

(No Model.)

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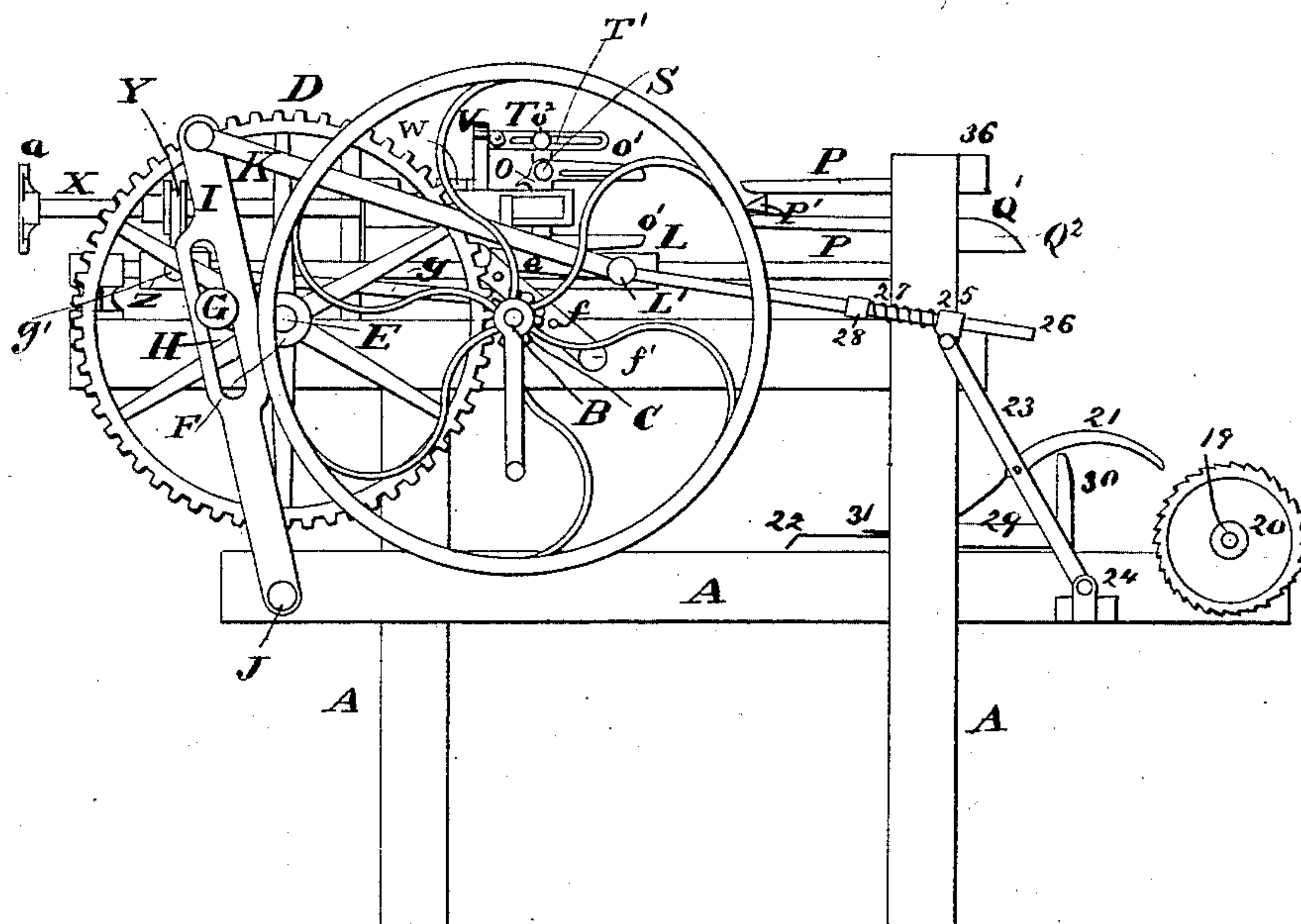
T. B. HARRISON.

MACHINE FOR MAKING WIRE AND PICKET FENCING..

No. 314,933.

Patented Mar. 31, 1885.

Fig. 1.



Attest:

W S Knight
Geo L Wheelock

Inventor:

Thomas B. Harrison

By Knight Bro
Atty.

(No Model.)

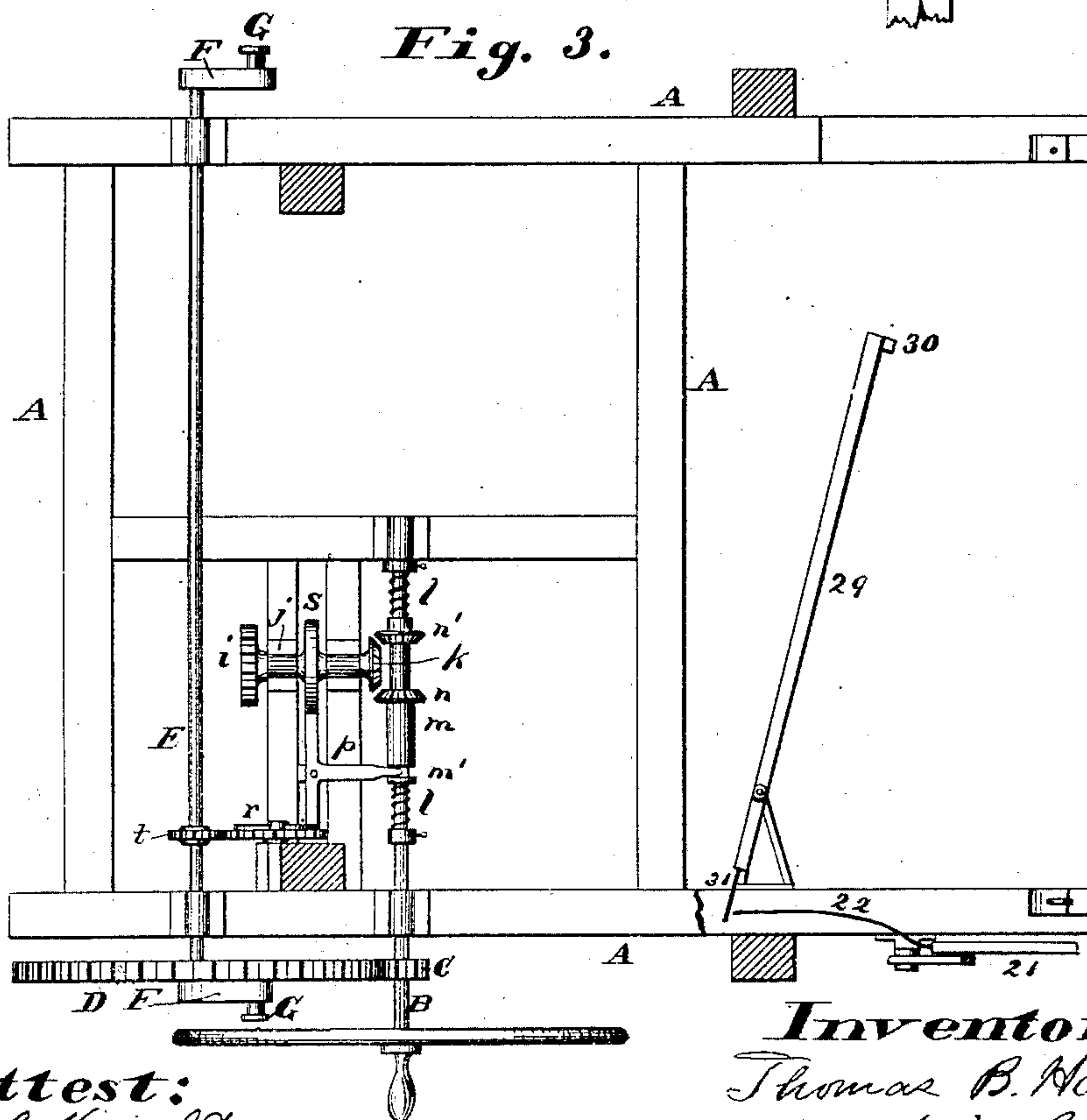
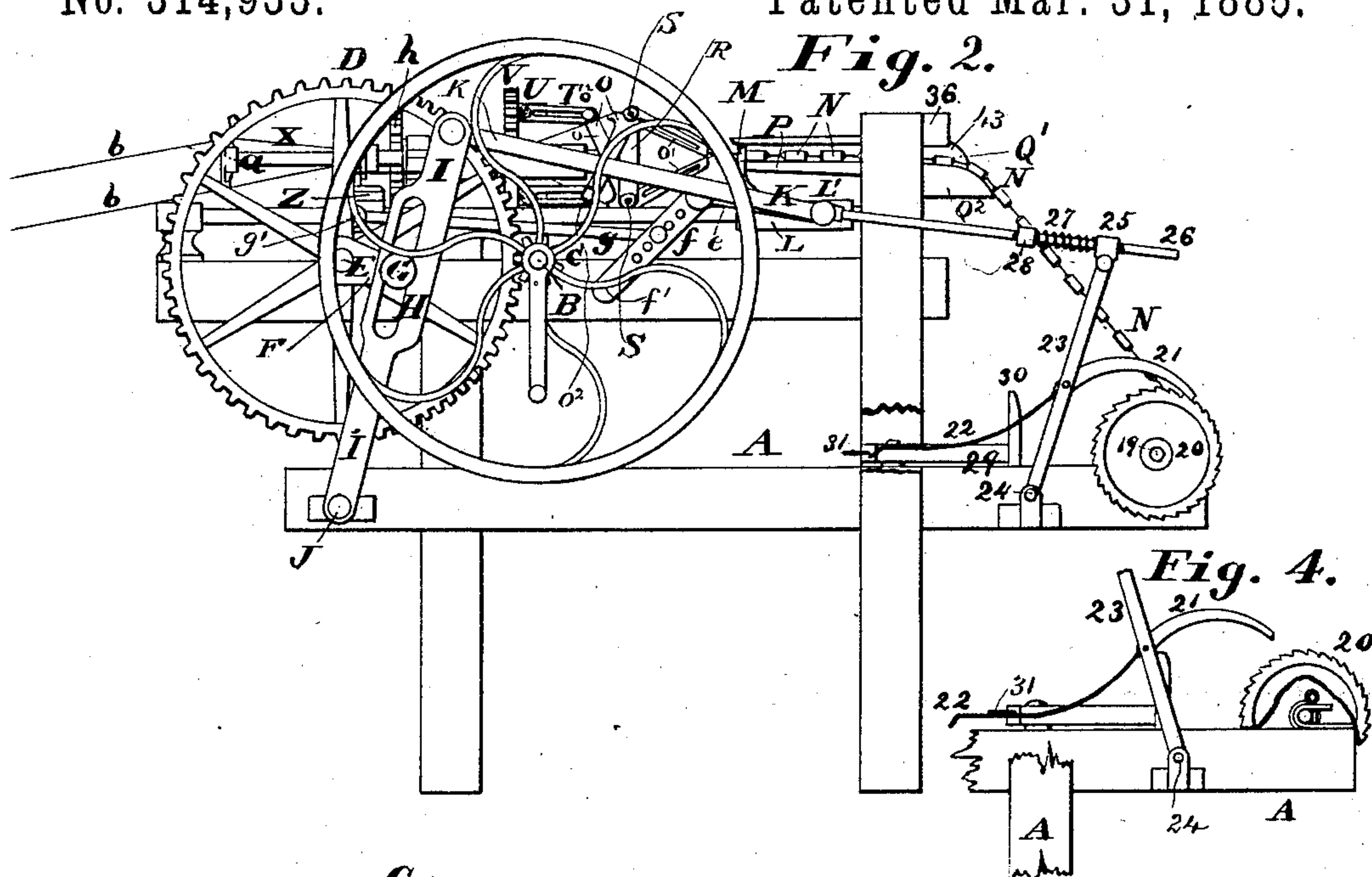
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T. B. HARRISON.

