

(No Model.)

5 Sheets—Sheet 1.

E. E. WITTER.
MACHINE FOR BUILDING PICKET FENCES.

No. 444,726.

Patented Jan. 13, 1891.

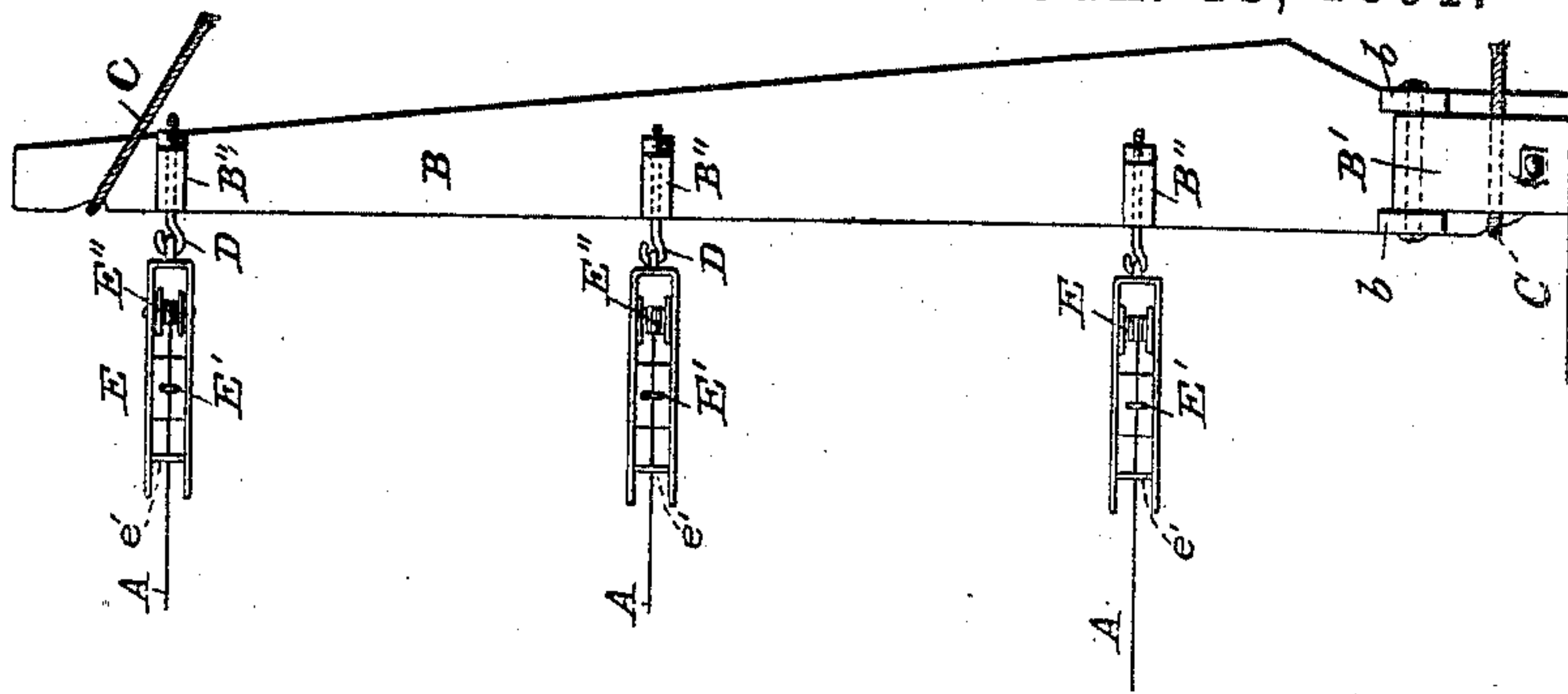
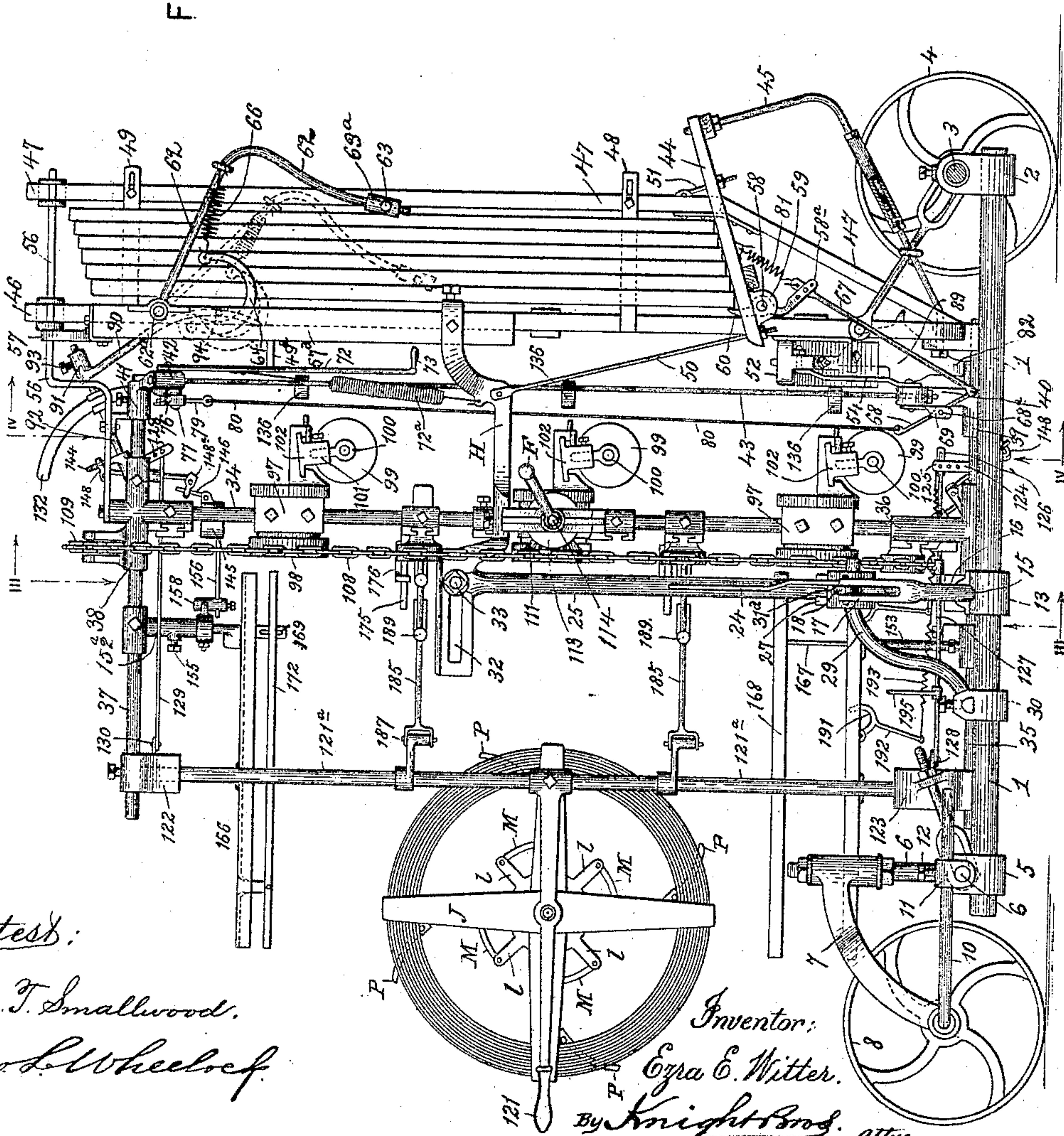


FIG. 1.



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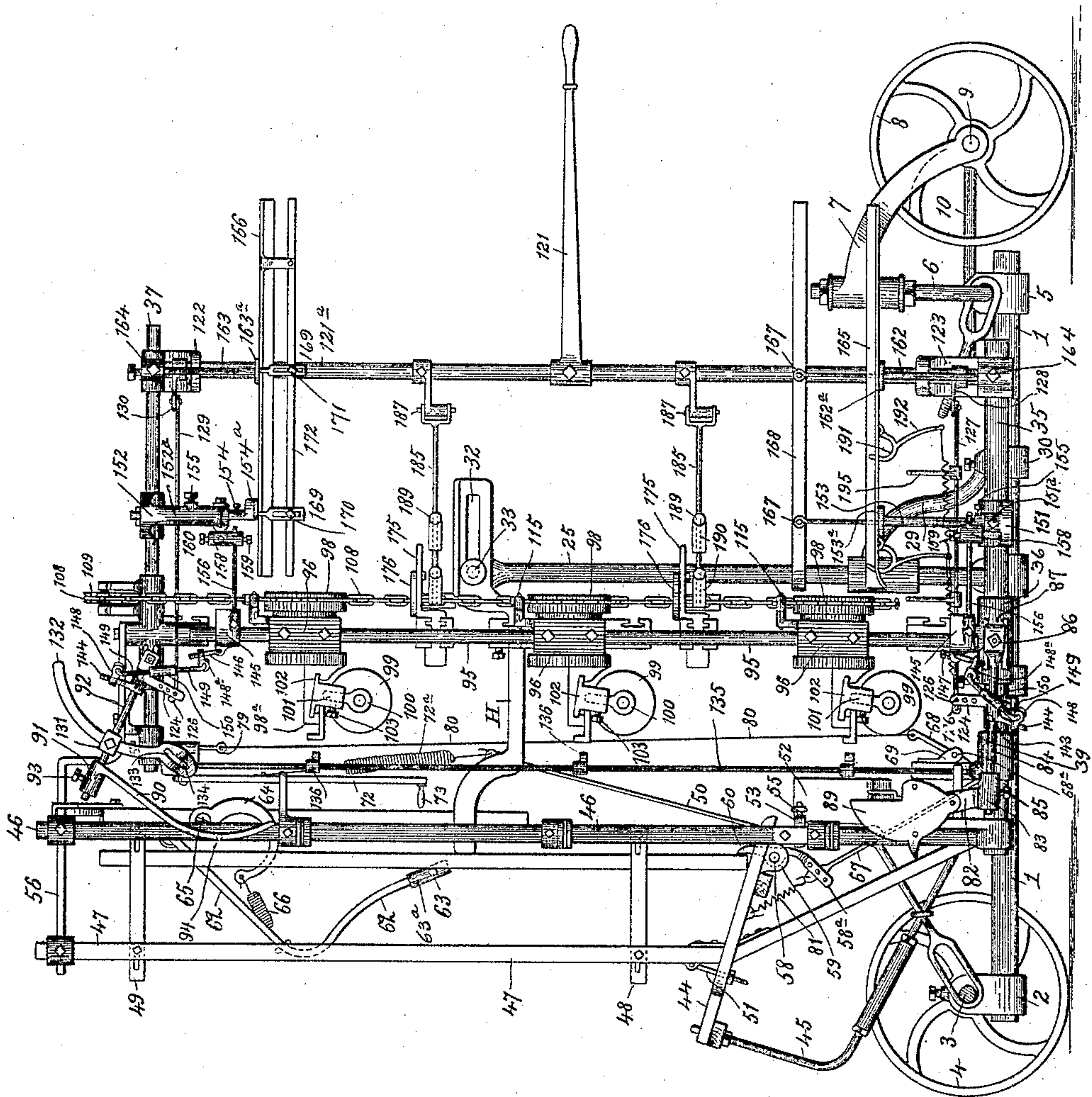


FIG. II.

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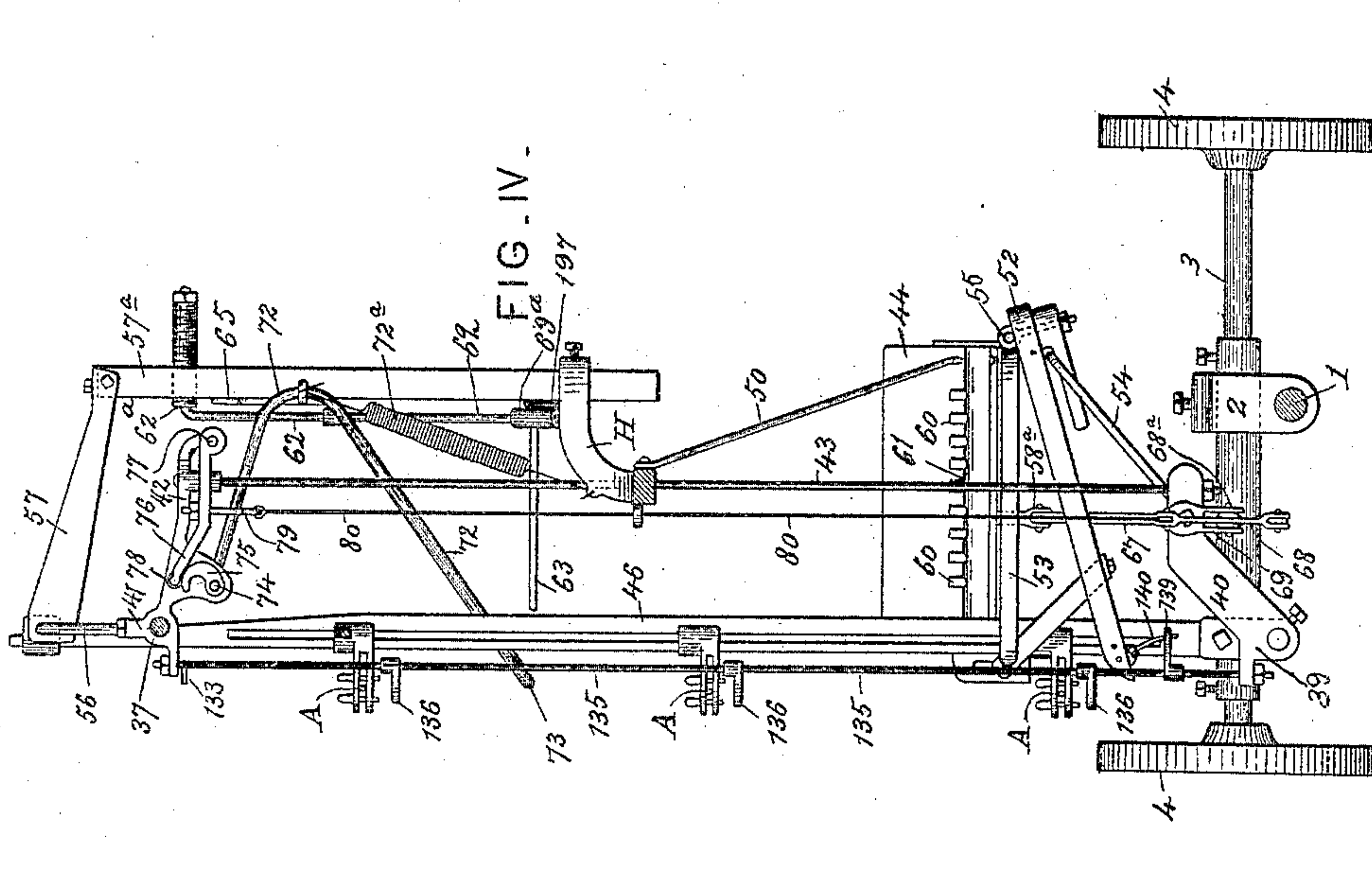


FIG. III.

