

3 Sheets—Sheet 1.

No. 361,005.

Patented Apr. 12, 1887.



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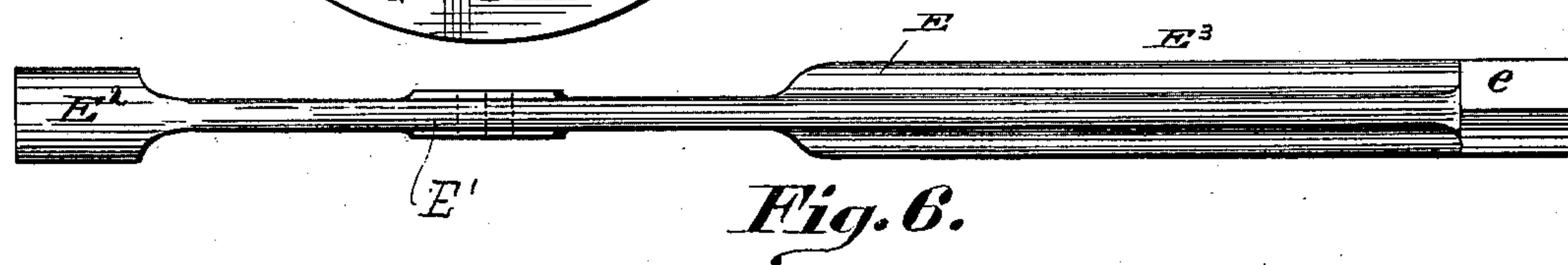
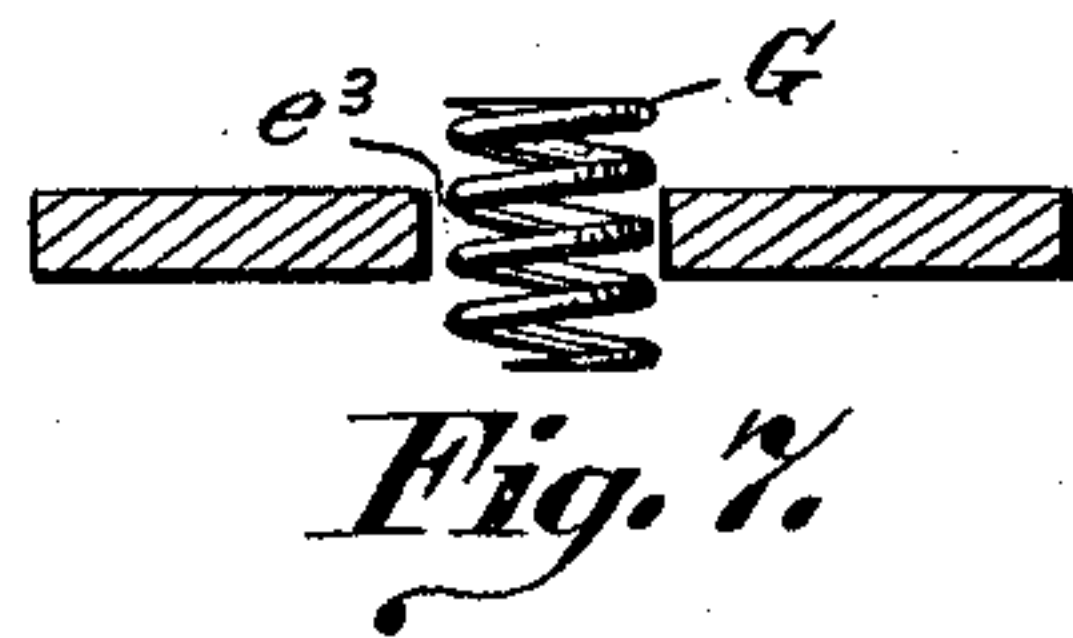
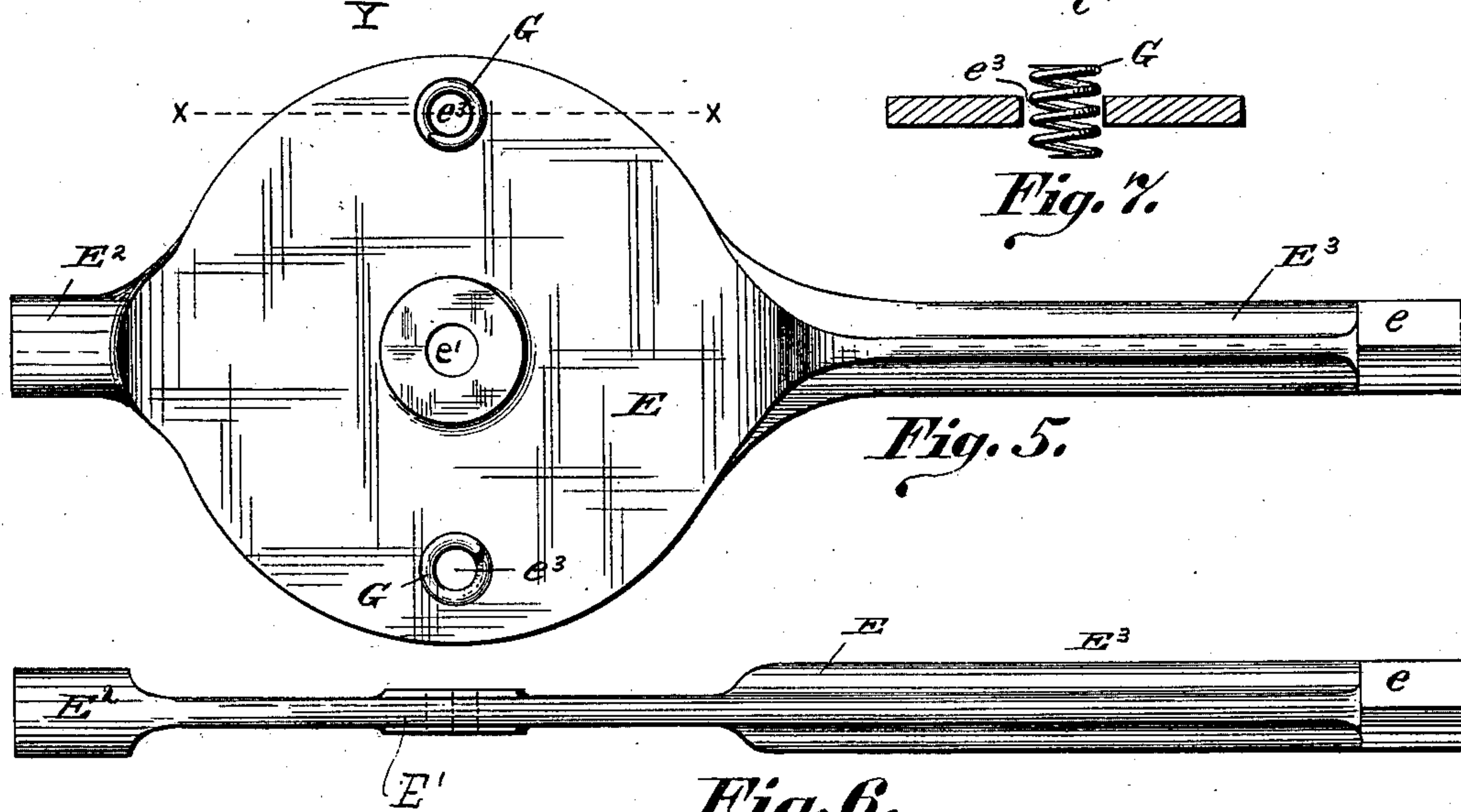
