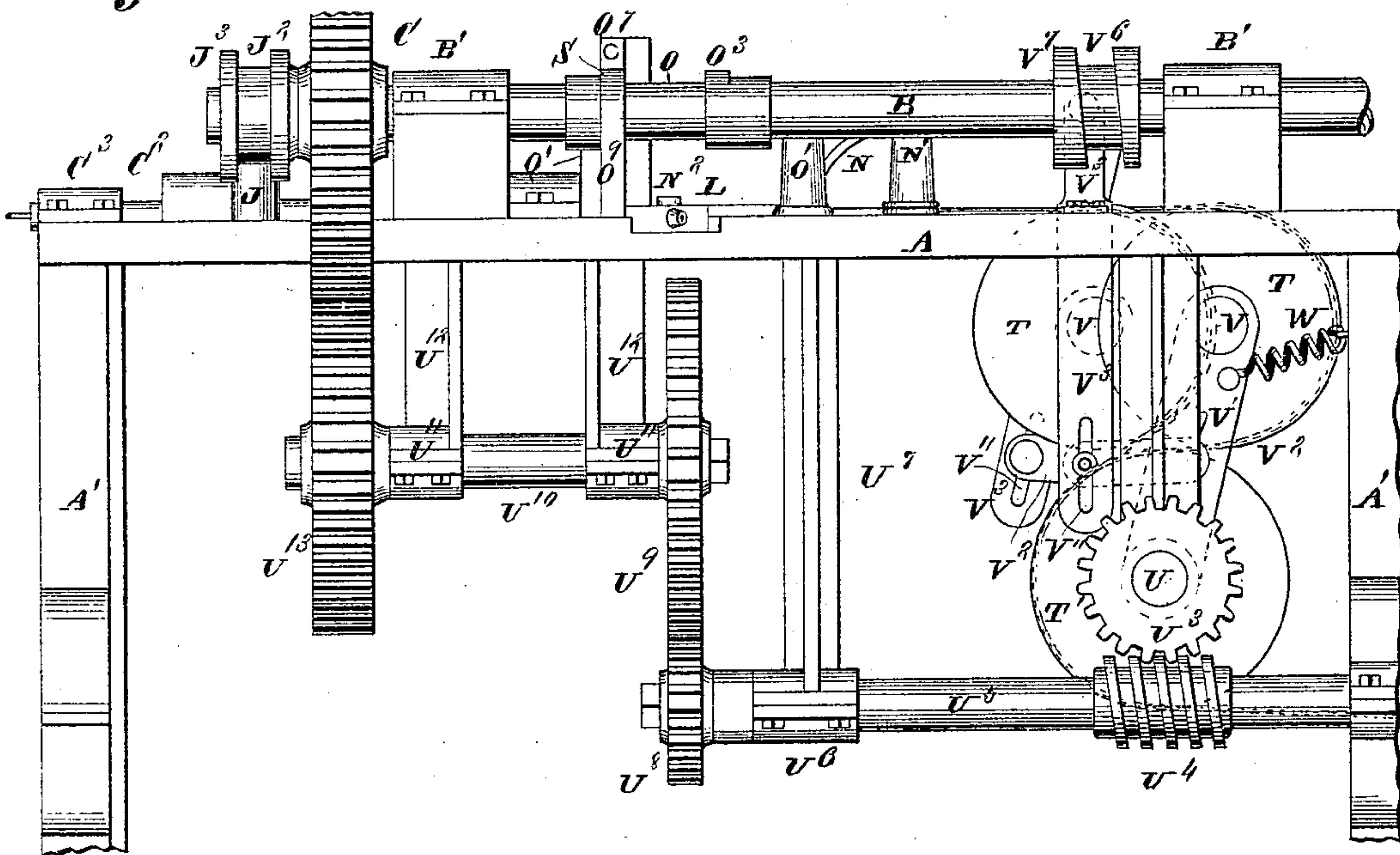


3 Sheets—Sheet 1.

BARB WIRE MACHINE.

Patented Jan. 16, 1883.



Attest:
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J^r f. Jagers.

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(No Model.)

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BARB WIRE MACHINE.

No. 270,645.

Patented Jan. 16, 1883.

Fig. 3.

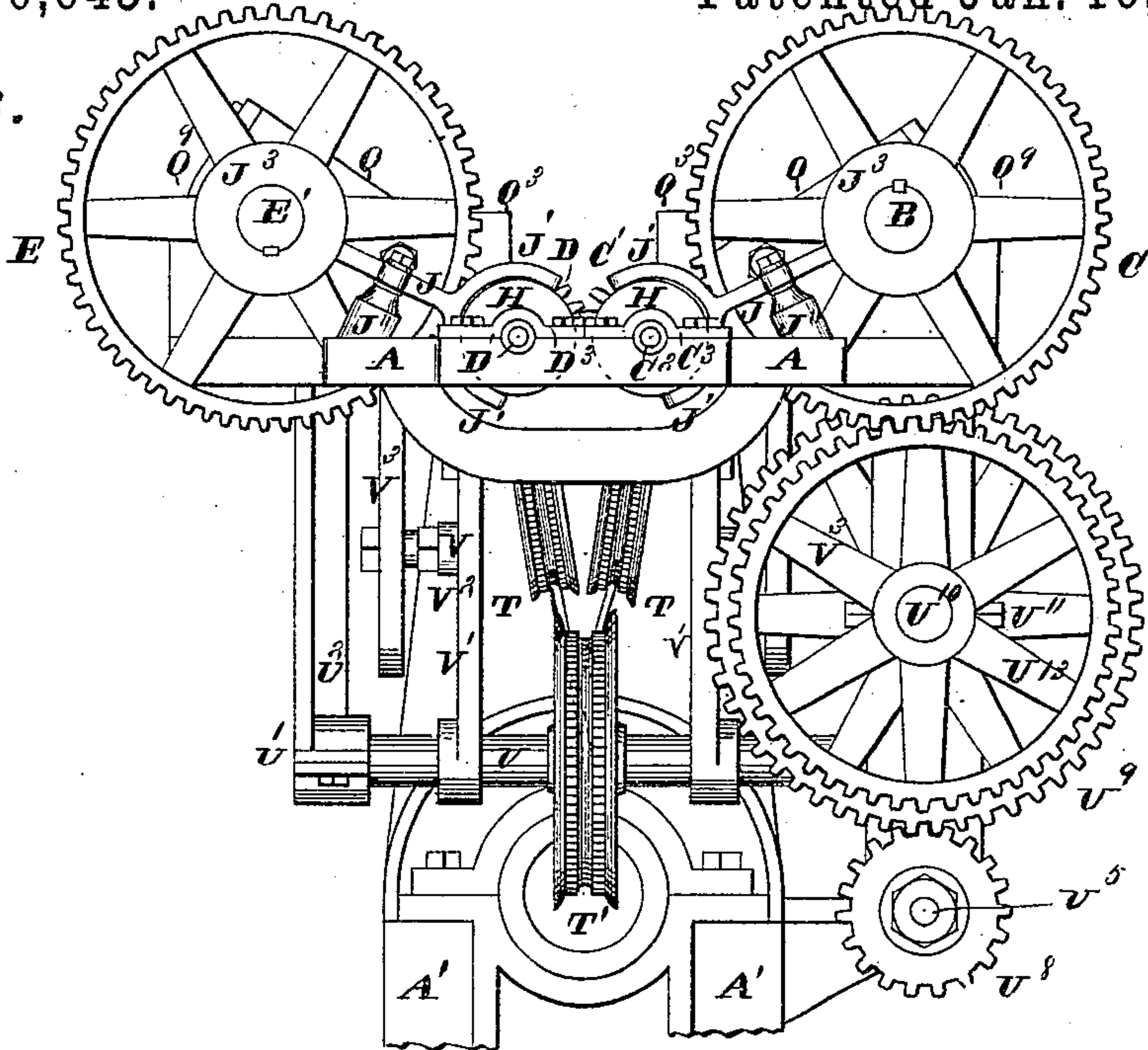
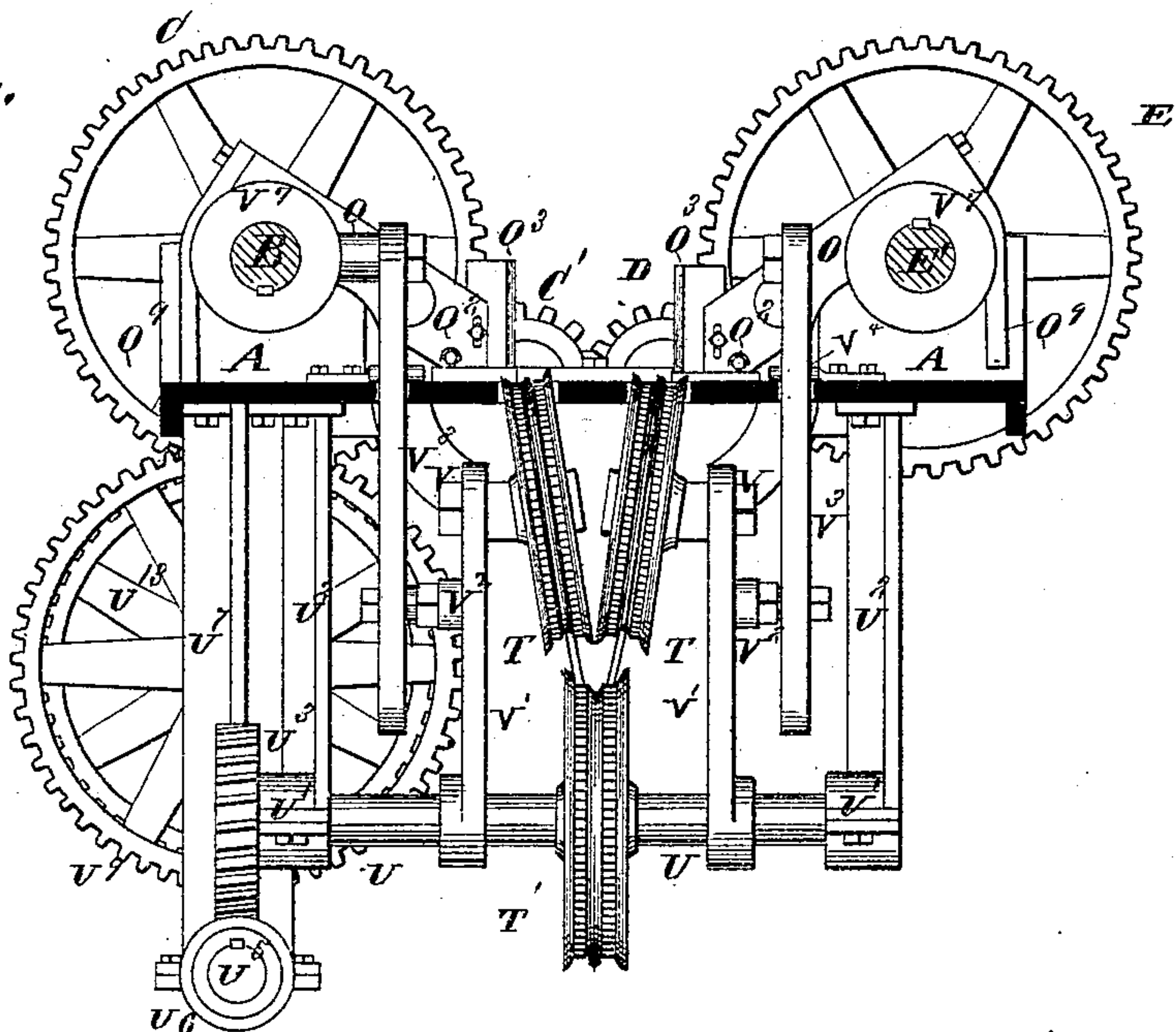


