

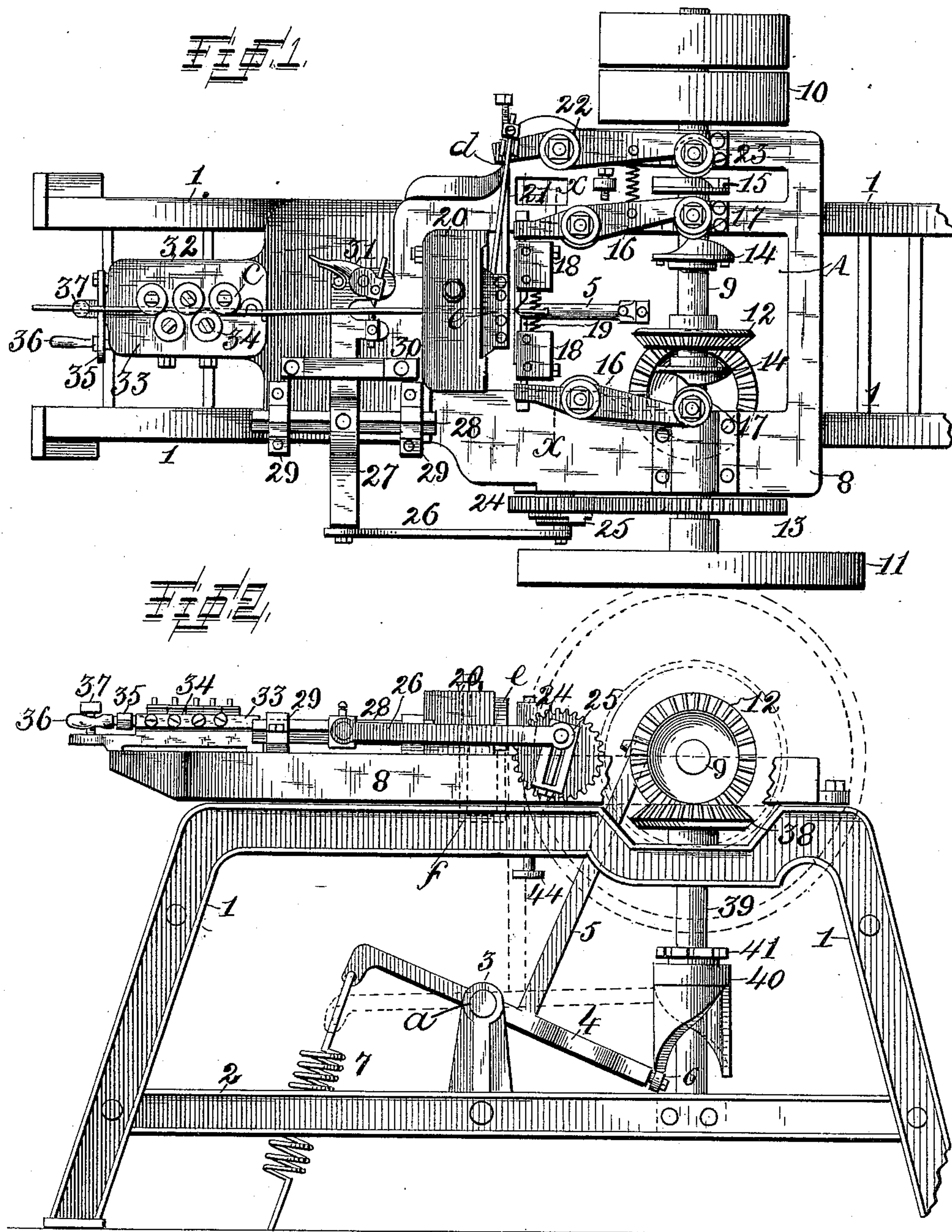
(No Model.)

2 Sheets—Sheet 1.

H. E. PIGGOTT.  
WIRE NAIL MACHINE.

No. 429,950.

