

(No Model.)

3 Sheets—Sheet 1.

G. W. ANGELL.  
WIRE NAIL MACHINE.

No. 604,203.

Patented May 17, 1898.

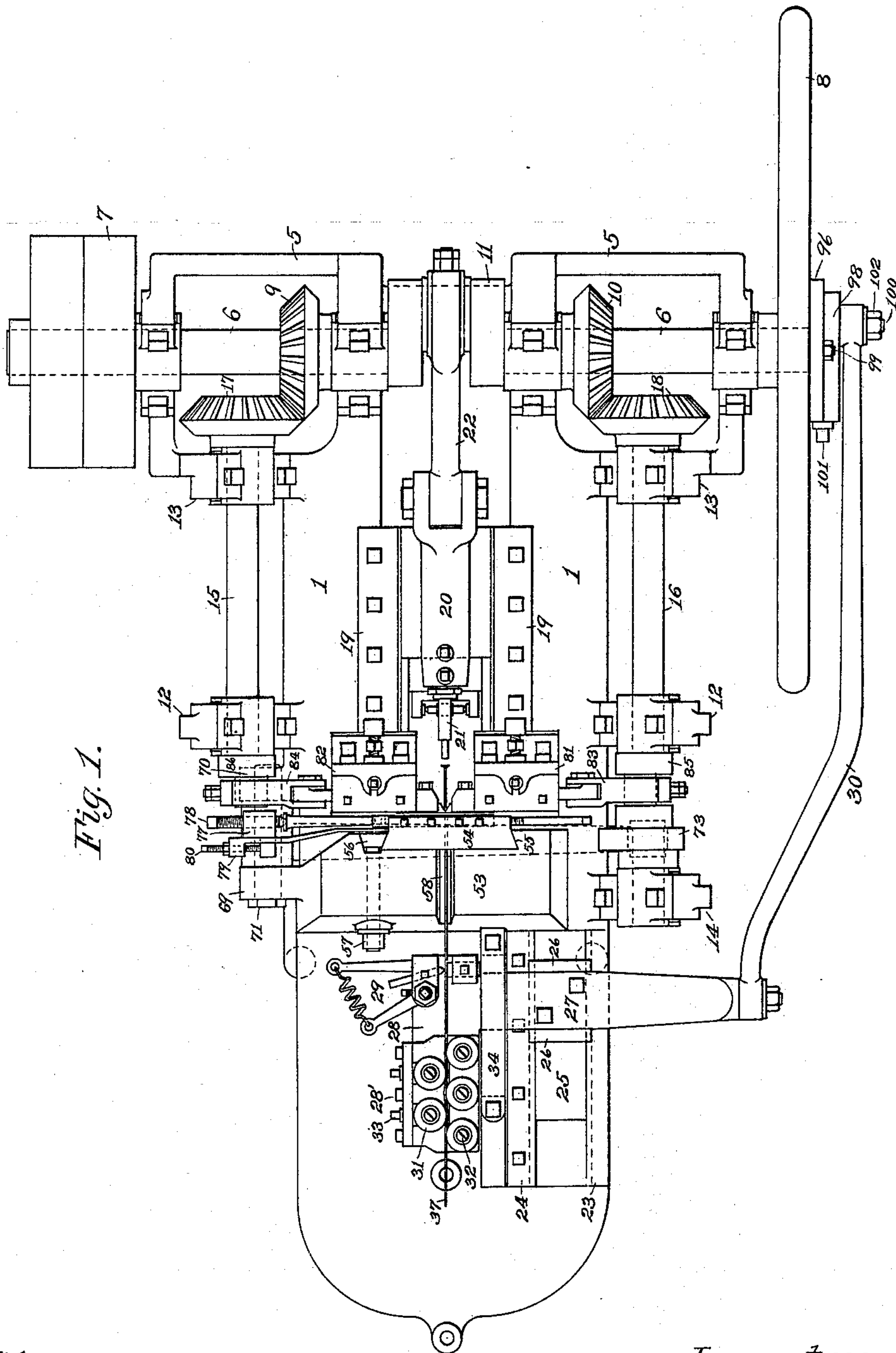


Fig. 1.

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Inventor,  
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by *J. H. Whittemore*  
Att'ys.