Fig. 4.



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BARB WIRE MACHINE.

No. 270,645.

Patented Jan. 16, 1883.

Fig. 5.

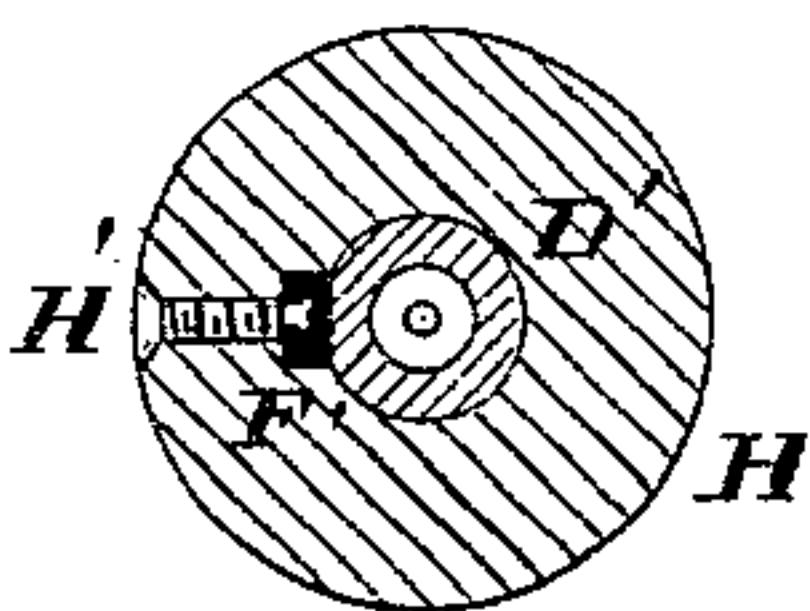


Fig. 6.

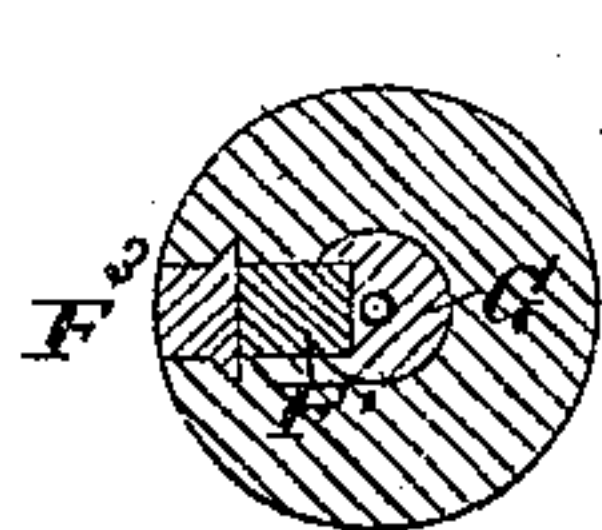


Fig. 7.

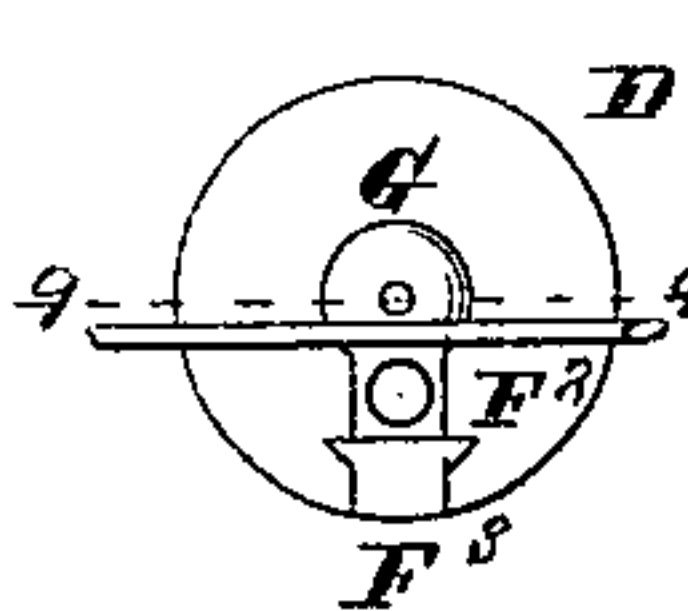


Fig. 8.

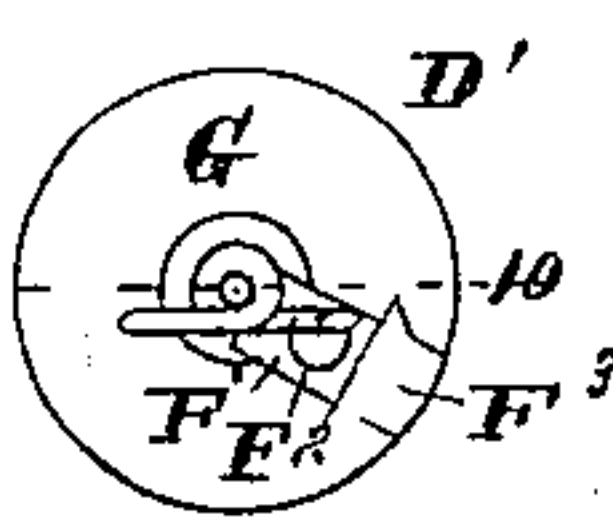


Fig. 11.

