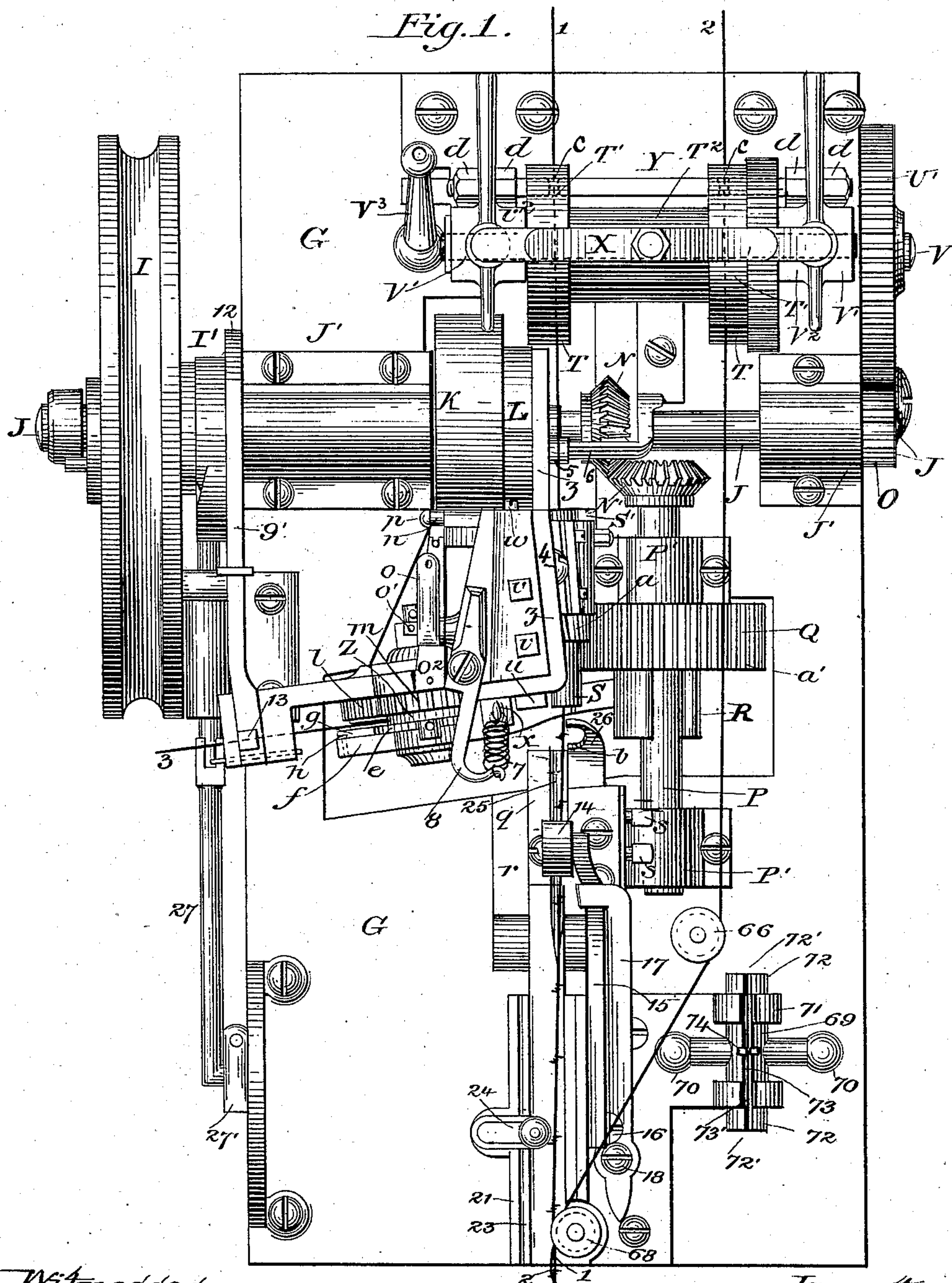


D. C. STOVER.  
Wire Barbing Machine.

No. 241,442.

Patented May 10, 1881.



Witnesses:

John C. Dewey  
Edwin E. Moore

Inventor:

Daniel C. Stover,  
By his Attorney,  
Thos. F. Dodge



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Fig. 3.

