

(No Model.)

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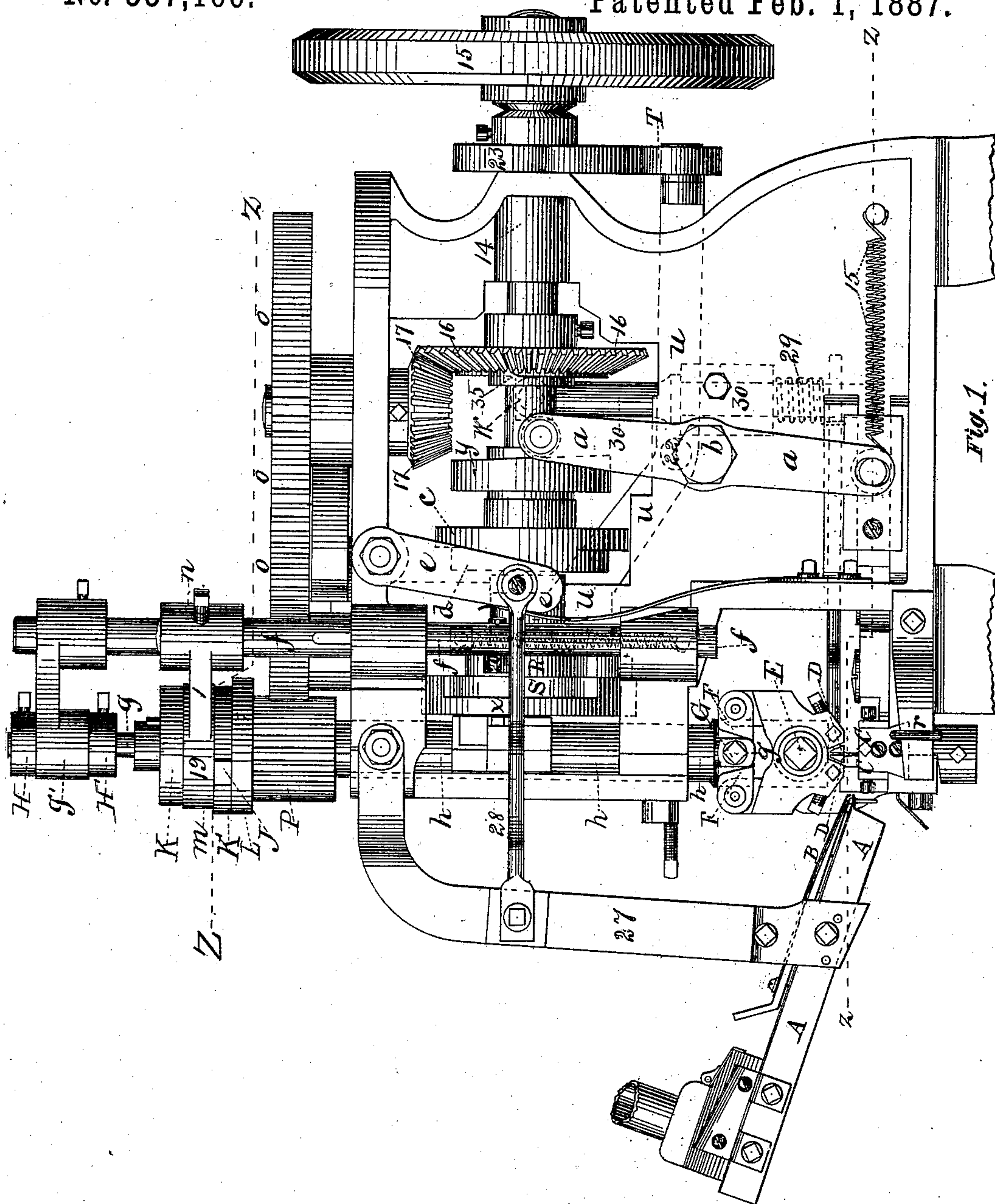
H. DUNHAM, Dec'd.

E. B. DUNHAM, Administratrix.

MACHINE FOR MAKING SCREW NAILS.

No. 357,166.

Patented Feb. 1, 1887.



Witnesses.

Anton M. Lyman
B. W. Harris.

Inventor:

Henry Dunham
by Charles F. Perkins Atty

(No Model.)