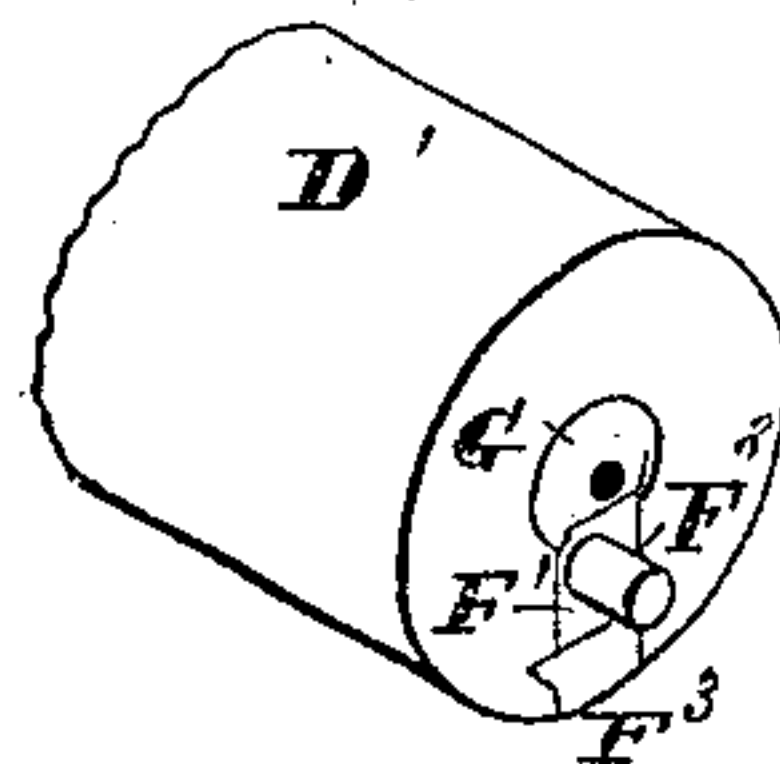


Fig. 9.

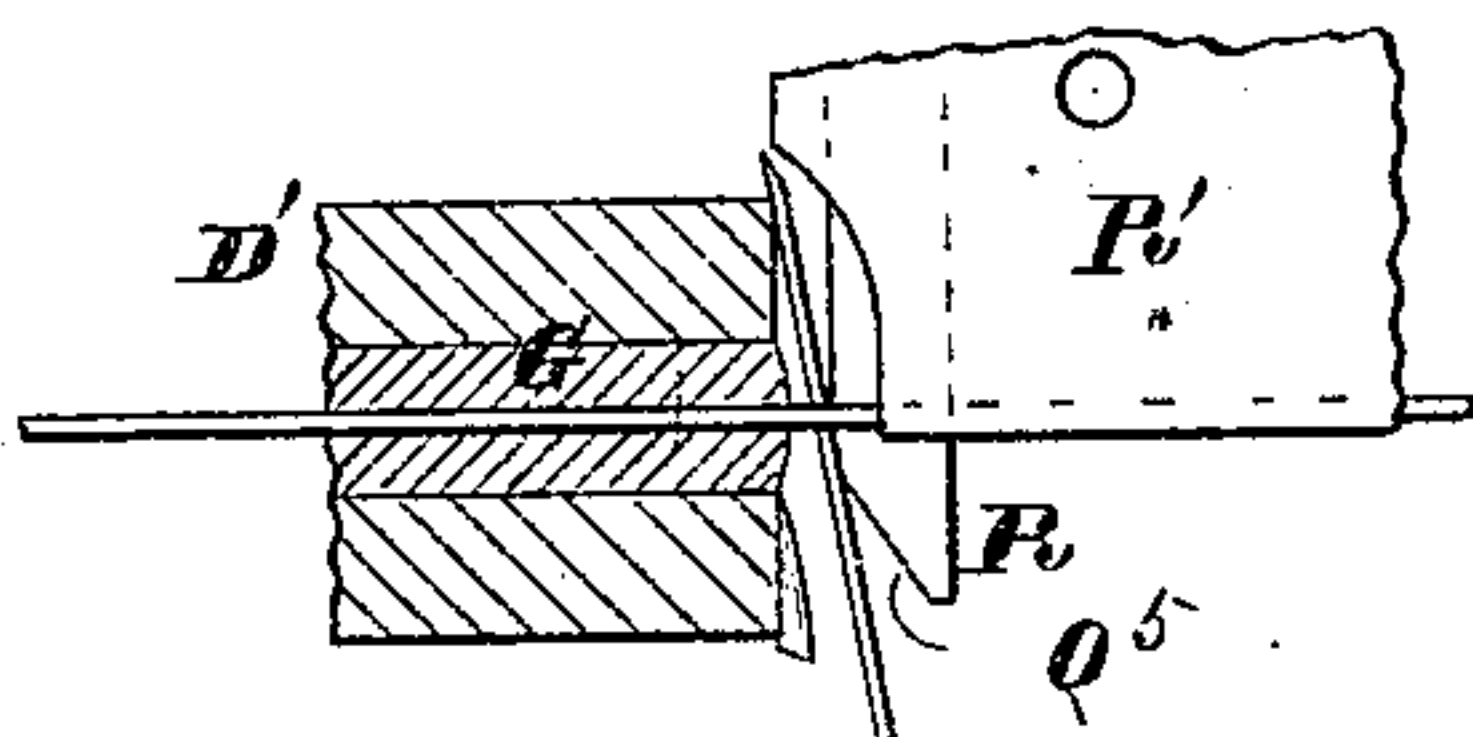


Fig. 10.

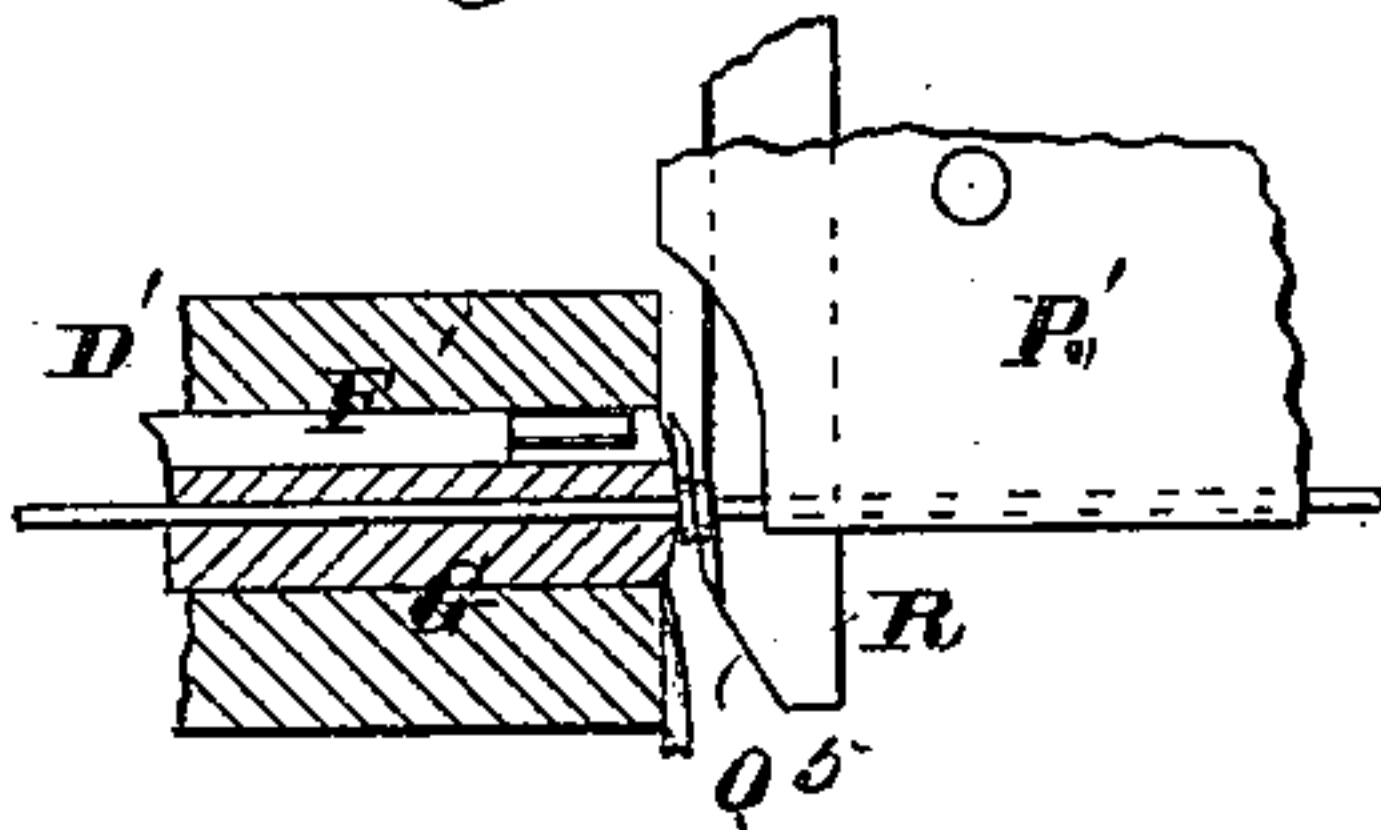


Fig. 12.