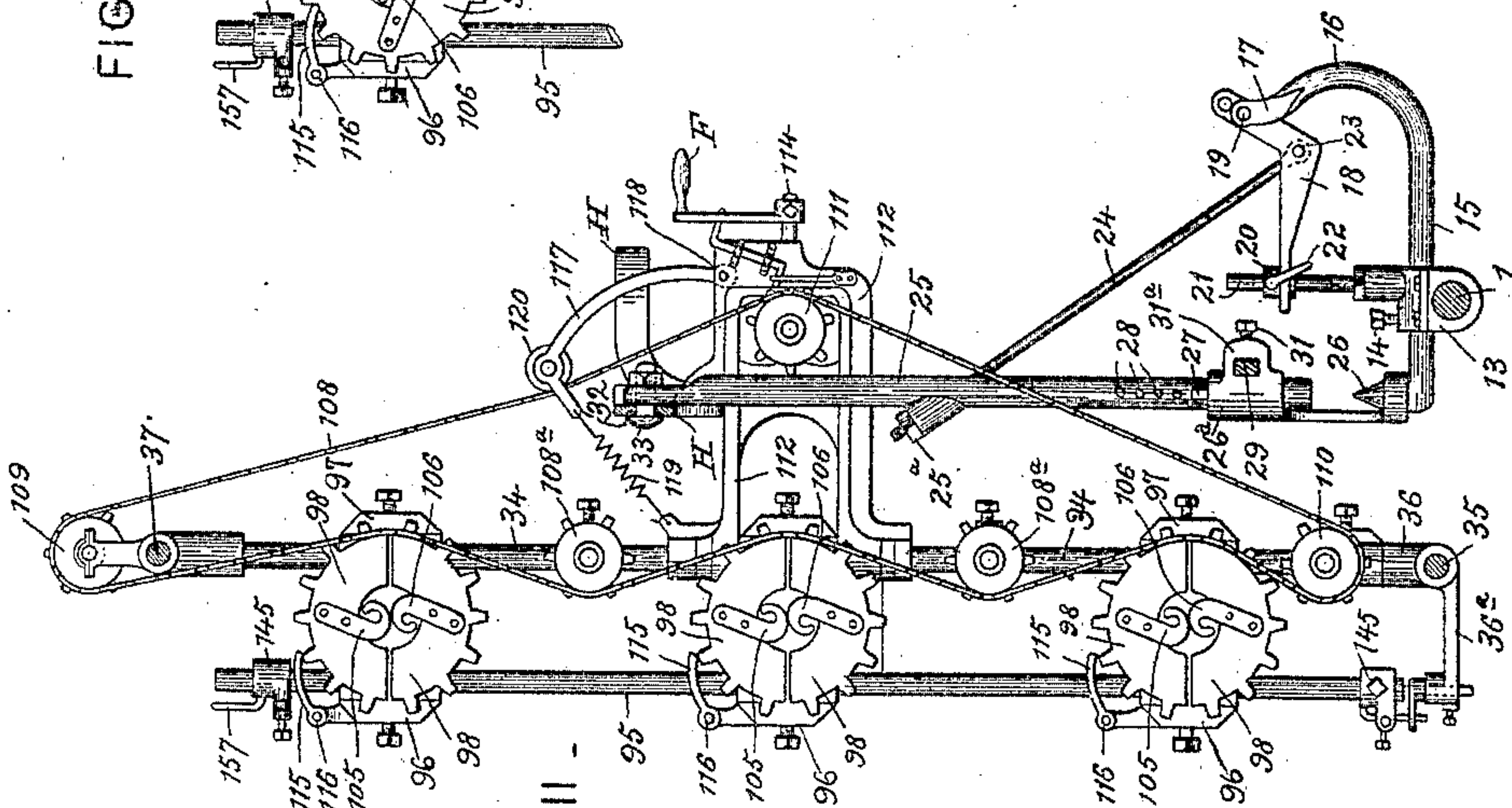


FIG. III.

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FIG. V.

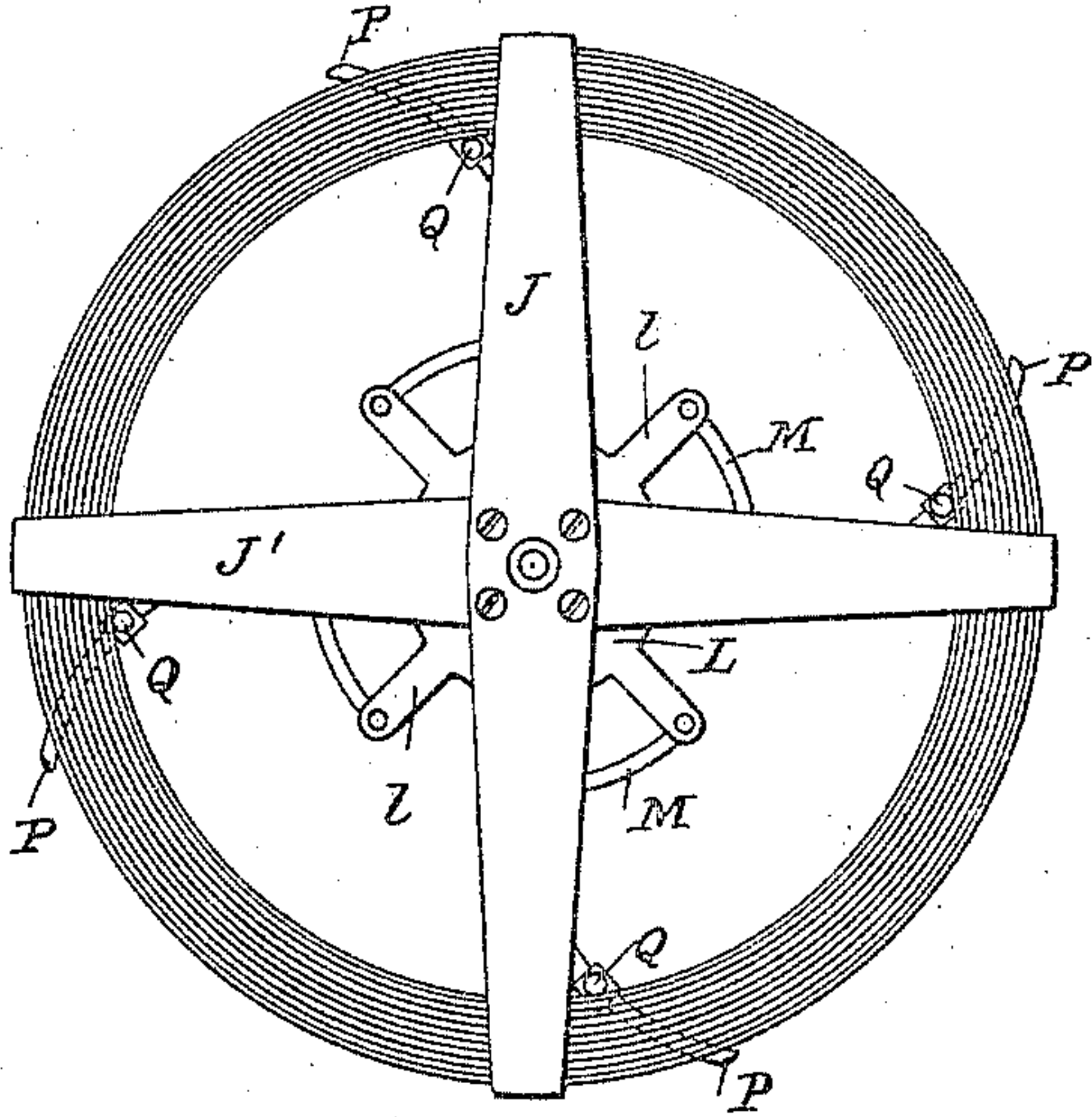


FIG. VI.

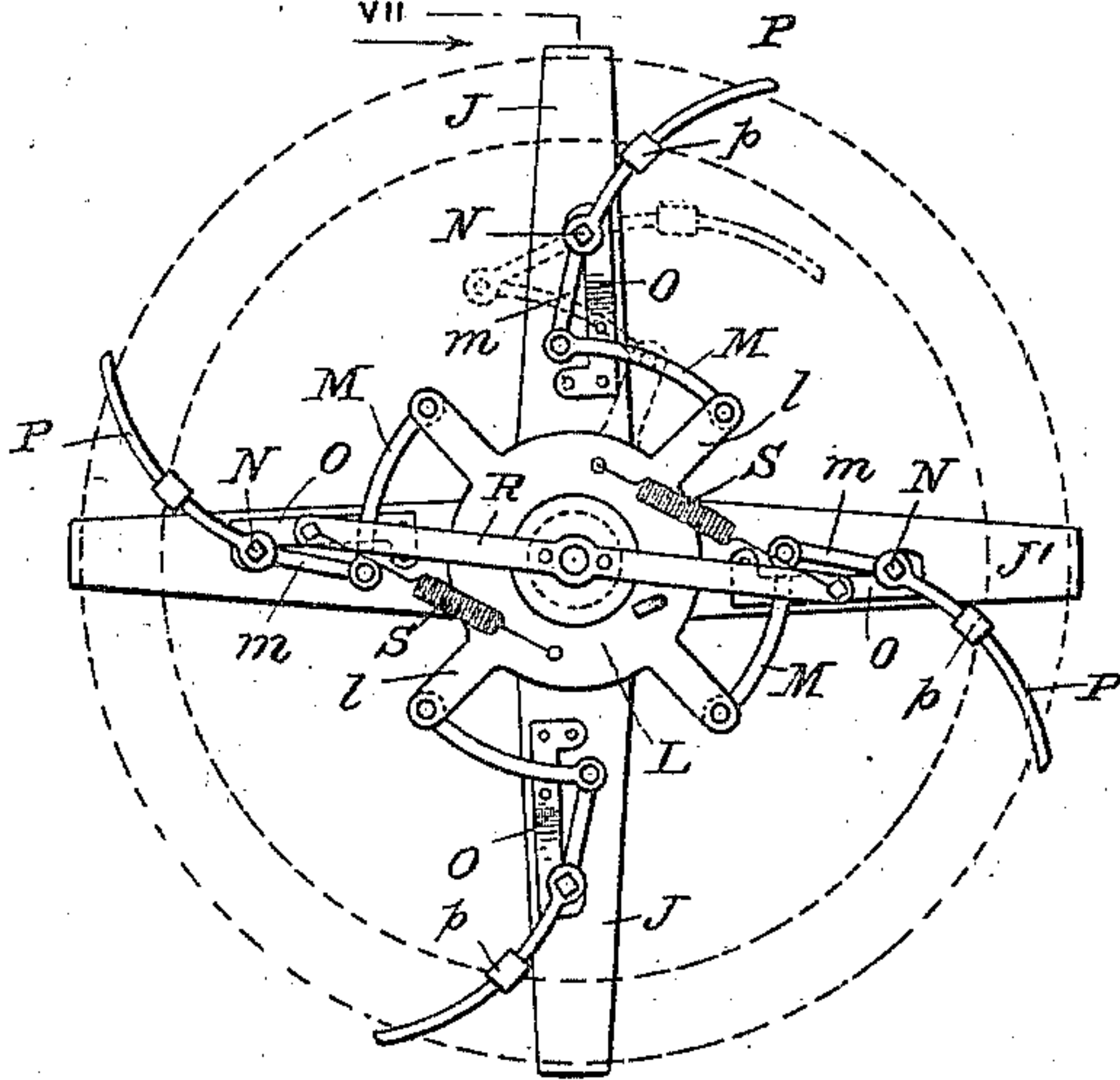


FIG. VII.

