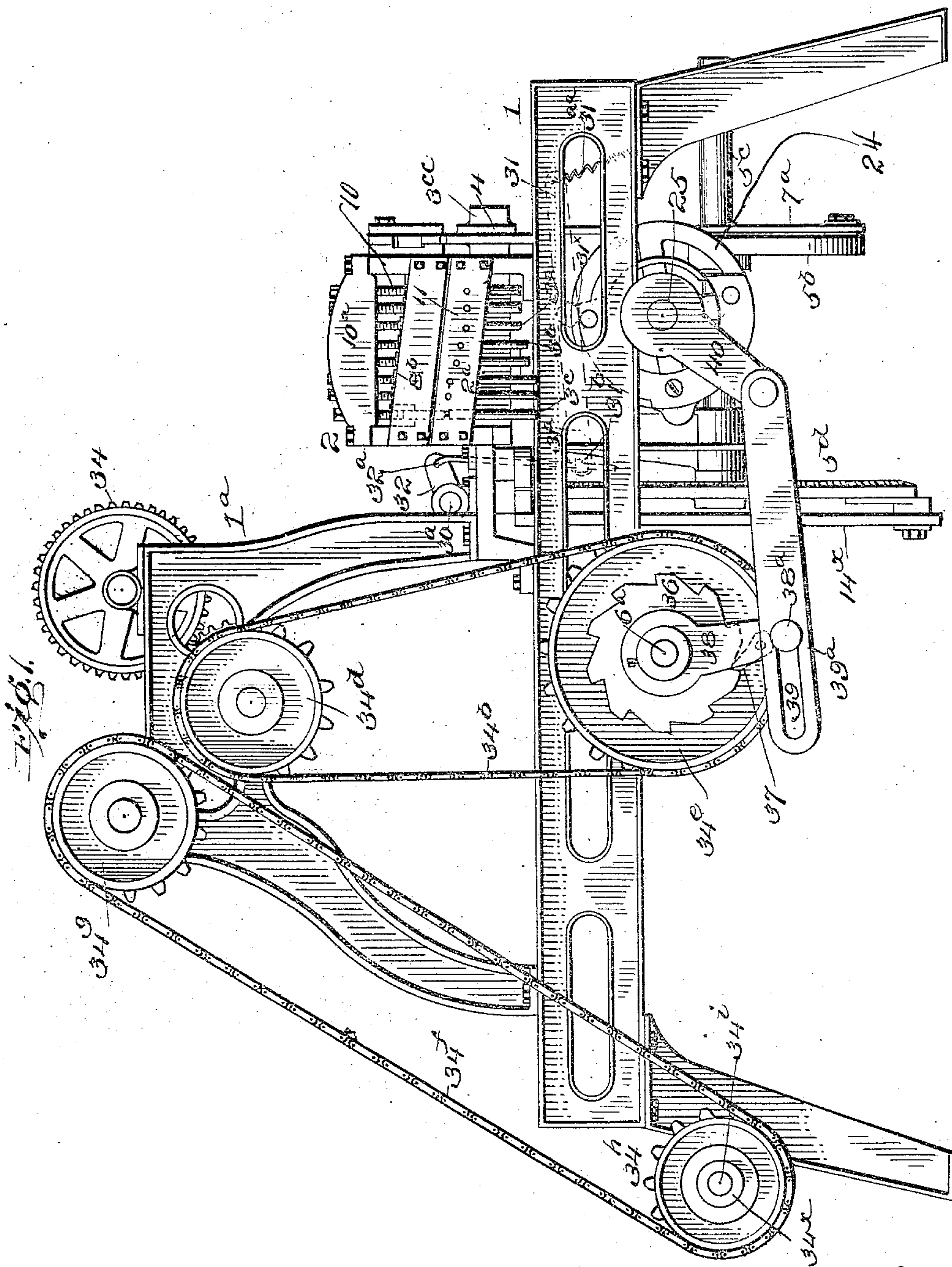


No. 800,986.

PATENTED OCT. 3, 1905.

T. M. CONNER.  
WIRE FENCE MACHINE.  
APPLICATION FILED JULY 15, 1904.

8 SHEETS—SHEET 1.



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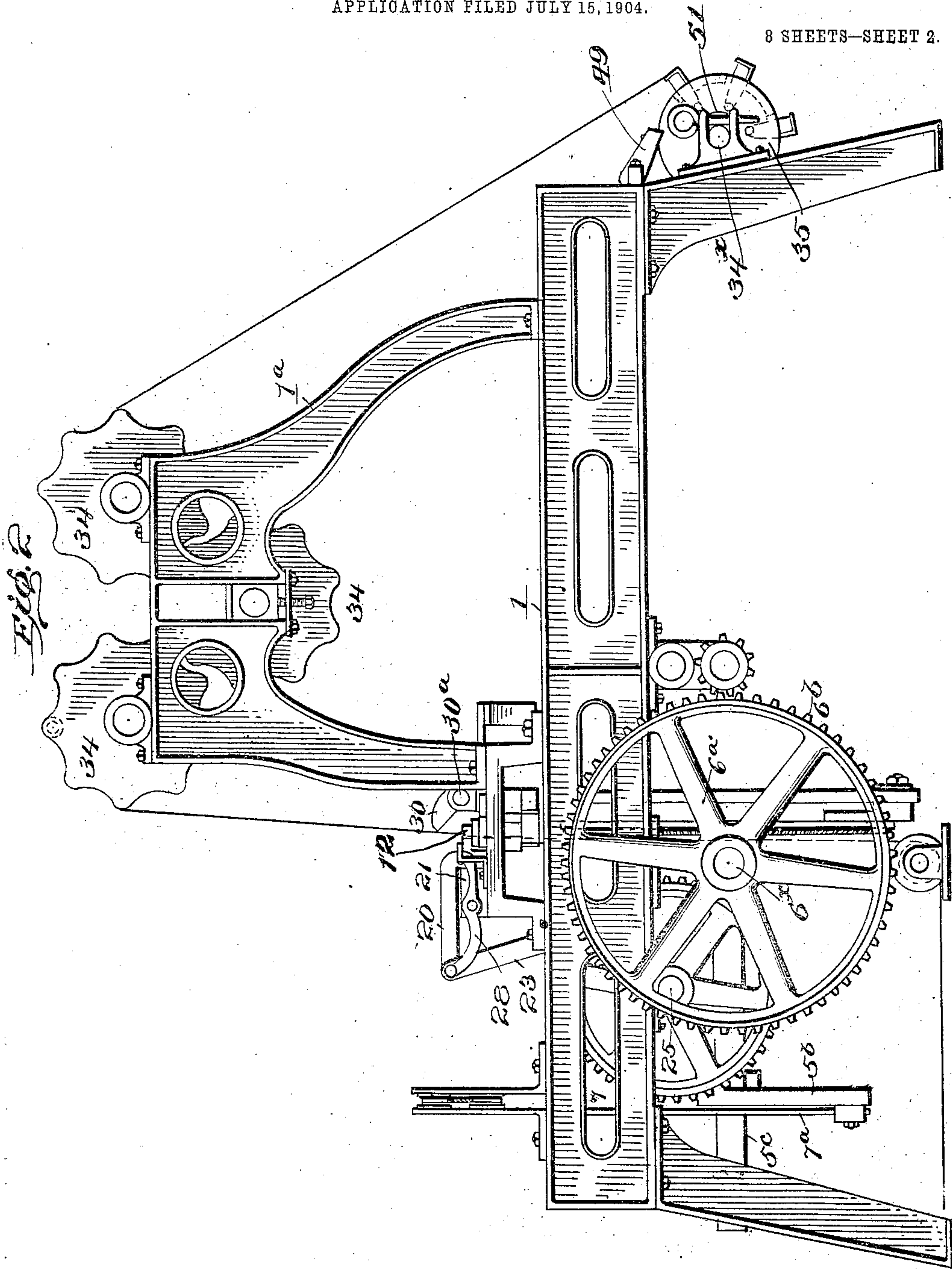
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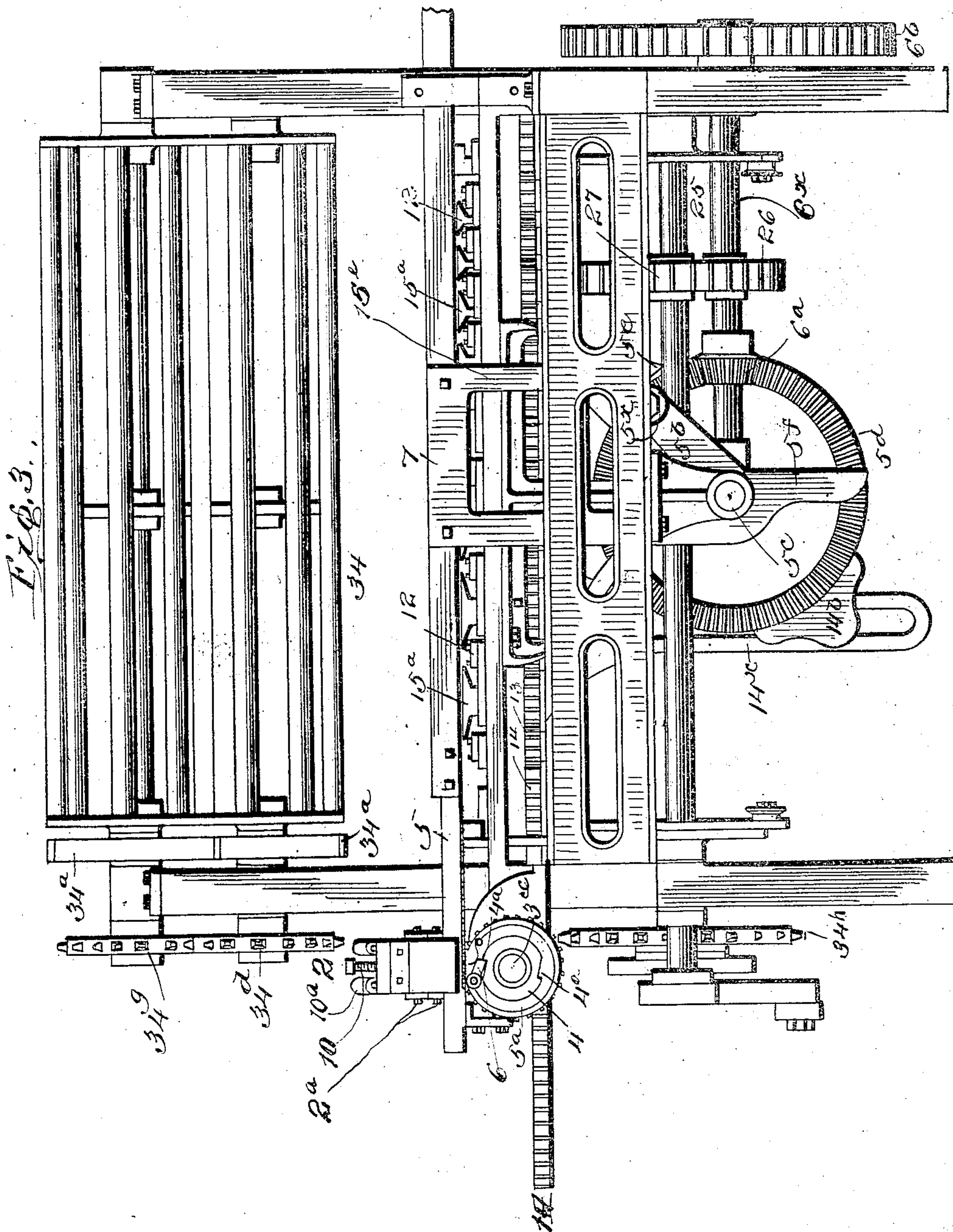


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8 SHEETS—SHEET 3.