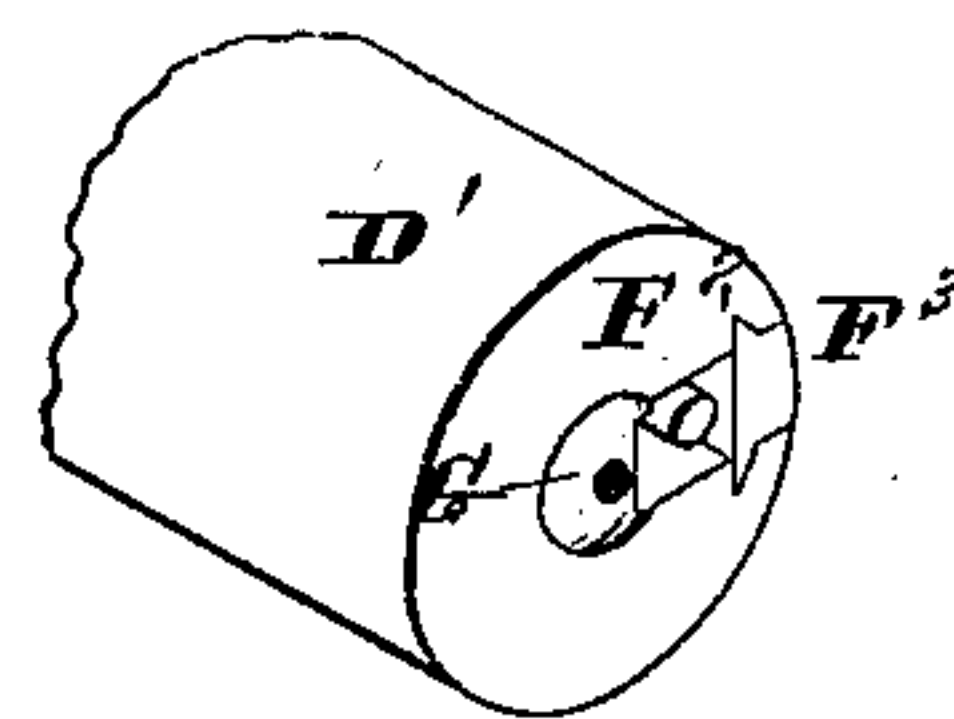


Fig. 13.

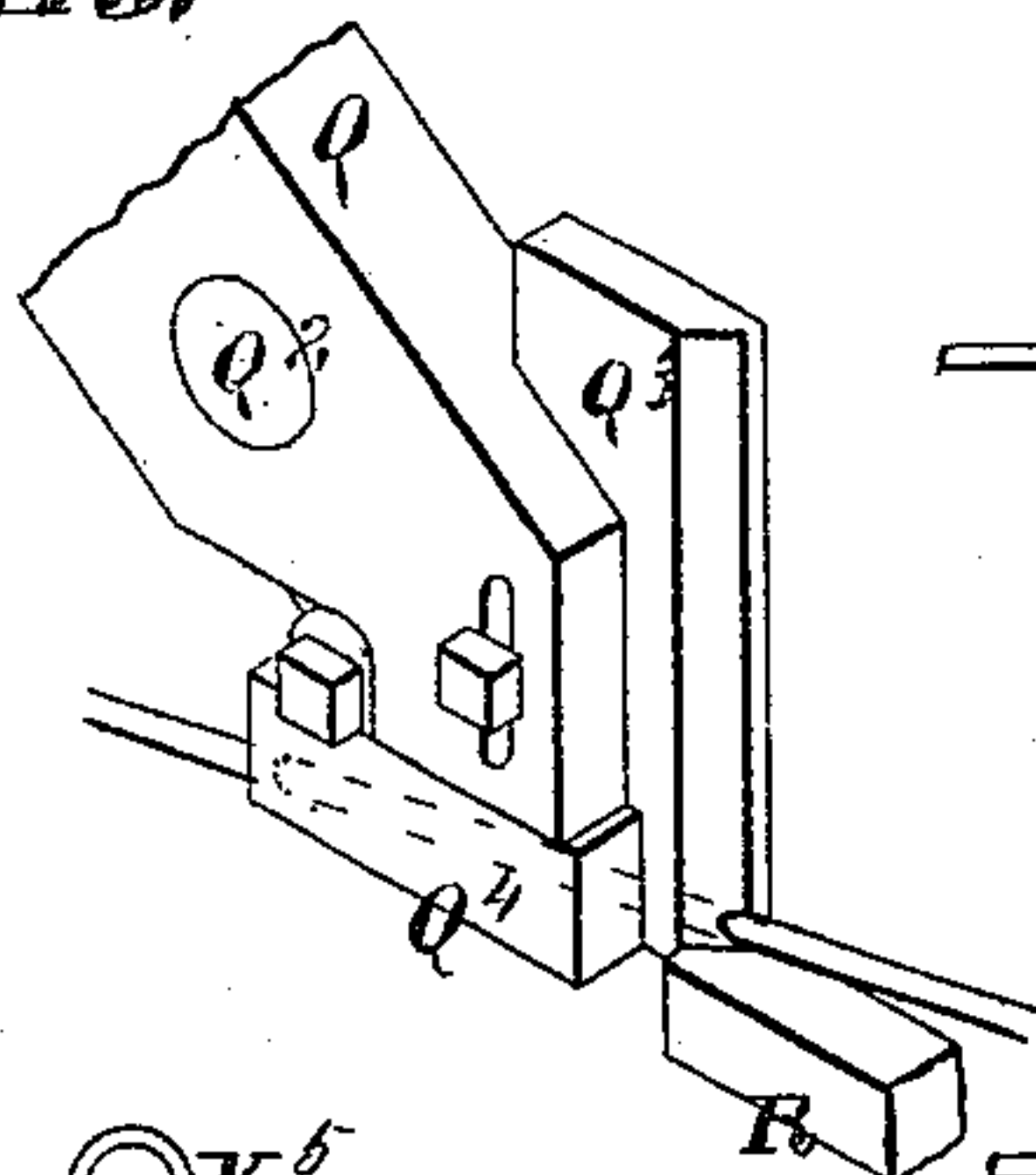


Fig. 15.

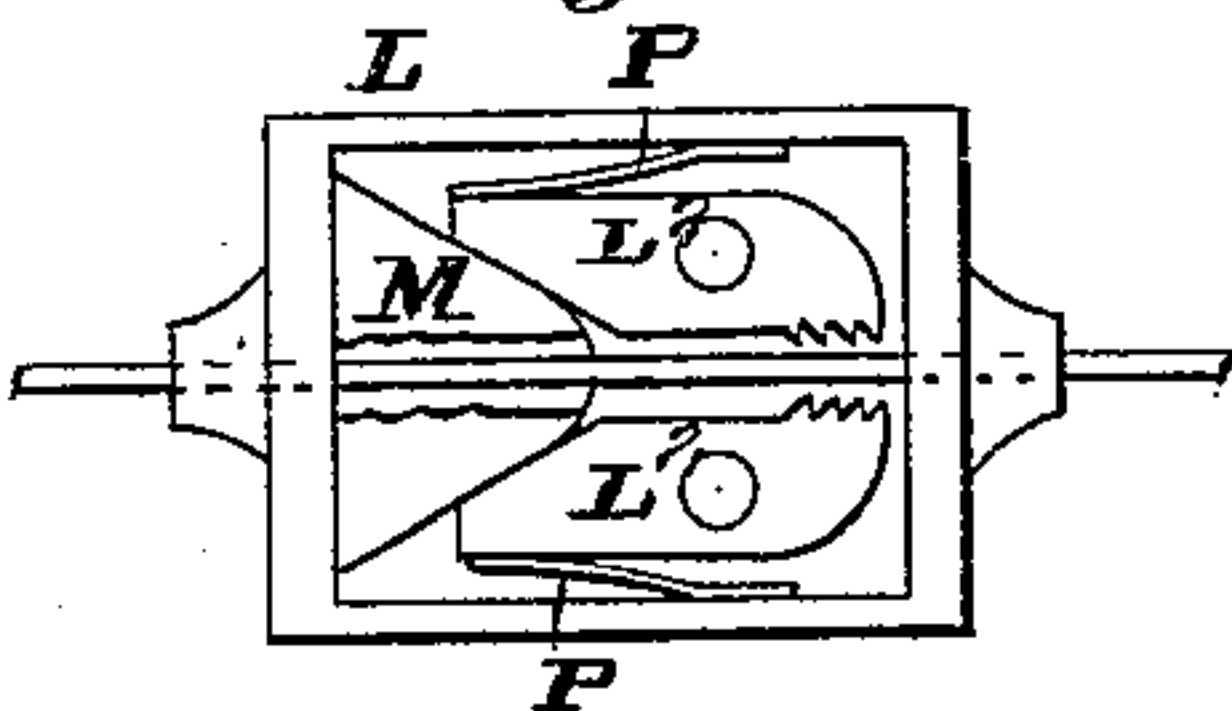


Fig. 14.