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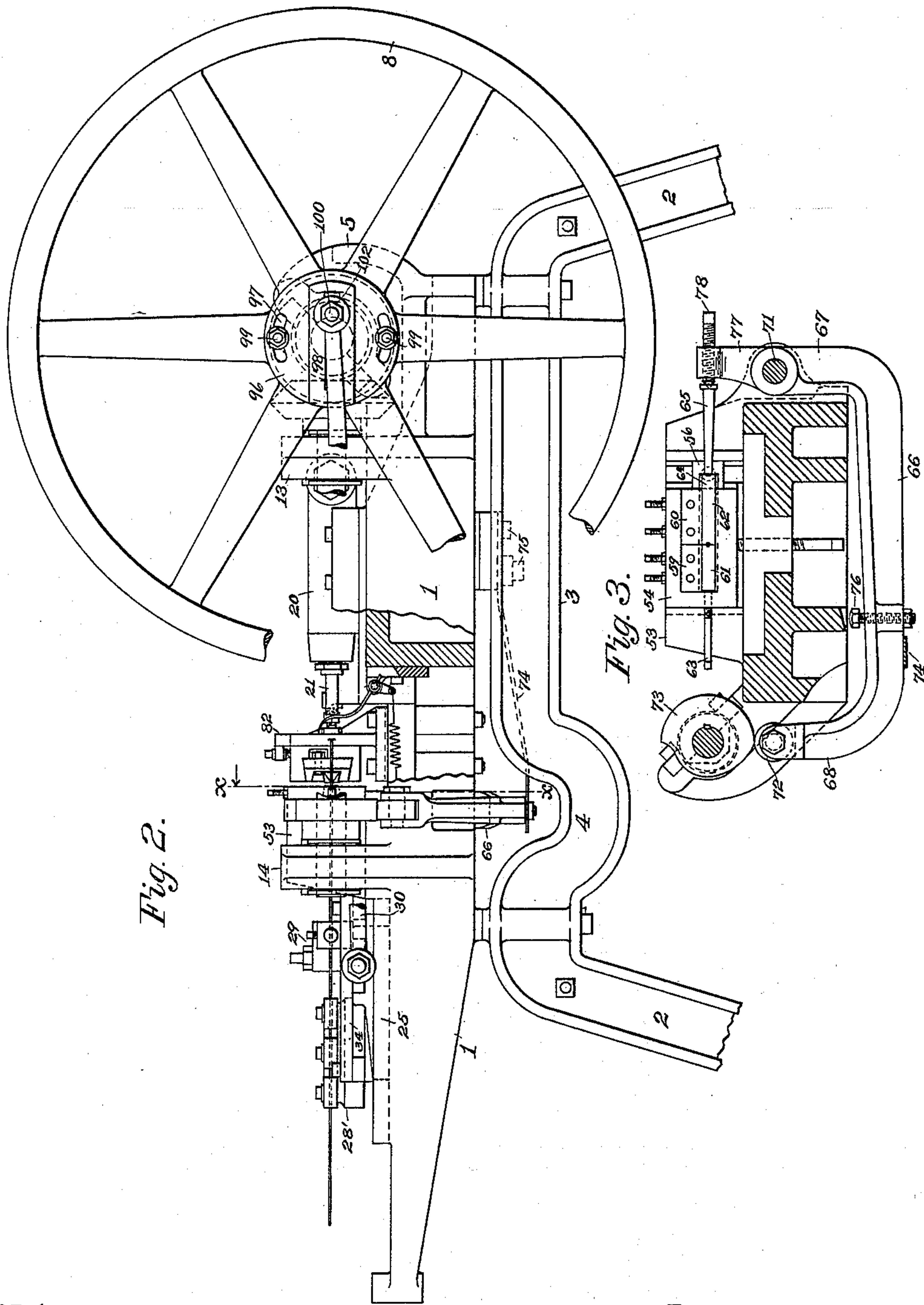


Fig. 2.

Fig. 3.

