(No Model.) 5 Sheets—Sheet 1.

T. FOWLER.

WIRE NAIL MACHINE.

No. 350,357. Patented Oct. 5, 1886.

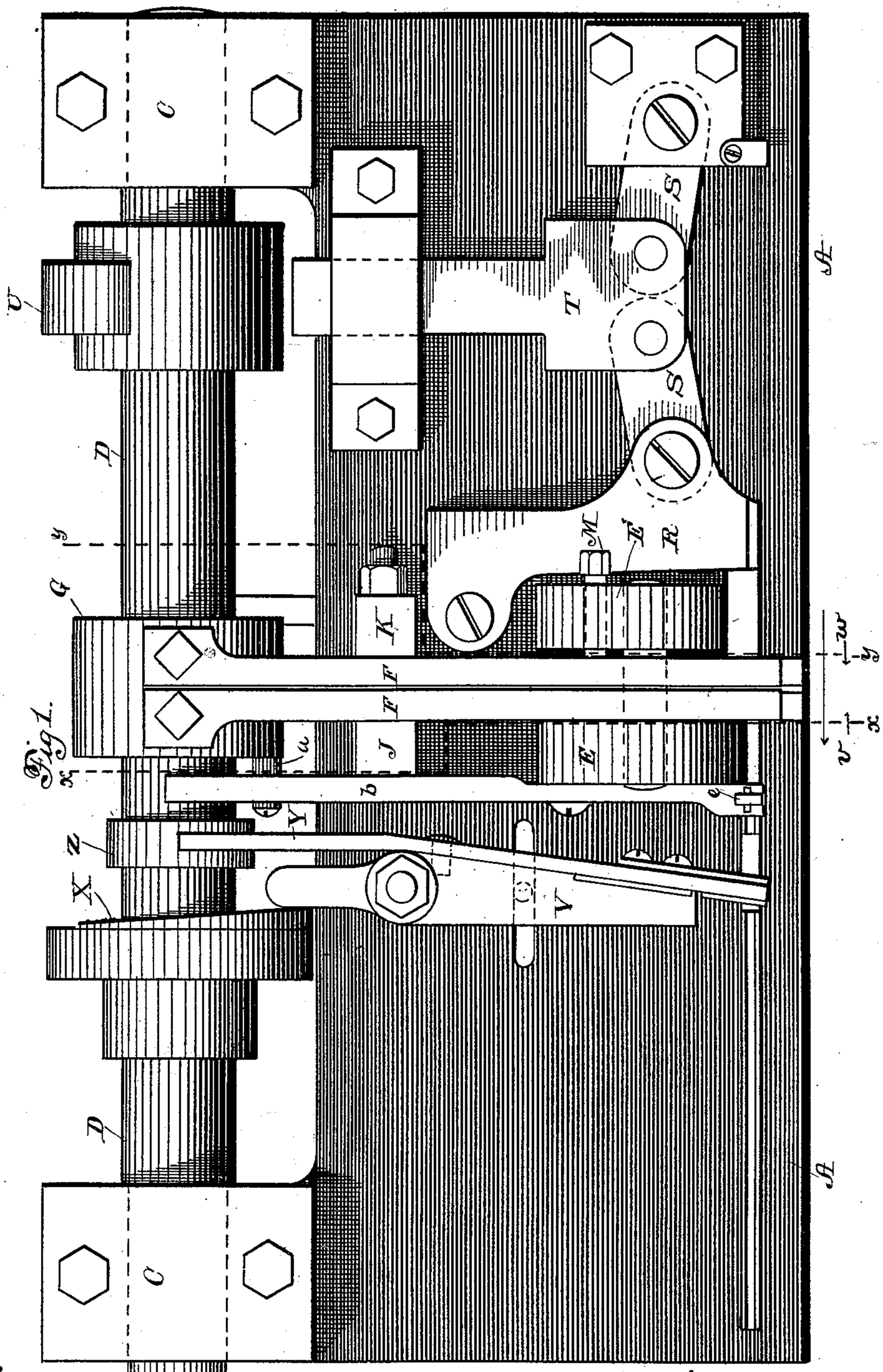


Fig 1.

Witnesses
S. S. Williamson
E. F. Mecker

Inventor
Phaddeus Fowler
by Smith & Hubbard
his Attorneys.

(No Model.) 5 Sheets—Sheet 2.

T. FOWLER.

WIRE NAIL MACHINE.

No. 350,357. Patented Oct. 5, 1886.