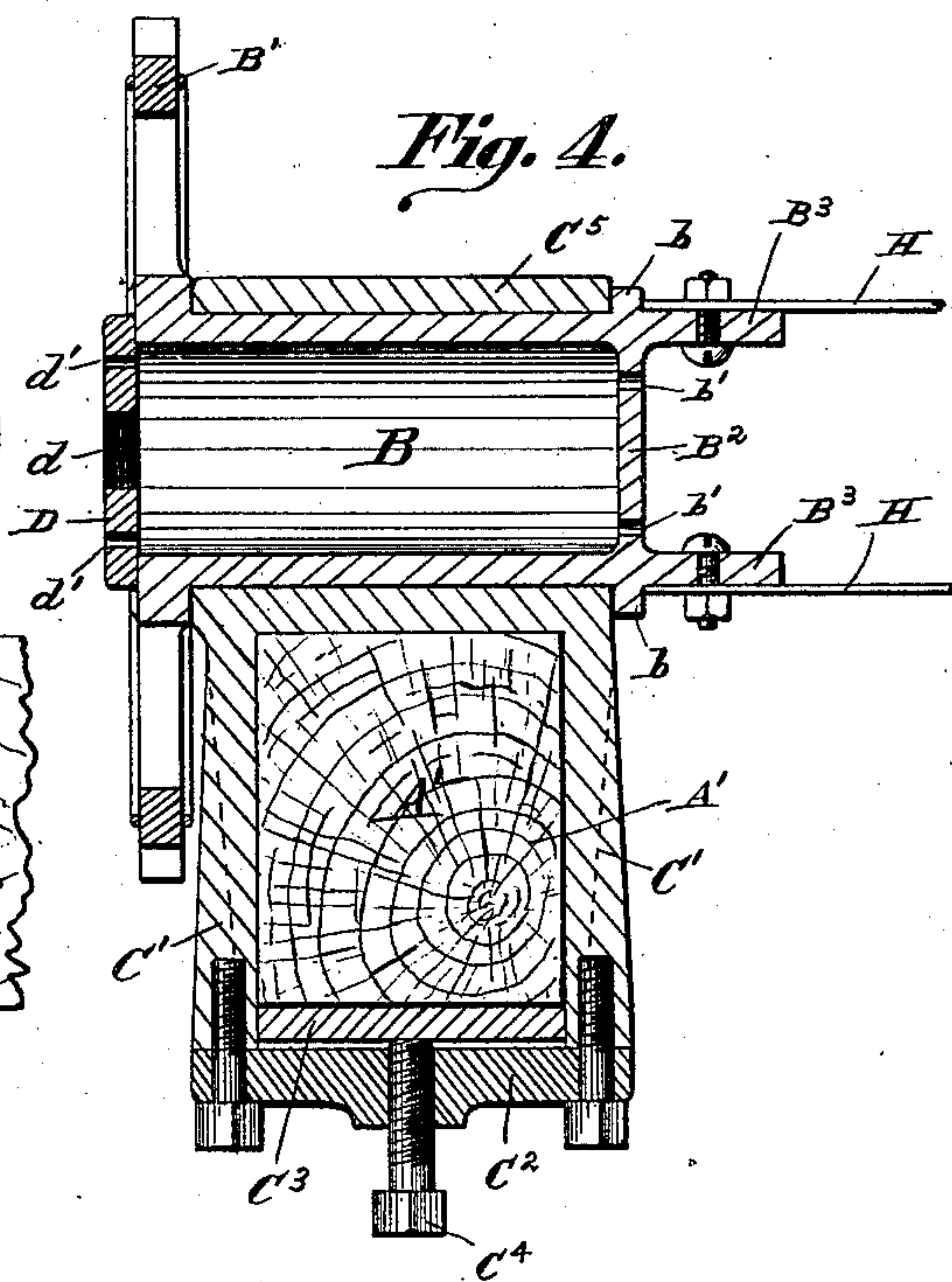
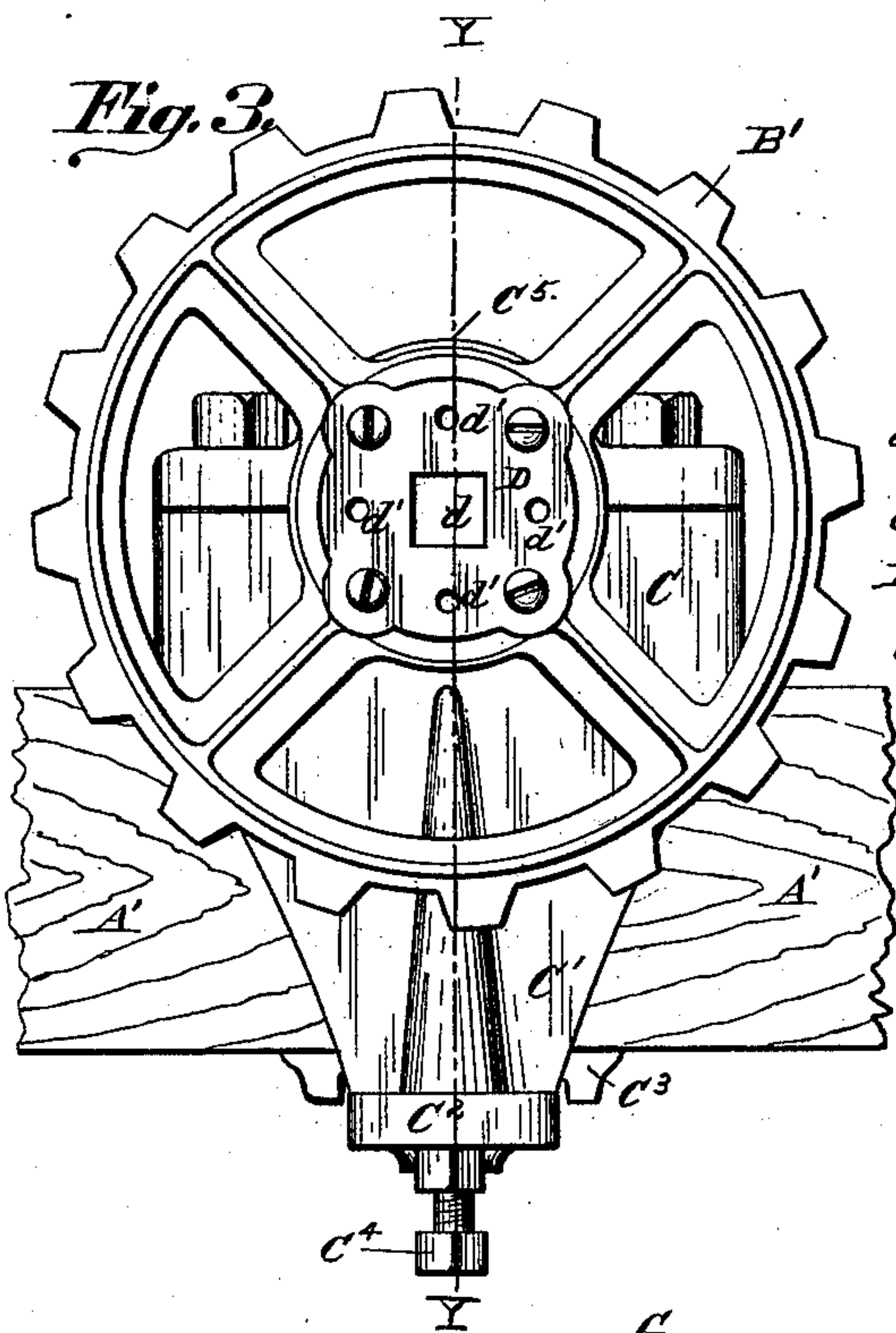
(No Model.)

