies, means for closing said two sets of dies simultaneously on said work-piece, means for opening said tongs when in the lowest position to release said work-piece, and means for closing said tongs when in the highest position to grasp said work-piece.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILHELM OFFERMANN.

Witnesses:

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ELIZE KOELBUSCH.