No. 646,112. Patented Mar. 27, 1900.

M. D. TAYLOR.

WIRE FENCE MACHINE.

(Application filed Nov. 24, 1899.)

(No Model.) 10 Sheets—Sheet 1.

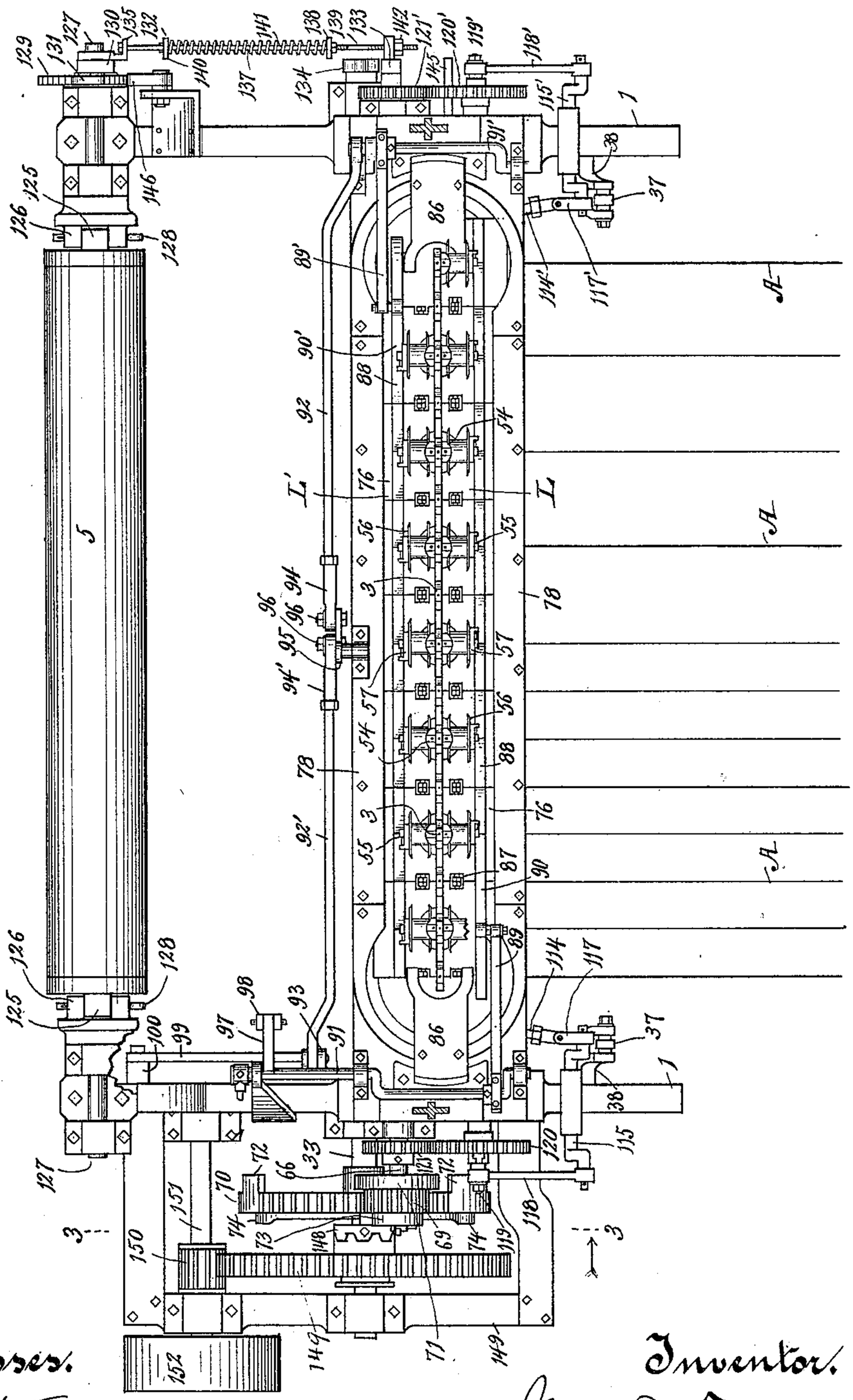

Fig. 1.

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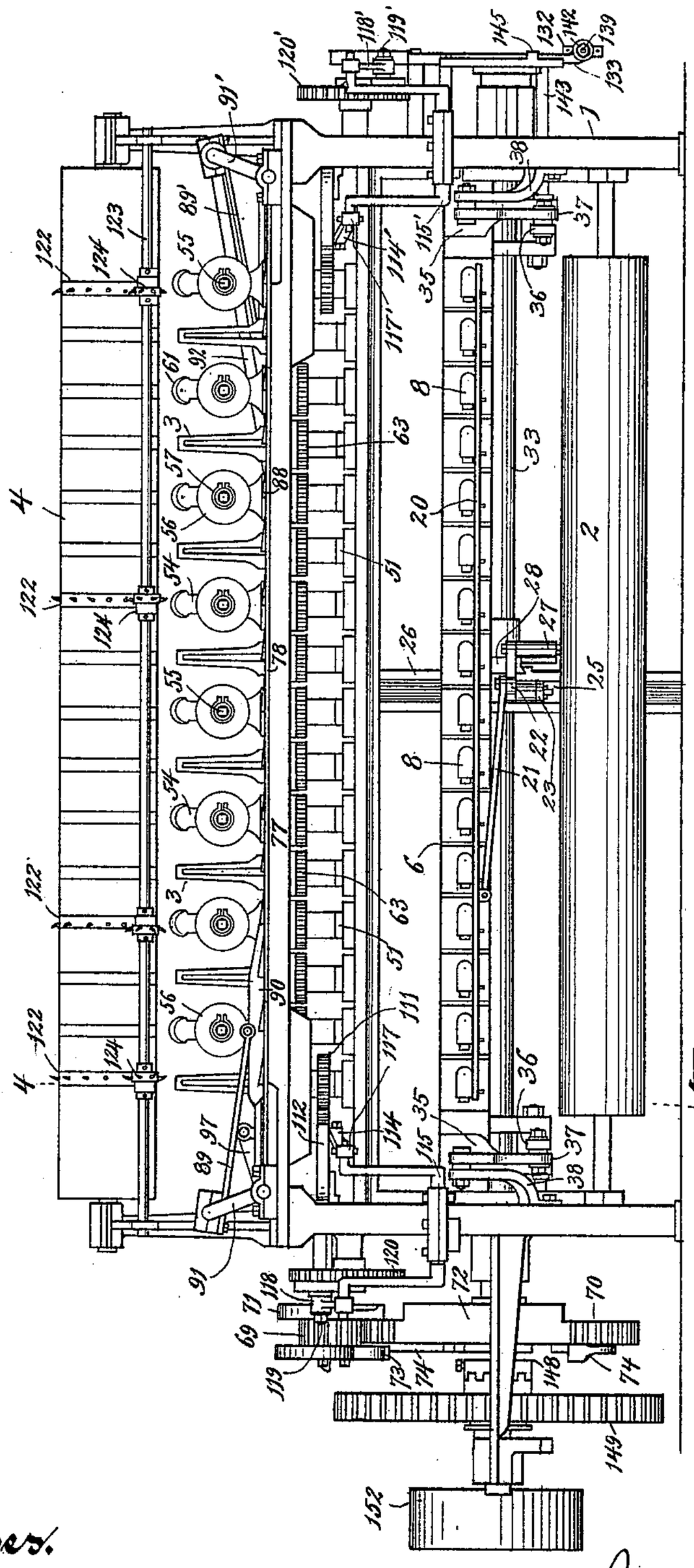
(No Model.) 10 Sheets—Sheet 2.

Fig. 2.



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(No Model.) 10 Sheets—Sheet 3.

Fig. 3.

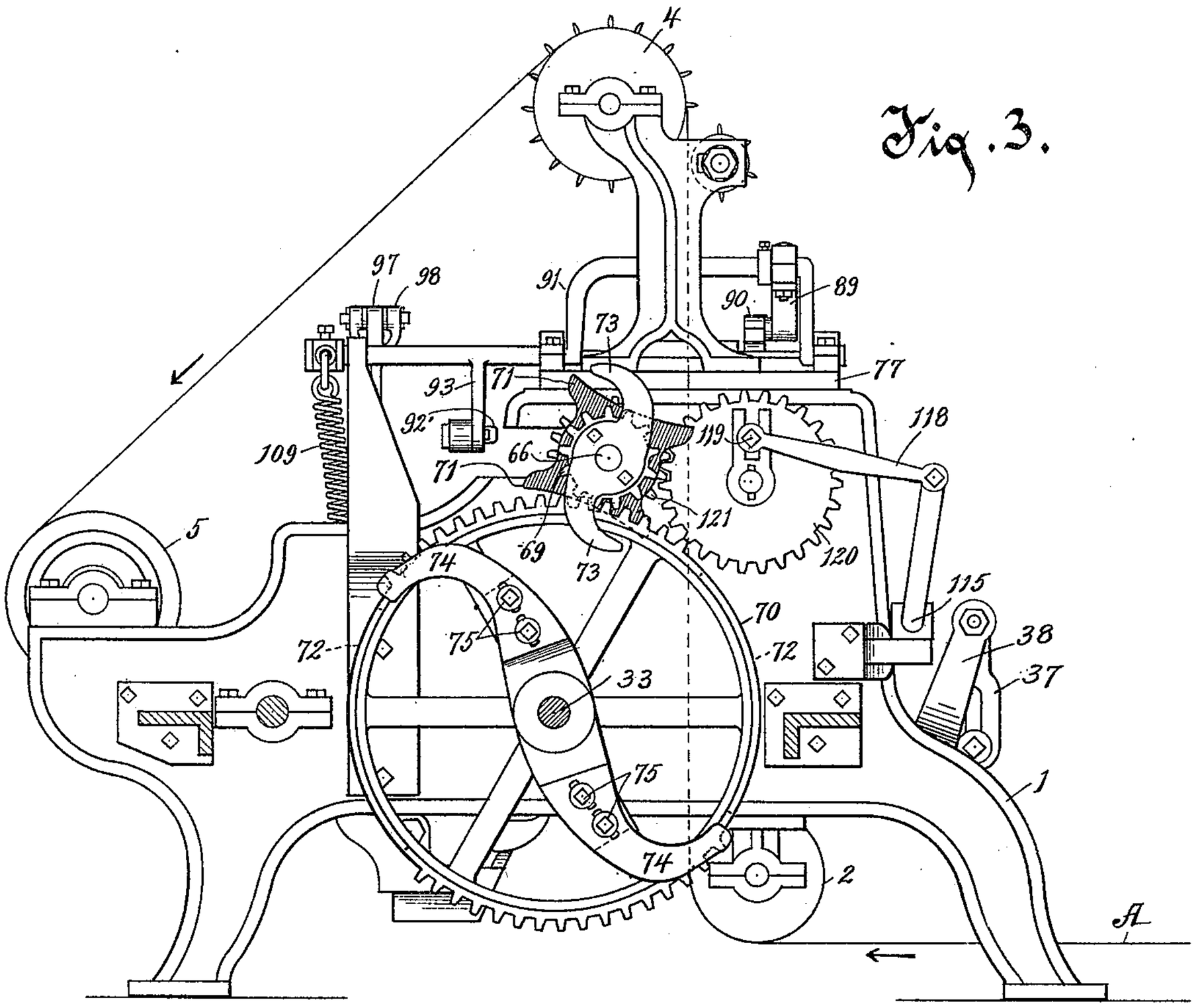

Fig. 7.

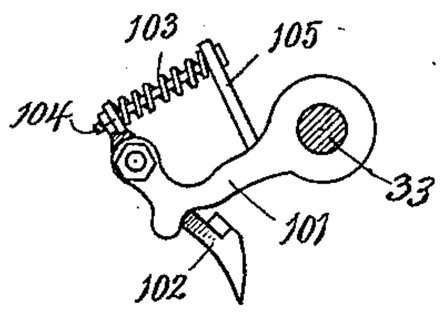

Fig. 6.

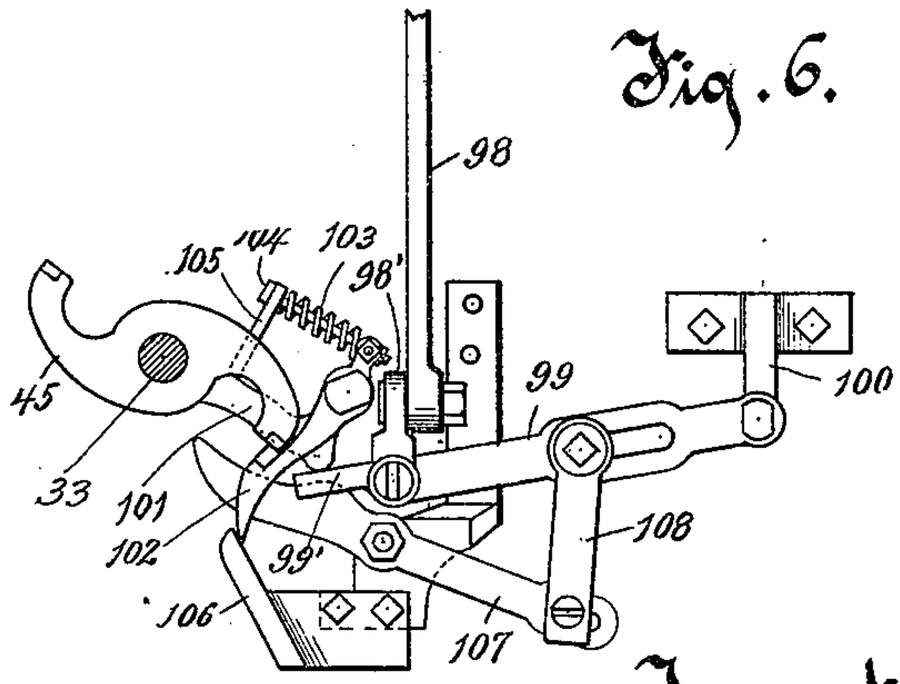

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Fig. 4.

