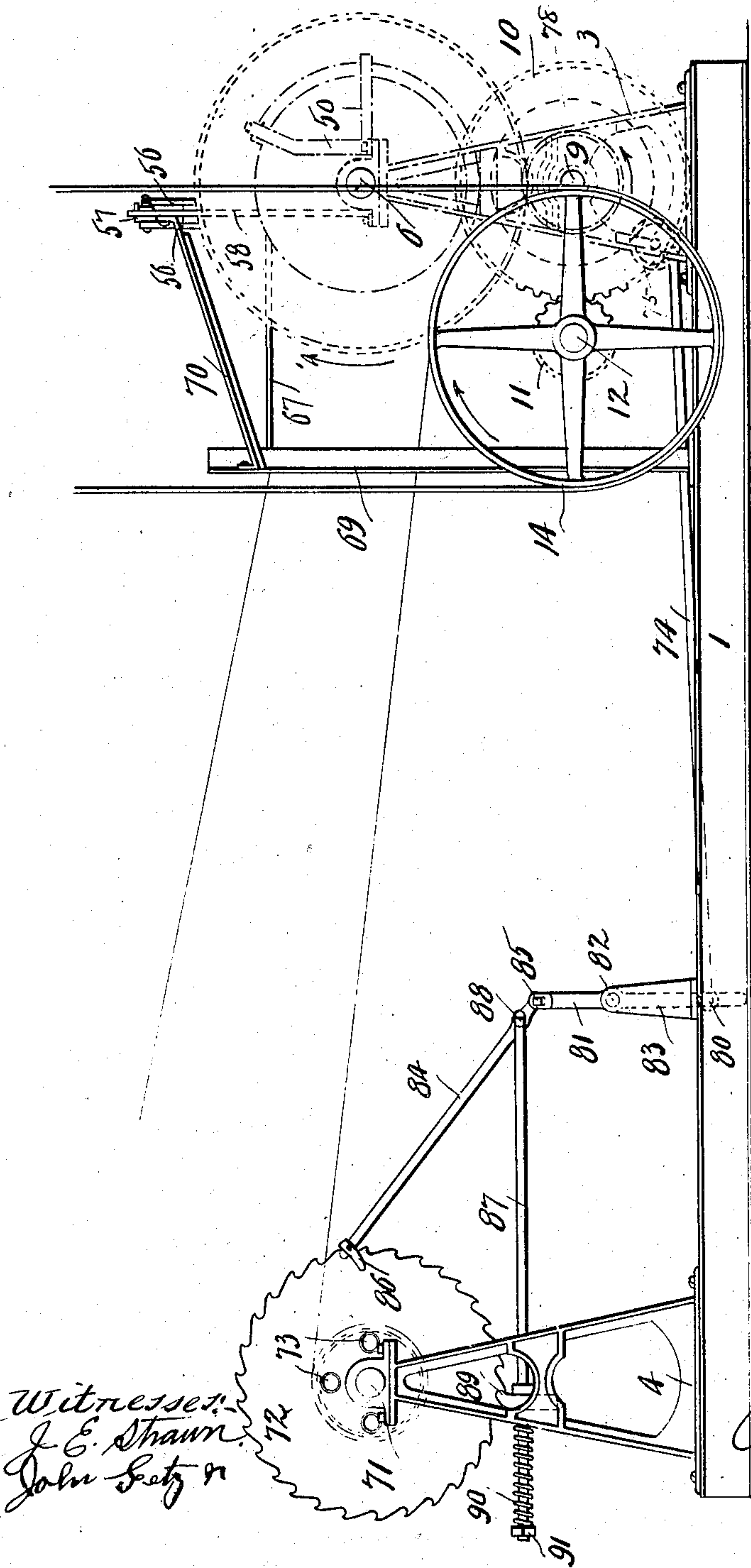


J. L. CLAUDIN.  
WIRE FENCE MACHINE.  
APPLICATION FILED MAR. 31, 1902.

923,770.

Patented June 1, 1909.  
7 SHEETS—SHEET 1.



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7 SHEETS—SHEET 2.

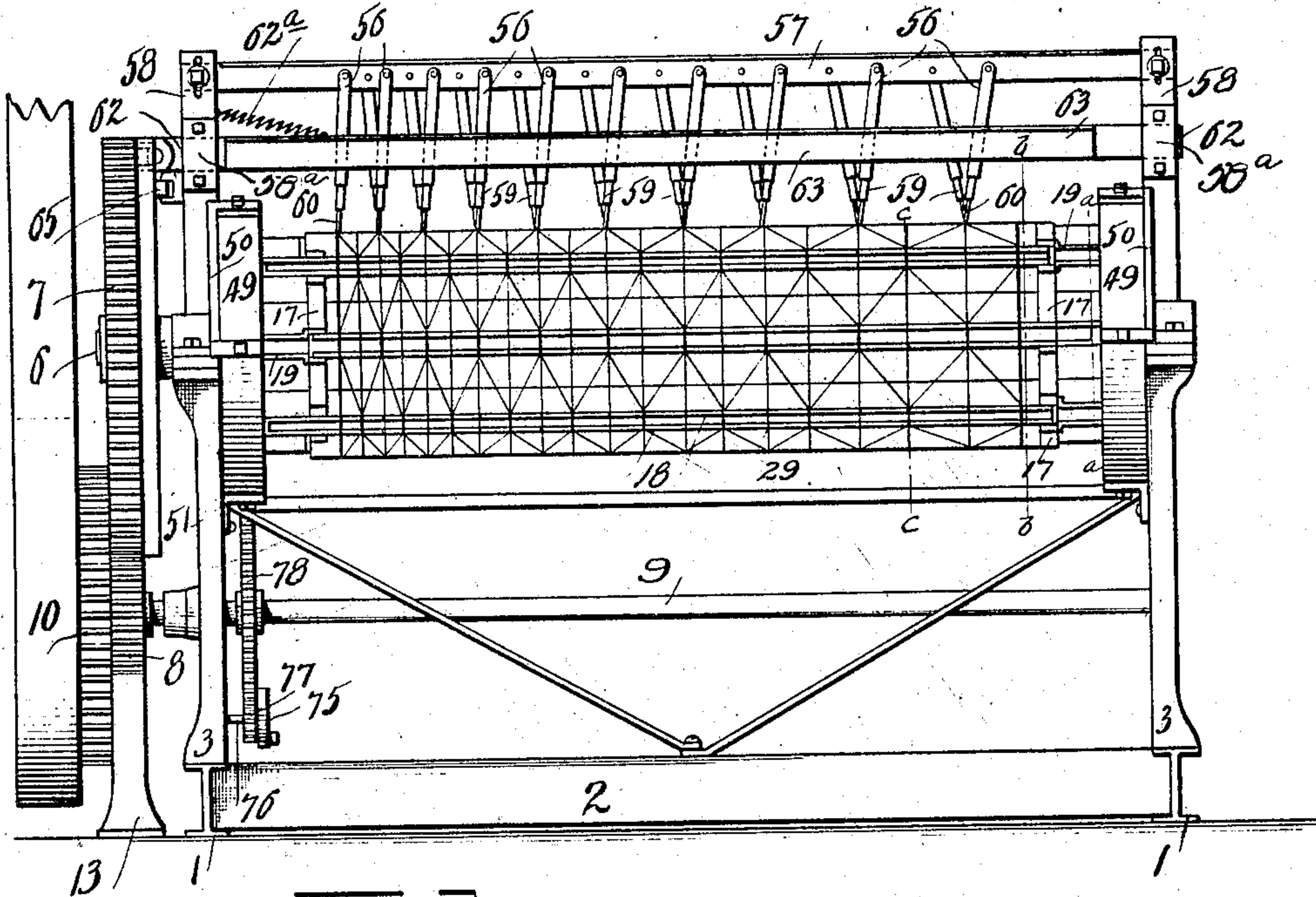


FIG. 2.