3 Sheets—Sheet 2.

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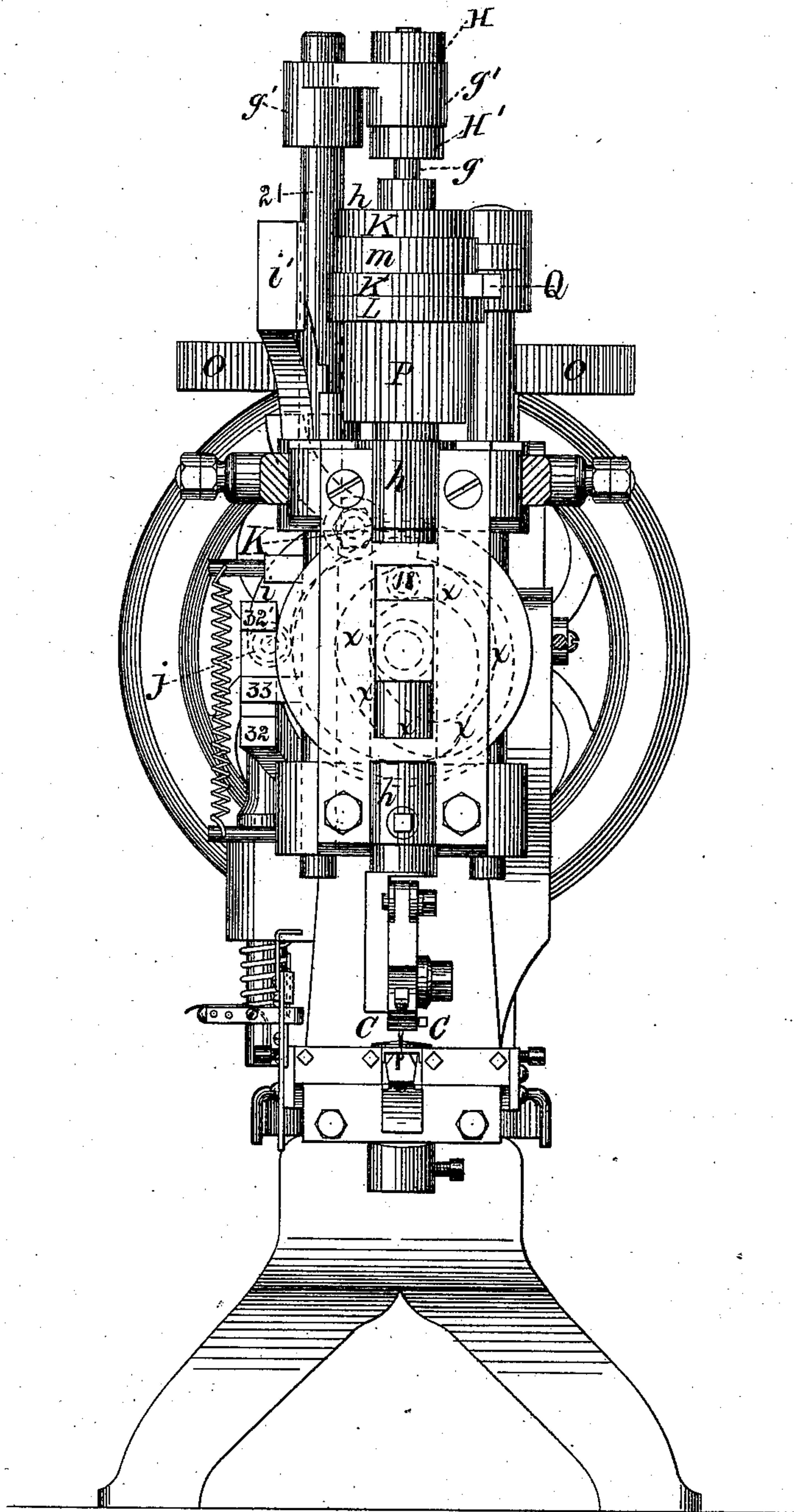


Fig. 2.

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3 Sheets—Sheet 3.