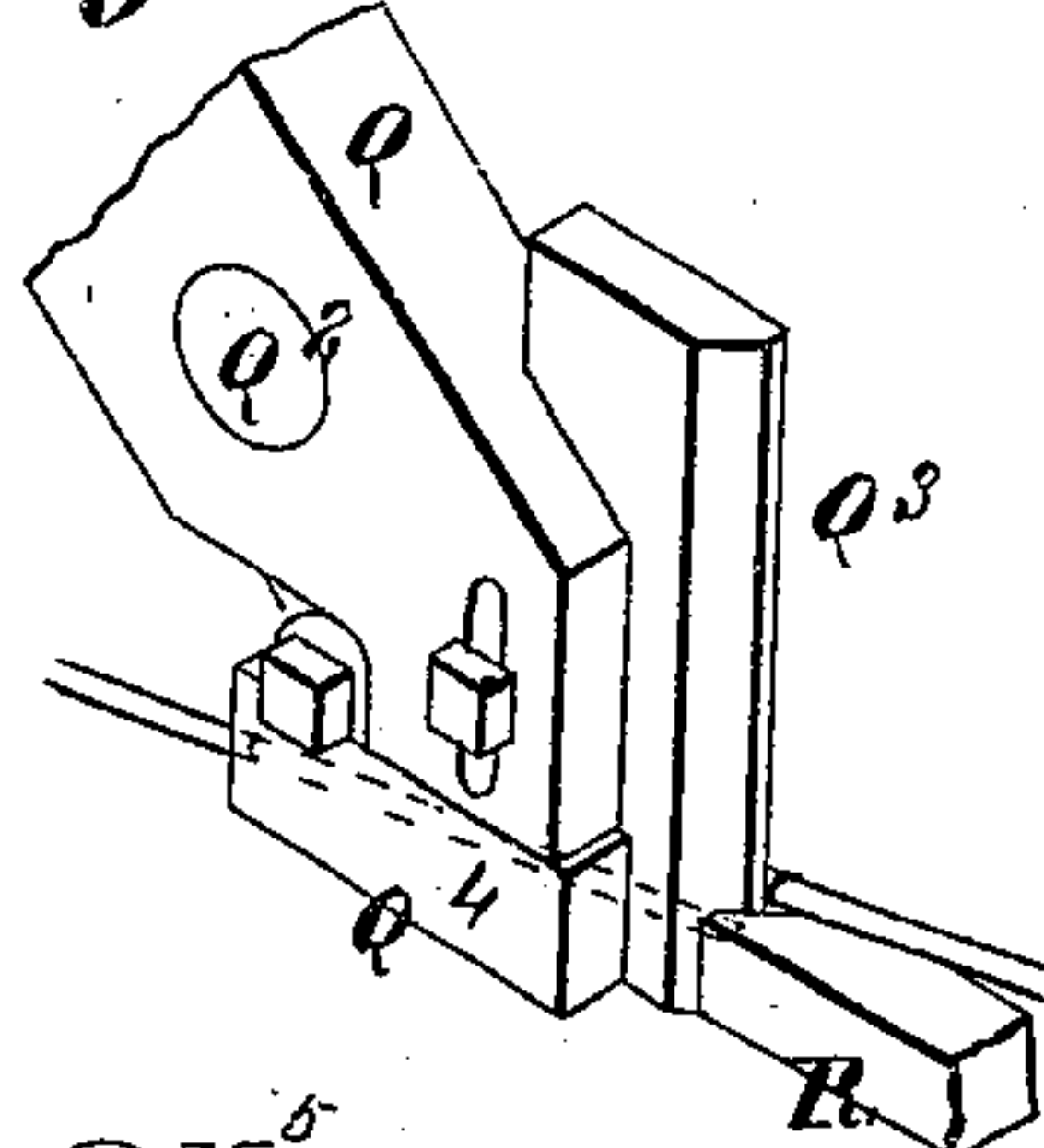


Fig. 16.

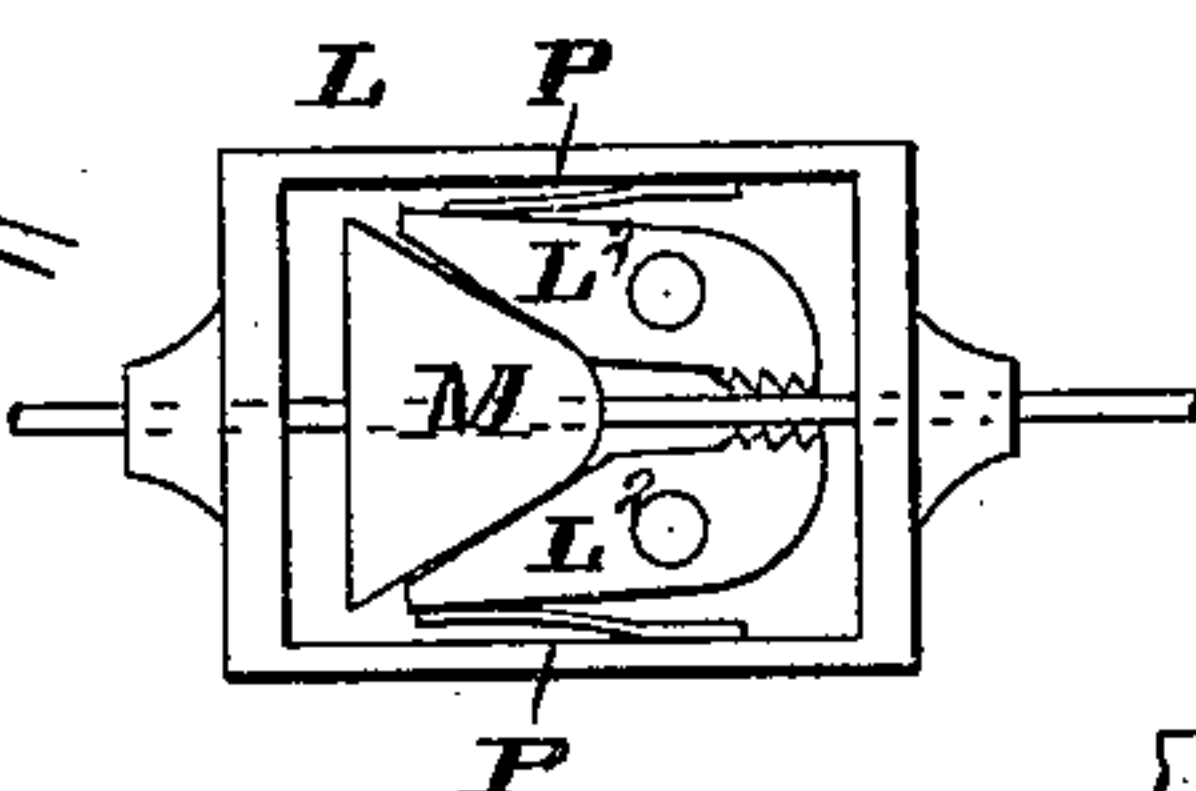


Fig. 17.

