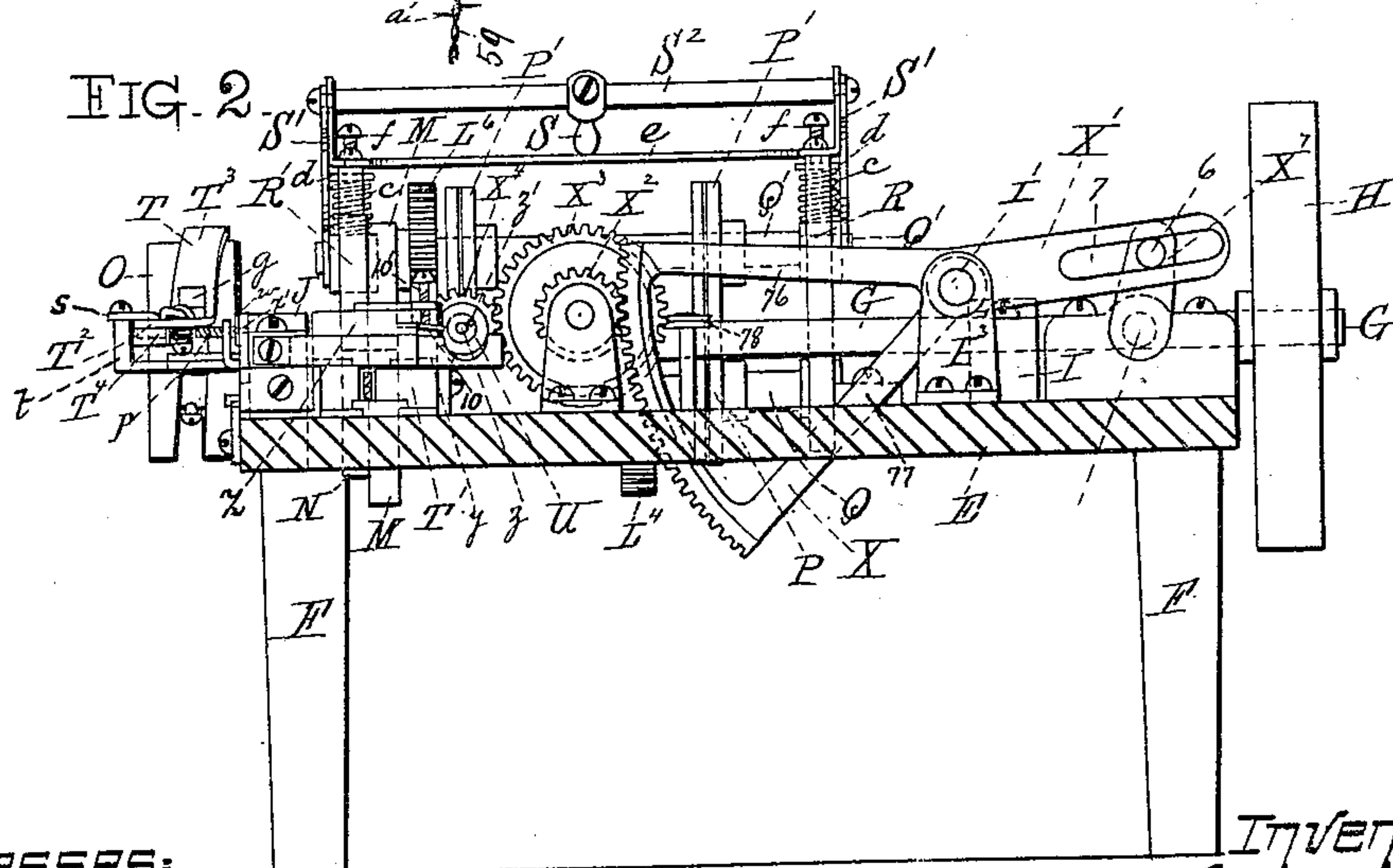
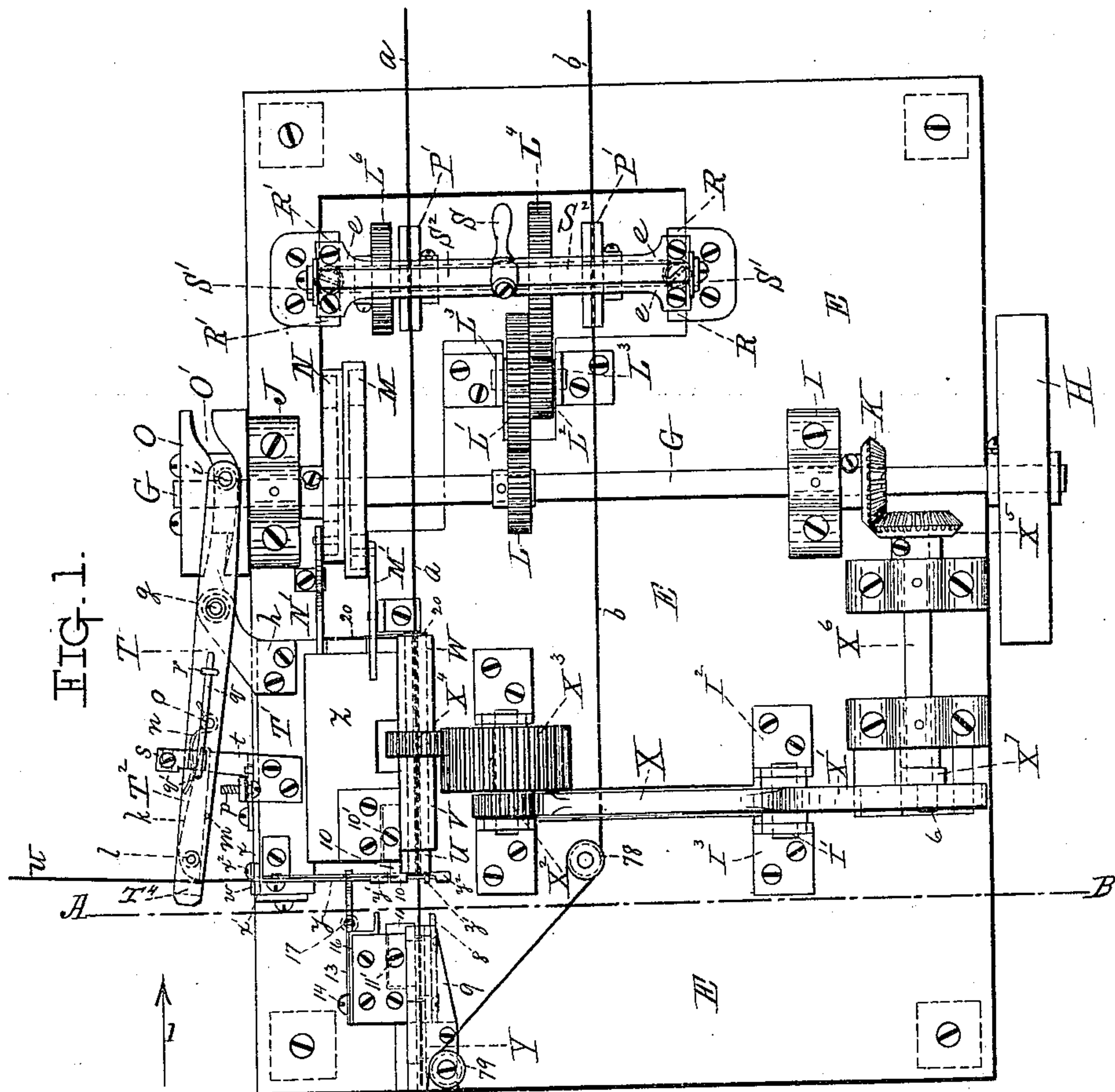