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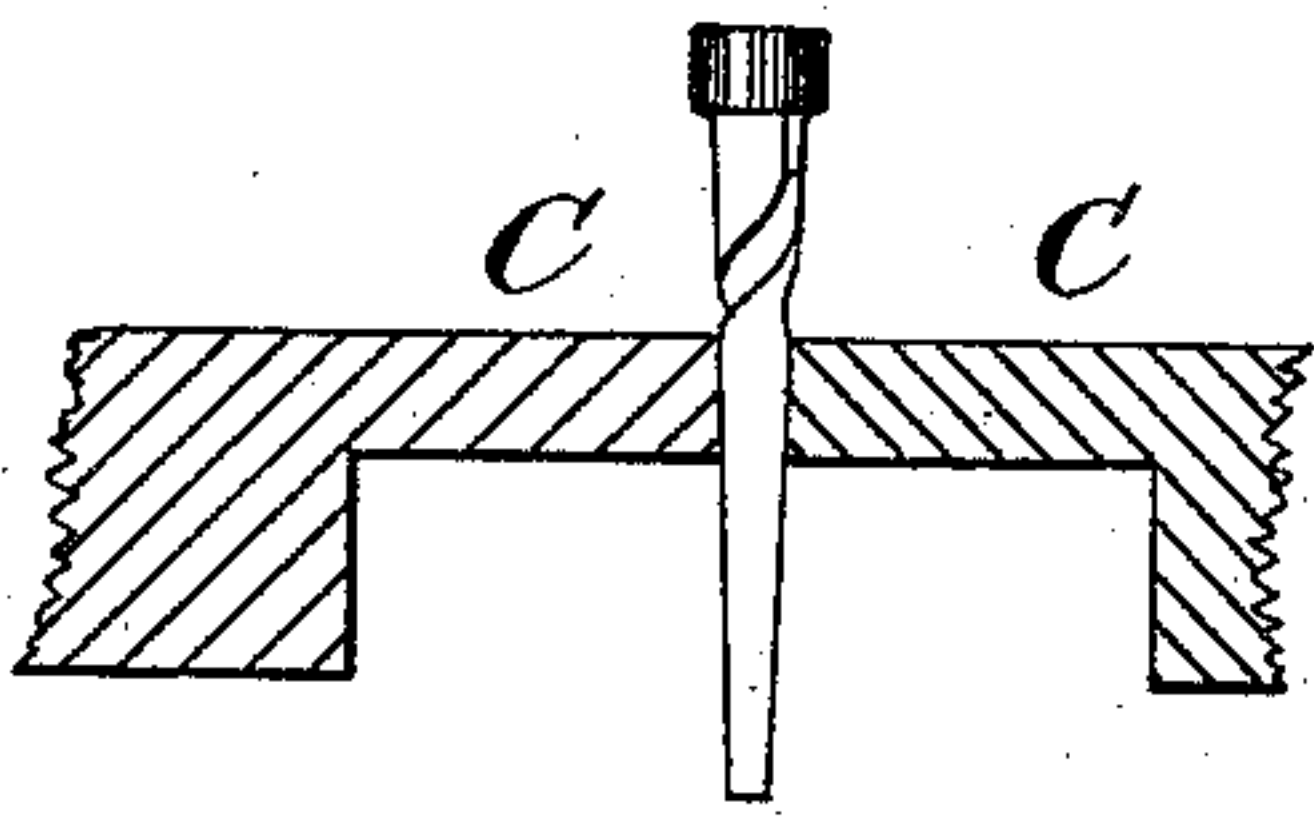


Fig. 3.