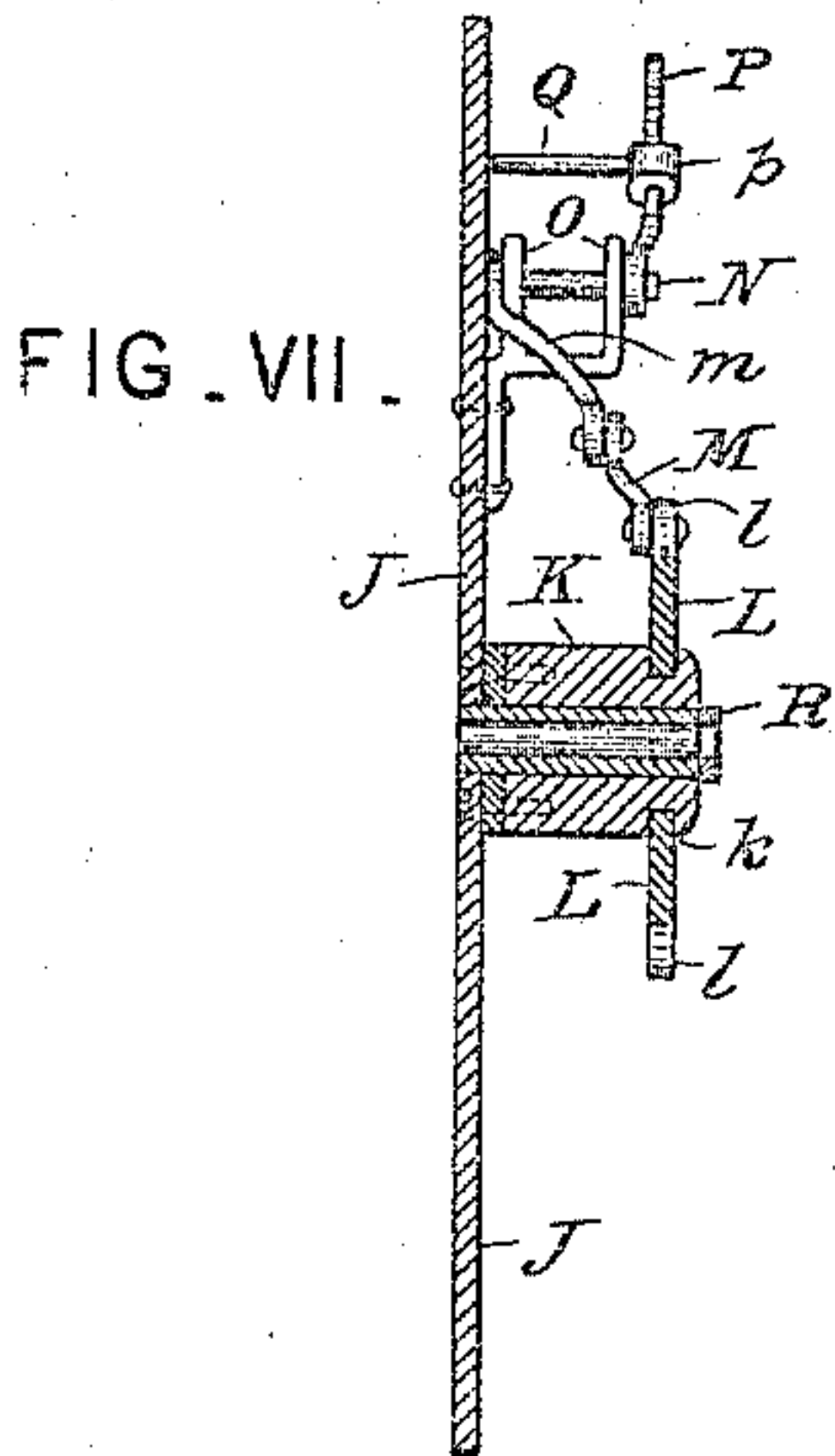


FIG. VIII.

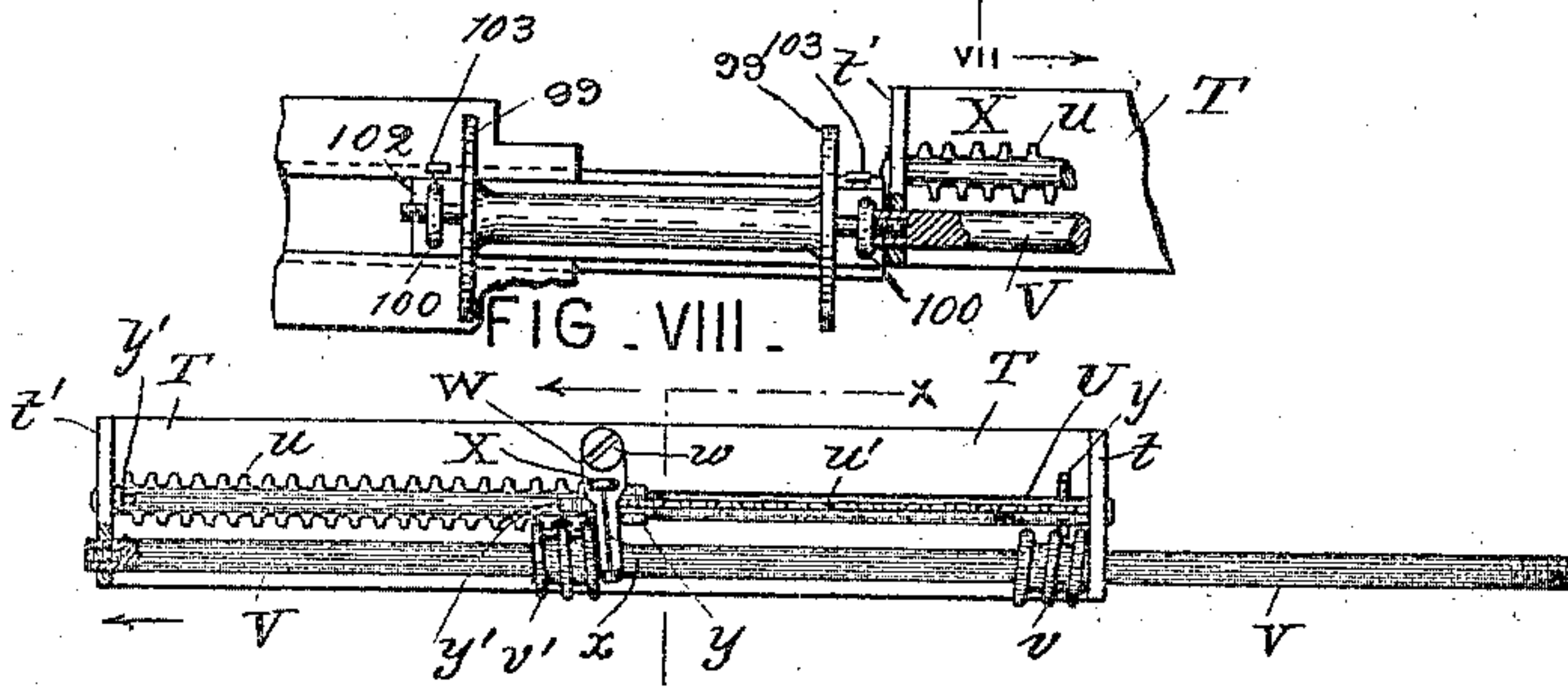


FIG. IX.

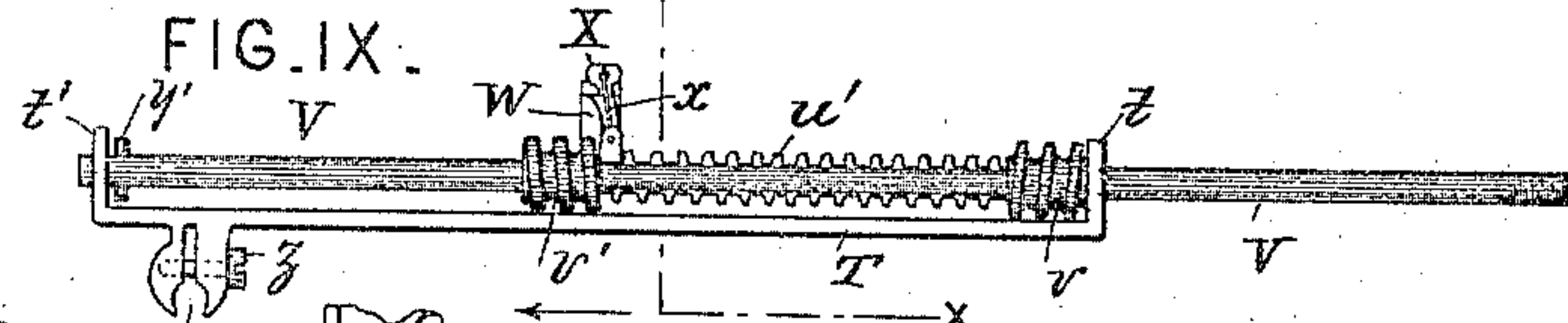


FIG. XI.

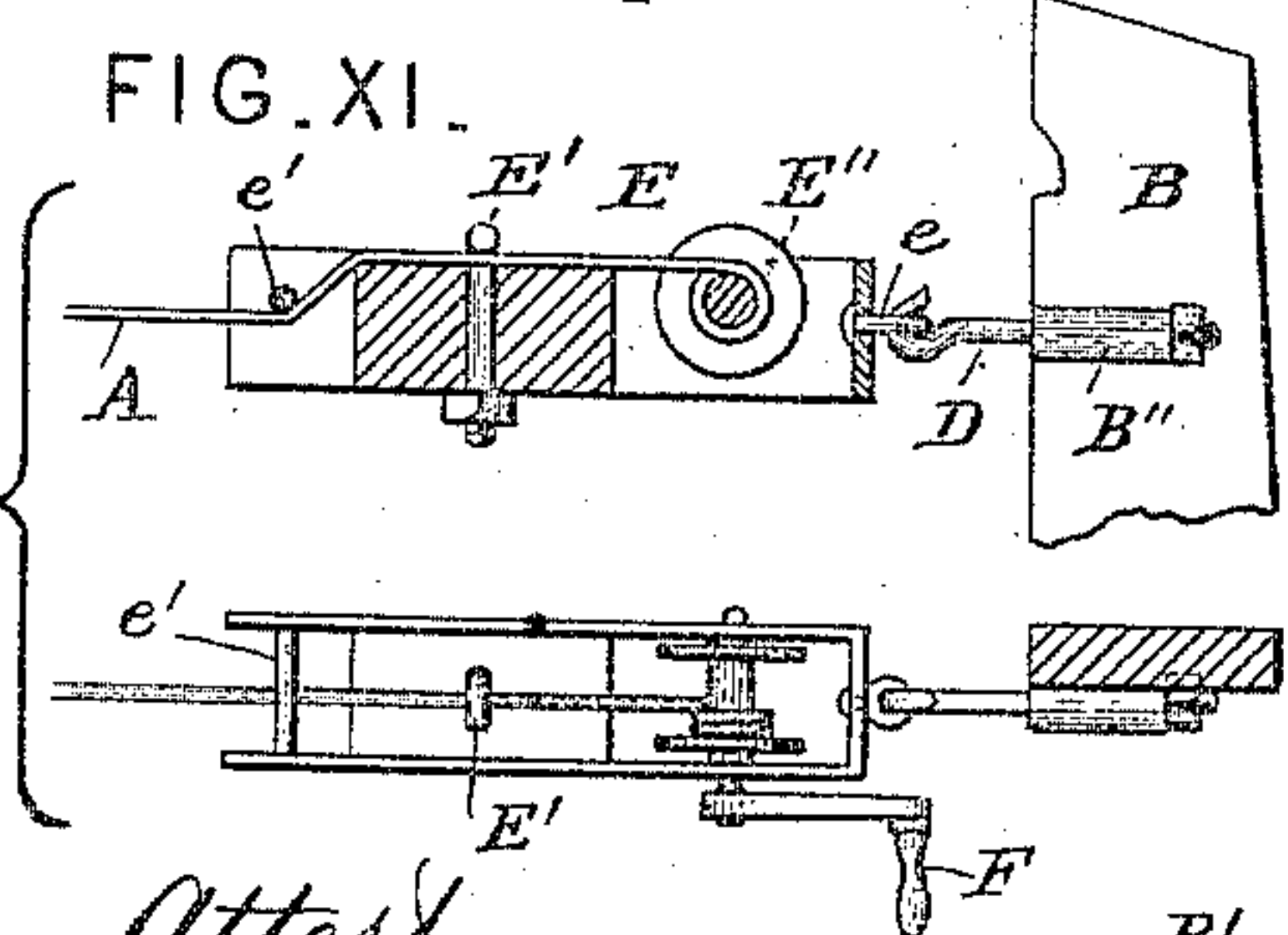


FIG. X.

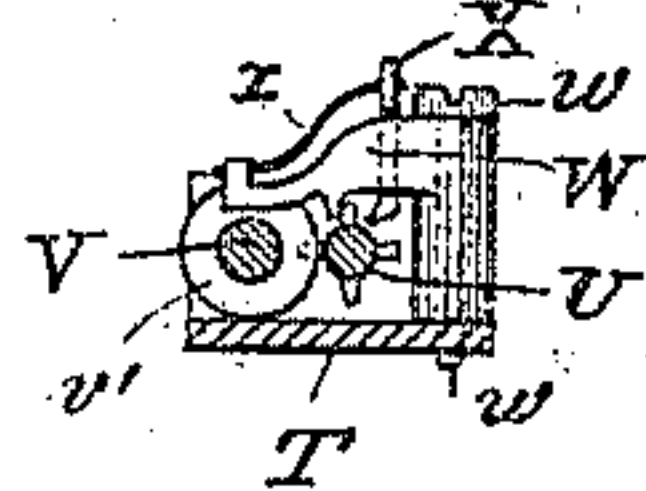
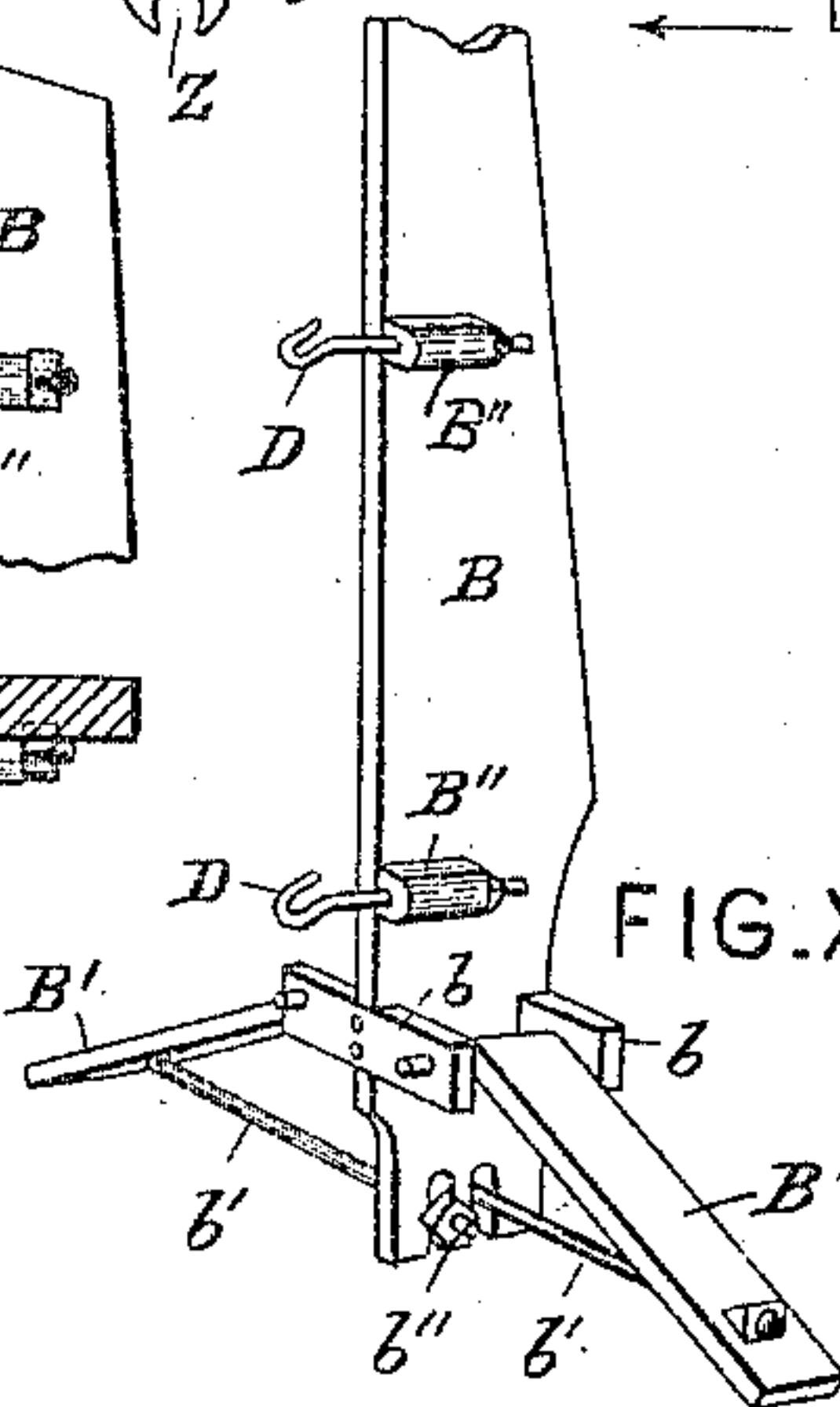


FIG. XII.