Patented June 10, 1890.



WITNESSES:

C. J. Fowler.  
E. E. Higdon

INVENTOR:

Henry E. Piggott.  
BY *Higdon & Higdon*  
his ATTORNEYS,

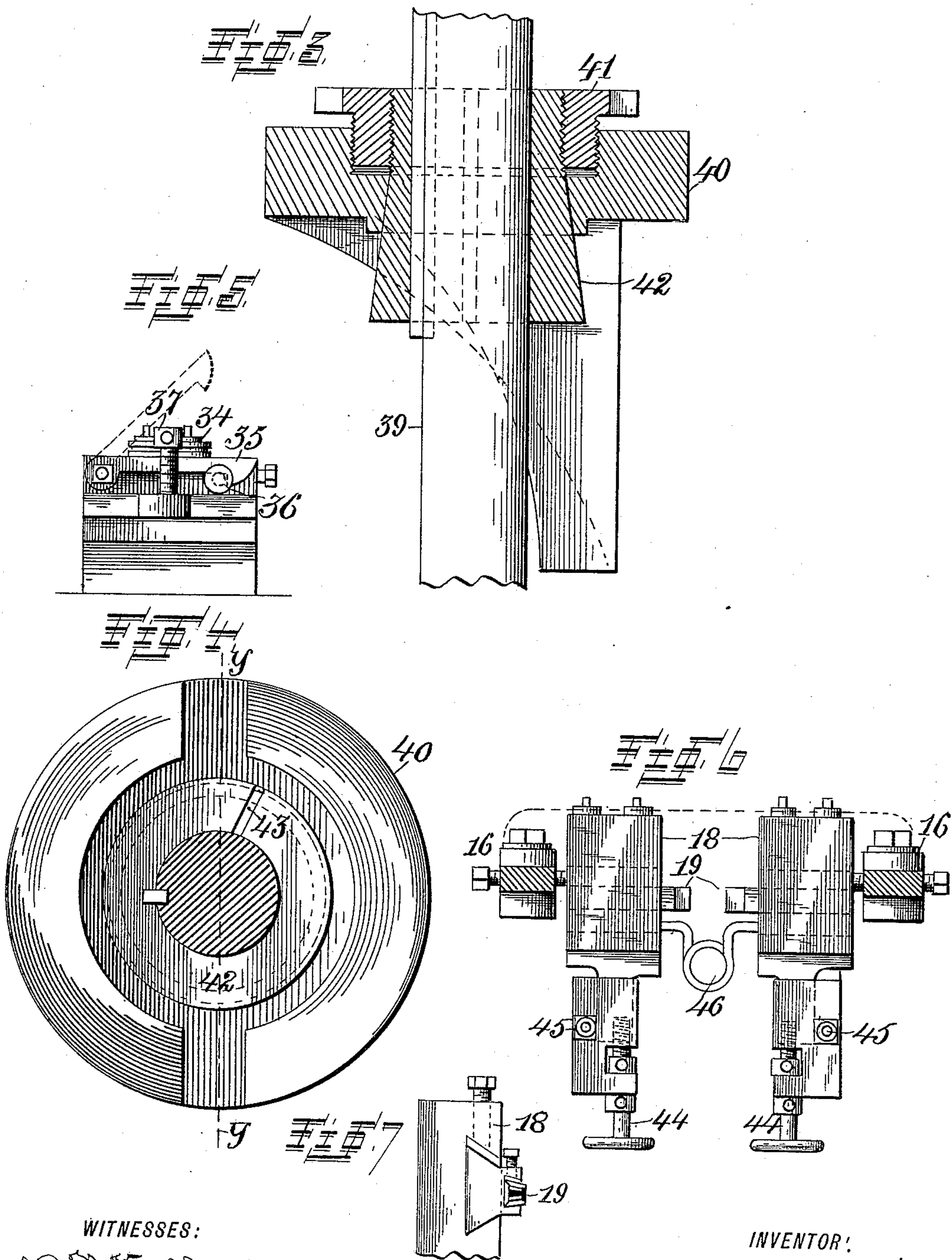
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# UNITED STATES PATENT OFFICE.

