

(No Model.)

5 Sheets—Sheet 1.

I. N. ELLIOTT & P. A. REID.

FENCE MACHINE.

No. 376,184.

Patented Jan. 10, 1888.

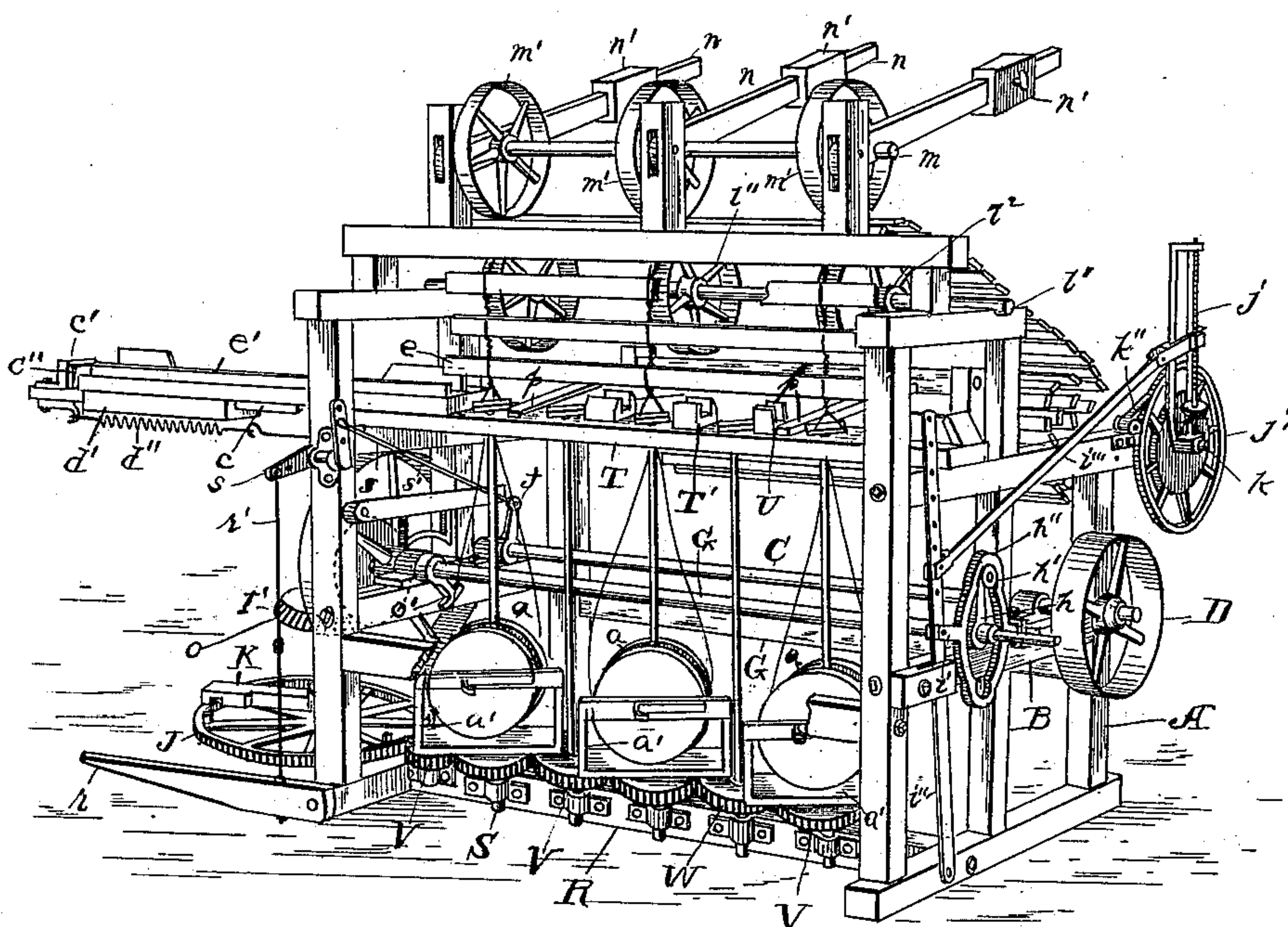


Fig. 1.

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INVENTOR:

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By

J. D. Zuber

Attorney.

(No Model.)

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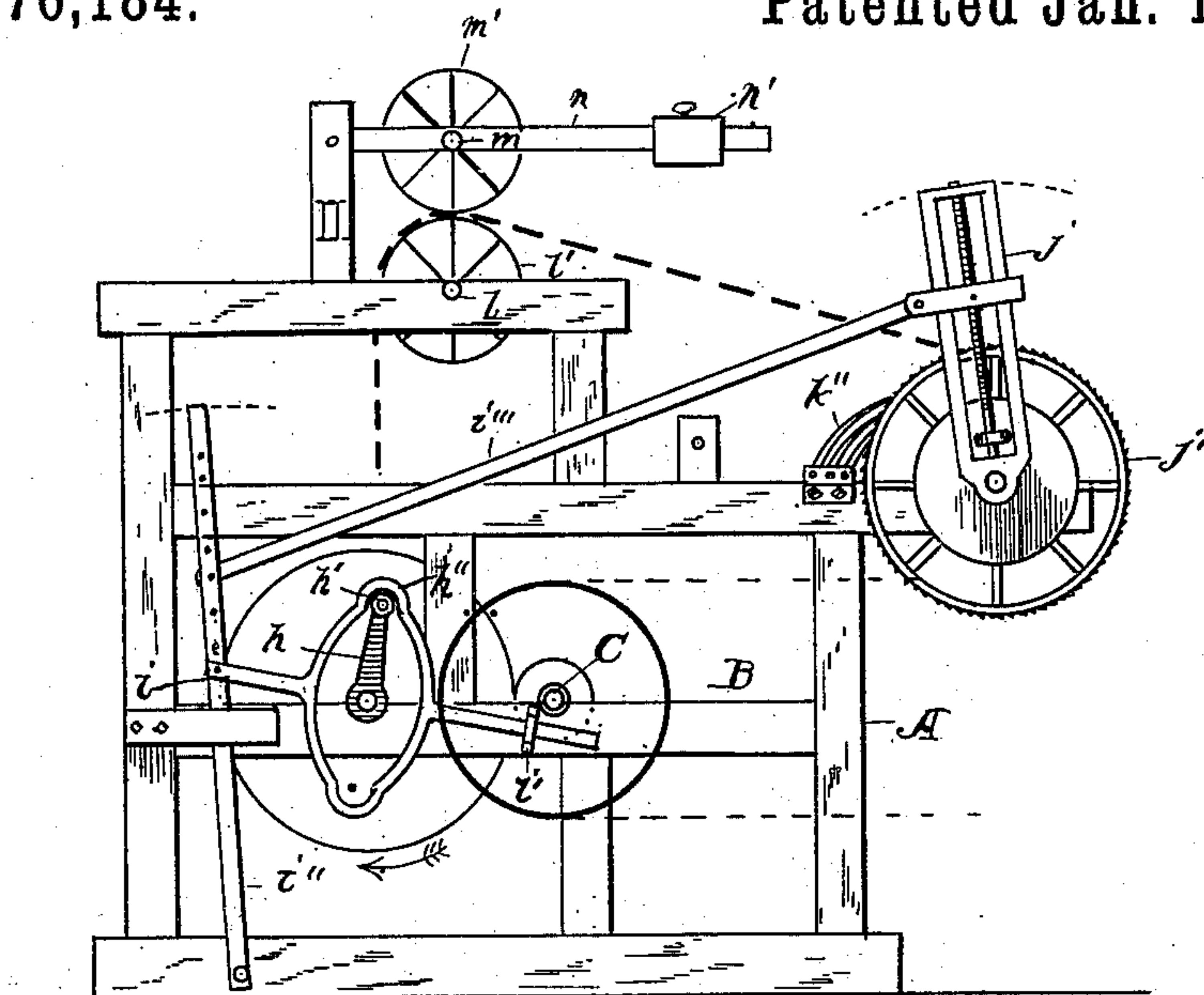


Fig. 2.