H. W. PUTNAM, L. BRADBURY & L. WILLIAMS.  
MACHINE FOR MANUFACTURING BARBED FENCE WIRE.  
No. 258,471. Patented May 23, 1882.



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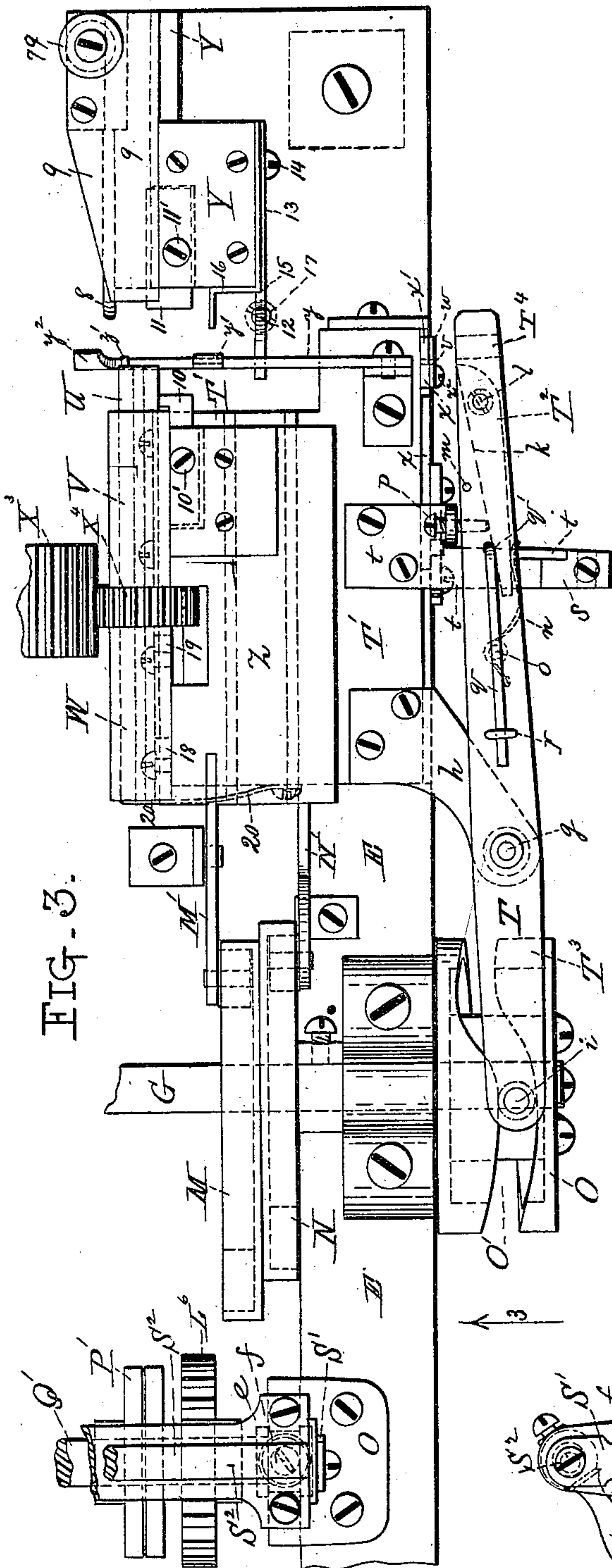