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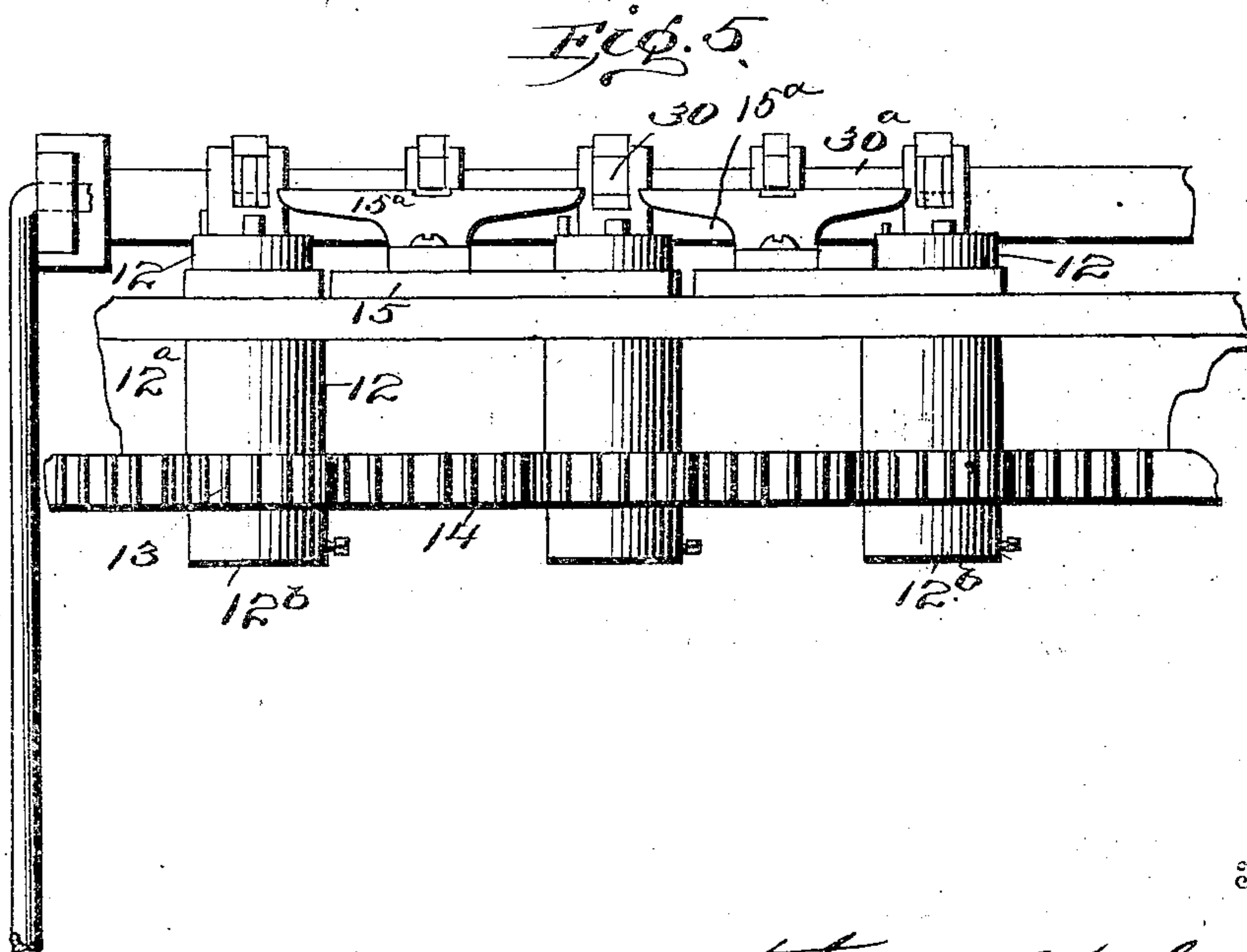
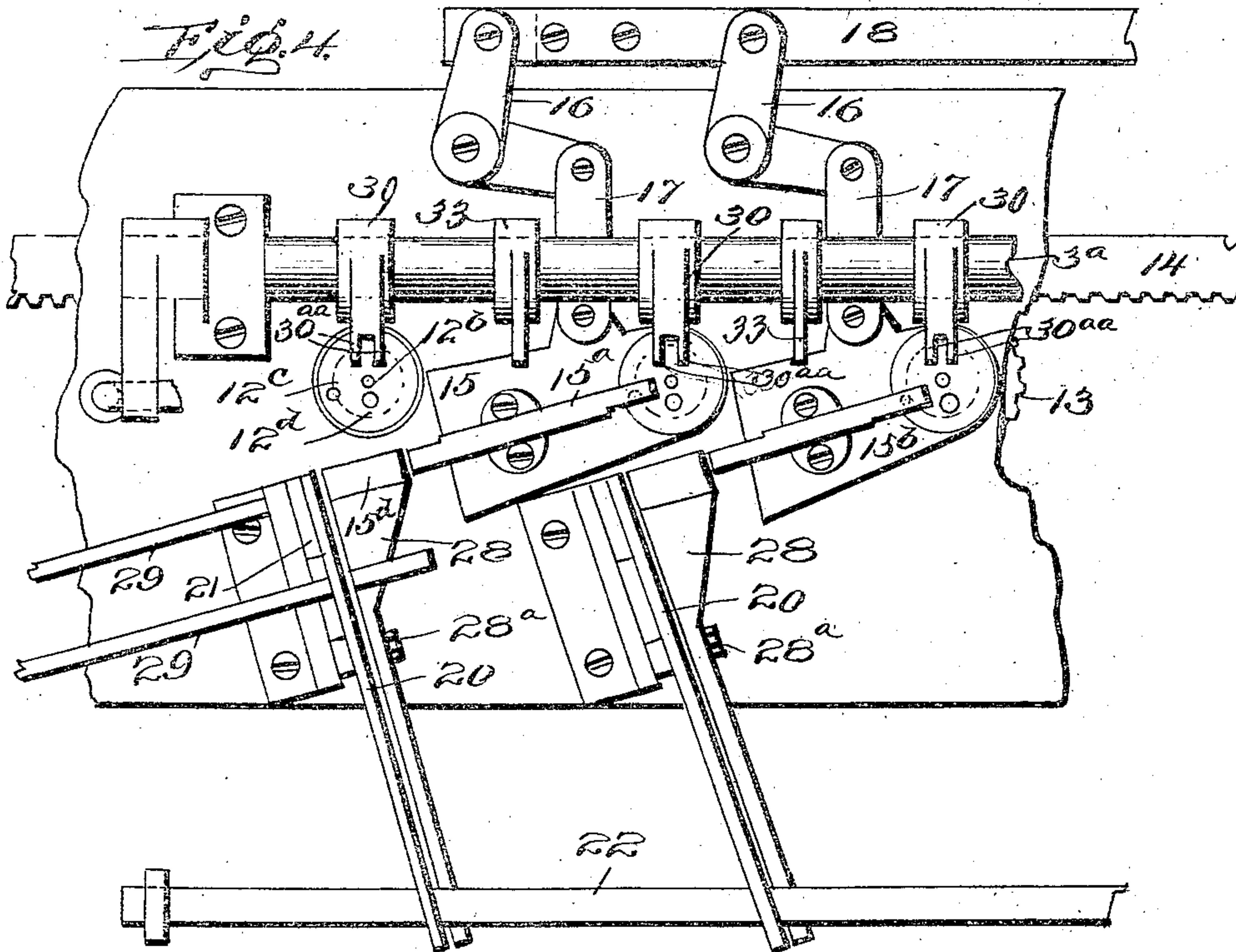
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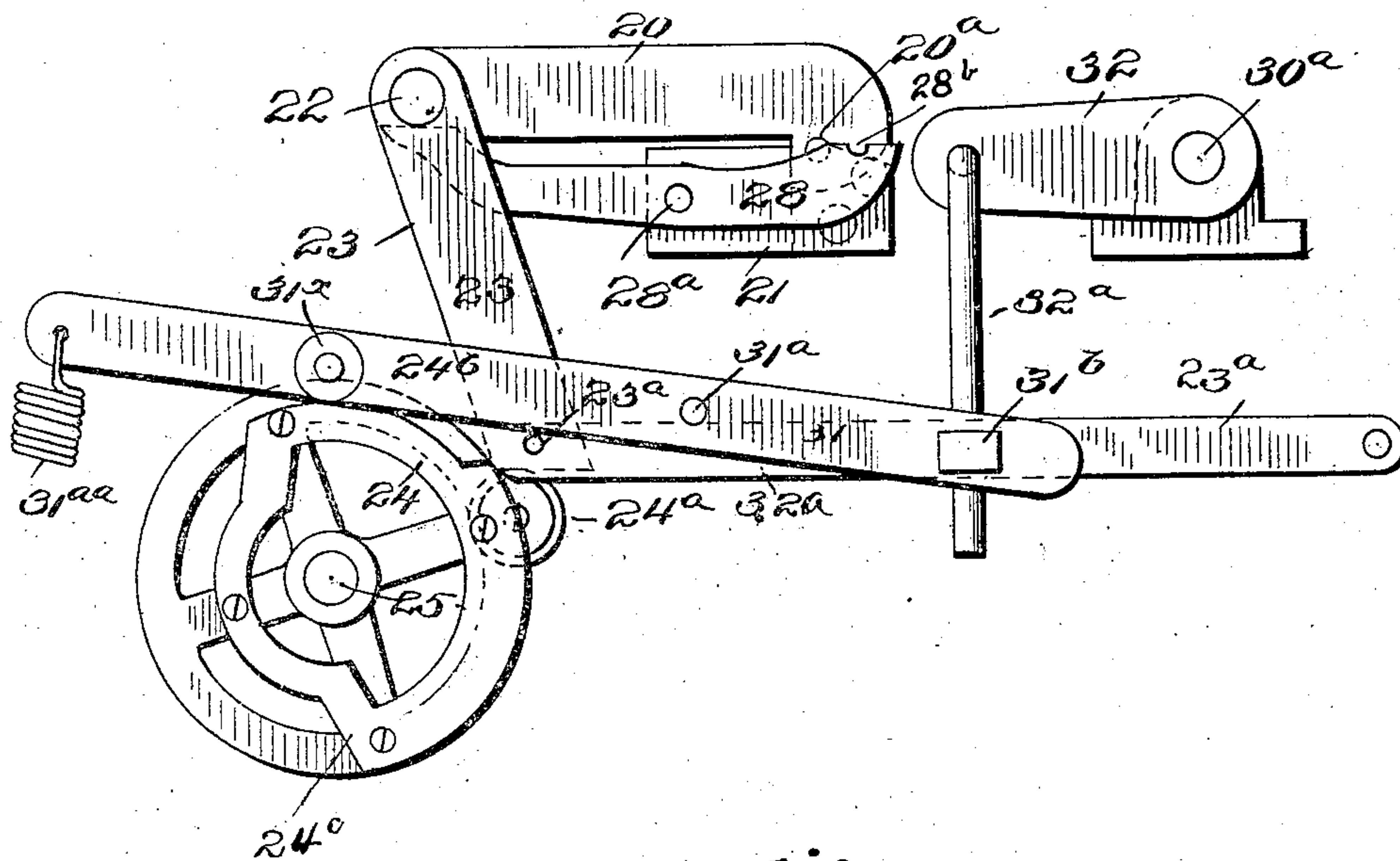
No. 800,986.