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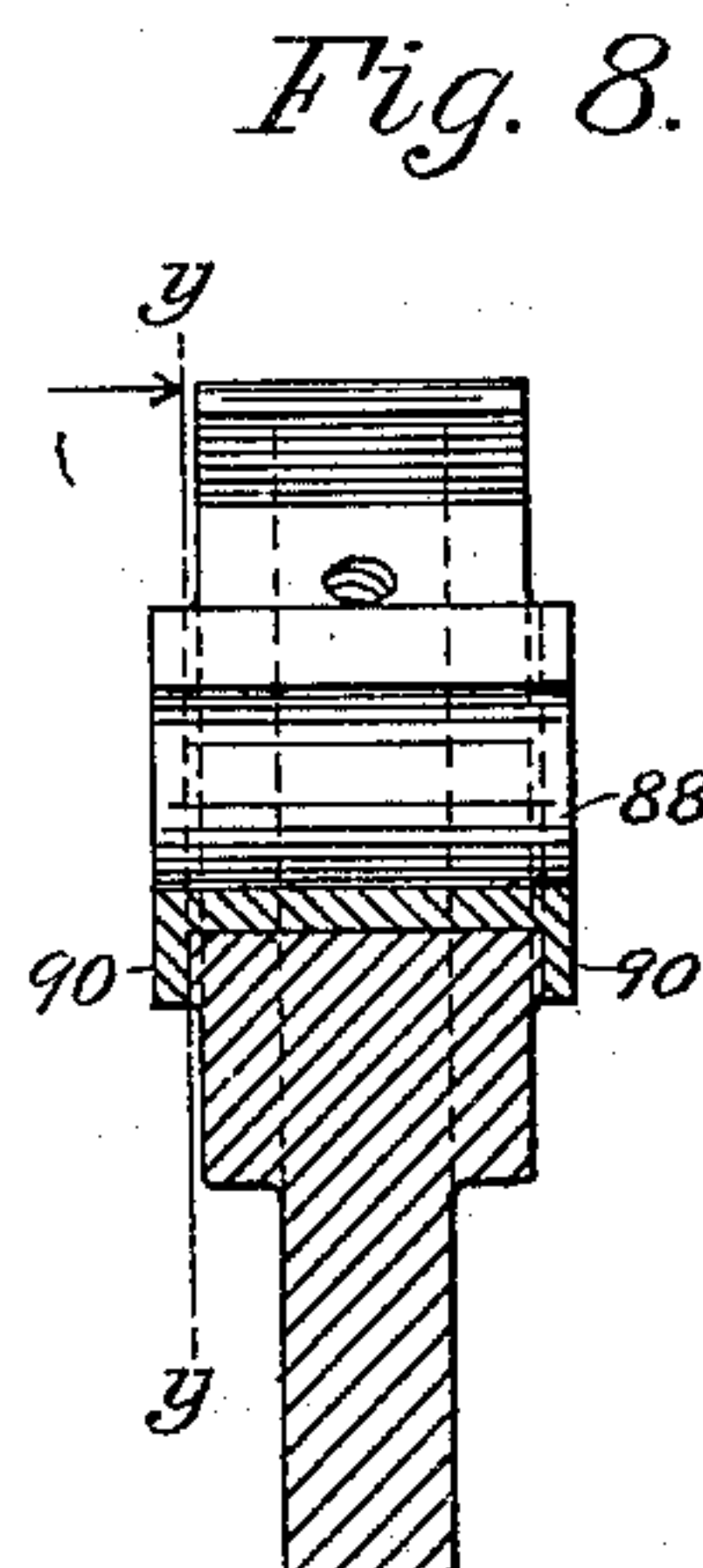