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FIG. XV.

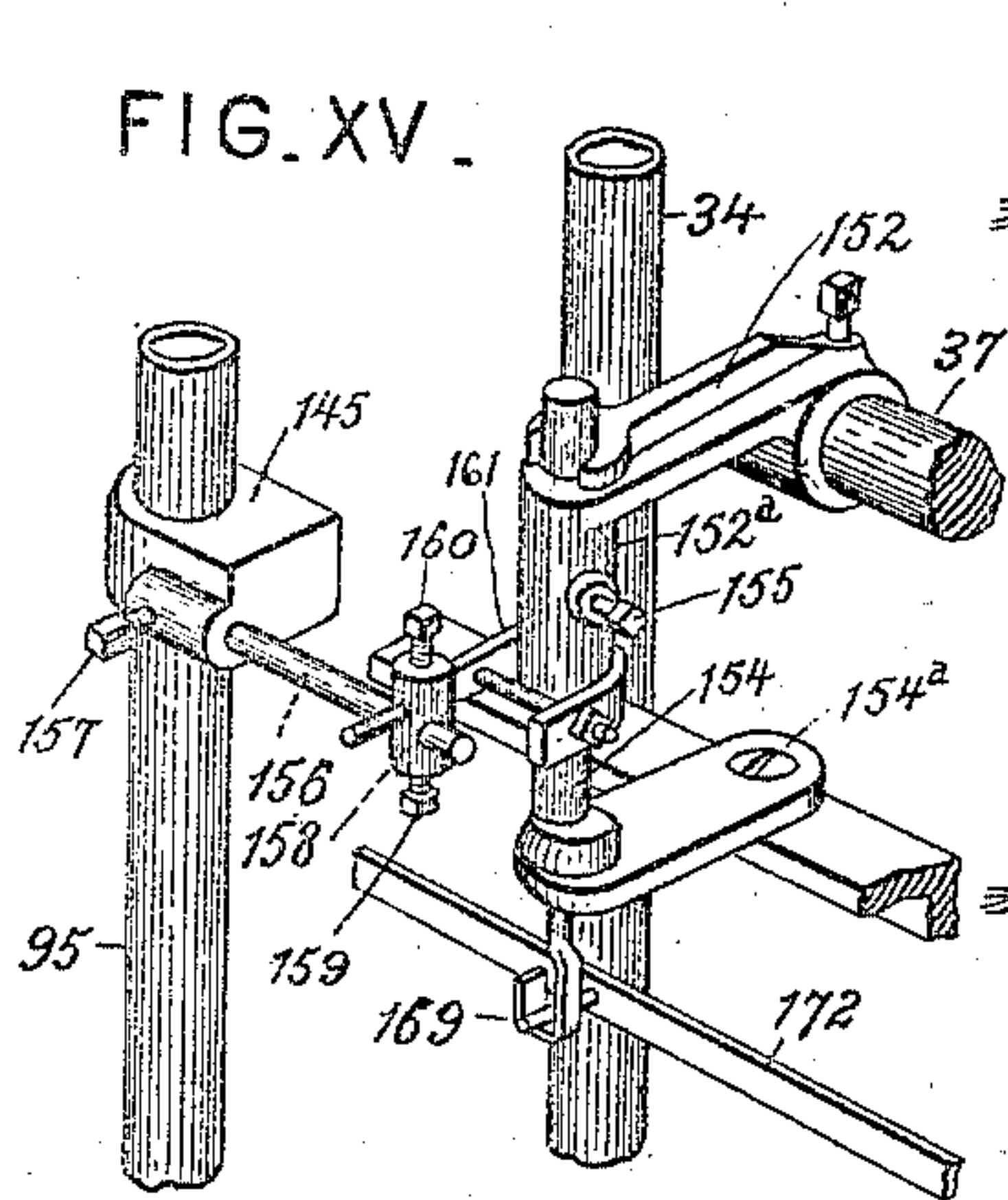


FIG. XVI

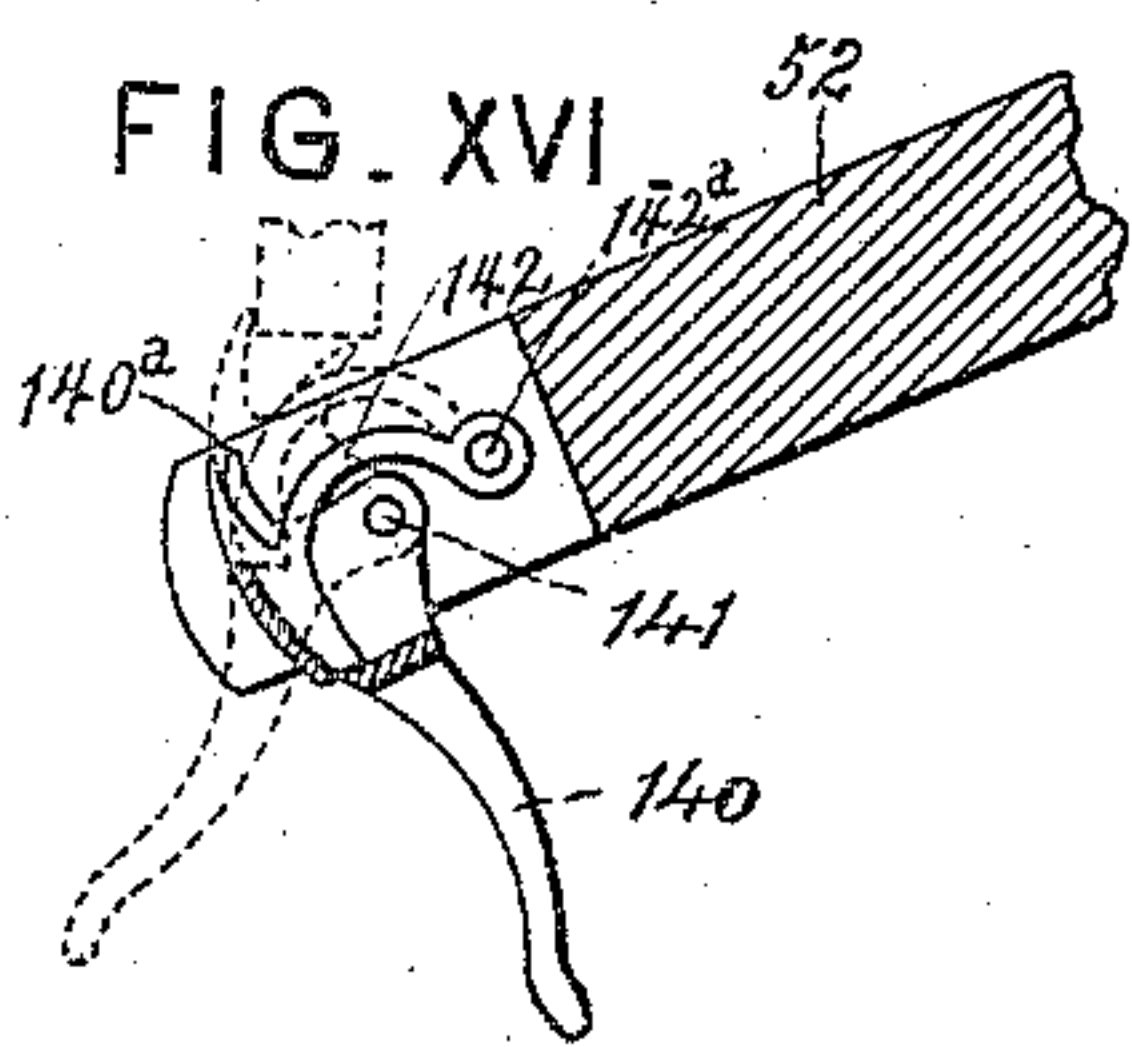


FIG. XVII.

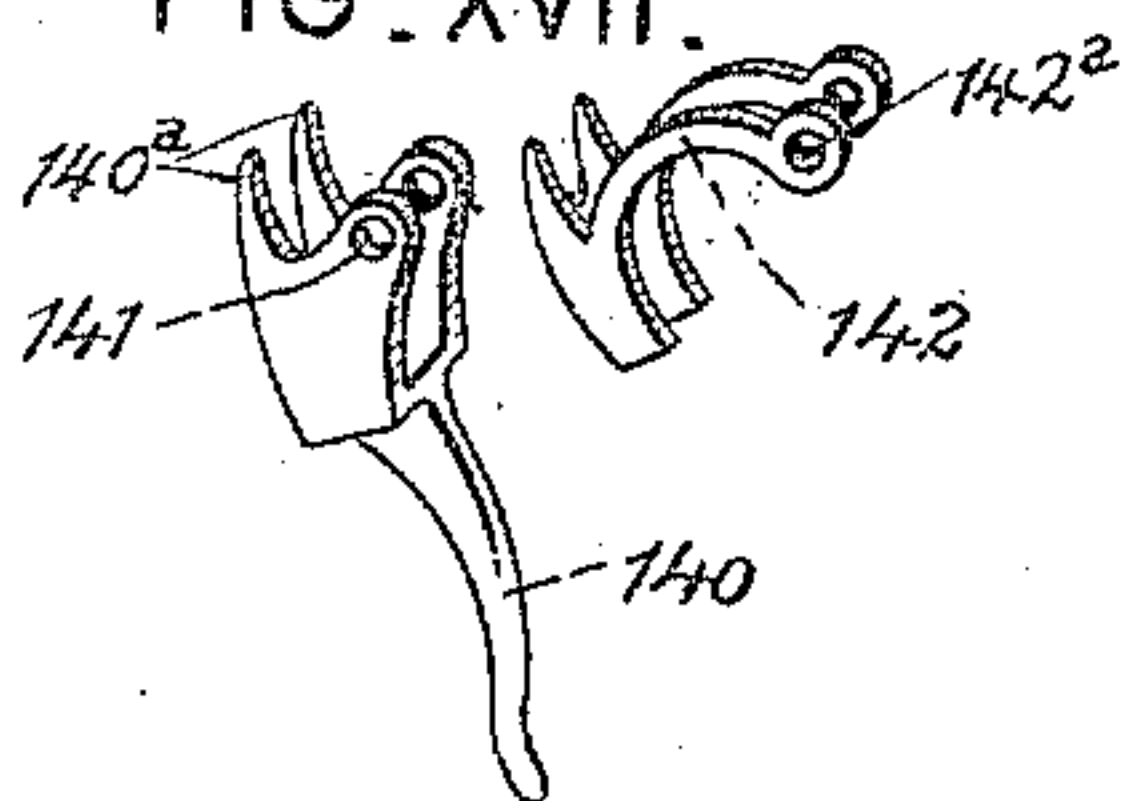


FIG. XXI.