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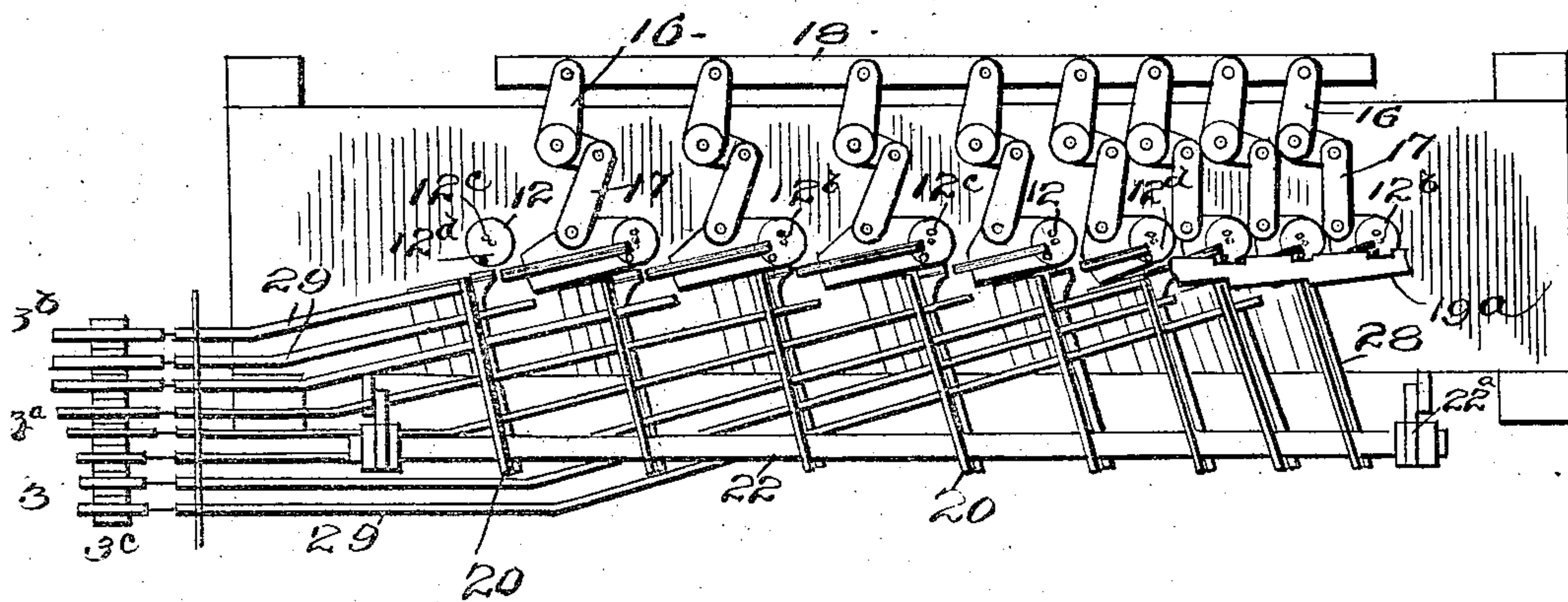
T. M. CONNER.  
WIRE FENCE MACHINE.  
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8 SHEETS—SHEET 5.