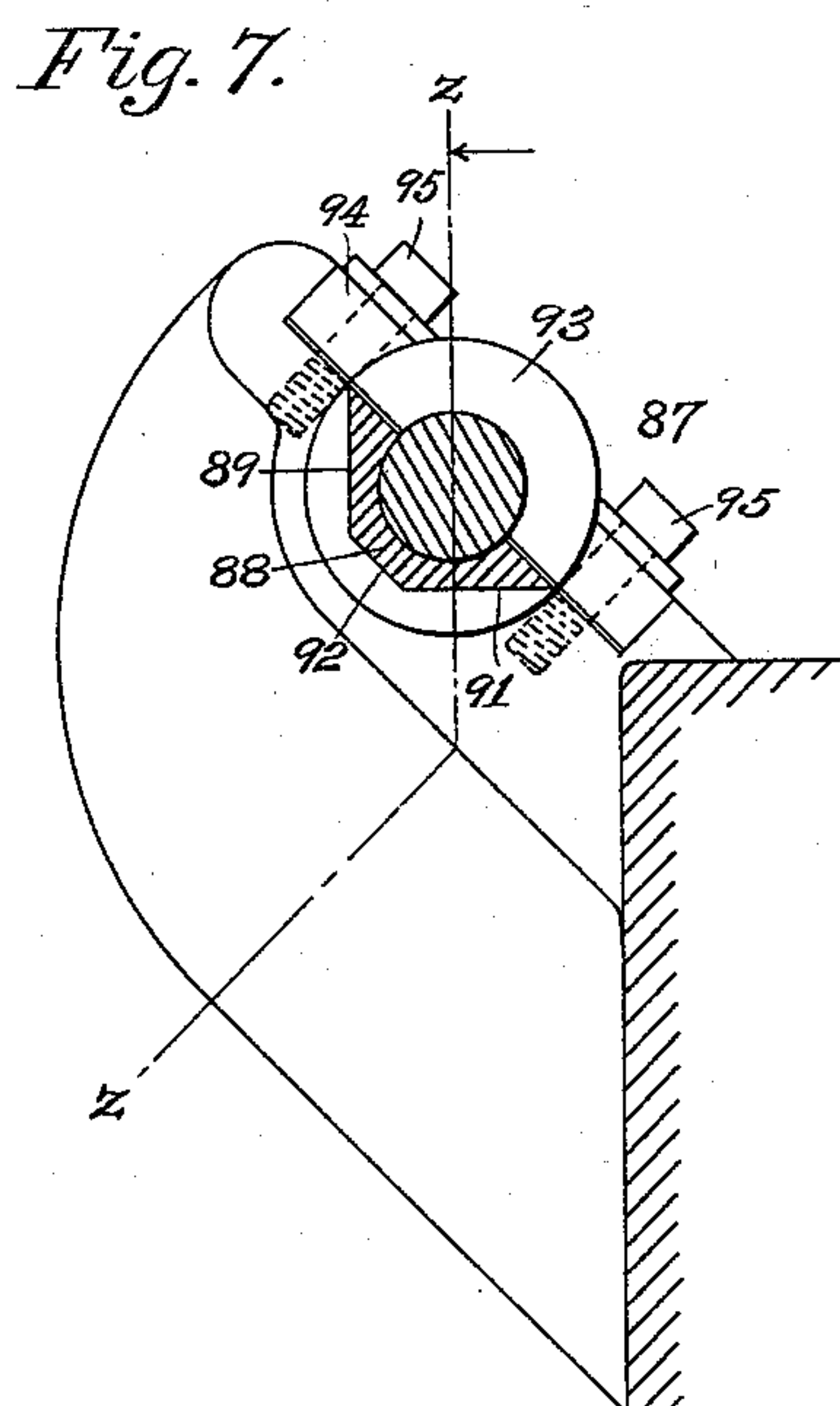
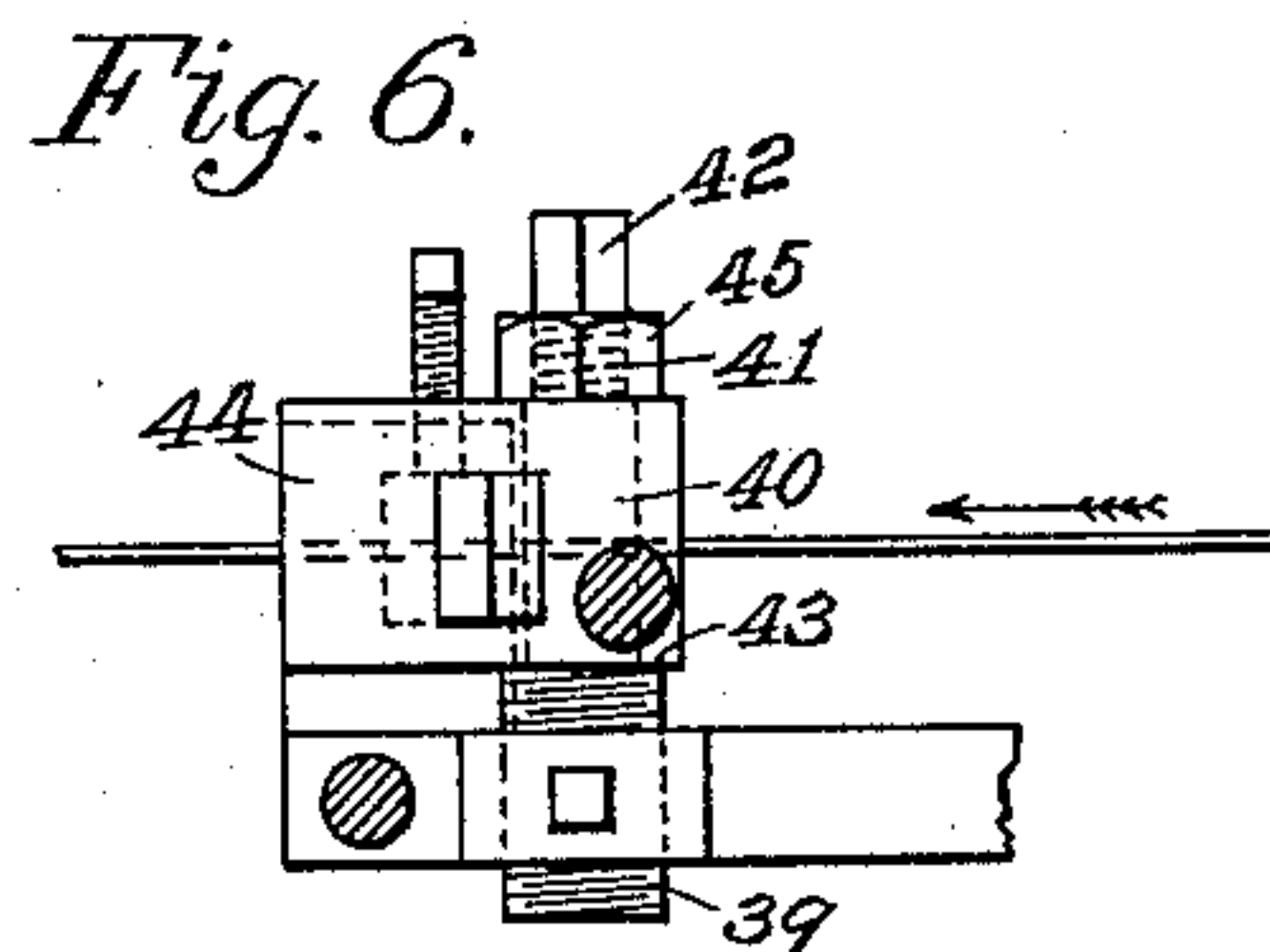
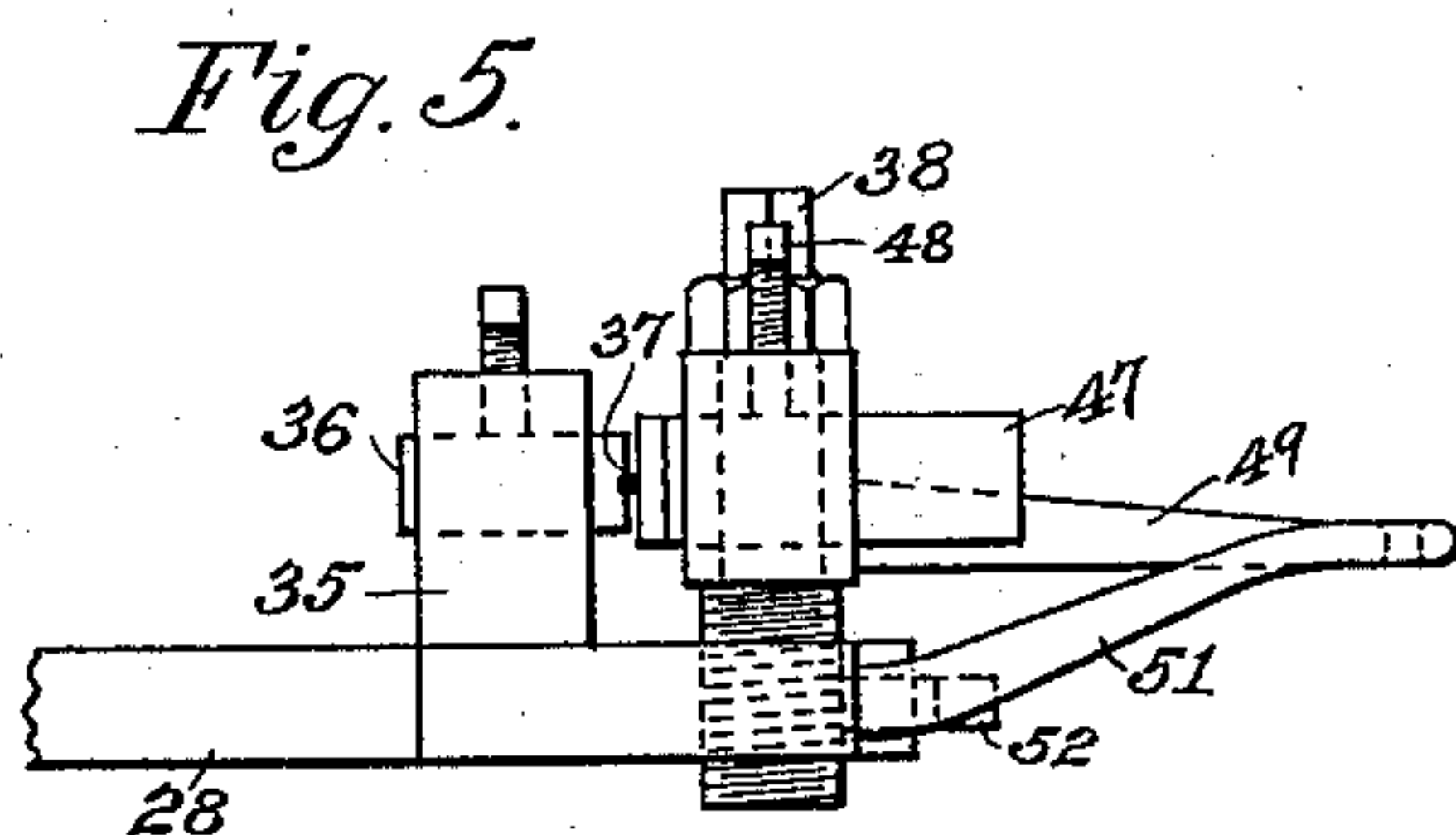