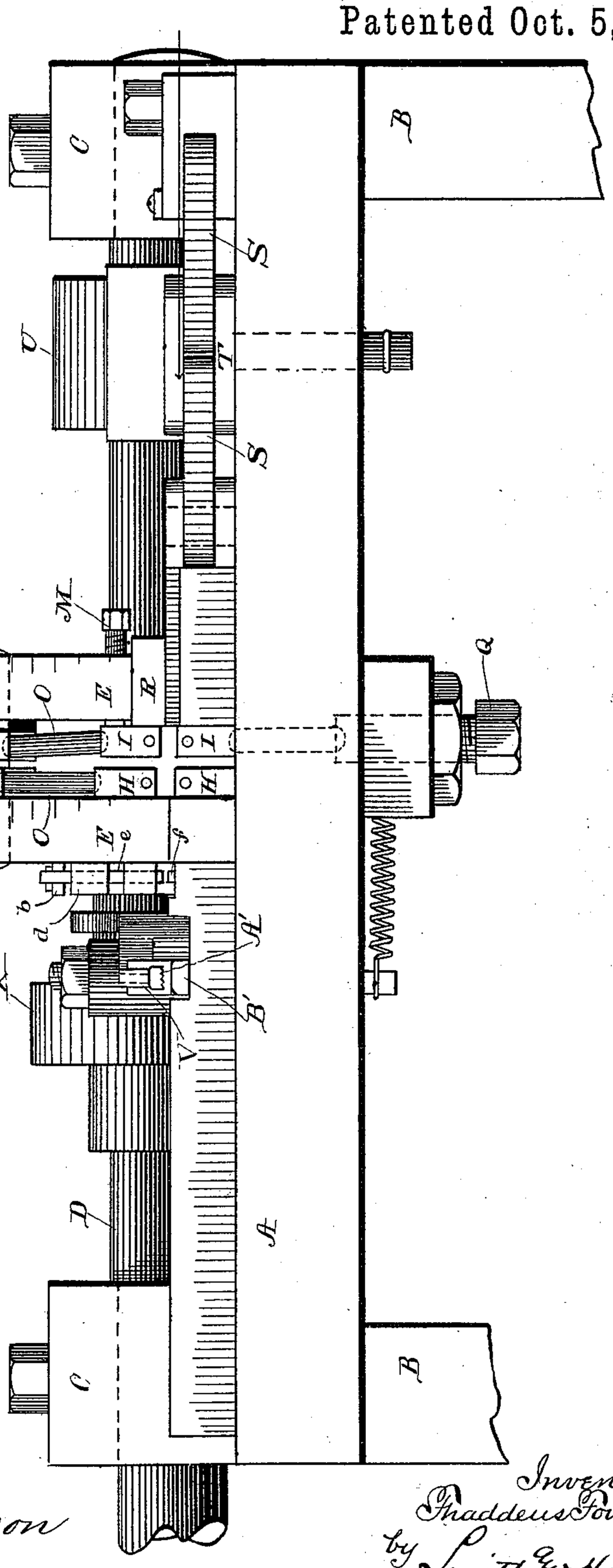


Fig. 2.

Witnesses
S. S. Williamson
E. F. Peeler

Inventor
Thaddeus Fowler
by Smith & Hubbard Jr
his Attorneys

(No Model.) 5 Sheets—Sheet 3.

T. FOWLER.

WIRE NAIL MACHINE.

No. 350,357. Patented Oct. 5, 1886.

Fig. 3.