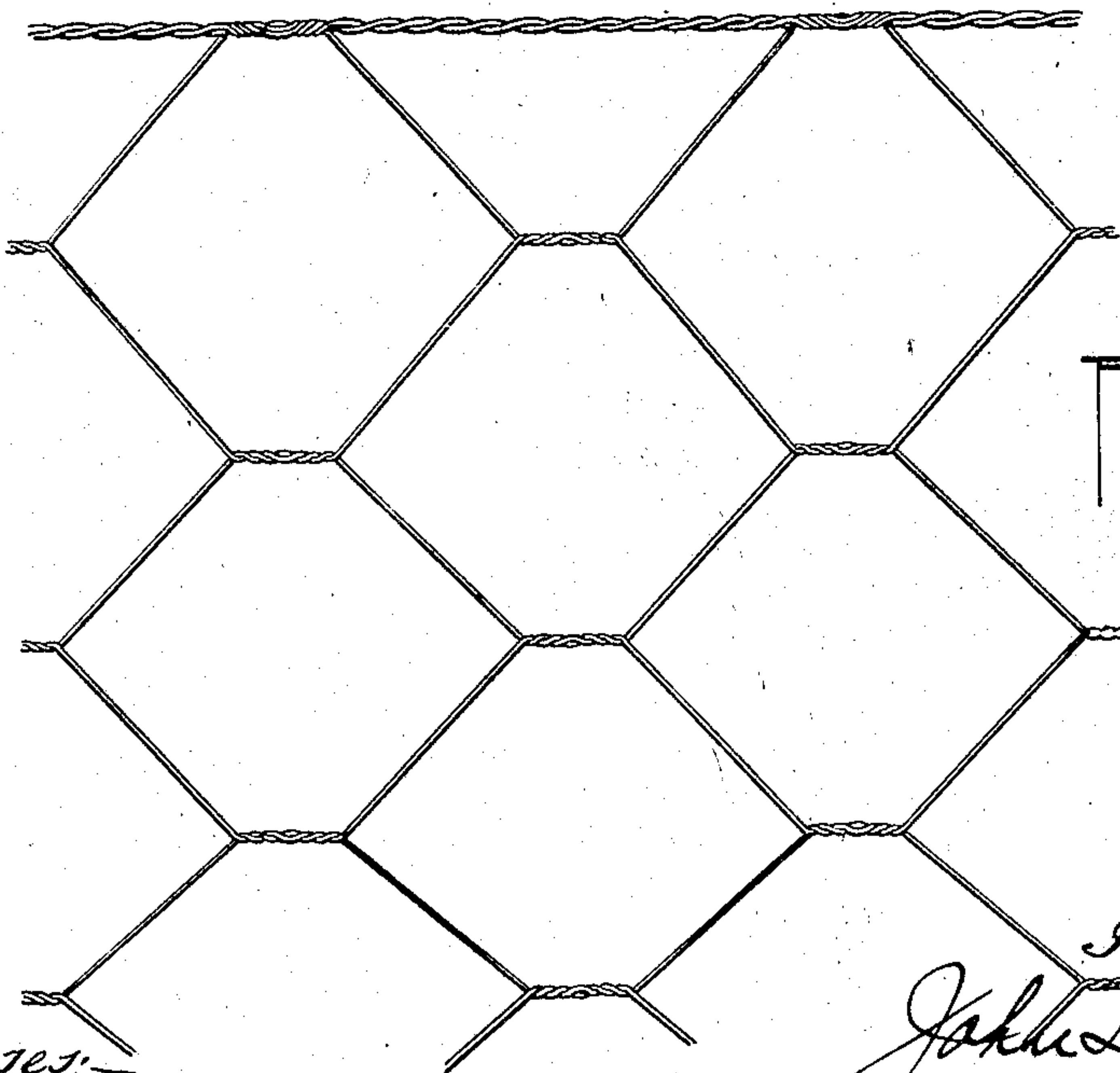


FIG. 3.

Witnesses:  
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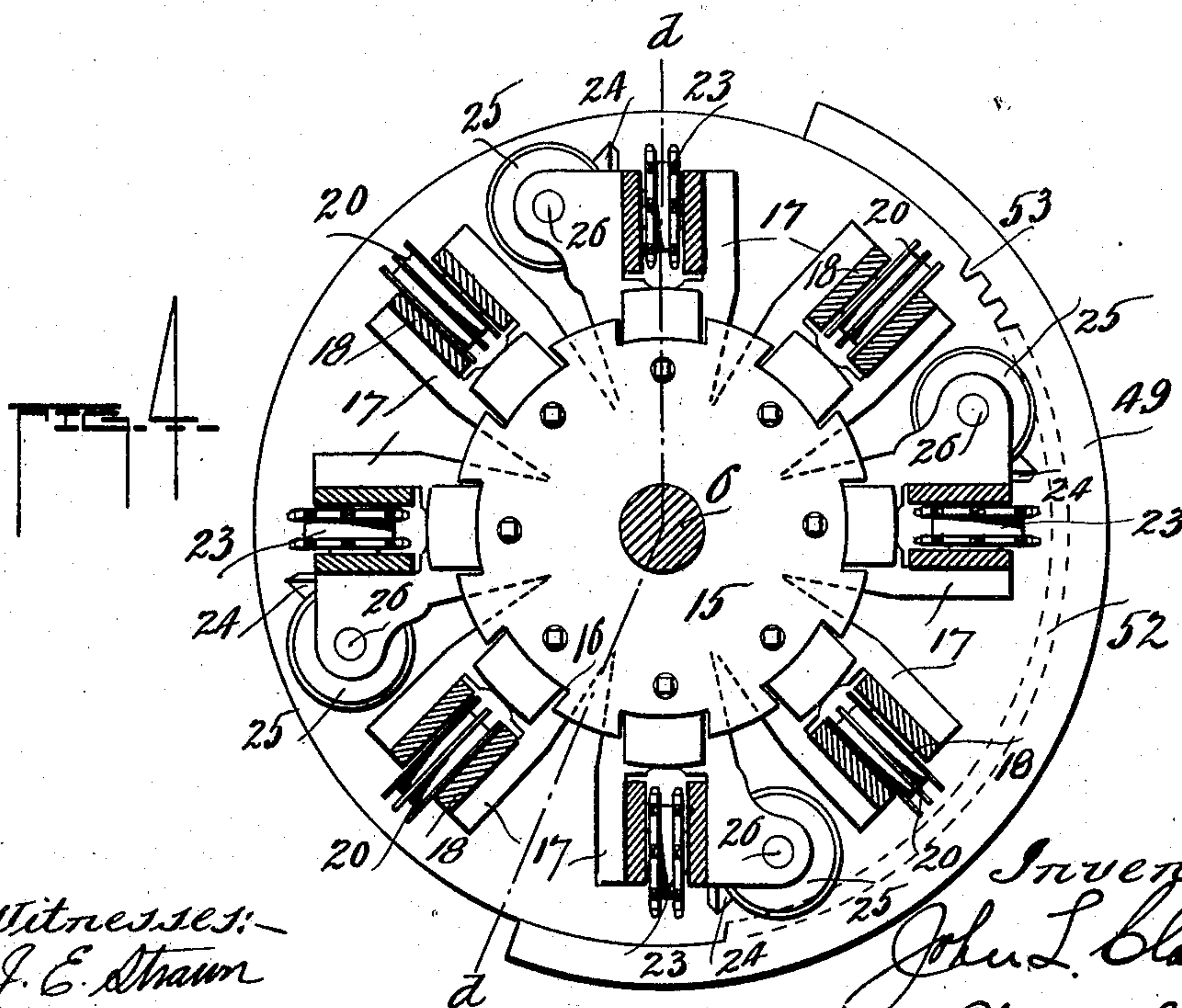
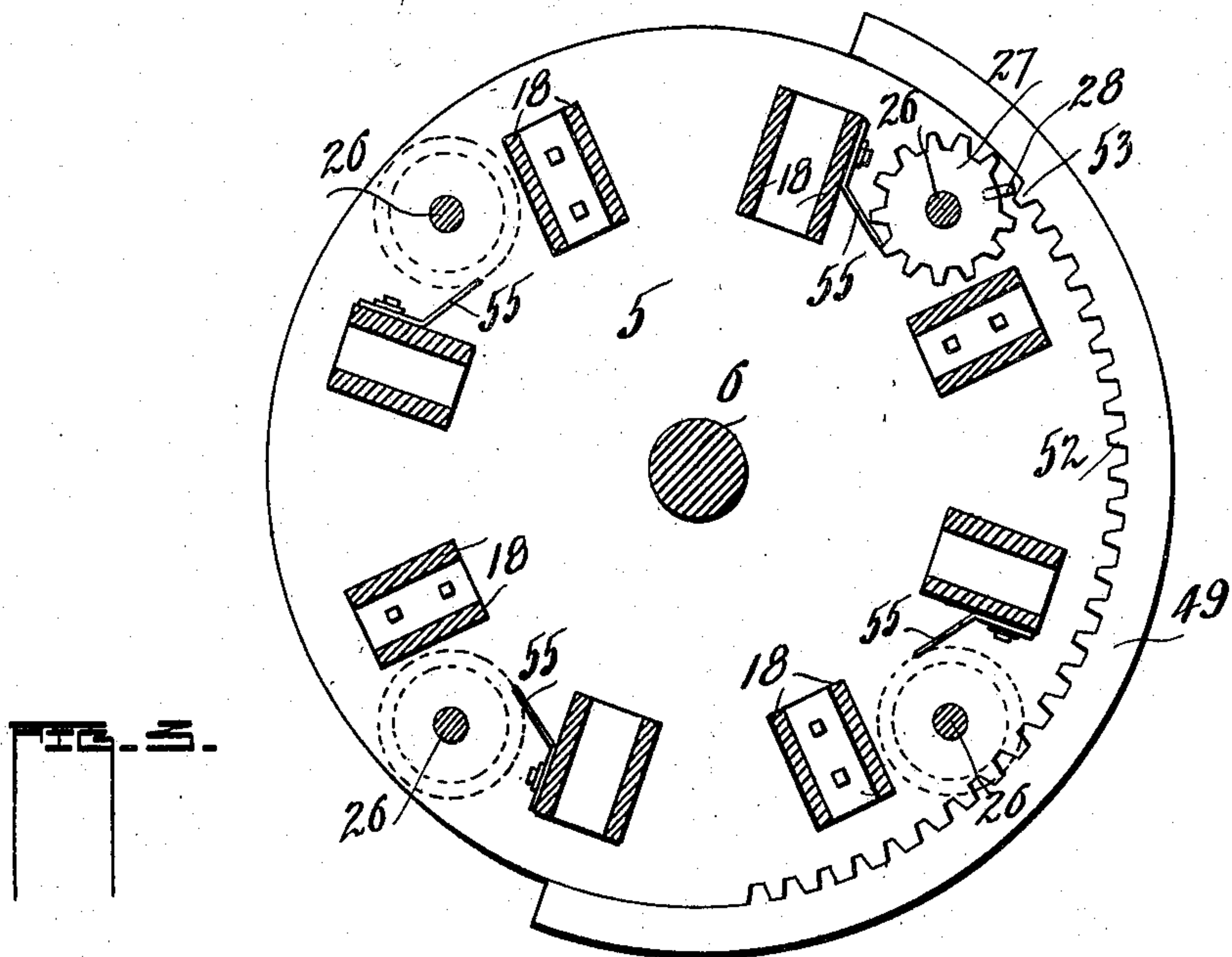
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Patented June 1, 1909.  
7 SHEETS—SHEET 3.