*Fig. 6.*



*Fig. 7.*



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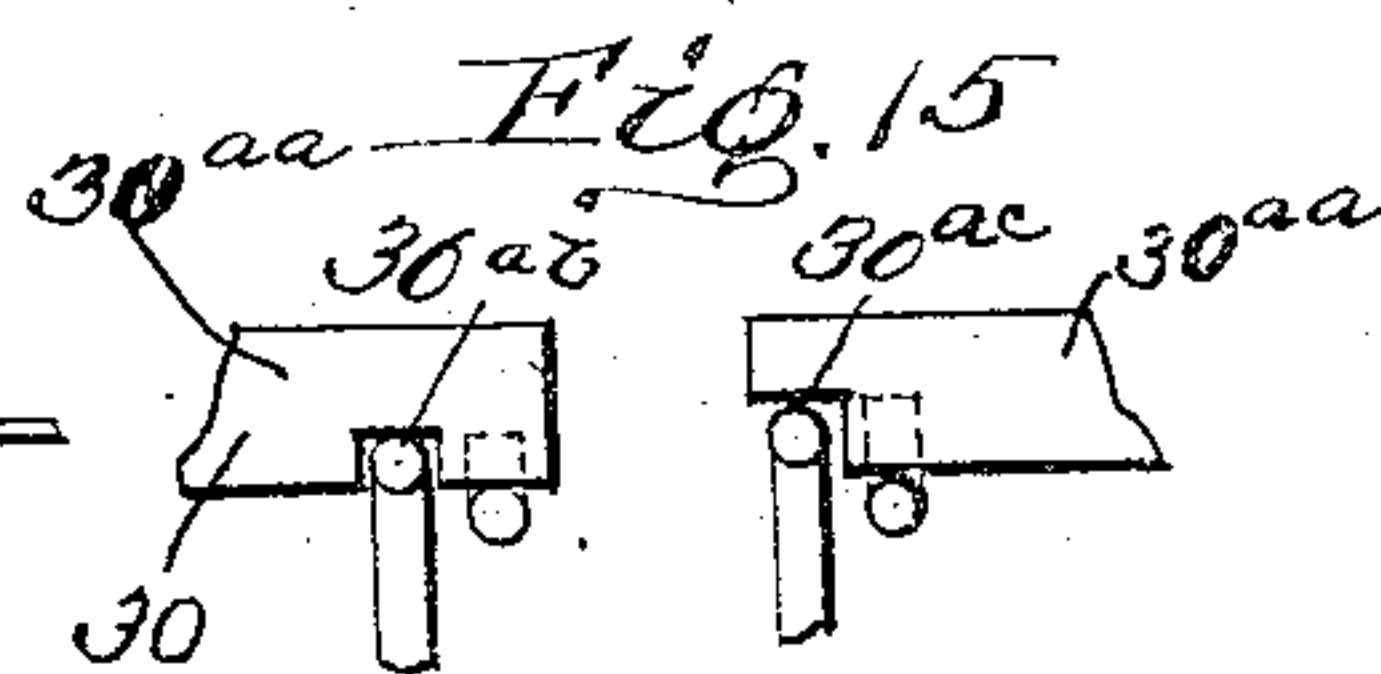
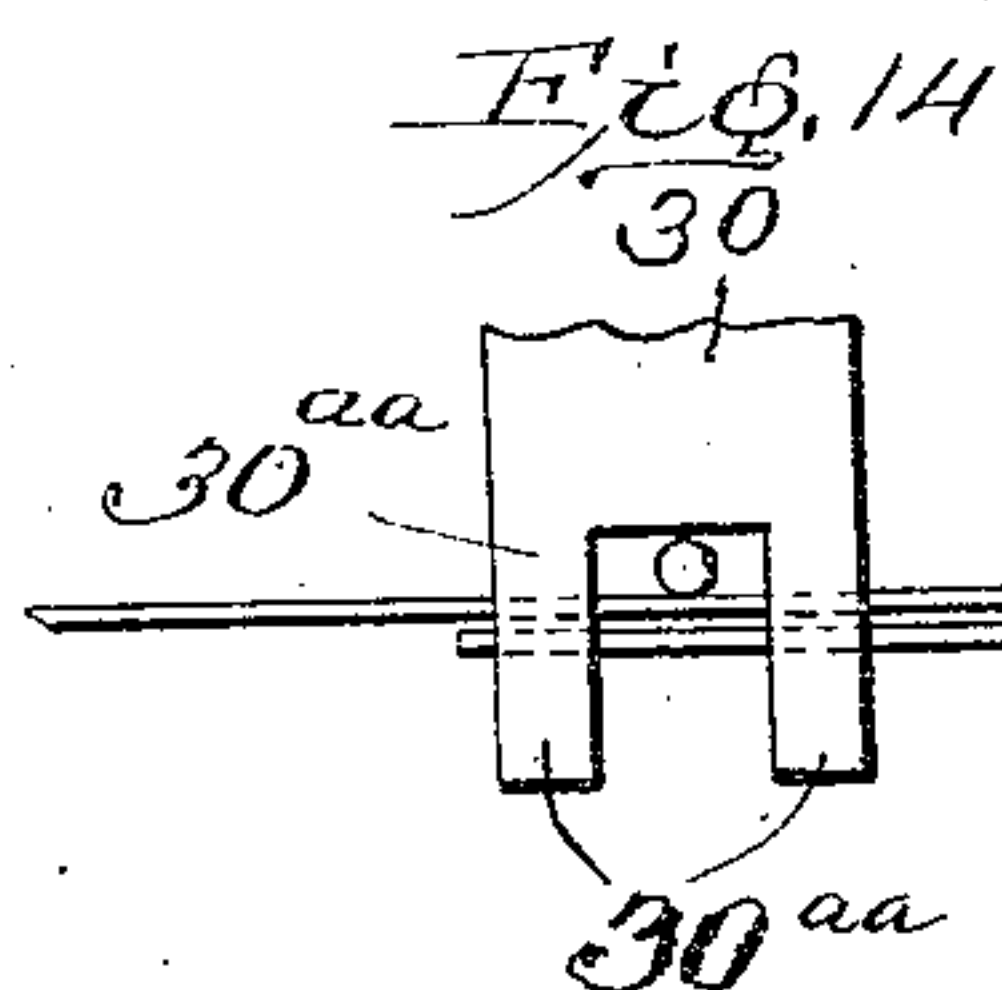
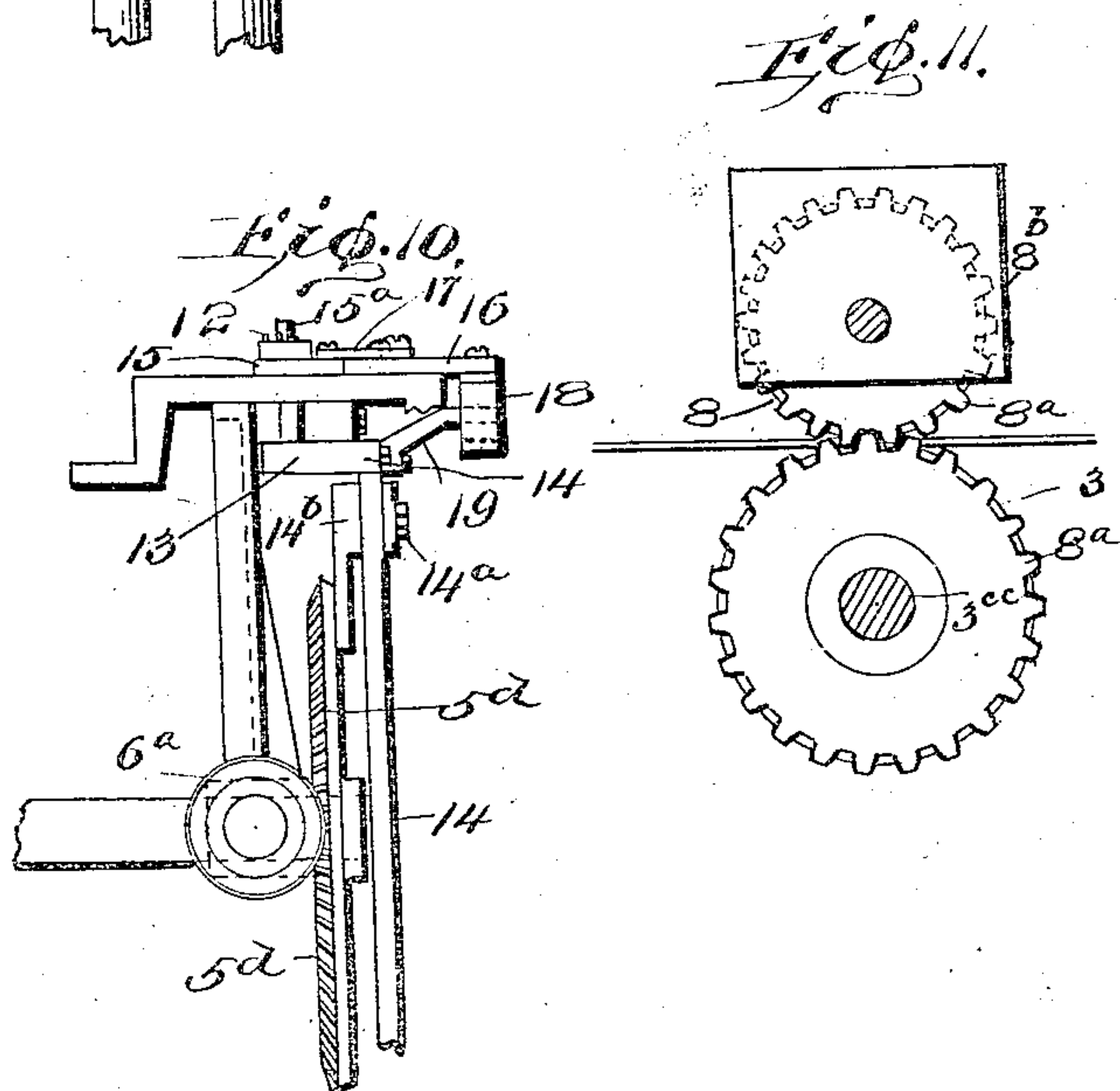
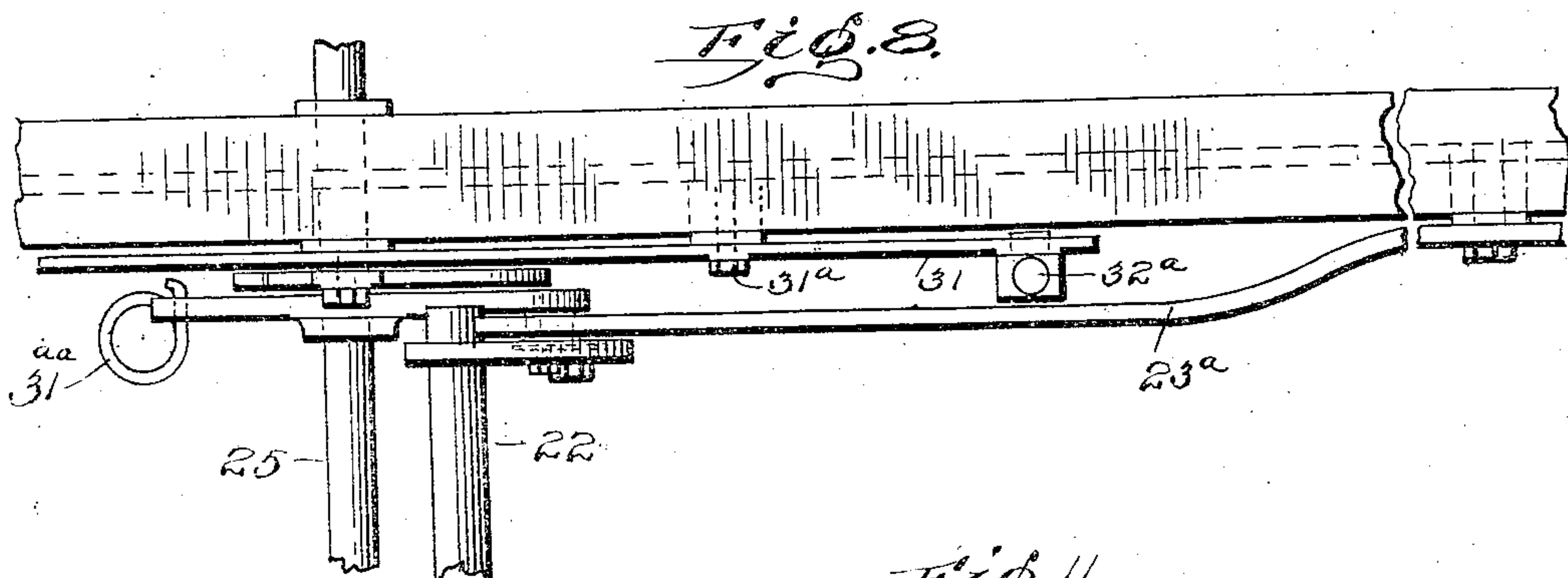
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T. M. CONNER.  
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8 SHEETS—SHEET 6.



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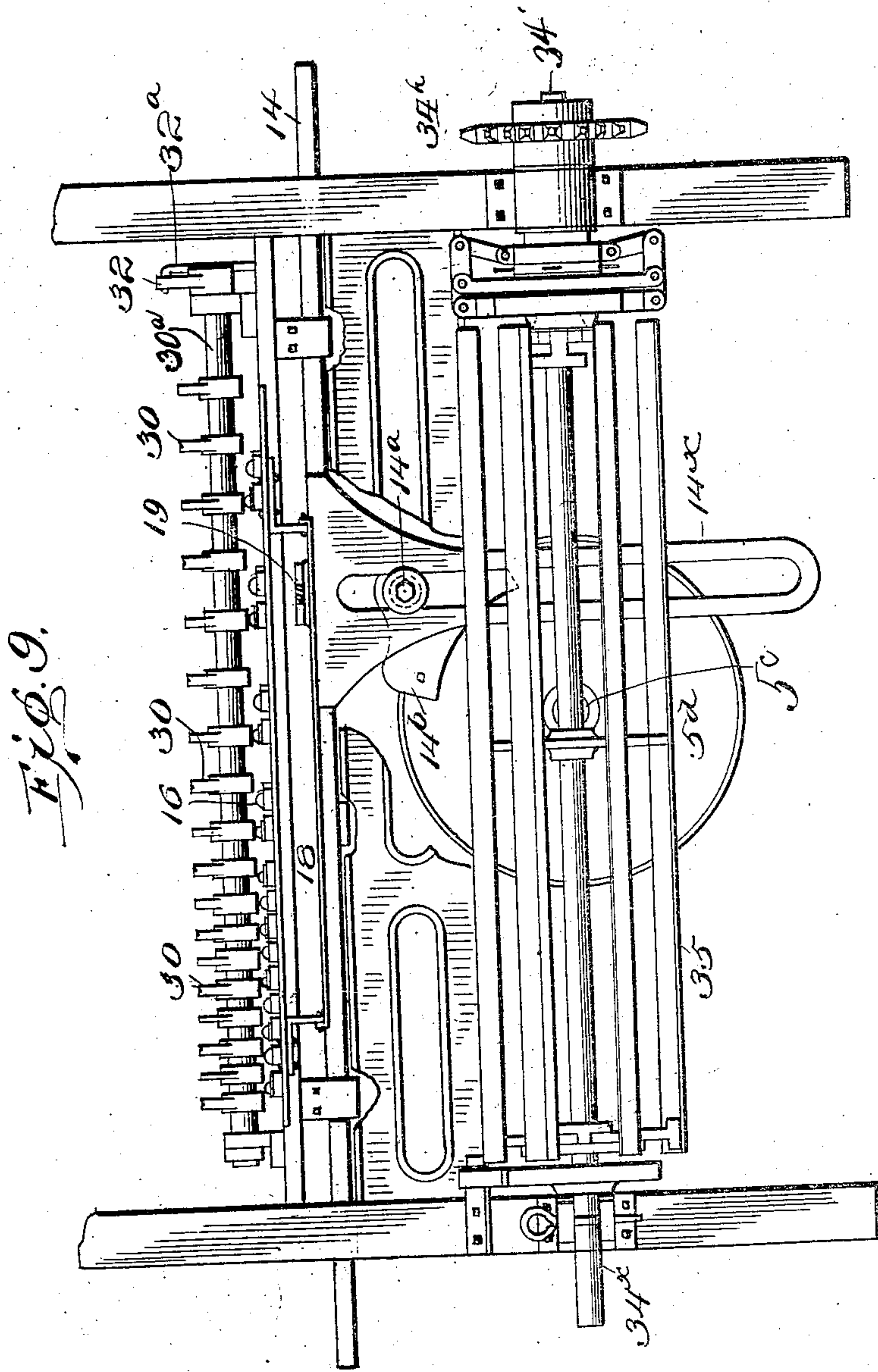
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WIRE FENCE MACHINE.  
APPLICATION FILED JULY 15, 1904.