FIG. 3.

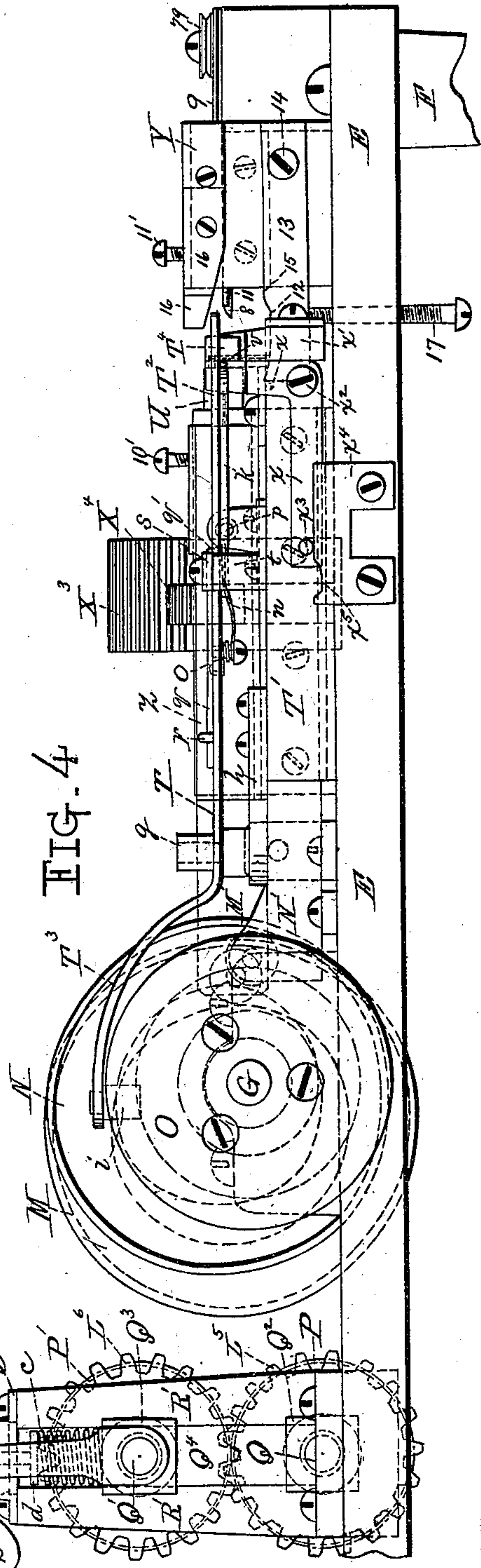


FIG. 4.

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FIG. 5.