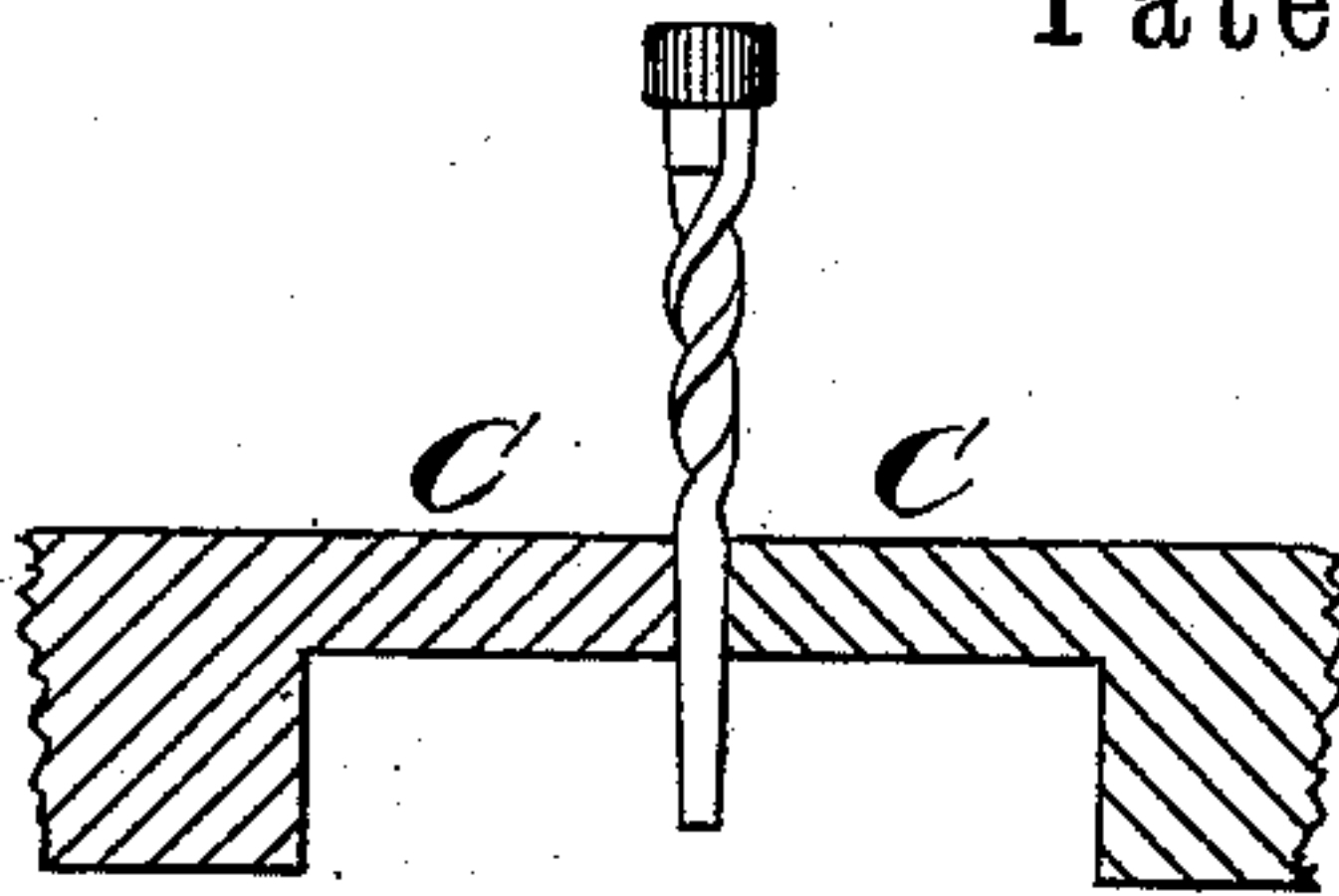


Fig. 4.

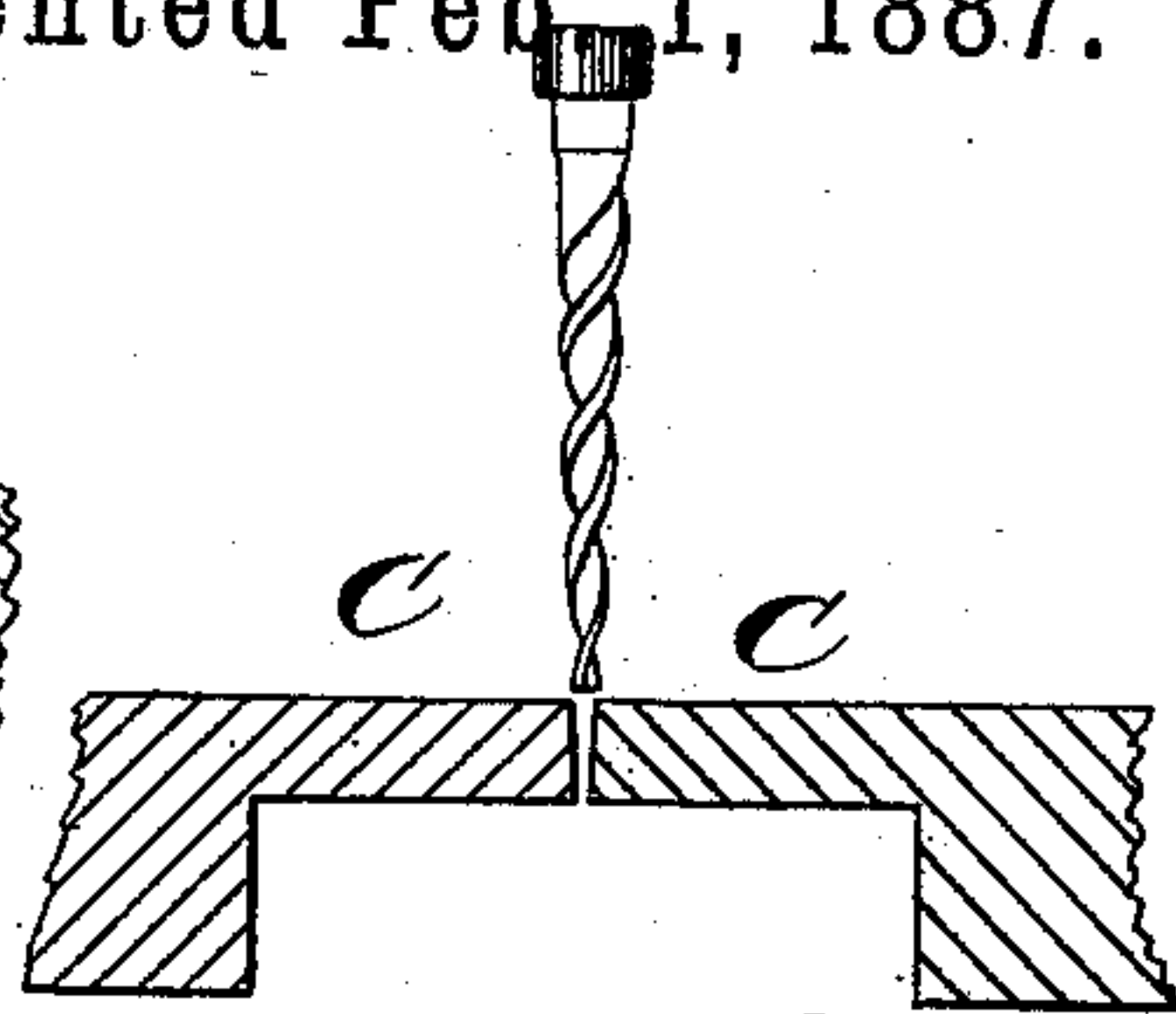


Fig. 5.