3 Sheets—Sheet 2.

B. L. FLETCHER.  
WIRE FENCE MACHINE.

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Attest.

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(No Model.)

3 Sheets—Sheet 3.

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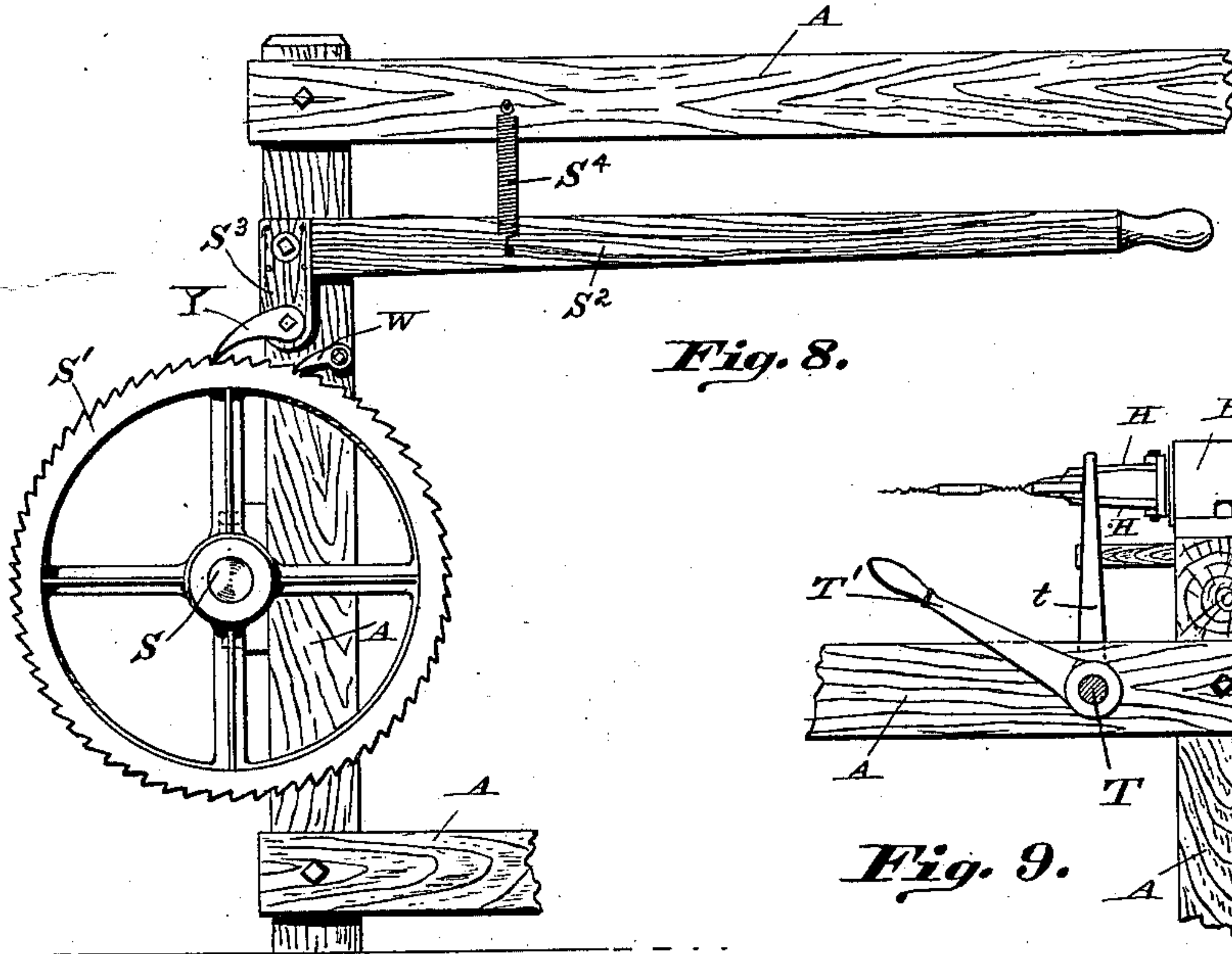


Fig. 8.