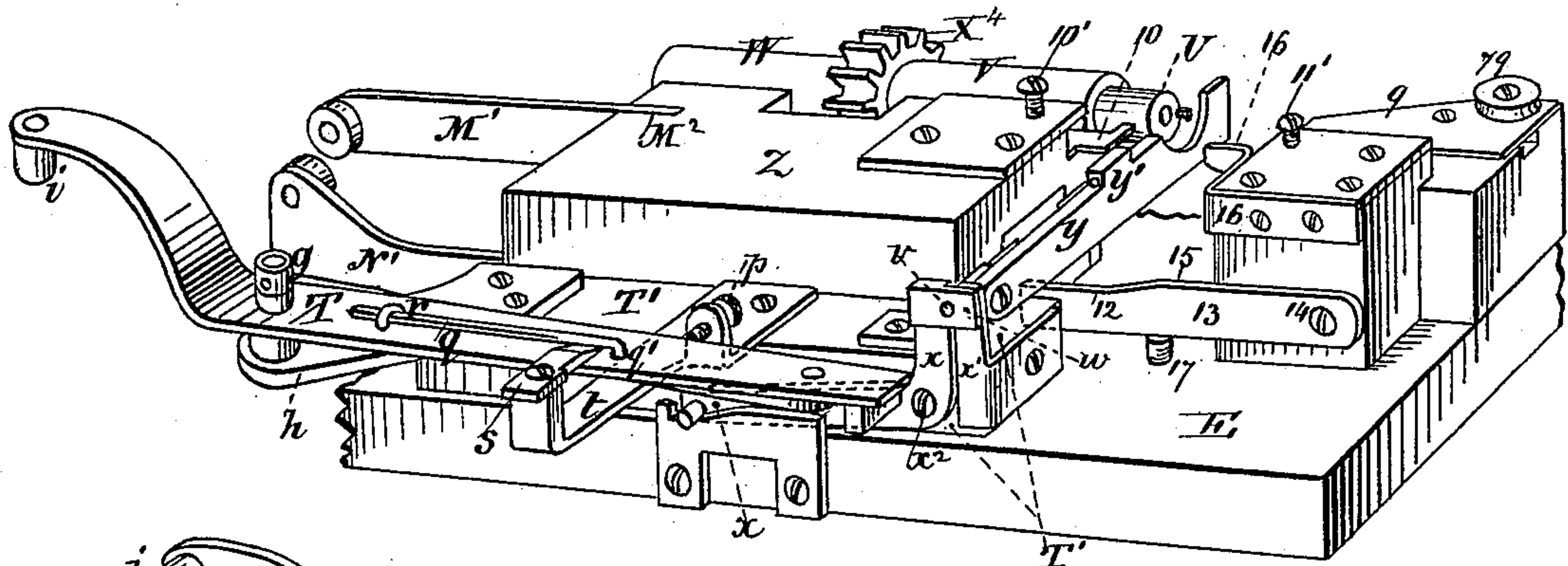


FIG. 6.