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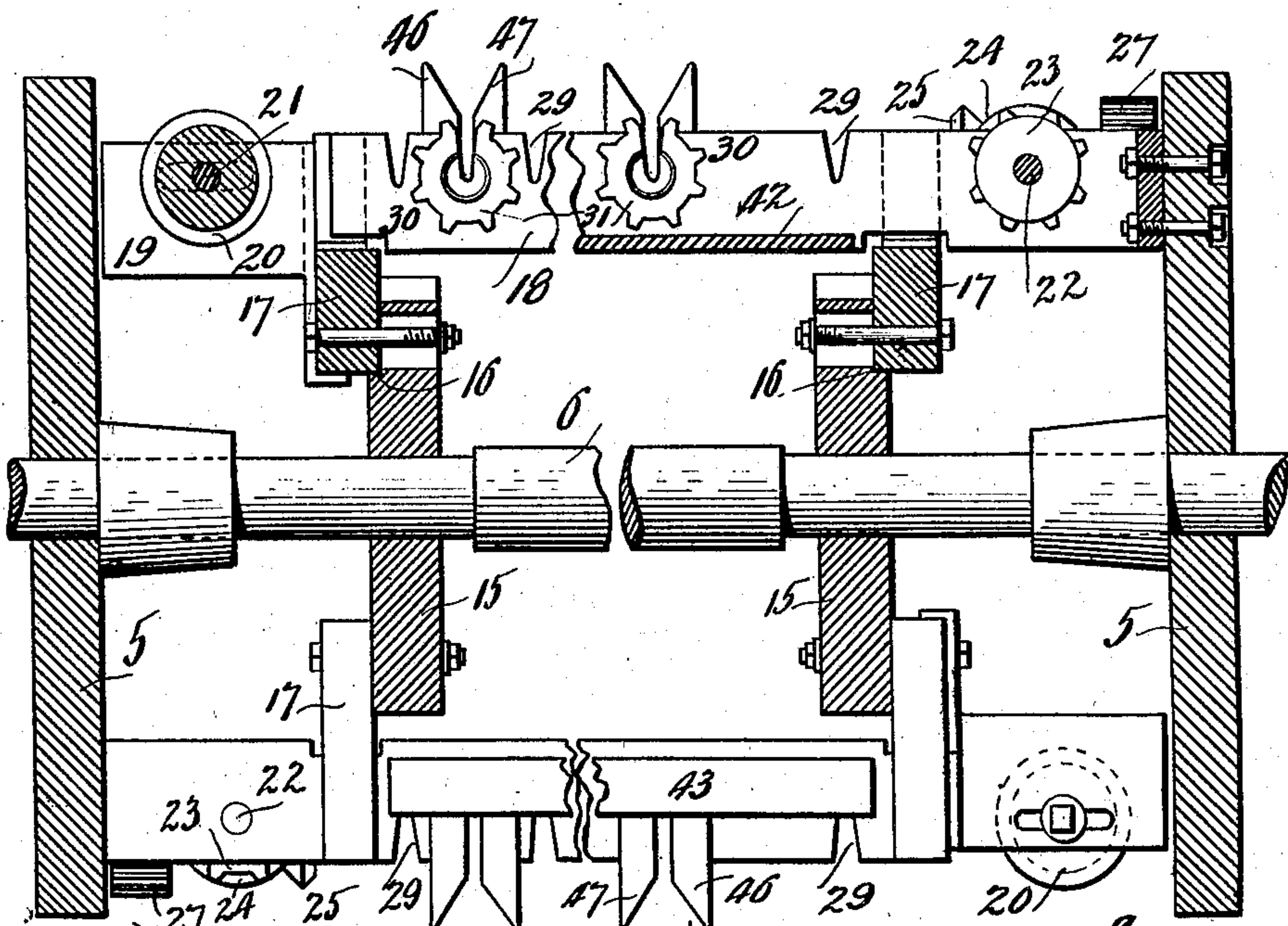
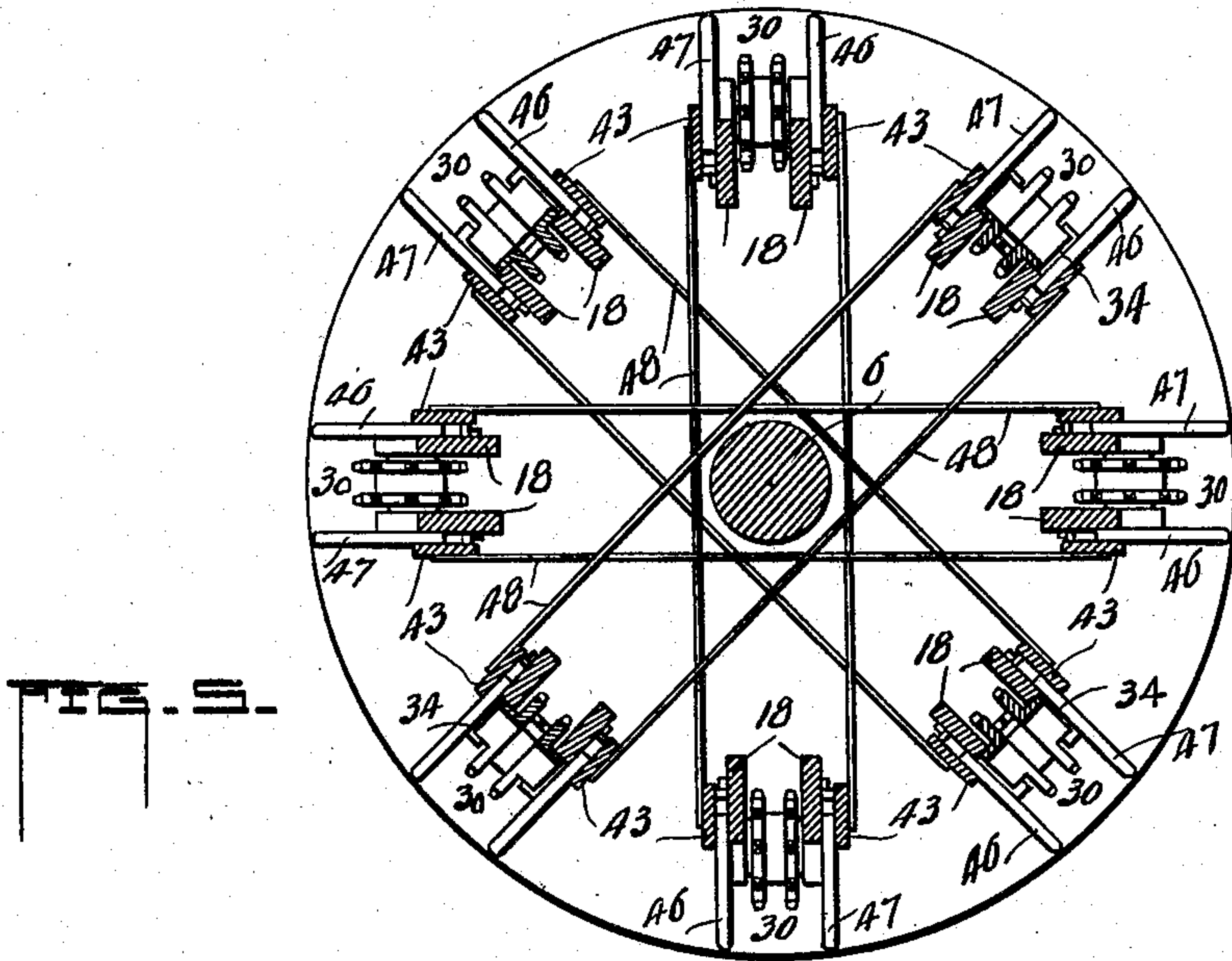
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APPLICATION FILED MAR. 31, 1902.

923,770.

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7 SHEETS—SHEET 4.