HENRY E. PIGGOTT, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO  
GEORGE R. BISPHAM, OF SAME PLACE.

## WIRE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 429,950, dated June 10, 1890.

Application filed March 18, 1890. Serial No. 344,397. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY E. PIGGOTT, of the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Wire-Nail Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to wire-nail machines; and it consists in the devices, combination, and arrangement of devices hereinafter set forth and claimed.

In the drawings, Figure 1 is a plan view of the improved machine. Fig. 2 is a side elevation of same, having portions of the bed-plate broken away and the fly and belt wheels removed. Fig. 3 is a vertical section of a double tripping-cam and its means of adjustment on its shaft used in making up the invention, the section being taken on line *y y* of Fig. 4. Fig. 4 is a plan view of same inverted. Fig. 5 is a front end view of the straightening devices, showing the hinged jaw thereof in closed position and locked by the latch. Fig. 6 is a sectional elevation of the cutting-off and pointing devices, the section being taken on line *x x* of Fig. 1, and looking from the right hand of said figure; and Fig. 7 is an end view thereof.

Heretofore in wire-nail machines but one stroke of the heading-hammer could be made with one whole revolution of the main shaft of the machine, which placed a considerable limit upon the capacity of same, while by my improved construction and co-operation of devices I embody, literally speaking, two machines in a single one, as will now be described. Before proceeding further, however, there is one more point of advantage possessed by an improved machine constructed after my invention, and that is, all strain heretofore thrown upon the main shaft during the heading process is removed.

1 is the frame, which may consist of any suitable number of upper parallel bars and legs reaching to the floor, secured together in a substantial manner, but which has located beneath it the mountings for the trip-cams or other suitable "trip-hammer" mechanism for operating the heading-hammer of the machine.

I prefer the tripping mechanism now to be described, the same consisting of a longitudinally-disposed framing-bar 2, having its ends secured to corresponding legs of the frame, and upwardly-projecting bracket 3, carried by said bar 2, in which the rock-journals *a* of the vibrating trip-lever 4 are mounted, while the hammer 5 is, preferably, wrought integrally with such trip-lever and extends upwardly a suitable distance to strike in line with the heading-dies and carries a hammer-head thereat.

6 is a small roller mounted on the free end of the trip-lever for engagement with the double tripping-cam, as will be presently described, and 7 represents a spring having its upper end attached to the end of said trip-lever that is opposite said roller and its lower end secured in or to the floor beneath the machine, and which spring normally tends to throw the hammer toward the heading-dies of the machine.

8 is the bed-plate which should be sufficiently heavy to support the boxes, bearings, lugs, anvil, &c., and which has an opening *A*, in which the hammer vibrates and other parts of the machine operate.

9 is the main shaft, mounted in suitable boxes and extending transversely across the bed-plate at the rear end thereof, and upon which are mounted the belt-pulleys 10 and fly-wheel 11, the belt-pulleys being located upon one projecting end of said shaft and the fly-wheel upon the opposite projecting end. 12 is a bevel-gear mounted on said shaft in the opening in the bed-plate. 13 is a gear-wheel mounted also on this shaft between the fly-wheel and the bed-plate. 14 represent a pair of cams mounted on said shaft with faces in reverse position, one upon either side of said bevel-gear, and constructed to impart a transverse movement to corresponding wheeled levers, as will be described farther on. 15 is a similarly-formed cam, but mounted on the main shaft adjacent to the pulleys 10 and adapted for a purpose similar to those just mentioned.

16 16 are rock-levers pivoted to the bed-plate by means of bolts, and which engage loosely the knife-blocks *e e* in the operation of the machine, causing the cutting and point-



ing edges of said knives or dies 19 19 to be brought together, and which are retracted by a suitable spring 46, having its ends secured between and to said blocks.