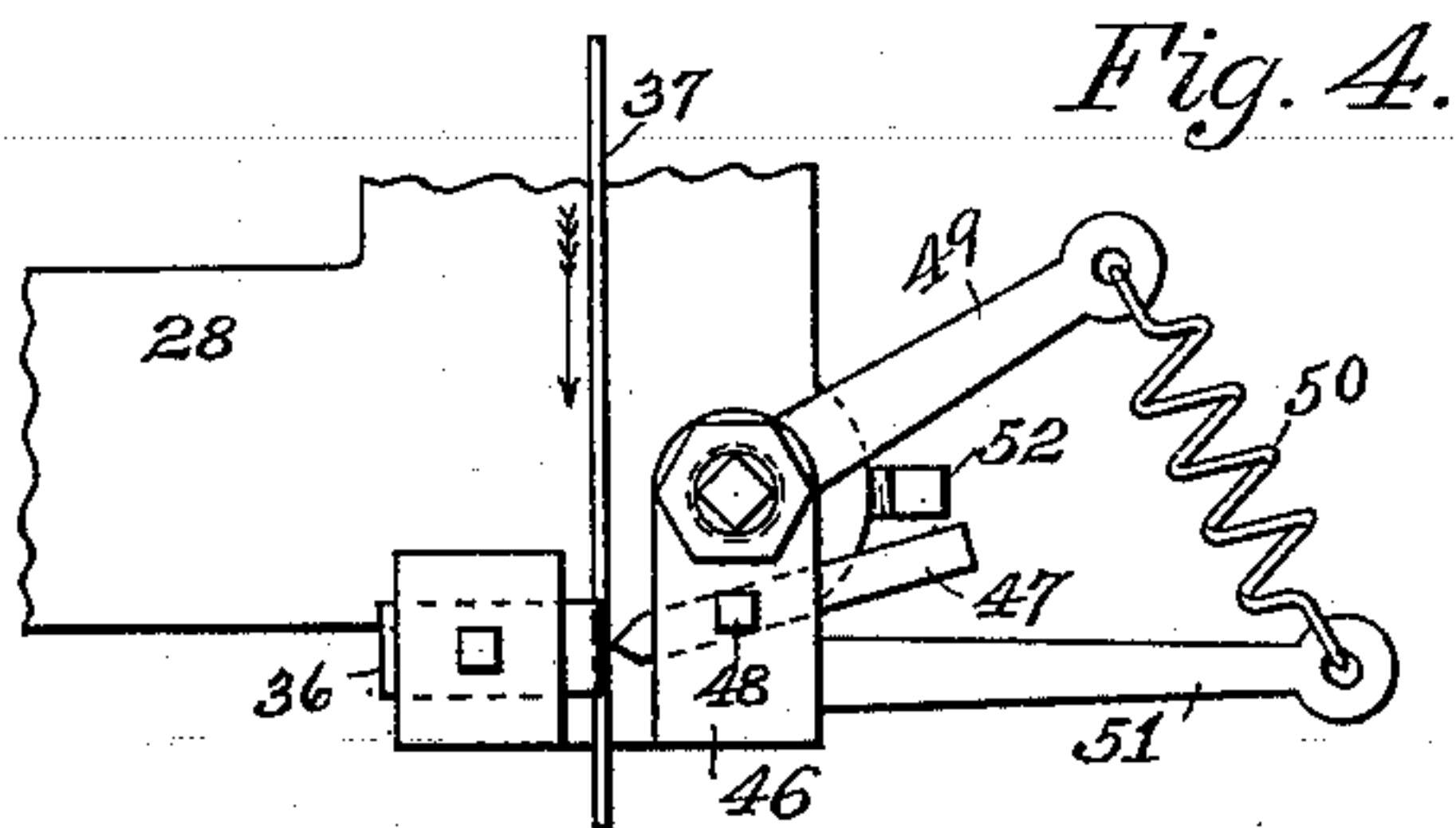
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# UNITED STATES PATENT OFFICE.