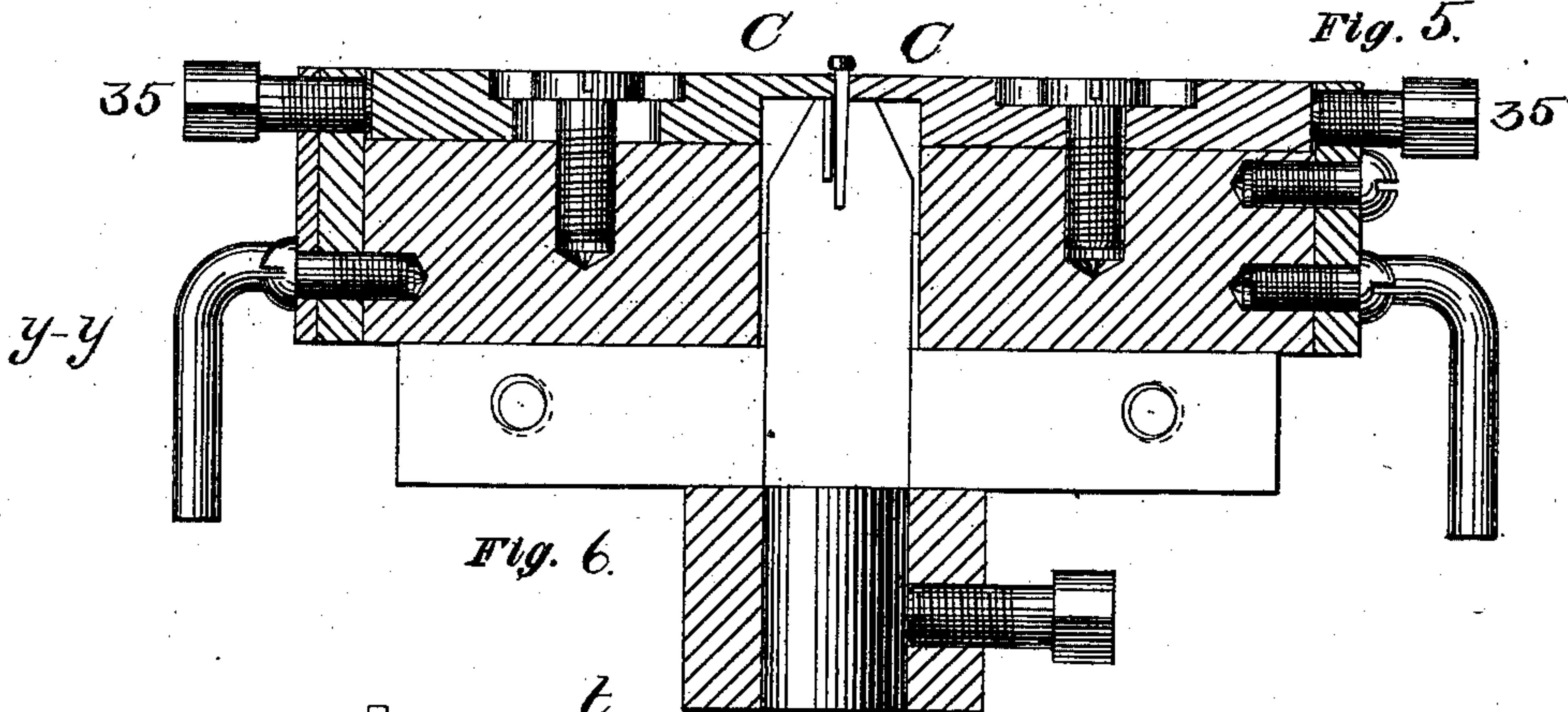


Fig. 6.