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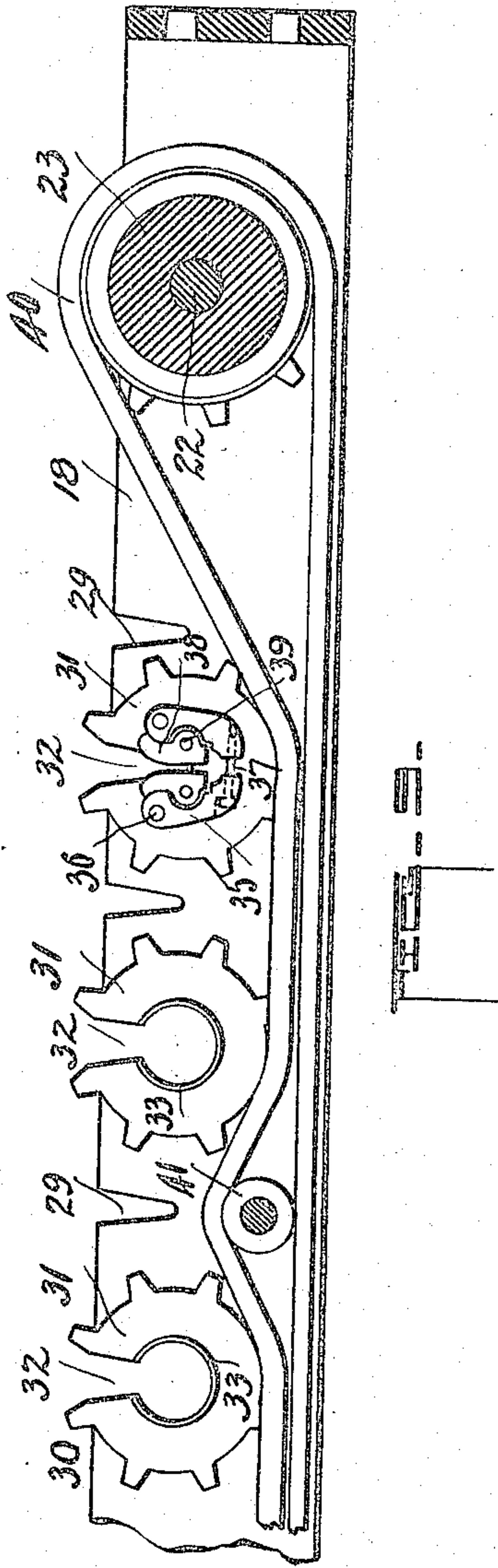
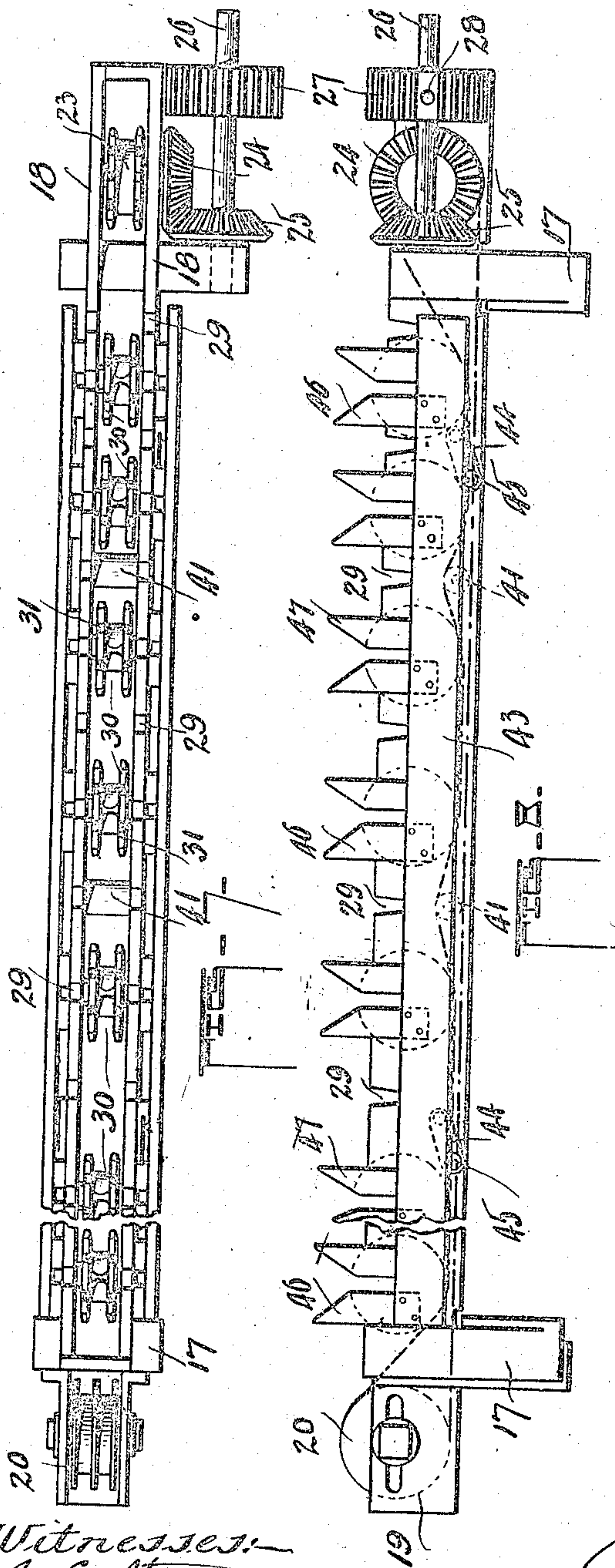
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WIRE FENCE MACHINE.  
APPLICATION FILED MAR. 31, 1902.

923,770.

Patented June 1, 1909.  
7 SHEETS—SHEET 6.



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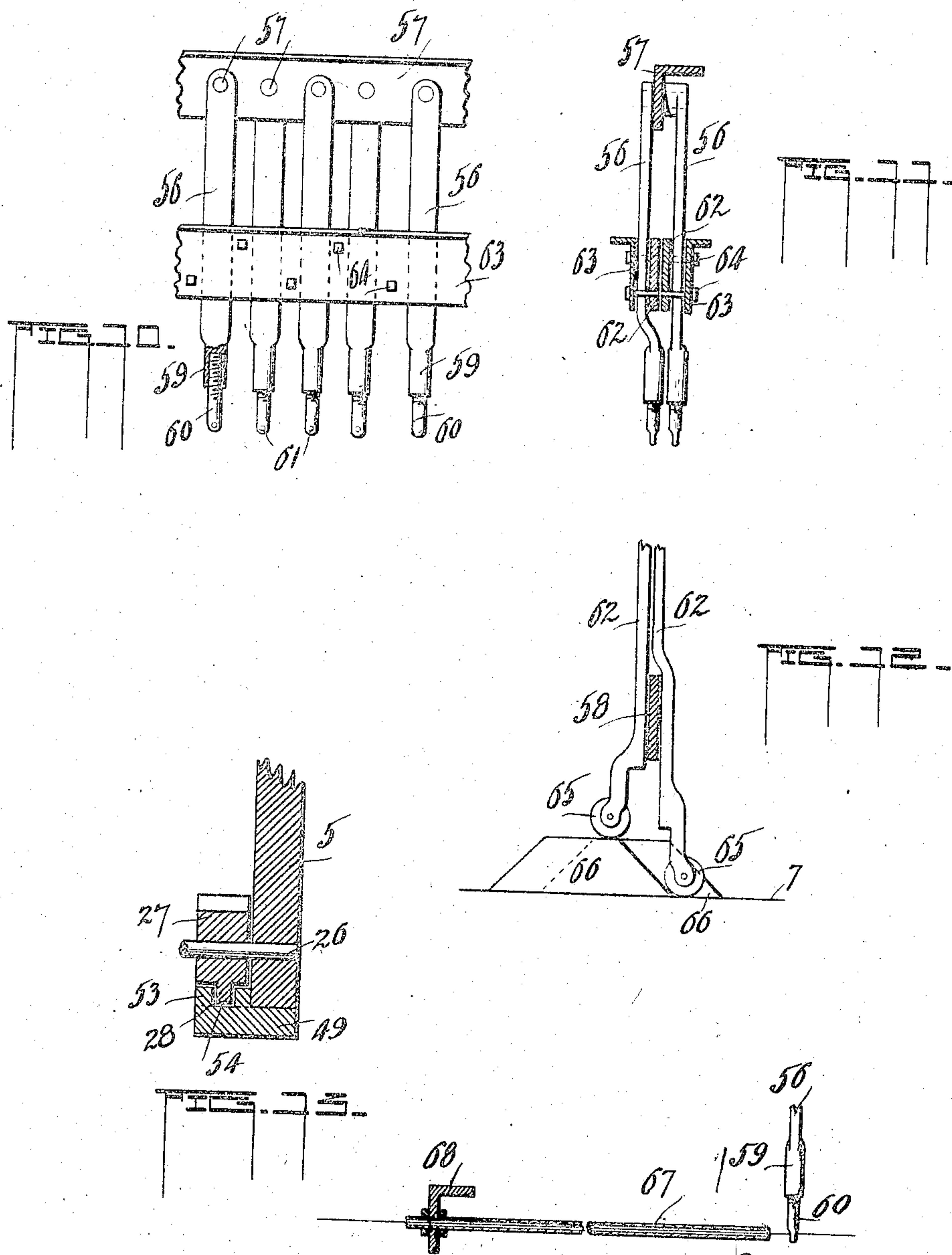
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WIRE FENCE MACHINE.  
APPLICATION FILED MAR. 31, 1902.

923,770.

Patented June 1, 1909.

7 SHEETS—SHEET 6.



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WIRE FENCE MACHINE.  
APPLICATION FILED MAR. 31, 1902.

Patented June 1, 1909.

7 SHEETS—SHEET 7.

923,770.

Fig. 16.