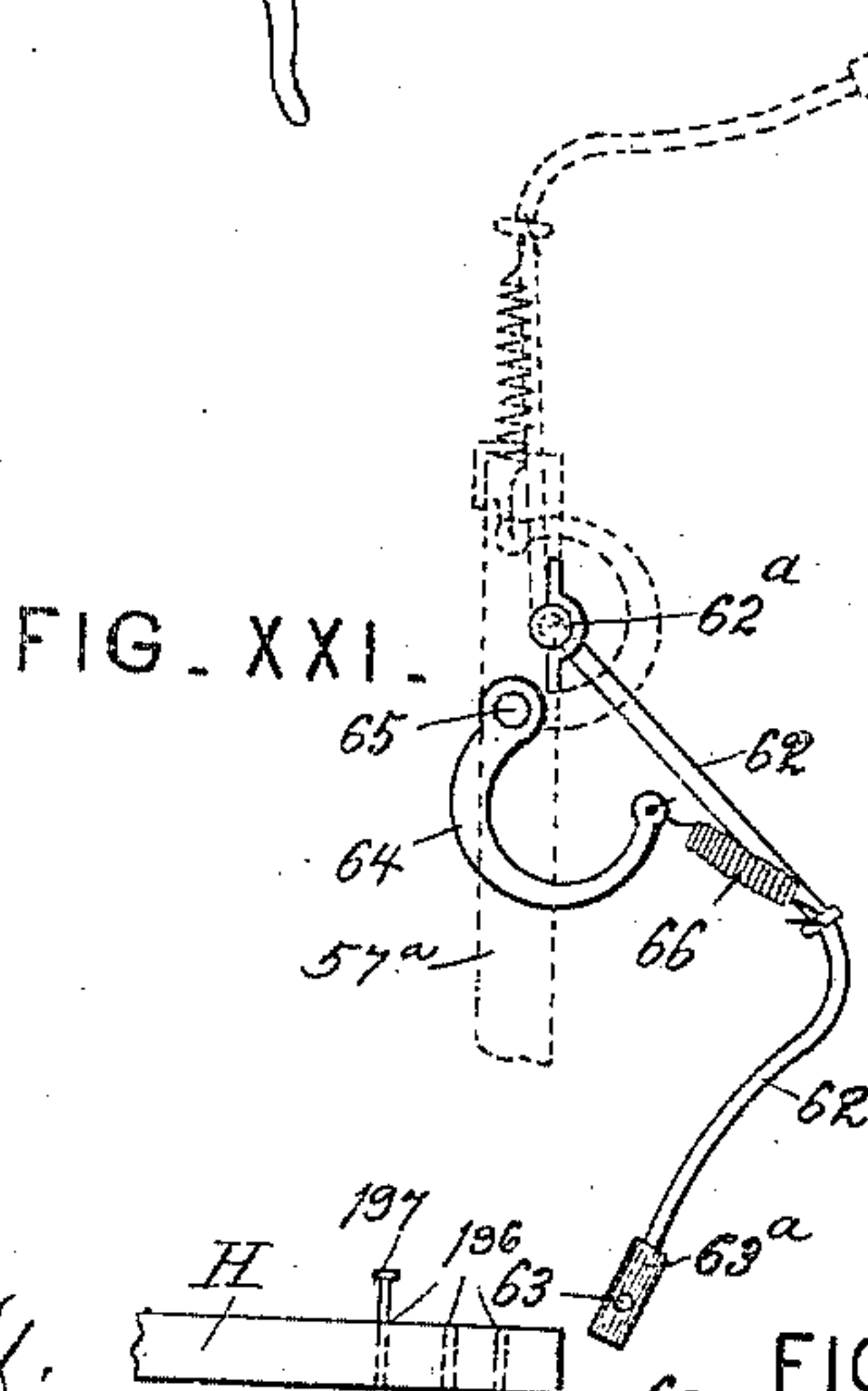


FIG. XXII

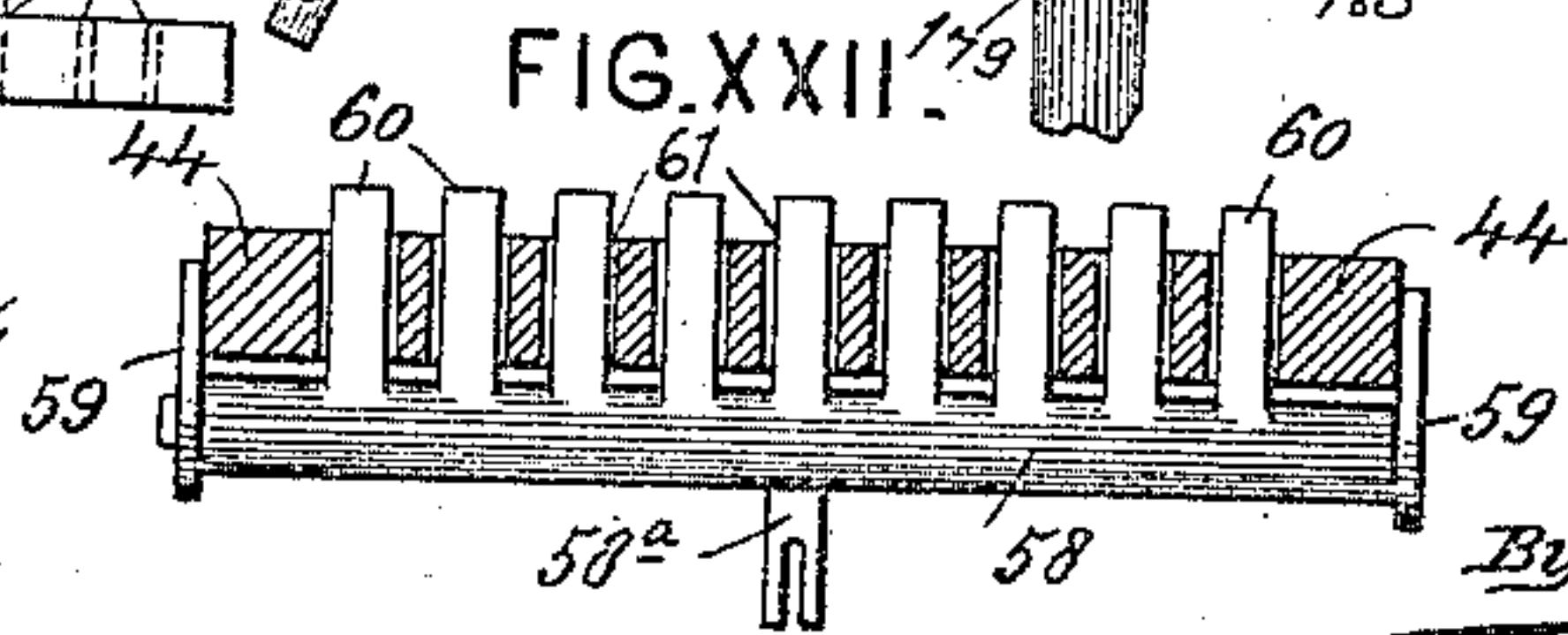


FIG. XIV.

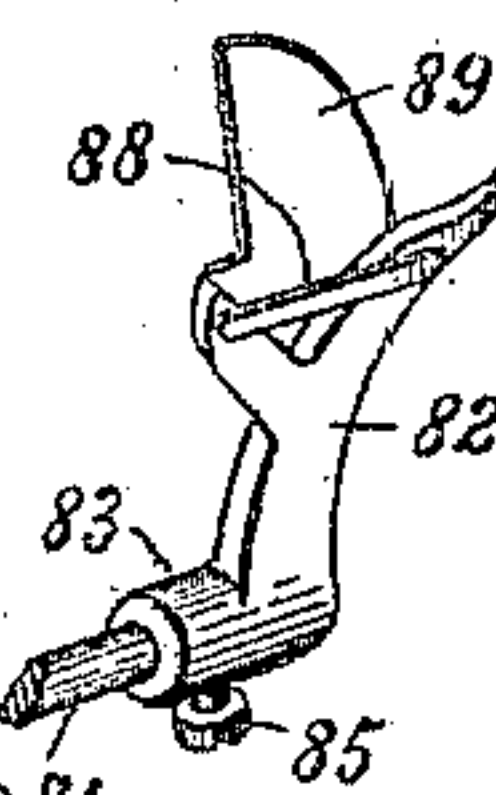


FIG. XIII.

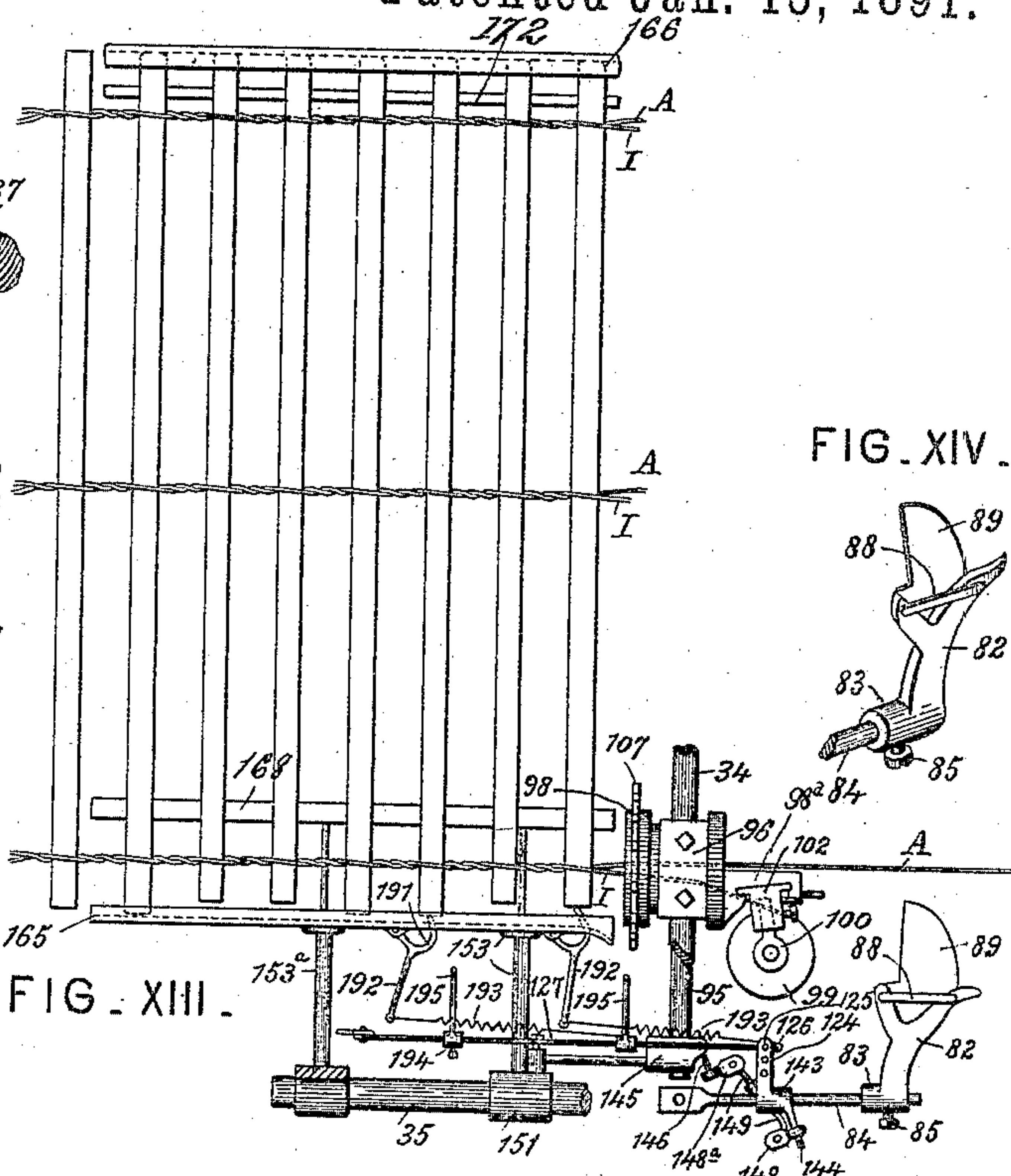
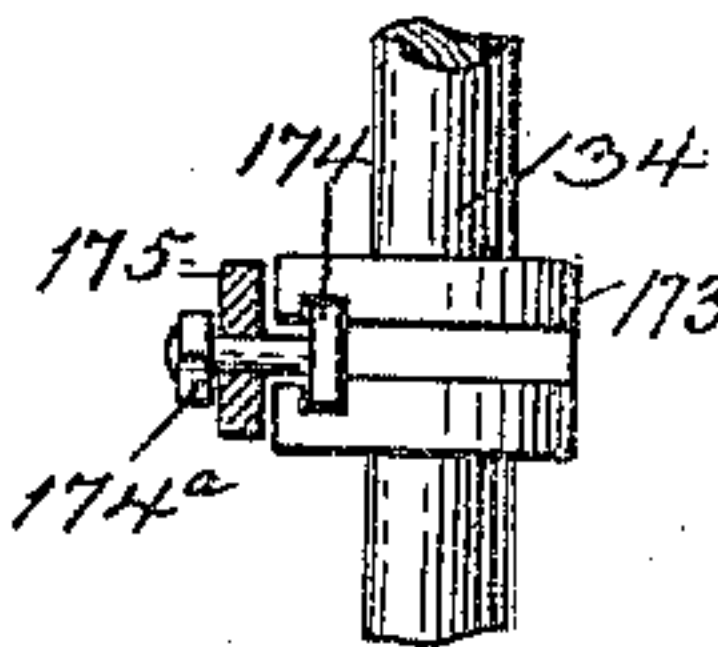
FIG XIX^a

FIG. XIX.

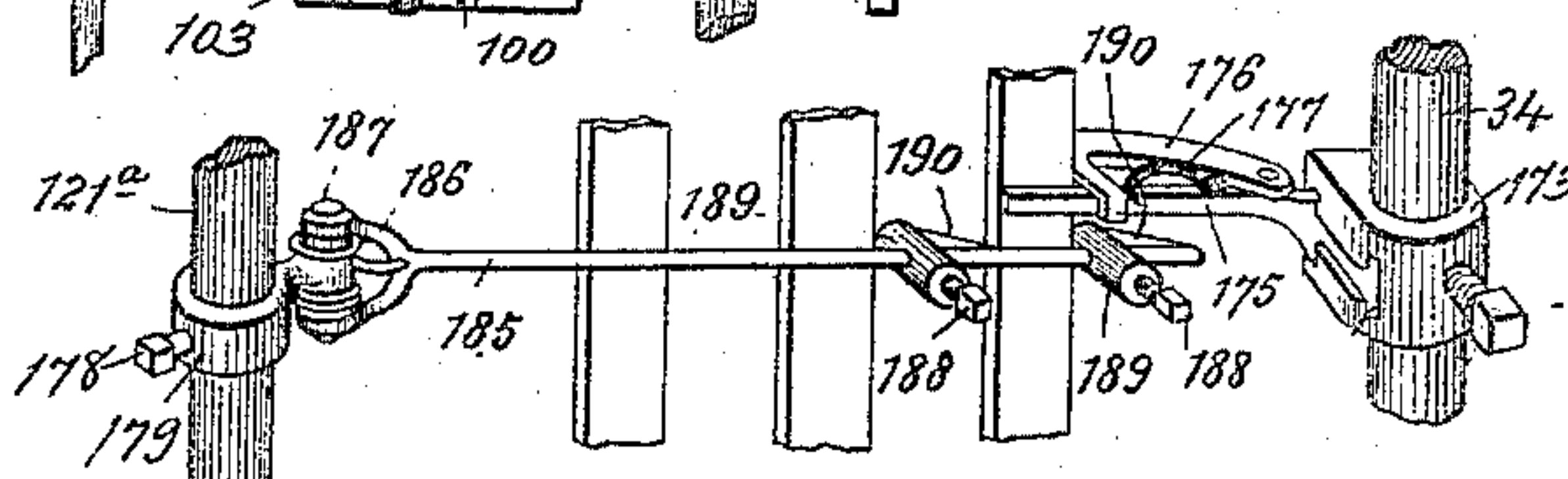
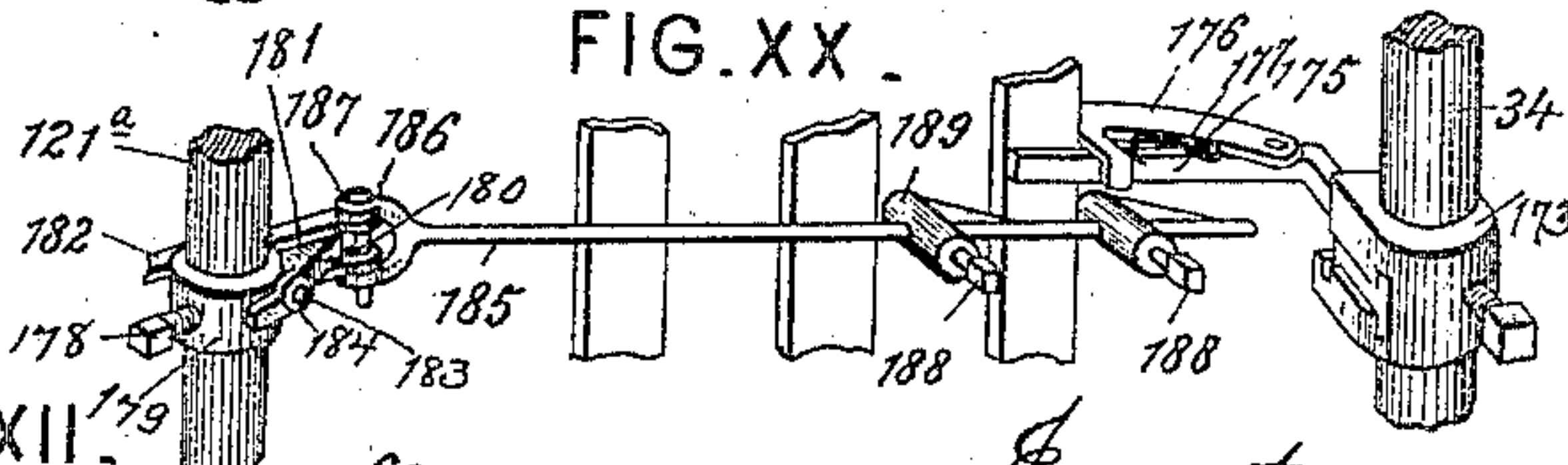


FIG. XX.