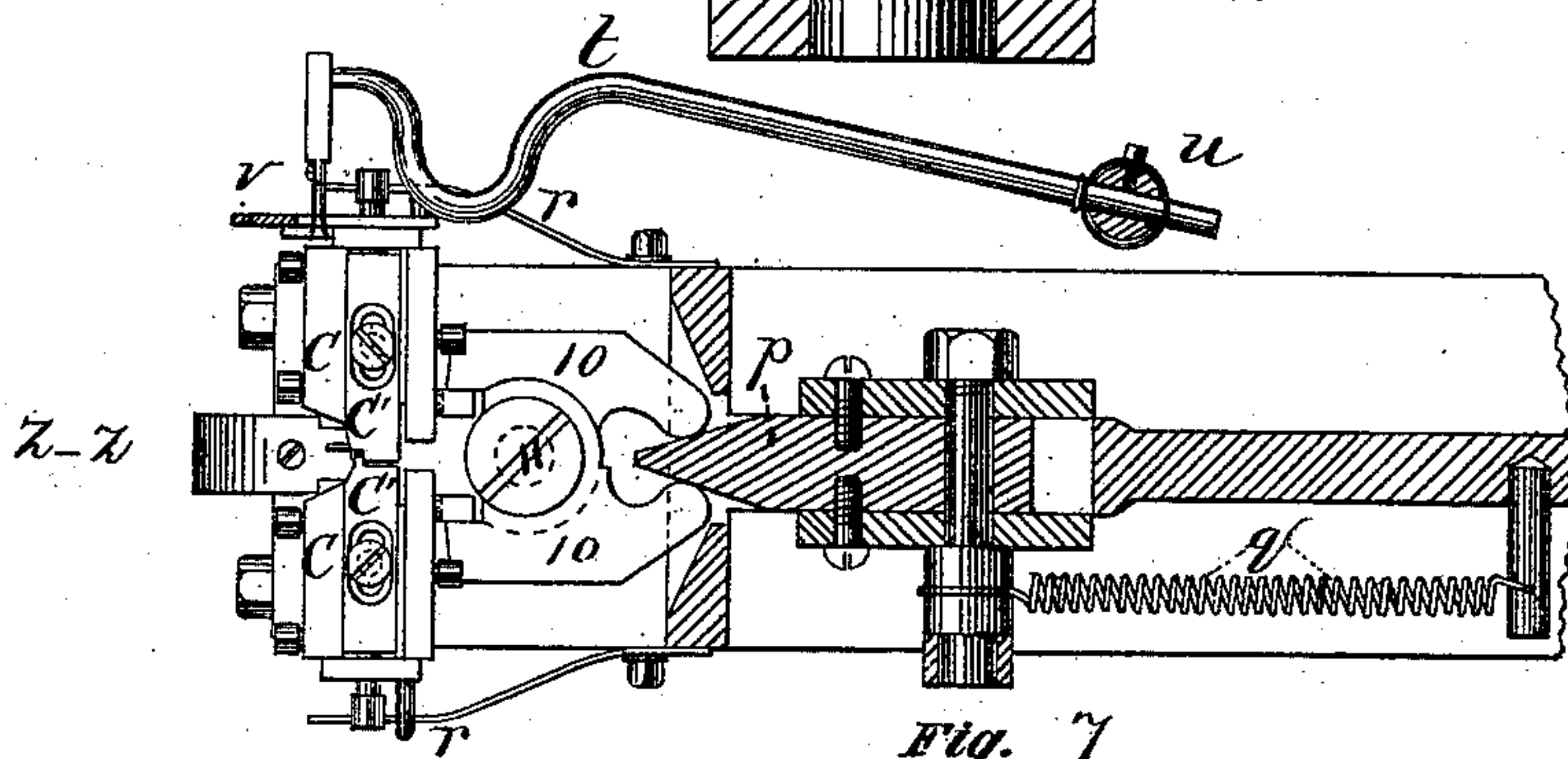


Fig. 7.