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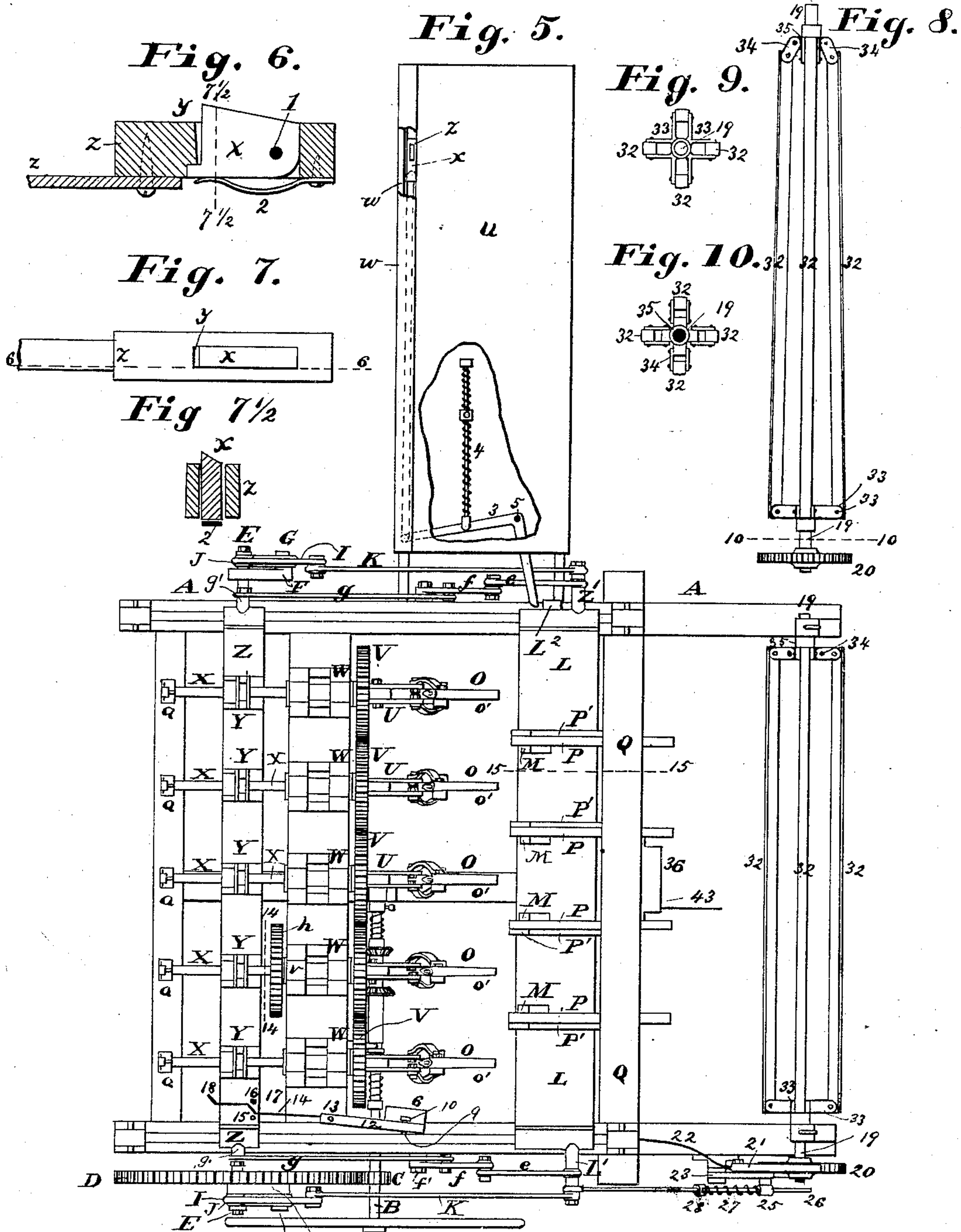
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Fig. 11.

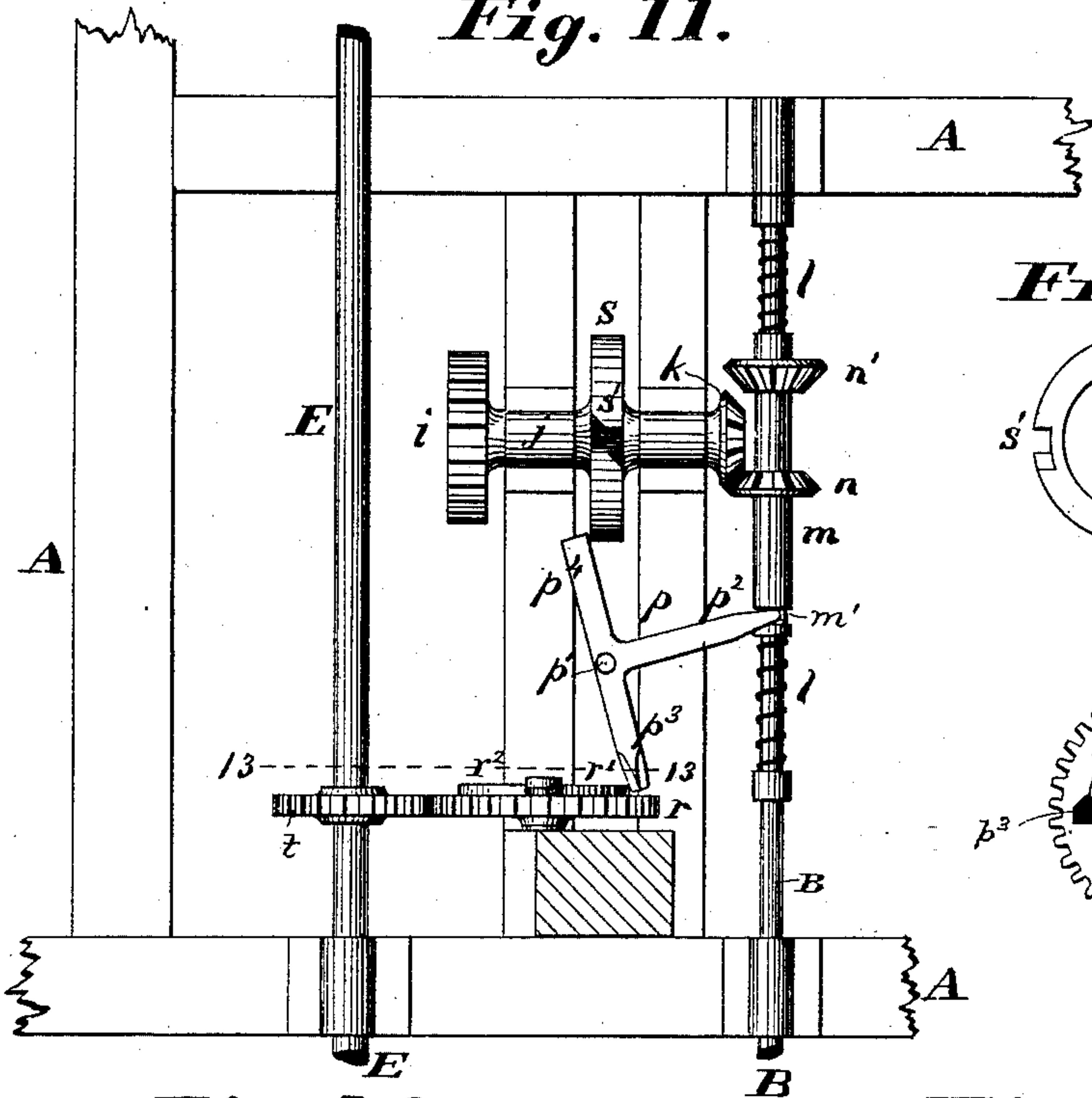


Fig. 12.

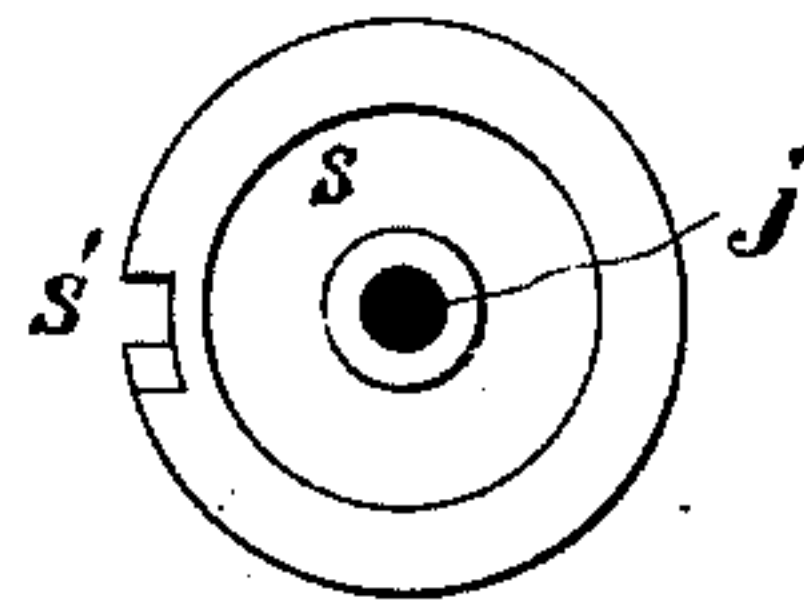


Fig. 13.