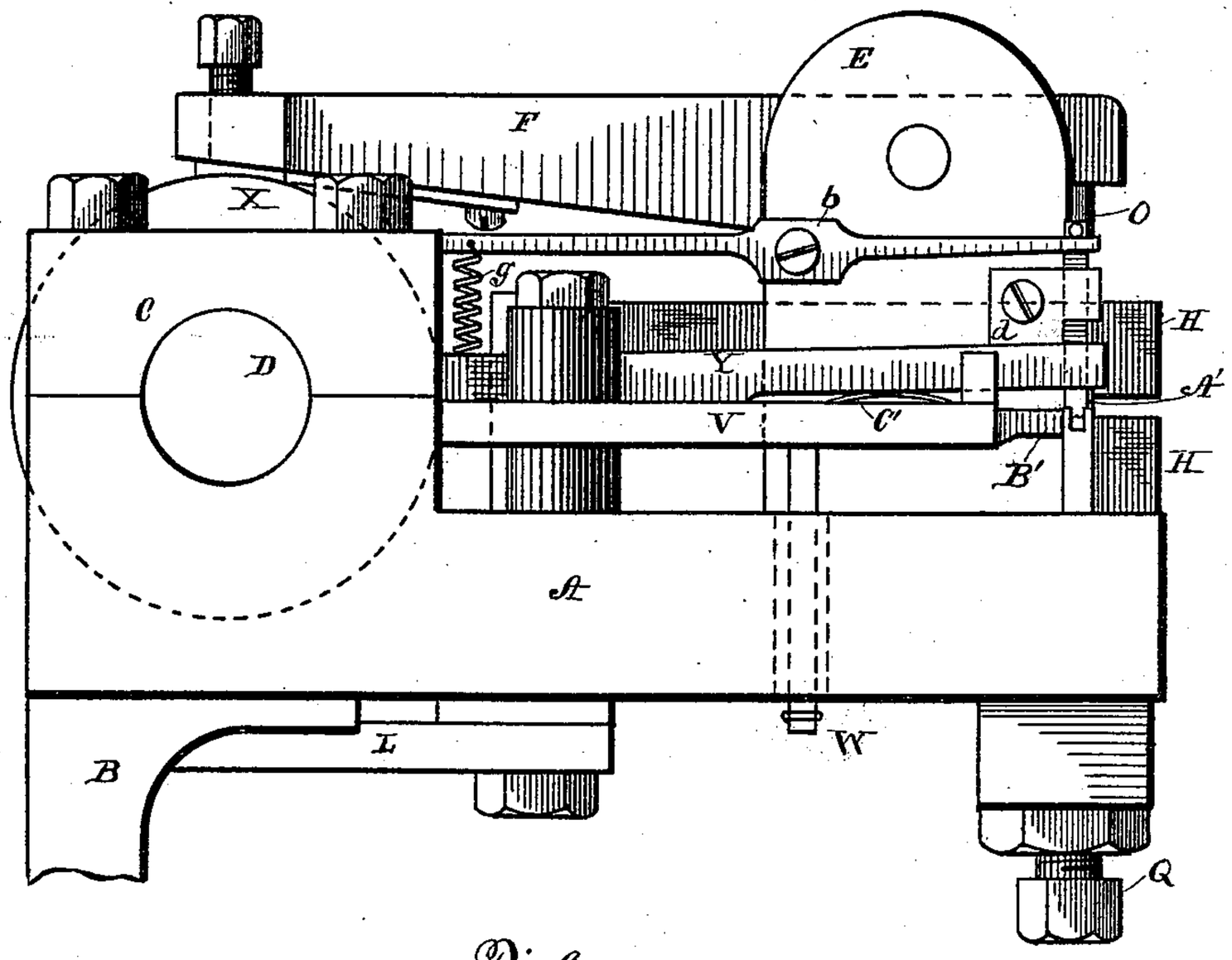
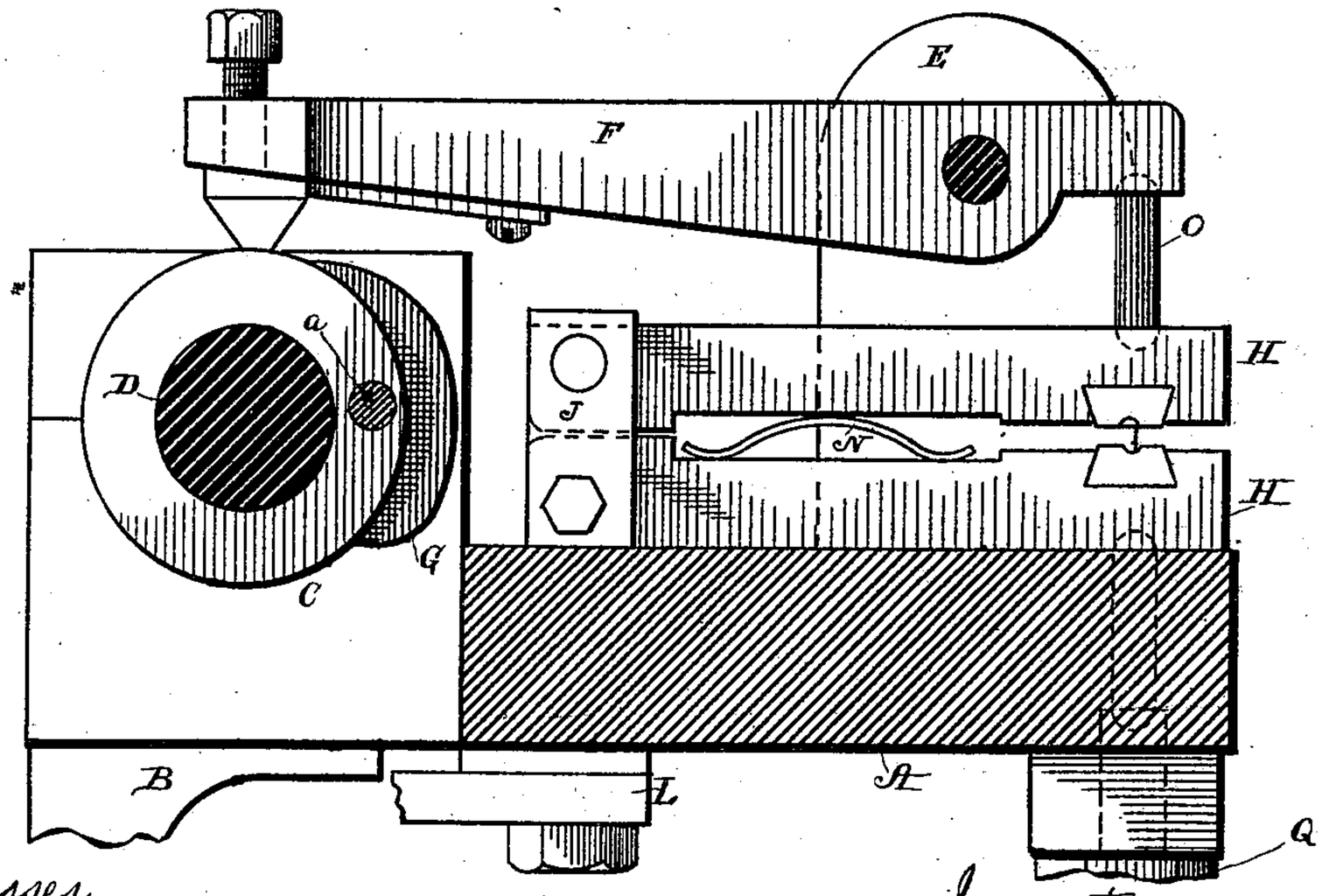