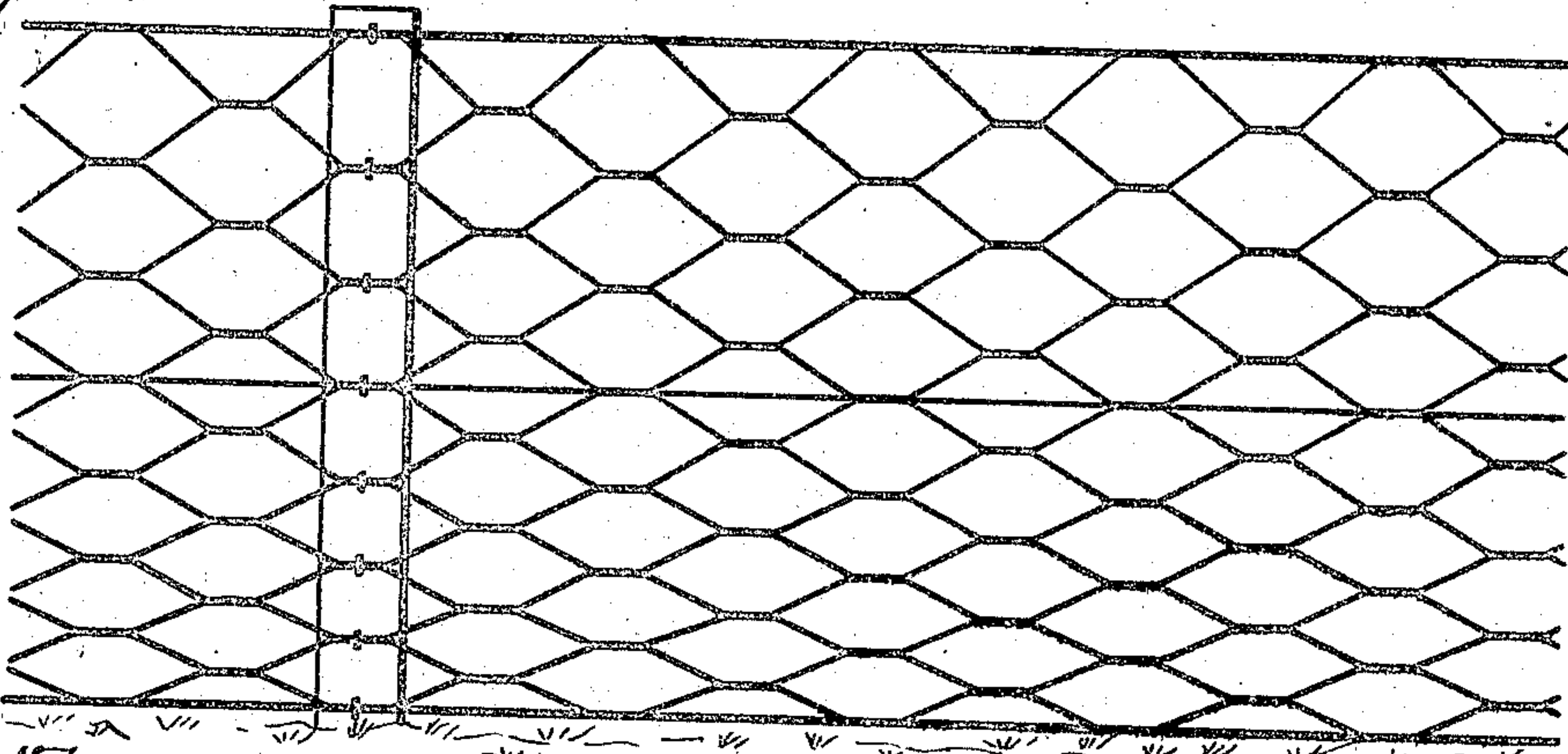


Fig. 17.

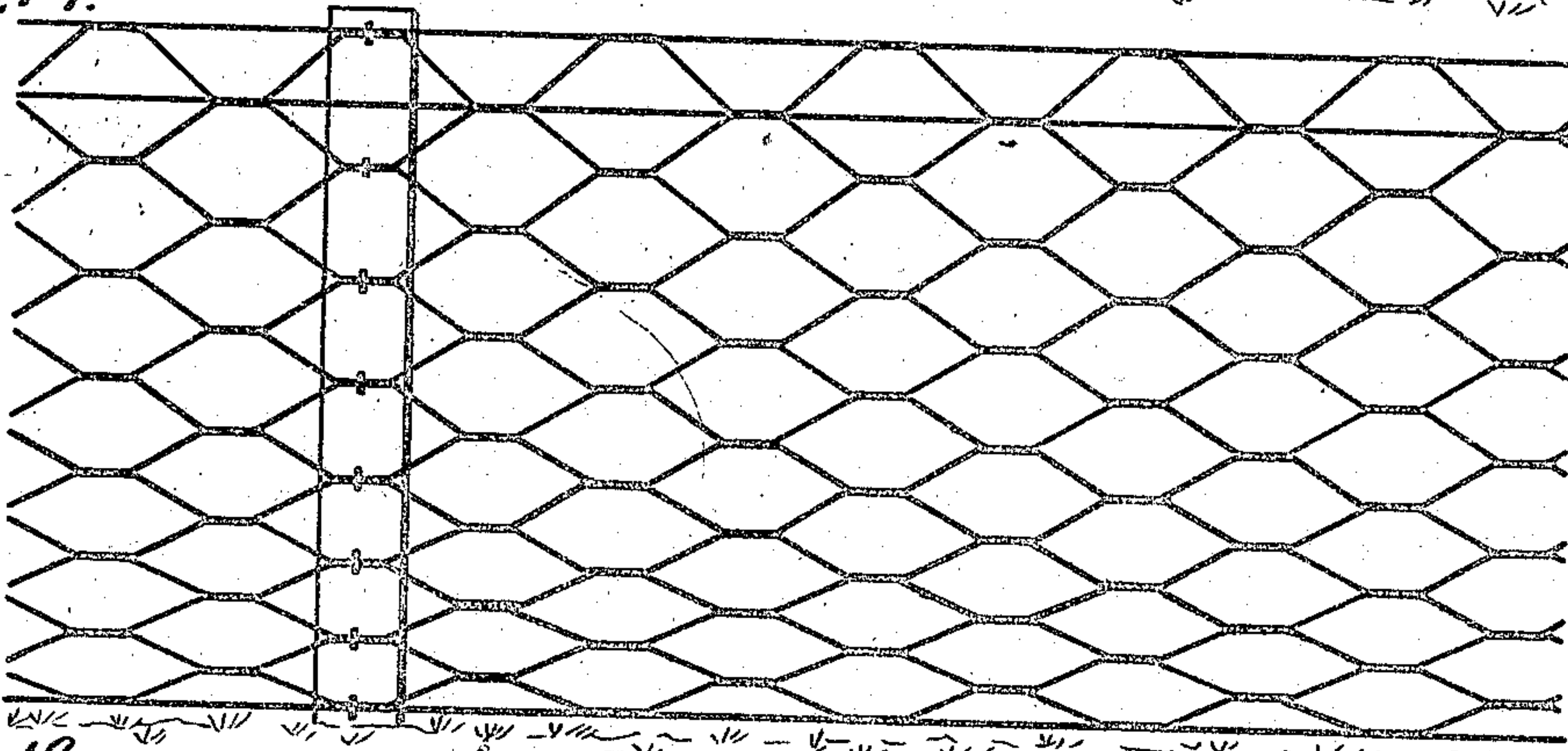
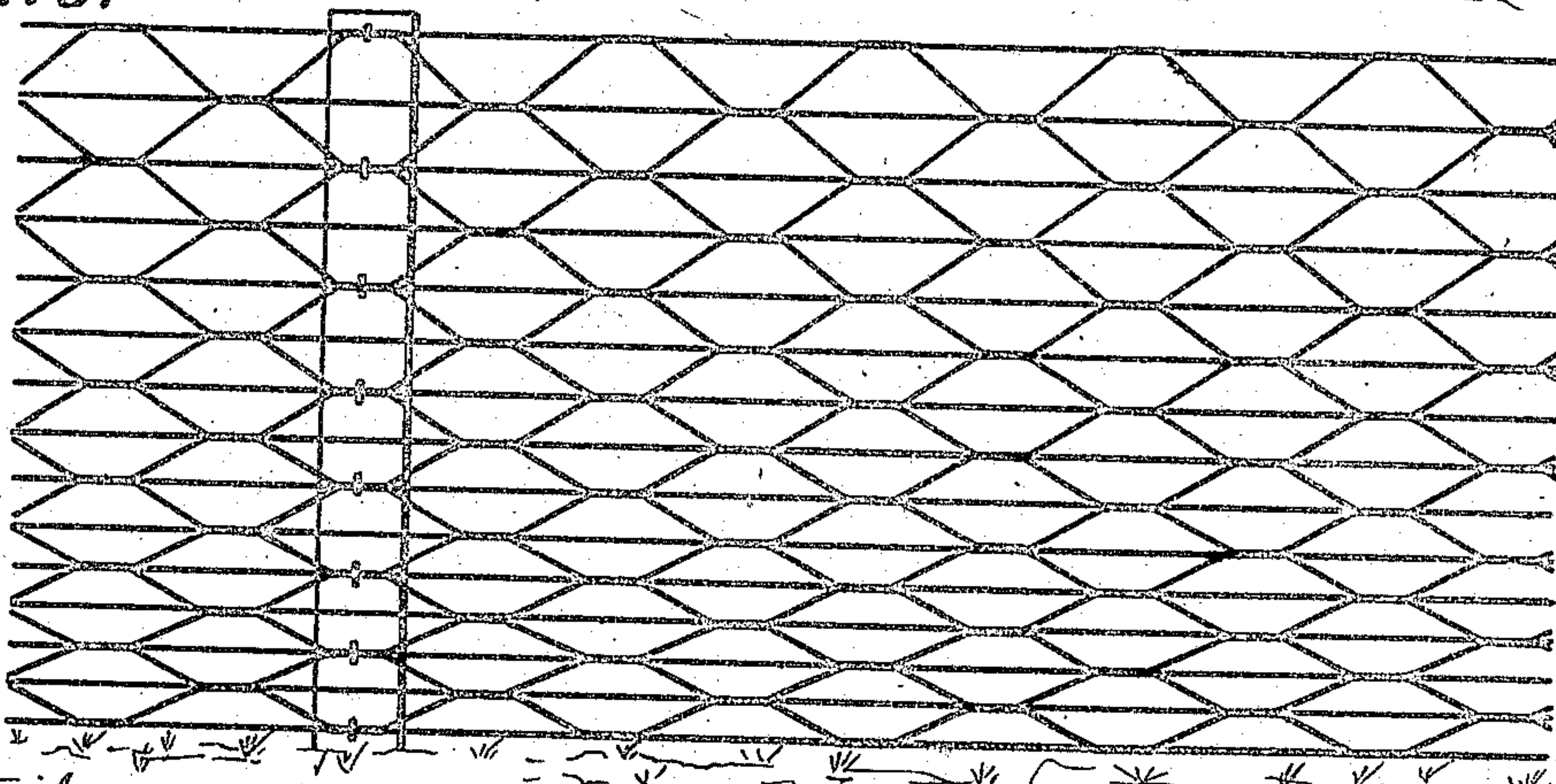


Fig. 18.



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# UNITED STATES PATENT OFFICE.

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LOCKING FENCE COMPANY, OF MORTON, ILLINOIS, A CORPORATION OF ILLINOIS.

## WIRE-FENCE MACHINE.

No. 923,770.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed March 31, 1902. Serial No. 100,774.