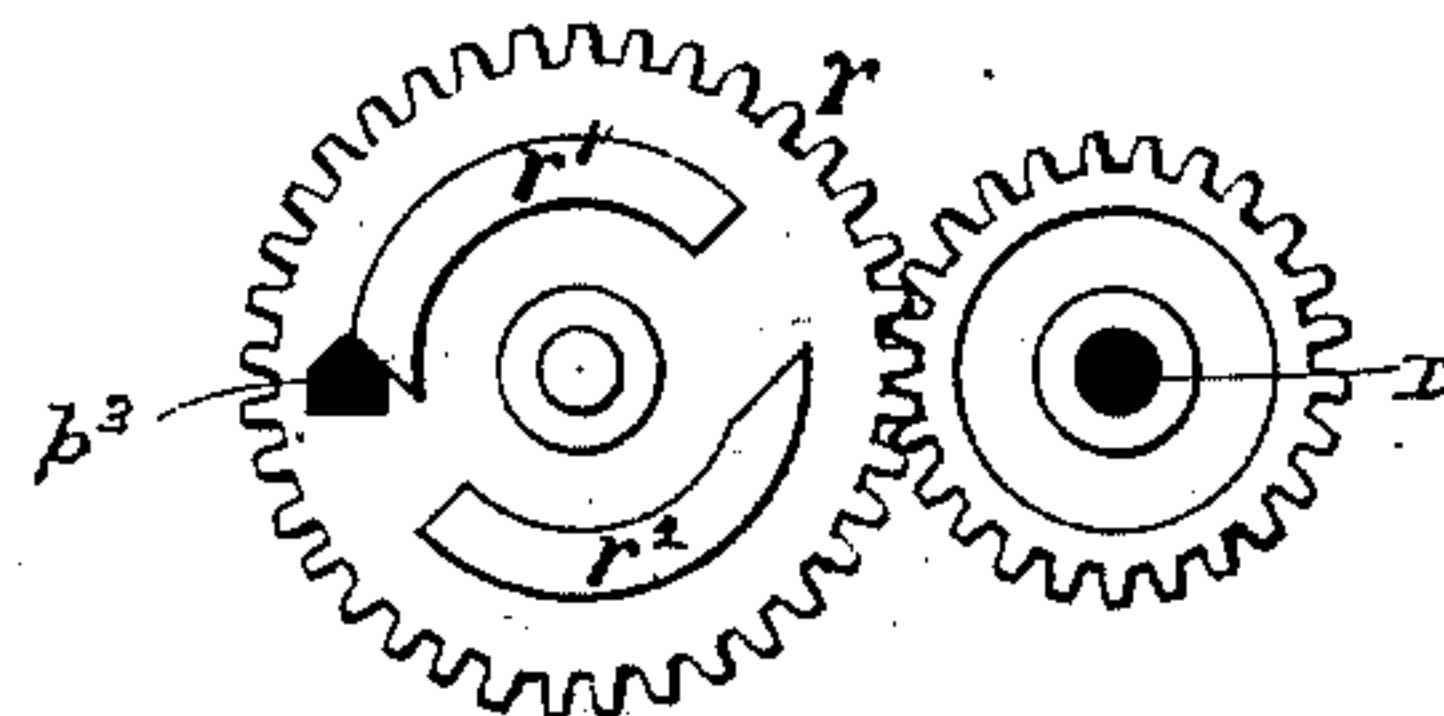


Fig. 14.

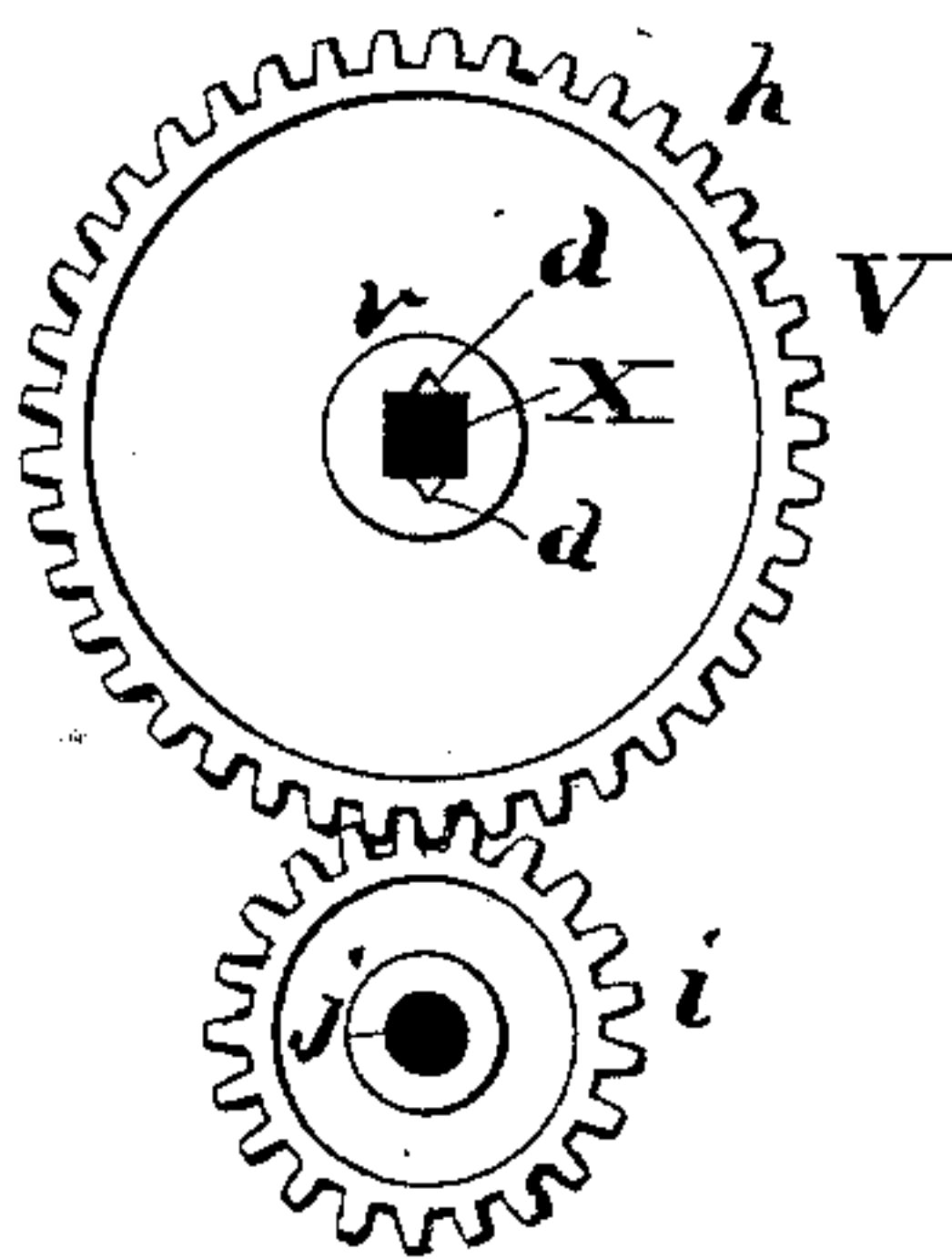


Fig. 15.

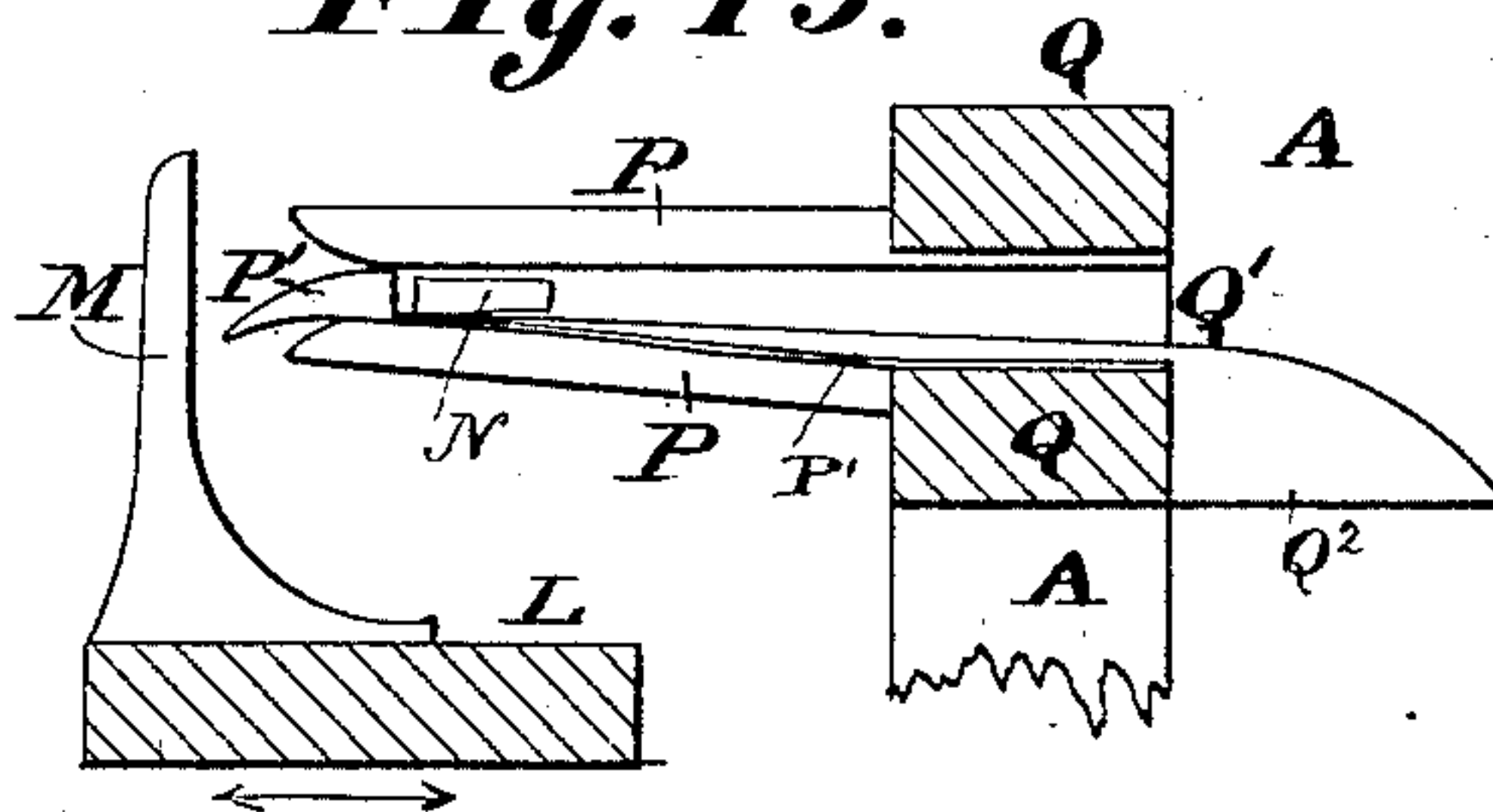


Fig. 16.