Fig. 4.



Witnesses
S. S. Williamson
E. F. Peeker

Inventor
Phadeus Fowler
by Smith & Hubbard Jr
his Attorneys

(No Model.)

5 Sheets—Sheet 4.

T. FOWLER.

WIRE NAIL MACHINE.

No. 350,357. Patented Oct. 5, 1886.

Fig. 5.

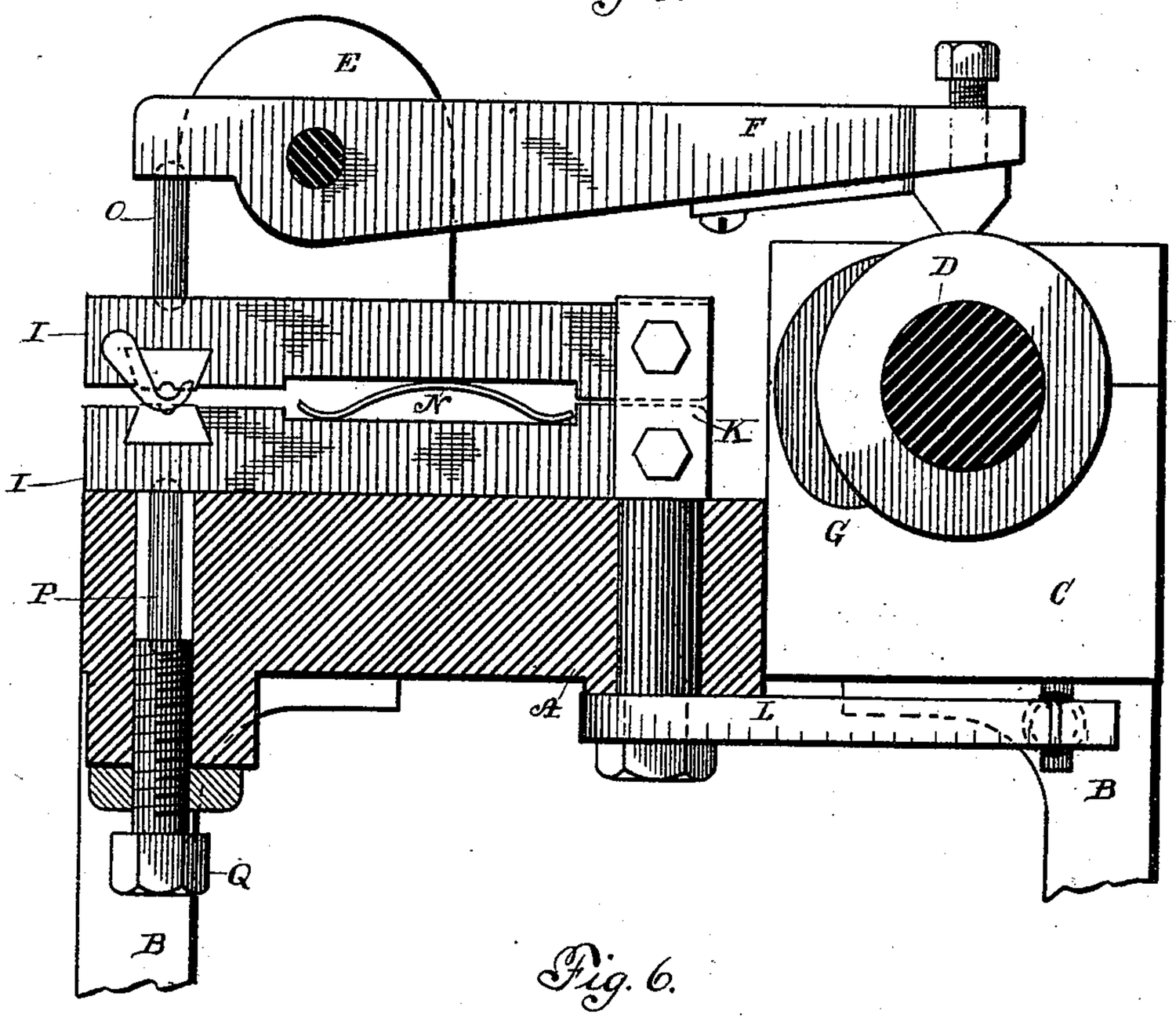