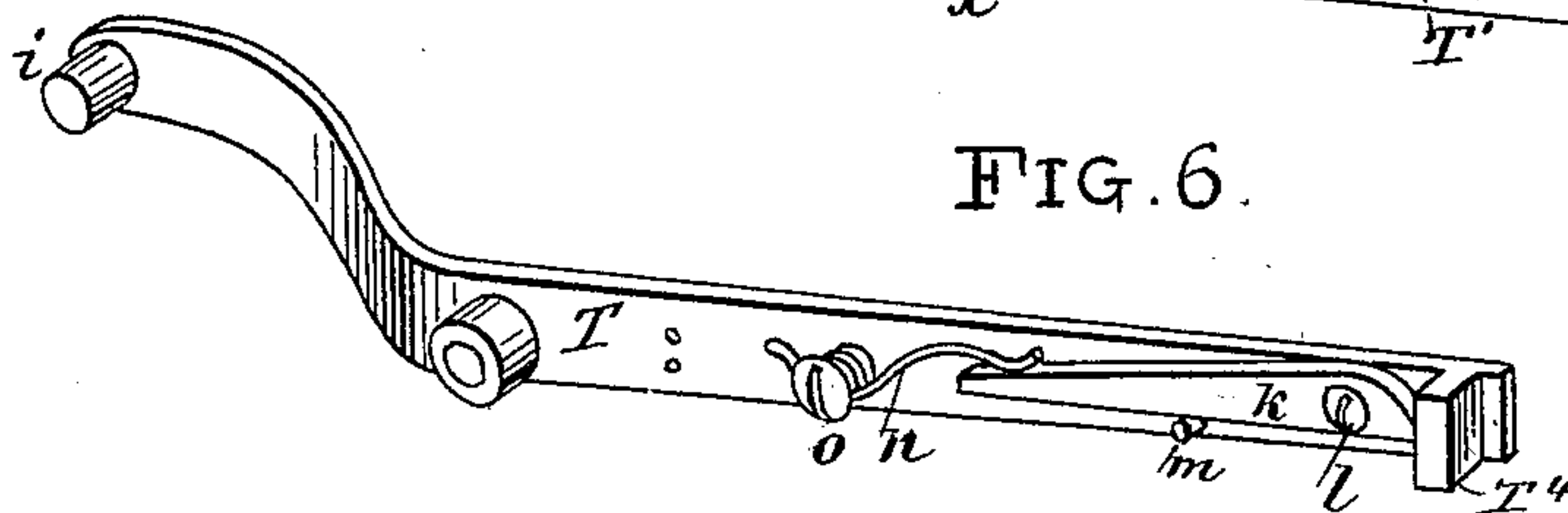
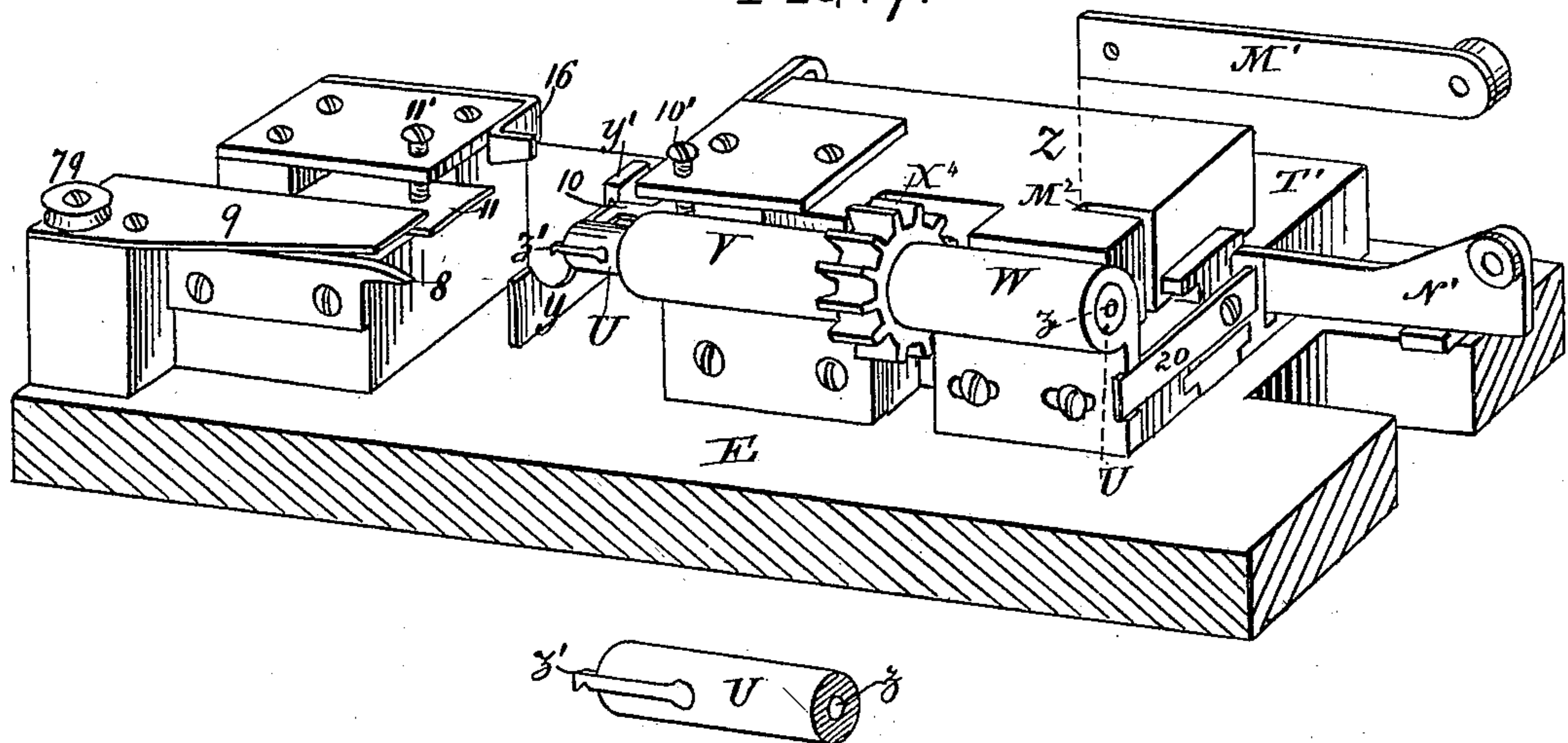


FIG. 7.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR MANUFACTURING BARBED FENCE-WIRE.

SPECIFICATION forming part of Letters Patent No. 258,471, dated May 23, 1882.

Application filed December 6, 1879.

*To all whom it may concern:*

Be it known that we, HENRY W. PUTNAM, LEVI BRADBURY, and LEWIS WILLIAMS, all of Bennington, in the county of Bennington and State of Vermont, have invented certain new and useful Improvements in Machines for Manufacturing Barbed Fence-Wire; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a top or plan view of the barbing portion of the machine, with the main and barb wires in the positions which they occupy in passing through said portion of the machine. Fig. 2 represents a vertical transverse section through the barbing portion of the machine, taken on line A B, Fig. 1, looking in the direction indicated by arrow 1 of said Fig. 1. Fig. 3 represents upon an enlarged scale a top or plan view of a part of the barbing portion of the machine, which will be hereinafter more fully described, and this and the following figure are upon the same enlarged scale. Fig. 4 represents a side view of the parts shown in Fig. 5, looking in the direction of arrow 3, same figure. Fig. 5 is a perspective view of that part of the machine showing the barb-wire feeding and bending mechanism and adjacent parts. Fig. 6 is a perspective view of the under side of the barb-wire-feeding arm. Fig. 7 is a perspective view of the main portion of the mechanism shown in Fig. 5, but taken from the corner diagonally opposite to said view.