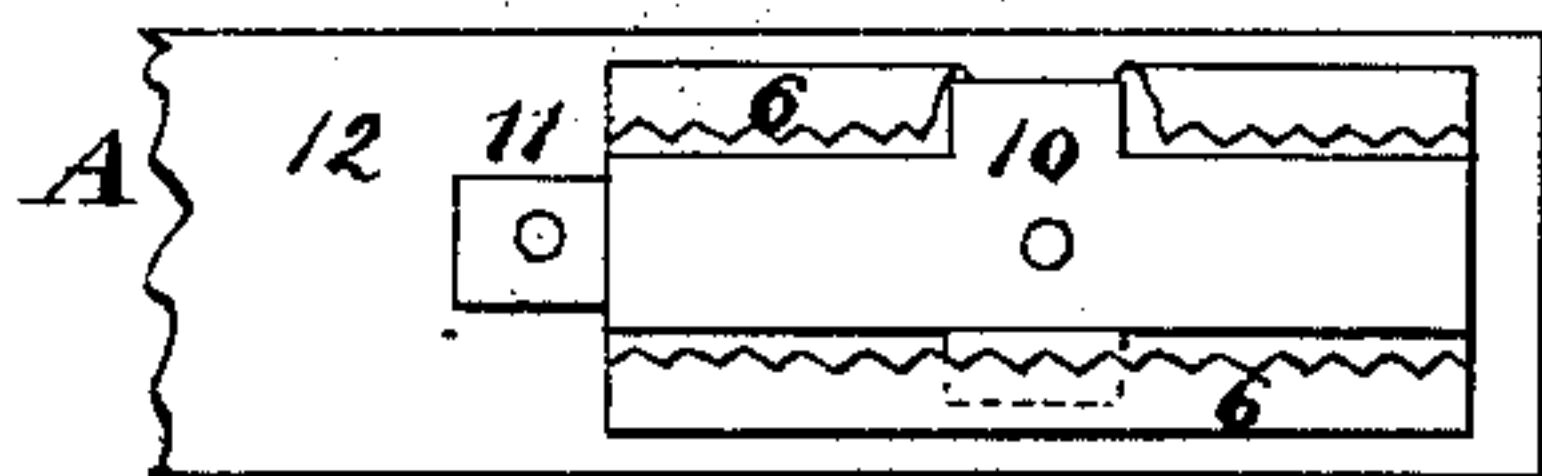


Fig. 17.

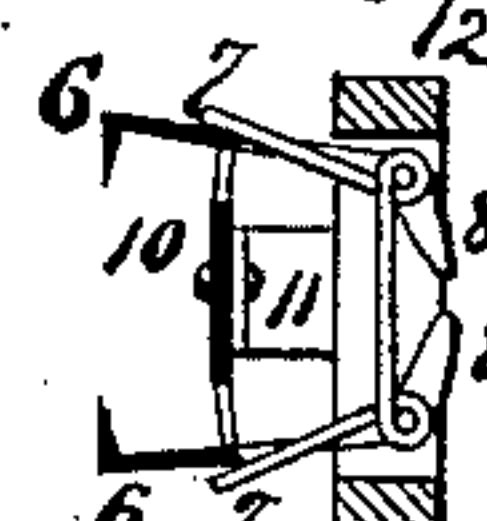


Fig. 18.

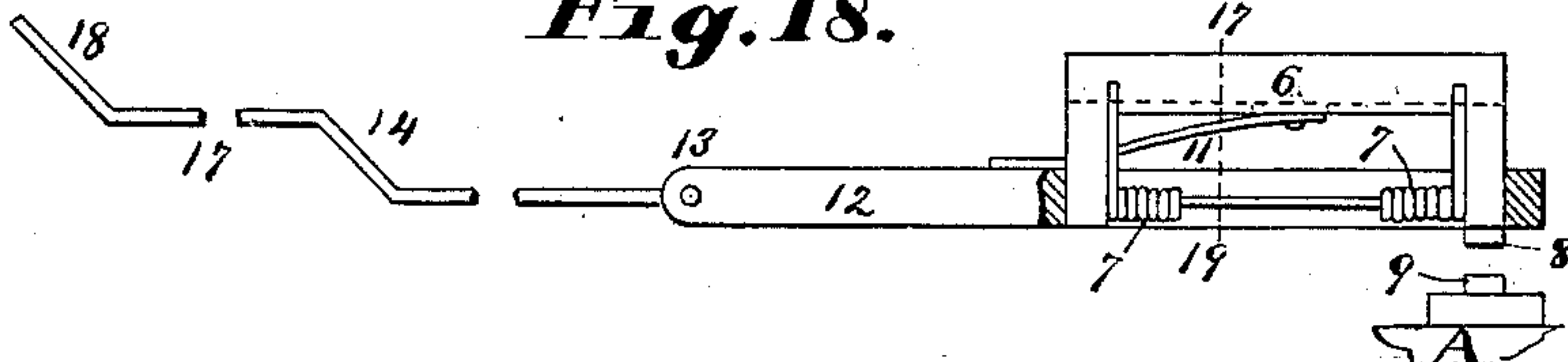
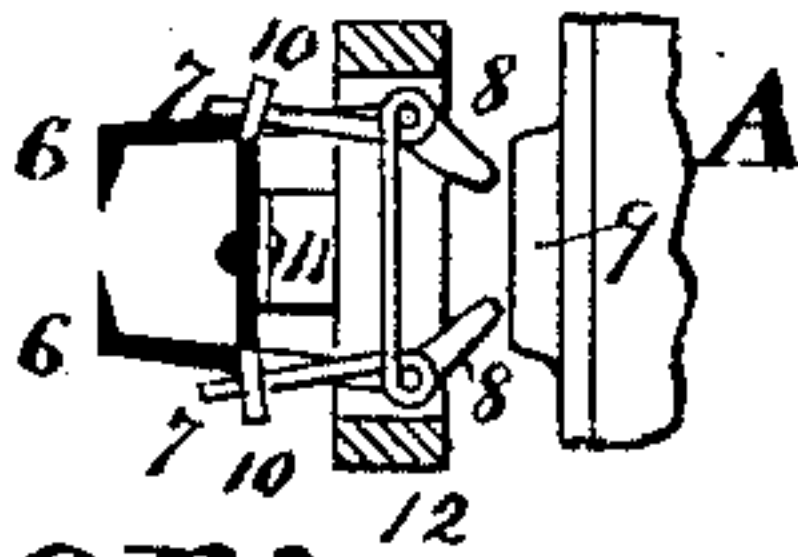


Fig. 19.



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Fig. 20.

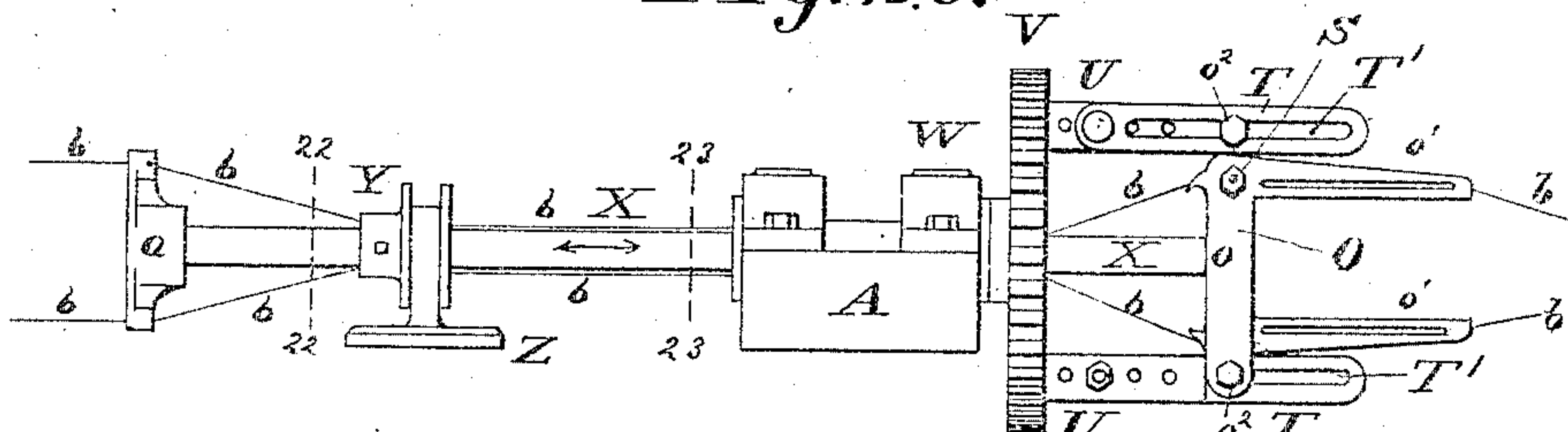


Fig. 21. Fig. 22. Fig. 23.

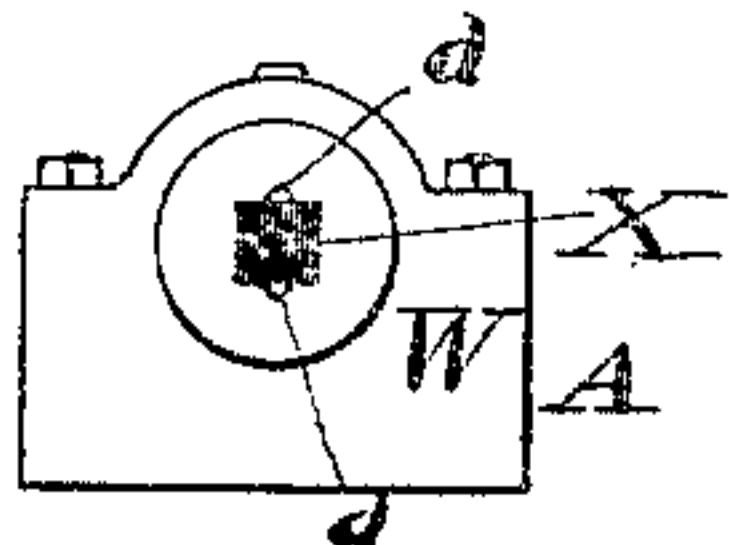
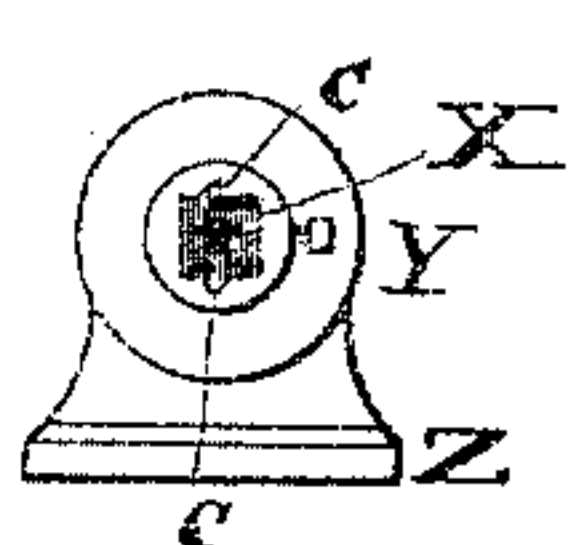
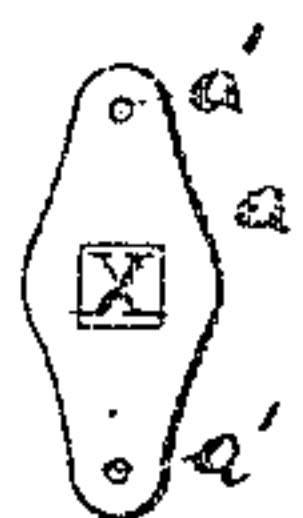


Fig. 24.