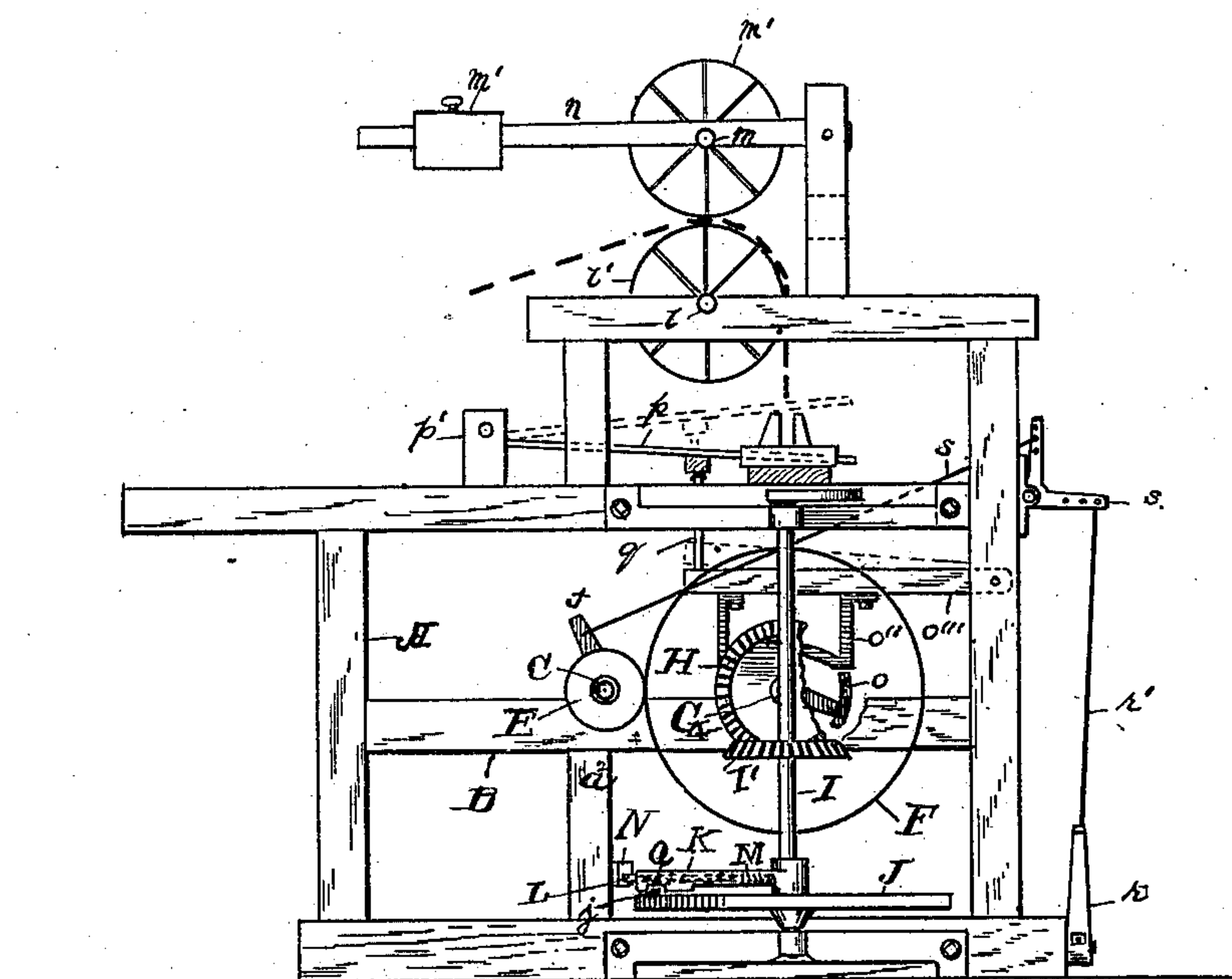


Fig. 3.