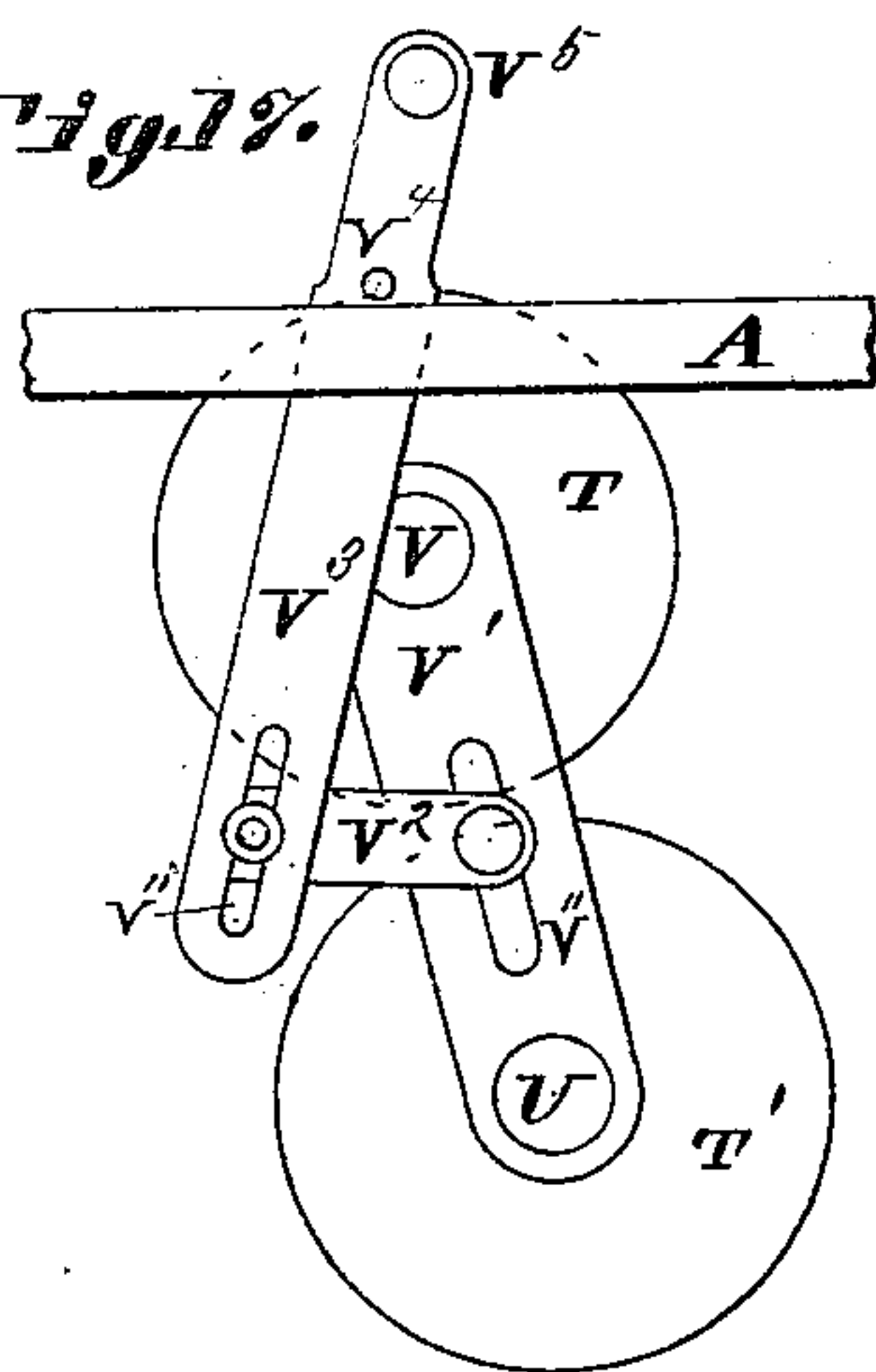


Fig. 18.

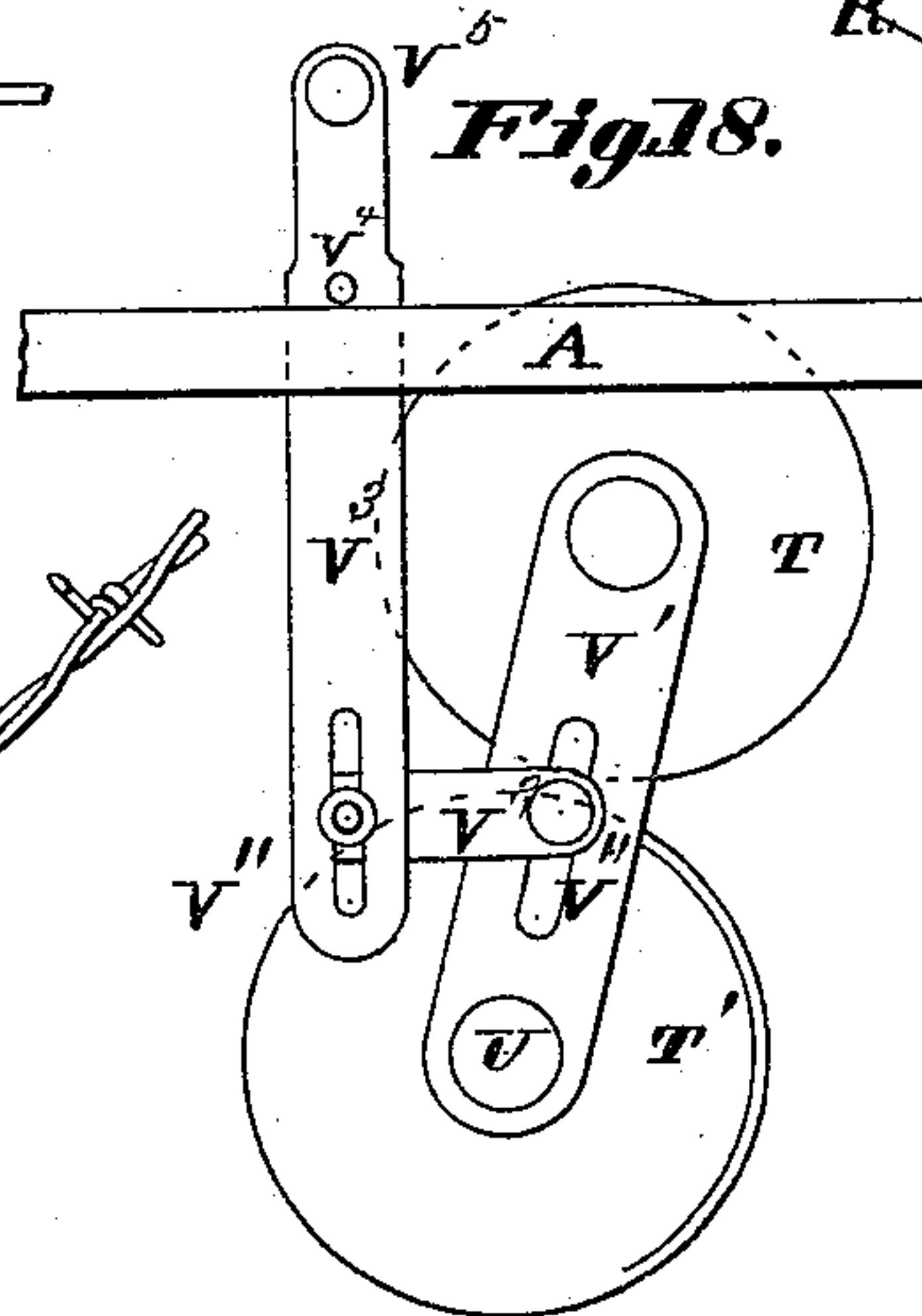
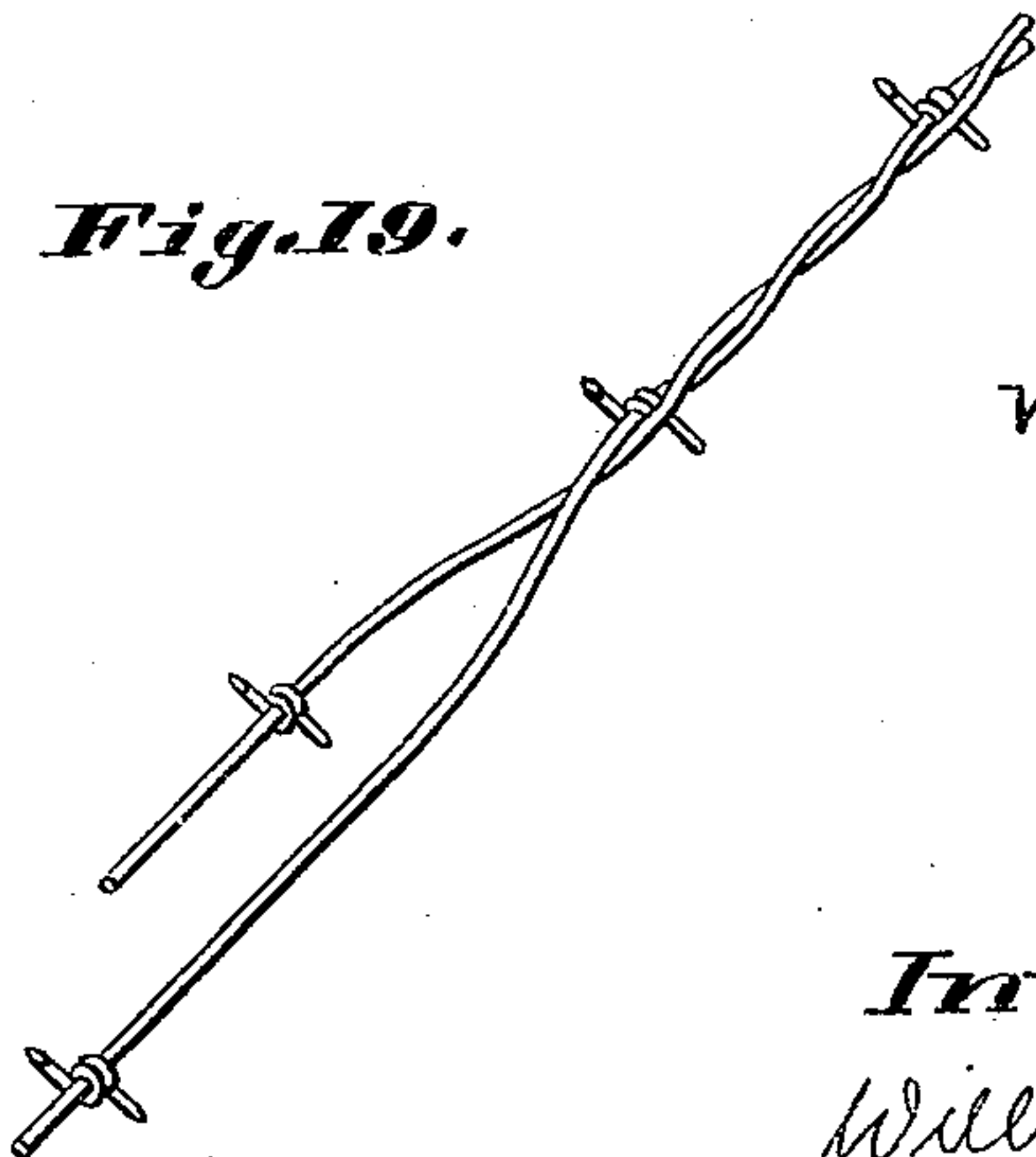