GEORGE W. ANGELL, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-THIRD TO  
WILBUR C. WHITEHEAD, OF SAME PLACE.

## WIRE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 604,203, dated May 17, 1898.

Application filed October 4, 1897. Serial No. 653,985. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. ANGELL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Wire-Nail Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention relates to improvements in nail-machines, and has particular reference to that class that are adapted to form the nails from wire.

One of the objects of my invention is to produce a machine of the type referred to that shall be composed of a lesser number of parts than is required in nail-machines as now manufactured, whereby the mechanism may be run at a high rate of speed and the friction of the parts and their liability of breaking will be reduced to a minimum.

Another object of the invention is to so construct the machine that access may be easily had to any of the parts for the purpose of adjusting or removing the same, whereby a larger number of machines may be cared for by a single operator.

With these objects in view my invention consists in the peculiar construction of a nail-machine and in the novel arrangement and combination of its various parts, as will be more fully hereinafter described, and pointed out specifically in the claims.

35 In the drawings, Figure 1 is a plan view of my improved machine. Fig. 2 is a side elevation thereof with the bed partially broken away. Fig. 3 is a section taken on line *x x*, Fig. 2. Fig. 4 is a detailed plan view of the feed mechanism. Figs. 5 and 6 are respectively front and side elevations thereof. Fig. 7 is a detailed view, partly in section, of my improved bearing, taken on line *y y*, Fig. 8; and Fig. 8 is a section on line *z z*, Fig. 7.

45 In Figs. 1 and 2, 1 is an ordinary bed-plate mounted upon suitable supports, such as 2, the horizontal member 3 of said supports being depressed at one end, as at 4, for a purpose hereinafter set forth. At the rear of the machine and projecting outwardly therefrom are brackets 5, which form bearings for a main drive-shaft 6, and upon this shaft are

secured the drive-pulleys 7. At the opposite end of the shaft a balance-wheel 8 is secured, and intermediate the pulley and balance-wheel are located two miter-wheels 9 and 10. 55 At its center the shaft is provided with a square crank 11. Forwardly of the brackets 5 and projecting upwardly from the bed on either side are bracket-arms 12 and 13, and upon one side of the machine is a similar bracket-arm 14. These bracket-arms form bearings for the side shafts 15 and 16, which carry, respectively, upon their ends at the rear of the machine miter-wheels 17 and 18, which engage with the miters upon the shaft 6. Forwardly of the crank 11 is a frame 19, bolted to the bed-plate, and 20 is a cross-head adapted to slide in said frame. In the forward end of the cross-head is the usual hammer 21, and the rear of the head is connected 70 to the square crank by a connecting-bar 22.

A general description having been given of the ordinary parts of the machine, a more detailed explanation will be given of the devices embodying my improvements. These embrace in general an improved feed mechanism, a novel construction of the clamping mechanism, and various other improvements relating to the adjustment and detachment of parts of the machine, as will be hereinafter 80 set forth.

In my improved feed mechanism 23 represents a frame bolted or secured in any suitable manner to the bed 1 and is provided with guideways 24, in which a block 25 is adapted 85 to reciprocate. The block just referred to is in turn provided with guides 26, between which is arranged a feed-arm 27, extending beyond the block 25 at either side, carrying at one end a rectangular feed-plate 28, upon which is located the straightener 28' and a chisel-feed 29, and at the other end the feed-rod 30. The rod last mentioned is adjustably connected at its free end with the balance-wheel 8. 95

The straightener is of the usual construction, comprising rolls 31, mounted on pins 32 and capable of lateral adjustment by means of bolts 33; also, the feed-arm 27 after passing through the guides 26 is provided with a cap 34 to prevent that portion of the arm from flying upwardly while in motion. 100



So far as the feed mechanism has now been described the construction is the same as in an ordinary machine. My invention, however, is embodied within the chisel-feed mechanism; and it consists in so constructing the feed that the chisel proper will be capable of a vertical adjustment. The object of this adjustment is to permit the chisel to be raised or lowered after some little time in use, so as to present a new portion of the chisel edge to the wire, whereby a new feed is provided without necessitating the complete removal of the chisel and the substitution of another.

In construction the feed is as shown in detail in Figs. 4, 5, and 6. Upon the plate 28 is located a support 35, in which is adjustably secured a wire guide or die 36, against which the wire 37 is adapted to bear. Adjacent to the support 35, upon the opposite side of the wire, is an upright, preferably in the form of a threaded bolt 38, which is adapted to be threaded within the plate 28. The bolt thus referred to comprises a threaded portion 39, a smooth cylindrical portion 40 of a lesser diameter than the thread, and a threaded portion 41, the latter portion terminating in a squared head 42. Swiveled upon the cylindrical portion of the bolt thus described and resting on the shoulder 43 is a chisel-support 44, which is prevented from vertical movement by means of a nut 45.

In construction the chisel-support comprises a chisel-plate 46, which is slotted longitudinally to permit a chisel 47 to extend therethrough, said chisel being secured to the plate by means of a bolt 48. An arm 49 is preferably formed integral with the chisel-support, and is secured, by means of a spring 50, to an outwardly-extending arm 51, that is formed integral with the feed-plate 28. A set-screw 52 is employed for the purpose of securing the threaded bolt in its proper position after the required adjustment is made.

It will be seen by the construction of feed thus set forth that when the edge of the chisel, which is preferably of a larger size than ordinarily employed, becomes worn a new surface may be presented to the wire by simply raising or lowering said chisel through the agency of the mechanism described. Thus I have provided an exceedingly simple and effective feed mechanism which may be made to perform its work in a more satisfactory manner than has heretofore been accomplished.