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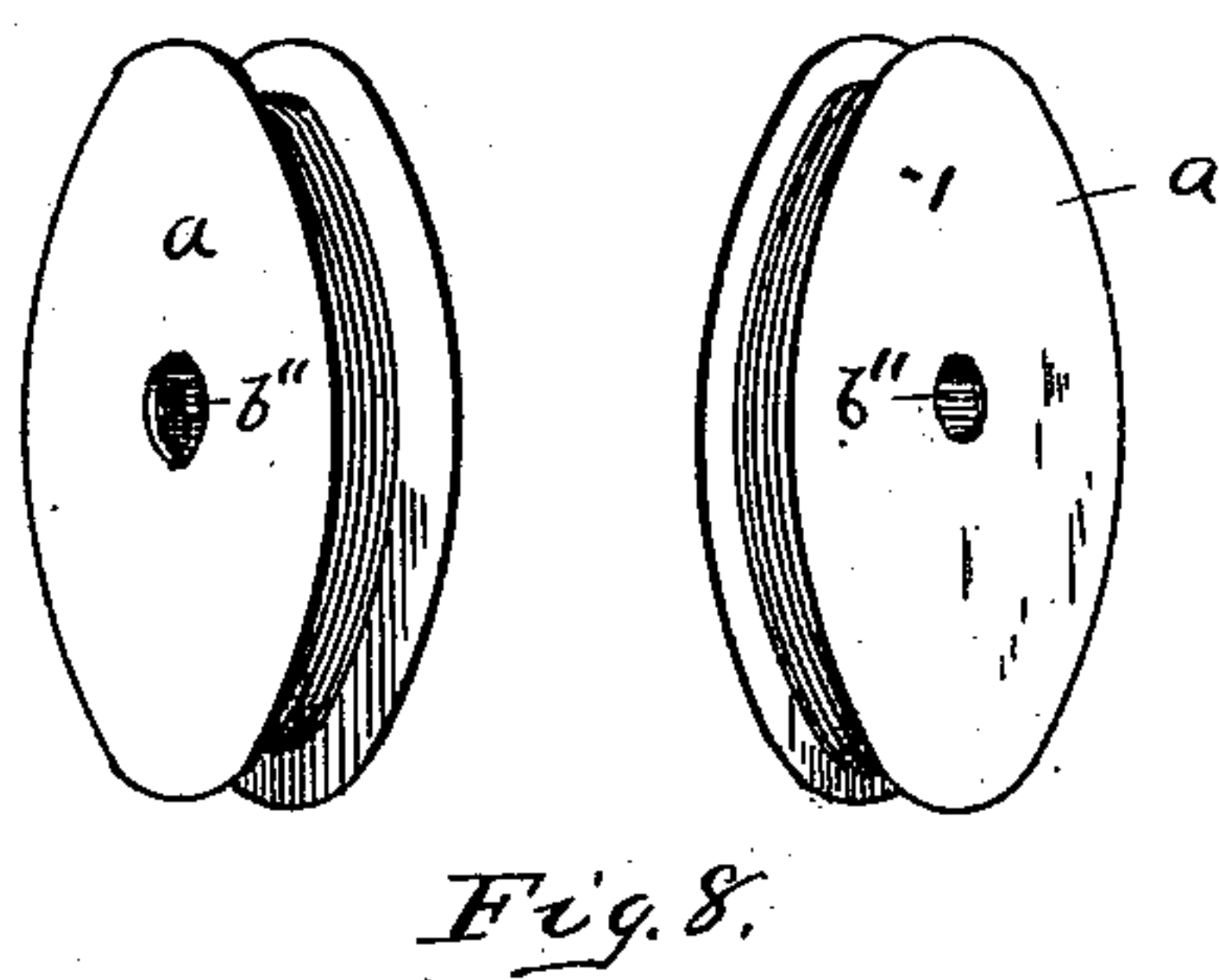
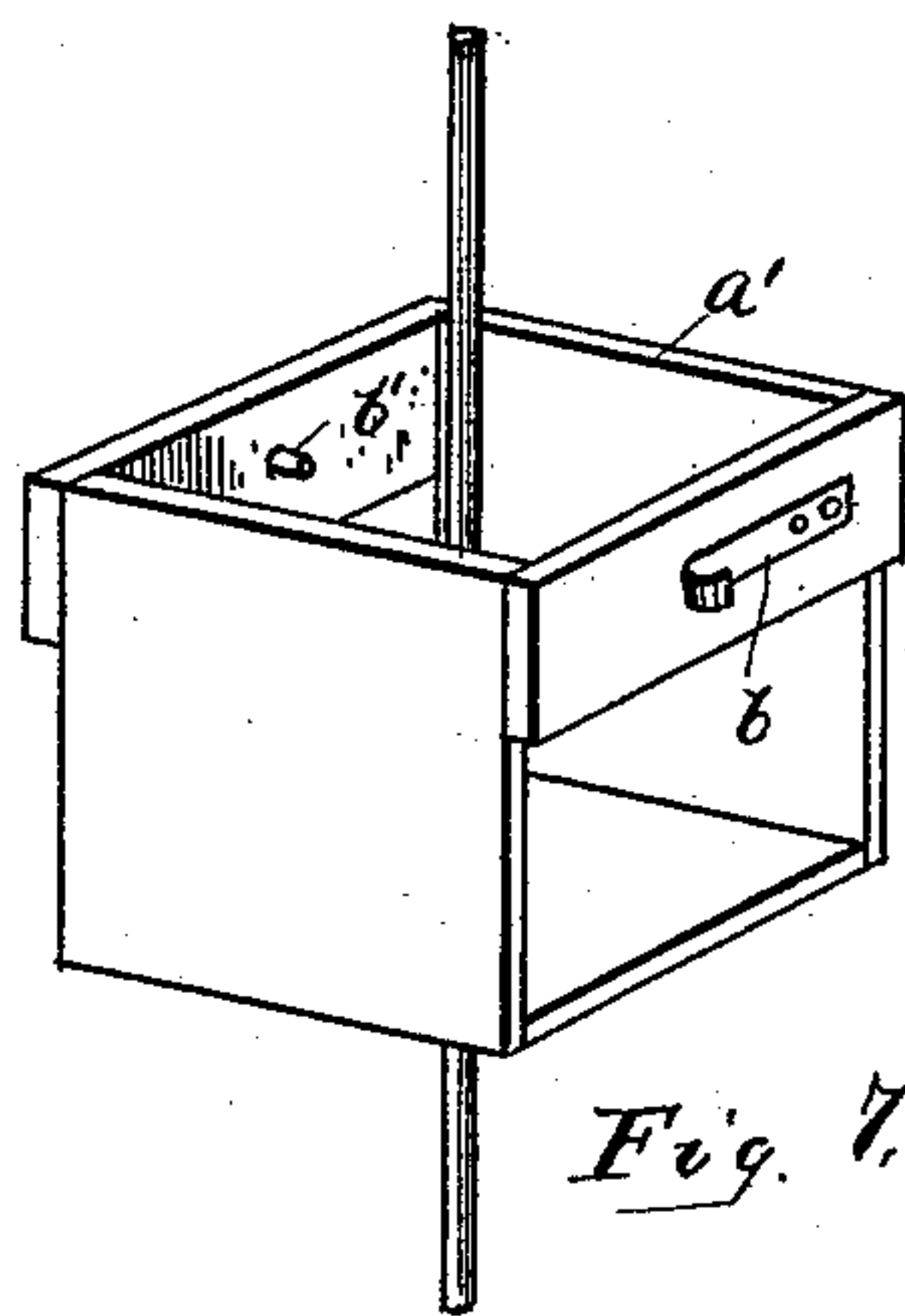
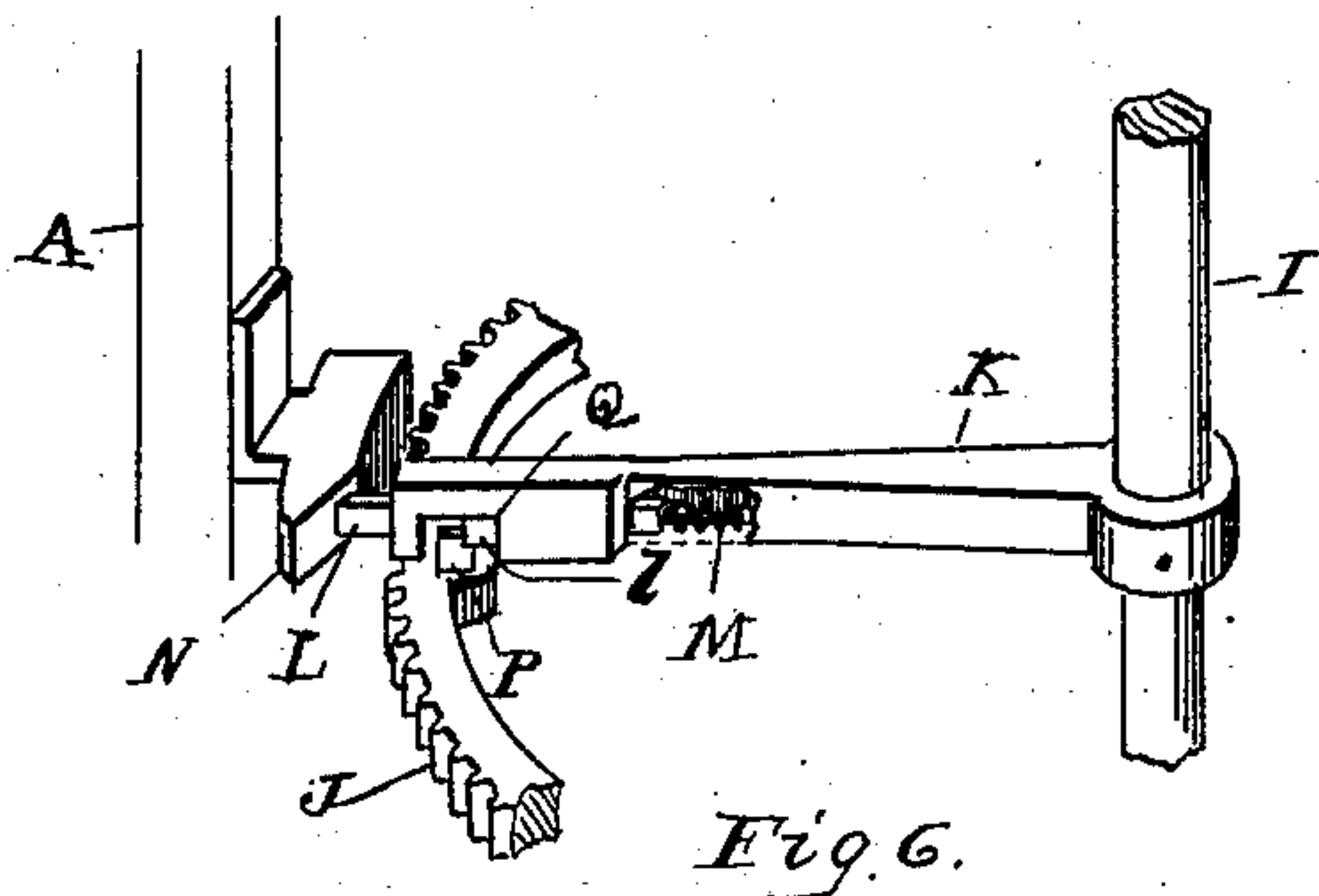
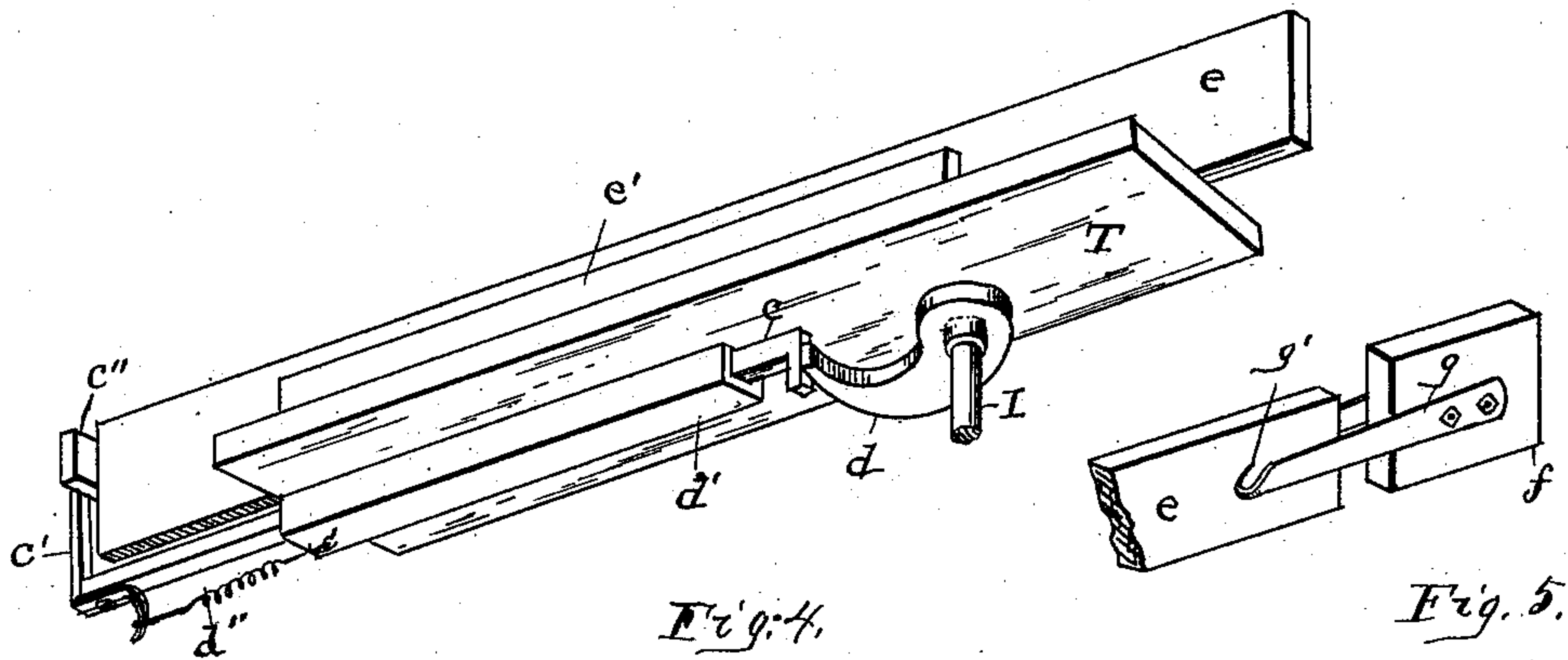
5 Sheets—Sheet 3.