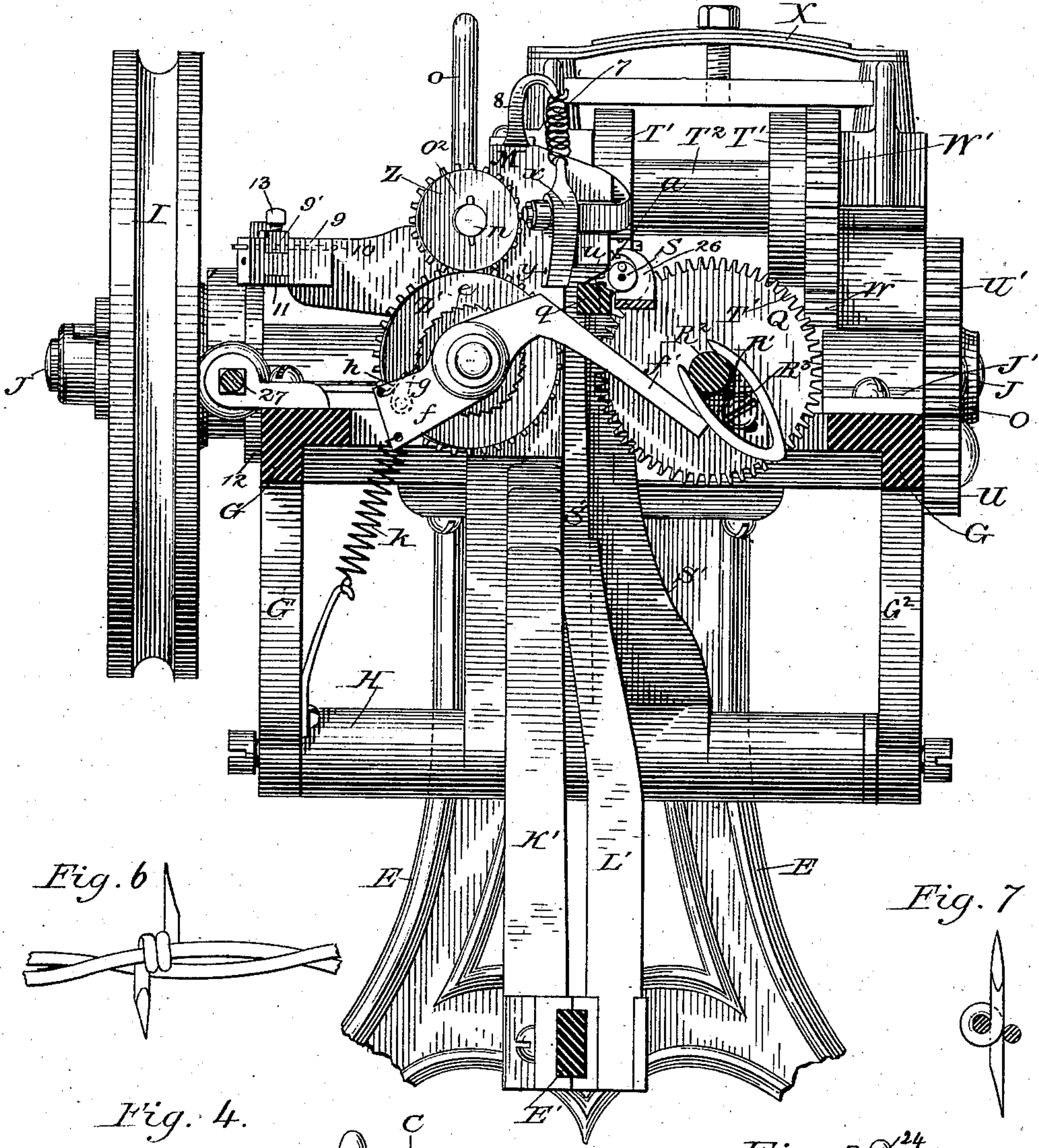


Fig. 6

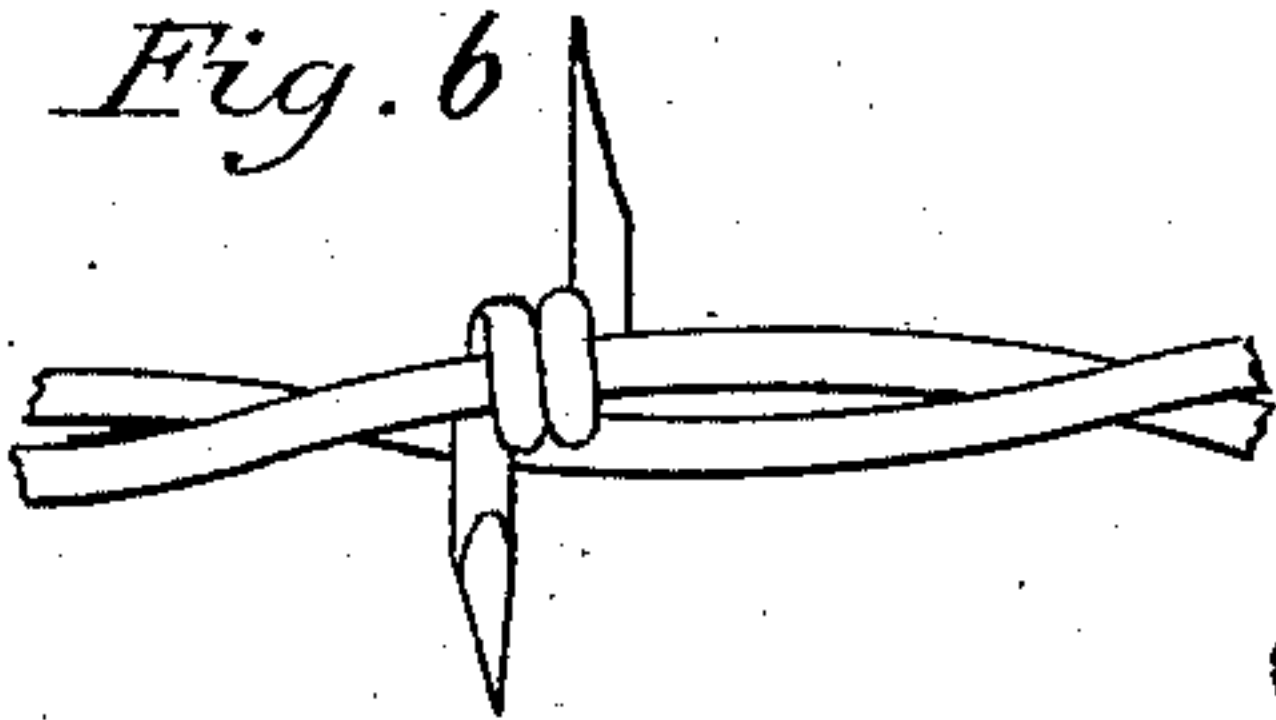


Fig. 4.