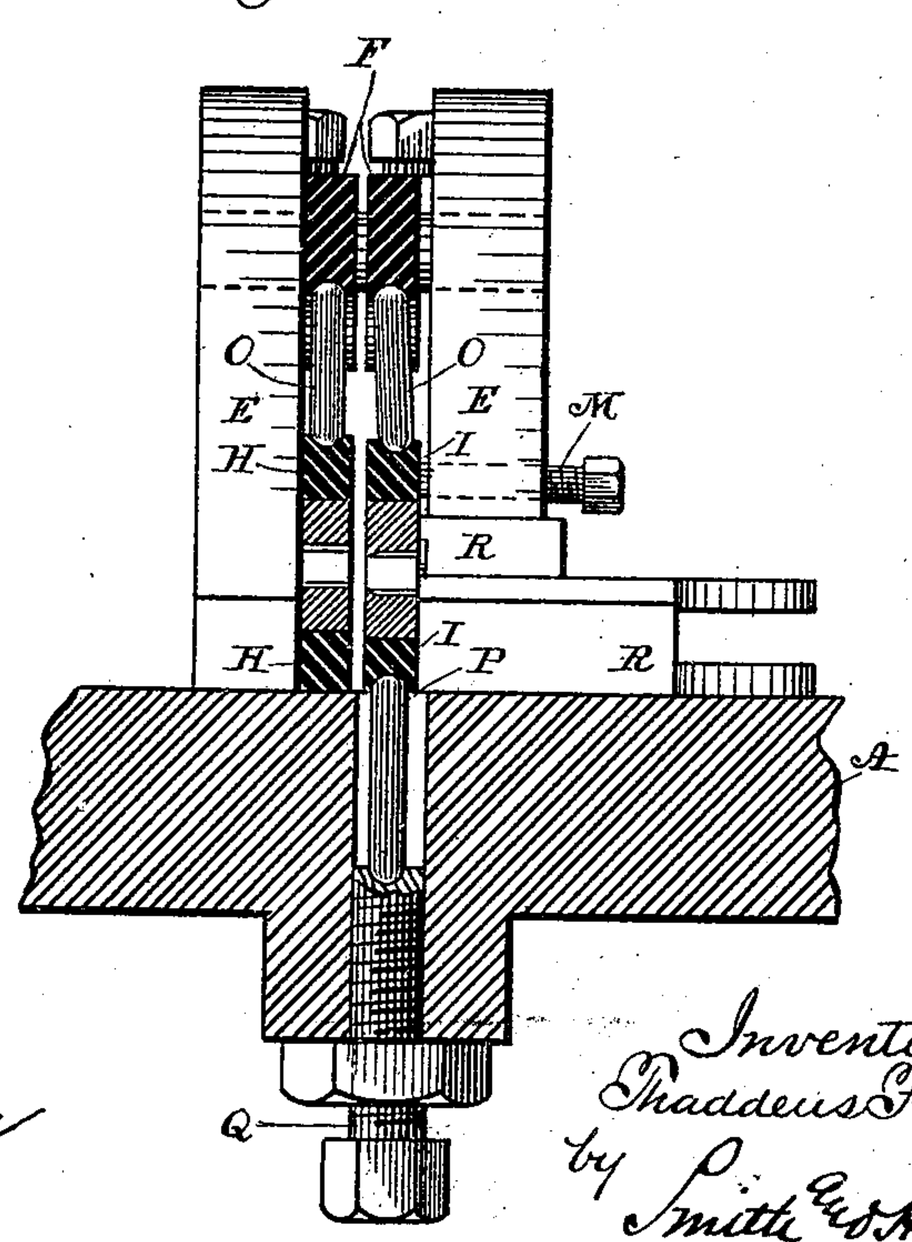


Fig. 6.



Witnesses.
S. S. Williamson
E. F. Mecker

Inventor
Thaddeus Fowler
by Smith & Hubbard
his Attorneys

(No Model.) 5 Sheets—Sheet 5.

T. FOWLER.

WIRE NAIL MACHINE.

No. 350,357. Patented Oct. 5, 1886.

Fig. 7.