*To all whom it may concern:*

Be it known that I, JOHN L. CLAUDIN, a citizen of the United States, residing at Morton, in the county of Tazewell and State of Illinois, have invented certain new and useful Improvements in Wire-Fence Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to machines or looms for the manufacture of wire fabric or netting and has special reference to a wire fabric machine, the wires of the fabric being united to form, preferably, a polygonal mesh and wherein the meshes are graduated from top to bottom of the fabric.

The object which I have in view is a wire fence machine, comprising a revoluble frame or drum journaled in a stationary base carrying means whereby a series of wires which are suitably fed to the revoluble frame or drum may be interlocked or woven together to produce a finished fabric or wire fence, during the revolving of said frame or drum.

A further object of the invention is a revoluble frame or drum journaled in a stationary base, carrying a multiplicity of revoluble wire-connecting devices or twisters arranged in rows, and in the provision of means whereby one or more rows of such wire-connecting devices or twisters are operated during a partial rotation of said frame, the means employed arranged in such a manner that each row of wire connecting devices or twisters will be successively operated during a full rotation of said frame or drum.

The invention has for its further object, a support or carrier on which is mounted several sets of revoluble wire connecting devices or twisters, preferably in rows and having staggered arrangement; the said support or carrier moving or traveling in an endless orbit.

It also includes mechanism for operating successive wire connecting devices or twisters in opposite directions, and mechanism for inaugurating the movement of the twisters at the same point in their travel.

A further object of the invention is means for feeding the wires to the revolving frame and means for alternately shifting certain wires as the wire connecting devices or

twistors are successively brought into line during the rotation of the revolving frame.

A further object of the invention is clamping devices carried upon opposite sides of frame parts supporting each row of wire connecting devices or twisters and revoluble with said frame, which are operated for clamping the wires of the fabric by pressure of the wires upon the clamping devices.

A further object is a supplemental clamping device carried by each wire connecting device or twister having means whereby the clamping jaws of said clamping device may be adjusted to and from each other.

The invention comprises details of arrangement and the combination of parts hereinafter more fully described in the specification, illustrated in the accompanying drawings, and claimed in the appended claims.

In the drawings:—Figure 1 is an elevation of one side of my wire fence machine, the drum or carrier thereof and certain other parts being shown in dotted outline only; Fig. 2 is a front elevation of said machine with parts shown in outline only, and in addition, one form of wire fabric shown, being formed on the revoluble frame: Fig. 3 is a cross section on the line *a—*a** of Fig. 2 showing revoluble frame parts only: Fig. 4 is a cross section on the line *b—*b** of Fig. 2, similar to that shown in Fig. 3: Fig. 5 is a cross section on the line *c—*c** of Fig. 2 similar to that of Fig. 3, but showing the arrangement of the wire-connecting devices or twisters, and clamping devices carried by the revoluble frame: Fig. 6 is a longitudinal section through the revoluble frame with the two ends thereof brought close together, as the same would appear on the line *d—*d** indicated on Fig. 4: Fig. 7 is a plan view; partly broken away, of one row of wire-connecting devices or twisters and clamping devices associated therewith. Fig. 8 is a side elevation of Fig. 7: Fig. 9 shows an enlarged partial section and side elevation of one end of a row of the wire connecting devices or twisters, including the longitudinally movable means for operating in unison a row of such connecting devices or twisters, and also shows the clamping devices carried by said wire-connecting devices or twisters. Figs. 10, 11 and 12, show enlarged, in elevation and plan partially in section, details of the wire shifting



devices. Fig. 13 is a detail in section showing the co-acting relation of the pin of the pinions with the internal ring gear. Fig. 14 shows a section of one form of fence fabric adapted to be made on my machine. In this view the fabric is illustrated as made of mesh-forming and margin wires only, the mesh-forming wires being interlocked with each other and the outside mesh-forming wires being locked with the margin wires; and attention is called to the manner of interlocking the mesh-forming wires and margin wires, first in a direction left and right, and the adjacent rows of meshes right and left, and so on alternately through the width of the fabric. Fig. 15 shows the wire feeding and guiding devices which direct the wires to the shifter. Fig. 16 is a view showing a strip of fencing in outline, wherein is embodied an intermediate line wire extending through the central body of the fence and interlocked or intertwisted with the mesh-forming wires where they unite. Fig. 17 is a view showing a strip of fencing in outline, wherein is embodied one intermediate line wire extending through the fence near the top thereof and interlocked or intertwisted with the mesh-forming wires where they unite; and Fig. 18 is a view showing a strip of fencing in outline, wherein is embodied a series of intermediate line wires extending across each mesh formed by the mesh-forming wires and interlocked or intertwisted with adjacent mesh-forming wires where they unite.

In the manufacture of fence fabric on the machine herein illustrated and described, there may be employed margin wires or selvage strands for the top and bottom of the fence, mesh-forming wires which may be intertwisted with each other and the outside of such mesh wires with the margin or selvage wires, and intermediate line wires which pass through the meshes formed by the mesh-forming wires and are intertwisted with such mesh-forming wires where they unite. The margin or selvage wires may consist of cable selvage strands or plain wires, and the intermediate line wires may be employed and passed through each of the meshes formed by the mesh-forming wires or only through a series of the meshes, substantially as they appear in Figs. 16, 17 and 18.

The construction of the machine with its arrangement of twisters and manner of feeding in the margin or selvage wires, the mesh-forming wires, and intermediate line wires, is such that a fence fabric may be made of a width to extend from one outside row of wire connecting devices or twisters to the opposite outside row thereof, or the width of the fabric may be changed by changing the position of the margin or selvage wires. This is accomplished by leaving off certain of the strands and mesh-forming wires, as may be

desired. The margin and intermediate line wires are fed from some suitable feeding devices such as reels, spools, etc., and fed directly into the wire connecting devices or twisters which serve as a positive feed for drawing the wires from their feed devices to and through the machine; and the mesh forming wires, while they may be fed substantially in the same manner as the margin and intermediate line wires, are passed through the shifters for shifting said wires to adapt them to be engaged by successive rows of wire connecting devices or twisters as the drum in which they are carried is rotated in position to receive the same.

In the drawings, 1 represents longitudinal frame parts connected at their opposite ends by frame parts 2. At opposite ends and supported by the frame parts 1, are the standards 3 and 4, for supporting working parts of my machine.

5 are head sections or disks, forming a part of the revoluble frame or drum to be hereinafter more particularly described, and 6 is a shaft upon which the head sections are carried and with which they may rotate, and the said shaft is journaled in the standards 3, substantially as shown; and upon one end of the said shaft is carried the gear 7, intermeshing with a pinion 8, carried upon a shaft 9, the latter being journaled in the standards 3, and adjacent to the pinion 8 and carried upon the shaft 9 is a gear 10, intermeshing with a pinion 11, carried upon the driving shaft 12, journaled in the standards 13, and carried by said shaft 12 is a driving pulley 14, receiving its power from any suitable source. This arrangement of gearing and the manner of applying the power to the shaft 6, may be modified in many ways and located in any suitable manner.

Referring to what I term my revolving or traveling frame, which is adapted to travel in an endless orbit and to which wires are fed and upon which they are interlocked, interconnected or twisted during the movement of said frame, the frame comprises disks 15 forming supplemental head sections which are secured to the shaft 6. The same have the grooved portions 16 in which are seated castings 17 and the said castings are bolted or otherwise secured to the sections 15. Arranged upon the sections 15 and in a suitable manner carried by the castings 17, I have provided a series of removable parallel frame parts 18, arranged in pairs, in such a manner that each alternate pair of frame parts is bolted to the opposite head section 5, substantially in the manner shown in Fig. 6, the frame parts extending from one head to the opposite casting 17; and from the casting 17 is supported a frame 19, carrying an idler 20, upon the spindle 21, journaled in the frame parts 18. Carried by the parallel frames 18 in their ends, adjacent to the head



section to which they are bolted, is a spindle 22, on which is carried a driving sprocket 23 carried in the manner shown between the frame parts 18; and on one end of the spindle 22 and upon the outside and adjacent to one of the frame parts 18, is a beveled pinion 24 meshing with a bevel pinion 25, carried upon a spindle 26, having its bearing at one end in the casting 17 and at the other in the head section 5; and carried by the spindle 26 and adjacent to the head section 5 is a spur gear 27 having a suitable number of teeth, and with one removed, and in place thereof is provided the pin 28, the function of both the gear 27 and its pin being hereinafter described. The frame parts 18, as has been described, are arranged in bearings and carried by the castings 17 which are supported by the supplemental head sections 15, and the arrangement is such that the frame parts are removable in pairs, and when so removed carry with them suitable revoluble wire connecting devices to be described. Each pair of frame parts 18, is provided with the open slotted portions 29, arranged at graduated distances, less and less, when looking at it from Fig. 2; and journaled in the frame parts 18, or each pair thereof, is a row of revoluble wire connecting devices 30, preferably of the type of twist-ers, known as body twist-ers, which are coincident with each alternate pair of slots 29 in the frames 18. That is to say, in one pair of frames, a row of wire connecting devices or twist-ers is provided, wherein such connecting devices or twist-ers will be coincident with the first pair of slots and with each alternate pair of slots thereafter, and in the succeeding pair of frame parts, the wire connecting devices or twist-ers are coincident with the second pair of slots and with each alternate pair of slots thereafter, or in other words the series of rows of wire connecting devices or twist-ers as they succeed each other have a staggered arrangement. In this manner, (see Fig. 2) a row of twist-ers will be brought into play for connecting a plurality of wires which are passed through each alternate pair of slots in the frames 18 and then, as the frame is rotated, certain of said wires will be shifted, so as to cause them to coincide with and enter a pair of slots in frame parts then brought into position, which said slots are arranged alternately to those in the previous section. This arrangement is provided to make it possible to make the polygonal mesh set out above and shown in Figs. 2 and 14; and the mechanism for operating each succeeding row of twist-ers as they are brought into line successively is such that one row will be revolved in one direction and each succeeding row in an opposite direction to those just previously operated. All of which features will be described in their turn and the cooperation of each of said parts more specifically set forth.