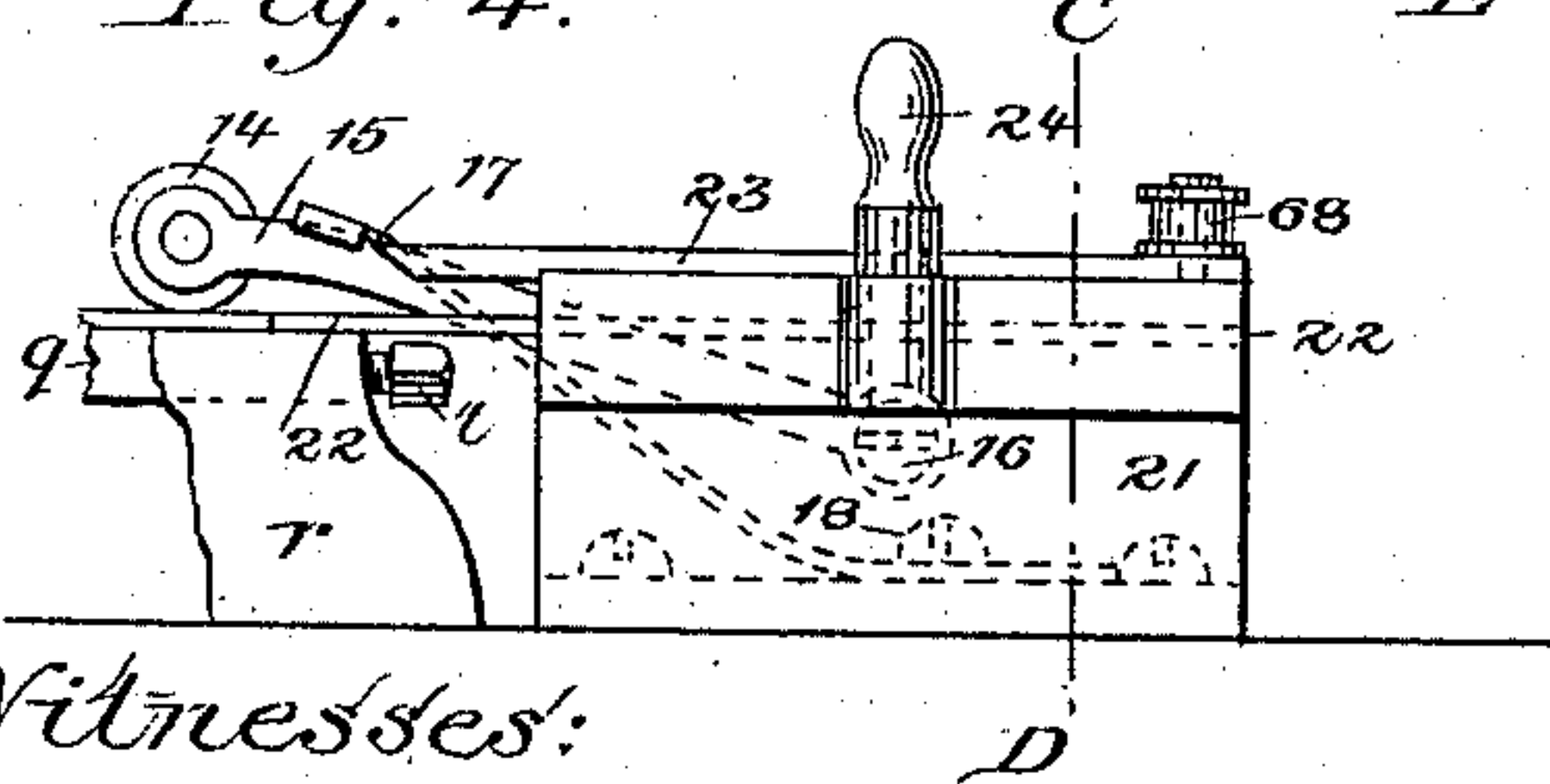
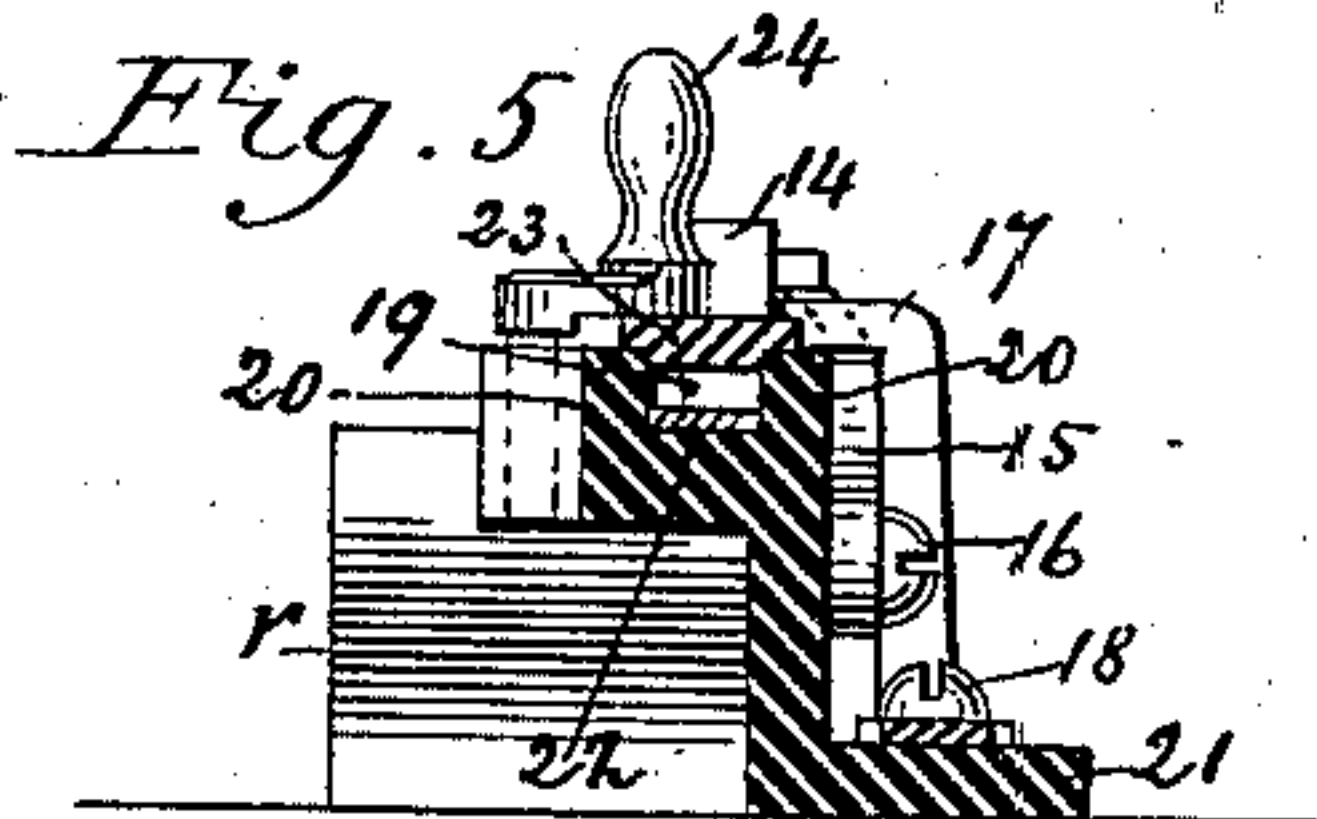


Fig. 7



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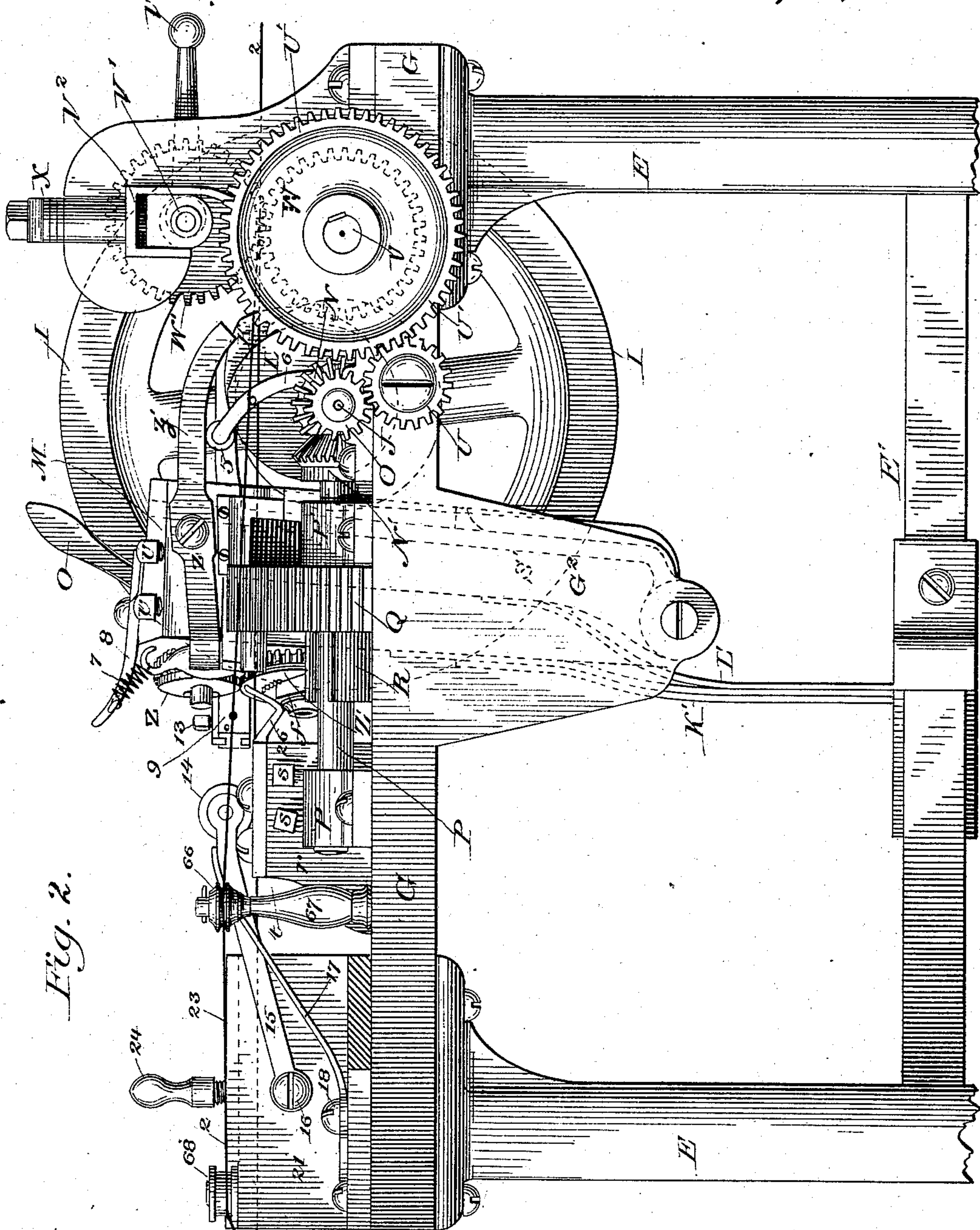