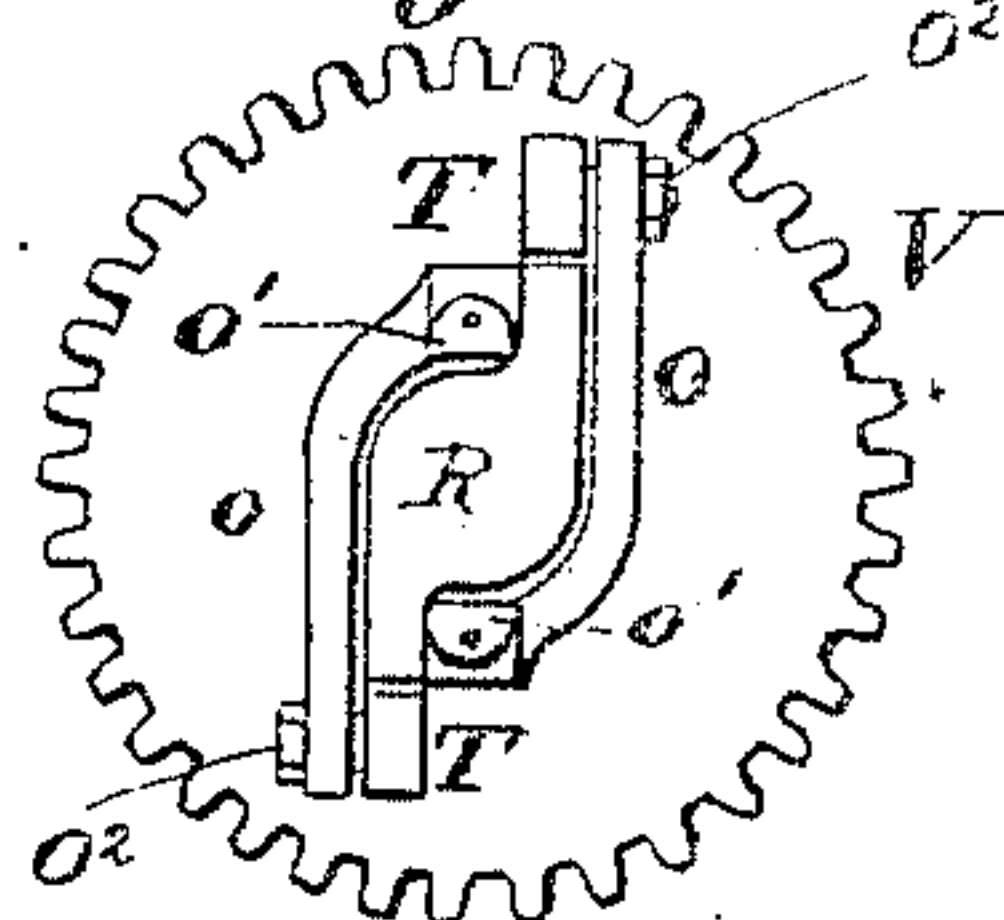


Fig. 25.

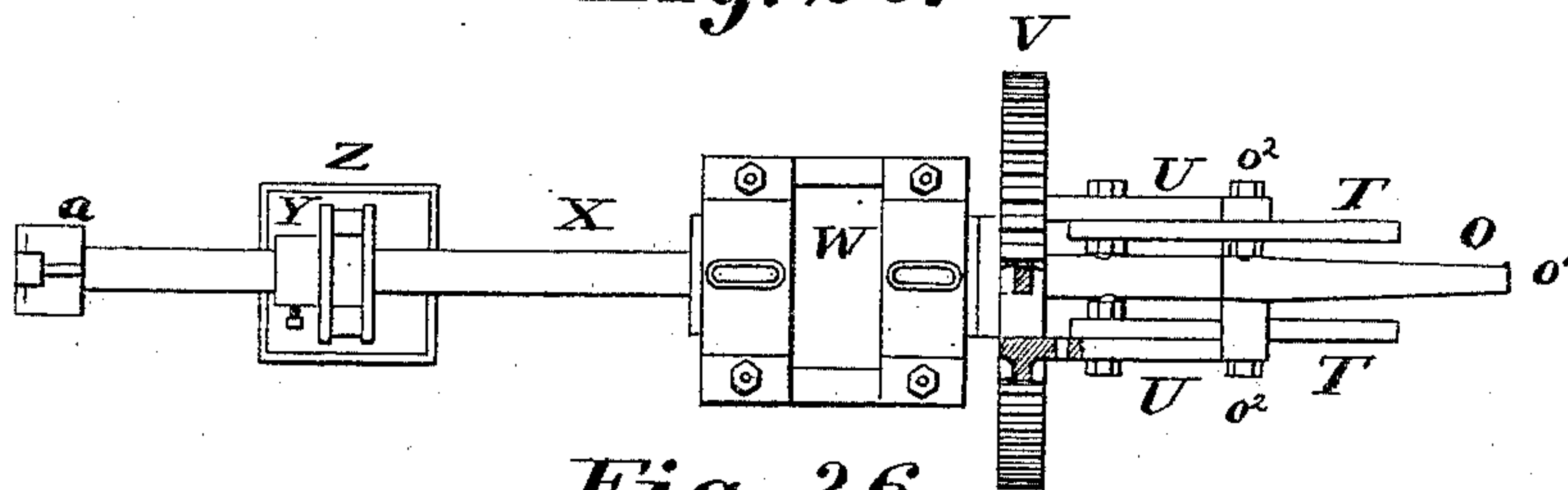


Fig. 26.

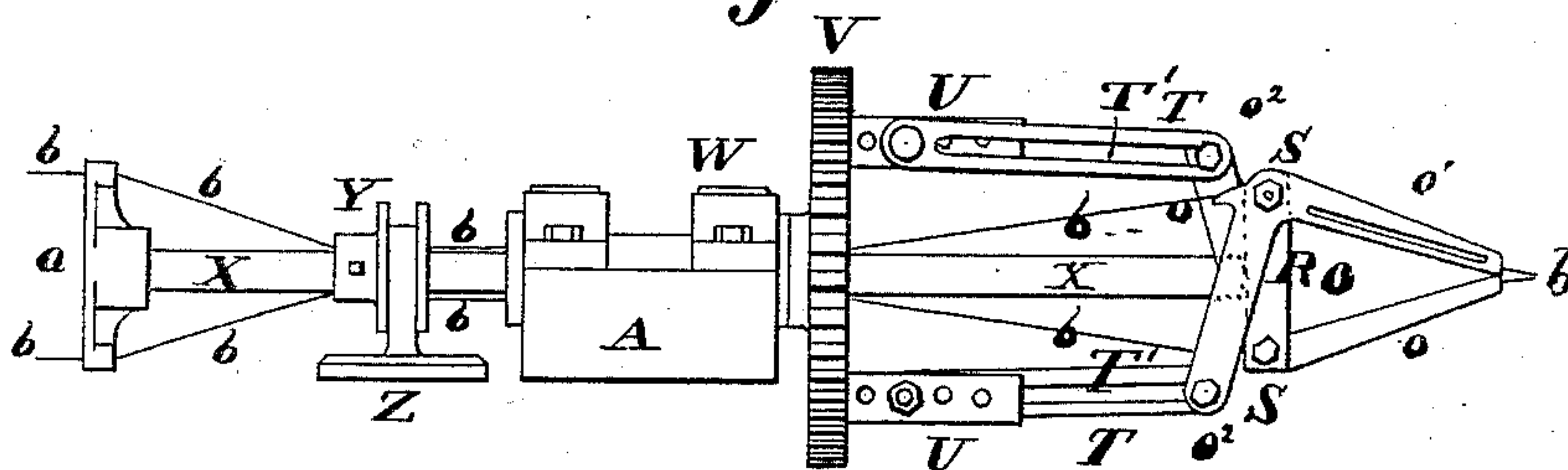
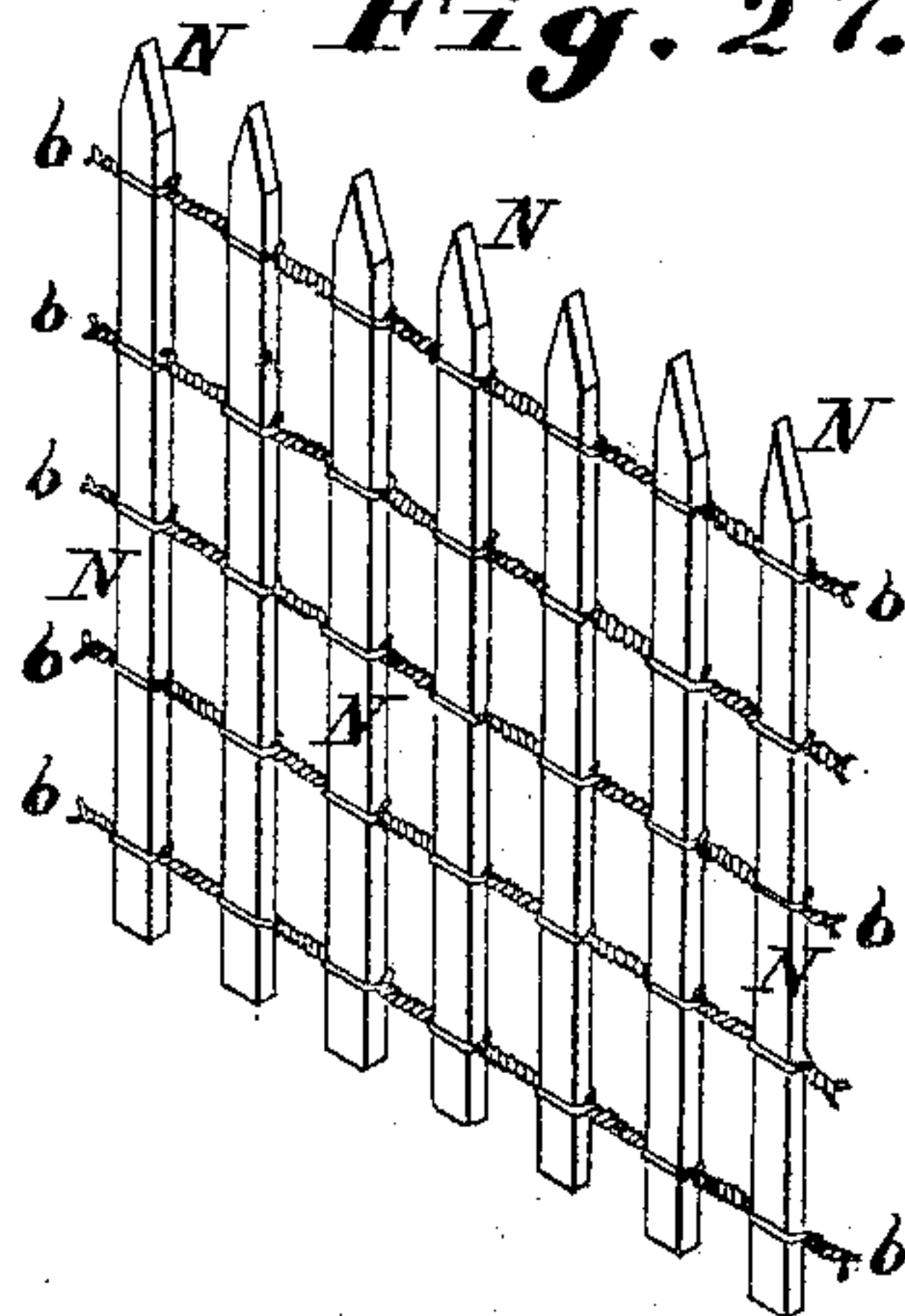


Fig. 27.