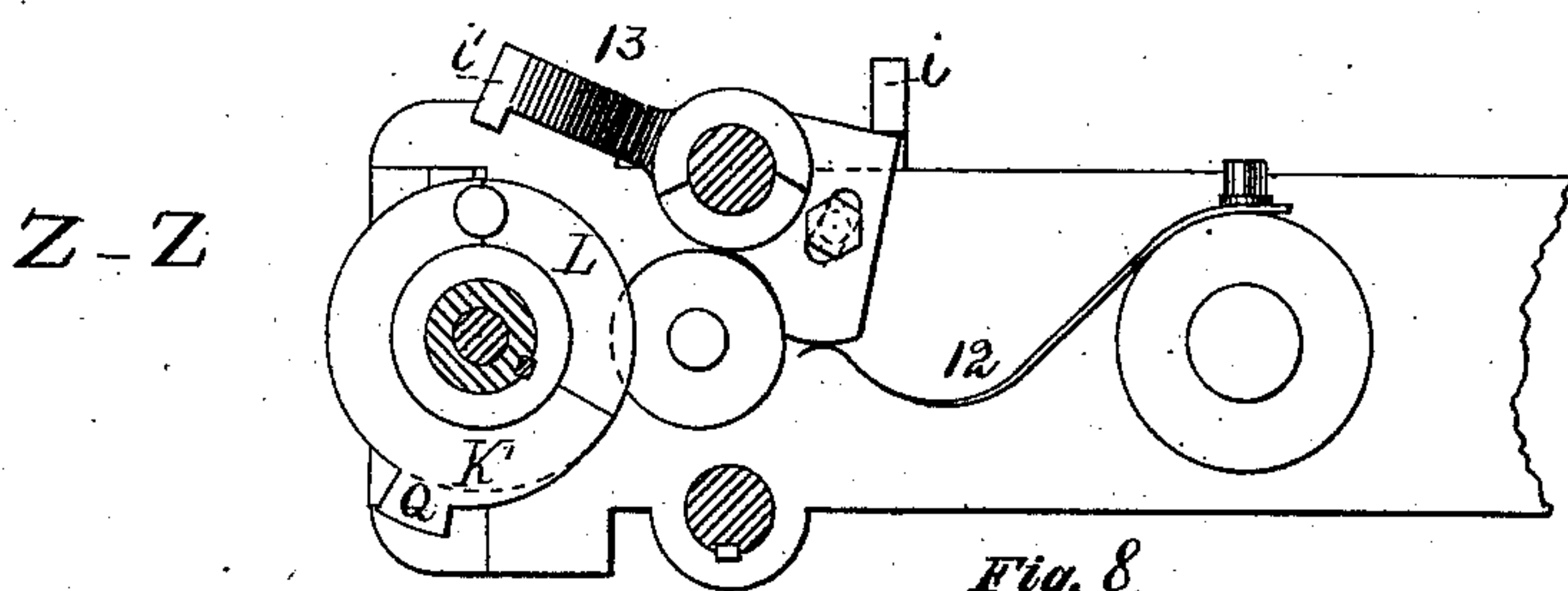


Fig. 8.

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Andon M. Lyman
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UNITED STATES PATENT OFFICE.

HENRY DUNHAM, OF ABINGTON, MASSACHUSETTS; ELLA B. DUNHAM (ADMINISTRATRIX OF SAID HENRY DUNHAM, DECEASED) ASSIGNOR TO HENRY S. JENKINS, TRUSTEE FOR THE CLINCHING SCREW COMPANY, OF BOSTON, MASSACHUSETTS.

MACHINE FOR MAKING SCREW-NAILS.

SPECIFICATION forming part of Letters Patent No. 357,166, dated February 1, 1887.

Application filed March 15, 1884. Serial No. 124,289. (No model.)

To all whom it may concern:

Be it known that I, HENRY DUNHAM, of Abington, in the county of Plymouth and Commonwealth of Massachusetts, have invented a certain new and useful Machine for the Manufacture of Screws and Screw-Nails, of which the following is a specification.

My invention consists of a machine which has jaws with which to grip a nail or screw blank just below its head so firmly as to prevent its being turned around therein, and from which the nail is vertically drawn upward by rotating jaws gripping the head and twisting the nail while being drawn from the stationary jaws. The result of the operation is to produce a thread upon the entire length of the nail or blank, which adds to it the qualities of a screw and makes it a superior fastening for leather, wood, or any other material.

The object of my invention is the construction of a machine to manufacture the screw-nail invented by me, and described and claimed in Letters Patent issued to me, numbered 266,276, and dated October 24, 1882.

In the drawings, Figure 1 represents a side elevation of the machine. Fig. 2 represents a front elevation of the machine. Figs. 3, 4, 5 and 6 represent sectional views of the fixed or stationary jaws holding the nail as it appears in several stages of the twisting process. Fig. 6 shows the nail just before the process of twisting has begun. Fig. 5 represents it after the twisting process is completed. Figs. 3 and 4 represent the nail in the intermediate stages of twisting.

Similar letters refer to similar parts wherever they occur in the different parts of the drawings.

A A is a nailway which receives nails from an automatically-operated nail-reservoir, and delivers them one at a time to the fixed jaws C C. One of these jaws has a wedge-shaped lip, which, when the jaws close, is inserted between the foremost nail and the others in the nailway. This jaw has a recess of the size and shape of the nail just under the head, and the other jaw is made with a tongue which fits

the recess. When the foremost nail is thus isolated, the nailway reciprocates backward, leaving the nail in the jaws, which are closed firmly upon it. The jaws are closed by means of the levers 10 10, having the common fulcrum 11, which are operated by the wedge *p* being forced between the ends of the levers 10 10. The wedge slides in a suitable way, and is moved forward by the lever *a a*, which is actuated by the cam *y* on the cam-shaft 14. The wedge is withdrawn by the spiral spring 15, and the jaws are then opened by the elliptical springs *r r*, which are secured to the frame of the machine and to the sides of the jaws by screws or any suitable means.

The jaws C C have a plate, C', with a screw and slotted hole on top, which is adjustable lengthwise by means of the screws shown at the back of the jaws in Fig. 6, and marked 35. The object of this adjustability is to adapt the jaws to different sizes of nails and center the nail under and for the nipper-jaws D D. The wedge *p* enters but a short distance at first to close the jaws upon the nail; but as the nail is gradually withdrawn from the jaws its tapering shape permits the jaws to gradually close, and the wedge is forced in and closes them gradually and firmly, so that the nail cannot turn around within them, and the thread is formed entirely to its point.

D D represent the jaws which are used to grip the head of the nail, and which are rotated and gradually raised by suitable mechanism, for the purpose of twisting the nail and drawing it from the stationary jaws. These jaws D D are levers which have their fulcrum at E, and are represented as closed in Fig. 1. The upper end of each of the jaws has a movable piece of irregular shape attached to it by a pin. These pieces are marked F F. The rotating nipper-jaws are opened by the descent of the rod *g g*, which causes the pieces F F to turn on their axes and follow the rod downward, and thereby release the upper ends of the jaw-levers which open the jaws. They are closed by the ascent of the rod *g g*.