5 18 18 are the knife-block carriers.

44 44 are hand-screws suitably collared and secured in position by means of the collars thereof, and which raise and lower the knife-block carriers, and 45 45 are bolts for  
10 adjusting them nearer to or farther from the anvil—that is, in a longitudinal direction with respect to the machine.

20 is the anvil or support for the grip and heading dies, which are operated in the usual  
15 manner, with the exception that I connect loosely a compression bar or rod 21 to the movable jaw, said rod leading to a third rock-lever 22, which operates the same, a smaller rod *d* being connected to both rock-lever 22  
20 and said movable jaw to retract same.

For vertically adjusting the grip-die carrier *e*, I provide an L-shaped hook *f*, having a thread at its upper end, and a nut thereon, and passing down through the anvil, and hav-  
25 ing its other end turned up and in contact with said grip-die carrier upon its under side.

24 is a small gear-wheel or pinion mounted upon an independent shaft or stud projecting from the bed-plate, and which meshes  
30 with gear-wheel 13, from which motion is communicated to the feed mechanism.

25 is an adjustable box secured to the pinion 24, and in which the connecting-rod 26 is secured at one end, while its opposite end is  
35 connected to the reciprocating feed device.

27 is the feed device, to which is secured the rectangular bar 28, working in bearings 29, and 30 a plate secured to the bed-plate, through which the said feeding device is held  
40 in position and guided in its proper movements.

31 is a spring-pressed dog or pawl carrying a wire gripper or tooth, which engages the wire during the feeding operation and presses  
45 it against a stationary lug or tooth, thereby gripping the same firmly, and intermittently feeding it forward the required distance to make a nail.

32 is a stationary plate carrying three or  
50 more grooved straightening-rollers *c*, mounted on vertical journals, against which the wire is run upon one side, while a hinged plate 33, carrying two or more similarly-grooved rollers, presses the wire upon its opposite side,  
55 whereby the wire is thoroughly straightened, as is well known and will be understood. This is the straightener. To said stationary plate is hinged a latch 35, which is adapted to lock the hinged jaw in a closed position,  
60 catching over the handle 36, carried upon the said hinged plate, and by means of which latter the rollers are brought and held together.

37 is an adjustable screw-eye threaded into  
65 a projection on the front end of the machine, and through which the wire is fed and guided to the straightening-rolls before described.

39 is a vertical shaft carrying upon its upper end a bevel-gear 38, meshing with the like gear 12, and upon the lower end of said shaft  
70 is a double tripping-cam made adjustable thereon by means of the screw-thimble 41, having a left-hand internal thread, and being threaded externally with a right-hand thread, the said threads engaging corresponding  
75 threads in the tripping-cam aforesaid, causing a tapered sleeve, which is split with a slot 43, to be clamped on the said shaft by means of the tapered surfaces being brought together.

The operation is as follows: Motion is im-  
80 parted to the belt-pulleys 10 from any suitable source of power which revolves the main shaft 9, revolving at same time gear-wheel 13, bevel-gear 12, fly-wheel, and cams 14 14 and 15. From the cams 14 14 motion is im-  
85 parted to the levers 16 16, which operate the knife-blocks and knives, causing the knives to cut the nail and at the same time point it. From cam 15 motion is imparted to the lever  
90 22, to which is connected rod 21, leading to the gripping and heading dies secured within the anvil 20, by means of which the wire is gripped and held firmly to be headed. The gear-wheel 13 meshes with pinion 24, and operates in its revolution the feed mechanism  
95 or device 27. This consists, as has been before stated, of a stationary jaw having a set-pin, while a spring-pawl 31, carrying also a set-pin, is so constructed that the pawl will slide upon the wire during its backward move-  
100 ment, but will grip and hold and carry forward the wire during forward movement. The wire is first led into the adjustable eye 37, and then to the straightening-rolls *c* and 34, where it is straightened, then between the  
105 pins of the feed mechanism, and thence through a passage in the anvil to the grip-dies, where it is held firmly to be headed. From the bevel-gear 12 motion is imparted to the gear 38, which revolves the vertical shaft  
110 39, and it in turn rotates the double tripping-cam 40, which engages the small roller on trip-lever 4, causing same to be depressed and released intermittently, which, when released, causes the hammer to strike a blow upon the  
115 projecting end of the wire, forming a head thereon, as will be understood. Thus it will be evident that two blows of the hammer are made with one revolution of the main shaft of the machine by means of the double trip-  
120 ping-cam; but should it be desired to convert the machine into what is commonly known as a "single-stroke" machine one side of the double tripping-cam can be dispensed with, which will bring about this last-named result.  
125