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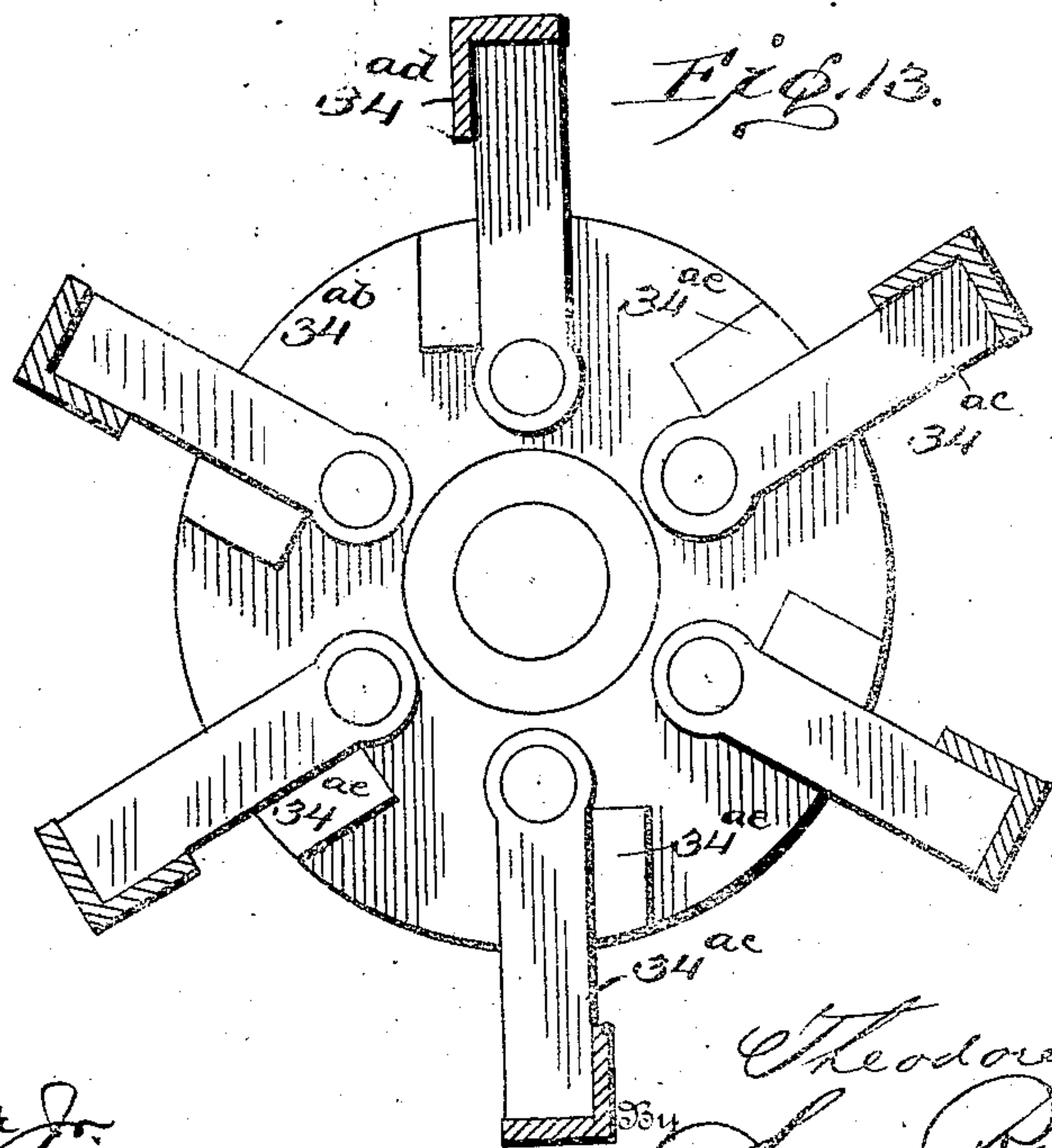
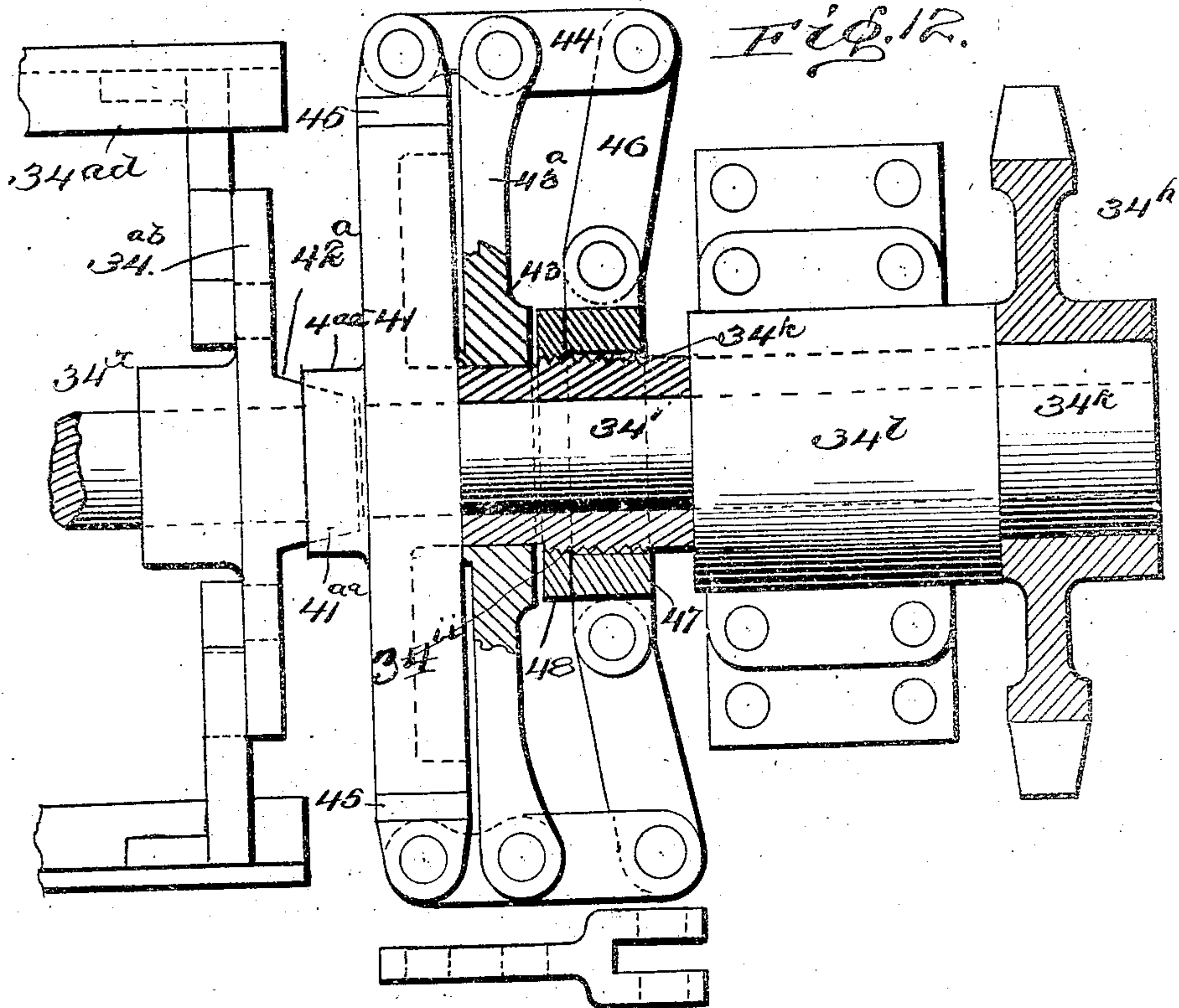


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APPLICATION FILED JULY 15, 1904.

8 SHEETS—SHEET 8.



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# UNITED STATES PATENT OFFICE.

THEODORE M. CONNER, OF KOKOMO, INDIANA.

## WIRE-FENCE MACHINE.

No. 800,986.

Specification of Letters Patent.

Patented Oct. 3, 1905.

Application filed July 15, 1904. Serial No. 216,738.

*To all whom it may concern:*

Be it known that I, THEODORE M. CONNER, a citizen of the United States, residing at Kokomo, in the county of Howard and State of Indiana, have invented new and useful Improvements in Machines for Making Wire Fences, of which the following is a specification.

My invention relates to improvements in wire-fence-making machines.

Said invention has for its object, among other things, to greatly simplify the construction and arrangement of the parts, to control the feeding action of the stay-wire delivering or feeding rolls, to properly reel the woven-wire-fence fabric, to suitably crimp the same, and to promote convenience and facility in the use and operation of the machine, as well as to provide for the gradating of the mesh of the fabric or product thereof.