14 is a rotary shaft set in motion by power

applied to a pulley attached thereto, which shaft has upon it the gear 16, which operates the gear 17, *o o*, and P.

The shaft *h h* is raised and depressed by means of the cam *a*, which is suitably grooved in the face to receive and act upon the roller 18, attached to the shaft *h h*. The raising of the shaft *h h* raises the nipper-jaws and draws the nail from the stationary jaws. The nipper-rod G is moved up and down inside of the nipper-shaft *h h*. On the top of the gear P is the piece L, fastened thereto.

J is a round piece of metal or pin attached to the upper side of L, and adapted to fit into a recess in the clutch K', as shown in Fig. 8.

In Fig. 1 the piece L and clutch K' are shown clutched together. The clutch K' is secured to the nipper-shaft *h h*. The collar K is also secured to the nipper-shaft and revolves with it.

The piece M is loose upon the nipper-shaft and fastened to the rod *f f*. The rod *f f* is raised by the action of the cam R upon the roller 20, which is attached to the rod *f f*. The cam R is so constructed that the roller is permitted to fall suddenly at the time required for the descent of the rod. The purpose of raising and dropping the rod *f f* is to raise and lower the clutch K'. When the clutch K' is lowered, it is engaged with the pin on the piece L, which engagement transmits the motion of the gear P to the nipper-shaft *h h*, and rotates the nipper-jaws and thereby twists the nail.

The nipper-rod *g g*, which opens and closes the nipper-jaws D D, is raised and forced downward by means of the rod 21, which is connected to the nipper-rod by the piece *g'*. The rod 21 is in turn raised and lowered by the lever *u u*, which has its fulcrum at 22. The lever is operated by the cam 23 and the roller T. The end which operates the shaft or rod 21 is forked shape. The tines 32 and 32' are arranged one above and the other below a projection, 33, on the rod 21. The lower tine serves to raise the rod when forced upward by the lever, and the other to force it downward when it descends. The motion of 32 closes the nipper-jaws when at their lowest position, and 32' opens them when at their highest position.

When the nipper-jaws seize the nail-head, it is important to have them in position to lay hold of the flat sides of the head, and not to catch upon the corners. For this purpose there is a device to stop the rotation of the nipper-shaft at a time when the nipper-jaws are in a position to directly descend and seize the nail by the flat sides of the head. As the nipper-shaft ascends it is rotating at considerable speed, and when disconnected from the gear its momentum would continue its rotation for a considerable time. This is stopped almost immediately, and in the required position for the nipper-jaws, by bringing the lever *i* against the projection Q on the clutch K'. For this purpose the lever *i* is operated by the spring 12. (Shown in Fig. 8.) The lever *i*, when

the rotation of the nipper-shaft is to be stopped, is thrown against the projection Q by means of the spring 12. (Shown in Fig. 8.) When the rotation is to begin, the lever *i* is thrown back or away from the projection Q by the cam *c* acting on the roller *j* in the end of the lever *i*, which in turn operates the lever *i*. The nail-way A A is made to reciprocate by the face of the cam *c* acting on the end of the arm *e e*, which swings the supporting-arm 27 by means of the connecting-rod 28. When the nipper-shaft has been raised to its highest point, the removing-forceps *v* (shown in Fig. 7) are thrown forward by the spiral spring 29 (shown in Fig. 1) and seize the nail which is in the nipper-jaws. The nipper-jaws then release the nail, and the forceps are thrown back by the lever 30, which has a projection at its top and at right angles to it, with a roller, W, thereon, which is acted upon by the face of the cam 35. When the removing-forceps reach the farthest point backward, they are opened by suitable mechanism, and the nail is thereby released and dropped into a receptacle for it.

Instead of the stationary jaws described, a pair of jaws having a half-thread tapped in each may be used for the purpose of cutting a thread upon the nail as it is withdrawn from them, instead of making the thread by twisting, as before described.

The mechanism for delivering and holding the blanks is adapted for any machine which has for its object any work upon nails or nail-blanks, when it is desirable to automatically feed and hold them for that purpose, such as slotting and milling the heads, &c.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for making screws or screw-nails, the jaws C C, having the adjustable plates C', in combination with the nipper-jaws D D, and mechanism, substantially as described, for rotating the nipper-jaws D D, substantially as and for the purpose set forth.
2. In a machine for making screws or screw-nails, the jaws C C, having adjustable plates C', in combination with the nailway A A, substantially as and for the purpose set forth.
3. In a machine for making screws or screw-nails, the nipper-jaws D D, in combination with mechanism, substantially as described, for twisting a nail, as and for the purpose above described.
4. In a machine for making screws or screw-nails, the jaws C C, with the adjustable plate C', in combination with the wedge *p*, and the springs *r r*, substantially as above described.
5. In a machine for making screws or screw-nails, the combination of the nipper-shaft *h h*, the clutch L and K', and the lever *i i*, for the purpose of intermittently rotating the nipper-shaft, substantially as described.

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Witnesses:

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CHAS. H. DREW.