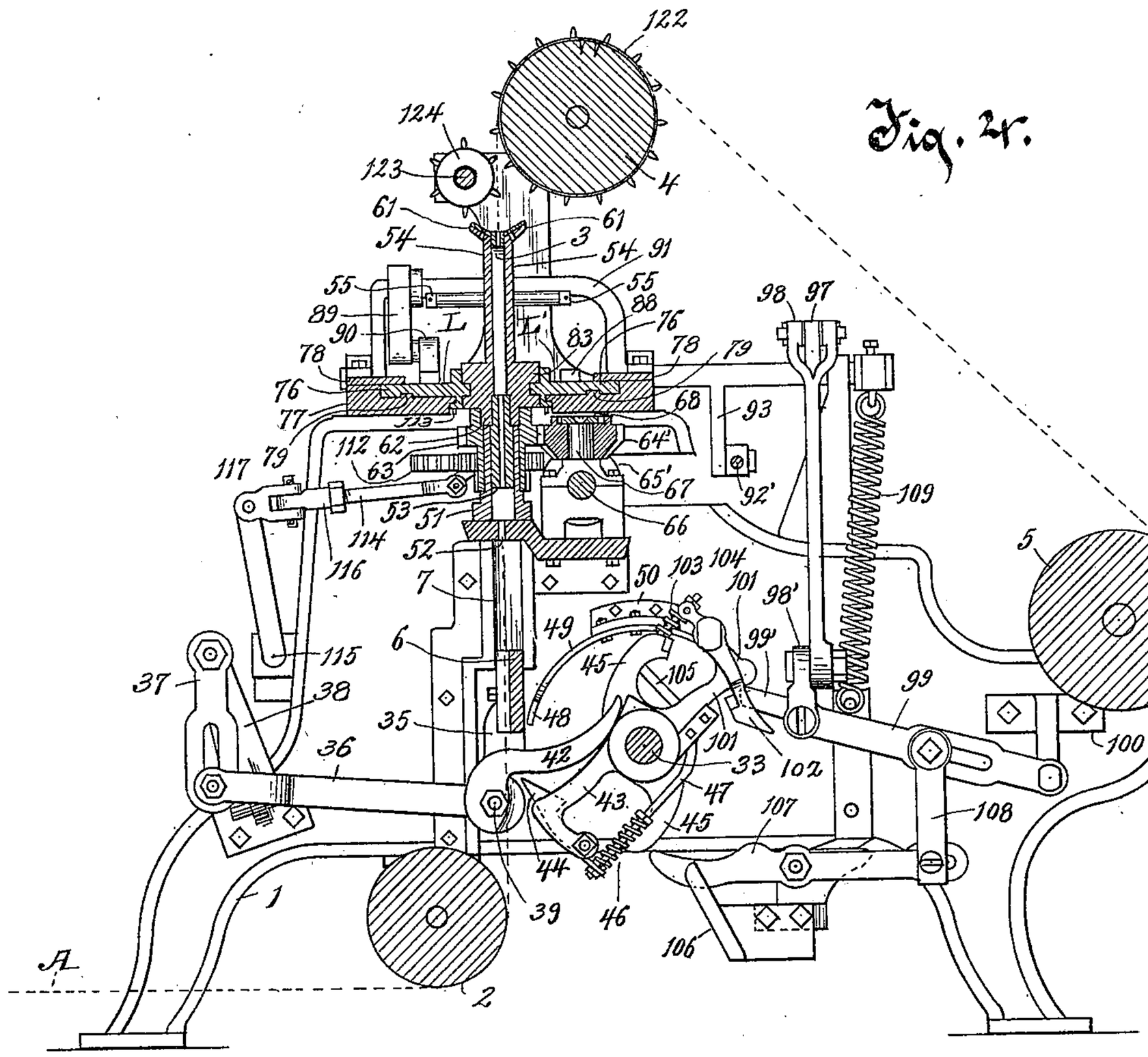

Fig. 5.

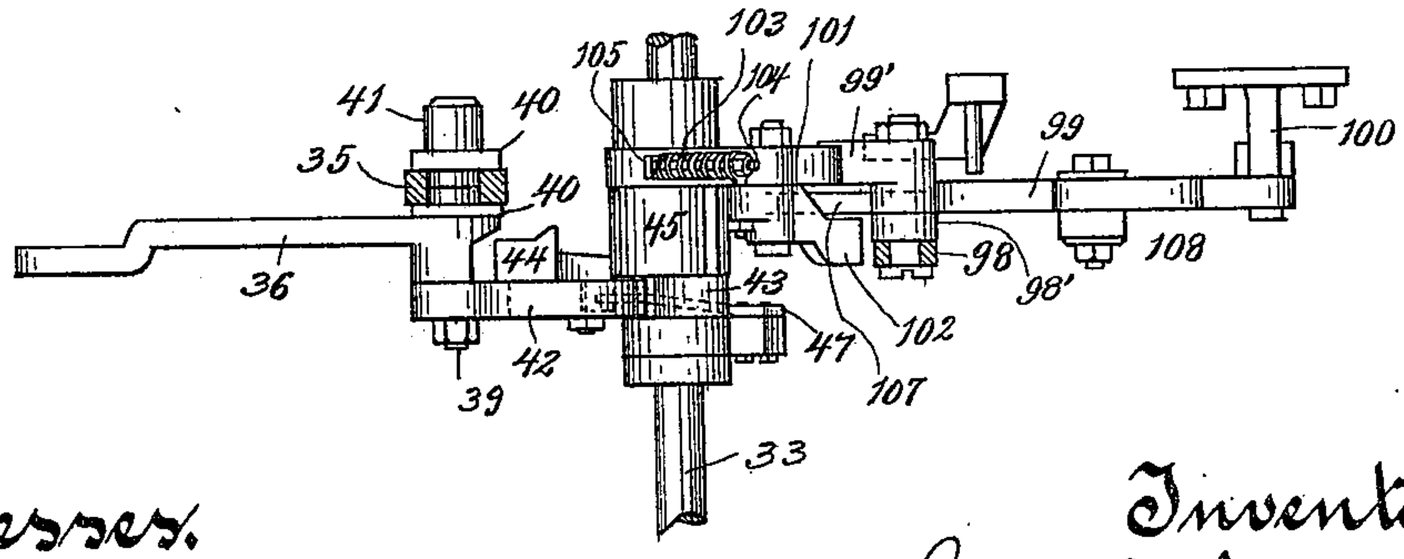

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Fig. 8.

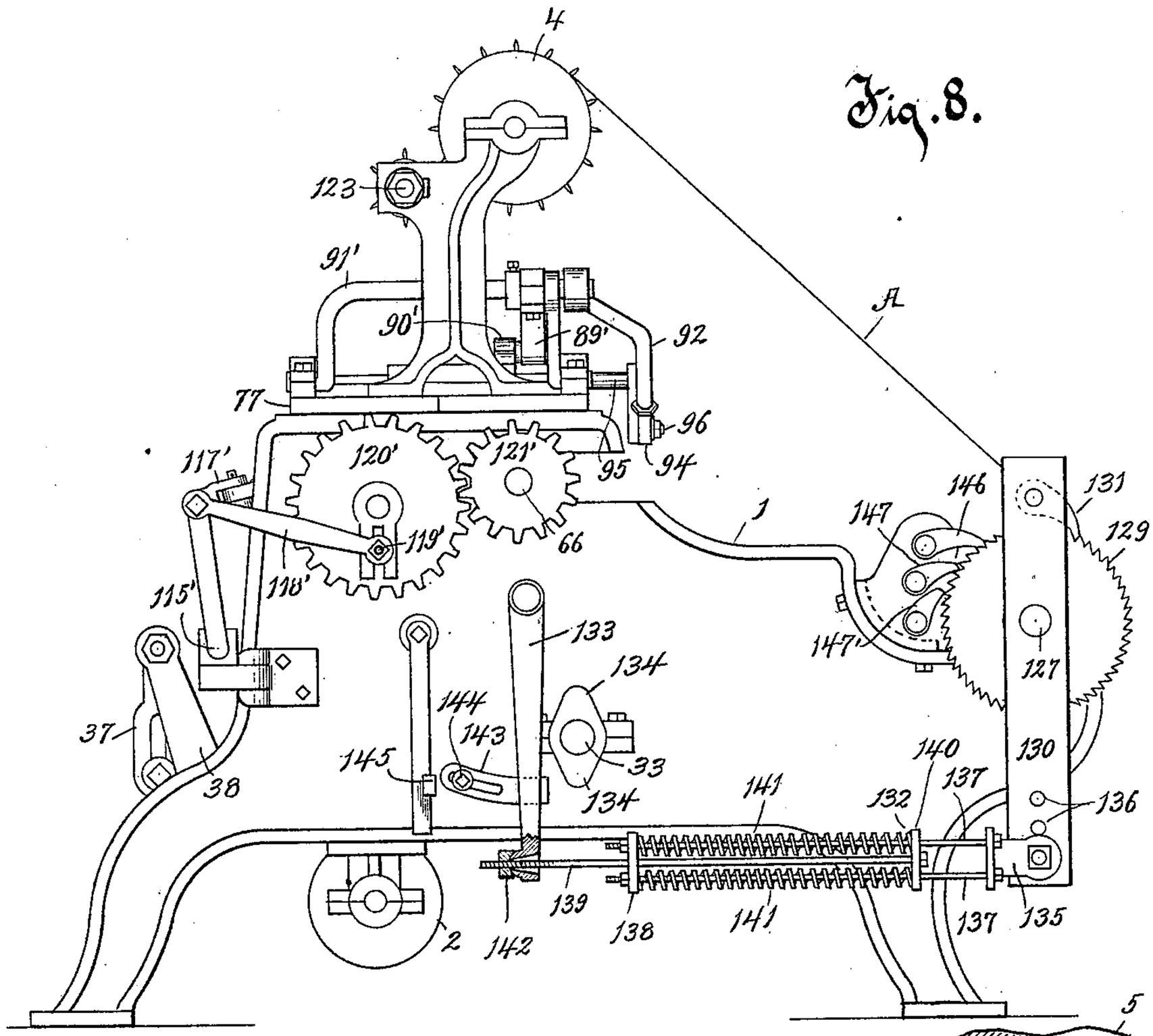


Fig. 10.

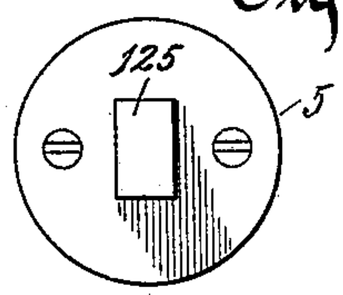


Fig. 11.

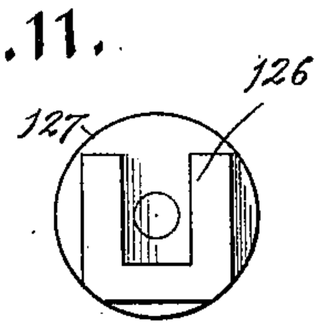
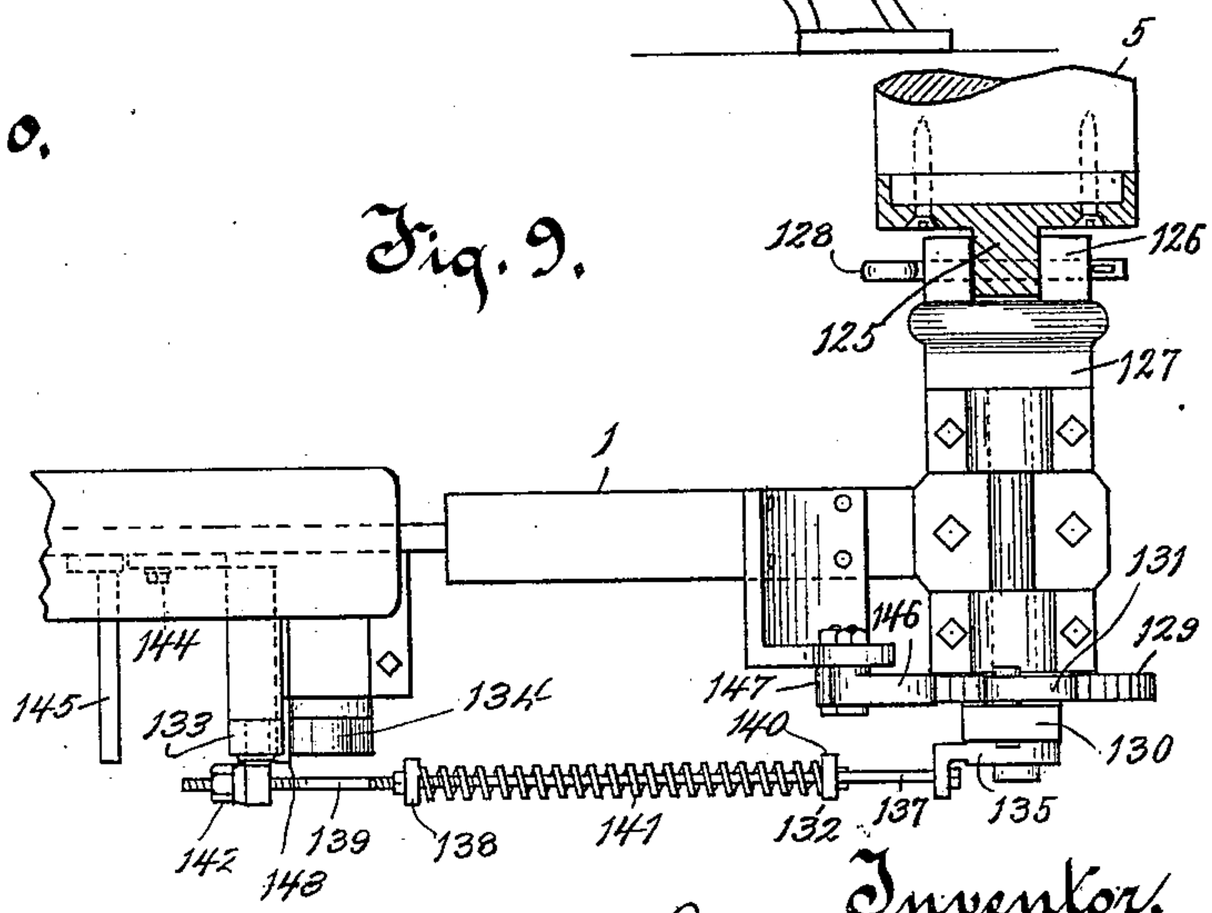


Fig. 9.



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WIRE FENCE MACHINE.

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Fig. 12.

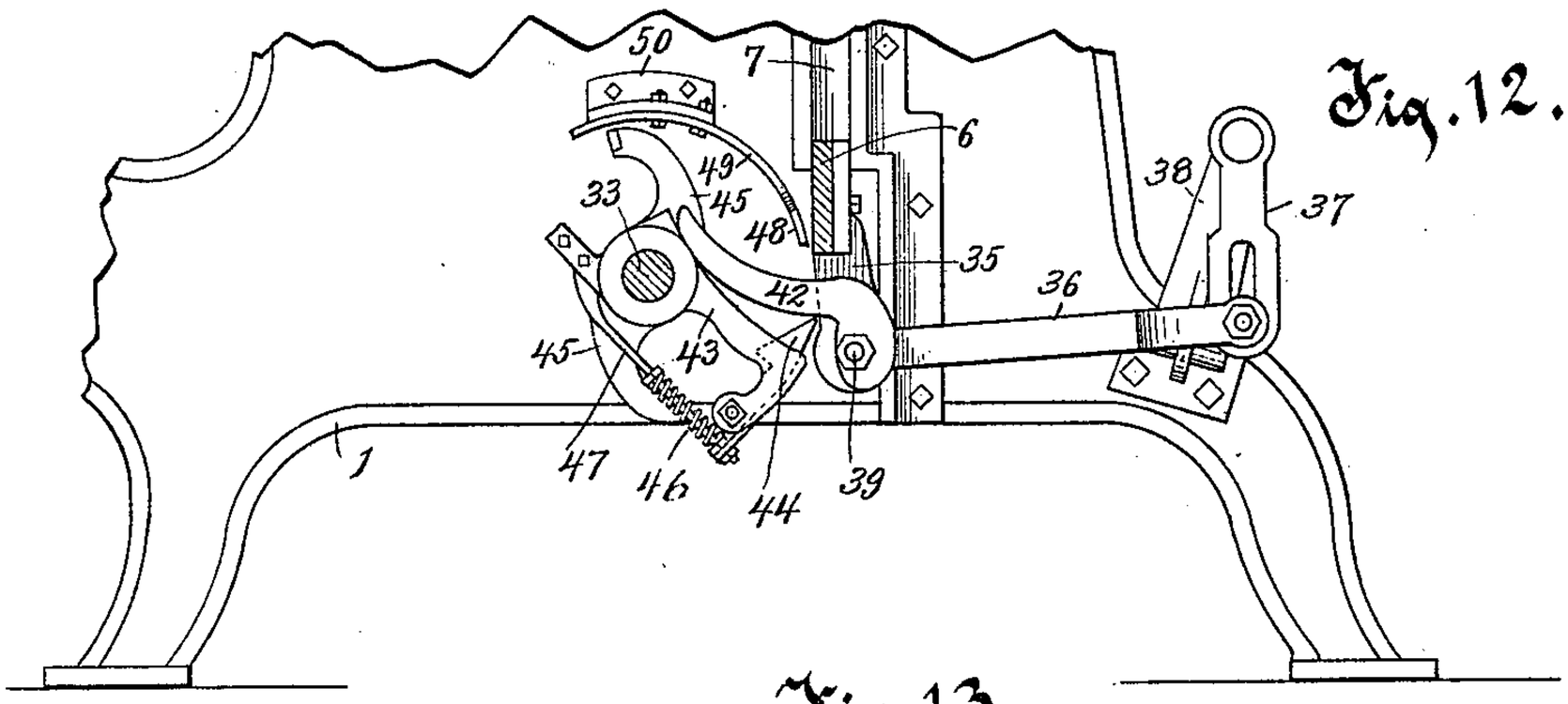
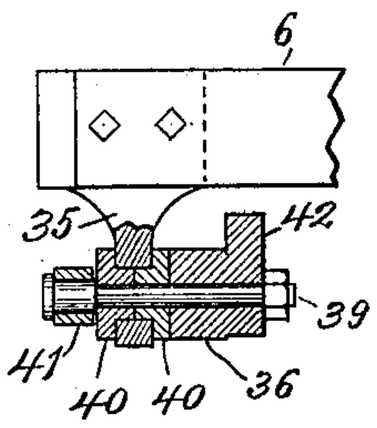


Fig. 13.