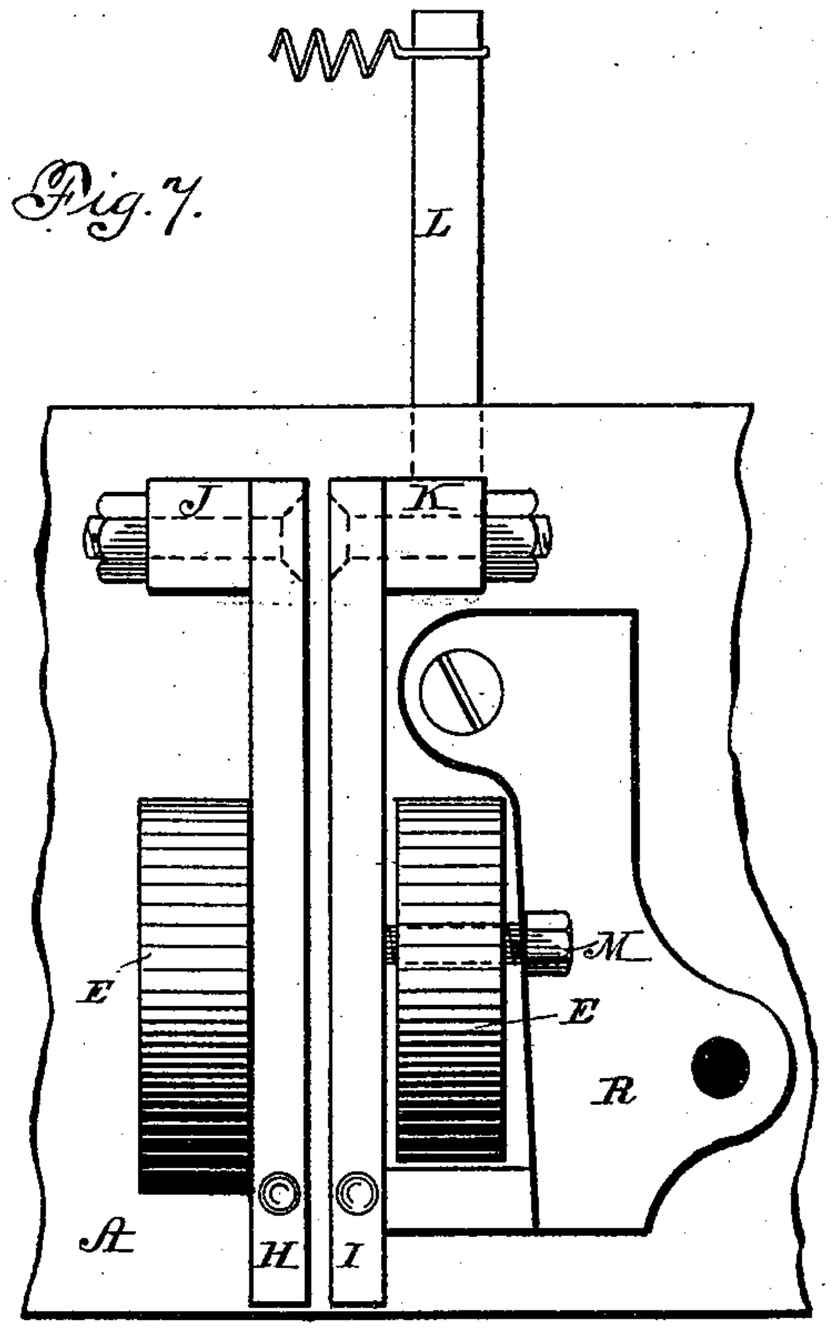


Fig. 8.

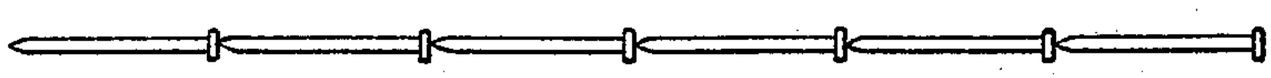
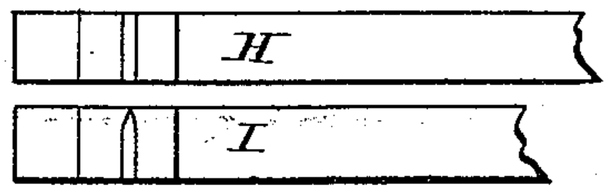


Fig. 9.



Witnesses
S. S. Williamson
E. F. Mecker

Inventor
Phaddeus Fowler
by Smith & Hubbard Jr
his attorneys

UNITED STATES PATENT OFFICE.

THADDEUS FOWLER, OF SHELTON, ASSIGNOR OF ONE-HALF TO THOMAS B. DE FOREST, OF BIRMINGHAM, CONNECTICUT.

WIRE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 350,357, dated October 5, 1886.

Application filed June 5, 1886. Serial No. 204,236. (No model.)

To all whom it may concern:

Be it known that I, THADDEUS FOWLER, a citizen of the United States, residing at Shelton, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Wire-Nail 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 invention relates to certain new and useful improvements in machines for making wire nails, and while it can be advantageously employed for the production of the loose wire nails which are in common use, it is more especially adapted for making string nails of the character set forth and described in Letters Patent of the United States granted to me the 4th day of May, 1886, and numbered 341,413.