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FENCE MACHINE.

No. 376,184.

Patented Jan. 10, 1888.



WITNESSES:

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5 Sheets—Sheet 4.

I. N. ELLIOTT & P. A. REID.

FENCE MACHINE.

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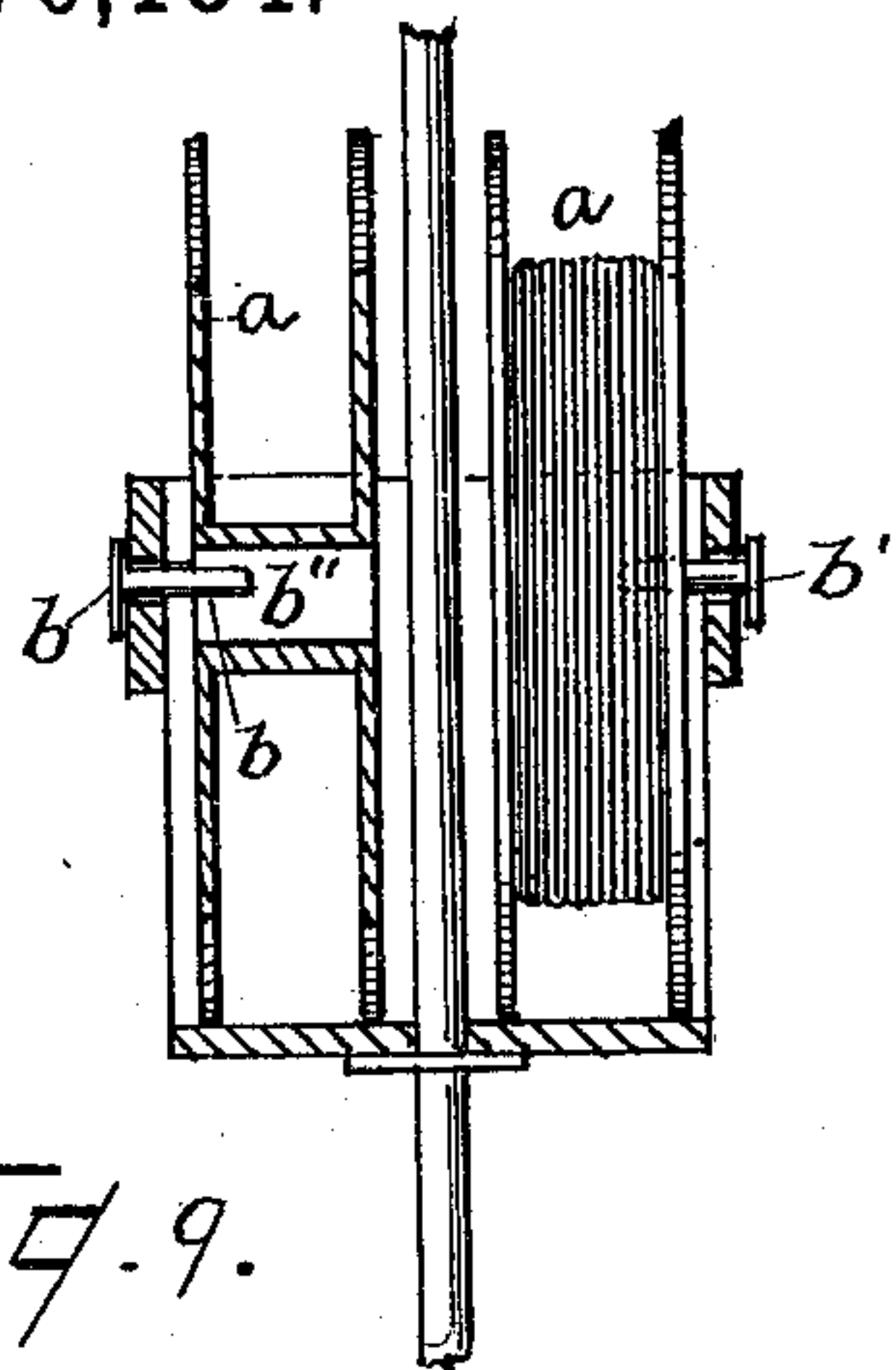


Fig. 9.