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6 Sheets—Sheet 6.

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Fig. 28.

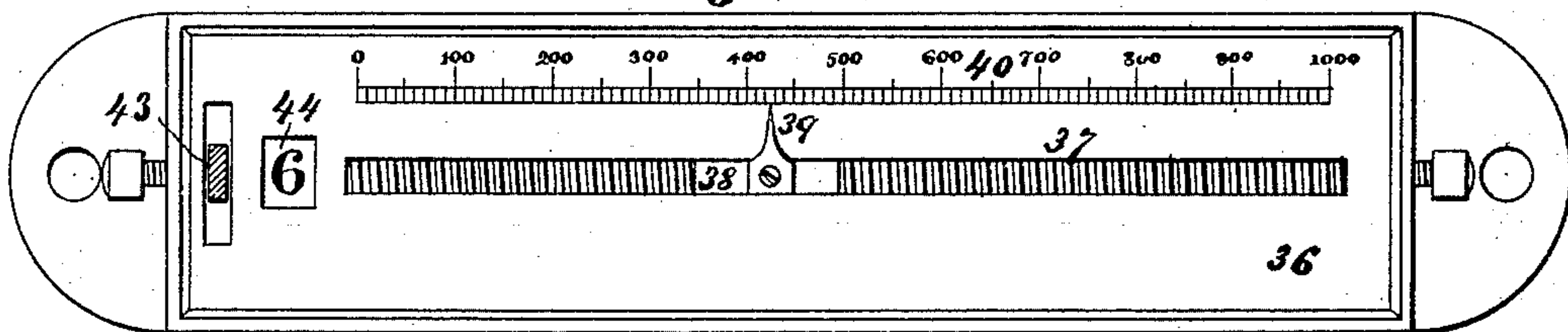


Fig. 29.

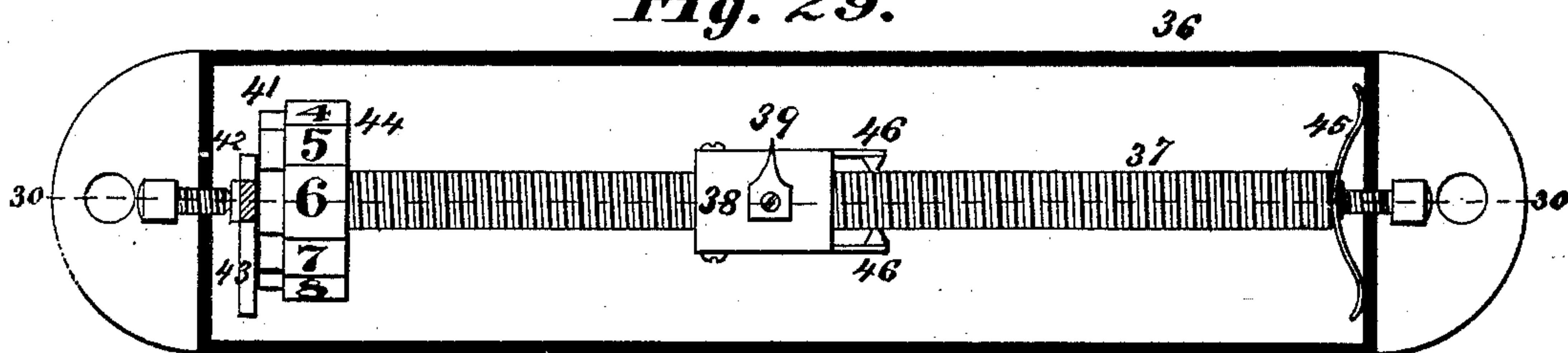
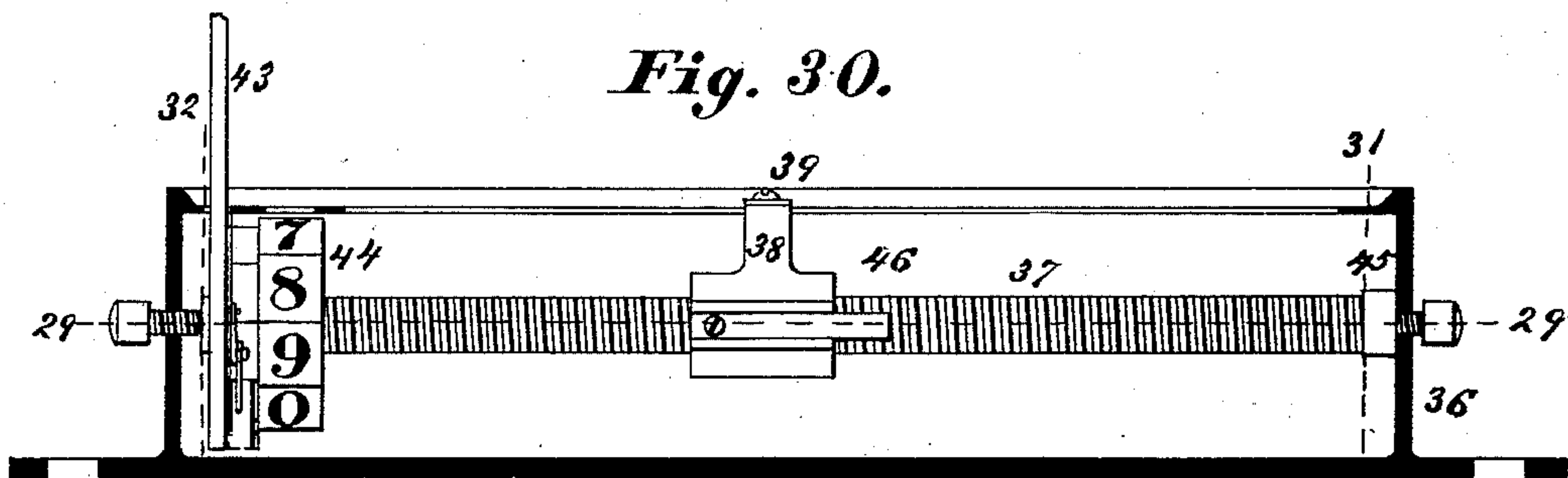
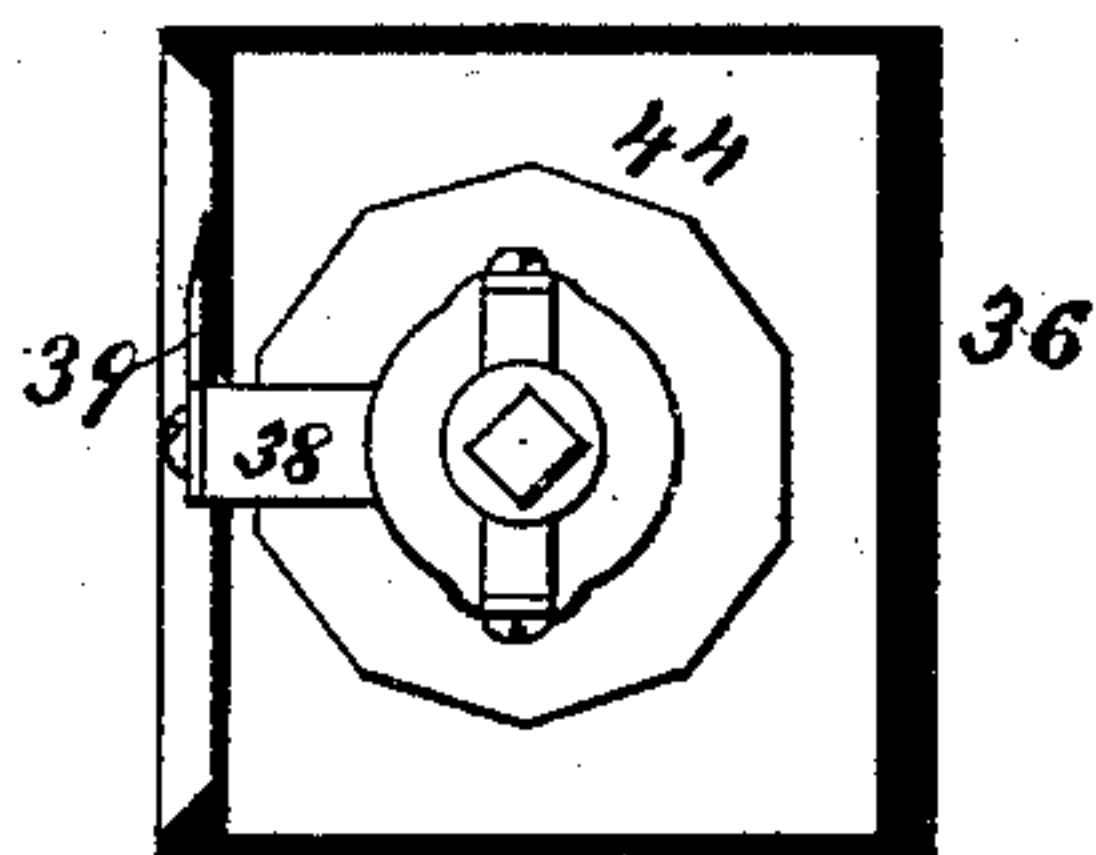