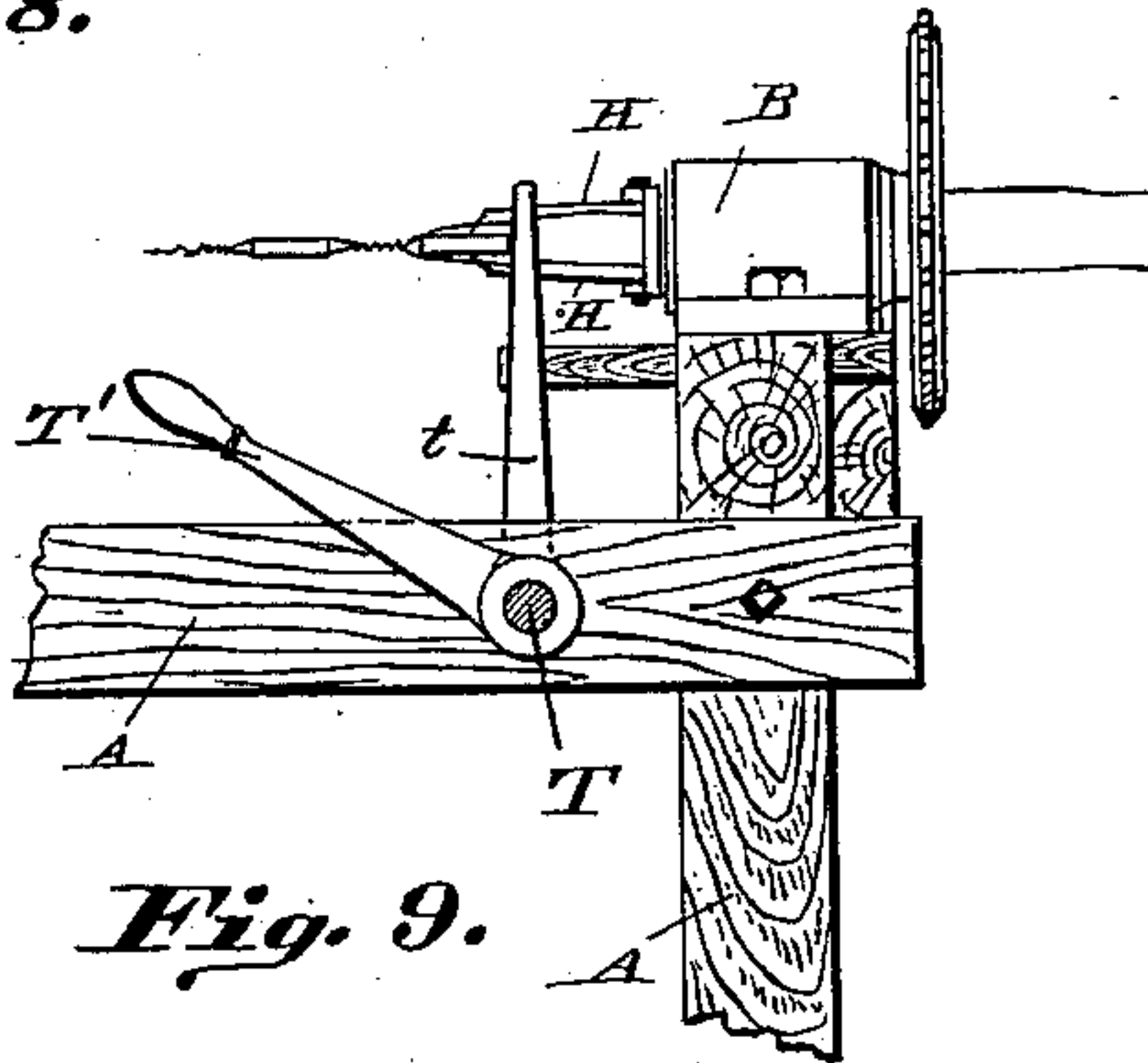


Fig. 9.