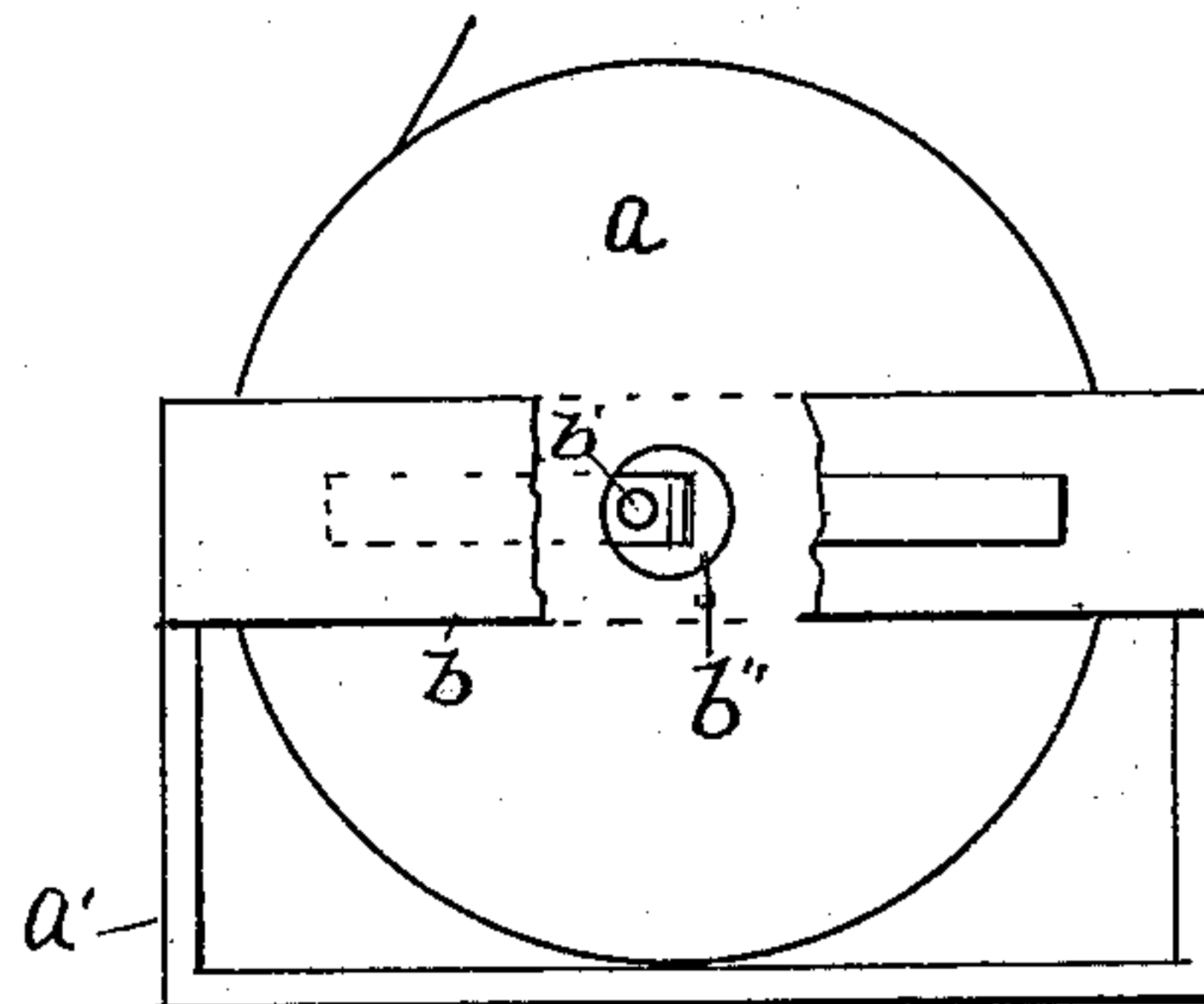


Fig. 10.

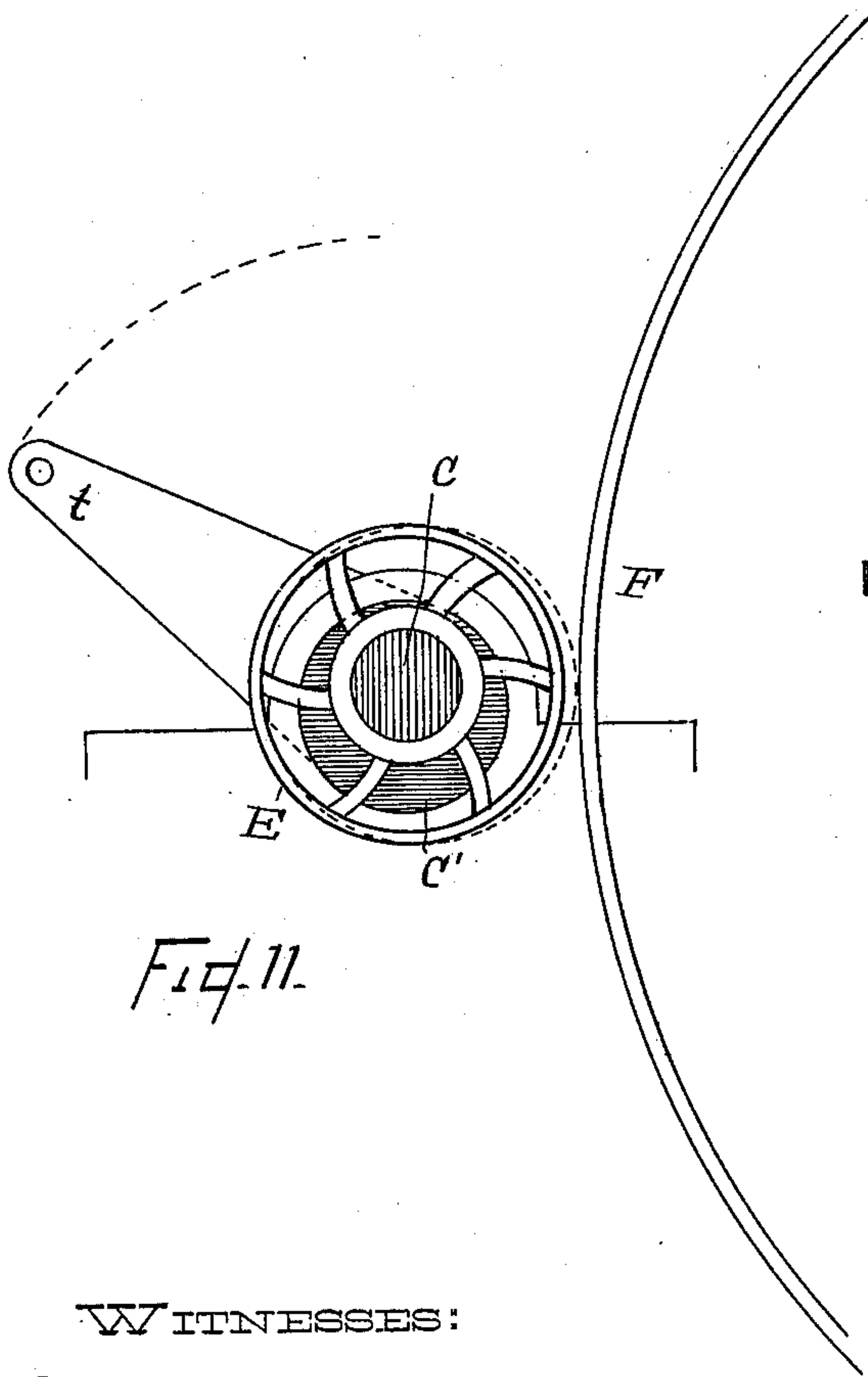


Fig. 11.