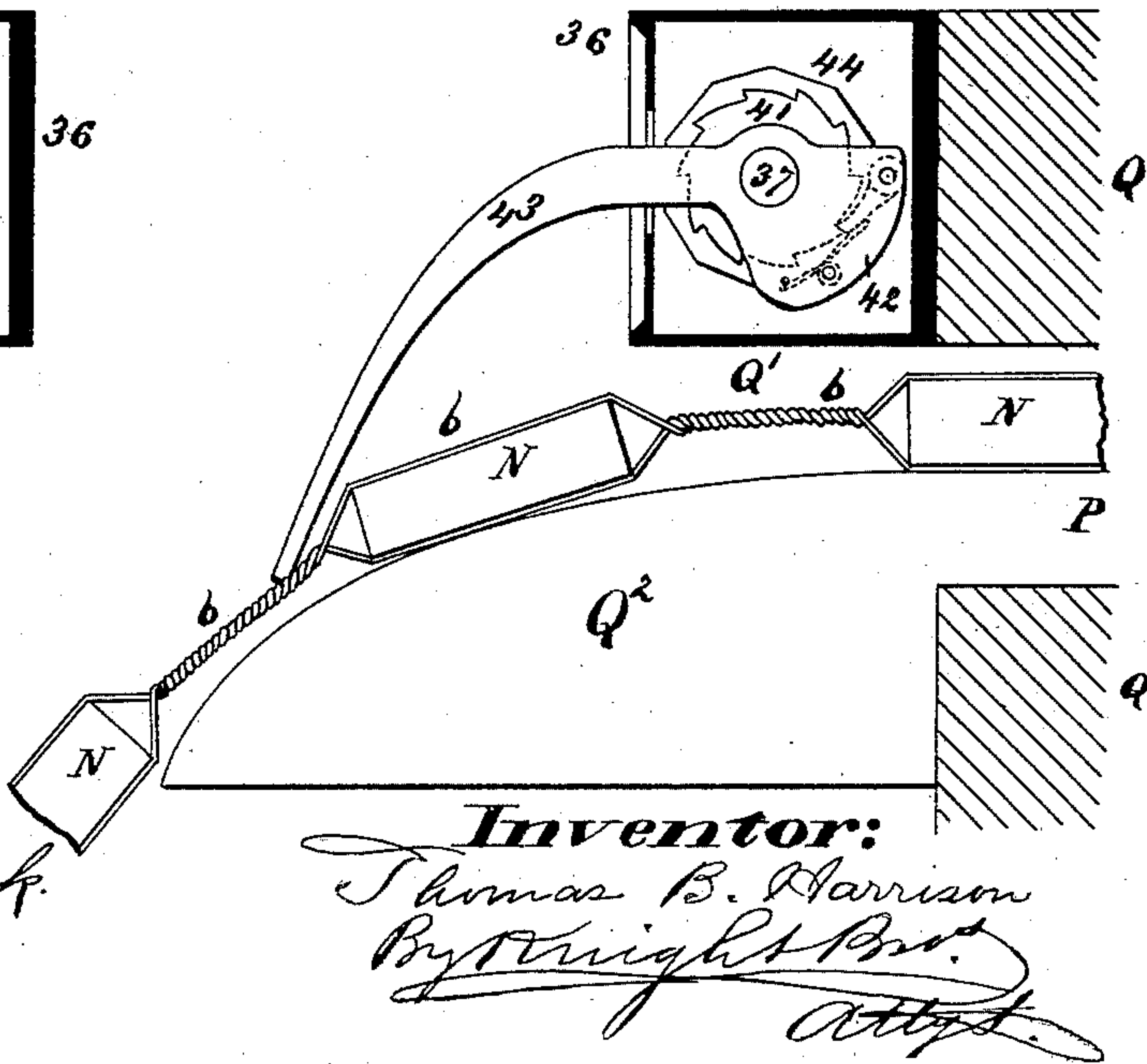
Fig. 30.



³² *Fig. 31.*



*Fig. 32.*³¹



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Inventor:

Thomas B. Harrison
By Freight Bro. Attys

UNITED STATES PATENT OFFICE.

THOMAS B. HARRISON, OF CLINTON, ASSIGNOR OF TWO-THIRDS TO JEROME W. MARTIN, OF KIRKSVILLE, AND ABRAHAM SIEGEL, OF ST. LOUIS, MO.

MACHINE FOR MAKING WIRE AND PICKET FENCING.

SPECIFICATION forming part of Letters Patent No. 314,933, dated March 31, 1885.

Application filed July 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. HARRISON, of Clinton, in the county of Henry and State of Missouri, have invented a certain new and useful Improvement in Machines for Making Wire and Picket Fencing, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This is an improvement on the machine for a similar purpose for which Letters Patent No. 299,471 were granted jointly to myself and J. W. Martin, May 27, 1884.

The present improvement relates to a new device for reversing and regulating the movement of the twisters; to a device for regulating the take-up movement of the reel upon which the finished fencing is wound; the construction of the reel by which it admits of contraction to allow of its easy withdrawal from the roll of fencing; to an automatic catch by which the forward end of the picket is seized when it arrives in position between the twisting-jaws.

Other details of construction are set forth in the claims.

Figure 1 is a side view with the parts in position to receive the picket. Fig. 2 is a side view with parts in position for the twisting to begin, certain parts being broken away to give view of parts behind them. Fig. 3 is a plan showing part of the frame and the reversing device of the twisters, also top view of the ratchet by which the winding-wheel is actuated. Fig. 4 is a side view of the ratchet, showing it in reverse position to that shown in Fig. 3. Fig. 5 is a top view of the machine. Fig. 6 is a section on line 6 6, Fig. 7. Fig. 7 is a top view of the picker by which the picket is thrown between the twister-jaws, with part of the picker-block and rod. Fig. 7½ is a transverse section at 7½ 7½, Fig. 6. Fig. 8 is a view of the reel when contracted. Fig. 9 is an end view of the reel, and Fig. 10 is a section at 10 10, Fig. 8, showing view of the other end. Fig. 11 is a top view of the reversing device of the twisting-jaws when in position for twisting in one direction. Fig. 12 is an end view of the stop-wheel. Fig. 13 is a section at 13 13, Fig. 11. Fig. 14 is an enlarged section at 14 14, Fig. 5. Fig. 15 is an enlarged section at 15 15, Fig. 5. Fig. 16 is a front view of the picket catch or trap.

Fig. 17 is a section at 17 19, Fig. 18, showing the jaws open for the reception of the end of a picket; and Fig. 19 is a section at same place, showing the jaws closed. Fig. 18 is a top view of the trap. Fig. 20 is a side view of the twister-jaws when open. Fig. 21 is an end view of the wire-spreader at the end of the twister-shaft. Fig. 22 is a transverse section at 22 22, Fig. 20. Fig. 23 is a transverse section at 23 23, Fig. 20. Fig. 24 is an end view of the twister when open. Fig. 25 is a top view of the twister. Fig. 26 is a side view of the twister when closed. Fig. 27 is a perspective view of a portion of finished fence. Fig. 28 is a face view of the indicator. Fig. 29 is a vertical section at 29 29, Fig. 30. Fig. 30 is a horizontal section at 30 30, Fig. 29. Fig. 31 is a transverse section at 31 31, Fig. 30. Fig. 32 is a transverse section at 32 32, Fig. 30.

The machine may have any suitable frame, A, giving support to the working parts. The reels or spools carrying the coils of wire may be supported on an extension of the frame A or upon a separate frame. These spools form no part of the present invention, and are not shown.

B is the shaft to which the power is applied. This shaft carries a spur-pinion, C, that engages a spur-wheel, D, upon a shaft, E. The shaft E carries a crank, F, whose wrist G plays in the slot H of a lever, I, which oscillates on a pin, J, at its lower end. It will be seen that the crank will impart an uneven oscillation to the arm, because the arm would move more quickly when the crank-wrist is in the lower than when it is in the upper part of the slot. The arrangement is such that the work is chiefly done when the arm is in slower motion and moving with proportionally greater power.

The arrangement of crank F and lever I is duplicated at the other side of the machine, and also the connections of the oscillating arm with the carriages, which parts will be now described.

At K are rods connecting the ends of the levers I to the ends of carriage L, which carries the upright fingers M, by which the pickets N are drawn from between the twisting-jaws O. The picket is carried by the fingers M between the fixed jaws P, secured to the

cross-bar Q. This bar has a horizontal slot sufficiently large to allow the finished fence to pass through, the upper member of each jaw P being fixed to the part of bar Q above the slot Q', and the lower member of the jaw being fixed beneath the slot, so that as the fence is finished it passes through the jaws P and slot Q' and to the winding-reel.

The twisting-jaws O are made in form of a bell-crank, having each a finger, *o*, and a finger, *o'*. The jaws are connected together by a shackle or link, R, to which each of them is hinged at the angle by a pin, S. The jaws turn on the pins S when opening and closing. Each arm *o* is carried beyond the hinge at S, and has a hinge-pin, *o''*, that works in the slot T' of the link T, said links being hinged at the inner end to studs U, projecting from the face of the spur-wheel V. The links T have a limited movement on their hinges, to allow the points of the fingers *o'* to come together, (when the twisting-jaws are in their advanced position.) The hub of the spur-wheel V is extended axially, and has bearing in a box, W, supported in a fixed part of the frame A. X is a shaft passing axially through the hub of the spur-wheel V, and having a fixed collar, Y, turning in a forked standard upon the carriage Z. The construction is such that when the carriage Z is moved forward the shaft X pushes forward the shackle R and carries forward the jaws of the twister, the pins *o''* passing along the slots T' until they reach the ends of the slots, when the continued movement of the shackle forces the points of the fingers *o'* together. The shaft X is made square or otherwise prismatic, or has spline-connection with the hub of wheel V, so that the wheel and shaft always turn together, while at the same time the shaft has endwise movement in or through the hub of the wheel. At the rear end of the shaft X is the spreader *a*, having at each end a hole, *a'*, through which the two wires *b* pass. The spreader keeps the two wires separate and out of tangle between it and the coils from which the wire is supplied. The arrangement is the same as that shown in Patent No. 299,471, aforesaid. The wires *b* pass from the spreader along the sides of the shaft and through passages *c* and *d*, made through the collar Y and spur-wheel V. (See Figs. 22 and 23.) The wires also pass through the fingers *o'* and issue from the ends of the fingers. (See Figs. 20 and 26.) The wires extend from the ends of the fingers *o'* to the twist upon the finished fence. The carriage Z is moved backward and forward longitudinally upon the frame by the following mechanism: L' are studs projecting from the ends of carriage L, (the rods K being connected to these studs.) Each stud L is connected by a rod, *e*, to the upper end of a lever, *f*, so that the upper end of the lever *f* has about equal play with the carriage L. *g* is a rod connecting the carriage Z to the lever *f*. This lever has a number of holes for the connection of the rod *g*, to regulate the

play of the carriage Z by making connection to the part of the lever having required distance of play.

It will be seen that the carriages L and Z will have simultaneous movement, but that the carriage L will move faster, and consequently a greater distance, than the carriage Z. The purpose of this will be explained in describing the operation of the machine.

The machine shows five twisters; but it may have more or less than this number. The drive-wheels V of all the twisters mesh together, so that when any one of the twisters is making a right twist in the wires the adjacent twister is making a left twist, and vice versa. The connection is such that it is only necessary to drive one of the twister-shafts directly, that one communicating motion to the others in turn.

h is a spur-wheel fast upon a sleeve, *v*, forming the extension of the hub of one of the wheels V, or secured in any way to said hub. The wheel *h* engages with a spur-wheel, *i*, beneath it, said wheel being fast upon a shaft, *j*, which is rotated alternately in opposite directions by means of a bevel-wheel, *k*, upon it. The drive-shaft B has upon it a sleeve, *m*, having spline-connection with the shaft B, as to turn therewith, but be capable of end movement thereon. At each end of this sleeve is a spiral spring, *l*, said springs tending to hold the sleeve in a central position upon the shaft, in which case both of the bevel-wheels *n n'* are out of engagement with the wheel *k*. The wheels *n n'* are fixed in such position on the sleeve *m* that by the endwise movement of the sleeve either of the wheels may be brought into engagement with the wheel *k*. These movements of the sleeve are accomplished by a T-formed shifter, *p*, oscillating on a fulcrum, *p'*. The shifter-arm *p''* is forked at the end and straddles a part of the sleeve, having a circumferential groove, *m'*. Thus the oscillation of the shifter causes the endwise movement of the sleeve. The shifter-arm *p'''* is thrown outward toward the periphery of the cam-wheel *r* by a cam, *r'*, and is thrown toward the center of the wheel by a cam, *r''*, upon the face of the same wheel.