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Ezra E. Witter.

By Mighty Bros Attys.

UNITED STATES PATENT OFFICE.

EZRA EDGAR WITTER, OF MILFORD CENTRE, OHIO.

MACHINE FOR BUILDING PICKET FENCES.

SPECIFICATION forming part of Letters Patent No. 444,726, dated January 13, 1891.

Application filed January 20, 1890. Serial No. 337,548. (No model.)

To all whom it may concern:

Be it known that I, EZRA EDGAR WITTER, a citizen of the United States, residing at Milford Centre, in the county of Union and State of Ohio, have invented certain new and useful Improvements in Machines for Building Picket Fences, of which the following is a specification.

My invention relates to a portable machine for building picket or paling fences; and it consists, first, in an automatic bobbin-winder and a universal reel that is adapted to be hung upon the main machine so as to be convenient to reel the wire from the bobbins by means of the bobbin-winder; secondly, in a self-feeding device for a portable machine where the pickets may be stored in large quantities; thirdly, in an arrangement whereby the machine may be driven the width of a picket and space at the time that the fresh picket is fed into the bight of the wires; fourthly, in a swiveled tension-block that lets out the twist as fast as the twist-ers put it into the main line-wire, means to hold the tension when the twist-ers are turned, and means to let off the tension when the machine is passed along the distance of the width of a picket and a space; fifthly, in providing a thoroughly adjustable machine, so that fences of different heights and different mesh may be constructed; sixthly, in providing automatic means to keep the pickets level on top of the fence while their lengths may be varied; seventhly, in providing adjustable means to open and close the divided twister-wheel as a fresh picket is being drawn through said division and into the bight of the wires; eighthly, in providing a laminated hopper-bottom with claws to catch the next to last tier of pickets and force all of them remaining forward, so as to leave the last tier in the transverse hopper free and to provide means for holding and separating the next to last tier; ninthly, in providing a similar arrangement in the transverse hopper to hold the next to last picket from falling out when the picket-feeding device has carried the last one deposited therein into the bight of the wires.

My invention further consists of certain features of novelty to be hereinafter described, and then pointed out in the claims.

In order that my invention may be fully

understood, I will proceed to describe the same with reference to the accompanying drawings, in which—

Figure I is a side elevation of the machine, looking from the side on which the operator stands while making the fence, showing also the adjustable post which holds the swiveled tension-blocks and the universal reel in position for winding the bobbins. Fig. II is a side elevation from the opposite side without the adjustable post and universal reel. Fig. III is a vertical transverse section taken on the line III III, Fig. I. Fig. III^a shows one of the twist-ers ready to be opened by the picket-feeding device, and shows the dog caught behind the nearest tooth on the upper part of the wheel and near to the division, which holds this division of the twister-wheel from revolving by its own weight and the weight of the line-wire. Fig. IV is a vertical transverse section on the line IV IV, Fig. I. Fig. V is a side elevation of the universal reel opposite the coil of wire. Fig. VI is an elevation of the same from the opposite side. Fig. VII is a transverse section on the line VII VII, Fig. VI. Fig. VIII is a plan view of the bobbin-winder. Fig. VIII^a is a detail view of parts of the bobbin-winder and bobbin attached. Fig. IX is a side view thereof. Fig. X is a transverse section taken on the line X X, Figs. VIII and IX. Fig. XI shows the tension-block in section and in plan. Fig. XII is a perspective view of the lower part of the post which supports the swiveled tension-blocks. Fig. XIII shows the devices for automatically elevating pickets which are not of such length as would otherwise produce a fence even on top, as shown. Fig. XIV is a perspective view of the lower picket feeder or carrier. Fig. XV is a detail perspective view showing the adjustable hinge and the manner of fastening the guide-rails so as to cause the finished fence to hold the machine in proper position. Fig. XVI is a detail view showing the lower end of the transverse hopper and the means to catch the next to the last picket fed by the picket-feeders. Fig. XVII is a detail perspective view of said means. Fig. XVIII is a detail view showing one of the twist-ers and the mechanism which keeps the bobbins or spools from revolving while the wires are being twisted, and the

rock-shaft which carries a cam which acts to release the brake when the picket is being fed. Fig. XIX shows the preferred form of spacing devices. Fig. XIX^a is a detail sectional view thereof, looking toward another face of one of the blocks shown in the latter figure. Fig. XX is a detail view of a modification thereof. Fig. XXI is a detail view showing the picket-retainer arm for the large hopper. Fig. XXII is a section of the large hopper, showing the claws.

Before proceeding to build a fence by means of my improved machine it is first necessary that each line-wire A, which forms one of the couplets to be twisted, be stretched from one of the fence-posts, being each secured thereon at the height of the opposite twister-wheel of the machine. It is then necessary to pass each through the hook of the division of the twisters opposite the semi-wheel carrying the bobbin or spool and through a guide. The other ends of the line-wires are carried to the tension-blocks on the standard B, that is supported on a base, (clearly shown in Fig. XII,) which consists of braces B', hinged at their inner ends to projecting pieces b, and their outer ends being made rigid by the rods b', that are secured thereto and engage in slots at the lower end of the standard, being rigidly held thereto by tightening-nuts b''. The standard is braced by the braces B' as to side-wise movement and as to movement toward the machine by means of a brace wire or rope C, (partly shown in Fig. I,) that may be secured to a stake driven in the ground. Swiveled in lugs B'' of the standard are hooks D.

The tension-blocks E are provided with eyes e to engage the hooks D, so that the blocks may turn. Each line-wire is passed under the pin e' of a tension-block under the retaining-hook E' and the end inserted in a hole in the drum or shaft E''. The drum or shaft E'' is turned by a removable crank F to impart a tension on the line-wire. By swiveling the hooks D, that support the tension-blocks, all twist that is put into the line-wires is let out.

The universal reel for supplying wire to the bobbins and the bobbin-winder that takes the wire from the reel will be described hereinafter, and it is to be understood that in the description of the machine proper the bobbins are filled with wire.

In referring to the machine, I term the parts thereof nearest the standard B the "rear end" and the parts farthest therefrom the "front end."

1 is a bar that has secured thereto at its rear end a coupling 2, secured in the perforation of which is the axle 3, formed of telescopic members. The ends of the axle are provided with wheels 4. At the front end of the bar is a perforated coupling 5, in which is secured the horizontal member of an L-shaped rod 6. On the vertical member of the rod a wheel-supporting frame or yoke 7 is hinged and it supports the front wheel 8, the axle 9 of which is connected with a curved rod 10, that passes

through a perforation in a coupling 11 at the outer end of rod 6. The curved rod 10 is adjustably held in the boss 11 by means of a set-screw 12. On this truck the operative parts of the machine proper are supported.

It may be necessary where the ground is uneven to tilt the machine in order to keep it upright when one wheel falls into a depression, and to this end the following devices are employed. On the sill or bar 1 of the truck (see Fig. III) is secured a coupling 13, having a transverse perforation, through which passes and is held by a set-screw 14 a bar 15, having an upturned or crooked outer end 16, forked at 17.

18 is an L-shaped lever having a short arm which is pivoted to the forked end 17 by means of a bolt 19. The upward movement of its long arm is limited by means of a stop 20, that is adjustable on a post 21 by means of a hand-screw 22. The L-shaped lever has a hole 23 at its angle, into which is hooked the lower end of an inclined rod 24, that passes up through an opening in a standard 25, and a nut 25^a adjustably connects it to the standard. The standard 25 is supported on a tapering pin 26 at the inner end of the bar 15 by means of a coupling-sleeve 26^a, that fits on the pin. The standard is adjustable relatively to the sleeve 26^a by means of a pin 27, that is inserted in the vertical series of holes 28 in the standard. To brace the standard and prevent it from falling either to the front of the truck or to the rear, it is necessary to use a curved brace 29, the lower end of which has a lateral projection extending transversely of the truck and fitting loosely, so that it may have a movement in an opening in a boss 30, secured to the sill or bar 1. The curved upper end of the brace 29 passes into an opening in a boss 31^a at the side of the sleeve 26^a and is retained adjustably with relation to the sleeve and standard by means of a set-screw 31.

The standard 25 extends up to a casting II on the frame-work of the operative parts of the machine proper, which is provided with a horizontal slot 32, through which and through the top of the standard a pin 33 passes to form a support for the operative parts of the machine proper. Upon this pin the operative parts of the machine proper may freely swing.

The frame-work of the operative parts of the machine proper consists of an upright post 34, fixed to a horizontal rod 35 at the bottom by means of a T-coupling 36. At the top of the post 34 is a horizontal rod 37, connected thereto by a coupling 38. On the rod 35 is a casting 39, having an extension 40, and on the rod 37 is a casting 41, also having an extension 42. Secured in the extensions 40 and 42 at its lower and upper ends, respectively, is an upright rod 43. (See Fig. IV.) The operative parts mounted on this frame-work are constructed as follows:

44 is the bottom of a chute inclined down-

ward from the rear of the machine toward the front. On the side nearest the operator, who stands on the side of the machine, (shown in Fig. I.) it is supported at its outer end on an arm 45, that is secured to the uprights 46 47, that extend up from the horizontal bar 35 on the opposite side of the machine. The uprights 46 47 are connected at top and bottom by the cross-pieces 49 and 48 to prevent the pickets that are placed upon the chute-bottom with ends up from falling out on that side. At its inner end the chute-bottom is supported by an arm 50, extending down from the casting H. The ends of the arms 45 and 50 are screw-threaded to receive nuts for adjusting the position of the bottom 44. The side of the chute-bottom opposite the operator is supported on a short arm 51, that is screw-threaded and provided with a nut for adjustment of that side. Somewhat below the lower end of the inclined bottom or board 44 is a board or support 52, that is inclined downwardly from the side of the machine at which the operator stands toward the other side. This board or support 52 is adjustable by means of hinged supporting-links 53 and 54, the former being above it and the latter below, and a pin 55, secured to link 53 and extending down through an opening in the upper end of the board, where it is screw-threaded to receive a nut. The lower end of the board 52 may be supported in any suitable manner. The tops of the uprights 46 47 are held parallel by means of a brace 56, extending from the upper horizontal bar 37. Connected with the brace and extending transversely of the machine is a cross-piece 57, that at its other end is supported on a post 57^a, extending up from the rear end of the casting H.

58 is a shaft journaled in bearings 59 below the chute-bottom 44, and is provided with a series of claws or detents 60, which are adapted to extend up through openings 61 in the bottom 44. These claws 60 prevent the pickets from falling out at their lower ends except when desired, and the cross-piece 57 at the top prevents their tops from falling. The bundle of pickets resting on the bottom 44 are pressed forward when the claws 60 are lowered below the bottom by means of a follower-arm 62, that is bent at an angle, as shown, its inner end being pivoted at 62^a to post 57^a, and its outer end having an adjustable lateral bar or extension 63, that bears against the pickets. A swinging U-shaped link 64, that is pivoted at one end at 65 below the pivot 62^a of the follower-arm, has connected therewith at its other end a spiral spring 66, that is connected with the follower-arm at or about its angle. This construction is such that when the follower-arm is lowered its extension 63 is held against the pickets by the force of the spring; but when the follower is elevated, (as shown in dotted lines in Fig. XXI,) so as to introduce a fresh supply of pickets, it is retained in such elevated

position by the spring, the arm resting against the cross-piece 57 at the top.

Secured to and projecting down from the oscillatory shaft 58 is an arm or projection 58^a, to which is pivoted at its end a link 67, that at its other end is pivoted to one end of a lever 68, fulcrumed intermediately of its ends at 68^a to lugs 69 on the bracket 40, extending from the rod 35.

Extending from the inner end of the rod 37 is the bracket 42, between which and the cross-piece 57 a space is left sufficient for one tier of pickets. Pivoted to the bracket 42 is a transversely-operating follower-arm 72, that is bent similar to the other follower-arm 62, and has at its outer end a lateral projection 73 to bear against the pickets that are resting upon the transverse chute-bottom 52. The follower-arm 72 is acted on by a spring 72^a, secured to the casting H and to the arm near its bend. The pivotal end of the follower-arm 72 has a laterally-extending short shaft 74, that extends through to the other side of the bracket 42, and carries a cam or eccentric 75, that when the arm is raised by hand to its highest limit turns into horizontal position.