Said invention consists of the sundry combinations and arrangements of parts substantially as hereinafter more fully disclosed, and particularly pointed out by the claims.

In the accompanying drawings, illustrating the preferred embodiment of my invention, Figures 1 and 2 are front and rear elevations thereof, respectively. Fig. 3 is a side elevation of the same. Fig. 4 is an enlarged detached plan view showing more especially the stay-wire and line-wire connecting devices—*i. e.*, for bending and coiling and interlapping said wires in a certain manner. Fig. 5 is a detailed edge elevation of the same devices as disclosed by Fig. 4. Fig. 6 is a greatly-enlarged detailed view showing more particularly one of the stay-wire cutters, its actuating mechanism, and the means of connection therebetween and the crank-arm of the shaft of what I term “depressors” or “holding devices.” Fig. 7 is a detached plan view disclosing, in addition to certain devices referred to in Fig. 4, more especially the arrangement thereof and additional wire-delivering devices for aiding the gradating of the mesh of the fence-wire fabric. Fig. 8 is a detailed plan view of certain of the devices as disclosed by Fig. 6. Fig. 9 is an enlarged fractional side view showing more particularly the means for directly actuating what may be called the “depressors” for bending or relatively disposing the stay-wires preliminarily to bending them around the line-wires. Fig. 10 is an enlarged edge view of certain of the parts as disclosed by Fig. 9. Fig. 11 is an enlarged detailed sectional view more especially of the wire

feeding or delivering rolls produced through the axes thereof. Figs. 12 and 13 are enlarged detailed and sectional views of the reel and its mechanism. Figs. 14 and 15 are enlarged detailed plan and side views of one of the depressors or wire-bending devices.

In the carrying out of my invention I provide a suitable upright frame 1, upon which all the various operative parts are mounted, as shown. At the feeding or forward end of said frame is suitably secured an upright supplemental frame 2, within which is arranged a number of series of feeding-rolls 3 3<sup>a</sup> 3<sup>b</sup> 3<sup>c</sup> of varying or successively-gradated diameters, according to the meshes it may be desired to give the wire-fence fabric—as, for instance, three inches, four inches, five inches, and six inches, respectively, in the same piece of fabric. Said rolls have a common shaft 3<sup>cc</sup>, suitably journaled in said frame and equipped with a ratchet or notched collar 4, having but two teeth 4<sup>a</sup> 4<sup>b</sup>. A rack 5, engaging a ratchet-disk 5<sup>a</sup>, loose upon the feed-roll shaft and carrying a pivoted spring-pressed propelling pawl or dog 6, engaging the teeth 4<sup>a</sup> of a ratchet or notched collar 4, fixed to said feed-roll shaft, is suitably actuated, as presently explained, to cause said pawl or dog, via said ratchet or notched collar, to impart a semirotation to said feed-rolls for each operation effecting the bending of the stay-wires and their twisting around the line-wires. The actuating means for said rack 5 preferably comprises a crank-arm 5<sup>b</sup>, secured to a shaft 5<sup>c</sup>, suitably driven by a second shaft 6<sup>x</sup>, to which is fixed a beveled pinion 6<sup>a</sup>, geared to a corresponding gear-wheel 5<sup>d</sup>, fixed upon the shaft 5<sup>c</sup>. Said crank-arm 5<sup>b</sup> has a sweeping action, during which its lateral frictional roll 5<sup>e</sup> will engage, first, a beveled terminal 5<sup>e</sup> of one arm or pendant of a frame or sash 7, secured to the rack 5, and, secondly, travel along and accordingly actuate a lower elongated terminal 5<sup>f</sup> of said sash or frame, by which a longitudinally-reciprocating movement will be imparted to the latter. Said shaft 6<sup>x</sup>, geared to the shaft 5<sup>c</sup>, as noted, is suitably driven by a large gear-wheel or pulley 6<sup>b</sup> secured upon the shaft 6<sup>x</sup>, said latter wheel itself being geared to a suitable motor or engine. (Not shown.)

The feeding-rolls 3 3<sup>a</sup> 3<sup>b</sup> 3<sup>c</sup> have arranged directly above them rolls 8, suitably journaled in position with their peripheries presented to the corresponding surfaces of the first-named and between which former and



latter rolls are fed the stay-wires, the upper or former rolls aiding to hold the wires in position while being fed upon the latter rolls and may be provided with peripheral grooves for that purpose. Said upper and lower rolls are geared together, as at 8<sup>a</sup>, to insure the uninterrupted rotation of the upper rolls or as against retardation from any cause. Said upper rolls have their respective journal-bearings 8<sup>b</sup> suspended from adjusting-screws 10, working in a common cross-bar 10<sup>a</sup> of the frame 2, for effecting the adjustment of said rolls with relation to the lower rolls, as in applying the requisite pressure to the feeding of the stay-wires therebetween. Said screws have their upper ends terminating in angular portions to provide for the convenient application thereto of a wrench, as in effecting the turning of said screws for the purpose aforesaid. Suitable openings or apertures 11 are provided in the lower of the connecting-pieces 2<sup>a</sup> of the uprights of the frame 2 for the passage and guidance there-through of the stay-wires *en route* to the feeding-rolls, said apertures being stepped in their arrangement according to the varying diameters of said rolls. Removed some distance from said feeding-rolls and arranged somewhat laterally of a line passing longitudinally through any one thereof is a series or plurality of vertical spindles 12, themselves arranged about in the same line one with the other and relatively at intervals apart and in groups agreeably with the differentiated or graduated groups of said rolls, as shown particularly in Fig. 7. Said spindles are journaled or rotatively supported in position, being suitably held within hollow journals or shafts 12<sup>a</sup>, having bearings and provided with pinions 13, intergeared with an actuating-rack 14. Said rack depends a suitable distance therebelow and has secured thereto a pendent slotted arm 14<sup>x</sup>, receiving a cylindric stud 14<sup>a</sup>, projecting from a cam-offset 14<sup>b</sup>, bolted to the rear surface of the gear-wheel 5<sup>d</sup>, before described, by means of which said rack is actuated or has transmitted thereto a longitudinal reciprocating movement, in turn rotating the pinions 13 for actuating the spindles 12. Said spindles are provided with longitudinal central openings 12<sup>b</sup> for the passage therethrough of the longitudinal or horizontal wires of the prospective wire-fence fabric, also with stay-wire-engaging pins 12<sup>c</sup> 12<sup>d</sup>, relatively arranged in their upper ends to the longitudinal wire-receiving openings or passages 12<sup>b</sup>, the function of which will be presently explained. Relatively arranged to all of said spindles, saving the initial one, with their inner ends pivoted therearound, are what I term "depositors" 15, adapted to move horizontally and deflected somewhat laterally or rearward from a right-lined position. Said depositors have upon their upper surfaces up-  
standing longitudinally-grooved portions or

members 15<sup>a</sup>, suitably secured thereto, preferably as shown, for the reception of the stay-wires and the carrying or moving the latter into a right-lined position, as hereinafter described. Said upstanding members 15<sup>a</sup> have diagonally opposite reduced end portions or recesses 15<sup>b</sup>, the purpose of which will appear later. These depositors are actuated by the following contrivances: Bell-cranks 16, suitably fulcrumed in position, are connected by links 17 to said depositors and directly to a slide or stirrup 18, as seen in Figs. 4 and 9, said stirrup receiving the outer end of and actuated by an arm 19, with its opposite end secured to the rack 14, driven by the wheel 5<sup>d</sup>, cam 14<sup>a</sup> 14<sup>b</sup>, and slotted arm 14<sup>x</sup>, as aforesaid. Said arm 19 is not, however, moved by said stirrup or slide until the rack 14 has nearly reached the end of its movement. Then as the last named makes said movement said arm will be engaged thereby and effect the movement of said depositors so as to in their initial movement carry the stay-wire sections into a right-lined position and after the weaving action be returned to their initial position, as hereinafter more fully disclosed.

Suitable housings 19<sup>a</sup> are so arranged and secured in position upon the bed-plate as to guard against the possibility of the wires springing upward out of the depositors 15 as they are delivered thereinto from the tubes 29, also against their displacement while being transferred to a point under the depressors 30 and clamping-arms 33.

A series or plurality of cutters 20, having their fulcrums at 20<sup>a</sup>, are provided, one being arranged contiguously to each spindle 12, but a little forward and laterally thereof and with their cutting edges disposed about in the same general alinement with the grooves of the members 15<sup>a</sup> of the depositors 15, which places them at right angles to said depositors and diagonally with reference to the frame of the machine, as shown in Fig. 4. This arrangement causes the cutters to sever the wire-forming stays into the requisite lengths or sections, as will more fully appear presently. Alongside of the forward or cutting edge of each cutter is suitably secured edgewise a block or steel 21, through which passes and is supported the wire while being cut. Through the heel ends of these cutters passes a common rod 22, suitably supported in position in bearings 22<sup>a</sup>, as seen in Fig. 7, and to this rod is connected a pendent arm 23, with its lower end connected to a pivoted bar 23<sup>a</sup>, adapted to be engaged by a frictional roll 24<sup>a</sup>, carried eccentrically by a cam-wheel 24 for actuating said arm and through it the cutter or knife. Said cam-wheel is secured upon and receives its motion from a shaft 25, geared to the main driving-shaft 6<sup>a</sup> by a spur gear-wheel 26, secured upon the shaft 25 and meshing with a trundle-pinion 27, secured upon the shaft 6<sup>a</sup>.



Also alongside of each knife or cutter and between it and a depositor 15 is arranged what may be termed a "bridge" or "bar" 28, pivotally supported at 28<sup>a</sup> from the part 21 and of suitable construction to fill in or span the intervening space between such knife and depositor, as shown particularly in Fig. 4, for the temporary support of the stay-wire adjacent the point of cutting the latter. Said bridge-piece or bar 28 has in the upper surface of its forward end a notch or recess 28<sup>b</sup> for the reception and passage transversely therethrough of the stay-wire as the latter is being cut, as seen especially in Fig. 6, the same surface of said bridge being also preferably concaved or curved downward to remove the same out of the way. The outer or rear end of said bridge-piece or bar has its upper surface adapted to rest under the rod 22 to hold said bridge-piece or bar temporarily in horizontal position, as while cutting the wire, as seen in the latter-referred-to Fig. 6.