Fig. 2.

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Fig. 8.

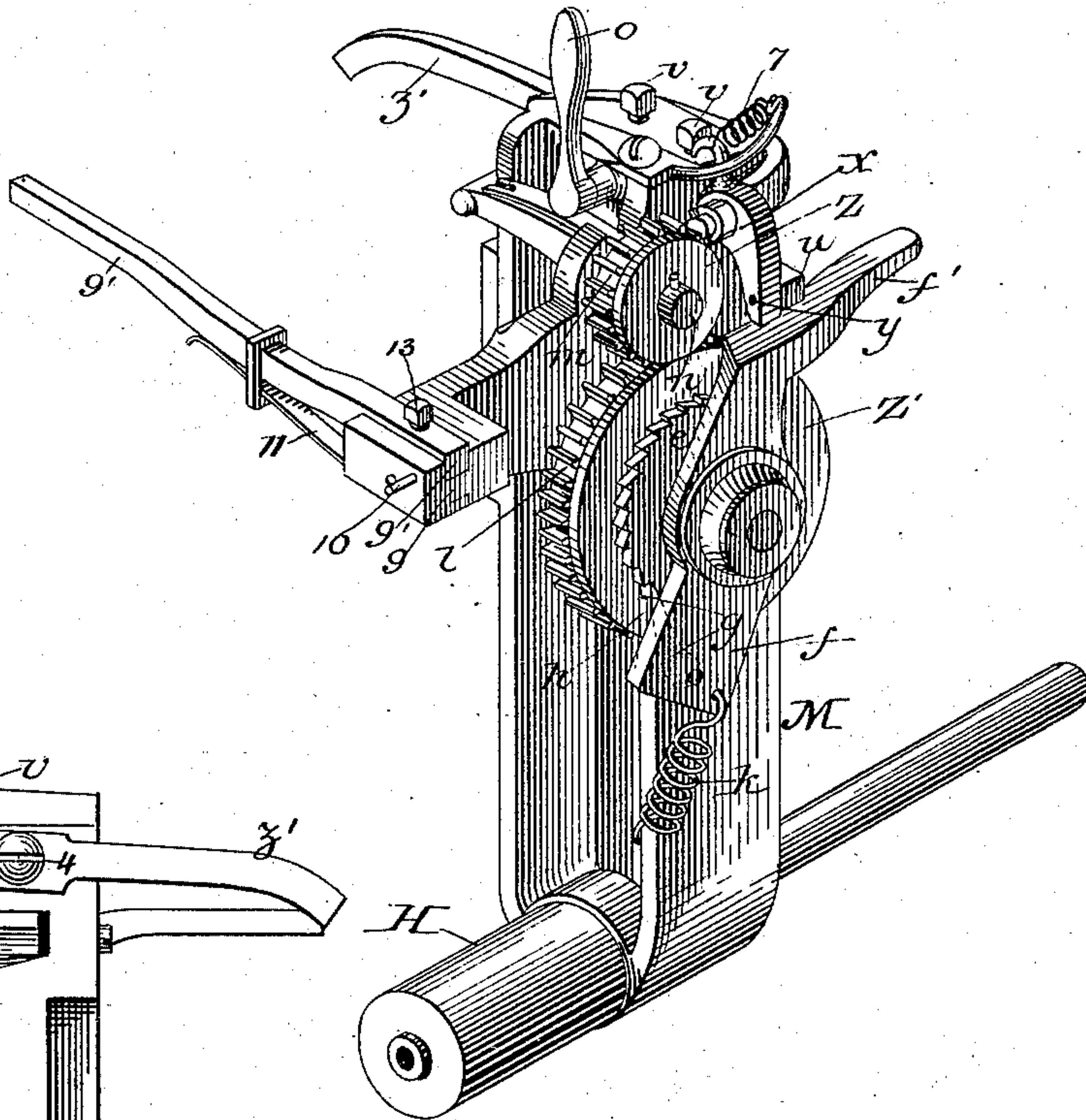


Fig. 9.