In the improved mechanism for clamping the wire, which holds the same firmly while the nail-head is being formed, the principal object of my invention is to reduce the number of operating parts in order that less friction may arise and to apply power to the clamps in a more positive manner than heretofore has been done. In construction my clamping mechanism comprises the usual anvil-block 53, preferably integral with the bed and provided with a large recess adapted to

receive a die-block 54, as plainly shown in Fig. 3, which is secured to the anvil by means of the bevel 55, formed on one side of the block, and a wedge bolt 56 upon the opposite side, said bolt passing through the anvil 53 and secured in proper position by means of a nut 57. The anvil is deeply grooved at 58, which terminates in a similar groove and hole in the die-block, through which groove and hole the wire 37 is adapted to pass from the feed mechanism.

The die-block 54 is suitably recessed to permit blocks 59 and 60 to be fixedly secured therein, and within the blocks just mentioned are arranged the dies 61 and 62. The die 61 is made adjustable within its block through the agency of a threaded bolt 63, which passes through the die-block and bears against the end of the die, as plainly shown.

The die 62 is adapted to slide within the block 60 and is provided with an extension 64 at its free end, which is recessed to receive the end of a drive-rod 65. The free end of this driving-rod is secured to my improved driving mechanism, which is of the following construction:

The numeral 66 represents a transverse lever arranged, preferably, beneath the machine, passing through the depressed portions 4 of the bed-supports, and is provided with upwardly-extending ends 67 and 68. The end 67 is pivotally supported between bearings 69 and 70 upon a pin 71, Fig. 1, while the remaining end of the lever 68 carries a roller 72, which is adapted to frictionally engage with a cam 73 or with any suitable driving mechanism located upon the side shaft 16. The extension 67 of the lever terminates in an upright portion 77, through which a threaded bolt 78 passes, engaging with the recessed end of the driving-bar 65, as plainly shown in Fig. 3. A puller 79, of ordinary construction, is secured to the die 64 and rests in a slot formed in the top of the extension 77, being secured thereto by a threaded bolt 80, as plainly shown in Fig. 1.

A spring-bar 74, secured to the under side of the bed by bolts 75, is adapted to bear against the lever, the function of said spring being to move said lever upwardly after its depression by the cam, thereby releasing the clamping-die to permit the wire to pass readily therethrough. A stop 76, adjustably secured within the lever, as shown in Fig. 3, limits the upward movement of the same, thereby regulating the travel of the clamping-die.

In the construction of the clamping mechanism as thus set forth it will be seen that I have materially reduced the number of parts by employing a single lever which is operated upon one side of the machine by the side shaft, the lever in turn acting at the opposite side of said machine upon the movable die for the purpose of reciprocating the same. It is also to be noticed that in employing a transversely-



arranged lever, one end of which is pivotally secured to the machine, a greater degree of leverage is obtained and a minimum amount of space is utilized, whereby more simple and effective means are employed for operating the parts than heretofore has been used.

The mechanism for severing the finished nail from the wire is preferably of ordinary construction, comprising the usual standards 81 and 82, in which are secured the ordinary cutters, operated through connecting-bars 83 and 84, which in turn are connected to and operated by the square cranks 85 and 86 upon the side shafts 16 and 15.

A further feature of my invention is a novel method of mounting the side shafts upon the machine-bed, whereby the lateral thrusts imposed upon the shafts will be transmitted to, met, and sustained by a solid backing formed by parts of said bed, thus producing a more compact machine and one capable of operating for a considerably longer period of time than an ordinary machine before repairs or adjustments are necessary. To accomplish this result, I provide the bracket-arms 12 and 13, before referred to, each with an inclined face upon the side in proximity to the machine-bed, and in each inclined face I form a recess so constructed that the free end of the bracket-arm will be shaped thereby into a substantially vertical portion with respect to the bed, the inner vertical face of which will be substantially parallel to the side of said bed. Within these recesses are placed journal-boxes, which are adapted to receive the shafts. By this construction a solid backing is formed by the bracket-arm for the shaft at a point where the latter receives its greatest strain—namely, on the line of lateral thrust.

To permit the shafts to be removed from their bearings in a rapid and easy manner, each recess in the inclined face is made angular in configuration, the angle being substantially a right angle, and construct the lower member of the divided journal-box of similar configuration, so that a vertical face of the box and the vertical portion of the arm will abut, the line of abutment being parallel to the side of the machine, whereby the shaft, together with its boxes, may be lifted directly from the bearings.

More particularly the construction of the device is as follows: In Figs. 7 and 8 the numeral 87 represents a divided journal-box, the lower member 88 of which is preferably a right angle in configuration, having a flat vertical face 89 and the horizontal face 91, the junction of the two faces being beveled for convenience, as at 92. A cap 93 completes the box, forming the upper member thereof, and is clamped to the lower by means of marginal flanges 94 and securing-bolts 95. At either end of the box are semicircular flanges 90. The lower member of the box described is adapted to rest in a recess of like configuration formed for the same in the inclined face of the bracket-arm, as plainly

shown in Fig. 7, and the vertical face 89 of the member abuts against the corresponding face upon the vertical portion of the arm.

While I have shown and described in my improved clamping mechanism the operating-lever as having a pivotal connection at one end with the machine, I do not desire to limit myself to this particular construction, although I deem the point at which the lever is supported as the preferable point of suspension for the lever in order to obtain the maximum amount of leverage. It will be obvious that the fulcrum of the lever may be changed at will without departing from the spirit of my invention; moreover, that different types of lever-bars may be employed other than that shown and described, which will still be within the scope of my invention.