Fig. 14.



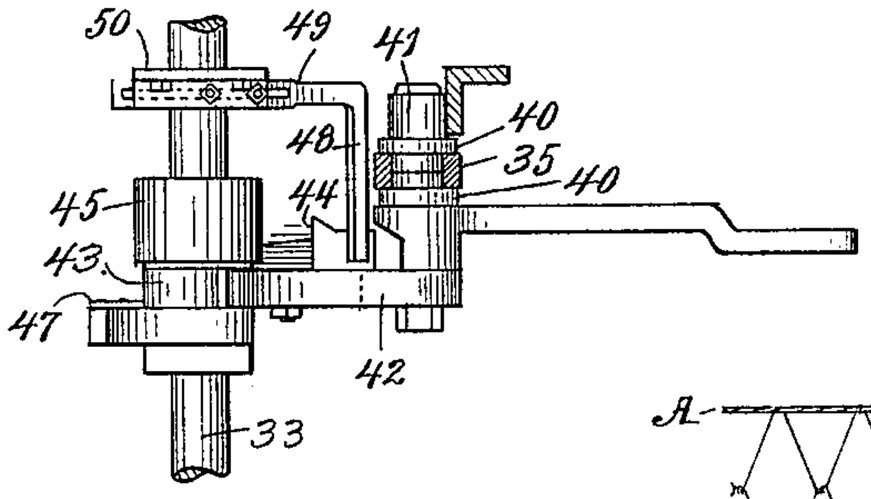


Fig. 32.

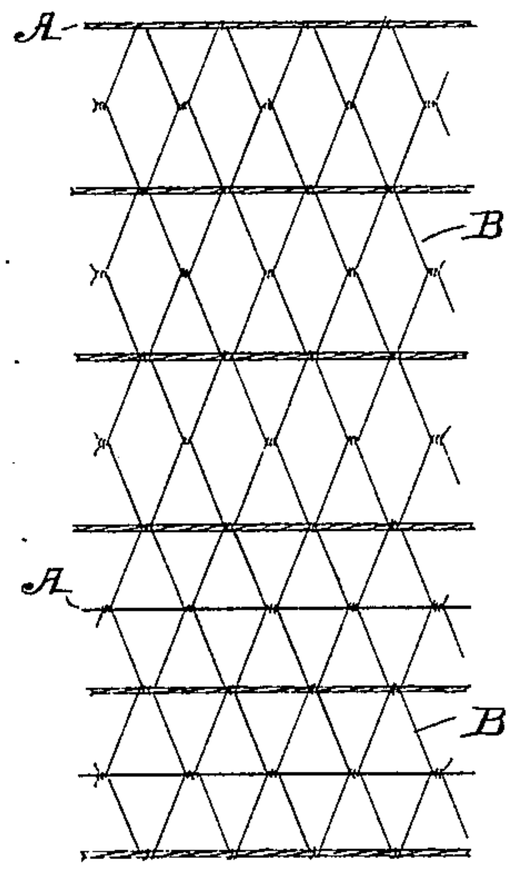


Fig. 33.

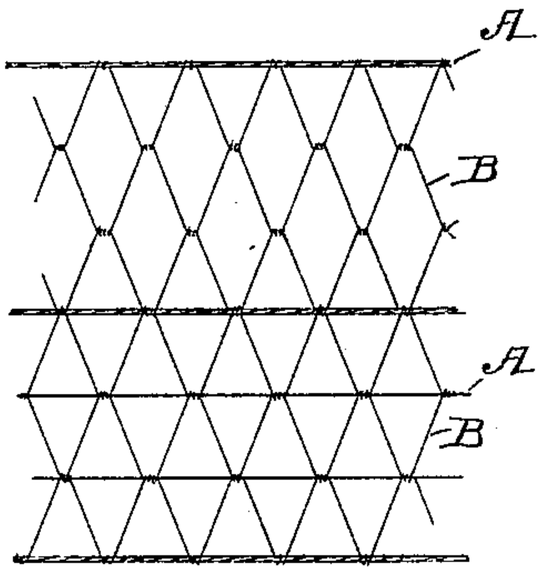
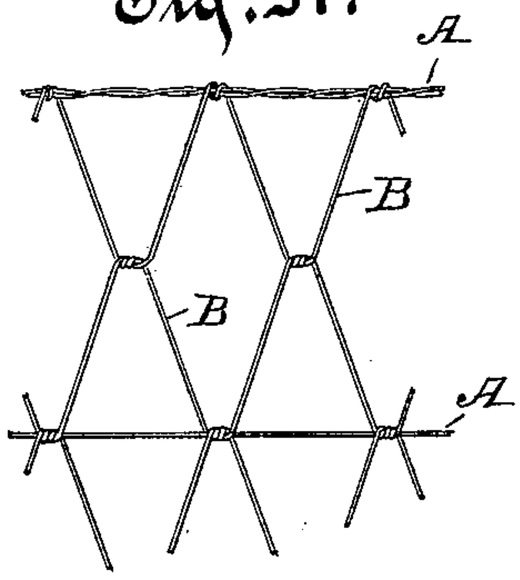


Fig. 31.



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No. 646,112. Patented Mar. 27, 1900.

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WIRE FENCE MACHINE.

(Application filed Nov. 24, 1899.)

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Fig. 15.

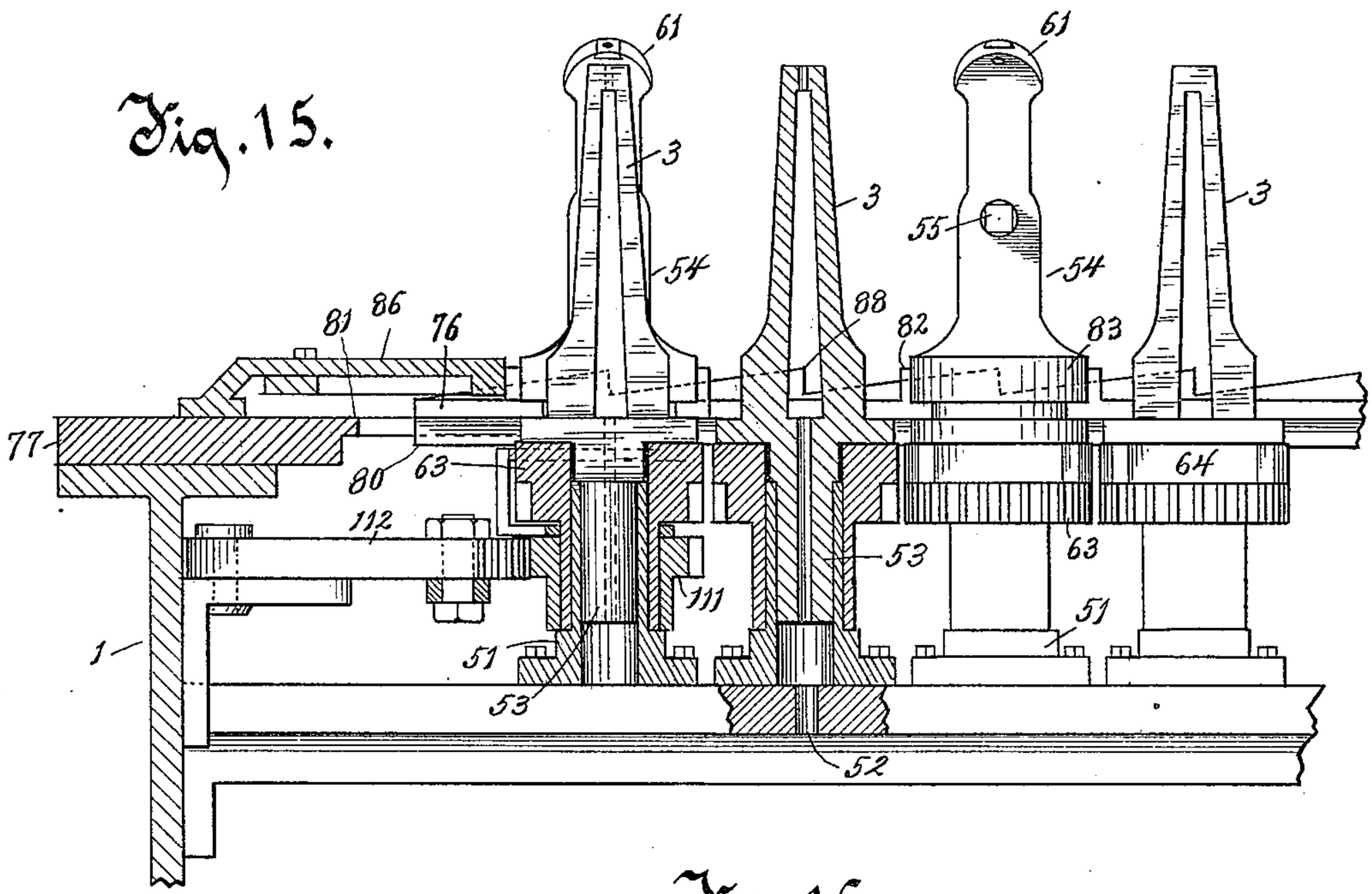

Fig. 16.

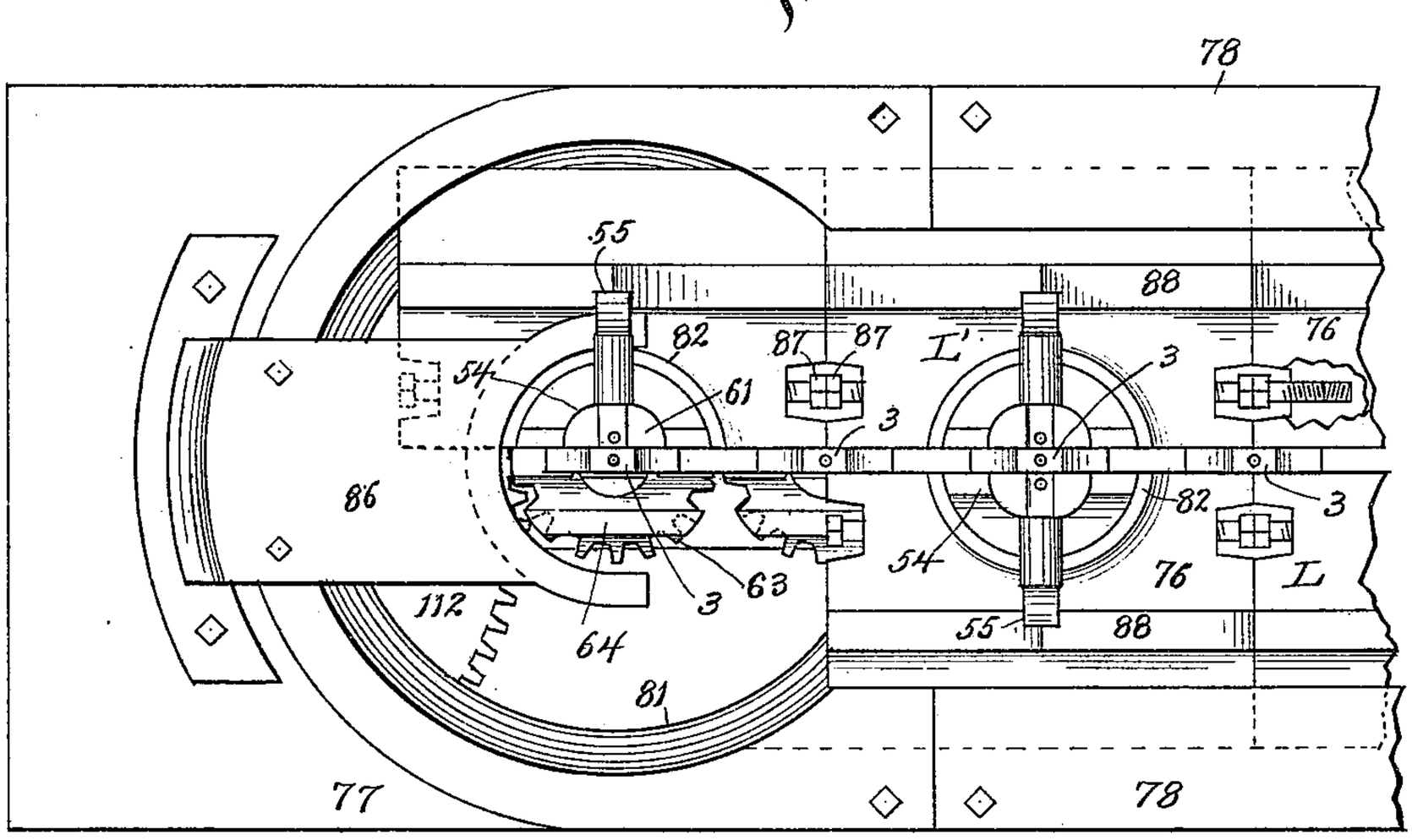

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Fig. 17.