The revoluble wire connecting devices 30, which are preferably shown as body twist-ers, are composed preferably of two sections, designated as 31, each constructed in the form of a gear, and provided with the open slotted portions 32, extending to a point central therein; and 33 are tubular bearings of the said sections, journaled in the frame parts 18 at 34 (see Fig. 5), and the said bearings have cut out portions to correspond to the open slotted portions 32 thereof. 35 indicate adjustable members of a clamping device which are pivoted at 36 to the said sections 31, the pivotal point thereof serving as a means for retaining the sections 31 of a complete wire connecting device or twister together. The members 35 of the clamping device are adjustable toward and from each other by means of a threaded pin 37, engaging threaded portions of each of said members, (see Fig. 9). And 38 refers to clamping jaws having a pivotal relation at 39 with the members 35, sufficient play being provided between the clamping jaws 38 and the members 35 that they will move when engaged upon their fulcrums 39, so as to clamp the body engaging therewith. They may be separated or brought adjacent to each other by unscrewing or screwing up the threaded pin 37, as is readily apparent from an examination of Fig. 9.

The revoluble wire connecting devices or twist-ers are geared to means movable beneath the same, which said means parallels the axis of the shaft supporting the frame or drum carrying such connecting devices or twist-ers; the preferred mechanism in this instance being sprocket or driving chains 40, in mesh with the teeth of the sections comprising said wire connecting devices or twist-ers, although other suitable means may be substituted.

The sprocket chains 40 which are in constant mesh with the wire connecting devices or twist-ers of each row, are driven by the driving sprockets 23 above referred to. The wire connecting devices 30 having or being composed of the two sections, necessitates two chains and a similar provision is made in the sprockets 23, around which the chains 40 travel; and as shown said chains engage the under portions of each of said wire connecting devices in each row, and at the end of each row, opposite to the ends where the driving sprockets are located, said chains travel around the idlers 20 which are journaled in the frame 19, and return again to the sprockets 23; and to provide for the engagement of the sprocket teeth of the twist-ers by the chains 40, I have arranged a series of idlers 41; and where the twist-ers are far apart, a bottom portion 42 is shown: which said features are more clearly seen in Figs. 6, 7, 8, and 9. By this means of driv-



ing the twist-ers, a great amount of friction is avoided and much smaller sprocket chains may be employed and the means is more positive than would be the case if only one chain were used.

Reference is now had to the clamping devices which are supported by the duplicate frame parts 18 and upon the outside thereof and which have been referred to as being operated by contact or pressure of the wires of the fabric. The same comprise the longitudinal plates or bars 43 which are supported by the short cranks 44, and the said cranks have a pivotal bearing 45 on the frame parts 18. These cranks are pivoted oppositely to each other upon the frame parts 18 to facilitate the moving of one plate or bar 43 in one direction and the bar upon the opposite side in the opposite direction. Each plate 43 carries a series of clamping plates 46 which correspond to a series of clamping plates 47 fixed to the sides of the frame parts 18 and the said clamping plates are arranged to be coincident with the slots 29 in the frames which are in line with the twist-ers journaled in the frame, and the clamping plates 46 are arranged for movement in opposite directions to correspond with the plates or bars 43 movably arranged on the frames 18. The reason is apparent, when wires which are passed through the slots 29 bear down upon the upper edge of the plates 43, it will cause the plates to be moved in longitudinal lines in a partial circle and result in bringing the clamping plates 46 adjacent to the clamping plates 47, in such a manner as to firmly impinge upon the wires carried between them. I have provided in connection with this clamping means, devices whereby when one pair of plates 43 is moved in a direction such as to cause the plates 46 and 47 to impinge upon wires carried between them, it will shift the plates 43 of the frames 18 directly opposite in the revolving frame which comprises the rods or bars 48 which are fast at their opposite ends to the frame parts 18 which are clearly seen in Fig. 5 of the drawings. These may be arranged and connected throughout the length of the frame at any suitable point.

Referring to head sections 5, I will now describe the means for rotating the revolving or traveling frame carrying with it the wire connecting devices or twist-ers above described.

49 is a substantially semicircular ring at each end, which rings are carried around a portion of the peripheral face of the head sections 5 and are supported in place by means of straps 50, secured to the ring and attached to the standards 3 and further supported by means of the castings 51 which are also secured to the standards 3. These semicircular rings are provided with the in-

ternal ring gears 52, the teeth of which lie adjacent to the inner edges of the head sections 5 (see Fig. 3), and the tooth of said ring at the head of the gear, which I will designate as 53, has the cut out or slotted portion 54 (see Fig. 13). Referring to the duplicate frame parts 18, it is to be understood that one pair of frames will carry the spur gear 27 upon one end to engage the ring gear 52 upon one side of the revolving frame, and the next succeeding pair of frame parts will carry the next adjacent or alternate spur gear, so as to engage the ring gear 52 upon the end opposite to that just previously mentioned, and as the shaft 6 is revolved through the mechanism hereinbefore described, the frame parts carrying the gears 27 will be brought into position to cause the said gears to engage the ring gears 52 and be rotated by such engagement, which will impart a similar movement to the wire connecting devices or twist-ers through the sprocket chains 40; and as the next and succeeding frame parts are brought into position, the same action will take place with reference to its gear 27, and the wire connecting devices or twist-ers carried thereby, so as to cause first one row of wire connecting devices or twist-ers to be revolved in one direction and the next row in an opposite direction. And the arrangement of the internal ring gears 52 is such that during the rotation of a head section 5 the gears 27 at opposite ends of the alternate rows of twist-ers will successively follow each other in engaging their respective ring gears to operate the longitudinal rows of connecting devices or twist-ers in succession. I have preferred however, to so arrange the ring gears and the means coacting therewith for operating such connecting devices or twist-ers, that the movement of each row will be inaugurated at the same point in their travel, and that as the gear 27 of one row is leaving its ring gear, the gear 27 of the two succeeding rows will have entered its ring gear. In this way about three rows will appear to be simultaneously actuated and produce fabric very quickly. As wires are fed to the wire connecting devices or twist-ers of this revolving frame or drum, they will be interlocked, interconnected or twisted during the rotation of said frame and delivered therefrom in the form of fabric or wire fence, it being understood that the entire width of the fence coincident with a row of wire connecting devices or twist-ers is caused to be interlocked, interconnected or joined at one time, and by the arrangement of the rows of wire connecting devices or twist-ers and the means for operating the same, there is continuously made and delivered wire fabric or fence, so long as the machine is in operation.

Attention is called to the means for retaining the wires in a fixed position during the in-



terlocking, interconnecting or twisting of the wires, which is through the action of the clamping devices carried by the wire connecting devices or twisters and frame parts 18.

For example, where a fence fabric is made employing intermediate line wire and mesh-forming wires, as a row of wire-connecting devices or twisters is brought into position, two mesh-forming wires will be caused to engage with each alternately arranged wire connecting device or twister in said row and also an intermediate line wire carried therein, and by such engagement the clamping plates 38 of the wire connecting devices or twisters will impinge the wires at a point which will form the center of the interlocking or interconnecting of the wires in opposite direction and as the frame is rotated, the wires will bear down on the plates 43 and cause the clamping plates 46 and 47 to impinge the wires upon the opposite ends of the twist, and during this rotation of the frame the gears 27 will engage the internal ring gears 52, and cause the rotation of the wire connecting devices or twisters for interlocking, interconnecting or twisting the wires as has been described. As the several wires are gripped by the clamping devices herein described, mechanism which has a predetermined movement is brought into play for shifting the mesh-forming wires away from each other and to the alternately arranged wire-connecting devices or twisters of the next and succeeding row, which is for the purpose of forming the polygonal mesh of the character described, and in so doing the arrangement of the clamping device acts as a form upon which and by which the wires are guided and which will cause the wires to be tight between their points of connection.

To provide for the slots of the wire-connecting devices or twisters being coincident with the slots 20 of the frames 18, when said frames and wire-connecting devices are moved into position for receiving the wires of the fabric to be formed, I have provided the springs 55, supported by the frame-parts 18, which act as ratchets for engaging the teeth of the spur-wheels 27, which permits the gear to be rotated during its engagement with the internal gear 52 and retains it in a fixed position during its movement away from the ring-gear, until it reaches the beginning of the gear once more; and to provide for its ready engagement with the ring-gear, I have provided the pin 28, previously described, which is in position when the gear comes into alinement with the ring-gear which passes through the slotted portion 54 of the tooth 53 at the head of the ring-gear for causing a preliminary starting movement to be imparted to the gear 27.

The mechanism whereby certain of the wires, preferably the mesh-forming wires, as they are fed to the rotary drum or traveling

wire-connecting devices or twisters, may be shifted or deflected laterally to present different portions thereof to different wire-connecting devices or twisters arranged out of line, or to cause two wires to be coincident, first with one row of twisters and then with the others as they are successively brought into position, comprises the shifters 56 of short arms or cranks having a pivotal relation with the cross frame 57, the said frame being adjustably secured to uprights 58 supported by the standards 3. The arrangement of the shifters is for a series to be pivoted on one side of the support 57 and an alternate series to be supported from the opposite side, which is seen in Figs. 2, 10, and 11. The lower ends of the shifters have the threaded tubular portions 59 in which are arranged the screw-threaded plugs 60, which are each provided with the wire opening 61 at their lower ends.