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

1. In a wire-nail machine, the combination with the bed, of a reciprocating feed-plate arranged thereon, a device for vertically adjusting the feed, consisting of an upright 38 provided with a threaded portion 39, adapted to engage in a threaded recess formed in the plate, a shoulder 43, and cylindrical portion 40, means for clamping the upright within the plate, after the required adjustment of the former has been made, a chisel-carrier swiveled upon the upright, comprising the chisel-plate 46 and outwardly-extending arm 49, a chisel fixedly secured within the chisel-plate, and a spring connection between the arm 49 and an arm 51 integral with the feed-plate.

2. In a wire-nail machine, the combination with the bed, of a main driving-shaft mounted thereon and a side shaft driven thereby, a wire-clamping device comprising a horizontally-arranged stationary die, and a similarly-arranged movable or operating die, said operating-die being mounted for lateral movement, a transverse lever fulcrumed at one side of the bed, extending across the latter to the opposite side in proximity to the driven side shaft, and adapted to be operated by said shaft, a connecting device intermediate the supported end of the lever and the movable die, whereby, upon the actuation of the lever, an inner lateral pressure will be exerted by the latter upon said die, and means for returning the lever to its initial position after its actuation.

3. In a wire-nail machine, the combination with the machine-bed and a main driving-shaft mounted thereon, of a driven side shaft, a wire-clamping device, a transverse U-shaped lever arranged across the machine-bed and embracing the sides thereof, said lever having one of its embracing-arms fulcrumed upon one side of the bed, and the other arm extending in proximity to the side shaft upon the opposite side of said bed, and adapted to be operated by the driven shaft, an extension projecting upwardly from the



supported end of the lever above the level of the bed, a connecting device intermediate the extension and the clamping device, whereby, upon the actuation of the lever, a lateral pressure will be exerted by the latter upon the clamping mechanism, and means for returning said lever to its initial position after its actuation.

4. In a wire-nail machine, the combination with the machine-bed, of a main driving-shaft mounted thereon, a side shaft driven thereby, a wire-clamping device comprising a horizontally-arranged stationary die, and a similarly-arranged movable or operating die, said operating-die being mounted for lateral movement, a transverse U-shaped lever arranged across the machine-bed and embracing the sides thereof, said lever having one of its embracing-arms fulcrumed upon one side of the bed, and the other embracing-arm extending in proximity to the shaft upon the opposite side of said bed, and adapted to be operated by the shaft, an extension projecting upwardly from the supported end of the lever above the level of the bed, a connecting device intermediate the free end of the extension and the operating-die, whereby, upon the actuation of the lever, an inward lateral pressure will be exerted upon the die by the extension, and means for returning the lever to its initial position after its actuation.

5. In a wire-nail machine, the combination with the machine-bed, of a bracket projecting from the side of the bed above the level thereof, said bracket having an inclined face toward the bed and a bearing in said inclined face below the top of the bracket, and a cap for said bearing, the parts being so arranged and constructed that the side thrusts will be received by the bracket-body and transmitted therethrough to the frame or bed itself.

6. In a wire-nail machine, the combination with the main driving-shaft, of a driven shaft operated thereby, a lever having upwardly-projecting end portions 67 and 68, and an extension 77, a pin 71 upon which one end of the lever is pivotally supported, a roller-bearing in the free end of the lever, a clamping-die, connections between the extension 77 and said die, a cam secured to the driven shaft adapted to bear against the roller-bearing in the free end of the lever, the spring 74, and the adjustable stop 76, substantially as described and shown.

7. In a wire-nail machine, the combination with the machine-bed and a main driving-shaft mounted transversely thereon, of a plurality of bracket-arms arranged upon each side of the bed and extending upwardly there-

from, each arm being provided with an inner inclined face and having a recess formed within said face, shaping the free end of the arm thereby into a substantially vertical portion with respect to the bed, a journal-box arranged within each recess, each box constructed to abut against the vertical portion of the arm, whereby a solid backing is formed for the side shafts adapted to receive and sustain the lateral thrusts imposed upon said shafts, and the side shafts arranged one upon each side of the machine within the journal-boxes, and adapted to be driven by the main shaft.

8. In a wire-nail machine, the combination with a machine-bed and a main driving-shaft mounted transversely thereon, of a plurality of bracket-arms arranged upon each side of the bed and extending upwardly therefrom, each arm being provided with an inner inclined face and having a recess formed within said face shaping the free end of the arm into a vertical portion with respect to the bed, a journal-box arranged within each recess, each box having constructed thereon a vertical face adapted to abut against the vertical portion of the bracket-arm, whereby a solid backing is formed for the side shafts adapted to receive and sustain the lateral thrusts imposed upon the shafts, and the said side shafts arranged one upon each side of the machine within the journal-boxes and adapted to be driven by the main driving-shaft.

9. In a wire-nail machine, the combination with the machine-bed and a main driving-shaft mounted transversely thereon, of a plurality of bracket-arms arranged upon each side of the bed and extending upwardly therefrom, each arm being provided with an inner inclined face and having a recess, substantially a right angle in configuration, formed within said face, shaping the free end of the arm, with respect to the bed, into a vertical portion having an inner vertical face, a divided journal-box mounted within the recess, the lower member of said box conforming in configuration to said recess, whereby a solid backing is formed by the bracket-arm for the shafts, and the said shafts arranged one upon each side of the machine within the journal-boxes and adapted to be driven by the main driving-shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. ANGELL.

Witnesses:

L. J. WHITTEMORE,  
P. J. HALLA.