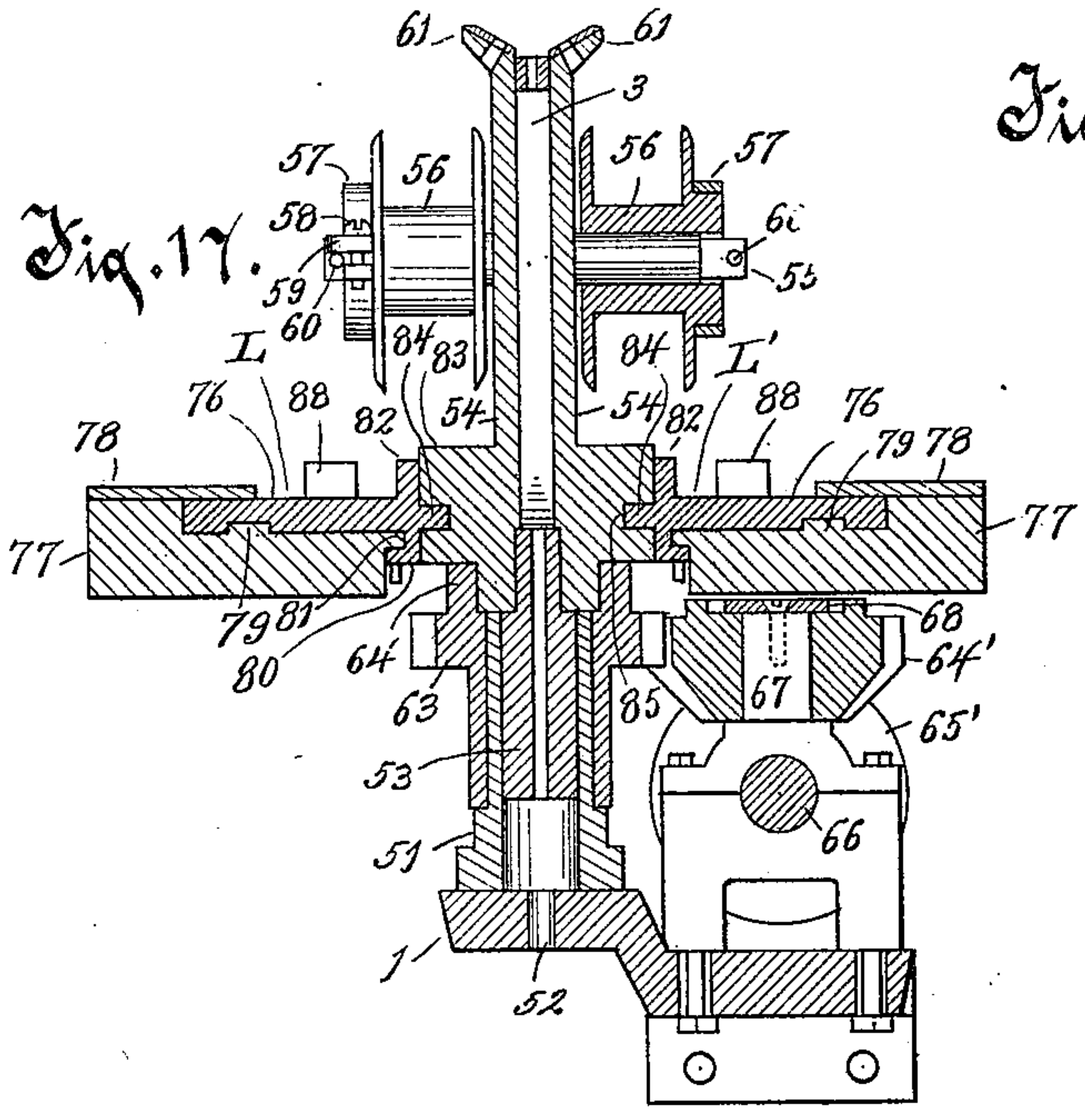


Fig. 18.

Fig. 19.

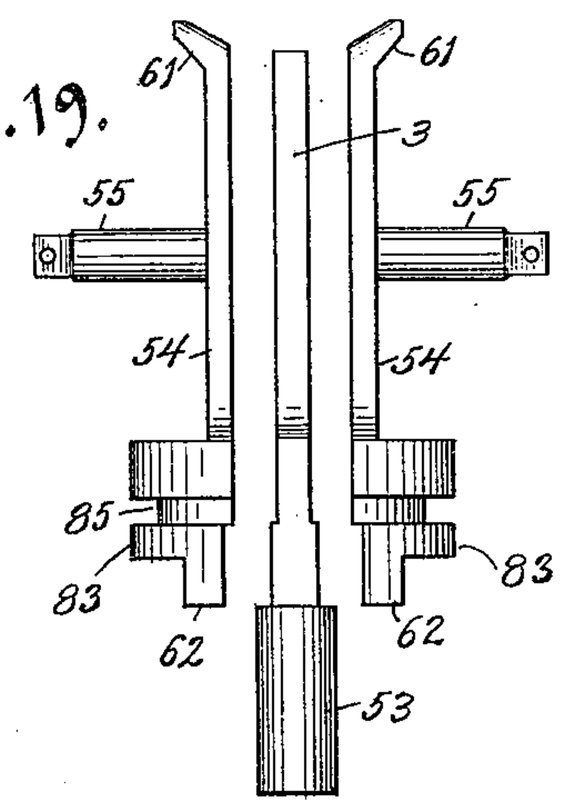
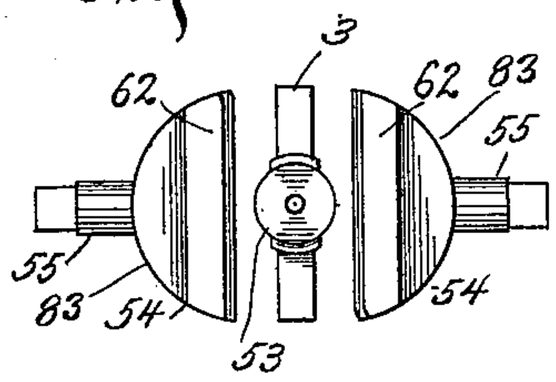


Fig. 20.



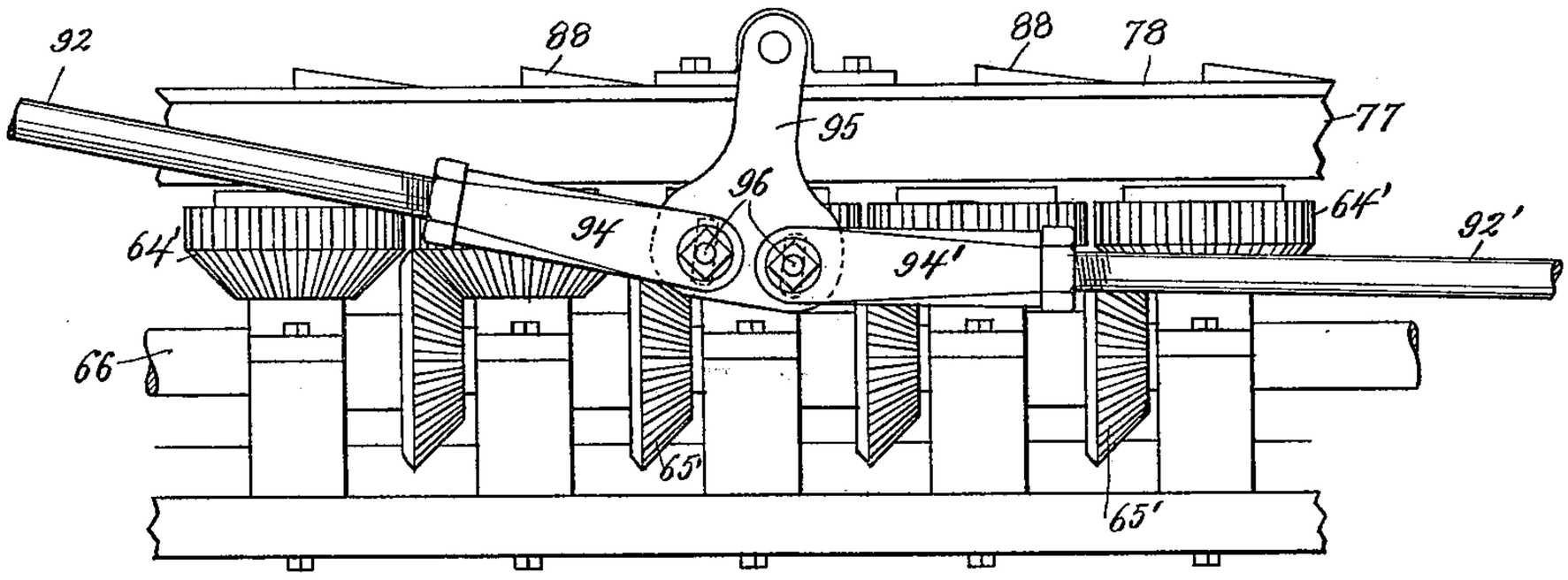
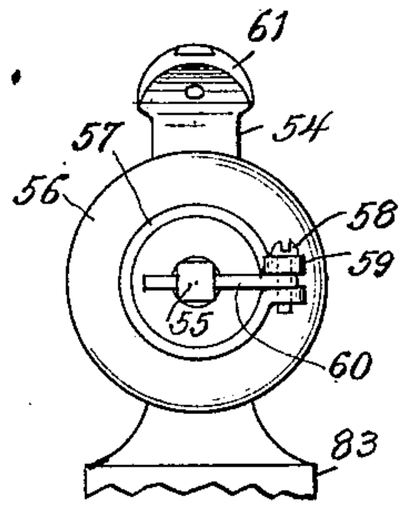


Fig. 21.



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(No Model.) 10 Sheets—Sheet 9.

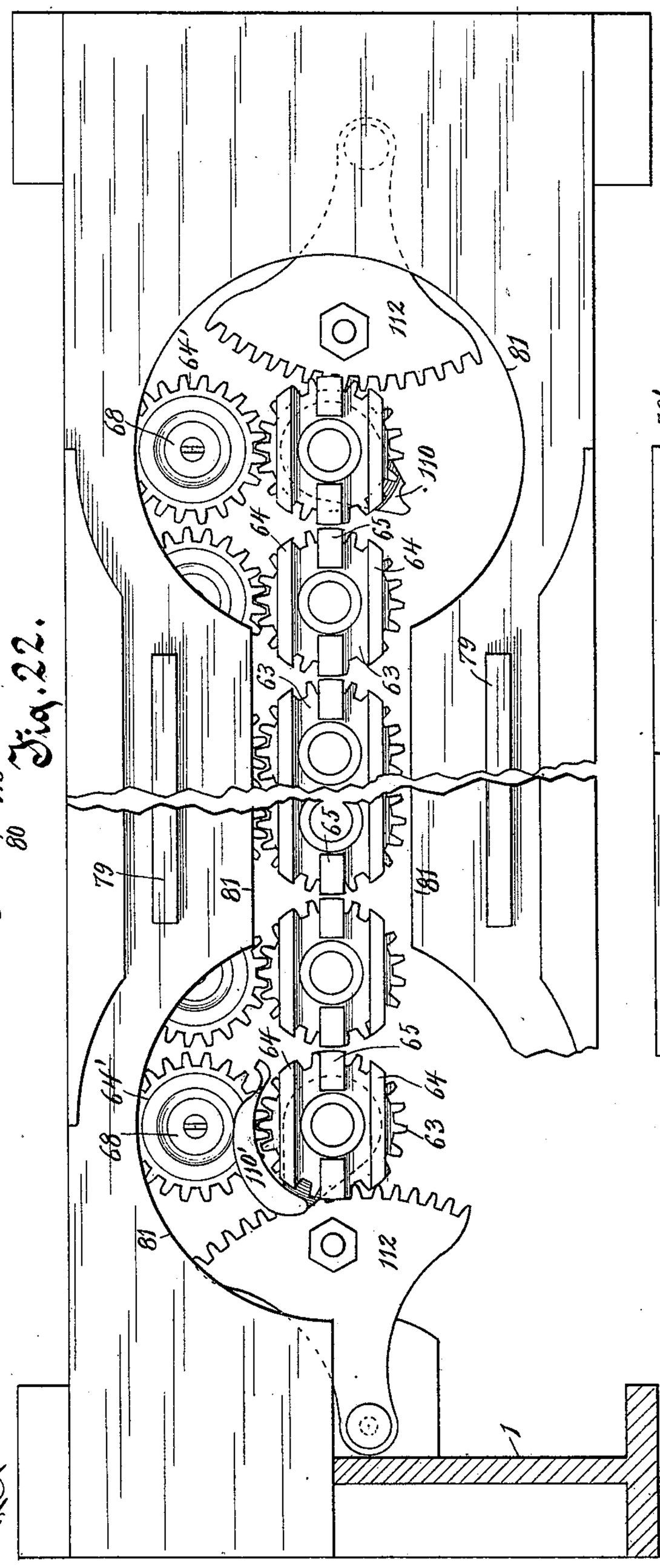

Fig. 24.

Fig. 25.

Fig. 22.

Fig. 26.

Fig. 23.

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(No Model.) 10 Sheets—Sheet 10.

Fig. 29.

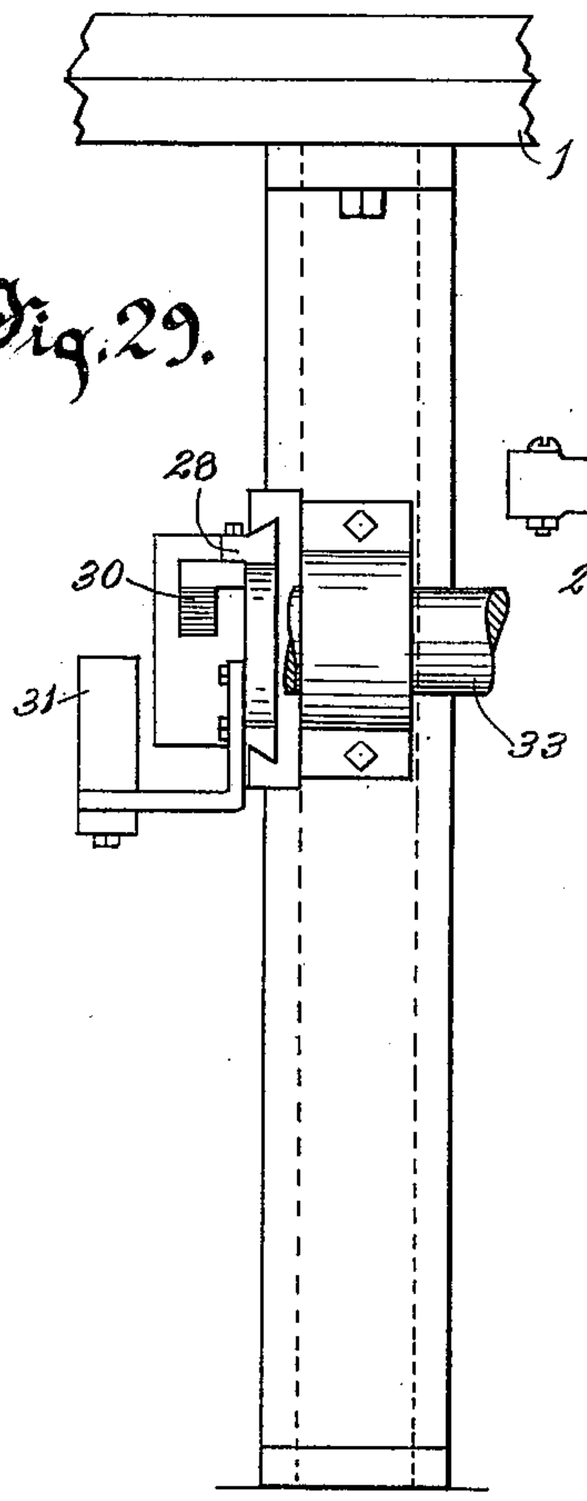


Fig. 27.