Fig. 19.



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Herbert Knight

Inventor.

William Edenborn
Gustav Griesche
By Knight & Brog
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM EDENBORN AND GUSTAV GRIESCHE, OF ST. LOUIS, MISSOURI;
SAID GRIESCHE ASSIGNOR TO SAID EDENBORN.

BARB-WIRE MACHINE.

SPECIFICATION forming part of Letters Patent No. 270,645, dated January 16, 1883.

Application filed November 1, 1882. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM EDENBORN and GUSTAV GRIESCHE, both of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Wire-Barbing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a top view of the front end of the machine. Fig. 2 is a side elevation of same, showing part of the supporting-legs broken away. Fig. 3 is a front end view of same with legs broken off. Fig. 4 is a vertical transverse section taken on line 4 4, Fig. 1. Fig. 5 is a transverse section taken on line 5 5, Fig. 1, enlarged. Fig. 6 is a similar view taken on line 6 6, Fig. 1. Fig. 7 is an end view of the barb-former, showing its position before making the bend. Fig. 8 is a similar view after the barb is formed. Fig. 9 is a detail longitudinal section of same, taken on line 9 9, Fig. 7. Fig. 10 is a similar view taken on line 10 10, Fig. 8. Fig. 11 is a detail enlarged perspective view of the barb-former, showing the finger in its outer position. Fig. 12 is a similar view, showing the finger in its inner position. Fig. 13 is an enlarged perspective view of the shears or cutters, showing their position just before cutting the wire. Fig. 14 is a similar view, showing their position just after cutting. Fig. 15 is an enlarged top view of the clamp for feeding the barb-wire inward toward the main wire, showing the clamping-jaws open, which is their position as the clamp moves outward. Fig. 16 is a similar view, showing the jaws closed upon the wire, which is their position as the clamp moves inward. Figs. 17 and 18 are diagrams showing in side elevation and in different positions the device for carrying the wires forward in such a manner that while they are fed continuously to the spooling apparatus, yet they are allowed to remain still, forward of this point, at intervals of sufficient length to have the barbs applied. Fig. 19 is a perspective view of a piece of the barb-fencing.

This invention relates to a machine for putting barbs alternately—that is, first putting a barb on one of the wires and then on the

other—on the two wires, which are subsequently twisted together in the usual manner by the spooling apparatus, which would be attached to the same machine, but which we have not shown, as any well-known form may be used; and this invention consists in points of novelty hereinafter fully described and claimed.

Referring to the drawings, A represents the table of the machine, and A' the supporting-legs.

B represents the main shaft of the machine, journaled in boxes B', secured to the table. On one end of the shaft B (not shown) would be a driving-pulley, and this end of the shaft would connect, by means of suitable gearing, with the spooling apparatus. We have shown these parts, which are of common well-known construction, in another application of even date herewith. On the other end of the shaft B is a cog-wheel, C, which engages with a pinion, C', on a hollow shaft, C², of one of the barb-formers, which is journaled in suitable boxes, C³, secured to the frame A. The pinion C' engages with a similar pinion, D, on a hollow shaft, D', similar to that C², which is journaled in boxes D³, secured to the table. In Fig. 1 the tops of the boxes D³, are removed and the shaft D' is shown in section. The pinion D engages with a cog-wheel, E, on a shaft, E', working in boxes E², resting upon and secured to the table A. One wire passes through shaft C², the other through shaft D'.

As the two barbing devices and their accompanying parts are exactly alike, it will only be necessary for us to describe one of them, the same letters of reference referring to the other.

The shaft D', and of course that C² also, is made of different diameters, being considerably the largest at its forward end, where it is channeled to receive the forming-finger F', which has a pin, F², on its outer end. After inserting the finger the channel is closed above it by a dovetailed piece, F³, which holds the finger in place. This end of the shaft is also bored out to receive a bushing, G, which has a conical outer end, (see Figs. 11 and 12,) for the purpose hereinafter explained, and it has a central opening through which the wire passes. As the finger finishes the formation of the barb it has an endwise motion imparted

to it, which causes it to recede into the hollow shaft, out of contact with the barb-wire, while the shaft continues to revolve, and immediately after it recedes it is thrust forward again to its outer position, ready to form another, the main wire in the meantime having been moved forward the desired distance, as hereinafter described. This reciprocating motion is given to the finger by the following means:

10 H is a collar fitting loosely over the reduced or smaller portion of the shaft D', and is connected with the finger by means of a set-screw, H', (see Figs. 1 and 5,) or by other suitable means. The collar is grooved to receive an
15 annular ring or band, H², to which the arms J' of one end of a lever, J, are secured. The lever is fulcrumed to a post, J'', secured to the frame A, and its other end works in a groove, J², of a collar, J³, secured to the end of the
20 shaft E'. The corresponding collar of the other side of the machine is on the end of the shaft B. The outer wall of the groove J is provided with a projection, J⁴, and the inner wall with a corresponding notch, J⁵, (see Fig. 1,) which,
25 coming in contact with the end of the lever, moves the collar H outward, as shown on one side of the machine in Fig. 1, causing the projecting part of the finger to recede into the shaft, as stated, and then, as the projection
30 leaves the end of the lever, it (the lever) is moved to its other position, throwing the finger to its working position. It will thus be seen that the fingers have continual revolving and intermittent reciprocating motions impart-
35 ed to them.

We will now describe the devices for intermittently feeding the wires from which the barbs are cut.

40 L is a block working in a suitable groove in the top of the table. The groove admits of an end-play of the block, and is lettered L'.

L² L² are jaws pivoted to the top of the block L, as shown, and having their rear ends so formed that a V-shaped opening is left between them. The jaws where they bear upon
45 the wire are notched or serrated.

M represents a wedge, which rests and has capacity for a limited end movement on the block L, its inner end fitting between the rear
50 ends of the jaws. The top of the block is formed with a flange around the outside, forming a cup in which the jaws and wedge fit.

N is a lever pivoted at N' to the top of the table, and connected at one end by means of
55 an arm or link, N², to the wedge M. The other end of this arm is connected by means of a link, N³, to one end of another lever, O, which is pivoted at O' to the table, and which has on its other end a friction-roller, O², which
60 bears against an eccentric, O³, on the shaft E'. The corresponding roller on the other side of the machine bears against an eccentric on the shaft B. With this connection between the sliding blocks L and the shafts E' and B
65 it will be seen that the former will be moved inward each time the salient parts of the ec-

centrics bear against the friction-rollers, the wedges first being moved inward, as they connect with the arms, as described, pressing the notched faces of the jaws against the wires, 70 which pass between them, as shown in Figs. 15 and 16, and thus the wires are moved toward the main wires with the blocks the necessary distance to give wire enough for the barbs, and the eccentrics are so located on 75 their shafts that they will act alternately on the levers, so that one places a barb on its wire and then the other, a barb on the wire passing through its hollow shaft, and so on, the principal advantage being rapidity in 80 work, for as the two are working at the same time, and each only having to do half the work, the main wire can be passed through twice as fast as when it has got to wait for one device to apply all the barbs. The spooling 85 apparatus would of course have to be geared sufficiently high to take up the wire. The projections J⁴ on the collars J³ are so located as to act on their respective arms or levers J in conformity with the action of their levers 90 N O.