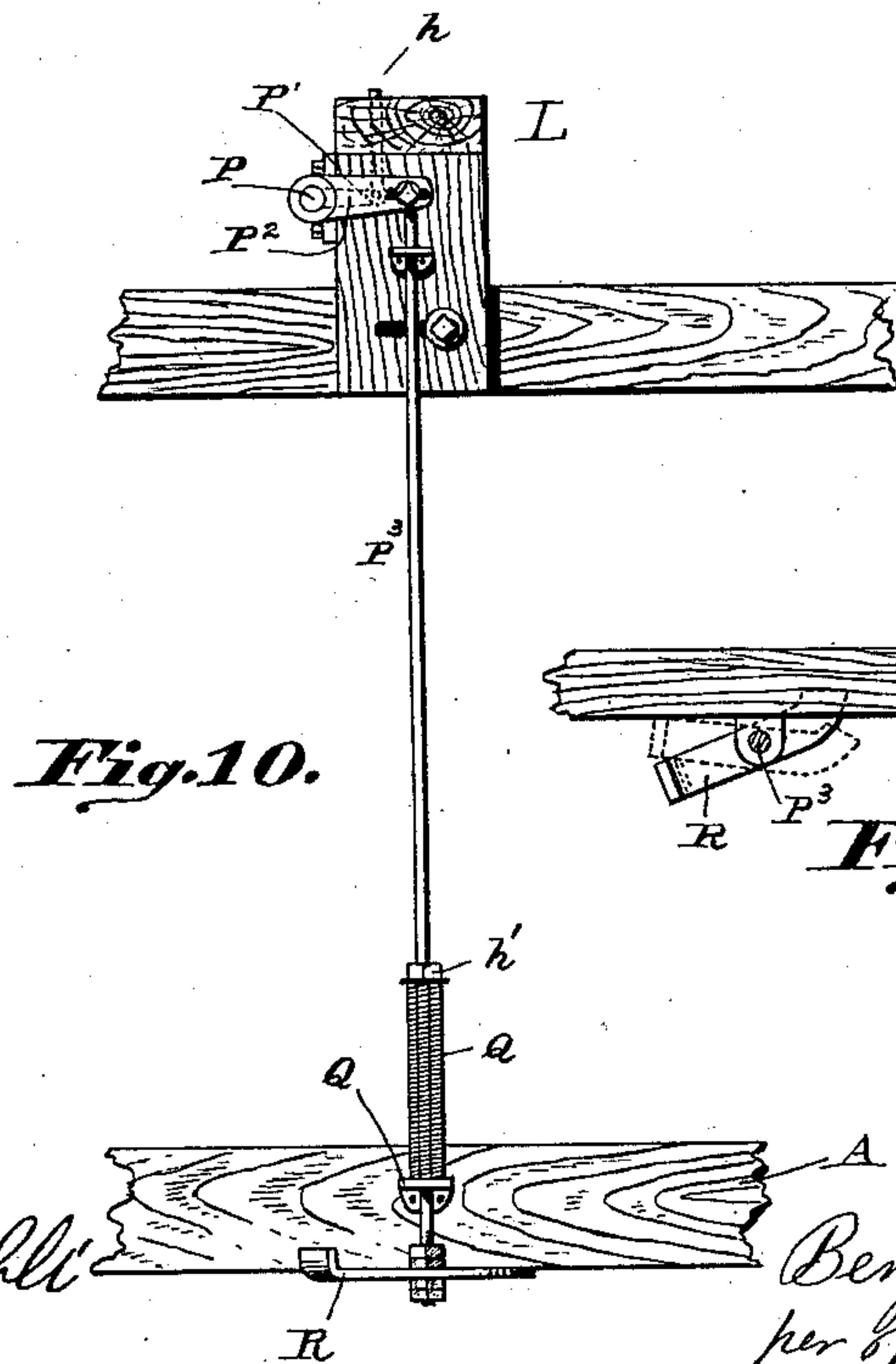


Fig. 10.

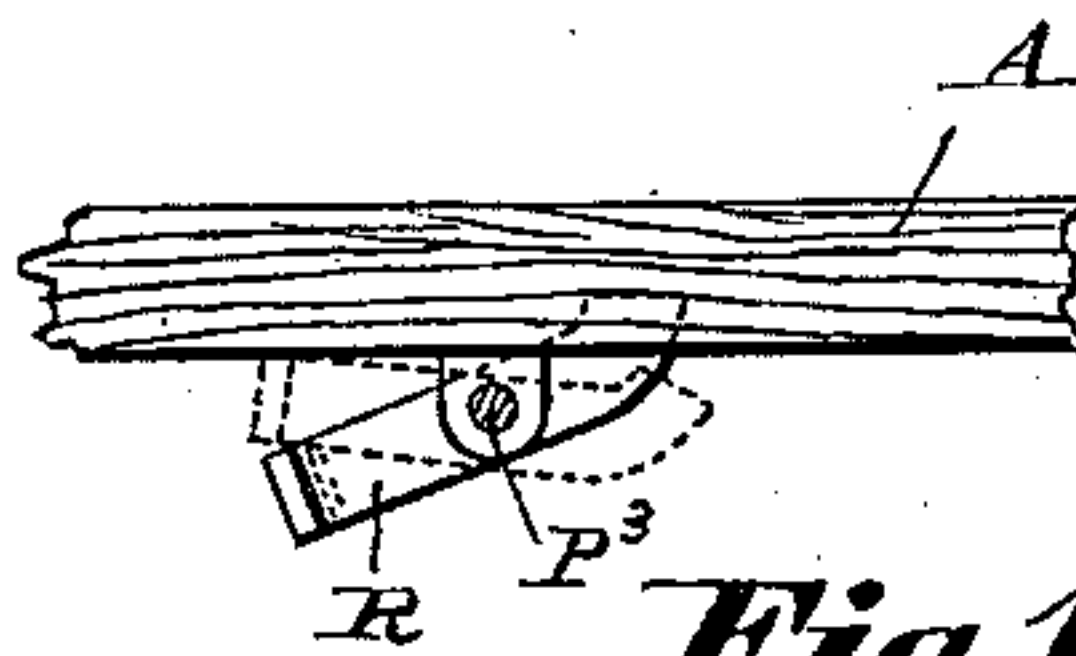


Fig. 11.

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# UNITED STATES PATENT OFFICE.

BENJAMIN L. FLETCHER, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF  
TO JOSEPH E. SHEPHARD, OF SAME PLACE.

## WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 361,005, dated April 12, 1887.

Application filed January 11, 1886. Serial No. 188,193. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN L. FLETCHER, a citizen of the United States, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Wire-Fence Machines, of which the following is a specification.

One object of my invention is to provide in a machine for making wire fence means whereby twisting and untwisting of the wire previous to its being woven into the fence is obviated.

Other features of the invention will be apparent from the following specification:

In the accompanying drawings, forming part of this specification, Figure 1, Sheet 1, is a side elevation of my improved wire-fence machine. Fig. 2, Sheet 1, is a top view of the same. Fig. 3, Sheet 2, is a rear elevation of one of the twister-heads. Fig. 4, Sheet 2, is a vertical central section through the same, taken at the line *yy*, Fig. 3. Fig. 5, Sheet 2, is a side elevation of the spool-carrying spindle. Fig. 6, Sheet 2, is a top view of the spindle shown in Fig. 5. Fig. 7, Sheet 2, is a section taken at the line *XX*, Fig. 5. Fig. 8, Sheet 3, is a side elevation of a portion of the machine, showing the apparatus for winding up the made fence. Fig. 9, Sheet 3, is a side elevation of a portion of the machine, showing the device for holding the paling in place while being woven into the fence. Fig. 10, Sheet 3, is an elevation illustrating the device for raising and lowering the pins which render the palings parallel. Fig. 11, Sheet 3, is a plan view of the lower part of the device shown in Fig. 10.