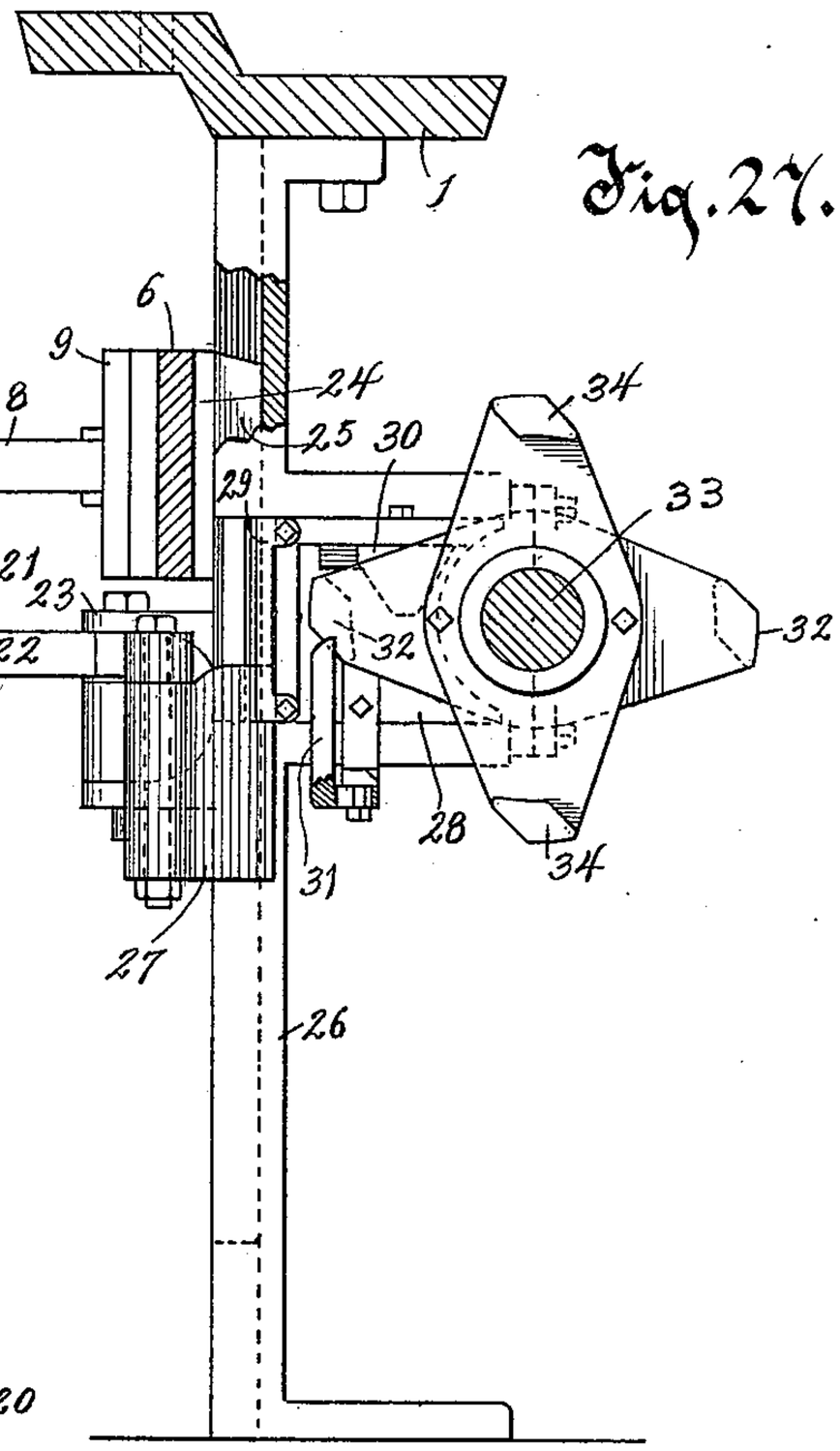


Fig. 30.

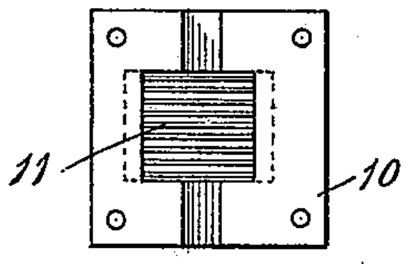
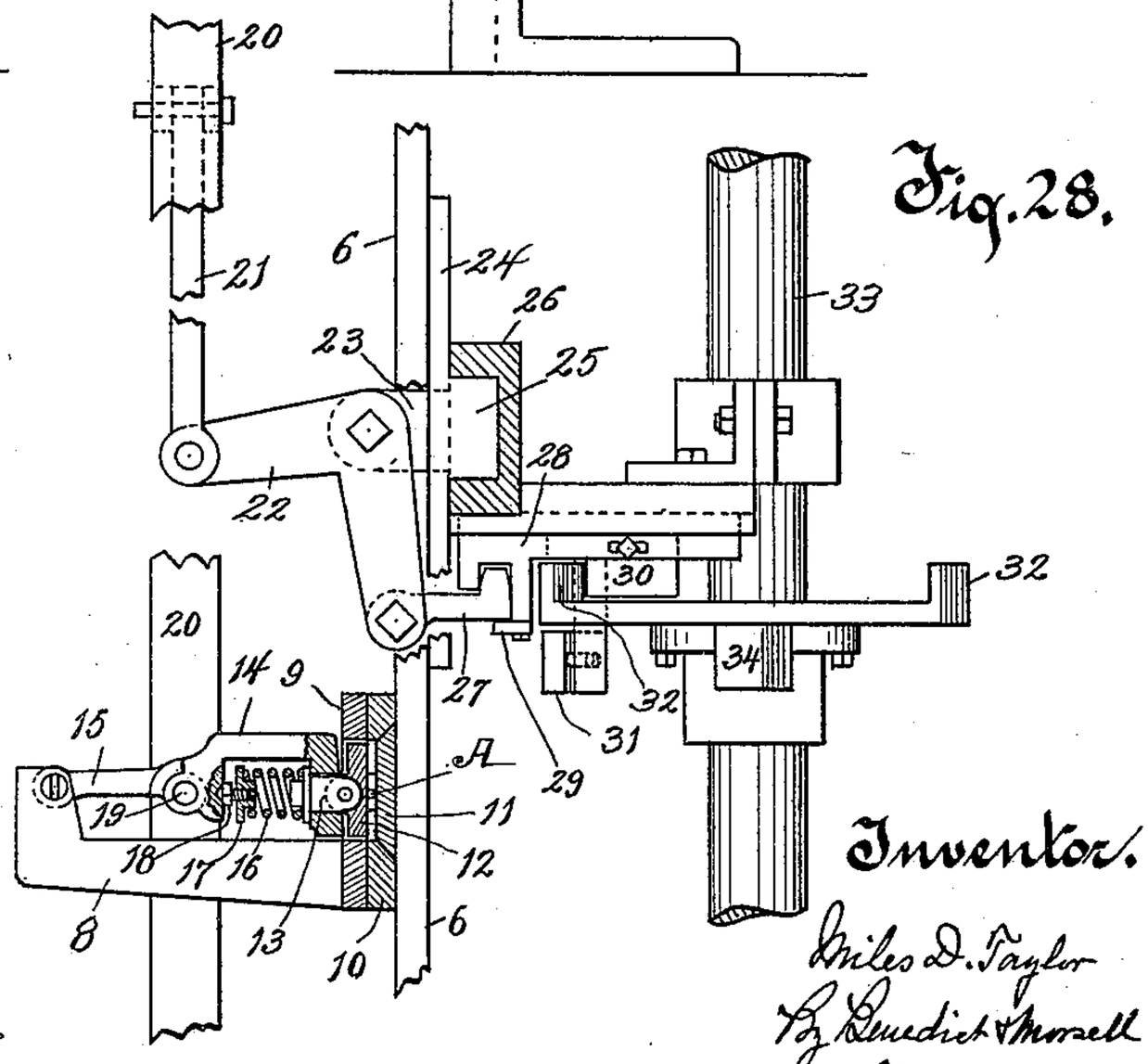


Fig. 28.



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UNITED STATES PATENT OFFICE.

MILES D. TAYLOR, OF JANESVILLE, WISCONSIN.

WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 646,112, dated March 27, 1900.

Application filed November 24, 1899. Serial No. 738,190. (No model.)

To all whom it may concern:

Be it known that I, MILES D. TAYLOR, of Janesville, in the county of Rock and State of Wisconsin, have invented a new and useful Improvement in Wire-Fence Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention relates to machines of a class that are adapted to manufacture wire-fence fabric ready to be secured to posts to form a complete fence. The fabric manufactured by my improved machine has longitudinal strands or cables forming a warp and cross-strands forming a woof, the woof being woven into or so twisted about the warp-cables as to permanently secure them to the warp forming the complete flexible fabric. The warp-cables are substantially straight longitudinally of the fabric, and the cross-strands run obliquely from cable to cable or to engagement with each other between the cables, forming diamond-shaped or triangular open meshes.

The object of the invention is to provide an improved machine of comparatively simple and inexpensive construction that is strong and durable in all its parts and that is capable of feeding and weaving the wire supplied to it into a complete fence fabric in any of several analogous forms, all of which forms are attractive to the eye and are adapted for ready use, and of winding the completed fence fabric up into rolls convenient for transportation and for building into a fence.

The invention consists of the machine, its parts and combinations of parts, as herein described and claimed, or the equivalents thereof.

In the drawings, Figure 1 is a top plan view of a machine embodying my improvements, except that a fabric-carrying roll and a guide located above the principal part of the machine are omitted to exhibit the principal parts of the machine completely. A minor part of the construction is broken away to exhibit an otherwise hidden part below. Fig. 2 is an elevation of my improved machine as seen from the front or from that side which is at the bottom of the sheet as shown in Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1 looking toward the right, the figure showing an end view of principal parts of the machine. Fig. 4 is a section on line 4 4 of Fig. 2 looking toward the left, showing many of the parts of the machine seen on that section, but some parts being omitted for clearness of representation of the parts shown. Fig. 5 is a top plan of parts of the mechanism shown in Fig. 4 in the foreground, some parts being in section. Fig. 6 shows with clearness in elevation parts found also in Fig. 4, but in relatively-different positions. Fig. 7 is a detail of parts shown obscurely in Figs. 4, 5, and 6 and in a position reverse to the positions in Figs. 4 and 6. Fig. 8 is an elevation of the machine at the end at the right in Figs. 1 and 2, parts being in section for convenience of illustration. Fig. 9 is a view of a fragment of the fabric-winding roll in section and related operating mechanism, the mechanism being that shown at the right and near the bottom in Fig. 8. Figs. 10 and 11 show details of the construction of the mechanism in Fig. 9. Fig. 12 shows a detail of the warp-wire-feed mechanism located on the inside of the frame at the right in Figs. 1 and 2. Fig. 13 is a plan, parts in section, of a detail of the mechanism shown in Fig. 12. Fig. 14 is a detail, mostly in section, of mechanism shown in Figs. 12 and 13. Fig. 15 is a view, largely in section, of a fragment of the frame, the bed thereon, some of the warp-wire or cable guides, two of the woof-wire carriers, and some related mechanism. Fig. 16 is a top plan view of a fragment of the bed and of some of the cable-guides and three of the woof-wire carriers thereon with related devices and mechanism. Fig. 17 is a vertical section transversely through the bed, a cable-guide, two woof-wire carriers, the actuating traveling blocks or travelers, and some related mechanism. Fig. 18 is a detail in elevation of a fragment of the frame and bed and of mechanism for revolving and causing the travel of the woof-wire carriers on the bed. Fig. 19 is a detail of a pair of woof-wire carriers and the sometime-interposed cable or warp-wire guide, the parts being disassembled for clearness of illustration. Fig. 20 is a plan view from below of the devices shown in elevation in Fig. 19. Fig. 21 is a detail of a part of a woof-wire carrier with its spool and wire-tension device in the foreground. Fig. 22 is a top plan view of the

extremities of the bed, it being broken away medially and the central portion being omitted, and mechanism therewith for rotating the warp-wire guides and the woof-wire carriers and for guiding and advancing the woof-wire carriers. A portion of the bed is omitted and a part of the supporting-frame is shown in section. Figs. 23 and 24 show in detail devices seen in Fig. 22 at the respective ends of the bed for advancing or causing the travel of the blocks or travelers in a semicircular direction at the ends of their route of travel. Fig. 25 is an under side view of two of the traveling blocks or travelers, the top view of which is shown in Fig. 16. Fig. 26 is an end view of one of the traveling blocks or travelers. Fig. 27 is an elevation, parts being in section, of mechanism for gripping and advancing or feeding the cables or warp-wires into and through the machine. Fig. 28 is a plan view, parts being in section, of substantially the same mechanism shown in elevation in Fig. 27. Fig. 29 is an elevation of some of the mechanism shown in Fig. 27 at a right angle thereto. Fig. 30 is an inner end view of a device shown in Fig. 28 for gripping a cable or warp-wire. Figs. 31, 32, and 33 show fragments of wire-fence fabric in forms produced by my improved machine.

In the drawings, 1 represents the frame of the machine, which should be of such size and form as to suitably adapt it for the support of the operative mechanism.

A machine of the character of my improved machine can be made of any width desired for the manufacture of very wide fence fabric; but in the drawings I have shown a machine of a width sufficient to manufacture fabric somewhat wider than is ordinarily required for a fence, and this machine may be used for manufacturing a fabric of such width or for manufacturing a fabric of any narrower width, as desired.

In manufacturing wire-fence fabric with this machine the cables or warp-wires A A are supplied to the machine in parallel strands in such numbers as are desired for the fabric to be woven. These warp-wires A A run under the idle roll 2, Figs. 1, 2, 3, and 4, and thence upwardly through the warp-wire guides 3 3, and thence after being interwoven in the guides by the woof-wires over the idle fabric-carrying roll 4, and thence to the fabric-winding roll 5, on which the wire-fence fabric is wound up. The warp-wires or cables A A may consist of single straight steel wires or may be severally formed of twisted wires, as shown in Figs. 31, 32, and 33. It is desirable to have extra strong strands at the two edges of the fabric especially, and for this purpose the twisted strands or warp-wires are desirable, and such twisted strands or wrap-wires may be used through the fabric at intermediate lines or the single-wire strands may be employed exclusively or intermediate of and with the twisted strands.

For advancing or feeding the warp-wires through the machine a warp-feed bar 6 is employed, which bar is reciprocable vertically in ways 7 7 therefor in the frame, Figs. 2, 4, 12, 27, and 28. This feed-bar 6 is located directly below the warp-wire guides 3 3 and is adapted by its upward movement to carry the warp-wires when gripped to it upwardly through the guides 3.