76 is a lever pivoted at 77 to the bracket 42. At its other end it has a friction-roller 78, which when the follower-arm is moving inward is engaged by the cam 75 to raise the lever, which, acting through the bolt 79 and connecting-rod 80 on the lever 67, raises the claws 60 on the oscillating shaft 58 above the board 44. When the cam 75 is lowering into the horizontal position before mentioned, the lever 76 will be brought down with it by the force of a spring 81, secured to the arm 58^a and the chute-board 44, and at the same time the claws on shaft 58 will be lowered to permit a tier of pickets to fall onto the inclined transverse board 52, so that they may be engaged by the projection 73 of the follower-arm 72, to be forced thereby toward the picket-carriers. When the claws are projected above the board again, they, while doing so, catch under the lower ends of the tier of pickets next to the tier which has been deposited on the transverse chute-board 52 and push them bodily up the chute-board 44, thus separating them from the tier in the transverse chute, and permitting the latter tier to move freely down the transverse chute until the first one strikes the cross-piece 49^a at the top, when they are stopped from moving farther at the top. At the bottom the first picket is received and stopped by the lower picket-carrier, which is constructed as follows: (See Figs. XIII and XIV.)

82 is a Y-shaped or notched support having a sleeve 83 at its lower end that receives the end of a pivoted arm 84, and is retained adjustably therein by a set-screw 85. This arm is pivoted on a bolt 86, (see Fig. II,) the head of which is received by a horizontal T-slot 87 in the lower T-coupling 36 to facilitate adjustment, if required. To the inner

side of the Y-shaped forked or notched support is applied a strip 88, that connects the forks near their ends. On the opposite side of the forked support a plate 89 is secured that extends above the forks a distance and which closes the space between the forks on the outer side. This space forms a pocket to receive the lower end of a picket, and as it is lower than the lower end of the transverse chute-board it allows the first picket of the tier on the said board to drop down behind the strip 88 and enter the pocket, said picket being prevented from escaping from the picket-carrier by the upwardly-projecting plate which forms a stop. As the picket drops into the pocket it falls below the cross-piece 49 at the top, where it comes in contact with the upper picket-carrier. This upper picket-carrier consists of a hooked member 90, having a sleeve 91, which fits over one end of a pivoted arm 92, and is adjustably secured by a set-screw 93. The free end of the member 90 is provided with a laterally-projecting pin 94. The top of the picket comes against the end of the member 90 and in front of the pin 94. The arm 92 is pivoted and adjusted similarly to the arm 84. (See Fig. II.) The picket received by the picket-carrier is now ready to be carried out and separated from the rest of the tier in the transverse chute when a twist has been made in the pair of wires. The line-wires A have already been referred to and the devices that support them described. I will now describe the mechanism for carrying and supporting the other wires I.

95 is a swinging post that is parallel with the fixed post 34, supported on hinges to be hereinafter described, and on the adjustable foot-piece 36^a. As shown in the drawings, there are three bearing-blocks 96 on post 95, arranged at desired intervals apart, and the same number of blocks 97 on the post 34, arranged opposite the blocks 96. The meeting faces of these blocks are normally in contact and are provided with semicircular recesses to provide bearings for the divided twister-wheels 98, one section of each of which is received by a recess in a bearing-block when the divisions of the wheels are in vertical line. The axis of each wheel is an opening, and through the openings the wires pass.

The wires I are supplied from bobbins or spools 99, journaled each in adjustable bearing-pieces 100, secured in bosses 101 of a base or slide 102 by set-screws 103. The base 102 is adapted to slide on a guideway transverse of the extension 98^a of the part hub of one of the sections of each twister-wheel. From the bobbins or spools the free ends of the wires I pass through perforations 104 into the axial openings of the twister-wheels and extend parallel with the line-wires. They, with the line-wires, are engaged, respectively, with hooks 105 106, that project over the outer ends of the axial openings from each section of the twister-wheels. The free ends of the wires I

are secured to the same fence-post that the line-wires A are.

The principle and operation of the twister-wheels are the same as described in my patent, No. 389,784, dated September 18, 1888. Each semi-twister wheel is provided with sprocket-teeth 107, that are engaged by a sprocket-chain 108. The chain does not encompass the wheels in any manner, but merely engages them on the side nearest the operator, so that when the divisions of the wheels are in vertical line the wheels may be easily separated. One lap of the chain on the side that engages the wheels passes over intermediate sprocket-wheels 108^a and over the wheels 109 and 110 at top and bottom of the post 34, while the other lap of the chain engages a combined bevel and sprocket wheel 111, that is mounted on a bracket 112, fixed adjustably to the post 34, and upon which the casting H is fixed. The bevel part of the wheel is engaged by a bevel-wheel 113, fixed on a shaft 114, journaled in the bracket, and the shaft is screw-threaded at its outer end to receive the same crank F, that is employed to turn the drums of the tension-blocks as well as the bobbin-winder. When the shaft 114 is turned, the twist is put in the wires. When the divisions of the twisters are in vertical line, it will be observed that the halves thereof which are on the opposite side of the machine to the operator will turn when the parts of the twisters are separated, so that their lower parts will obstruct the passage of the pickets fed by the picket-carriers. To avoid this, I provide dogs 115, that are pivoted on adjustable brackets 116 on the post 95, so as to engage behind the last upper tooth of said halves of the twisters.

It may be necessary to have a tightener for the chain 108, in which case I provide an arm 117, pivoted at 118 and operated by a spring 119, and provided with a roller 120, that bears against the chain, as shown in Fig. III.

The first operation after a twist has been made is to revolve, by means of handle 121, the rock-shaft 121^a, that is journaled at top and bottom in similar brackets 122 and 123, fixed adjustably by set-screws to rods 37 and 35, respectively. By this operation of shaft 121^a various devices are actuated by mechanisms presently to be described.

Projecting from the arm 84 is a lug 124, having a pin 125, received by a slot 126 at one end of a rod 127, the other end of which is pivoted to a crank 128 on the shaft 121^a. The slot in the rod 127 is to prevent the lower picket-carrier from moving as soon as the handle 121 starts to move. Projecting from the arm 92 of the upper picket-carrier is a lug 128, to which is pivoted one end of a rod 129, the other end of which is pivoted to a crank 130 on the shaft 121^a, so that this picket-carrier starts to move with the first movement of the handle 121. Fixed adjustably to the arm 92 is a block 131, having a recess to receive an adjustable arc-shaped strip 132,

that at its lower end has a slot 133, that receives a pin 134, projecting from a rock-shaft 135, that is journaled at top and bottom in bearings in the upper and lower brackets 41 and 39, respectively, so that as soon as the upper picket-carrier starts to move this rock-shaft 135 is moved. Fixed on the rock-shaft 135 are eccentrics or cams 136, which when the shaft is moved engage with the operating-pins 137^a of the oscillatory brake-shoes 137 (see Fig. XVIII) to release the latter from the spools or bobbins 99, against which they are held by means of the springs 138 to prevent their rotation when the wires are being twisted. Simultaneously with the releasing of the brakes, the operator having hold of handle 121, the machine is moved along the line, the wire paying out readily from the spools or bobbins. At the same time an arm 139 on shaft 135, Fig. IV, comes in contact with the pendent stem of a gravitating Y-shaped catch 140, Figs. XVI and XVII, provided with claws 140^a at its upper ends and pivoted at 141 in an opening in the lower end of the transverse chute-board 52, and lifts the claws into engagement with the under side of the first picket in the transverse chute and separates this picket from the one in the picket-carriers. To insure the separation of the pickets mentioned, when the one in the picket-carriers is to be carried into the bight of the wires, a detent 142, pivoted at 142^a in front of the catch 140, is provided, which extends beyond the latter between its forks or claws, so that when the claws are moved to engage under the picket the detent 142 will be forced up behind the same to prevent its falling back.

To separate the parts of the twisters so that a picket may be placed in the bight of the wires, the following mechanism is employed: The divisions must first be in vertical line and the spools or bobbins on the side near the operator, so that the line-wires may be on the proper side. The lower picket-carrier has fitted on its arm 84 a collar 143, that has a downwardly-projecting screw-threaded stem 144. Fixed adjustably at the lower end of the swinging post 95 is a block 145, that is provided with a socket to receive one limb of an angular piece 146, that is held adjustably by a screw 147, and the other limb of which is screw-threaded and projects downwardly. Screwed onto the stem 144 and the screw-threaded limb of the angular piece 146 are similarly-shaped pieces 148, 148^a, that also receive at right angles to the perforations receiving said parts, the screw-threaded bent ends of a coupling-link 149 of two similar parts having right and left screw-threads to fit in correspondingly-threaded portions of a sleeve 150, that connects them. Similar devices, excepting that their position is reversed as the lower picket-carrier moves upward and forward, connect the arm 92 of the upper picket-carrier, which moves downward and forward by the post 95. By this construction

when the picket-carriers move forward the picket is placed in the bight of the wires, the parts of the twisters being separated to this end by the post 95 swinging out through the influence of the carriers. Secured to the rods 35 and 37 are brackets 151 and 152, respectively, (see Figs. II and XV,) both of the same form and having, respectively, upwardly and downwardly extending perforated bosses 151^a and 152^a, in the perforations of which are inserted upwardly and downwardly projecting posts 153 and 154, the ends of which support plates 153^a and 154^a. The posts are held adjustably by means of set-screws 155.

The swinging post 95 is hinged to the small posts 153 and 154 by the following devices: The blocks or sleeves 145 at top and bottom of the post 95 receive rods 156, that are adjustably held by set-screws 157, their outer ends being retained in perforations in the blocks 158 by set-screws 159. Secured in perforations in blocks 158 at right angles to the rods 156 by set-screws 160 are hinges 161, that are pivoted on the small posts 153 and 154, so that the post 95 is permitted to swing.

The brackets 122 and 123, Fig. II, are extended horizontally, so as to provide supports for the small posts 163 and 162, similar to posts 153 and 154, and fitting in vertical perforations in said brackets, where they are secured by means of set-screws 164. Plates 162^a and 163^a, similar to plates 153^a and 154^a, are secured to the posts 162 and 163. Fixed at the bottom to the plates 153^a and 162^a and at the top to the plates 154^a and 163^a are guide strips or ways 165 and 166, that are right-angular in cross-section, with portions horizontal to provide guides for the top and bottom of the fence being made, and the other or vertical portions of which extend toward one another and prevent the fence from falling out on the side near the operator. Fitted removably in longitudinal openings in the lower posts 153 and 162 are pintles 167, to the upper ends of which is fixed a horizontal strip 168. Fitted to and projecting downwardly from the upper posts 154 and 163 are slotted pintles 169. In Fig. XV are shown hooked instead of slotted pintles. Secured to the slotted pintles by suitable screws 170 171, passing through the slots, is a removable horizontal strip 172, that is above and in the same vertical plane with the strip 168. Between the strips 168 and 172 and the vertical portions of the angular strips 165 166 the fence being made passes. These strips or side rails 168 and 172 are removable to facilitate the removal of the fence from the machine or the machine from the fence while it is yet supported by the tension devices at one end of the fence and the post at the other, or for other purposes.

Fixed adjustably on the upright 34 are blocks 173, that are provided with T-grooves to receive the heads of T-bolts 174, that are adjustable in the grooves by means of nuts 174^a. Fixed on and projecting from these

bolts are arms 175, that extend forwardly, and to which are pivoted catches 176, that are forced out by springs 177, and which, when a picket of the fence passes by, are forced in, 5 and when it has passed they immediately spring out and engage in front of the picket to prevent it going back and to space the distance between the pickets. There are two of these spacers shown in Figs. I and II, one 10 above and the other below the center of the upright 34.

Fitting on the rock-shaft 121^a, and secured adjustably by means of set-screws 178, are sleeves 179, that are provided with projections 15 180. One edge of each projection fits in a groove or slot 181 of the arm 182, said arm being held adjustably by means of a bolt 183, that passes through the slot 181 and through an opening in a swelling or boss 184 of the 20 sleeve.

185 is a rod which is bifurcated to provide forks 186, through which and through the outer end of the arm 182, which is placed between the forks, a pivot-bolt 187 passes. There 25 are two of these rods 185 shown, one above and the other below the center of the machine. To each of the rods 185 are secured adjustably, by means of set-screws 188, catches or hooks 189, and extending from the outer ends 30 of the latter rearwardly to the bar are inclined projections 190. When the lever 121 is moved to work the picket-carriers and to carry a picket into the bight of the wires, the machine is pushed along by reason of the 35 hooks 189 bearing against the pickets of the completed fence, and when the lever is moved in the contrary direction the inclined projections will slide over the pickets so that the hooks may obtain a fresh hold, ready to be 40 moved forward when a new picket is fed in.

It frequently happens that the pickets of which the fence is made are of different lengths, and in order to make their ends level at top I have devised the following mechanism: Projecting up through openings in the 45 lower guide-strip or floor 165 are the free ends of curved lifters 191, that are pivoted below the floor, and projecting down from them are arms 192. The lower ends of the arms are 50 attached to springs 193, that act to project the lifters normally above the floor. To the connecting-rod 127 are adjustably secured, by means of set-screws 194, the fingers 195, that when the lower picket-carrier is moved forward 55 ward come in contact with the arms 192 of the lifters and withdraw their free ends from above the floor, so that the machine may be moved a short distance. The springs keep the lifters in contact with the lower ends of 60 the pickets and force them up against the upper angular guide when not withdrawn, as stated. As there will be different widths of pickets, I provide a series of holes 196 in the top of the casting or bracket H, Figs. IV and 65 XXI, into one of which is placed a pin 197. As the follower-bar 63 of the upper follower-arm (see Fig. IV) projects somewhat on the

outer side of the arm, it will strike the pin, and thus limit the forward movement which the spring produces. 70

The construction of the reel shown in Figs. V, VI, and VII is as follows: J J' are two strips crossed at right angles and secured together at their mid-lengths. Protruding from one side of the same is a hub K, which at its outer 75 end is provided with a peripheral groove *k*, which receives loosely a disk or wheel L, provided with radiating arms *l*, to the ends of which are pivoted links M, that are pivoted to the inner ends of levers *m*, that are angled, 80 as shown, the outer ends of which levers *m* extend to the cross-strips J J'. Extending laterally from the outer ends of the levers *m* parallel with the axis of the reel are pins N, that are journaled in the forks of castings O, 85 secured to the cross-strips J J'. Fixed to and extending radially from the outer ends of the pins N are arms P, on which are placed collars *p*, from which and parallel with the axis of the reel, near the periphery thereof, screw- 90 threaded rods Q extend to the cross-strips and screw into the collars and engage the arms so that they may be adjusted thereon. Secured to the outer end of the hub K is a strip R, to the outer ends of which are secured the outer 95 ends of spiral springs S, the inner ends of which are secured to the loose disk or wheel L, so as to cause the arms P to be normally projected outwardly, as shown in full lines in Fig. VI, so that they may retain a bundle of 100 wire placed over the rods Q. When the arms are thrown to dotted position, as shown by one of the arms in Fig. VI, the bundle of wire is easily inserted upon the reel and over the ends of the arms, which spring out as soon 105 as the bundle is placed thereon. The free end of the wire from the reel (which is mounted when in use on the handle 121) being passed through the hook of that half of each of the twisters that carries the bobbin and through 110 the perforation or opening in said half, and being secured to the shaft of the bobbin in any suitable manner, the wire from the reel is ready to be wound upon the bobbin.