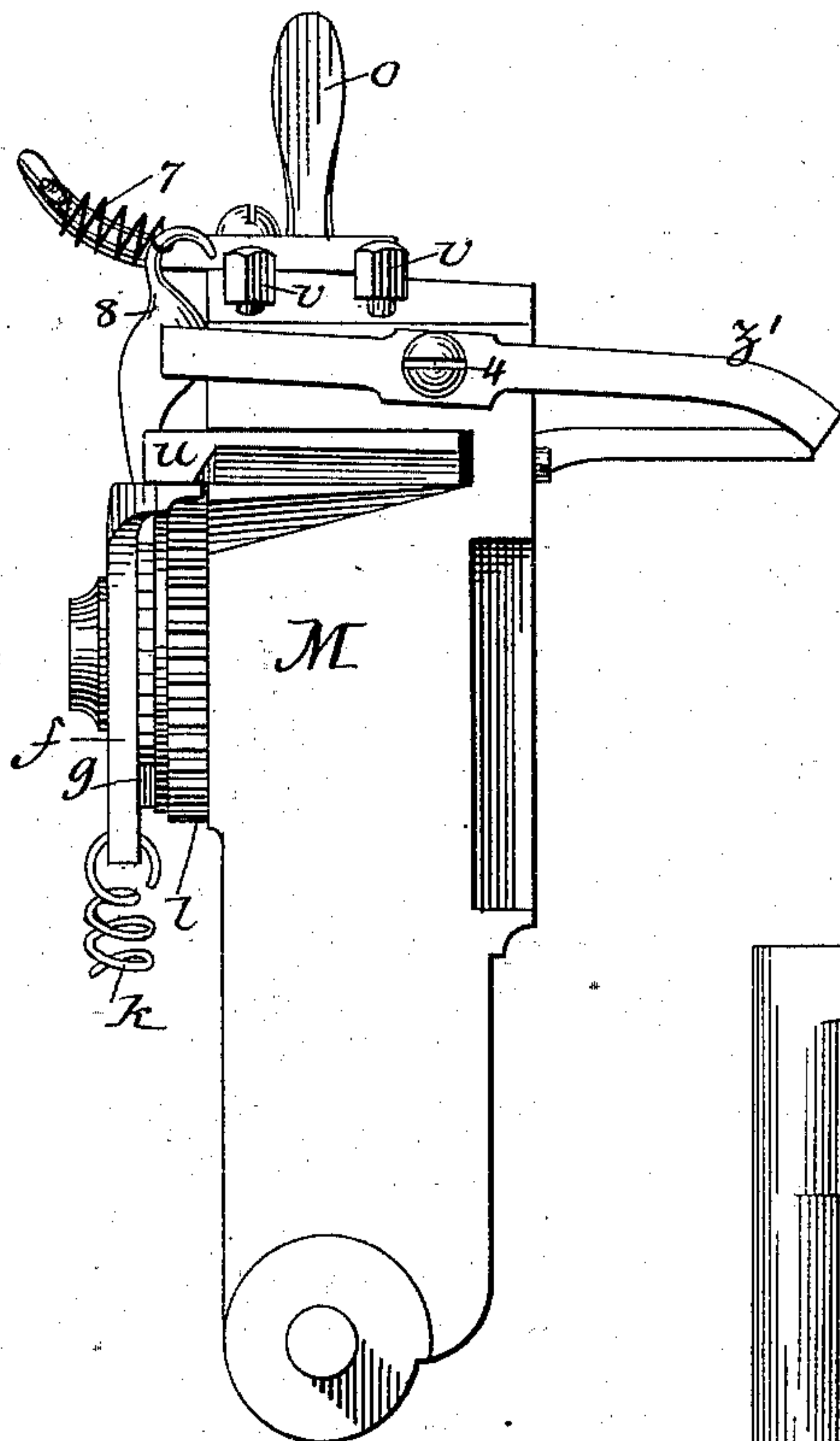
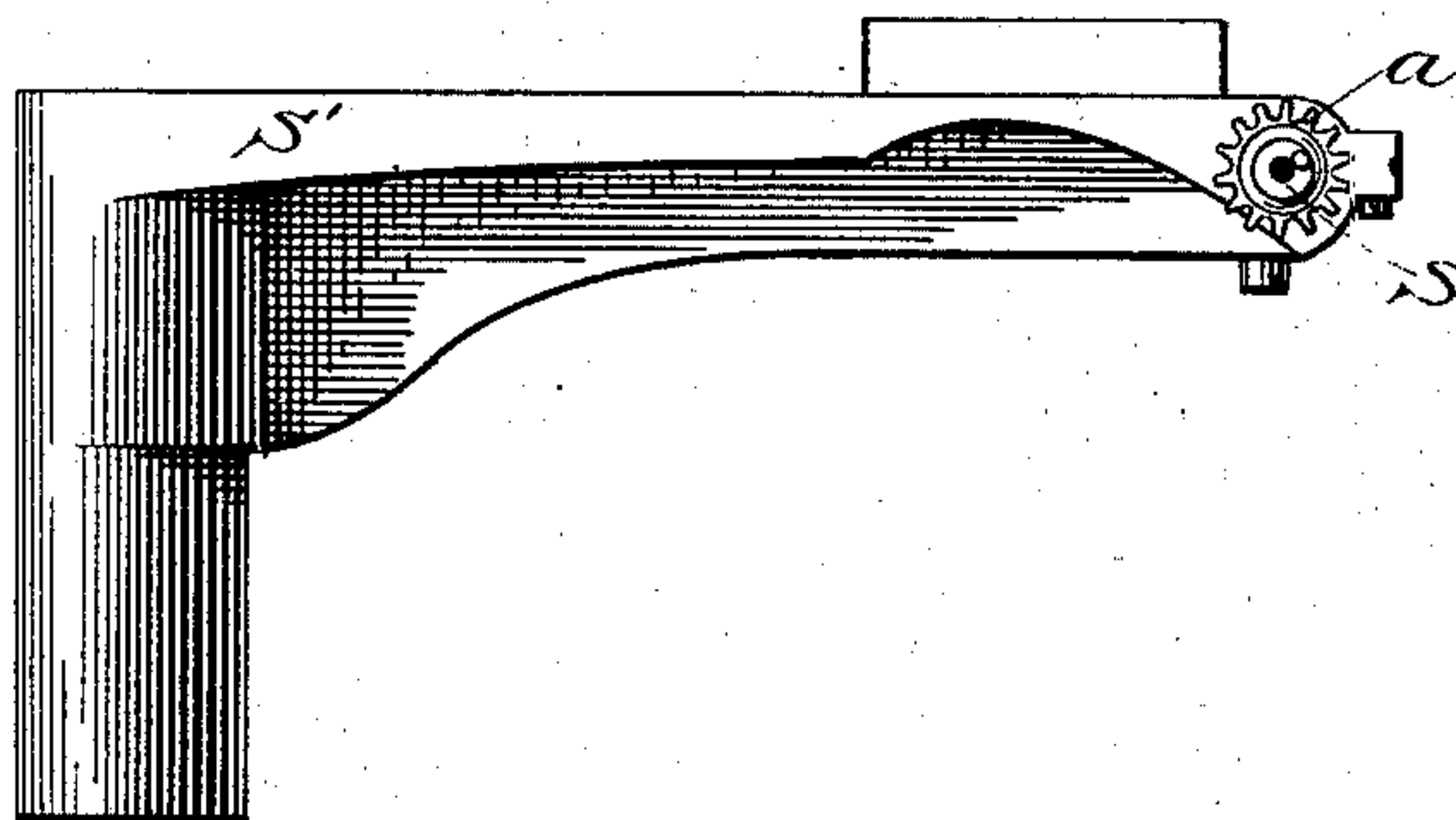


Fig. 10.



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# UNITED STATES PATENT OFFICE.

DANIEL C. STOVER, OF FREEPORT, ASSIGNOR TO I. L. ELWOOD & CO., OF DE KALB, ILLINOIS.

## WIRE-BARBING MACHINE.

SPECIFICATION forming part of Letters Patent No. 241,442, dated May 10, 1881.

Application filed September 29, 1879.

*To all whom it may concern:*

Be it known that I, DANIEL C. STOVER, of Freeport, county of Stephenson, and State of Illinois, have invented certain new and useful  
5 Improvements in Wire-Barbing Machines; and I 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  
10 in which—

Figure 1 represents a top or plan view of the wire-barbing portion of the machine. Fig. 2 represents a side view of the parts shown in Fig. 1, looking in the direction indicated by arrow 1 of the same figure. Fig. 3 represents a  
15 vertical transverse section through the wire-barbing portion of the machine, taken on line A B, Fig. 1, looking in the direction indicated by arrow 3 of said figure. Fig. 4 represents a side view of a portion of the machine hereinafter more fully described, looking in the direction indicated by arrow 4, Fig. 1. Fig. 5  
20 represents a vertical transverse section taken on line C D, Fig. 6, looking in the direction indicated by arrow 5 of the same figure. Fig. 6 represents a side view of a section of barbed and twisted fence-wire, (full size,) such as is manufactured by my improved wire barbing,  
25 twisting, and spooling machine; and Fig. 7 represents a section through said wire fencing, showing a side view of the barbs secured upon the same. Fig. 8 represents a perspective view of the rocking bar carrying the barb-wire feeding and cutting devices. Fig. 9 represents an  
30 end view of the same, and Fig. 10 represents a side view of the rocking arm carrying the wire-wrapping spindle.