To enable those skilled in the art to which our invention belongs to make and use the same, we will proceed to describe it more in detail.

In the drawings, Figs. 1 and 2 represent the different parts of the barbing-machine in the positions which they occupy just previous to feeding the barb-wire forward over the main wire, as hereinafter described, while Figs. 3 and 4 represent said parts in the positions which they

occupy just after the barb-wire is fed over the main wire, and previous to its being wound or wrapped about the same and cut off, as will be hereinafter more fully described.

E represents the bed of the machine, which in this instance is represented as being supported upon standards F.

The main driving-shaft G, to one end of which is secured a large driving wheel or pulley, H, is arranged horizontally and fitted to turn in suitable bearings, I and J, secured to bed E.

Driving-power is imparted from shaft G to the several operating parts of the machine by means of bevel-gear K, spur-gear L, cams M and N, and cam O, all of which are secured upon said shaft G.

The feed rolls or wheels P P' are secured upon horizontal shafts Q Q', which are fitted to turn in suitable bearings, Q<sup>2</sup> Q<sup>3</sup>, arranged between standards R R', secured to bed E; and said feed-rolls are turned so as to feed the two main wires *a* and *b* forward into and through the machine by spur-gear L through spur-gears L<sup>1</sup> L<sup>2</sup>, arranged to turn in bearings L<sup>3</sup> L<sup>3</sup>, spur-gears L<sup>4</sup> L<sup>5</sup>, secured to shaft Q, and spur-gear L<sup>6</sup>, secured to shaft Q'.

The bearings Q<sup>2</sup> Q<sup>3</sup> of shaft Q, upon which the lower feed-rolls are secured, rest in the lower ends of slots Q<sup>4</sup>, formed between standards R R', while the bearings of the shaft of the upper feed-rolls are arranged to slide up and down a short distance in aforesaid slots, thus allowing the upper feed-rolls, P', to rest upon the lower ones, P, and they are pressed down, so as to produce sufficient pressure upon the wires passing between them to feed the latter forward by spiral springs *c c*, being arranged between the tops of said bearings and the under sides of plates *d d*, arranged under the ends of a plate, *e*, secured to the tops of standards R R'. A greater or less pressure may be produced upon the wires by turning adjusting-screws *f f* (which pass through plate *e* and bear upon the tops of plates *d d*) up



or down, so as to contract or expand springs *c c*.

The upper feed-rolls, *P'*, may be raised off of the lower ones, *P*, so as to insert the ends of the wires *a* and *b* between them, by raising hand-lever *S*, link-pieces *S' S'* being connected at their lower ends with the ends of shaft *Q'*, and at their upper ends off of the center of the ends of shaft *S<sup>2</sup>*, to which aforesaid hand-lever is secured.

Cam-wheel *O* operates the barb-wire-feeding mechanism in the following manner: A cam-lever, *T*, is pivoted at the point *g* upon a projecting arm, *h*, secured to sliding block *T'*, and said cam-lever is provided at its end *T<sup>2</sup>* with a gripping or clamping device for clamping the wire, so as to feed it forward, while its other curved end, *T<sup>3</sup>*, is provided with a pin or wheel, *i*, which travels in a groove, *O'*, formed in wheel *O*, thus imparting the necessary swinging motion to lever *T* to feed forward the barb-wire. The throw of the forward end, *T<sup>2</sup>*, of lever *T* may be varied, so as to feed the barb-wire forward more or less, by changing the curve of groove *O'*.

As the barb-wire is fed forward it is gripped between a stationary block or projection, *T<sup>4</sup>*, (which may be made adjustable, if preferred,) and the end of a clamping-lever, *k*, which is pivoted at the point *l* to lever *T*, being held in this position against a pin, *m*, upon one side and a spring, *n*, secured at *o*, upon the other side.