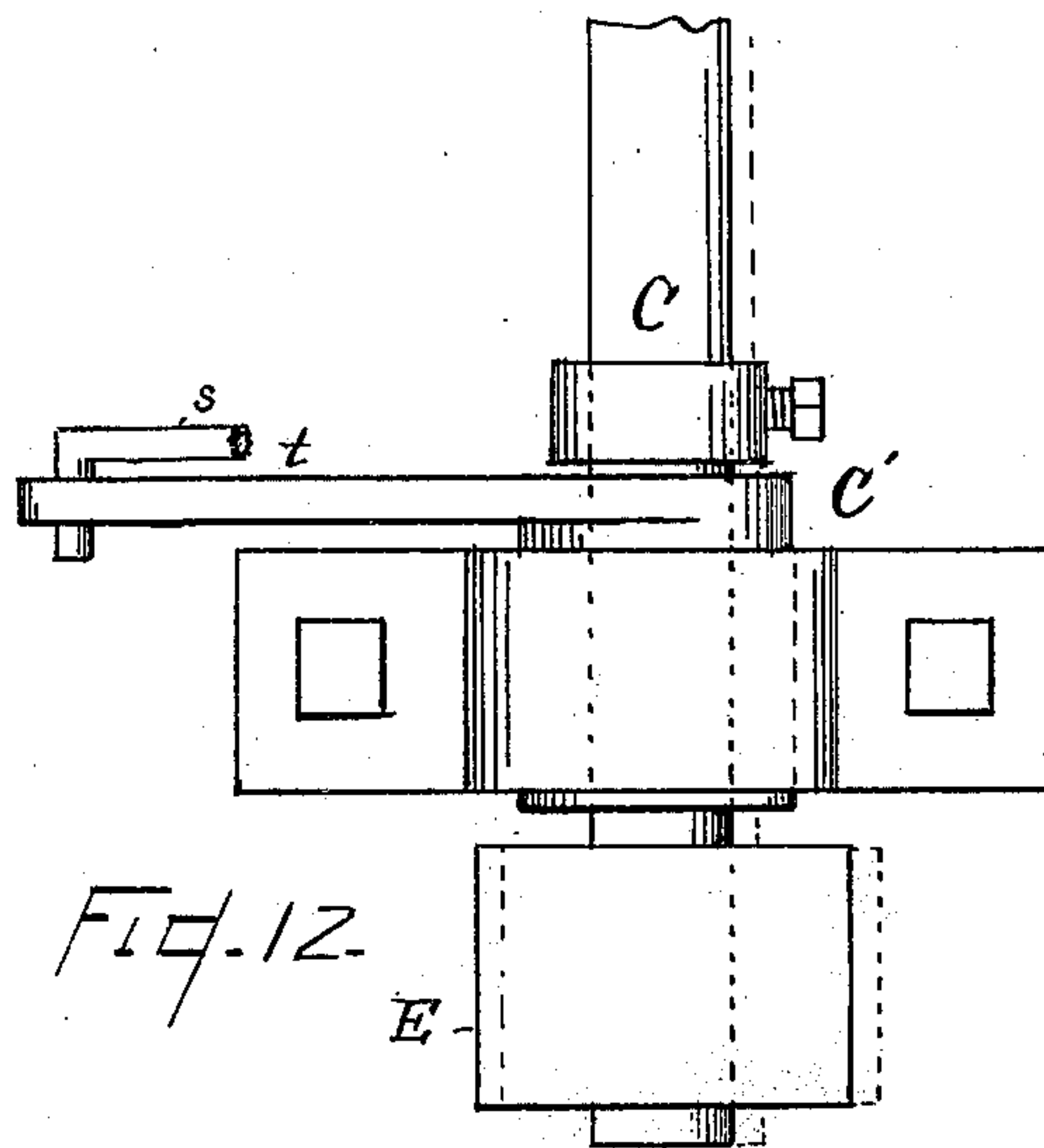


Fig. 12.

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Attorney.

(No Model.)

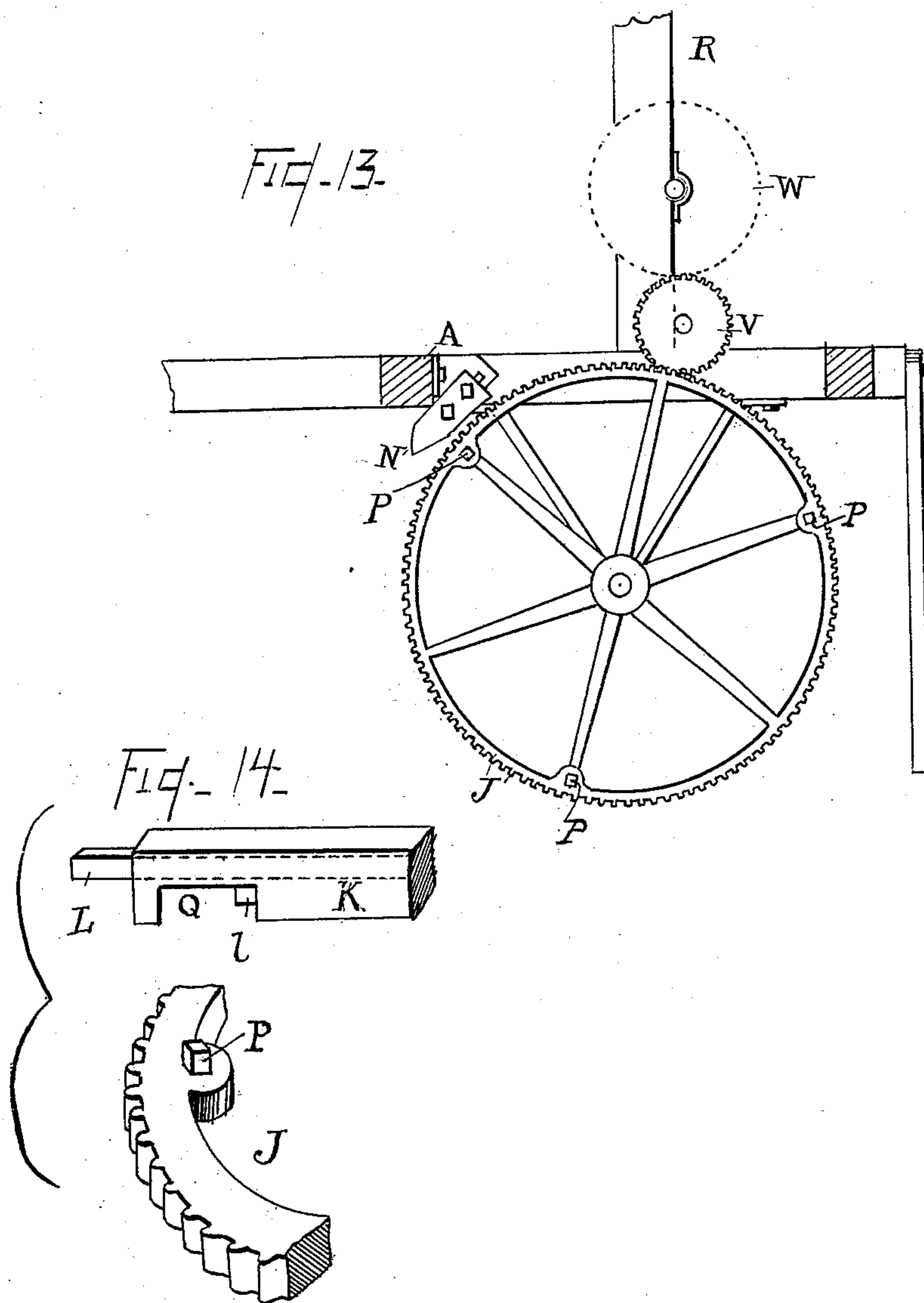
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I. N. ELLIOTT & P. A. REID.