This invention relates to certain improvements in wire-barbing machines, and is an improvement on a machine for which Letters Patent of the United States were granted to me  
40 October 23, 1877.

The invention consists in the combination of mechanism so constructed and arranged,  
45 as hereinafter described, that barbs may be wrapped upon one wire, said barbs cut by a continuous and automatic operation, and that, too, while the longitudinal or main wire or  
50 wires is or are moving forward with a uniform speed, although the barb-wire is fed intermittently.

It also consists in the combination of a friction-roller and plates, as hereinafter described, for holding and properly conducting the barbed wire from the point at which the barbs are  
55 wrapped upon the wire to where the two wires are intertwined, and also in an adjustable guide for conducting the main wires in between the feed-rolls, and of an eccentric device for raising and lowering the upper feed-roll, so as  
60 to allow of the insertion of the ends of the main wires between the rolls, and to produce a greater or less friction upon said wires to properly feed the wires forward into the machine, as will be hereinafter more fully described.

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

In the drawings, E represents the frame-work of the machine, which is secured to a section  
70 of flooring or base.

G represents the bed-plate of the machine, which is slotted out to receive the different portions of said machine which project below the upper surface-line of the bed-plate, and is also  
75 provided with downwardly-projecting bearing or hanger parts G' G<sup>2</sup>, in the lower ends of which are fitted to turn the ends of a rock-shaft, H, to which the lower end of the rocking head M, which supports the barb cutting and feeding  
80 mechanism, is attached.

I represents the main driving-wheel of the machine, which is secured to the end of a horizontal shaft, J, arranged to turn in bearings J' J', secured to the bed-plate G of the machine.

Driving-power may be imparted to wheel I by proper connection with any suitable and convenient driving mechanism arranged above or below the flooring.

Upon horizontal shaft J are also secured  
90 cams K and L, the former being arranged to operate block or head M, before referred to, upon which the barb-wire feeding and cutting mechanism is arranged and secured, and the latter to operate the block or head S', upon which  
95 the barb wrapper or coiling device of the machine is arranged, both of said blocks or heads being arranged to rock back and forth, as hereinafter described.

Bevel-gear N and small spur-gear O are also  
100 secured upon driving-shaft J. Bevel-gear N is for the purpose of engaging with and driving



a corresponding beveled gear,  $N'$ , secured upon the end of a horizontal shaft,  $P$ , arranged to turn in suitable bearings,  $P' P'$ , secured to bed-plate  $G$ . Upon said shaft  $P$  are also secured  
 5 a large spur-gear,  $Q$ , and a cam,  $R$ . Spur-gear  $Q$  is for the purpose of operating the barb-wrapping spindle  $S$ , which is arranged to turn in the upper part of rocking arm  $S'$ , being provided with teeth  $a$ , which engage with the teeth  
 10  $a'$  upon spur-gear  $Q$ . Said wrapper is also provided with a pin or lug,  $b$ , which catches and wraps the barb-wire 3 about the main wire 1 to form the barb, as hereinafter more fully described.

15 The feed-rolls  $T T'$  are operated by means of spur-gear  $O$ , through spur-gear  $U$ , arranged to turn upon a suitable bearing secured to bed  $G$ , spur-gear  $U'$ , secured upon the outer end of the shaft  $V$  of the lower feed-rolls,  $T T$ , spur-gear  
 20  $W$ , also secured upon shaft  $V$ , and spur-gear  $W'$ , secured to the shaft  $V'$  of the upper feed-rolls,  $T' T'$ .

Shafts  $V V'$  are arranged to turn in suitable bearings formed in side supports or standards,  
 25  $V^2 V^2$ , secured to bed-plate  $G$ .

The upper feed-rolls,  $T' T'$ , are formed upon the ends of a cylindrical sleeve or barrel,  $T^2$ , which, with the parts connected therewith, are fitted to turn loosely upon an eccentric-shaft,  
 30  $V'$ . Thus by turning shaft  $V'$ , which may be done by means of a hand-lever,  $V^3$ , secured to the end of the shaft, an eccentric motion is imparted to the feed-rolls to slightly raise the same, when desired, for the purpose of insert-  
 35 ing the ends of the wires between said feed-rolls.

The necessary pressure upon the wires to properly feed them forward into the machine may be produced by means of a strong spring,  
 40  $X$ , or other suitable spring or device for depressing the ends of the eccentric-shaft  $V'$ .

$Y$  represents an adjustable guide, provided with holes  $c c$  for the passage of the wires, and which may be adjusted laterally by means of  
 45 turning nuts  $d d$ , so as to properly guide the wires in between the feed-rolls  $T T'$ , should such adjustment become necessary, as the rolls become worn away at one point by long usage.

Cam  $R$  upon shaft  $P$  is for the purpose of  
 50 operating at each revolution of shaft  $P$  the barb-wire feeding and cutting mechanism of the machine, which operation is performed in the following manner: Upon swinging block or head  $M$  are arranged to turn two feed-wheels,  
 55  $Z Z'$ , and to the hub or side of the lower and larger feed-wheel,  $Z'$ , a ratchet-wheel,  $e$ , is secured, and a swinging arm,  $f$ , is arranged to turn upon the shaft of the same. Upon the inner side of the rear end of swinging arm  $f$ ,  
 60 and arranged to catch into the teeth of ratchet-wheel  $e$ , is hinged a ratchet pawl or dog,  $g$ , which is pressed down so as to catch into the teeth of wheel  $e$  by means of a spring,  $h$ , which is secured above said pawl or dog to swinging  
 65 arm  $f$ . The forward end,  $f'$ , of swinging arm  $f$  is made to bear constantly against the periphery of cam  $R$  by means of a spiral or other