When the barb-wire has been fed forward a sufficient distance, say, to be wrapped twice around wire *a*, leaving sufficient length for the barb *a'*, gripping-lever *k* strikes against the end of an adjustable screw, *p*, which forces it back, thus releasing the pressure upon the wire, so that it will not be drawn back by the backward motion of lever *T*. The gripping-lever *k* is held in the last-named position until it is required to grip the wire again by bearing against the end *q'* of a spring, *q*, secured to lever *T* at *r*, which springs down below the under surface of lever *T*, when the lever *k* is forced back by screw *p*, as before explained. As the end *T<sup>2</sup>* is swung back away from the machine a wedge-shaped piece, *s*, secured to the part *t*, passes under spring *q*, and, forcing it up by the still further backward movement of lever *T*, raises the end *q'* of spring *q* above the under surface of lever *T*, thereby allowing spring *n* to force the forward end of lever *k* against the wire, so as to grip it again, as before explained. The forward end of lever *k*, as will be observed from Figs. 1 and 3 of the drawings, is rounded for gripping and releasing the barb-wire, as above stated.

The barb-wire *u*, as it enters the machine, first passes through an opening, *v*, (see Fig. 4,) in guide-plate *w*, and between guide-plates *x x'*, thence over a swinging guide-arm, *y*, and into and through another guide and holding

piece, *y'*, secured to or formed upon guide *y*, thence over the main wire *a* a sufficient distance to be wound about the latter—in this instance—twice and leave a sufficient length, after being so wound, to form the barb, as before stated.

The wrapping-spindle *U*, which is provided with a hole or opening, *z*, for the passage of wire *a*, and with a pin, *z'*, for wrapping the barb-wire *u* about said main wire *a*, is arranged to turn in suitable bearings, *V W*, secured to sliding block *T'*. Said wrapping-spindle *U* is turned by means of a rack or geared segment-piece, *X*, (with which is combined a slotted crank-arm, *X'*,) through spur-gears *X<sup>2</sup>*, *X<sup>3</sup>*, and *X<sup>4</sup>*, and said geared part *X* is in turn operated by bevel-gear *K* upon shaft *G* through bevel-gear *X<sup>5</sup>*, shaft *X<sup>6</sup>*, crank *X<sup>7</sup>*, and crank-pin 6. The latter working back and forth in the slot 7 of crank-arm *X'* operates the geared part *X* up and down, thereby turning, through the instrumentality of gears *X<sup>2</sup>*, *X<sup>3</sup>*, and *X<sup>4</sup>*, the wrapping-spindle either to the right or to the left, according to the direction of the motion of said geared part *X*.

The several parts which operate the wrapping-spindle and its pin are so constructed and combined together that the wrapping-pin *z'* is stationary, or nearly so, at the point shown in the drawings until the barb-wire is fed forward over the main wire *a*, as before explained, when it turns so as to coil the wire down under and over the main wire—in this instance twice. By this time the sliding block *T'*, upon which the wrapping-spindle and barb-wire-feeding mechanism are arranged, has been moved forward by its operating-cam *N* by means of a link-piece, *N'*, so that as the end of the barb-wire which forms the barb is coiled over for the last time by its wrapping-pin it lies horizontally over a guiding-piece, 8, secured to stationary block *Y*, and is thereby guided under plate 9, secured to the top of said block *Y*. At the same time that cam *N* is moving forward the wrapping-spindle and its other parts cam *M*, by means of link-piece *M'*, is moving forward sliding block *Z*, upon which the movable cutter 10 is arranged, and by the time the barb-wire arrives at the point above stated, with its uncut side against the end of the stationary cutter 11, which is secured to stationary block *Y*, movable cutter 10 passes over the top edge of stationary cutter 11, thereby cutting the barb-wire in two to form the barb, both cutters being arranged upon an angle, as represented by cutter 10, Fig. 2 of the drawings. Said cutters 10 and 11 may be adjusted by means of adjusting screws 10' and 11' when desired.

As sliding block *T'* and parts connected thereto are moved forward by cam *N* and link-piece *N'* guiding-arm *y* slides forward over the inclined surface 12 of an adjustable supporting-plate, 13, hinged at 14 to stationary



block Y, and arriving at the flat part 15, (which is the end of the forward motion of block T',) is held perfectly rigid between that point and the under side of an angular plate, 16, also secured to block Y, thereby holding the barb-wire perfectly secure and rigid while it is being cut by cutters 10 and 11.

The forward end of guide-arm-supporting plate 13 rests upon an adjusting-screw, 17, which may be turned up or down to vary the height of the part 15 of plate 13 as desired.

The barb-wire is securely held from drawing forward during the wrapping operation in the following manner: Guide-plate  $x$ , upon which is secured guide-plate  $w$ , is arranged to swing slightly, being pivoted at the point  $x^2$  to movable block T', and is provided at its lower end with a pin,  $x^3$ , which slides upon the upper surface of a stationary plate,  $x^4$ , secured to bed E. The upper edge of plate  $x^4$  is cut out for a short distance, as represented at  $x^5$ , Fig. 4, while the rest of its surface is flat and level. Thus it will be seen that as pin  $x^3$  passes over the level surface the upper end of the plate is held with a uniform pressure upon the wire to hold it secure for the purpose before stated, and that when it rests in the recess  $x^5$  the pressure is released upon the wire, thereby allowing it to be fed forward into the machine, as before explained.