For feeding the warp-wires into the machine it is necessary that the wires should be gripped and held firmly to the bar 6 during its upward movement. For this I employ devices and mechanism as follows: A series of laterally-projecting studs 8 8, Figs. 2 and 28, each provided with a flat foot 9, are bolted to the side of the warp-feed bar 6. A base-piece 10 is preferably employed, interposed between the foot 9 of the stud and the bar 6 to support the stud at a little distance from the bar. The foot 9 and the base-piece 10 are each provided with a central aperture, and a grip-plate 11, preferably of steel, with a roughened face, is placed in the base-piece 10, with its face exposed through the aperture, and a grip-block 12 is fitted loosely in the aperture in the foot 9 and is swiveled on a block-stem 13. The block-stem 13 is movable endwise through the overturned extremity of the arm 14, which arm 14 is hinged at its other extremity to an arm 15, and this arm 15 at its distant extremity is hinged in the overturned outer extremity of the stud 8, the two arms 14 and 15 forming as thus mounted a toggle-joint lever. An expansion-spring 16 is interposed between the end of the stem 13 and an adjustable resistance-block 17, which block is provided with a screw 18, turning into the block and resisting against an opposed part of the arm 14. The spring 16 bears at one extremity against a shoulder or collar on the stem 13. The mounting of the grip-block 12 in the arm 14 is adapted by means of the spring 16 to hold the block 12 yieldingly toward the grip-plate 11. The toggle-joint, including the arms 14 and 15, is adapted by swinging the joint laterally to release the block 12 from its grip on the warp-wire A, which passes upwardly and is held between the plate 11 and the block 12. One of these gripping devices is located on the feed-bar 6 directly below each of the warp-wire guides 3, mounted in the plane of the bed of the machine above. The pivot-pin 19, that hinges the arms 14 and 15 together in a toggle-joint, extends through the connecting-rod 20, thus connecting all these toggle-joints and compelling synchronous movement thereof. A pitman 21 is pivoted at one end to the connecting-rod 20 and at the other end to one arm of a bell-crank 22, which bell-crank is pivoted at its angle on a lug 23, fixed on a plate 24, secured to the bar 6, and provided with a bearing-block 25, that travels vertically in ways therefor in a standard 26, forming a part of the frame. The other extremity of the bell-crank 22 is provided with a plate-link 27, hinged to the arm of the bell-crank and provided with a laterally-turned extrem-

ity forming a head that fits movable vertically in a groove therefor in the horizontally-reciprocable slide 28. A strap-guard 29, secured to the slide 28 by screws, holds the plate-link 27 in place movably in the slide. The slide 28 is mounted reciprocable horizontally in ways therefor in the frame. The slide is provided with an inner tappet 30 and an outer tappet 31, which are severally adjustable laterally thereon by means of screw-bolts through slots in the tappets and turning into the slide. Cams 32 32 on oppositely-extending radial arms on the driving-shaft 33 are adapted to contact with the inner tappet 30 and draw the slide 28 toward the shaft, while cams 34 34 on oppositely-disposed radial arms on the shaft 33 are adapted to contact with the tappet 31 and push the slide 28 laterally away from the shaft 33. It will be understood that the mechanism just described is adapted to reciprocate the connecting-rod 20, and thereby to move the grip-block 12, thus gripping and releasing the warp-wire A, the disposition of the parts of the mechanism being such that the block 12 is made to grip the wire just before and during the upward movement of the feed-bar 6 and to release the wire just before and during the downward movement of the feed-bar. The disposition of the cams 32 and 34 on the shaft 33 is such that the slide 28 is intermittently reciprocated, causing the alternate gripping and release of the warp-wire A.

The warp-wire-feed bar 6 and its load assumes by gravity its lowest position. To move this feed-bar and its load upwardly, and thereby to feed forward the warp-wires, I provide the following mechanism: Near each end of the bar it is provided with a leg 35, Figs. 2, 4, 5, 12, 13, and 14, and these legs at their lower extremities are pivoted medially to the swinging tappets 36. These tappets 36 are pivoted at their rear extremities adjustable radially in the hangers 37 37, which are hinged on and depend from brackets 38 38, rigid to and forming a part of the frame. The tappets 36 are made adjustable in the hangers 37 toward and from their axis by bolts adapted to be moved in slots therefor in the hangers toward and from their common axis. The legs 35 are pivoted to the tappets 36 by means of bolts 39 and collars 40 40, one at each side of each leg, which collars have projecting annular flanges or sleeves that surround the bolt and serve for the bearings of the legs thereon, the flanges projecting toward each other and substantially meeting within the legs. Antifriction-wheels 41 41 on the bolts 39 are adapted to travel on vertical ways or bearings therefor on the frame 1, thereby supporting and guiding the movement of the wire-feed bar 6 reciprocably vertically. The rigid forwardly-projecting toes 42 42 of the tappets 36 36 are in the path of wipers 43 43, loose on the driving-shaft 33. Dogs 44 44 are so pivoted on the wipers 43 that their engaging catches are normally in the paths of the steel-faced cams 45 45, fixed on the shaft 33. There are two of these cams 45, located severally at opposite sides of the shaft 33, adapted to temporarily engage each of the dogs 44. Expanding-springs 46 46 are adapted to hold the catches on the dogs 44 44 normally in the paths of the cams 45 45, these springs being coiled loosely about rods 47 47, that extend from a support therefor on the hubs of the wipers 43 at the opposite side of the shaft 33 to and loosely through rearwardly-projecting parts of the dogs 44. Stops 48 48, fixed on the frame, project therefrom laterally into the path of the laterally-projecting portions of the front beveled or inclined ends of the dogs 44 44 and are adapted, as the dogs revolving with the cams 45 come thereto, to contact against these beveled front extremities of the dogs and force them radially out of engagement with the cams 45. It will be understood that the construction is such that as the shaft 33 rotates the cams 45 engage the dogs 44 and carry the wipers 43 with the cams, thereby lifting the tappets 36 and the wire-feed bar 6 until the dogs 44 contact with the stops 48 and are pushed thereby out of engagement with the cams 45, whereupon the wipers 43 under the weight of the tappets 36 thereon and their load fall back into their normal positions, which are at the lowest point to which the wire-feed bar 6 can go, and at which limit of movement downwardly it is supported by the toes 42 of the tappets 36, resting on the wipers 43 and their shaft 33, as shown in Figs. 4 and 12. The length of the movement of the bar 6 vertically and of the feed of the warp-wires is regulated by the adjustment of the stops 48. These stops 48 are on the extremities of curved arms 49 49, that are mounted adjustably in the direction of the circle of the arc of the motion of the dogs 44. To accomplish this, the arms 49 are bolted to brackets 50 50, rigid on the frame, the bolts passing through slots therefor in the arms 49. The warp-wires on being fed to and passing upwardly through the guides 3 are woven into the fabric, which fabric then passes over the fabric-carrying roll 4 and to and is wound upon the fabric-winding roll 5 by a concurrent intermitting winding movement that will be hereinafter described. By these means the warp-wires are fed into and through the machine and are kept constantly at a suitable tension and are carried forward throughout by synchronous movement of the different parts of the machine.

For carrying and feeding the woof-wires and leading them forward and back across the plane of the fabric, twisting them about the warp-wires and about themselves, and thus weaving them into and forming the wire-fence fabric I employ the following mechanism: The warp-wire guides 3 3 are in the general form of elongated spindles provided with a central bore or aperture for the passage therethrough upwardly of the warp-wires. Of these guides as many are provided as will

equal the number of warp-wires that by any possibility will be required in any fabric to be manufactured on the machine. In manufacturing the wire fabric, however, in my improved machine it is not necessary to use as many warp-wires as there are spindles, because the woof-wires may be twisted, and thus woven about themselves, thereby forming meshes without the use of warp-wires except at the longitudinal edges of the fabric and at such medial longitudinal lines thereof as may be desired. These guides 3 3 are severally supported in upright position rotatably in and on a hollow pedestal 51, which pedestals are secured to and supported in permanent position on a rail of the frame 1. Apertures 52 through the rail are provided for the passage of the warp-wires upwardly. So much of the lower portions of the guides 3 as enter the pedestals 51 are cylindrical, as shown at 53, Figs. 15 to 20, and the portion of the guide above this cylindrical portion is flattened and extended laterally in both directions, normally in the direction of the length of the bed of the machine. These flattened and laterally-extended wings of the guides form shoulders that rest on the top of the pedestals 51 and also form flat side surfaces for receiving against them the normally-abutting woof-wire carriers. Woof-wire carriers 54 54 are located normally on opposite sides of warp-wire guides 3. These woof-wire carriers are substantially as long vertically as the laterally-flattened portions of the guides 3 and are of substantially the same width as the guides. These carriers are employed in pairs opposite every alternate guide 3, except that when the alternate guide is at the end of the series, only one carrier is employed, the opposite carrier to make up the pair being omitted, Fig. 1. These carriers are each provided medially with a laterally-projecting arbor 55, on which a spool 56 is mounted rotatably. These spools carry the woof-wire wound thereon. To regulate the tension of the wire as it leaves the spool 56, I provide means for resisting the free rotation of the spool 56, which consists of a flexible metal strap 57, passing around the hub of the spool, the two ends of which strap come near together and are provided with a screw 58, adapted to draw the ends toward each other, and thus tighten the strap more or less snugly about the hub of the spool. One extremity of the strap is provided with a lug 59, that projects laterally therefrom, so as to bear against a pin 60, inserted transversely through the arbor 55, and thus prevent the rotation of the tension-strap and yieldingly retarding the rotation of the spool. The upper extremities of the carriers 54 are preferably turned outwardly obliquely above the spools 56, and these oblique terminations or heads 61 of the carrier are each provided with an aperture inclining inwardly upwardly for the passage therethrough of the woof-wire as it is uncoiled from the spool and is fed into the fabric being woven. Each carrier 54 is provided at its lower end with a transversely-disposed tongue 62, which fits slidably in a transverse groove therefor on the upper face of a pinion 63. The pinions 63 are each footed on a shoulder on the several pedestals 51, about which pedestal the pinion is fitted and rotates. The pinions 63, Fig. 22, are each provided with two transverse grooves across its upper face, (one for the tongue of each carrier 54, of a pair of carriers,) formed by the outer ribs 64 64 and the middle mutilated rib 65, which is omitted centrally, providing a space for that portion of the interposed guide 3, Figs. 15 and 17. It will be understood that the rotation of these pinions revolves the carriers 54 thereon and the guides 3, interposed between them, about the warp-wires extending upwardly through the guides, thus coiling the woof-wires about the interposed warp-wires or twisting the two woof-wires about each other in the absence of an interposed warp-wire.

For rotating the pinions 63 intermittently at the proper moment each pinion meshes with a double pinion 64′, Figs. 17 and 18, the beveled teeth of which mesh with a beveled pinion 65′ on the counter-shaft 66, having its bearings in suitable boxes therefor on the frame. The double pinions 64′ are severally mounted on a stud 67, projecting from the boxes in which the counter-shaft 66 has its bearings, and the double pinions are held in position thereon by a cap-plate 68, secured to the studs 67 by a screw. The cap-plate extends laterally over the upper end of the beveled pinion. The counter-shaft 66 is rotated intermittingly from the main shaft 33, Figs. 1 and 3, by a pinion 69 on the counter-shaft, that meshes intermittently with the teeth on the mutilated cog-wheel 70 on the main shaft. Concave stops 71 71 on radial arms fixed on the counter-shaft 66 ride on rim-flanges 72 72, projecting laterally from the wheel 70 opposite the untoothed portions of the perimeter, and prevent the movement rotatably of the counter-shaft while the untoothed portion of the perimeter of the wheel 70 is passing the pinion 69. To insure the prompt and proper initial rotative movement of the counter-shaft 66 when the pinion 69 comes to the toothed portion of the wheel 70, I provide radially-extending curved arms 73 73 on the counter-shaft 66, adapted to be engaged at the proper moment by the radially-projecting arms 74 74 on the main shaft 33. These radial arms 74 74 are curved forwardly in the line of motion at their outer extremities and are made in two parts, the outer ends of the arms being secured to the inner or hub portion thereof by bolts 75 75, passing through slots, preferably at a slightly-oblique angle to radii of the shaft, whereby the extremities of these arms may be moved outwardly or inwardly and slightly advanced forwardly or retrieved, thus making the arms adjustable with reference to securing the engagement thereof with the arms 73 at the proper mo-

ment to initiate the rotation of the countershaft 66 when the pinion 69 comes to teeth on the wheel 70. The construction and relation of the parts are such as to cause a rotation of the pinion 63 once and a half around by the action of each of the two segmental sections of teeth on the mutilated wheel 70 as it rotates. This results in carrying each woof-wire in a coil once and a half around the interposed warp-wire or the intermeshing woof-wire in the absence of the warp-wire.

For carrying the woof-wires from one weft-wire to another or transversely of the fabric limitedly I employ the following mechanism: A considerable number of push-blocks 76 76, Figs. 1, 2, 4, 16, 17, 18, 25, and 26, arranged in adjacent lines L L′ and adapted to travel, respectively, in opposite directions, are mounted and slidable on the bed 77, that forms a part of the frame 1. These push-blocks 76 are duplicates of each other and are adapted to travel in succession one after the other in a substantially-endless procession in the two lines L and L′, the blocks at the ends of the lines of travel turning around from one line into the other. The blocks rest on the bed 77 and are let into the bed, so that their upper surfaces are flush with the top of the bed, and guards 78, secured to the upper surface of the bed, project over the push-blocks and retain them movably in position on the bed. Raised ribs 79 79 on the bed extend in straight lines thereon along the route of the travel of the push-block in straight horizontal lines, and these ribs or guides enter grooves 79′ therefor in the under surface of the push-blocks and also serve as guides for the movement of the blocks along the straight lines of their travel. The push-blocks are also provided near their inner edges with downwardly-projecting and laterally-turning flanges 80 80, that fit against and under the edge of the bed about a longitudinal aperture therein, which aperture at its extremities is enlarged and curved in a circular direction, this edge 81 of this aperture in the bed forming a guide against which this flange 80 on each of the push-blocks may bear movably during their travel along the straight lines of their route. Each of these push-blocks has a substantially-semicircular recess in its inner edge, medially about which recess, projecting upwardly and downwardly from the push-block, there is a semicircular flange 82, which flange fits movably about the semicircular base 83 of the woof-wire carrier 54. A semicircular horizontally-projecting tongue 84 on the block 76 enters a groove 85 therefor in the carrier-base 83, Figs. 17, 19, 25, and 26. Each of these push-blocks is thus so fitted to and about the base of a carrier 54 that when a push-block is caused to travel ahead in its route it carries its partially-encircled woof-wire carrier with it. At the extremities of the lines of travel of the push-blocks and opposite the ends of the row of warp-wire guides 3, Figs. 1, 15, and 16, there are located semicircular guides 86 86, one at each end, secured at their outer extremities to the frame and at their inner extremities terminating in a semicircular concave end located and adapted to receive against it the semicircular flange or collar 82 on each push-block 76 as the push-block is advanced thereto and to guide the push-block as it is advanced at the end of the route of travel around from one line of blocks to the other reversely-traveling line of blocks. These push-blocks during their travel on the straight lines bear against each other end to end, and the line of blocks is advanced by pushing one or two of them ahead. As these blocks may, by reason of wear or otherwise, require a slight adjustment relatively to each other, I advisably provide adjusting-bolts 87 87, turning into the ends of these blocks, the heads of which bolts on adjacent blocks register with each other and are adapted to contact and provide a proper adjusted bearing for the blocks.