With this in view my invention consists in the details of construction hereinafter fully set forth, and then recited in the claims which form a part hereof.

In order that those skilled in the art to which my invention appertains may fully understand the construction and operation of my machine, I will now describe the same, referring by letter to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a plan view of my machine; Fig. 2, a front elevation; Fig. 3, an end elevation, looking from the left of Fig. 1; Fig. 4, a section at the line *x x* of Fig. 1, looking in the direction indicated by the arrow *v;* Fig. 5, a section at the line *y y* of Fig. 1, looking in the direction indicated by the arrow *w;* Fig. 6, a detail cross-section through the dies and bars, and showing the device for the support and adjustment of the lower pointing-die; Fig. 7, a plan view of the die-bars and posts, the levers being removed; Fig. 8, a short length of completed nails, and Fig. 9 a detail plan of the die-bars and dies.

Similar letters denote like parts in all the figures of the drawings.

A is the bed-plate, and B are legs upon which it is supported. In suitable bearings, C, formed at the back of the bed-plate is hung and adapted to revolve the main shaft D, which receives its motion from a pulley secured thereon, but which I have not thought it necessary to show in the drawings.

E are standards mounted upon and projecting upward from the bed-plate, and F are two levers pivotally hung to said standards, as seen at Figs. 4, 5, and 6. The rear ends of levers F, which are preferably provided with shoes, rest upon and are actuated by a cam, G, on the main shaft. Beneath the levers are arranged two pairs of die-bars. Those lettered H have formed or secured therein grasping-dies. Those lettered I are similarly provided with dies tapered as to their operating surfaces, and adapted not only to grasp the wire, but to compress it to form the point of the nail. (See Figs. 9 and 6.) The lower grasping-die bar lies upon the surface of the bed-plate, and its rear end is secured to a short post, J, projecting upward from the bed-plate. The upper grasping-die bar is pivoted to the post J, so that it may swing vertically away from the lower grasping-die bar. The pointing-die bars are similarly secured to a post, K, which in the form of a short shaft is extended downward through the bed-plate, as shown at Fig. 5. This arrangement of the pointing-die bars gives to them not only a vertical opening movement upon the post K, but also a lateral movement toward or away from the grasping-die bars upon the journaled post as a pivotal point.

A spring-actuated bar, L, (see Figs. 5 and 7,) is secured on the bottom of post K, and tends to hold the pointing-die bars away from the grasping-die bars. The extent of the separation just mentioned is determined by a screw, M, threaded through one of the standards, as seen at Figs. 1, 6, and 7.

Springs N, interposed between the two grasping-die bars, and also between the two pointing-die bars, serve to keep them normally separated vertically. (See Figs. 4 and 5.)

O are links through which the downward movement of the levers F is transmitted to the die-bars to close the latter. They are employed to permit motion vertically to both pairs of die-bars, and both vertically and laterally to the pointing-die bars. To further facilitate the movement last referred to, a third link, P, is employed to support the lower pointing-die bar. Said link stands in a hole

in the bed-plate, and is adjustable for wear by a screw, Q, threaded into the hole from beneath, and upon which the link stands. As will be readily understood, the raising of the rear ends of the levers F by the cam on the main shaft closes both pairs of dies vertically. The movement of the pointing-die bars toward the grasping-die bars against the spring action of the bar L is effected by means of the pivoted block R, an extension of which abuts against the pointing-die bars, the toggle-levers S, the follower T, resting upon the bed-plate, and the cam U on the main shaft, which operates through the follower to straighten the toggle-joint. The follower and toggle-levers, after each action of the cam, are returned to their normal position by a spring.

The feeding of the wire in my machine is accomplished as follows: A lever, V, is pivoted to the bed-plate, as seen at Figs. 1 and 3, and is oscillated upon its pivotal point against the action of a spring, W, (seen at Fig. 3,) by a face-cam, X, on the main shaft. A lever, Y, whose rear end is engaged by a peripheral cam, Z, is pivoted to the side of lever V, and is as a whole carried thereby. The forward extremity of the lever Y carries a serrated jaw, A′, and this, by the action of the cam Z upon the rear end of said lever, is caused periodically to bind the wire between it and an extension, B′, of the lever V. When the wire is so grasped, the action of cam X carries both levers forward. When the face-cam ceases to act, the lever Y is thrown up out of engagement with the wire by a spring, C′, placed beneath it, and both levers are thrown back by the spring W to take a fresh hold.

The trimming mechanism of my machine consists of a friction-roller, *a*, secured on cam G, a lever, *b*, secured to the face of standard E and curved at its rear end for engagement with the friction-roller, a bracket, *d*, secured to standard E, a cutter, *e*, sliding in ways formed in the bracket *d*, and having a V-shaped and longitudinally-tapered cutting-edge, a cutter-block, *f*, and a spring, *g*, against which the lever *b* is raised. The cutter is adjustably secured to and carried by the lever *b*.