spring,  $k$ , secured at one end to the rear lower end of swinging arm  $f$  and the other end to the part  $G'$  of bed  $G$ . Driving-power is im-  
 70 parted from the lower feed-wheel,  $Z'$ , to the upper one,  $Z$ , by means of a spur-gear,  $l$ , secured in this instance to the side of said feed-wheel  $Z'$ , which engages with another spur-gear,  $m$ ,  
 75 secured to the side of feed-wheel  $Z$ . The upper feed-roll,  $Z$ , is arranged to turn upon a loose angular-shaped spindle,  $n$ , which is held in position vertically by means of a cam-lever,  $o$ ,  
 80 hinged at the point  $o'$  to block or head  $M$ , and longitudinally by the form of the spindle, and the rear end of the same being also hinged to  
 85 block or head  $M$  at  $p$ . The lower end of lever  $o$  is cam-shaped, and a flat upwardly-curved spring,  $o^2$ , is arranged between said cam and the top of spindle  $n$ , so that when lever  $o$   
 90 is swung over in the direction shown by Fig. 3 of the drawings said spring is depressed, thereby forcing the feed-wheel  $Z$  to press with  
 95 sufficient power upon the top of the barb-wire to properly feed the latter forward when the rolls are in motion. Supposing the lever  $o$  to be in the last-named position, from the forego-  
 100 ing-described construction and arrangement of the feeding mechanism it will be seen that by now rotating cam  $R$  from right to left (the  
 105 direction in which the machine rotates it) it is brought in contact with the forward end,  $f'$ , of swinging arm  $f$ , depressing the same, and thereby raising its rear end, which causes pawl or  
 110 dog  $g$  to catch into one of the notches in ratchet-wheel  $e$  and turning the latter, with its feed-wheel  $Z'$  and  $Z$ , as before explained, thus feed-  
 115 ing the barb-wire forward the distance that cam  $R$  causes the peripheries of feed-wheels  $Z'$  and  $Z$  to travel. Cam  $R$  is made with two slots,  $R'$  and  $R^2$ , one of which is just sufficient to al-  
 120 low its being slipped over shaft  $P$ , and the other of the proper width to receive the adjusting-screw  $R^3$ , by means of which the cam is se-  
 125 cured to the side of the cog-wheel  $Q$ . By this construction and arrangement of parts cam  $R$  can be quickly removed by removing screw  $R^3$ , and can also be readily adjusted to give a  
 130 greater or less throw or motion to arm  $f$  by simply loosening holding-screw  $R^3$  and moving the cam  $R$  out from or toward shaft  $P$ , as the case may be, and then tightening up screw  $R^3$  again, which latter, together with the support  
 135 which the forked ends of cam  $R$  receive from shaft  $P$ , insures the holding of cam  $R$  in a perfect manner during the operation of the machine.

In this instance cam  $R$  is made shell form on its outside. Thereby lightness and strength are  
 140 combined, and such a construction and arrangement of parts obtained as enables the operator to adjust the barb-feed very accurately, and which should feed the barb-wire forward a  
 145 sufficient distance to allow of its being wrapped twice around the main wire 1, leaving a suffi-  
 150 cient length at each end, when cut off, to form the barbs.

The stationary cutter  $q$  of the machine is arranged in a stationary block,  $r$ , formed upon



or secured to bed-plate G. Said cutter may be adjusted laterally by means of adjusting-screws *s s* and longitudinally by means of a screw, *t*. (See Fig. 4.)

5 The movable cutter *u* is arranged in swinging block or head M, and may also be adjusted laterally and vertically by means of screws *v v* and longitudinally by means of a screw, *w*.

10 Cams K and L on driving-shaft J are relatively formed and arranged to give to their respective swinging heads or blocks variable motions.

15 The form of cam L causes the end of the wrapping-spindle S to keep a little in advance of the movable cutter *u* until the barb is wrapped about the main wire 1 by the wrapping pin or lug *b*, when it then retreats, and the cutter continues to advance until the barb is cut by its passing over the edge of the stationary cutter *q*. Spur-gear Q is made broad, whereby teeth *a* always remain in mesh therewith, although having a forward-and-backward motion with wrapping-spindle S.

25 Swinging block or head M and the arm S', upon which the wrapping-spindle S is arranged, are caused to constantly press against their respective cams K and L by means of flat springs K' and L', secured to cross-bar E', which is, in turn, secured to frame E.

30 In order that the wire may be cut upon an angle so as to form a pointed barb, such as shown in Figs. 6 and 7, the barb-wire rest or anvil in front of the stationary cutter *q* is inclined downward from the main wire 1 toward the feed-rolls Z Z'; and in order to keep the wire down in position for obtaining such a cut, a holding-guide, *x*, provided with a hole, *y*, for the passage of the wire, and hinged upon the end of a swinging lever, *z*, fulcrumed at the point 4, is provided. Said guide is arranged to press upon the wire at the time it is being cut by the outer end, *z'*, which is curved down, as represented in Fig. 2, bearing upon a roll, 5, arranged to turn upon the end of arm 6, which is secured to bed-plate G, thus acting as a cam to depress said guide *x*.

40 The outer curved end, *z'*, of swinging lever *z* is made to bear upon the periphery of roll 5 by means of a spiral spring, 7, one end of which is secured to the upper end of swinging guide *x*, and the other end to the end of an upwardly and outwardly projecting arm, 8, secured to the top of swinging block or head M. By this arrangement of spring 7, which forces the lower end of the guide in toward swinging block or head M, the guide is made to serve the purpose not only of holding the wire in position while being cut, but also to press it against the end of spindle S during the wrapping operation, thereby insuring the catching of the wire by the wrapping-pin *b*.

65 The wrapping operation is still further facilitated by the barb-wire being held perfectly taut and secure during said operation from drawing forward through the feed-rolls by being pinched at 9, where it is guided into the machine from the reel. Any suitable device

for this purpose may be employed. In this instance a lever, 9', is used, which is hinged at the point 10, and held down by a flat spring, 11, underneath, being raised during the feeding operation by a cam, 12, secured upon driving-shaft J. The pressure upon the wire may be varied by means of an adjusting-screw, 13. If such an arrangement were not provided, the process of wrapping the barb about the main wire would be imperfect, inasmuch as the wire would draw forward and become slack, thereby producing uneven and imperfect barbs.

80 The barb-wire 3 passes over the main wire 1, and is wrapped around the latter from right to left toward the end of the spindle. In order that it may be properly wrapped without binding, the cam L, operating said spindle, is formed so as to move the latter forward a little slower than the wire 1 is fed forward by its feed-rolls T T', since, if they move forward with the same velocity, it will be seen that each coil would be liable to be lapped over or covered by the succeeding one, thereby producing unsatisfactory results.

90 The barbed wire 1 is guided and kept in position so as not to catch and become retarded in its forward movement from where the barbs are put on to where the wires 1 and 2 are twisted together, first by a wheel or roll, 14, pressing upon the wire, which is arranged to turn upon the end of a swinging arm, 15, hinged at 16, and held down by a flat spring, 17, secured at the point 18, and then by passing through a flat rectangular-shaped slot or opening, 19, (see Figs. 4 and 5,) formed by the sides of angular-shaped block 21 and plates 22 and 23, the former being fitted in the bottom of slot 19, formed in angular-shaped block 21, and extending forward nearly to roll 14, and the latter over the top of said slot and extending forward, as represented in Fig. 4. By this arrangement the wire and its barbs are prevented from turning between the points mentioned, thereby effectually insuring the proper movement of the same.

115 Plate 23 is fitted loosely and held in position by a clamp, 24, thus allowing of its ready removal when desired.

In order that the main wire 1 may come at the proper level for cutting the barbs by cutters *u* and *q*, a groove, 25, (see Fig. 1,) is formed under the wire, extending to slot 19 in block 21, which also serves to assist in keeping the barbed wire in its proper position as it moves forward.

125 26 is an angular plate secured to the top of block *r*, which fits over the end of wrapping-spindle S during the latter part of the wrapping operation, and serves to prevent the barb from being drawn back by the wrapping-pin *b* when head or block S', which supports the wrapping device, recedes.