FENCE MACHINE.

No. 376,184.

Patented Jan. 10, 1888.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ISAAC N. ELLIOTT AND PETTIS A. REID, OF RICHMOND, INDIANA.

FENCE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 376,184, dated January 10, 1888.

Application filed February 3, 1887. Serial No. 226,396. (No model.)

To all whom it may concern:

Be it known that we, ISAAC N. ELLIOTT and PETTIS A. REID, both of Richmond, in the county of Wayne and State of Indiana, have
5 invented a new and useful Improvement in Fence-Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a perspective view of our improved fence-machine; Fig. 2, an elevation of the right side; Fig. 3, an elevation of the left side; Fig. 4, an enlarged under perspective view of the self-feeding attachment; Fig. 5, a detached perspective view of the automatic
15 paling-grip; Fig. 6, a perspective view of the spur-wheel and spur-wheel arm; Fig. 7, a perspective view of the spool-box, and Fig. 8 a perspective view of the opposite faces of the wire-spool. Fig. 9 is a detail showing an edge elevation of the spool. Fig. 10 is a side elevation showing one of the spools in its box; Figs. 11 and 12, respectively, detail side elevation and top plan, showing the construction
20 by which the friction-wheel is forced against the larger wheel. Fig. 13 is a top view of the large horizontal spur-wheel and its relation to the train of wheels that turn the spool-box shaft. Fig. 14 is a detail, enlarged, of some of the parts shown in Fig. 6.

This invention is an improvement in wire-fencing machines, and especially in that one patented to Isaac N. Elliott, No. 343,232; and it consists in the devices and their construction and combination with said machine, all
35 as will now be more fully described, and pointed out in the claims.

These improvements may be generally specified as combining a set of pawls with a reel carrying the finished fencing, applying adjustable wheels on the shafts to accommodate
40 the strands of the fencing, and the automatic feed attachment and other minor details relating more or less closely thereto.

In the accompanying drawings, A represents the frame-work of our improved fencing-machine somewhat modified, but having the general features of the machine of the patent above mentioned. Within the side and

ends of the frame A are beams B, horizontally disposed. Above the side beam we provide
50 a transverse driving-shaft, C, having thereon at one end a drive-wheel, D. One end has a small friction-wheel, E, which engages with a larger wheel, F, disposed on the outer end of the second horizontal shaft, G, parallel with
55 the driving-shaft C.

Outwardly from the friction-wheel F, on the shaft G, is a bevel-wheel, H, so disposed as to engage with the twin bevel-wheel I' on the vertical shaft I, the said vertical shaft being
60 journaled just outside of the frame. The lower end of the vertical shaft I is provided with a large spur-wheel, J, while on the shaft, immediately above the spur-wheel, is a fixed arm, K, provided at its outer end with a bolt, L, and within the arm, back of the bolt, a spiral spring, M, is disposed, so that the normal position of the bolt will be with its end projecting outwardly from the bar. Upon
70 the vertical brace a^2 of the frame, and contiguous to the periphery of the spur-wheel J, is provided, preferably, one metal piece, N, the forward face being somewhat inclined on the side next to the spur-wheel J, so that at every rotation of the arm K bolt L will be forced
75 inward by the inclined face of the inner side of the piece N. The under face of this arm K is provided with a recess, Q, near its outer end, so that a lug, l , disposed on the under face of the bolt L, will operate within the recess Q.
80 The upper face of the spur-wheel is provided with preferably three lugs, P, so disposed that in the rotation of the arm K the lug l on the lower face of the bolt L will engage with one of the said lugs P and carry the spur-
85 wheel J partially around until the end of the bolt L is forced inwardly by the inclined face of the inner side of the piece N, when the said bolt is forced inward, releasing the two
90 lugs and permitting the spur-wheel J to become stationary, and allowing the lug l to pass through the opening Q on the under side of the arm K.

The spur-wheel J is journaled loosely on the shaft I, and as the said shaft I rotates, the lug
95 l on the lower face of the bolt L engages within

one of the lugs P, so that at every revolution of the shaft I and arm K the lug *l* engages with one of the lugs P and causes the spur-wheel to make two-thirds of a revolution, or until the outer end of the bolt strikes the inclined face of the metal piece N and forces it inward, and thus releases the lugs. The spur-wheel J then becomes stationary, while the arm K and shaft I continue to rotate until the lug *l* reaches the next lug P, when the spur-wheel again makes a partial rotation.

We do not confine ourselves to three lugs on the spur-wheel J, nor to the special disposition or spacing of these lugs, as the different parts of the machine may be so varied as to require different numbers and a different disposition of the lugs.

At the lower part of the frame-work, immediately inward from the vertical shaft I, is provided a horizontal beam, R, extending across the machine and secured at the end of the frame A and forming a part thereof. At the side of this beam the lower ends of a series of vertical spindles are journaled. The upper ends of the spindles are journaled through a table, T. The upper ends of these spindles are provided with a cross-head, T', with vertical openings outwardly from the spindle, through which the wires from the spools beneath pass. The said table is provided on the upper face with guide pieces or ways U in such a position that when the palings are placed in position they will rest between these guides within a loop formed by the wires above the spindles. These spindles S are provided at their lower ends with spur-wheels W, and between each two of these spur-wheels W are idler-wheels V. The wheel V at the left engages with the large spur-wheel J in connection with the idler-wheels. The said wheels V and W form a train which rotates intermittently in connection with the large spur-wheel J.

Heretofore the spools *a* were simply placed within the box *a'* and confined therein by gravitation; but as this is open to objections, inasmuch as when the wires become partially removed from the spools they have a tendency to become dislodged from the box, we therefore provide oppositely-disposed metal pieces *b* on the outside of the box, having inwardly-projecting lugs *b'*, extending through the opening in the side of the box, so as to engage with the central opening, *b''*, within the center of the spools *a*. These metal pieces *b'* are preferably formed of spring material, so that the ends carrying the lugs *b'* may be bent outwardly, thus permitting one of the spools being placed therein or removed therefrom, as desired.

The lugs *b'* on the spring *b* are designed to be at a distance above the bottom of the box a little greater than the radius of the spool, and to project into the hole in the spool to prevent the spool from being pulled out of the

box when the wire is so reduced that its weight will not keep it down, as, the wire being stiff and the inner coils of small diameter, the tendency is to lift the spool out.