The various parts of the frame-work are designated by the letter *A*. That part of the machine shown at the left in Fig. 1 is considered the front of the machine. The twisting-heads, preferably five in number, are mounted on the cross-piece *A'*, joining the two sides of the frame. Each twisting-head *B* is mounted in a journal, *C*. The preferred mode of attachment of the journals *C* to the cross-piece *A'* is shown in Figs. 3 and 4. Two lips, *C'*, project down from the journal on each side of the cross-piece *A'*. The ends of these lips are

connected together under the cross-piece *A'* by a short cross-head, *C<sup>2</sup>*, and between this latter and the wooden cross-piece *A'* a metal bearing-plate, *C<sup>3</sup>*, is preferably inserted. The screw-bolt *C<sup>4</sup>* passes through the cross-head *C<sup>2</sup>*, and, bearing against the plate *C<sup>3</sup>*, holds the journal firmly in place. A cap, *C<sup>5</sup>*, completes the journal-box.

The front end of the twisting-head *B* has the toothed wheel *B'* rigidly secured to it and preferably cast with it, as shown. A shoulder, *b*, on the opposite end of the twisting-head, together with the wheel *B'*, holds the twisting-head in its box. The twisting-head is hollow, but each of its ends is partially covered. In the rear end a cross-piece, *B<sup>2</sup>*, is provided with two openings, *b'*, one at each end, through which the wires pass.

From the front end of the twisting-head two lips, *B<sup>3</sup>*, project. From each projection an elastic finger, *H*, extends rearwardly, as shown in Figs. 1, 2, and 4. Their free ends are approximated. Through the free end of each finger a small opening is made for the transmission of a wire.

The front end of the twisting-head is covered by the plate *D*. This plate *D* has a central square opening, *d*, or so otherwise shaped and constructed as to compel the shank of the spindle to turn with the twisting-head. The plate *D* has two or more small, preferably circular, openings, *d'*, near its edge and opening into the cavity of the twisting-head. These openings *d'* are for the transmission of the wires.

The spool-carrying spindle *E* is shown in Figs. 5 and 6. It consists of a disk, *E'*, from opposite sides of which a journal, *E<sup>2</sup>*, and a shank, *E<sup>3</sup>*, project. The spindle is preferably made of one piece of metal, as shown. The shank *E<sup>3</sup>* terminates in the head *e*, which fits into the opening *d* of plate *D*, and when the opening *d* is square, as shown, the head *e* will be square. The journal *E<sup>2</sup>* is journaled in bearings *e<sup>2</sup>* on the cross-piece *A<sup>2</sup>*.

A suitable device to properly retard the revolution of the spools is to be employed, and I preferably employ one of my own invention, which is as follows: An opening, *e'*, in the center of the disk *E'* provides for the spindle *f*, on



which the spools F are mounted. The ends of the spindles *f* are provided with nuts or other means for holding the spools F on the spindle.

5 Near the periphery of the disk E' two openings, *e*<sup>2</sup>, are cut, and in each of these openings a spiral spring, G, is placed. This spring G is slightly compressed between the two spools F F, attached to the same spindle, and acts as  
10 a tension, preventing undue turning of the spools.

The chain I is provided with links which mesh with the teeth of the wheels B', and also with those of the driving-wheel K, and passes  
15 alternately over and under the wheel K under all the wheels B'. In this way it moves alternate twisting-heads in opposite directions. Motion is imparted to the wheel K by the crank K'. A table, L, holds the fence in process of  
20 manufacture, and in connection with this table I preferably employ a novel device for holding that part of the fence which is already made stretched and taut while a new paling has been woven into the fence.

25 The table L is provided with openings, through which pins *h* may be pushed upwardly to hold the fence while tightening. This device for operating these pins is shown in Figs. 10 and 11. A rod, P, is journaled on each side  
30 of the machine to the pieces supporting the table L. The rod P has rigidly attached to it several arms, P', corresponding in number to the pins *h*. The arms P' extend under the table L, and each has attached to its end one of the  
35 pins *h*, which extend upwardly through the openings in the table L. One end of the rod P is provided with an arm, P<sup>2</sup>, one end of which is rigidly connected with the rod P and the other end is pivoted to the upper end of the rod  
40 P<sup>3</sup>. The preferred means for keeping rod P<sup>3</sup> elevated when not depressed through human agency are as follows: The rod P<sup>3</sup> passes through the spiral spring Q, which is compressed between the support Q, attached to the  
45 frame A, and the washer *h'* on the rod P<sup>3</sup>. This spring therefore tends to raise the rod P<sup>3</sup> when left free to act. The lower end of the rod P<sup>3</sup> is provided with the rotating catch R. By putting the foot on the catch R the rod P<sup>3</sup> may  
50 be forced down and slipped under the bottom of the frame A, as shown in Fig. 11, thus holding the rod down. In this position the pins are held just below the surface of the table L. By pushing the free end of the catch R the rod  
55 P<sup>3</sup> is liberated and the spring Q acting forces the rod P<sup>3</sup> upward, and thus projects the pins *h* above the surface of the table L.