Intermediarily of the various cutters or knives 20 and the series of feeding-rolls are tubes or guides 29, adapted, as shown particularly in Fig. 7, to conduct or direct the sundry stay-wires to said cutters or knives and for subsequent manipulation, as presently described. Said tubes or guides are of varying lengths and arranged to deliver their respective wires or contents successively to the respective knives or cutters, spindles, and depositors of the whole series, as shown, as the same are fed therethrough by said rolls. Such arrangement of said tubes or guides involves the extending thereof initially in right lines varying distances and then extending them diagonally in like manner with their delivering ends terminating short distances beyond the respective knives or cutters, but short distances from the receiving ends of the grooves of the respective depositors and in alinement therewith.

A series of what may be called "depressors" or "bending devices" 30 is arranged to cause their effective or bifurcated ends to act upon and, as their names denote, depress or bend downward the stay-wires as the latter are delivered thereunder by the depositors 15, as indicated particularly in Fig. 5, as in the weaving operation, as in connecting together said wires and passing them around the line or longitudinal wires of the wire-fence fabric. Each depressor has the prongs or members 30<sup>aa</sup> of its effective or bifurcated end (see Figs. 4, 14, and 15) provided with undercut notches 30<sup>ab</sup> 30<sup>ac</sup>, respectively, one notch 30<sup>ab</sup> being adapted to receive one of the lapping stay-wires forward of the "line" or longitudinal wire, while the unnotched surface of this prong engages or impinges the other of these stay-wires. The other notch 30<sup>ac</sup> receives one of said stay-wires rearward of said line or longitudinal wire, while the unnotched surface of the prong impinges or engages the

other of said wires. Thus alternating portions of the side-by-side-disposed stay-wires are depressed below and raised above the plane of its opposite portion, respectively, to provide for the corresponding engagement thereof by the twisting-pins 12<sup>d</sup> of the twistors for effecting the intertwisting of said stay-wire sections with their application to the line or longitudinal wires. Said depressors or bending devices are secured to a common shaft 30<sup>a</sup>, actuated by the cam-wheel 24, engaging a roll 31<sup>x</sup> of a bar or lever 31, pivoted, as at 31<sup>a</sup>, and held in a depressed position or in forcible engagement with said cam-wheel 24 by a spring 31<sup>aa</sup>, suitably secured to said lever and a fixture. Said lever is preferably connected to an eyebolt 31<sup>b</sup>, coupling it to the pivoted bar 23<sup>a</sup> and to the crank-arm 32 of the shaft 30<sup>a</sup> via a cranked rod 32<sup>a</sup>, pivoted in said arm, and passing through the eye of said bolt, respectively, particularly as shown in Fig. 6. Upon the shaft 30<sup>a</sup> is also secured a series of clamping or holding arms or devices 33, adapted to overlie and retain the stay-wires within the grooves of the members 15<sup>a</sup> of the depositors 15 until after each weaving operation, as shown especially in Fig. 5, said clamping-arms alternating with said depressors. Said depressor and clamping-arm carrying shaft 30<sup>a</sup> is suitably affected to cause the depressors and clamping-arms to assume certain positions, as in the weaving operation, as presently described, by the action of cam members 24<sup>b</sup>, 24<sup>c</sup>, and 24<sup>d</sup>, with which the cam-wheel 24 is equipped, said cam members being adapted to separately actuate the lever 31, through which and the parts 32 32<sup>a</sup> said shaft is operated, as above noted.

Suitable crimping or scalloped trundle-rolls 34 are journaled or hung so as to interact one upon the other in an elevated frame or support 1<sup>a</sup>, superposed upon the frame 1, and over and in between these is passed the woven-wire-fence fabric during the weaving operation for crimping said fabric, and finally wound upon a reel 35, adjustably secured upon and receiving motion from a shaft 34<sup>x</sup>, driven as presently described. Said reel comprises, preferably, two heads 34<sup>ab</sup>, carried by its shaft 34<sup>x</sup>, and pivoted radial arms 34<sup>ac</sup>, applied to said heads, each pair of arms being connected together by means, preferably, of any angle-iron cross-bar 34<sup>ad</sup>, secured to said arms at their outer ends and upon which is directly wound or reeled the wire-fence fabric as it is woven. To the heads 34<sup>ab</sup> are secured or with them are cast stops 34<sup>ae</sup>, which are so arranged as to have contact with the radial arms 34<sup>ac</sup> and hold them in effective or operative position as the fabric is being reeled. After the reeling operation the pivoted arms 34<sup>ac</sup> are capable of being moved or swung inward to permit of the collapsing of the reel, whereby the reeled fabric may be readily removed from the reel, as readily understood. Said crimp-



ing-rolls are rotated or driven, preferably, by intergeared wheels 34<sup>a</sup> 34<sup>a</sup>, secured upon the shafts of the lower and one of the upper of said reels or rolls and chain belt 34<sup>b</sup>, encompassing sprocket-wheels 34<sup>d</sup> and 34<sup>e</sup>, respectively; the wheel 34<sup>d</sup> being secured to the lower one of the rolls 34, while the wheel 34<sup>e</sup> is loosely sleeved or journaled upon a fixed shaft 6<sup>a</sup> and equipped with a ratchet 36, with which engages a dog or pawl 37, carried by a crank-arm 38. Said crank-arm has a lateral pin 38<sup>a</sup> at its outer end engaging an elongated slot 39 of a pitman 39<sup>a</sup>, adapted to be reciprocated by a crank-arm 40, secured to the shaft 25. A second chain belt 34<sup>f</sup> encompasses a sprocket-wheel 34<sup>g</sup>, secured to one of the upper rolls 34, and a sprocket or cog wheel 34<sup>h</sup>, secured upon a sleeve 34<sup>k</sup>, keyed or fixed upon a shaft 34<sup>i</sup>, journaled in a bearing or box 34<sup>j</sup>, secured to a leg of the machine-frame 1 and from which shaft motion is transmitted to the reel-shaft 34<sup>x</sup>, as presently disclosed. By this arrangement it will be noted that the requisite intermittent actuation of the crimping-rolls and the fabric-reel is secured at the required interval as relates to each stay and line wire connecting operation of the weaving process, so as to provide for the taking up of the fabric as fast as woven and suitably reeling the same.

Upon the shaft 34<sup>i</sup> before noted is secured or keyed a friction-wheel 41, having upon one side around its axial opening a central socket extension 41<sup>aa</sup>, with its inner surface or face flared outward and angular in cross-section. The reel 35 has one of its heads 34<sup>ab</sup> provided with a central, conical, or tapered boss 42<sup>a</sup>, adapted to enter the socket extension 41<sup>aa</sup> of the friction-wheel 41 to provide by frictional contact therebetween, as more fully later disclosed, for transmitting motion to the reel.

Suitably keyed upon the sleeve 34<sup>k</sup>, contiguously to the friction-wheel 41, is a yoke 43, having diametrically opposite arms 43<sup>a</sup>, and suitably pivoted in the outer ends of said arms are levers 44, to one end of each of which is connected or pivoted a clutch or clamp 45, preferably faced with leather or other suitable friction-producing material and adapted to engage the periphery of the wheel or pulley 41, as will be more fully later disclosed. To the opposite ends of said levers are connected links 46, in turn connected to a collar or ring 47, encompassing the sleeve 34<sup>i</sup>. Engaging a screw-threaded surface 34<sup>ii</sup> of said sleeve is a corresponding spoked or armed annular nut 48, arranged laterally in contact with said sleeve. It will be noted that by actuating the nut 48 so as to move the ring or collar 47 into such position which will cause the links 46 to assume right-lined positions the levers 44 will apply the clamps or clutches 45 to and cause them to bind upon the friction-wheel periphery to provide for the compact winding of the fabric upon the

reel. This pressure may be controlled by accordingly adjusting the nut 48, as said pressure, of course, is required to be lessened as the quantity of wire fabric reeled increases to provide for the greater slipping action as between the parts 41<sup>aa</sup> and 42<sup>a</sup> during such reeling action.

Upon the frame 1, contiguously to the opposite end of the reel 35, is suitably hung a pawl 49, engaging the teeth of a ratchet-wheel 50, secured to that end of said reel, thus providing for the holding of the latter against involuntary reverse rotation.

Provision is made, as by the pinning of the opposite end of the reel-shaft 35 in its bearing, as shown at 51, for permitting the ready removal of the reel with its reeled fabric from its bearings or position in the frame, as in taking off the fabric.

In operation the line or longitudinal forming wires having been unwound from their respective rolls (not shown) suitably held in position and initially passed through the spindles 12 and properly applied to the crimping rolls 34 and the reel 35, as indicated, the stay-forming wires are fed through the respective feeding-rolls 33<sup>a</sup> 33<sup>b</sup> 33<sup>c</sup>, the machine, it being understood, having been put in operation. Said latter wires are conducted by the tubes 29 to and past the respective knives or cutters 20 and to the depositors 15 and the spindles 12 and severed into the required lengths for forming the prospective stays or braces for the stringers or line-wires. After the feeding operation the thus-formed stay or brace wire sections will be carried into right-lined positions, still in alinement with each other, above said spindles and their pins 12<sup>c</sup> 12<sup>d</sup>. The depressors 33 now descend and the prongs 30<sup>aa</sup> of the bifurcated end portions engage and depress or bend downward said stay-wire sections, as seen in Fig. 5, said sections thus being lapped by one another and disposed to be engaged by the pins 12<sup>c</sup> 12<sup>d</sup>, as presently described. Simultaneously with this action of parts the clamp-arms 33 are caused to assume a position above the depositors and retain the wire-sections in the latter, as when subsequently acted upon by the pins 12<sup>c</sup> 12<sup>d</sup>. The action of the cam-surface 24<sup>a</sup> of the wheel 24 will be effective via the various intermediary connecting devices previously described to cause the depressors 30 to assume a horizontal position by the time the depositors 15 have reached their dotted-lined positions, as when they are in right-lined positions, and the action of the cam-surface 24<sup>b</sup> is effective to still further depress the wire-sections to bring the latter into such position as to be engaged by the pins 12<sup>c</sup> 12<sup>d</sup>, said cam-wheel of course having by its rotation effected such disposition of said pins with relation to said wire-sections. The spindles 12 will now begin to rotate and bring the pins 12<sup>c</sup> into engagement with and cause the bending or carrying one of the wire-sections