In Fig. 13 the arm *p'''* has just been carried out by the cam *r'*, the wheel *n* has been carried into engagement with the wheel *k*, and the end of the shifter-arm *p''* has been carried out of the stop-notch *s'*, which is in the periphery of the stop-wheel *s* on shaft *j*. The twisters are all thrown into rotation and continue to turn until after the heel of the cam *r'* passes the arm *p'''*. When the sleeve *m* is thrown into its central position, the point of arm *p'''* falls in between the two cams *r'* and *r''*, and the end of arm *p''* enters the stop-notch. The relative arrangement of the twisters and the notch *s'* of the stop-wheel *s* is such that when the arm *p''* is in the notch the twisters stand in vertical position, as shown in the drawings, so as to permit the introduction of a picket from the side of the machine. When the motion of

the cam-wheel brings the inclined head of the cam r^2 against the arm p^3 , the arm is carried inward toward the hub of the cam-wheel, and the wheel n' is put into engagement with the wheel k , and the shaft j is made to rotate in an opposite direction to that before described, so that the rotation of the twist-ers is also reversed. The cam-wheel turns on a fixed arbor and receives motion by engagement with a cog-wheel, t , on the shaft E .

u is the table on which the pickets are fed to the machine. This table has at one side a raised rib or fence, w , against which the edge of the picket is placed. x is a picker or spring-toe that engages the outer end of the picket. The toe works in a mortise, y , of the picker bar z , turning on a pintle, 1 , and being sustained by a spring, 2 , beneath it. The outer side and rear end of the picker are level with the top of the table u , so that on the one hand the picket will form no obstruction to the picker in its backward movement, and on the other hand the picket can be pushed over the picker from the side, the picket sliding up the beveled top and depressing it into its mortise. The picker-rod is connected at its inner end to one arm of a bell-crank lever, 3 , which is pushed inward by a spring, 4 . This lever turns on a fulcrum, 5 , and has an arm extending from the fulcrum toward the carriage L .

L^2 is a projection on the carriage, which comes in contact with one arm of the bell-crank lever and throws out the picker-rod, so as to put the picker into position to engage the outer end of the picket. When the carriage L has nearly completed its movement toward the twister-heads, the bell-crank lever escapes from the projection L^2 , and the picker is thrown quickly inward by the force of the spring 4 and shoots the picket through all the twister-jaws.

To prevent the rebound of the picket from the abutment against which it strikes, at the other side of the machine, I provide two spring-jaws, 6 6 , which are held asunder to receive the end of the picket, but which are tripped by the same, and close upon it by the action of springs 7 . Each jaw has at its back an inclined toe, 8 , which, when the trap is moved outward toward the side bar of the frame, comes in contact with the boss 9 on said bar, and the pressure against the toes throws the jaws open into the position shown in Fig. 17. At the same time the trip-plate 10 is pushed between the jaws, so that they are held open, after the toes are removed from contact with the boss 9 , until the end of the entering picket knocks back the trip-plate from between the jaws. The trip-plate is carried by a spring, 11 , attached to the body 12 of the trap. The trap is connected to the frame by a pivot, 13 , allowing it a sufficient vibratory movement to carry the trap into position to receive the end of the picket and to carry the toes 8 against the boss 9 and force them inward, as seen in Fig. 17. This oscillatory movement is given to the trap by a tail,

14, which extends from it, and which has inclined parts acted on by studs 15 16 upon the carriage Z . (See Fig. 5, where the trap is shown in the same position as in Fig. 17—namely, in position nearest to the side bar of the frame.) To carry it into this position, the forward movement of the carriage Z has brought the stud 15 in contact with the incline 17 . To move the trap forward, the rearward movement of the carriage brings the stud 16 in contact with the incline 18 , thus moving the free end of the tail outward and the trap inward. As the fence is finished it passes through the slot Q' , and is wound upon a reel composed of a number of slats surrounding a central shaft, 19 , carrying a ratchet-wheel, 20 .

21 is a ratchet pivoted to a lever, 23 , and having a tail, 22 , to give means for regulating the action of the ratchet upon the ratchet-wheel. The lever 23 is fulcrumed to the frame A at 24 , and its upper end is hinged to a collar, 25 , through which passes a rod, 26 , that is connected to the pin L' of the carriage L .

27 is a spiral spring which is around the rod 26 , one end of the spring bearing against the collar 25 , and the other end bearing against a collar, 28 , fixed on the rod 26 . The construction is such that as the carriage L moves toward the reel the pawl acts on the ratchet-wheel, turns the reel, and winds up a length of fence equal to the distance from the center of one picket to the center of the next.

It will be observed that to wind the necessary amount of fence upon the reel a greater movement of the reel will be required when the roll is small than when it is larger.

I will now describe the device for giving a decreased movement to the reel-shaft as the size of the roll increases.

29 is a lever whose shoe 30 is in contact with the outside of the roll of fencing upon the reel. The shoe 30 may be kept in contact with the roll by a spring, a weighted cord, or any suitable means. At the end of the lever opposite to the shoe 30 is a pin, 31 , beneath which the tail 22 passes when the ratchet is moved backward. When a certain point upon the tail 22 reaches the pin 31 , the ratchet is lifted from the ratchet-wheel, and of course does not come in contact with the ratchet-wheel again until in its forward movement that point of the tail has again reached the pin 31 . Thus only that part of the forward stroke of the ratchet, after the same comes in contact with the wheel, is effective to turn the reel. Now, it will be seen that as the roll of fencing upon the reel increases, the shoe 30 is pushed back, and the pin 31 moved forward, so as to diminish the effective part of the stroke of the ratchet. The slats 32 , of which the outer part of the reel is composed, are hinged at one end of the reel to radially-extending arms 33 , and at the other end are connected by hinge-links 34 to a collar, 35 , which slides on the shaft 19 . The hinge-connection is such that the collar can be moved inward until the links are perpendicular to the shaft 19 , and no farther.

The slats are then parallel with the shaft. From this point the collar may be moved outward, (when the reel is removed from its journal-bearings,) which allows the free ends of the slats to fall inward toward the shaft, and the reel becomes loose in the roll of fencing and can be easily drawn out therefrom.

To register the number of pickets, and consequently the length of fence made, I secure to the bar Q a box, 36, in which a register-screw, 37, has bearing. Upon the screw is a traveling sleeve, 38, having spring-jaws 46 engaging the screw-thread. The sleeve carries a pointer, 39, which moves in front of a scale, 40, which is marked to indicate the number of pickets issuing from the slot Q'.

Upon the screw 37 is a ratchet-wheel, 41, turned by a ratchet, 42, upon a finger, 43, pivoted upon the screw or a pivot in line therewith. The point of the finger rests upon the fence as it issues from the slot Q', and passes over the guides Q'. As each picket passes it lifts the finger and moves the ratchet-wheel one tooth, thus turning the screw 37 and moving the pointer 39 along the scale.

44 is a register-wheel upon the screw 37, numbered to indicate the number of pickets passing.

45 is a friction-spring insuring the steady movement of the screw by bearing against its end. The jaws being sprung outward admit of disengagement from the screw, so that the pointer may be freely moved to any place on the scale.

The machine operates as follows: The wires *b* extend from the supply-spools through the spreaders *a* and the twister-fingers *o'* to the winding-reel, (upon which the finished fence is wound.) Suppose the parts in position for the reception of a picket, as seen in Fig. 1. The picket is shot through the open jaws of the twisters, and its front end seized by the trap. The beater-carriage L and the twister-carriage Z then commence to move forward, the beater-fingers M drawing the picket from the twister jaws or fingers *o'* and carrying it between the fixed fingers P, where it is engaged by the spring-catches P', and its withdrawal prevented when the carriages make their return movement. At the time the picket is being carried forward by the beater-fingers M the twisters are moving forward, but at a slower pace, the arrangement being such that when the picket has reached its position between the fingers P the points of the twisters have reached the position for making the twists in the wires, the points of the twister-jaws being drawn together. By this time the cam *r'* or *r''* has thrown the twister-rotating mechanism into operation and the twists are made. Then the twisting mechanism is thrown out of motion, with the jaws *o'* in vertical position, and the carriages move back into position to receive another picket. While the carriages L and Z are moving backward the winding-drum is turned a sufficient distance, the relief-spring 27 preventing undue strain,

if such would otherwise occur. The register at the same time moves to indicate an advance of one number.

I claim—

1. The combination, with the twisting-jaws and rotating mechanism, of the shaft B, sleeve *m*, springs *l*, wheels *n n'*, wheel *k*, cam-wheel *r*, having cams *r' r''*, shaft *j*, spur-wheel *i*, stop-wheel *s*, and lever *p*, having arms *p² p³ p⁴*.

2. The trap consisting of spring-jaws 6 6, toes 8, trip-plate 10, body 12, having spring 11, and tail 14, formed with inclines 17 18.

3. The trap composed of jaws having a trip-plate between them, means for forcing the jaws toward each other, setting-toes, and means for operating the toes to open the jaws.

4. The trap having spring-jaws to engage the end of the entering picket with setting-toes 8 thereon, a trip piece or plate, 10, constructed to operate substantially as described, the trap having hinge-connection to the frame, and an extension or tail with inclined parts in the course of projections of the twister-carriage Z or other movable part of the machine.

5. The combination of the twister-carriage Z and the beater-carriage L, means for advancing and retracting the twister-carriage, and means by which the beater-carriage has simultaneous movement in the same direction at a different rate of speed, substantially as and for the purpose set forth.

6. The combination of twisters O, capable of rotary and longitudinal movement, means, substantially as described, for giving to them such movement, and the beater-carriage having fingers M, arranged and operated to work between the twisters to withdraw the pickets therefrom, substantially as set forth.

7. The combination of twisters O, beater L, having fingers M, and jaws P, having catches, substantially as set forth.

8. The picker mechanism consisting of depressible picker *x*, carried by a rod connected to a lever, 3, actuated by a projection, L², and spring 4, substantially as set forth.

9. The combination, with a winding reel or drum, of a ratchet-wheel upon or connected with the reel-shaft, a reciprocating ratchet acting on the ratchet-wheel with a projection or tail, 22, and a bar, 29 30 31, actuated by the roll of material on the reel to govern the action of the pawl, substantially as set forth.

10. The winding-reel having bars 32, hinged at one end to links which are hinged to a sliding collar, substantially as and for the purpose set forth.

11. The register having a finger, 43, resting on the fence and carrying a ratchet operating upon a ratchet-wheel on a screw which carries a pointer working in connection with a scale, for the purpose set forth.

THOS. B. HARRISON.

Witnesses:

SAML. KNIGHT,
GEO. H. KNIGHT.