At the rear of the machine an axle, S, is placed, on which the made fence is rolled.

60 The device for operating axle S is shown in Fig. 8, Sheet 3. The axle is provided at one end with a large ratchet-wheel, S', which is held in position by the retaining-pawl W, pivoted to the frame of the machine. A bent lever consisting of a long arm, S<sup>2</sup>, and a short  
65 arm, S<sup>3</sup>, preferably at right angles to the long arm, the long arm and the short arm being rig-

idly connected, is pivoted to the frame-work A, and carries the driving-pawl Y. Between the twisting-heads and the table L a rock-shaft, 70 T, is journaled in the frame A. Arms *t* are rigidly attached to the rock-shaft T, and extend upwardly, as shown in Fig. 9. The shaft T is provided, preferably outside the frame-work, with the hand-lever T', for operating it. 75

A convenient device for reeling or winding the fence-wire is as follows: At the front of the machine, on one side, a reel, M, is journaled. This reel is large enough to carry a hank of wire as it comes from the factory. On the op- 80 posite side of the machine a reeling apparatus is placed. This apparatus consists of the beveled gear-wheels N N', operated by the crank O'. The axle of the wheel N is prolonged to form the spindle *n*, on which the spools F are 85 placed to be filled.

The mode of operation is as follows: The spools F are first filled with wire and then put in place on the spindle E. The wire from each spool is carried back through one of the 90 openings, *d'*, of its corresponding twisting-head; thence through the opening *b'*, then through the opening in the end of the finger H. The wires are attached to the axle S at the rear and wound tight by means of the lever 95 S<sup>2</sup>. A few twists are given to the wires to make a starting-point. A paling is now inserted between the two series of fingers H H by means of the arms *t*, and lever T' forced tightly between the wires about to the edge of the table 100 L. The crank K' is now turned, twisting each pair of wires tightly against the paling, another paling is inserted, and the operation is repeated. As each paling is inserted the made fence is carried toward the rear and gradually 105 wound on the axle S.

It frequently occurs that a machine weaves the fence tighter on one side than on the other, in this way making the fence crooked. To obviate this difficulty and keep the fence per- 110 fectly straight, the pins *h* are provided. The pins *h* are shot up between palings, and, as the fence is tightened on the axle S, the coming paling is drawn against the pins *h*. As soon as the paling touches both pins *h* the fence is 115 straight. In this manner each paling is straightened against the pins *h*. To allow the fence to pass over the pins, these latter are lowered in the manner already described, and shot up after the paling has passed and before 120 the next paling has reached them. In this operation of twisting the chain I turns the twisting-heads B simultaneously, alternate heads moving in opposite directions. As the heads B rotate they carry the spindle E and the 125 spools F with them. In this way the wires are not alternately twisted and untwisted between the spools and the twisting-heads, as is the case when the spools are stationary—that is to say, when they do not revolve around 130 the axis of the spindles E.

While the various features of my invention are preferably employed together, one or more of said features may be employed without the



remainder, and so far as applicable one or more of said features may be used in making wire fence in connection with devices other than those specifically hereinbefore set forth.

5 What I claim as new and of my invention, and desire to secure by Letters Patent, is as follows:

10 1. The combination of the disk E', spools F F, mounted on spindle f, the latter provided with means for holding the spools in position, and tension-spring G, compressed between spools F F and supported in an opening in disk E', substantially as and for the purposes specified.

15 2. The combination of the twisting-head and disk E', spools F F, mounted on spindle f, the latter provided with means for holding the spools in position, and tension-springs G, compressed between spools F F and supported in an opening in disk E', substantially as and for the purposes specified.

20 3. The combination of the disk E', provided with opening or openings e', tension spring or springs G, spindle f, provided with means for retaining the spools on the spindle, spools, and twisting-heads, substantially as and for the purposes specified.

4. The combination of the disk E', spindle f, provided with means for retaining the spools

on the spindle, spools, springs G, and shaft E<sup>3</sup>, 30 having head e, and twisting-head having plate D, provided with opening d, substantially as and for the purposes specified.

5. In a wire-fence machine, the combination of the fence-support L, fence-straightening 35 pins h, rod P, arms P', levers P<sup>2</sup>, and device for reciprocating the lever P<sup>2</sup>, substantially as and for the purposes specified.

6. In a wire-fence machine, the combination of the support L, fence-straightening pins h, 40 arms P', rod P, lever P<sup>2</sup>, and reciprocating rod P<sup>3</sup>, spring Q, and treadle or catch R, substantially as and for the purposes specified.

7. In a wire-fence machine, the combination of the support L, pins h, arms P', rod P, lever 45 P<sup>2</sup>, rod P<sup>3</sup>, spring Q, inclosing rod P<sup>3</sup>, stop h', and treadle or catch, substantially as and for the purposes specified.

8. In a wire-fence machine, the combination of the rotating catch or treadle R, stationary 50 piece A, rod P<sup>3</sup>, arm P<sup>2</sup>, rod P, arms P', pins h, and support, substantially as and for the purposes specified.

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