For advancing the blocks in their travel intermittently on the straight lines I provide actuating mechanism as follows: Each of the push-blocks is provided on the upper surface thereof with two rack-teeth 88 88, Figs. 1, 2, 3, 4, 15, 16, 17, and 18, facing rearwardly of the motion of the blocks. The distance of these teeth apart on each block and on each line of blocks when in position on their straight routes is equal to the distance apart of the apertures through the axes of the warp-wire guides 3 3. A pawl 89, Figs. 1, 2, 3, and 4, provided with a toothed pawl-block 90, pivoted to the free end of the pawl and adapted to engage the teeth 88 on the push-blocks, is mounted on the crank of a rock-shaft 91 and is adapted by the oscillation of the shaft to advance the line L of the push-blocks intermittently. A complementary pawl 89′, Figs. 1, 2, and 8, provided with a toothed block 90′ and mounted on the crank of the rock-shaft 91′, is adapted by the oscillation of the rock-shaft to advance the line L′ of the push-blocks intermittently in the opposite direction to the motion of the push-blocks in the line L. The crank-arm on the rock-shaft 91′ is connected by a rod formed of two members 92 92′ to a radial crank-arm 93 on the rock-shaft 91, Figs. 1, 3, and 4, which crank-arm 93 projects from the rock-shaft radially in an opposite direction to the crank on which the pawl 89 is pivoted. The two members 92 92′ of the connecting-rod, Figs. 1 and 18, are severally provided with a head 94 94′, into which the rods turn by screw-thread, thereby providing for their longitudinal lengthening or shortening, and the heads 94 94′ are severally secured pivotally to the free extremity of an arm 95, pivoted on and depending from the frame. These heads are secured to the arm 95, adjustable radially toward and from its axis by bolts 96 96, movable in slots therefor in the arm. By this construction the throw of the members 92 92′ of the connecting-rod can be regulated to suitably adjust

the movements of the block-moving pawls 89 89′.

To intermittingly oscillate the rock-shaft 91, it is provided with a radial arm 97, which is connected by a rod consisting of two hinged members 98 98′ to an actuating-lever 99, pivoted at one extremity to a bracket 100 on the frame, Figs. 1, 3, 4, and 5. The free extremity or toe 99′ of the lever 99 is in the path of a radial arm or wiper 101, loose on the main shaft 33. The wiper 101 is provided with a dog 102, pivoted thereon and so disposed that its steel-faced catch is in the path of and adapted to be caught by the steel-faced cams 45, Figs. 4, 5, 6, and 7. The dog 102 is held normally releasably in the path of the cams 45 by an expansion-spring 103, coiled about a rod 104, that is supported on a standard 105, fixed on the wiper 101, which rod projects loosely through an eye fixed in a rearwardly-projecting part of the dog 102. The wiper 101 by means of the contact of the dog 102 with a cam 45 is carried around therewith until the dog contacts with a stop 106, fixed on the frame, which stop is so disposed as to engage the beveled front end of the dog and force it out of engagement with the cam. An actuating-lever 107, pivoted medially on the frame, is connected at its rear end by a link 108 to the lever 99, and the free extremity of this lever 107 is also in the path of the cams 45 and is so disposed, Fig. 6, that just after the dog 102 is released from a cam 45 the cam 45 will engage the lever 107 and tilt it, forcing the lever 99 back to its initial position, and thereby oscillating the rock-shaft 91 in the other direction. The link 108 is connected adjustably both to the lever 99 and to the lever 107 by bolts passing through slots therefor in the levers. By this means the relative throw of the levers may be adjusted. A contractile compensating spring 109 is attached at one end to the frame and at the other end to a short radial arm on the rock-shaft 91 and is adapted to ease the movements and assist in retrieving the pawls 89 89′.

For advancing the push-blocks severally in their route of travel around the ends of the line of guides 3 3 I provide rotatable pushers, Figs. 23 and 24, one at each end of the route of travel, which severally consist of a finger 110 110′, mounted on a pinion 111. The fingers at the two ends of the route of travel are of such different form as adapts them for contacting with the pins 113 113 on the under side of the push-blocks 76 in the situations in which they are placed, Fig. 22. These pinions 111 encircle the hubs of the two end pinions 63 and are footed revolubly on a shoulder therefor on the end pedestals 51, Figs. 15 and 22. Segmental racks 112, one at each end, pivoted on the frame, mesh with these pinions and by their oscillation rotate the pinions intermittently in reverse directions. The fingers are so constructed and disposed that when moved from their initial positions (shown in Fig. 22) they are adapted severally to engage the pins 113 on the push-blocks opposite thereto, and as the fingers are swung around the ends of the line of the guides 3 3 they carry the push-blocks engaged thereby around from one straight line of push-blocks to the other straight line of push-blocks, and immediately thereafter by the reversal of the movement of the segmental racks 112 they are brought back to the initial positions. (Shown in Fig. 22.) These segmental racks 112 are severally connected medially by pitmen 114 114′, Figs. 1, 2, 3, 4, 8, and 15, to crank-arms of rock-shafts 115 115′, journaled in the frame. Each pitman is provided with a head 116 116′, Figs. 1 and 4, into which the pitman turns and by means of which the pitman can be lengthened and shortened as desired, and each pitman is also provided with a terminal coupling member 117 117′, to which the heads are hinged, and which coupling member is in turn pivoted on the crank of its rock-shaft 115 and 115′. The other cranks of these double-cranked rock-shafts 115 115′ are connected by rods 118 118′, Figs. 3 and 8, to crank-pins 119 119′ on cog-wheels 120 120′, which cog-wheels mesh with pinions 121 121′ on the counter-shaft 66. The crank-pins 119 119′ are adjustable radially in slots therefor on the cog-wheels, thereby providing for regulating the extent of the oscillation of the racks 112 to secure the proper movement of the fingers 110 110′.

When the machine is put in operation, warp-wires A A are led up through the guides 3 3 and over the roll 4, Figs. 1, 2, and 3, and are thence taken to and secured on the winding-up roll 5. The woof-wires on the spools 56 are carried up through the apertures in the heads 61 of the carriers 54 and are initially secured to the warp-wires with reference to anchoring the ends of the woof-wires preparatory to weaving the fence fabric. Thereupon, the machine being in the position shown in Fig. 1, so far as the push-blocks and the warp-wire guides and the woof-wire carriers are concerned, the machine is started and the woof-wire carriers and the warp-wire guides are rotated once and a half around by the rotation of the counter-shaft 66. This rotation of the woof-wire carriers once and a half around coils the woof-wires correspondingly about the central warp-wire just above the tops of the woof-wire carrier and the warp-wire guides, or where the warp-wire is absent coils about each other the two woof-wires that are being delivered from the woof-wire carriers in the same pairs of carriers opposite each other in the relations clearly shown in Fig. 1. This twist of the woof-wires about the warp-wire or about themselves may, if desired, be more than once and a half around—as, for instance, the twist may be two and a half or more times around. At the same time and by the revolution of the counter-shaft 66 the push-block at the right-hand extremity of the line L of push-blocks is carried around by the limited rotation of the finger 110, Fig. 22, to the other side of the line of guides 3 3

and into the line L′ of the push-blocks. Thereupon by the reciprocal movement of the pawls 89 89′ forwardly the push-blocks 76 will be advanced a distance equal to the distance between the vertical centers of the guides 3, the push-blocks in the line L moving toward the right and the push-blocks in the line L′ moving toward the left, so that the woof-wire carriers (shown in pairs opposite each other in Fig. 1) will be moved away from each other in opposite directions to a location opposite the adjacent guides 3 3, which in Fig. 1 are shown as being unattended by any woof-wire carriers. At the time of this movement of the woof-wire carriers the warp-wires are advanced upwardly by the feed movement of the bar 6, which may be greater or less, as desired, the extent of which feed movement of the warp-wires upwardly will determine the angle of obliquity of the woof-wires B B from one warp-wire to the next warp-wire or to engagement with the adjacent woof-wire, as indicated in Figs. 31, 32, and 33—that is to say, the extent of the feed of the warp-wires will determine the angle of the woof-wires thereto, and consequently the angle of the sides of the diamond-shaped or triangular meshes of the fabric. Following this movement of the push-blocks and of the shifting of the woof-wire carriers the woof-wire carriers are again rotated with the warp-wire guides once and a half around, thus again coiling the woof-wires about the warp-wires or about each other, and at the same time the push-block at the extreme left in line L′ will be carried around the end of the line of guides 3 to the line L of the push-blocks. It should be observed that the movement of the push-blocks ahead is in the same direction that the woof-wires are wound about the warp-wires, so that when the rotation of the woof-wire carriers about the warp-wires has wound the woof-wires thereon the forward movement of the carriers, advanced by the push-blocks in the same direction, will continue the tension on the woof-wires, and the coils formed thereby about the warp-wires or about each other of the woof-wires will not be slackened up or released by the subsequent movement of the woof-wire carriers, which is a movement continued in the direction of the coil. The fabric when completed is carried over the fabric-carrying roll 4, which is preferably provided with two or more bands 122 122, each having a number of radially-projecting spike-guides therein. In the drawings, Fig. 2, I have shown four of these bands. They are fitted snugly and yet adjustably lengthwise on the roll 4 and are advisably to be so arranged on the roll that the spikes will register alongside of warp-wires in the fabric on the inner side thereof. The bands 122 in Fig. 2 are shown as arranged for weaving two pieces of the fabric at the same time, one wider and one narrower, these spiked bands being so arranged as to be alongside the outer or marginal warp-wires of the two fabrics. I also preferably employ a guide-rod 123, mounted on the frame a little at the front of the roll 4 and below the horizontal plane of the axis of the roll 4. This guide-rod 123 is also provided with adjustable revoluble collars 124 124, having radial spikes therein, and this rod, with its spikes, is adapted to guide the fabric in its movement toward the roll 4 and to hold it to that roll. The spiked collars on the rod 123 are advisably located thereon to register with the spiked bands 122 on the roll 4. The fabric is carried from the roll 4 to the winding-up roll 5, on which it is wound in suitable form for transportation and for the market. The roll 5 is provided at each end with flattened tongues 125 125, Figs. 1, 9, 10, and 11, which fit removably in U-shaped sockets 126 126 on the ends of mandrels 127 127, journaled in the frame. Removable keys 128 128 secure the roll 5 detachably in the mandrels. This construction permits of the convenient lifting of the roll, with a quantity of fabric wound thereon, from its place on the mandrels and removing the roll from the coil of fabric, which is thereby left in a coiled or rolled-up condition. The roll 5 can then be readily replaced in the mandrels for winding other fabric thereon. The mandrel 127 at one end of the machine is provided with a ratchet-wheel 129, Figs. 1, 2, 8, and 9. A swinging arm 130, pivoted on the mandrel alongside the ratchet-wheel 129, is provided with a pawl 131, that engages the teeth of the wheel in one direction. The other extremity of the arm is connected by a device 132 to the free extremity of a swinging arm 133, pivoted on the frame. Cams 134 134 on the main shaft 33 are adapted to contact medially with the swinging arm 133 and push it laterally, causing the arm 130 to swing correspondingly and by means of the pawl 131 and ratchet-wheel 129 to rotate the roll 5 intermittingly. The connecting device 132 preferably consists of a head member 135, pivoted by a bolt to the arm 130, the bolt being adapted to be placed in any one of several apertures 136, located at unequal distances radially from the axis of the arm, two rods 137 137, with a cross-piece 138 on the two rods and secured adjustably thereto by nuts turning on threads on the rods, an overlapping rod 139, with its cross-head 140, through which the rods 137 pass movably, expansible springs 141 141, coiled about the rods 137 between the cross-piece and the cross-head, and a nut 142, turning on the rod 139 against the free extremity of the arm 133. The rod 139 passes movably through the cross-piece 138 and through the extremity of the arm 133. A stop 143, adjustable on the frame, by means of a bolt 144, through a slot in the base of the stop, is adapted to engage the swinging arm 133 and prevent its approach to the shaft 33 beyond a predetermined distance. This construction is adapted for regulating the throw of the swinging arm 130, and thereby is adapted for regulating the intermittent movement of the

roll 5, whereby the rotation of the roll is readily adapted for winding up the fabric thereon as fast as it is manufactured, both while the coil or fabric on the roll is small and after it has become large. A stop 145 prevents the throw of the arm 133 rearwardly beyond its normal movement. The stop is mounted adjustably on the frame. The springs 141 prevent any undue tension on the fabric. The adjustment that can be made of the head 135 on the arm 130 by means of its bolt and the apertures 136 also provides for the adjustment of the throw of the arm 130. A click 146, pivoted on the frame, is adapted to engage the rack-wheel 129 and prevent its rearward movement. Other clicks 147 147′ are also advisably employed, which are hinged on the frame and are of such length and disposition as to be adapted to engage the teeth of the ratchet-wheel 129 at points in its movement between those at which it is engaged by the click 146. These additional or supernumerary clicks 147 147′ are adapted to engage the teeth of the wheel 129 and prevent any backward movement of the wheel when the oscillation of the arm 130 is not sufficient to carry it a distance to be engaged by the click 146.

The main shaft 33 is provided with a clutch member 148, and a cog-wheel 149, loose on the shaft 33, is provided with a complementary clutch member and is adapted to be shifted on the shaft into engagement with the clutch member 148. The cog-wheel 149 meshes with an elongated pinion 150 on a pulley-shaft 151, journaled in the frame, and this pulley-shaft is provided with a pulley 152, adapted to be connected by a belt to any suitable source of power.

What I claim as my invention is—

1. In a wire-fence machine, the combination with a frame and a plurality of vertically-disposed warp-wire guides mounted thereon, of a vertically-movable warp-wire-feed bar located below the guides, and means for lifting the feed-bar and its load and permitting it to fall back to its initial position.

2. In a wire-fence machine, the combination with a frame provided with vertically-disposed ways thereon, of a warp-wire-feed bar mounted in the ways, means on the feed-bar for temporarily gripping the warp-wires thereto, and means for lifting the feed-bar and letting it fall back to its initial position.

3. In a wire-fence machine, the combination with a movable warp-wire-feed bar, of means for gripping a warp-wire thereto comprising a stud secured to the bar, a fixed grip-plate, a movable grip-block provided with a thereto-hinged stem, toggle-joint members hinged together and one member hinged to the stud, a spring bearing on the stem of the grip-block and a member of the toggle-joint, and means for actuating the toggle-joint.

4. In a wire-fence machine, a warp-wire-gripping device comprising a stud fixed on a feed-bar, a grip-plate, a movable grip-block opposite the grip-plate, a stem pivoted to the grip-block and passing movably through a toggle-joint member, toggle-joint members hinged together and one member hinged to the stud, a spring bearing against a toggle-joint member and acting on the stem and grip-block, and a screw and nut interposed between the spring and the toggle-joint member whereby the tension of the spring may be regulated.

5. In a wire-fence machine, means for actuating a device for gripping warp-wires to a feed-bar comprising a toggle-joint connecting-rod 20, a bell-crank 22, a pitman connecting said rod to said bell-crank, a link 27 pivoted to the bell-crank and taking movably into ways in a slide, the slide reciprocable in ways therefor on the frame, and means for reciprocating the slide.

6. In a wire-fence machine, means for actuating a grip-operating slide reciprocably comprising the slide 28, an inner tappet 30 and an outer tappet 31 secured detachably on the slide, a shaft 33, and cams 32, 34 on the shaft adapted alternately to contact respectively with the tappets and reciprocate the slide.