In order that the barb-wire may be properly wrapped about the main wire  $a$  toward the wrapping-spindle U, the forward end of guiding-arm  $y$  is curved out, as represented at  $y^2$ , Figs. 1 and 3, so that as the end of the wire is carried around by the wrapping-pin (which is notched upon its under side, so that it will not prematurely slip therefrom) it strikes upon said curved side  $y^2$  and is properly guided, as before explained. To further facilitate the operation, spindle U has a slight backward-springing motion, thus allowing it to recede slightly as each coil is wrapped about wire  $a$ , bearing W of said wrapping-spindle U being provided with slots 18 and 19 and a spring, 20, which is secured to block T' and bears against the end of said bearing, as represented in Fig. 3 of the drawings.

To prevent the barb-wire from being retarded or carried back by the winding-pin when the wrapping-spindle moves back to its original position, the latter commences to rotate in an opposite direction soon enough to turn the winding-pin up and over sufficiently to release the barb from the notch in the winding-pin just before the barb-wire is cut off, thereby permitting the barb-wire to move forward with the main wire as the latter is drawn through the machine.

The operation of barbing a section of fence-wire upon our aforesaid improved machine may be briefly summed up thus: The attendant first raises the upper feed-rolls, P', off of the lower ones, P, by means of lever S, as before ex-

plained. He then inserts wire  $a$  or  $b$  (wire  $a$  we will suppose it to be in this instance) between said feed-rolls, and passing it through draws it forward upon the opposite side thereof, then passes it into and through opening  $z$  in wrapping-spindle U, thence under plate 9, then draws it forward again a sufficient distance to be fastened upon the spool, and there drops it. He now takes hold of the end of wire  $b$  and draws it forward (it having been previously passed between rolls P P') over shaft G and between the arms 76 77 of geared section X, thence around guiding roll or wheel 78 and wheel 79, as represented in Fig. 1 of the drawings, to the spool, after which he takes the two ends of wires  $a$  and  $b$  and secures them together to one of the arms of the spool. He now lowers feed-rolls P' P' again by means of lever S, and then puts the twister in operation, thereby twisting the two wires  $a$  and  $b$  together between the barbing portion of the machine and the spool, which in practice are about five or six feet apart. When wires  $a$  and  $b$  have been sufficiently twisted the operator puts the barbing portion of the machine in operation, which now feeds forward the main wires  $a$  and  $b$  continuously and with a uniform speed, feeds forward the barb-wire  $u$ , twists it about the main wire  $a$ , and cuts it to form the barbs  $a'$ , as hereinbefore described. As the barbed wire  $a$  is fed forward it passes under plate 9, with the belly of the barb in a groove formed in the top of block Y, and the barbs lying horizontally or flatwise, thereby insuring the proper passage of the same from under plate 9, so that the unbarbed wire  $b$  will run upon and be twisted in contact with the backs of the barbs, whereby the latter are held more securely and firmly than would be the case if the unbarbed wire  $b$  were twisted against the belly part of the barbs.

Having described our improvements in machines for manufacturing barbed fence-wire, what we claim therein as new and of our invention, and desire to secure by Letters Patent, is—

1. The combination, with shaft Q' and lifting-shaft S<sup>2</sup>, of hand-lever S, hinged linked pieces S' S', top plate,  $e$ , springs  $c c$ , adjusting-screws  $f f$ , and plates  $d d$ , substantially as and for the purposes set forth.

2. The combination, with wrapping-spindle U and sliding block T', of bearing-piece V, sliding bearing W and its retaining-spring 20, cam N, and link-piece N', substantially as and for the purposes set forth.

3. The combination, with sliding block T' and wrapping-spindle U, provided with bearings V and W, of sliding block Z, cam M, and link-piece M', substantially as and for the purposes set forth.

4. The combination, with the notched winding-pin  $z'$ , wrapping-spindle U, provided with gear X<sup>4</sup> and the yielding bearing W, of oper-

ating-gears  $X^2$  and  $X^3$ , and rack-bar  $X$ , provided with slot 7, substantially as and for the purposes set forth.

5 5. The combination, with feed-arm  $T$ , of gripping-lever  $k$ , spring  $n$ , pin  $m$ , and adjusting-screw  $p$ , substantially as and for the purposes set forth.

10 6. The combination, with feed-lever  $T$  and gripping-lever  $k$ , of spring  $q$  and wedge-piece  $s$ , substantially as and for the purposes set forth.

7. The combination, with guide-arm  $y$ , of hinged guide-arm support 13, adjusting-screw 17, and angular holding-plate 16, substantially as and for the purposes set forth.

8. The combination, with wrapping-spindle 15  $U$ , of feed-guide arm  $y$  and guide-piece 8, substantially as and for the purposes set forth.

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