The operation of my machine when organized as above set forth is as follows: The wire is fed from a coil or reel through suitable straightening-rolls, and passes through the machine from right to left. When between the dies, both pairs, through the medium of the levers, links, and cam on the main shaft, are caused to close tightly upon it. As the normal position of the die-bars (determined by the spring action of bar L) is with the pointing-die bars separated from the grasping-die bars, it follows that when the dies are closed there is a short length of wire between their vertical surfaces. The pointing-die bars are now, by the block, toggle-levers, follower, and cam, forced up against the grasping-die bars, and the short length of wire is upset into a head, which is suitably flattened between the vertically-abutting faces of the four dies. At the completion of this operation the die-bars are separated in both directions by the action of springs N and spring-bar L. At this time the feed lays hold upon the wire and draws it forward the proper distance for the next operation of the dies.

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

1. The combination, in a machine of the character described, with the driving-shaft and cam thereon, of a pair of grasping-die bars and dies mounted upon the bed-plate, and a lever engaging with the main cam and operating to close said dies, a pair of pointing-die bars and dies alongside the grasping-dies and similarly operated, and means, as described, whereby the pointing-dies may be given a lateral movement against the grasping-dies, substantially as set forth.

2. The combination, with the main shaft and the cam G, secured thereon, of the levers pivoted between standards mounted upon the bed-plate and actuated as to their rear ends by said cam, the grasping-die bars and dies arranged beneath one of the levers and opening in a vertical direction only, the pointing-die bars and dies arranged beneath the other lever and both opening vertically and adapted to swing laterally, the links through which power is transmitted from the levers to the die-bars, and means—as, for instance, a toggle-joint, follower, and cam—for imparting to the pointing-die bars their lateral movement, substantially as set forth.

3. The combination, with the bed of the machine, of the pivoted and spring-opened grasping-die bars and dies arranged thereon, the pivoted and spring-opened pointing-die bars and dies, the post journaled in the bed-plate, to which the pointing-dies are pivoted, and the spring-actuated bar, whereby the dies and post are normally controlled as to their position, the cam-actuated pivoted levers, the links interposed between the latter and the die-bars, the supporting-link arranged within the bed-plate and the block, toggle-levers, follower, and cam, whereby the dies are closed longitudinally of the wire, substantially as set forth.

4. The combination, with the main shaft, of the feeding mechanism composed of the following elements: the face-cam on the main shaft, the pivoted and transversely-oscillating lever operated by said cam and spring-actuated against the same, the grasping-lever fulcrumed to the side of last-named lever and carried thereby, and the cam on the main shaft, whereby the grasping-lever is caused to act, substantially as specified.

5. The combination, with the bed-plate, of the grasping-die bars pivoted at their rear ends and adapted to open vertically, the pointing-die bars, also pivoted at their rear ends, the post journaled in the bed-plate, to which the bars last named are secured, the spring-actuated bar attached to and operating the post,

means, as described, whereby both pairs of dies may be closed vertically, and additional means whereby the pointing-die bars may be closed against the grasping-die bars, substantially as specified.

6. The combination, in a wire-nail machine, of a pair of standards mounted upon the bed, a pair of pivoted grasping-die bars and dies, and a pair of pointing-die bars and dies arranged between the standards, levers fulcrumed to the standards and adapted to close the die-bars vertically together, a cam whereby the levers are caused to operate, and means, as described, whereby the two pairs of dies may be closed laterally together for the swaging of the nail-head, substantially as specified.

7. The combination of the pair of grasping-die bars arranged upon the bed-plate and adapted to open vertically, the pair of pointing-die bars arranged beside the grasping-die bars, the spring-actuated post journaled in the bed-plate, and to which the pointing-die bars are secured, the standards, and the levers pivoted to said standards, whereby both pairs of dies are closed, and the toggle-joint, follower, and cam on the main shaft, whereby the pointing-die bars are swung upon their post against the grasping-die bars, substantially as set forth.

8. The combination, with the grasping and pointing dies and the means whereby they are actuated, of the vertically-reciprocating trimmer, the block against which it acts, the pivoted lever whereby it is carried, and the roller on the main cam, whereby the movement is imparted to the lever, substantially as set forth.

9. The combination, with the bed-plate, of the standards mounted thereon, the grasping and pointing die bars and their levers arranged between the standards, and the cam on the main shaft engaging the levers, the means whereby lateral movement is communicated to the pointing-die bars, the laterally-reciprocating and cam-actuated feed-lever, and the grasping-lever fulcrumed at the side thereof, the trimmer arranged in ways at the side of one of the standards, the lever whereby it is reciprocated, and the block against which said trimmer cuts, and the cam and roller on the main shaft, whereby the feeding and trimming devices are operated, all arranged as described, and for the purpose set forth.

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

THADDEUS FOWLER.

Witnesses:
S. H. HUBBARD,
D. JOSEPH FOLEY.