7. In a wire-fence machine, the combination of a vertically-reciprocable warp-wire-feed bar, wire-gripping devices on the feed-bar, an oscillating lever 22 mounted on the feed-bar and connected operatively to the gripping devices and provided with a thereto-pivoted link having an elongated vertically-extending head, and a horizontally-reciprocable actuating-slide provided with a groove in which the head of said link reciprocates vertically and by which the link is held to horizontal movement with the slide.

8. In a wire-fence machine, the combination with a frame, and a warp-wire-feed bar reciprocable vertically in ways therefor on the frame, of means for intermittingly lifting the frame, comprising swinging tappets 36 supported at one extremity on the frame and projecting into the path of wipers, a shaft, said wipers loose on the shaft, cams fixed on the shaft, dogs on the wipers adapted to engage the cams and hold the wipers to revolution therewith, and means for disengaging the dogs from the cams.

9. In a wire-fence machine, a vertically-reciprocable warp-wire-feed bar, a tappet pivoted medially to the feed-bar, a hanger suspended pivotally from the frame and hinged to the outer extremity of the tappet, an idle wheel 41 on the tappet-feed-bar pivot-bolt adapted to travel on ways therefor on the frame in the direction of the movement of the feed-bar, and means for lifting the tappet.

10. In a wire-fence machine, a means for lifting a feed-bar tappet comprising a shaft, a wiper loose on the shaft, a dog pivoted on the wiper, a spring adapted to hold the dog normally yieldingly in the path of a cam, the

cam fixed on the shaft adapted to engage the dog, and a stop adapted to contact with the dog and disengage it from the cam.

11. In a wire-fence machine, a means for lifting a feed-bar tappet comprising a shaft, a wiper loose on the shaft, a dog provided with a beveled head pivoted on the wiper, a spring adapted to hold the dog normally yieldingly in the path of a cam, the cam fixed on the shaft adapted to engage the dog, and a stop adapted to contact with the beveled head of the dog and disengage it from the cam, said stop being mounted adjustably in the arc of the circle of rotation of the dog whereby the extent of the lift of the feed-bar may be regulated.

12. In a wire-fence machine, a rotatable warp-wire guide provided with a bore for the passage through it of a warp-wire axially, a pair of woof-wire carriers respectively on opposite sides of the warp-wire guide, means for rotating the warp-wire guide and synchronously revolving the woof-wire carriers about the axis of the warp-wire guide, and other means for controlling and shifting the woof-wire carriers from the woof-wire guide tangentially in reverse directions and always continuously of the general direction of the rotation of the carriers and guide.

13. In a wire-fence machine, a pair of revoluble woof-wire carriers located opposite each other, means for revolving the pair of wire-carriers, and means for shifting the carriers of a pair tangentially in opposite directions always in continuation of the movement of their revolutions.

14. In a wire-fence machine, the combination with a wire-carrier, of an arbor, a spool rotatable on the arbor, a band about the hub of the spool, means for clamping the band adjustably to the hub, and means to contact with and prevent the rotation of the band with the spool.

15. In a wire-fence machine, the combination of a series of warp-wire guides arranged in a straight line, woof-wire carriers in pairs respectively on opposite sides of each alternate one of said guides, means for shifting the carriers of each pair in reverse directions tangentially from opposite one guide to opposite the next adjacent guides always in the direction of the revolution of the carriers about their woof-wire guides, and means for revolving the carriers about the axis of the guides.

16. In a wire-fence machine, the combination of warp-wire guides disposed in a continuous line, woof-wire carriers in pairs respectively on opposite sides of each alternate guide, means for shifting the carriers of each pair in opposite directions from one guide to the adjacent guides, means for revolving the wire-carriers once and a half around the axis of their newly-acquired companion guide, and means for shifting the carriers back to their initially-adjacent guide but at the opposite sides thereof.

17. In a wire-fence machine, the combination of a series of woof-wire carriers disposed in pairs opposite each other, a series of interposed warp-wire guides, pinions below and axially of the guides and the carriers, grooves and complementary tongues on the carriers and the pinions respectively holding the carriers to revolution with the pinions but permitting them to slide into and out of engagement with the pinions, means for rotating the pinions, and other means for shifting the carriers from the pinions.

18. In a wire-fence machine, the combination of a series of woof-wire carriers arranged in pairs opposite each other, means for revolving the carriers of each pair about their common axis, push-blocks in two lines in which the carriers are severally mounted movably revolubly, and means for advancing the lines of push-blocks intermittingly in opposite directions.

19. In a wire-fence machine, the combination of a series of warp-wire guides arranged in a line, two series of woof-wire carriers arranged normally opposite to and abutting movably against warp-wire guides, means for revolving the carriers about the axis of the guides, two lines of push-blocks supported slidably on a bed and severally encircling a warp-wire carrier, and means for advancing the two lines of push-blocks and the carriers in opposite directions simultaneously.

20. In a wire-fence machine, the combination with a frame and a bed thereon, of push-blocks arranged in two lines, a push-block way on the bed extending in adjacent parallel straight lines and continuously around at the ends, a series of warp-wire guides in a line between the straight lines of the push-blocks, woof-wire carriers mounted in the push-blocks in the two lines at the two sides of the guides, means for advancing the two straight lines of push-blocks concurrently, and other means for advancing the push-blocks severally around at the ends of the straight lines of travel and from one straight line to the other straight line.

21. In a wire-fence machine, the combination with a frame and a bed thereon having an elongated push-block way, of push-blocks having woof-wire carriers mounted therein, the push-blocks being disposed and adapted to travel in adjacent parallel straight lines through a portion of their route, racks on the push-blocks, rock-shafts, pawls on the rock-shafts respectively engaging the racks on a line of the push-blocks, and means for oscillating the rock-shafts.

22. In a wire-fence machine, the combination with a frame and a bed thereon having an elongated push-block way, of push-blocks having woof-wire carriers mounted therein, the push-blocks being disposed and adapted to travel in adjacent parallel straight lines through a portion of their route, racks on the push-blocks, rock-shafts, pawls on the rock-shafts, pawl-blocks pivoted on the pawls en-

gaging a plurality of teeth on a push-block or push-blocks, and means for oscillating the rock-shafts concurrently.

23. In a wire-fence machine having two lines of push-blocks adapted to be advanced intermittingly in reverse directions, means for advancing the push-blocks step by step in two lines in opposite directions comprising an actuating cranked rock-shaft 91 at one end of the lines of push-blocks, an actuated cranked rock-shaft at the other end of the lines of push-blocks, pawls on the cranks of the rock-shaft engaging respectively the lines of push-blocks, a rod connecting the cranks of the two rock-shafts, and means for oscillating the actuating rock-shaft.

24. In a wire-fence machine, the combination with two lines of push-blocks adapted to be advanced intermittingly in reverse directions, of cranked rock-shafts one at each end of the lines of push-blocks, pawls on the cranks of the rock-shafts engaging respectively a line of the push-blocks, a rod connecting the cranks of said rock-shafts, said rod comprising principal members 92, 92′, head members 94, 94′ adjustable on the principal members, and an interposed swinging member 95 to which the head members are pivoted adjustably.

25. In a wire-fence machine, means for oscillating a rock-shaft adapted for advancing woof-wire carriers intermittingly, comprising a swinging lever 99, a rod connecting the swinging lever to a crank-arm on the rock-shaft, a rotatable shaft, a wiper 101 loose on the shaft, a cam fixed on the shaft, a dog on the wiper in the path of and adapted to be engaged by the cam, and a stop for releasing the dog from the cam.

26. In a wire-fence machine, the combination with a rock-shaft 91 provided with a crank-arm 97, of a swinging lever 99, a rod consisting of two members 98, 98′ hinged together connecting the crank-arm to the lever, a shaft 33, a wiper 101 loose on the shaft, cams 45 fixed on the shaft, a dog with a beveled head pivoted on the wiper, a spring adapted to hold the dog normally yieldingly in the path of the cams, and a stop adapted to control the beveled head of the dog and push it out of engagement with the cams severally.

27. In a wire-fence machine, means for oscillating a rock-shaft 91 comprising a lever 99, a rod connecting the lever to a crank on the rock-shaft, a shaft 33, a wiper loose on the shaft, a cam fixed on the shaft, a dog on the wiper adapted to be caught by and released from the cam, a second lever 107 in the path of the cam and connected operatively to the first-mentioned lever, whereby the rock-shaft is oscillated positively in both directions.

28. In a wire-fence machine, means for oscillating a rock-shaft 91, comprising a lever 99, a rod connecting the lever to a crank on the rock-shaft, a shaft 33, a wiper loose on the shaft, a cam fixed on the shaft, a dog on the wiper adapted to be caught by and released from the cam, a second lever 107 in the path of the cam and connected adjustably operatively to the first-mentioned lever, and a compensating spring 109 connected to a radial arm on the rock-shaft and to a fixed resistance.

29. In a wire-fence machine, means for revolving one or two woof-wire carriers comprising a pinion 63 provided with a transverse groove or grooves for receiving therein a tongue or tongues on the wire-carrier or wire-carriers, a double pinion 64′ meshing with the grooved pinion, a beveled pinion meshing with the double pinion, a shaft on which the beveled pinion is fixed, and means for rotating the shaft intermittingly.

30. In a wire-fence machine, the combination with push-blocks carrying woof-wire carriers and adapted to travel in an elongated path on a bed, of pinions provided with fingers 110, 110′ located respectively at the ends of the elongated path of the push-blocks, the fingers being adapted to catch onto the push-blocks and advance them severally in a semi-circular direction, segmental racks meshing with the pinions, and means for oscillating the segmental racks.

31. In a wire-fence machine, the combination with push-blocks carrying woof-wire carriers and adapted to travel in an elongated path on a bed, of pinions provided with fingers 110, 110′ located respectively at the ends of the elongated path of the push-blocks, the fingers being adapted to catch onto the push-blocks and advance them severally in a semi-circular direction, segmental racks meshing with the pinions, doubly-cranked rock-shafts 115, 115′ having crank connections to the segmental racks and to a cog-wheel, and a rotating shaft 66 provided with a pinion meshing with said cog-wheel.

32. In a wire-fence machine, a means for rotating woof-wire carriers intermittingly, comprising a counter-shaft 66 connected to the wire-carriers operatively by intermediate pinions, a pinion 69 on the counter-shaft, a main shaft, a mutilated cog-wheel on the main shaft provided with a flange projecting from its rim opposite the unmutilated portion of the rim, and a concave stop 71 fixed on the counter-shaft and adapted to bear against the rim-flange on the mutilated wheel and prevent rotation of the counter-shaft while opposite said flange.

33. In a wire-fence machine, a means for rotating a woof-wire carrier intermittingly, comprising a counter-shaft provided with a pinion, a main shaft, a mutilated cog-wheel on the main shaft with which the pinion meshes intermittingly, curved radial arms on the counter-shaft, and radial arms on the main shaft so disposed as to contact the arms on the countershaft as the teeth on the mutilated wheel come initially to the teeth on the pinion and insure the prompt rotation of the counter-shaft by the main shaft.

34. In a wire-fence machine, the combination with a counter-shaft provided with a pin-

ion and radial arms, of a main shaft, a mutilated wheel on the main shaft meshing intermittingly with the pinion, and curved radial arms on the main shaft formed in two members, the outer member being adjustable on the inner member radially and forwardly, whereby the arms on the main shaft can be disposed to contact earlier or later in each revolution with the arms on the counter-shaft.

35. In a wire-fence machine, a woof-wire-carrier support and advancing device, consisting of a push-block of substantially-rectangular form provided with a semicircular recess in one edge thereof, a semicircular flange about the recess adapted to fit around the base of a wire-carrier, a longitudinal flange 80 with underturned edge on the under side of the block, a pin 113 projecting from said flange, and a toothed rack on the upper surface of the block.

36. In a wire-fence machine, the combination with a frame provided with an elongated bed, of push-blocks adapted to travel in an endless path in straight parallel lines with connecting semicircular ends, means for advancing the push-blocks, semicircular flanges on the push-blocks, and guides 86 secured to the frame and provided with semicircular concave ends adapted to receive therein the flanges on the push-blocks and guide the push-blocks in a semicircular direction when being advanced.

37. In a wire-fence machine, the combination of a frame, a hollow pedestal 51 fixed on the frame, a warp-wire guide supported and revoluble on the pedestal, a pinion 63 mounted and revoluble on the pedestal, a woof-wire carrier supported above and engaging and rotatable with said pinion, and means for rotating the pinion.

38. In a wire-fence machine, the combination of a frame, a hollow pedestal 51 fixed on the frame, a warp-wire guide supported and revoluble on the pedestal, a pinion 63 mounted and revoluble on the pedestal, a woof-wire carrier supported above and engaging and rotatable with said pinion, a block-actuating pinion 111 mounted on the pedestal and about the hub of the first-enumerated pinion, and means for rotating the pinions.

39. In a wire-fence machine, a fabric-carrying device, comprising an idle roll provided with a plurality of bands adjustable along the roll longitudinally thereof, said bands each having a considerable number of radially-projecting spikes adapted to pierce the fabric adjacent to warp-wires and guide and hold the fabric to proper position in its forward movement.

40. In a wire-fence machine, fabric-guiding devices, combining a roll provided with bands adjustable thereon longitudinally, the bands each having a considerable number of fabric-piercing spikes, and a guide-rod a little in front of the roll, and revoluble collars adjustable on the rod, the collars having spikes therein adapted to pierce the fabric alongside the woof-wires and guide the fabric in its forward movement.

41. In a wire-fence machine, a fabric-coiling device, comprising a detachable roll provided with terminal tongues, mandrels with laterally-open sockets, means to secure the roll releasably in the sockets, a ratchet-wheel on one of the mandrels, a click engaging the ratchet-wheel and preventing the rearward rotation thereof, and means for rotating the roll intermittingly.

42. In a wire-fence machine, means for rotating a fabric-coiling roll, comprising a ratchet-wheel on the mandrel of the roll, a swinging lever provided with a pawl engaging the ratchet-wheel, a shaft, a cam on the shaft, a swinging arm in the path of the cam, and a rod connecting the lever to the swinging arm.

43. In a wire-fence machine, means for rotating a fabric-coiling roll, comprising a ratchet-wheel on the mandrel of the roll, a swinging lever provided with a pawl engaging the ratchet-wheel, a shaft, a cam on the shaft, a swinging arm in the path of the cam, means connecting the lever to the swinging arm including a head member 135 pivoted on the lever, parallel rods 137 provided with a cross-bar, a rod 139 movable through the cross-bar and provided with a cross-head through which the parallel rods pass movably, said rod telescoping with the parallel rods and being connected to the swinging arm, expansible springs about the parallel rods between the cross-head and the cross-bar, and stops limiting the swinging of the arm.

44. In a wire-fence machine, means for rotating a fabric-coiling roll, comprising a ratchet-wheel on the mandrel of the roll, a swinging lever provided with a pawl engaging the ratchet-wheel, a shaft, cams on the shaft, a swinging arm in the path of the cams, means connecting the lever to the swinging arm including a head member 135 pivoted and adjustable on the lever, parallel rods 137 provided with an adjustable cross-bar, a rod 139 movable through the cross-bar and provided with a cross-head through which the parallel rods pass movably, said rod telescoping with the parallel rods and being connected adjustably to the swinging arm, expansible springs about the parallel rods between the cross-head and the cross-bar, and stops limiting the swing of the arm.

In testimony whereof I affix my signature in presence of two witnesses.

MILES D. TAYLOR.

Witnesses:
M. G. JEFFRIS,
M. O. MONAT.