The table T, carrying the ways U, is extended beyond the frame and provided at the lower side, near the frame, with a horizontal plunger-bar, *c*, having outwardly a vertical part, *c'*, provided with a cushion, *c''*, so disposed that a cam, *d*, at the upper part of the shaft I will move the plunger-bar outwardly through the ways *d'* and a spiral spring, *d''*, attached at one side of the lower end of the table T or frame A and at the other end of the bar C, which causes the side bar to spring back suddenly as soon as the cam has passed beyond its end. Thus, when the paling *e* is placed within the rack *c'* on the upper face of the table T outwardly from the frame A, a sudden reaction of the bar *c* will cause the cushion *c''* on the inner face of the vertical part *c'* to strike the end of the paling and shoot into position between the inner ways, U, within the frame. Between these inner ways, U, and exactly in line between the openings, are the heads of the spindles T', through which the wire from the spools passes, and the said paling is shot into position within the loop formed by the said wire above the head of the spindles. A stop, *f*, is placed at the inner end of the table T, provided with oppositely-disposed metal grips *g*, having hooked ends *g'*, between which the end of the paling enters and is secured into position.

The shaft G is provided at one end outwardly from the frame with a crank, *h*, having a friction-roller, *h'*, on the wrist-pin of the crank *h*, and so disposed as to operate with a vertically-disposed elliptical cam-frame, *h''*, and a horizontal bar, *i*. One end of this bar operates within a way, *i'*, while the other end is attached to a vertical lever, *i''*. This lever *i''* is hinged at its lower end, while the upper end is joined to a connecting-rod, *i'''*, the said connecting-rod being connected at the opposite end to a reciprocating lever, J, having pawls, which in turn is journaled to a shaft, *k*, carrying a reel, *k'*, so disposed as to wind up the fencing as fast as it is woven. Backlash of this reel is prevented by a series of pawls, *k''*. Upwardly from this reel *k'* a shaft, *l*, is journaled, having a series of wheels, *l''*, adjustably disposed thereon, forming a pressure-roller. These wheels are designed to be adjustably disposed upon the shaft to correspond with the wire strands in the fencing. Above this pressure-roller we provide a second series of rollers, *m*, adjustable on a shaft, *m'*, to correspond with the pressure-rolls beneath, this shaft *m* having adjustable weights *n'*. The shaft G is also provided with two or more arms, *o*, each having at the outer end a concentric segmental piecer, *o'*, so disposed that when the said shaft G rotates, the segmental piecer *o'* will engage with a concave piece, *o''*, on the lower side of the horizontal

lever o''' , and, after raising it a slight distance, will pass the end of the said piece beneath the horizontal lever and permit the end of the lever o''' to fall back into its original position. Above this lever o''' are a number of forwardly-projecting arms or levers, p , preferably corresponding in number with the number of spindles I . These levers p are hinged rearwardly to a transverse piece, p' , attached to the frame. The forward ends of these pieces p rest on the table T in such a way that the palings may be shot into position and rest over the ends of the said lever rearwardly. The upper face of the said lever o''' has adjustable fulcrum-bearing rods q centrally beneath the lever p , so that at every revolution of the shaft G , and immediately after the palings are shot into position, the lever o''' will be raised somewhat, thus lifting or forcing the paling within the loop formed by the wire strands while the wires are being twisted by the rotation of the spindles.

At the forward side of the machine is a foot-lever, r , hinged to the frame A , having a connecting-rod, r' , extending up to the bell-crank, which in turn, by a connecting-rod, s' , is joined to a crank, t , fixed in the end of the driving-shaft C , carrying the small friction-wheel E . This shaft C , at the end carrying the small friction-wheel E , is journaled eccentrically within the inner end of the crank t , so that by pressing downward on the foot-lever r the friction-wheel E will have a bearing against the large wheel F , and thus set the device in operation. The lever r is designed to be on the frame, so that the feeder can also control the operation of the machine.

The operation of our device is as follows: The wire-spools a are placed within the spool-box a' , with the ends of the said wires extending through the openings in the table T , and thence up through the openings in the head of the spindles, and thence over the pressure-rolls l . The machine is then set in motion by pressing on the lever r , and after several revolutions of the spindles S , so as to twist the wires, caused by the partial rotation of the spur-wheel J , these spindles S and train of wheels V and W will stop. At the same time the rotation of the vertical shaft I , causing the cam d to move the plunger-bar outwardly as far as possible, permits the paling being placed on the table T outwardly from the frame, so that when the ends of the cam d have passed the inner end of the bar c the spiral spring d'' will cause the bar to shoot the palings into position on the table T between the guides U and within the loops formed by the wires above the spindle-head. The lever p , resting on the table T , which is operated by a shaft, G , then immediately raises the paling and presses it into position within the wire loop.

The continuation of the revolution of the vertical shaft I , carrying the fixed arm k , engages the lug o with another lug on the wheel J , and again sets the said spur-wheel J in mo-

tion, rotating the spindles S as the wires are again twisted and securing the palings rigidly in position.

The number of rotations that the spindles S make in order to give the number of twists depends upon the size of the spur-wheels V , and may be varied to suit the convenience of the manufacturer. At the same time the crank carrying the friction-roller h , with the cam h'' operating the lever i , by connecting with a ratchet-lever, j , by means of the lever i'' and connecting-rod i''' partially rotates the ratchet-wheel j and reel k and winds up the finished fencing on the said reel.

As will be noticed, the finished fencing passes between the pressure-rolls, which makes partial revolutions as each paling is woven into the machine.

Having described our invention, what we claim as new is--

1. In a fence-machine, the table T , carrying the ways U and having on its lower side a horizontal plunger-bar, the end of which is vertical and cushioned, combined with the cam d , the shaft I , and ways d' , substantially as and for the purpose set forth.

2. In a fencing-machine, a spool-box having within it, on opposite sides, spring-lugs b' , combined with a spool, substantially in the manner and for the purpose set forth.

3. In combination with the lever r , rod i , bell-crank s , the rod s' , the crank t , the driving-shaft C , friction-wheel E , and the large wheel F , the shaft I and bevel-gearing, as set forth, the spur-wheel J , loosely journaled on said shaft and operated as described, and having a spring-actuated lug, l , the arm K , having opening Q , and the spring-actuated bolt L , having lug l , and the piece N , substantially as and for the purpose set forth.

4. In a fence-making machine, the combination, with the table T , carrying the ways U and extended beyond the frame, and having on its under side a plunger-bar provided outwardly with a vertical cushioned part, a spiral spring, the cam d , the shaft I , the shaft C , and beveled gear-connections, as set forth, whereby said plunger-bar is moved in one direction by the cam and automatically retracted by the spring, substantially as and for the purpose set forth.

5. In a fencing-machine, a reel for receiving the finished fencing, combined with pressure-rolls having an intermittent motion, and provided with the ratchet-wheel operated by a crank, h , and elliptical cam-frame h'' , and connecting mechanism, substantially as and for the purpose set forth.

6. The combination, with the shaft G , crank h , having roller h' , elliptical cam-frame h'' , the horizontal bar i , the lever i'' , connecting-rod i''' , the reciprocating lever and pawls, the reel k , and the pawls k'' , substantially as and for the purpose set forth.

7. In a fencing-machine, and in combination with the frame A , the feed-table provided with

a horizontal plunger-bar and a cam and spring actuating mechanism, an automatic grip having hooked ends, whereby the paling is retained between the ends, substantially as and
5 for the purpose set forth.

8. In combination with the shaft C and the crank *h*, having friction-roll *h'* and elliptical frame *h''*, the bar *i*, lever *i''*, rod *i'''*, the reciprocating lever *j*, having pawls, the shaft *k*,
10 and the reel *k'*, substantially as and for the purpose set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 11th day of August, 1886, in the presence of witnesses.

ISAAC N. ELLIOTT.
PETTIS A. REID.

Witnesses:

W. K. BRADBURY,
MARTIN KELLEY.