tions into contact with and around the line or longitudinal wires passing through said spindles, the other pin 12<sup>a</sup> serving to hold and prevent reverse movement of said wire-section. As this action of the pins 12<sup>c</sup> continues, which involves three separate rotations of said spindles, the two meeting wire-sections will be interlapped by one another in addition to the formation of the U by the initial action of the pins 12<sup>c</sup> upon the single wire, as above noted, and thus effect the weaving of the stay and line wires together or into the fence fabric. At the conclusion of the weaving operation as thus performed the wheel 24 will by its rotation render the cam-surface 24<sup>c</sup> effective to return the depressors 30 and clamping-arms 33 to their initial position out of the way of the woven fabric to permit the delivery of the latter to the crimping-rolls 34 and finally to the reel 35. At the starting of the operation of the machine the crank-arm 5<sup>b</sup> on the shaft 5<sup>c</sup>, actuated by the wheel 5<sup>a</sup>, will intermittently operate the sash 7 by alternately engaging the terminals 5<sup>c</sup> 5<sup>f</sup> of the latter as said shaft is rotated, and accordingly actuate the ratchet-wheel 5<sup>a</sup>. The last named will cause the pawl or dog 6 to engage or propel the shaft 3<sup>c</sup>, carrying the feeding-rolls 3 3<sup>a</sup> 3<sup>b</sup> 3<sup>c</sup>, consequently effecting the intermittent rotation of said rolls for the corresponding feeding of the stay wires or sections. Also simultaneously with this action of parts the slotted arm 14<sup>x</sup>, connected to the rack 14, will be actuated by the cam-arm 14<sup>b</sup>, carrying the pin 14<sup>a</sup>, engaging the slot in said arm 14<sup>x</sup>, and thus move said rack so as to cause it to actuate the arm 19, extending into the slide 18. Said slide is adapted to have only a limited longitudinal movement, as it is engaged by said arm 19 to accordingly actuate the depositors 15 to move them into a right-lined position. Said engagement is effected just before the rack is about to make its final movement in either direction, thus providing for the throwing of the depositors into their initial and final positions, respectively, at the beginning and conclusion of the operation of the other parts. As the depositors come into right-lined position it will be noted that the diagonally notched or reduced end portions 15<sup>b</sup> thereof will receive the end portions of the respective stay-wire sections as when performing the weaving operation. Also it will be noted that with the escape of the pivoted bar 23<sup>a</sup> from the cam-wheel roll 24<sup>a</sup>, as in effecting a cutting operation, the rod-carrying end portions 22 of the knives 20 and the corresponding end portions of the bridge pieces or bars 28 will drop or descend by the preponderant weight thereof sufficiently to effect the automatic opening of the knives or cutters and the temporary displacement of said bars 28, which latter, however, are adapted to automatically return to their initial position by the greater weight of their forward ends

when the cutters or knives are actuated, as above noted.

I claim—

1. A machine of the character described employing line and stay wire feeding devices, line-wire-guiding devices, means for relatively disposing the stay-wire sections pivoting upon said guiding devices, devices for interlocking said stay-wire sections as they are laid upon the line-wire, and means for intertwisting said stay-wire sections upon said line-wire.

2. A machine of the character described, employing stay-wire-feeding rolls and line-wire guiding or delivering spindles, means for severing the stay-wires into suitable lengths, means for relatively disposing said sections pivoting upon said line-wire-guiding spindles, means for bringing said sections into position to be acted upon by twisting-pins carried by said spindles, and means for actuating said twisting-pins.

3. A machine of the character described, employing stay and line wire feeding devices, means for severing the stay-wires into suitable lengths or sections, means pivoted to swing laterally for receiving and carrying said sections into longitudinal alignment, means adapted to interlock and intertwist said sections with the line-wires, and means adapted to depress said sections at their ends into position to be acted upon by said interlocking and intertwisting means prior to such action.

4. A machine of the character described, employing stay and line wire feeding devices, pivoted cutters arranged and adapted to cut the stay-wire into suitable lengths or sections, laterally-swinging devices having longitudinal grooves to receive said stay-wires prior to the severing thereof, vertically-reciprocated devices for depressing or downwardly bending said sections at their ends, twisting-pins for engaging the downwardly-bent portions of said sections, and means for actuating or rotating said twisting-pins.

5. A machine of the character described, employing stay-wire-feeding rolls, laterally-swinging "depositors" adapted to receive the stay-wires, means for severing said stay-wires into sections, after the reception thereof by said "depositors," line-wire receiving and delivering spindles carrying twisting-pins and adapted to form the axes or pivots of said "depositors," means for depressing the end portions of said sections into position for the action of said twisting-pins, and means for actuating said twisting-pin-carrying spindles.

6. A machine of the character described, employing stay-wire-feeding rolls, laterally-swinging "depositors" adapted to receive the stay-wires, wire-conducting tubes arranged between said feeding-rolls and depositors to deliver said wires to said depositors, cutters for severing said wires into sections, reciprocating depressors for bending downward the end portions of said wire-sections, spindles



having the line-wires passing therethrough and provided with twisting-pins adapted to interlock and intertwist said wire-sections together and upon said line-wires and means for actuating said spindles.

7. A machine of the character described, employing stay-wire-feeding rolls, laterally-swinging "depositors" having for their axes or pivots spindles through which are passed the line-wires, said spindles being equipped at their upper ends with twisting-pins, cutters for severing said stay-wire into sections, depressors adapted to bend downward the end portions of said sections into position for the action of said twisting-pins, means for actuating said spindles, and wire-conducting tubes having right-lined portions adjacent, and receiving, the stay-wires from said feeding-rolls, and their remaining portions extending diagonally toward, and in alinement with, the corresponding initial position of said "depositors."

8. A machine of the character described, employing peripherally-opposed stay-wire-feeding rolls of graduated diameters, laterally-swinging "depositors" adapted to receive the stay-wires and arranged at varying intervals apart relatively corresponding to the differential diameters of said rollers, said "depositors" having for their axes or pivots line-wire-delivering spindles provided, at their upper ends, with twisting-pins to engage said stay-wires, cutters for severing said wires into sections, means for actuating said spindles, depressors for bending downward said stay-wire sections for the action of said twisting-pins, and stay-wire-conducting tubes of varying or graduated lengths as suggested by the arrangement of said depositors and diameters of said feeding-rolls.

9. In a machine of the character described, the combination with wire-feeding rolls and cutters for severing the stay-wires into sections, of laterally-swinging "depositors" adapted to receive said wires, rotary spindles equipped at their upper ends with twisting-pins for acting upon said stay-wires and adapted to permit the passage therethrough of the line-wires, said "depositors" having diagonally opposite reduced end portions for the purpose set forth.

10. In a machine of the character described, the combination with wire-feeding rolls and cutters for severing the stay-wires into sections, of laterally-swinging "depositors" adapted to receive said wires, rotary spindles equipped at their upper ends with twisting-pins for acting upon said wire-sections and adapted to permit the passage therethrough of the line-wires, bell-cranks linked to said "depositors," a slide connected to said bell-cranks, a rack having an arm engaging said slide, and means for actuating said rack.

11. In a machine of the character described, the combination, with wire-feeding rolls and

cutters for severing the stay-wires in sections, of laterally-swinging "depositors" adapted to receive said wires, rotary spindles equipped at their upper ends with twisting-pins for acting upon said wire-sections and adapted to permit the passage of the line-wires therethrough, bell-cranks linked to said depositors, a slide connected to said bell-cranks, a rack having an arm actuating said slide, and a wheel, cam and slotted-arm mechanism for actuating said rack.

12. In a machine of the character described, the combination, with wire-feeding rolls and cutters for severing the stay-wires into sections, of laterally-swinging "depositors," adapted to receive said wires, rotary spindles equipped with twisting-pins for acting upon said wire-sections and adapted to permit the passage of the line-wires therethrough, means for actuating said "depositors," and depressors and mechanism for actuating the same including a rock-shaft, a cam-wheel, a spring-pressed lever operating in conjunction with said cam-wheel, and a pivoted bar, said rock-shaft having its crank-arm coupled to said lever.

13. In a machine of the character described, the combination, with wire-feeding rolls and cutters for severing the stay-wires into sections, of laterally-swinging "depositors" adapted to receive said wires, line-wire delivering or feeding means, means for twisting said wire-sections, reciprocating depressors for bending downward the stay-wire sections at their ends and holding devices or arms arranged upon the shaft carrying said depressors and adapted to overlie said "depositors" and retain said stay-wire sections in the latter at a certain step in the fabric-weaving operation.

14. In a machine of the character described, the combination with wire-feeding means and wire-severing cutters, of pivoted bridge-pieces arranged alongside of said cutters and each having in its upper edge, near one end a notch to permit the passage of the wire, and its other end adapted to rest under the rod connecting the heel ends of said cutters.

15. In a machine of the character described, the combination of means for feeding stay and line wires, means for cutting the stay-wire in sections, means for disposing said sections, after the wire-severing operation, in right-lined arrangement, means for intertwisting said sections, a shaft carrying depressors adapted to act upon said wire-sections to bring them into position for the action of the twisting means, and means for intermittently actuating said shaft including a cam-wheel equipped with cam-faces arranged at certain intervals apart, and a lever adapted to be engaged by said surfaces and connected via certain other parts, to said shaft, and means for actuating said cam-wheel.

16. A machine of the character described, employing pivoted depositors for disposing



the stay-wire sections in proper relation to the line-wires, and twisters forming the pivots for said depositors and adapted to cause one stay-wire section to initially assume a substantially U shape alongside of the line-wire, and thereafter and continuously to effect the interlocking of said stay-wire sections and the applying of the terminals of said stay-wire sections upon the line-wires.

10 17. A machine of the character described, employing pivoted depositors to receive and carry the stay-wire sections into position with relation to the line-wires, and twisters adapted to cause one stay-wire section to initially  
15 assume a substantially U shape alongside of the line-wires and thereafter and continuously to effect the interlocking of said stay-wire sections and the applying of the terminals of said stay-wire sections upon the line-wires.

18. A machine of the character described, 20 employing line and stay wire feeding devices, line-wire-guiding devices, means for relatively disposing the stay-wire sections, pivoting upon said line-wire-guiding devices, depressors for depressing said stay-wire sections, after hav- 25 ing been brought into position with relation to the line-wires for the action of the twisters, devices for interlocking said stay-wire sections as they are laid upon the line-wires, and means for intertwisting said stay-wire sections 30 and said line-wires.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THEODORE M. CONNER.

Witnesses:

W. W. DRINKWATER,  
M. E. NETHERCUT.