The wires from which the barbs are cut pass through the flanges of the ends of the blocks and through the wedges, as shown in Fig. 15, between the jaws. When the blocks have 95 been moved inward, as described, the salient parts of the eccentrics O³ are of sufficient length to hold them there until the fingers have given the barb-wires with which they then come in contact one bend around the main wires, and 100 then the eccentrics suddenly leave the arms, and suitable springs, O⁴, bearing against the levers N, (see Fig. 1,) force the wedges outward against the rear flanges of the blocks, which loosens the clamps upon the wires, and then, 105 as the wedges cannot move outward farther on the blocks, the blocks themselves are carried outward, the wires slipping through them, for, as before stated, they have been made fast to the main wires. 110

We prefer to place springs P P between the side flanges of the block and the rear ends of the jaws, (see Figs. 15 and 16,) which take the bearing of the grasping ends of the jaws from the wire as soon as the wedge has been forced 115 outward; but these springs are not absolutely necessary, as the jaws would slip over the wire without them, though they would bear slightly against it.

The ends of the levers N and O are adjusta- 120 bly connected together, preferably by means of the bolts securing the link N³ thereto passing through slots N⁴ O⁵. (See Fig. 1.) This adjustable connection gives means for changing the movement of the block, and consequently 125 the amount of wire fed at each operation. The barb-wire passes beneath the main wire at or near right angles thereto, and the finger, coming against its free end from beneath, bends it around the main wire twice, as shown in 130 Fig. 10, and then retreats into the hollow shaft, as before described. Immediately after the

block L has made its return movement, which takes place when the finger has bent the barb-wire around the main wire once, and while the finger is completing its work, the barb is cut from the main body of the wire by knives constructed as follows:

Q is an inclined lever pivoted to a post, Q', by means of a bolt passing through a hole, Q², in the lever. The post is secured to the top of the table. To the lower end of the lever (see Figs. 13 and 14) are secured a knife, Q³, and a guide-block, Q⁴. The barb-wire passes through this guide-block, and may also, as shown, pass through the lower end of the knife, (see dotted lines, Figs. 13 and 14,) and the knife has a beveled edge, which works against the beveled end of a stationary knife, R, secured to the table A by means of a plate, R', or by other suitable means. The hole in the guide-block and the knife through which the wire passes is so located that the wire will come out through the bevel-edge of the knife Q³. This knife has an intermittent circular motion imparted to it by means of the upper end of the pivoted lever extending over the shaft E' and being struck by an eccentric cam, S, (see Fig. 1,) on the shaft E'. As the cam strikes the lever it lowers the end to which the knife is attached, imparting the said circular motion to the knife by the lever turning on its pivot, which carries the wire down upon the stationary knife, cutting the barb, giving to it the desired sharp point. The knife Q³ works in the space Q⁵ (see Figs. 9 and 10) between the end of the hollow shaft D' and the stationary knife R. To force the wire over the stationary knife (see Fig. 10) the conical end of the bushing G, before mentioned, is employed. As the finger wraps the barb-wire around the main wire twice, and as there is only room enough for one bend of the wire between it when in its normal position and the end of the bushing, it will be seen that the second bend will move the first bend forward by wedging between it and the inclined end of the bushing, forcing the wire over the stationary knife before the knife Q³ descends. Not only does the bushing force the wire over the knife R, but by this lateral movement binds it in the opening of the knife Q³ or the guide-block, thereby enabling the knife to cut it more easily. As soon as the cam S operates the lever it leaves it, and the upper end of the lever is thrown down, thereby raising the knife Q³ by means of its own weight, assisted by a spring, Q⁶, secured to the upper end of the post Q', and bearing against a projection, Q⁷, on the upper end of the lever. (See Fig. 1.) In order that the lever will not bear or be pressed upon the shaft B by the spring Q⁶, we secure an arm, Q⁸, to the end of the lever or to the projection Q⁷, which, when the lever is not raised by the cam S, rests upon the table, as shown in Fig. 2, holding the lever up out of contact with the shaft. As soon as the fingers have completed the barbs and the knives

cut them off, the main wires are carried forward the proper distance by mechanism which we will now describe.

The wire from the barbing device passes over a wheel—one of course for each wire—T and beneath a single wheel, T', from where they pass to the spooling apparatus over a single vibrating wheel, as usual. The top of the wheel T works through a slot, T², of the table, so that its periphery is on a line or nearly on a line with the barbing device. The wheels are preferably formed with circumferential grooves, and their peripheries provided with teeth or notches, which engage the barbs on the wire, which fits in the grooves, thus giving to the wire a positive forward motion. If these wheels T T' were both stationary, the main wire would be moved continuously forward before reaching the wheels, as well as after, and to so arrange these wheels that the wire will be fed to the spool continuously, while in advance of the wheels it is allowed to stand still at intervals of sufficient length to have the barbs applied, we secure the wheel T' to a shaft, U, which is journaled in suitable boxes, U', suspended, by hangers U², beneath the table. Power is applied to this shaft preferably by means of a cog-wheel, U³, thereon engaging with a worm, U⁴, on a shaft, U⁵, journaled in boxes U⁶, suspended from the bottom of the table by hangers U⁷. On one end of the shaft U⁵ is a pinion, U⁸, engaged by a cog-wheel, U⁹, on one end of a shaft, U¹⁰, journaled in boxes U¹¹, suspended beneath the table by hangers U¹². On the other end of this shaft U¹⁰ is a cog-wheel, U¹³, similar to that, U⁹, which engages with the wheel C on the main driving-shaft B. Thus the wheel T', which carries the main wires forward, is driven from the main shaft of the machine. The wheel T is journaled in a short axle, V, on the upper end of an arm, V', supported by the shaft U. (See Figs. 3 and 4.) The arm V' is connected by a suitable link, V², to the lower portion of a lever, V³, which is pivoted to the table A, through which it passes at V⁴, and whose upper end has a lateral projecting pin, V⁵, which works in a groove, V⁶, of a collar, V⁷, secured to the shaft E', the duplicate collar on the other side of the machine being on the shaft B, as shown. The groove passes spirally around the collar until it has about surrounded it, and then with a sharp change passes in the other direction, as shown on one side of the top view, Fig. 1. As the pin works in this groove it will be seen that the lower end of the lever V³ will be gradually moved toward the front end of the machine, carrying the wheel T with it, and then when the pin comes to the change to the direction of the groove the lower end of the lever and wheel will be forced with a quick movement in the other direction—that is, away from the front end of the machine. The machine has its parts so arranged that this quick forward movement of the wheel T occurs just after each barb has been attached and cut off, and it carries enough of the main

wire forward to bring the next barb in the proper place. Then as the wheel moves slowly backward the spool takes up the slack beneath. The wheels T of course act alternately in conformity with their respective parts.

We prefer to assist the quick forward movement of the wheel T by a spring, W, connecting the upper end of the arm V' back of the wheel with the bottom of the table. The arm V' and the lower end of the lever V³ are adjustably connected by the bolts securing the link V² thereto passing through slots V'', as shown in Figs. 2, 17, and 18.

We do not claim broadly in this application the mechanism for moving the main wires forward, nor the mechanism for feeding the barb-wires, nor the mechanism for cutting the barbs off, as they form the subject-matter of our other application above mentioned; but

What we do claim in this application, and desire to secure by Letters Patent, is—

In a wire-barbing machine, the combination of duplicate revolving hollow shafts, through

which the main wires pass respectively, duplicate barb-forming fingers within said hollow shafts, duplicate collars and levers connecting said fingers with operating-shafts, whereby the fingers get a reciprocating motion, duplicate sliding blocks carrying clamping-jaws, and wedges operated through means of levers connecting them with eccentrics on the main shaft, and duplicate wheels over which the main wires pass, which have capability for movement in the direction of the travel of the main wires, and means for operating them from the shafts of the machine, and connected means for operating the said parts alternately, substantially as and for the purpose set forth, the two wires passing from the duplicate vibrating wheels onto a single wheel to which power is applied, as described and shown.

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GUSTAV GRIESCHE.

Witnesses:

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GEO. H. KNIGHT.