130 The driving-pulley I, which in this instance is secured to shaft J so as to turn loosely thereon, except when clutched to hub I' fast on shaft J, may be clutched or unclutched to or from hub I' fast on shaft J, or any other convenient



mode of communicating the driving-power may be adopted. In this instance, as before stated, a clutch device is used for that purpose and operated by sliding arm 27 and lever 27'.

5 The operation of the machine may be briefly summed up thus: Having put the machine in operation, the attendant first raises feed-rolls T' T', as before explained, then inserts the end of wire 1 through its hole *c* in guide *y*, and  
 10 pushes it forward between its feed-rolls through the hole in the wrapping or barbing tube S, thence on under roll 14 and between plates 22 and 23 to the rear of the barbing part of the machine. He then lowers the upper feed-rolls,  
 15 T' T', after which he passes the end of the barbwire 3 through a hole in guide-piece 9 and under clamping-lever 9', thence forward between its feed-rolls Z Z', through swinging guide *x*, and into position, as indicated in Fig. 3 of the  
 20 drawings; then starts the machine, taking hold of the end of wire 1, drawing it with sufficient tension to keep it taut until a sufficient length of wire has been barbed to enable him to fasten the end to the spool of the spooler, when  
 25 the machine is stopped, and the attendant raises feed-rolls T' T' again and takes the end of wire 2 and passes it through its hole *c* in guide Y, and thence between the feed-rolls and forward upon the outside of guide-roll 66, arranged  
 30 upon standard 67, and upon the inside of another guide-roll, 68, upon plate 23, thence forward over the sprockets of the sprocket-wheel of the spooling-machine with wire 1, and fastens it to the spool to which wire 1 has already  
 35 been fastened. The feed-rolls are now lowered and drive-wheel I unclutched, when the twister part of the machine is started and allowed to run until the two wires are properly twisted together between the sprocket-wheel  
 40 and the barbing part of the machine, after which driving-wheel I is thrown into clutch, and the machine is then in full operation, the main wires 1 and 2 being drawn from their respective reels or spools, supported upon suitable  
 45 stands arranged at proper distances from the machine, and the barbwire also drawn from a spool or reel supported in a similar manner.

It frequently happens during the operation  
 50 of a wire-barbing machine that one of the main wires breaks or is found defective, so that a piece has to be cut out; and to expedite the operation of securing the ends of the wires together when thus cut or broken, and also when  
 55 the end of a new reel or coil of wire, 1 or 2, is to be connected to the end of the coil run out, a wire-splicing machine, F', is attached to my machine, and which wire-splicing device is constructed as follows: A short hollow shaft,  
 60 69, provided with a slot, 73, and with turning-handles 70 70, is arranged to turn in bearings formed in the upper ends of upright side supports or standards; 71 71, which are also provided with slots 73' 73', and to the outer sides  
 65 of said standards 71 71 are secured two other stationary holding-pieces, 72 72, provided with slots 72' 72'. In splicing two ends of wire to-

gether hollow shaft 69 is turned to bring its slot in line with the slots 73' and 72', as indicated in the drawings, and then the wires are placed in said slot with one wire lapped or placed over the other, the ends of the wires being lapped and extending in opposite directions, the end of each wire extending a short distance beyond its respective end of the device, and in which it is held from turning or twisting about the other end of the wire, since slots 72' are only wide enough to receive a single strand of wire.

The center of slotted shaft 69 is provided with a set of holding jaws or teeth, 74, which are set just far enough apart to leave a slot corresponding to the width of the slots 72'. Consequently, when tubular shaft 69 is rotated by means of handles 70, the wires will be carried around by the jaws or teeth 74 and the ends of the wires twisted together on each side of said teeth or jaws, such twists extending from the sides of the jaws or teeth 74 in opposite directions to the inner sides of slotted pieces 72. After the ends of the wires have been twisted together, as above described, by means of this splicing device, the attendant turns tubular shaft 69 so as to bring the slots all in line again, after which, by a slight upward pull on the wire, the latter is removed from the splicing device, the slots 73 and 73' being wide enough to allow the twisted and spliced portions of the wires to be lifted out or withdrawn freely.

Those skilled in the art to which my invention belongs will readily perceive and understand the practical advantages necessarily resulting from my present invention. The main wires 1 and 2 having a continuous and uniform longitudinal or forward motion during the operation of the machine, all the noise and straining of the parts of the machine incident to or resulting from the constant stopping and starting of the main wires, or the parts which feed them forward, are obviated by my improvements hereinbefore described, while at the same time the improvements referred to render the operation of barbing, twisting, and spooling the wire very expeditious and uniform.

Having described my improvements in wire barbing, twisting, and spooling machines, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the bed-plate G and a horizontal shaft under said bed-plate, of the wire barbing or wrapping spindle S, with a head, S', pivoted upon said shaft, and means for swinging or rocking said head and spindle, substantially as and for the purposes set forth.

2. The combination, with the bed-plate G and a horizontal shaft under said bed-plate, of wire-wrapping spindle S, head S', pivoted upon said shaft, cam L, and spring L', substantially as and for the purposes set forth.

3. The combination, with the bed-plate and a horizontal shaft under said bed-plate, of head



S', pivoted upon said shaft, spindle S, provided with gear-teeth *a*, and broad driving-gear Q, substantially as and for the purpose set forth.

4. The combination, with the bed-plate and a horizontal shaft under said bed-plate, of head S', pivoted upon said shaft, barb-wrapping spindle S, and angular plate 26, substantially as and for the purposes set forth.

5. The combination, with the swinging blocks or heads M and S', of wrapping-spindle S, movable cutter *u*, and cams K and L, constructed and relatively arranged substantially as and for the purposes set forth.

6. The combination, with rocking head M, of hinged lever *z* and swinging barb-wire guide *x*, substantially as and for the purposes set forth.

7. The combination, with feed-roll Z and angular spindle *n*, upon which it is fitted to turn loosely, of cam-lever *o* and spring *o*<sup>2</sup>, substantially as and for the purposes set forth.

8. The adjustable slotted cam R, substantially as and for the purposes set forth.

9. The combination, with feed-rolls Z Z', ratchet-wheel *e*, and feed-arm *f*, provided with pawl *g* and spring *h*, of adjustable operating-cam R and shaft P, substantially as and for the purposes set forth.

10. The combination of the feed-rolls T T', their connecting-barrel T<sup>2</sup>, and eccentric-shaft V' with spring X, pressing upon the bearings of said shaft, and operating hand-lever V<sup>3</sup>, secured to the end of said shaft, substantially as and for the purposes set forth.

11. The combination, with broad smooth-face feed-rolls T T', of the adjustable wire-guide bar Y, substantially as and for the purposes set forth.

12. The combination of the wire and barb holding roll 14 with pivoted arm 15 and spring 17, said roll being arranged relatively to the barb-cutters *q* and *u*, substantially as and for the purposes set forth.

13. The combination, with the grooved block 21, of the barb-guide plates 22 and 23, substantially as and for the purposes set forth.

14. The combination, in a wire-barbing machine, of guiding and holding roll 14 and removable guide-plate 23, substantially as and for the purposes set forth.

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