By this construction in wire-nail machines all strain and wear and tear are taken from the main shaft, and the heading of a nail is more effectually accomplished by means of the blows of the trip-hammer than it might  
130 be by direct pressure. It should be noted, also, that the knives are reciprocated in a perfect straight line, in contradistinction to the construction heretofore made use of,



which caused the knives to move in the arc of a circle, following the line described by the ends of the rock-levers to which they were rigidly secured. In my improved construction the knife-blocks are loosely connected. It will further be noted that the tripping-cam may readily be adjusted up or down upon the vertical shaft which carries it by means of the thimble 41, as has been stated before this. By such adjustment the strength of the blow delivered by the hammer may be varied, according to whether light or heavy wire is being used in the machine. For instance, a comparatively light blow is required and is desirable for heading small nails or brads, and the tripping-cam is accordingly raised upon the shaft, thereby permitting the tripping-lever to run off the cam surface or surfaces earlier and before it has been depressed to the full limit of its capacity, and the spring will therefore impart less force to the hammer and a lighter blow will be struck by it, and vice versa.

What I claim is—

1. A wire-nail machine consisting of a suitable frame or bed-plate, journals secured to the same, within which the trip-hammer mechanism is mounted, the main shaft geared to a vertical shaft, and which has a tripping-cam mounted upon the said vertical shaft, and a vibrating trip-hammer operated by said tripping-cam, substantially as hereinbefore set forth.

2. A wire-nail machine consisting of a suitable frame and bed-plate supported thereby, a main shaft journaled thereon, and rotating cams mounted on said main shaft, levers operated by said cams, gripping and cutting dies operated by said levers, a bevel-gear on said shaft, which meshes with a correspond-

ing gear, a tripping-cam revolved by said bevel-gears, and a vibrating trip-hammer operated by said tripping-cam, substantially as hereinbefore set forth.

3. In a wire-nail machine, the knife-block carriers 18 18, in combination with the knives 19 19, the spring 46, and the collared screws 44 44 for vertically adjusting said carriers, substantially as herein set forth.

4. In a wire-nail machine, the combination of the vertical shaft 39, the bevel-gears for imparting motion thereto, the tripping-cam, the thimble 41, threaded into said cam, and the tapered and split or slotted sleeve 42, substantially as set forth.

5. In a wire-nail machine, a trip-hammer mechanism comprehending a shaft, a tripping-cam thereon, a tapering sleeve between the said cam and shaft, and a thimble threaded into the cam and sleeve, as described.

6. In a wire-nail machine, a trip-hammer mechanism comprehending a shaft, a tripping-cam thereon, a split tapering sleeve between the shaft and the cam, and means for moving the sleeve and cam in opposite directions, securing the latter in place, as described.

7. In a wire-nail machine, the feeding device 27, in combination with the rectangular bar 28, secured thereto and sliding in bearings 29, and a plate 30, secured to the bed-plate and adapted to guide said feeding device, substantially as set forth.

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

HENRY E. PIGGOTT. [L. s.]

Witnesses:

G. R. BISPHAM,  
JNO. C. HIGDON.