The bobbin-winder shown in Figs. VIII, 115 IX, and X is constructed as follows: T is a frame or base having upturned ends *t t'*, in which is loosely journaled so that it may revolve, a shaft U, that is provided for half its length with two diametrically-opposite series 120 of teeth *u*, and for the other half of its length with two diametrically-opposite series of teeth *u'*, that are at right angles to and intermediate of the lines of the teeth *u* of the other half of the shaft. Parallel with the shaft U is an 125 operating-shaft V, that is provided with two worm-wheels *v v'*, that are at a distance apart equal to about one-half the length of the toothed shaft U, or the length of one series of teeth. One end of the worm-shaft V is ex- 130 ternally screw-threaded to receive the crank F, and the other end has a screw-threaded socket that receives the screw-threaded end of any one of the shafts of the bobbins 99.

(See Fig. VIII^a.) W is a dog pivoted upon a pin *w*, extending from the base T midway of the length of the toothed shaft U. Extending down through a vertical opening in the dog is a detent-pin X, that is pressed down by a spring *x*. The shaft U has at each end thereof intermediately of the ends of the series of teeth flexible projections *y* and *y'*, respectively. This device is applied and operated as follows: Adapted to be received by the upright 43 is a clamp Z of the bobbin-winder, which is retained thereon by a set-screw *z*. The socket end of the worm-shaft V being screwed onto the bobbin-shaft (see Fig. VIII^a) and the set-screw that retains the slide that carries the bobbin loosened, the latter is ready to be wound, the wire having been led thereto from the reel. The worm-wheel *v* of the shaft V being brought in contact with the end *t* of the base, which operation will draw the slide of the bobbin out, (see Fig. VIII^a.) and one of the series of teeth *u* being thrown into gear with the worm-wheel *v'*, the crank F is ready to be turned. When the crank is turned, the worm-wheel *v'*, the shaft of which moving, of course, with it, traverses the series of teeth *u* on one side of the toothed shaft until the inner side of the bobbin has reached about midway of the twister-wheel. At this point the worm-wheel *v* has engaged and pushed the dog W past and off of the inner end of the teeth *u'*, with which it is in engagement, and the worm-wheel *v'* presses against the projection *y'*, thus turning the toothed shaft by friction until the worm-wheel *v* engages one of the series of teeth *u'*, and at this moment the dog W catches upon the inner end of the other teeth *u*, while the detent-pin X keeps the worm-shaft from retrograde movement. Now the movement of the operating or worm shaft is continuous during each winding operation, and at the same time the wire is drawn from the reel and the coils evenly wound upon the bobbin or spool. The thread of the worm-wheels is usually a little coarser than the wire. A number of removable worm-wheels of different thread may be used to suit the size of wire. When one bobbin is wound, the same operation is repeated with the others.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a machine for building picket fences, an inclined supply-chute for holding a bundle of upright pickets in tiers, a transversely-inclined chute at the lower end thereof, means for depositing a tier of pickets at a time from the supply-chute into the transverse chute, the twisters, and means for carrying a picket at a time from the lower end of the transverse chute to the twisters, substantially as set forth.

2. In a machine for building picket fences, a supply-chute, a follower to act on a series of tiers of upright pickets in the chute, a

transverse chute at the lower end of the supply-chute, toward which the pickets are forced by said follower, means for depositing a tier of pickets at a time from the supply-chute into the transverse chute, the twisters, and means for carrying a picket at a time from the lower end of the transverse chute to the twisters, substantially as set forth.

3. In a machine for building picket fences, a supply-chute for containing a series of tiers of upright pickets, a transverse chute at the lower end thereof, means for depositing a tier of pickets at a time from the supply-chute into the transverse chute, a follower to press against the tier of pickets in the transverse chute, the twisters, and means for carrying a picket at a time from the lower end of the transverse chute to the twisters, substantially as set forth.

4. In a machine for building picket fences, a supply-chute and a follower-arm having a rod or lateral extension adjustable thereon to press against the pickets, substantially as set forth.

5. In a machine for building picket fences, a supply-chute, a follower, and a spring acting on the follower to hold it in raised or lowered position when it has been raised or lowered by the operator, substantially as set forth.

6. In a machine for building picket fences, a supply-chute, a follower, a spring secured at one end to said follower, and a swinging bent link to which said spring is secured at its other end, substantially as set forth.

7. In a machine for building picket fences, an inclined chute for pickets, retracting claws or catches at the lower end of the chute, and a strip above the chute, against which the tops of the pickets impinge, substantially as set forth.

8. In a machine for building picket fences, a chute for pickets, a follower, retracting claws or catches at the lower end of the chute, and a strip above the chute, against which the tops of the pickets impinge, substantially as set forth.

9. In a machine for building picket fences, an inclined chute having slits or openings near its lower end, retracting claws or catches adapted to be projected through the openings, and a strip above the chute, against which the tops of the pickets impinge, substantially as set forth.

10. In a machine for building picket fences, a chute, an oscillatory shaft pivoted in bearings below the chute, claws projecting from said shaft and adapted to extend above the chute, a spring acting on said shaft to retract the claws, and positive means for projecting the claws above the chute, substantially as and for the purpose set forth.

11. In a machine for building picket fences, the combination of a frame, a chute, retracting-claws adapted to extend above the chute, and a strip secured to the frame above the

chute adapted to be engaged by the tops of the pickets, substantially as and for the purpose set forth.

12. In a machine for building picket fences, the combination, with a supply-chute for containing a bundle of pickets and means for releasing one tier of pickets at a time, of a transverse chute at the lower end of the supply-chute, adapted to receive a tier of pickets, a follower adapted to press against said tier and feed it forward, and suitable connection between the follower and said releasing means of the supply-chute, whereby they are both compelled to act together, substantially as set forth.

13. In a machine for building picket fences, in combination with a supply-chute and a transverse chute at the lower end thereof, a follower above the transverse chute, a cam actuated thereby, a pivoted lever adapted to be engaged by the cam, means for releasing a tier of pickets at a time in the supply-hopper, from which it is deposited into the transverse hopper, and intermediate mechanism connecting said releasing means and the lever, substantially as set forth.

14. In a machine for building picket fences, in combination with a supply-chute and a transverse chute at the lower end thereof, a follower above the transverse chute, a rock-shaft at the lower end of the supply-chute, having claws to project above the latter, an arm projecting from the shaft, and suitable mechanism connecting said follower with the arm of said shaft, substantially as set forth.

15. In a machine for building picket fences, in combination with a picket-chute, the wire-twisting mechanism, a picket-carrier at and operating transversely to the lower end of the chute, and means for supporting the upper ends of the pickets, substantially as and for the purpose set forth.

16. In a machine for building picket fences, the combination of a picket-carrier having a pocket to receive the lower ends of the pickets, means for supporting the upper ends of the pickets, means for depositing a picket in the pocket, and the wire-twisting mechanism, to which the picket is conveyed by the carrier, substantially as set forth.

17. In a machine for building picket fences, the combination of a lower picket-carrier, an upper picket-carrier, a chute for supplying a picket in upright position to said carriers, and the wire-twisting mechanism, to which a picket is conveyed in upright position by the carriers, substantially as set forth.

18. In a machine for building picket fences, a chute for supplying pickets in upright position, a lower picket-carrier consisting of a swinging arm, a device at the outer end thereof adapted to receive a picket from the chute, and means for supporting the upper ends of the pickets, substantially as set forth.

19. In a machine for building picket fences, a picket-carrier consisting of a swinging arm, and a notched support attached thereto to

provide a pocket for a picket, substantially as set forth.

20. In a machine for building picket fences, a picket-carrier consisting of a swinging arm, and a notched support adjustably attached to said arm, substantially as set forth.

21. In a machine for building picket fences, a picket-carrier consisting of a swinging arm, a notched support attached to said arm, a cross-strip applied to said support at one side of the notch, and an upwardly-extending plate applied to the support at the other side of the notch, substantially as set forth.

22. In a machine for building picket fences, in combination with a lower picket-carrier, an upper picket-carrier consisting of a swinging arm, a hooking curved member secured thereto, which keeps the pickets from falling in advance of the carrier, and a pin projecting laterally from said member, substantially as set forth.

23. In a machine for building picket fences, in combination with the picket-carriers, a chute having means for depositing a picket in said carriers, consisting of a gravitating-catch, means for actuating the same, and a detent actuated by said catch, substantially as and for the purpose set forth.

24. In a machine for building picket fences, in combination with the picket-carriers, a chute having means for depositing a picket in said carriers, consisting of a gravitating Y-shaped catch having a pendent stem, means for engaging said stem, and a detent actuated by said catch, substantially as and for the purpose set forth.

25. In a machine for building picket fences, the combination of a rock-shaft carrying a rock-arm, a chute, catches at the lower end of said chute adapted to be moved by said arm to release a picket in said chute, and a picket-carrier in which a picket is deposited, substantially as set forth.

26. In a machine for building picket fences, the combination of an upper and a lower picket-carrier, the latter being adapted to move in advance of the former, a rock-shaft, means of connection between the two picket-carriers, means of connection between the upper picket-carrier and the shaft, and the devices operated by the shaft, substantially as set forth.

27. In a machine for building picket fences, the combination of a picket-carrier, a strip carried at an angle thereto, provided with a slot at one end, a rock-shaft having a pin engaging in said slot, the carrier, when in normal position, presenting the slot at an incline to the pin, and the devices operated by the shaft, substantially as and for the purpose set forth.

28. In a machine for building picket fences, the combination of a picket-carrier having a swinging arm, a strip on the arm at an angle thereto adjustable transversely and longitudinally with relation thereto and having a slot, a rock-shaft having a pin engaging in

said slot, the carrier, when in normal position, presenting the slot at an incline to the pin, and the devices operated by the shaft, substantially as and for the purpose set forth.

5 29. In a machine for building picket fences, the combination of the picket-carriers and means for actuating one in advance of the other, consisting of an operating rock-shaft, a rod operated by said shaft and pivotally
10 connected with one of the carriers, another rod connected with the shaft and provided with a slot, and a pin on the other of said carriers engaging in said slot, substantially as and for the purpose set forth.

15 30. In a machine for building picket fences, the combination of the picket-carriers, a rock-shaft operated by one of them, cams on the rock-shaft, the twisters provided with bobbins, and brakes to act on the bobbins and
20 engaged by said cams to release them, substantially as and for the purpose set forth.

31. In a machine for building picket fences, the combination of the picket-carriers, divided twisters, a fixed support, a swinging
25 support, each support carrying a half of each twister, means for moving the swinging support, and gravitating dogs or detents to engage and hold one-half of each twister when the divisions of the twisters are in line, sub-
30 stantially as and for the purpose set forth.

32. In a machine for building picket fences, the combination of the divided twisters, vertical supports, one for each half of said twist-
35 ers, one of which supports is movable, the vertically-disposed picket-carriers, and connection between the picket-carriers and the movable support, whereby the latter is moved out simultaneously with the movement of the
40 picket-carriers, substantially as and for the purpose set forth.

33. In a machine for building picket fences, the combination of the framing, upper and lower horizontal guideways for the completed
45 fencing, supported above and below from the framing, means for moving the fencing along the guideways, and removable side strips or guides supported from above and below, sub-
stantially as set forth.

34. In a machine for building picket fences,
50 the combination of upper and lower guideways for the pickets, and lifters working through the lower guideway to engage the lower ends of and to adjust pickets of different lengths, so that they will be in line at top,
55 substantially as set forth.

35. In a machine for building picket fences, the combination of the upper and lower guide-
ways for the completed fencing, and lifters pivoted below the lower guideway and adapt-
ed to be projected above the same and to en- 60
gage the lower ends of the pickets, substan-
tially as and for the purpose set forth.

36. In a machine for building picket fences, the combination of the upper and lower guide-
ways for the completed fencing, lifters adapt- 65
ed to project above the lower guideway and engage the lower ends of the pickets, springs for keeping the lifters so projected, and means for retracting the lifters below the lower
guideway, substantially as and for the pur- 70
pose set forth.

37. In a machine for building picket fences, the combination of the carrying-truck, a
standard supported therefrom, the frame-
work carrying the operating parts of the ma- 75
chine proper pivotally supported above its middle on said standard, and the horizontal guide for the fencing fixed to the frame-work, substantially as and for the purpose set forth.

38. The combination, with the twisting 80
mechanism, of means for supporting the line-wires, consisting of tension-blocks provided with drums for the wire, guides and retaining-
hooks for engaging the wire from the drums and preventing it running off the drums, and 85
a standard to which the blocks are attached by swivels, substantially as and for the purpose set forth.

39. A reel for supplying wire to the bob-
bins of the twisting mechanism in a fence- 90
building machine, constructed with a frame on one side and outwardly-movable arms provided with lateral pins on the other side, and on which the coil of wire is supported, said
arms when retracted permitting the insertion 95
of the coil of wire upon the pins, substantially as set forth.

40. The combination, with a bobbin mount-
ed on a slide, of means for winding the bob-
bin, comprising a suitable frame, a toothed 100
shaft mounted therein, a worm or operating shaft parallel therewith and applied to the bobbin-shaft, and suitable shifting devices, substantially as set forth.

EZRA EDGAR WITTER.

Witnesses:

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