The shifters 56 extend down between the plates 62 and 63. The plates 62 are movably supported, and when moved carry with them the respective plates 63 to which they are attached. The opposite ends of the plates 62 are movable adjacent to opposite sides of the uprights 58 and in boxings 58<sup>a</sup> secured to the said uprights. The shifters by being alternately disposed upon opposite sides of the plates 62, are separated so as to permit them to be alternately shifted in opposite direction. And the said plates 62 are attached to the adjacent plates 63 by means of short studs or pins 64 which are disposed intermediate the shifters, and it is designed to place these pins 64 where the meshes of the fence are closer and closer together, much wider apart; so that in shifting the plates 62, the pins 64 will not engage the shifters 56 until the plates have moved a short distance so as to bring them in proper alinement with twisters in which the wires are to be seated. And where the meshes are wider apart the movement of the plates 62 is not so great before the shifters are operated.

I have arranged mechanism whereby the plates 62 may be alternately shifted in opposite directions, so that the shifters 56 are caused to be moved first in one direction and then in the opposite direction. To explain this more fully, reference is had to Fig. 2 where the shifter, beginning at the left of the series, has been shifted by its plate 62 to the left to cause the wire carried through the plug 60 to be interlocked, interconnected or intertwined with the margin wire, selvage or cable strand of the fence; it being understood that the margin or selvage wires are presented to the twisters without lateral deflection, substantially in the same manner as the intermediate line wires are presented to the twisters. And the remainder of the shifters carried upon the front face of the frame 57 are shifted in like direction, while



the shifters 56 pivoted upon the opposite side of the frame 57 are engaged by the movement of the additional plate 62 for causing the shifters to be moved in a direction opposite to those just described, which will cause the first shifter at the left of the series upon the opposite side of the frame 57 to have its plug 60 coincide with the second shifter of the first series, above described as being on the front of the frame 57, and so on throughout the entire series.

Upon the outer ends of the plates 62 I arrange the rollers 65 journaled in a suitable manner thereon, which engage alternately a series of cam faces 66, which are carried in a circumferential line on the spur gear 7 carried by the shaft 6. The cam faces are so arranged that when one of the plates 62 is riding upon the cam, the opposite plate will be off or nearly off its cam, the movement to be imparted to the plates 62 being such that the plates must be shifted and then retained in such shifted position for a short period before moving again in an opposite direction to permit the proper alinement of the mesh-forming wires, first with one row of wire-connecting devices or twistors and with each succeeding row, and held to permit the connecting or twisting of the mesh-forming wires and line wires during the rotation of the frame. By the use of the plug 60, and by the arrangement of the same as shown, the shifting or deflecting of the wires, as they are fed, first to one shifter and then the other, will adapt itself to the movement of the wires, as is apparent from an examination of Fig. 10.

Guiding devices are shown for directing and feeding the wires of the fabric from suitable spools or other devices to the plugs 60, which comprise the tubular stems 67 through which the wires are passed, as shown in detail in Fig. 15, and the said stems are supported by a cross-frame 68, attached at its opposite ends to an upright 69 supported from the frame parts 1 and braced by means of a reach 70 connected at its ends to the uprights 58 in such a manner that the uprights tend to brace each other.

Referring to the shifting plates 62 carrying the roller devices engaged by the cams 66 on the gear 7 for the purpose of shifting the plates 62, it is necessary to provide means whereby the plates will be caused to return to the depressions in the cams; in other words, the said plates should be held under flexible pressure, and to accomplish this I provide springs 62<sup>a</sup> connected at one end to the plates in the manner shown, and connected at the opposite ends to the uprights 58.

I have illustrated means for winding up the fabric automatically as it is delivered from the revolving frame, which comprises the shaft 71 journaled in the standard 4 and upon

which is carried a ratchet wheel 72 upon one end thereof; and 73 are frame parts carried by the ratchet and with suitable frame parts upon the opposite end of the shaft 71 upon which it is designed to wrap or reel the wire.

74 is a pitman attached at one end to the disk 75 supported by the standard 76 which also carries the pinion 77 meshing with a gear 78 which is carried by and receives its power from the shaft 9. The opposite end of the pitman is attached at 80 to a crank 81 fulcrumed at 82 to a frame part 83 supported by the frame 1.

84 is a ratchet arm pivotally secured at 85 to the upper end of the crank 81 and its free end designed to engage the ratchets of the wheel 72 and held in its relation therewith by means of the lips 86 attached thereto and extending over and upon the face of the ratchet wheel.

87 is a supplemental arm or rod pivoted at 88 to the ratchet arm 84, and the said rod 87 carries a ratchet lug 89 which also engages the ratchets of the wheel 72, and 90 is a spring bearing against the ratchet lug 89 and held in position by the nut 91 on the end of the rod 87, all of which is illustrated in Fig. 1 of the drawing.

It is obvious that various changes may be made in the construction and arrangement of parts of my machine, and I do not wish to be confined to the details therein shown, as the broad object which I have in view is to manufacture a wire fabric on a frame which is moved continuously, when the machine parts of said device are in operation, for interlocking, interconnecting, or twisting together a series of wires which are suitably fed to said moving frame or drum and which are suitably connected or twisted during the movement of the frame without stopping or starting the same after once set in motion, and to have the arrangement of the wire connecting devices or twistors such that they will be brought into operation for making a series of connections or twists arranged in a row the whole width of the fabric and operated during only a partial movement of the frame or drum, and in the use of clamping devices which, when one series is engaging the wires the series opposite thereto will be caused to release the wires engaged thereby. The said clamping devices are operated during the movement of the frame or drum which carries the wire-connecting devices or twistors.

In the following claims, I do not wish to be understood as limiting myself to the details of construction of the individual elements which go to make up the several parts or combinations of the machine herein illustrated and described, as I regard the invention as of a character to admit of variations of these details within considerable limits without departing from its spirit and scope.



Having thus fully described my invention, what I claim and desire to secure by Letters Patent of the United States, is:—

1. A machine for the continuous manufacture and interweaving of wire fabric, comprising a revoluble frame, means for feeding a series of wires to said frame, twisting devices carried by the revolving frame, and means for alternately shifting the wires in opposite directions previous to engagement by the said twisters.
2. A machine for the manufacture of wire fabric, comprising a revoluble frame, means for feeding a series of wires to said frame, means carried by the revolving frame for twisting said wires to produce a finished fabric during the rotation of said frame, and clamping devices carried within the twisters for engaging the wires of the fabric, as and for the purposes set forth.
3. A wire fence machine, comprising a rotating frame, a series of revoluble wire-connecting devices arranged on said frame, each row of said devices successively actuated during the rotation of said frame for continuously connecting a series of wires engaging said devices.
4. A wire fence machine, comprising a rotating frame, a series of rows of revoluble wire-connecting devices arranged on said frame, and mechanism arranged in such a manner that as the frame is revolved one or more rows of the series of said devices will be operated during a partial rotation of said frame.
5. A wire fence machine, comprising a rotating frame, a series of rows of revoluble wire-connecting devices arranged in said frame, power devices engaging each independent row of said wire-connecting devices, and means engaged by the power devices for intermittently operating each successive row of wire-connecting devices.
6. A wire fence machine, comprising a rotating frame, a series of rows of twisting devices arranged in said frame, power devices coacting with each row of twisters during the rotation of said frame arranged in a manner to engage and actuate only a few of said rows, the remaining rows being substantially inoperative until moved into the path of the power devices, substantially as described.
7. A wire fence machine, comprising a rotating frame, journaled in a stationary base, one or more substantially fixed sections of an internal gear, one or more rows of twisting devices supported by the rotating frame, coacting with power devices arranged to intermittently engage the sections of internal gears, substantially as described.
8. A wire fence machine, comprising a rotating frame journaled in a stationary base, one or more substantially fixed sections of an internal gear, one or more rows of twisting

devices supported by the rotating frame, each row of twisters carrying power devices alternately arranged at opposite ends of the rows, arranged to intermittently engage the sections of internal gears, substantially as described.

9. A wire fence machine, comprising a rotating frame journaled in a stationary base, a series of rows of twisting devices supported by the rotating frame, power devices alternately arranged at opposite ends of the rows, and duplicate internal ring gears supported by the stationary base and in line with the power devices of the twisting rows to be intermittently engaged by the said power devices for intermittently and alternately actuating the twisters in opposite directions, substantially as described.

10. A machine for the manufacture of wire fabric, comprising a revolving frame, means for feeding suitable wires to said frame, revoluble wire-connecting devices for engaging said wires, said connecting devices arranged to revolve in directions different from the rotation of said frame, for connecting said wires at their intersections during the rotation of the revolving frame.

11. A wire fence machine, comprising a revoluble frame, duplicate head sections mounted on a power shaft journaled in a stationary base, semi-circular gears supported by said base, one or more rows of twisting devices supported between the head sections, and mechanism for actuating the twisters, said mechanism revolving in the path of the semi-circular gears and intermittently actuated thereby, substantially as described.

12. A wire fence machine, comprising a revoluble frame, duplicate head sections mounted on a power shaft journaled in a stationary base, semi-circular internal ring gears supported by said base and overlapping the inner edge of the head sections, a series of frame supports carried between the head sections and having journaled therein a series of twisters, and means carried by the last-mentioned frame supports arranged to intermittently engage the semi-circular gears for actuating the twisters, substantially as described.

13. A wire fence machine, comprising a revoluble frame, duplicate head sections mounted on a power shaft journaled in a stationary frame, supplemental sections carried by the power shaft, one or more frames of parallel bars supported by the sections on the power shaft, twisting mechanism carried by the parallel bars, means for actuating the twisting mechanism, and clamping devices movable with and carried by the twisters, substantially as described.

14. In a wire fence machine, parallel frame supports mounted on a revoluble frame, a series of rotating twisters journaled in the



frame supports and arranged at graduated distances apart from each other, means engaging said twist-ers and actuated by power devices carried at one end of the frame supports, and means for actuating said power devices, substantially as described.

15 15. In a wire fence machine, parallel frame supports mounted on a revoluble frame, a series of rotating twist-ers journaled in the frame supports, a driving sprocket at one end of the frame, one or more driving chains en-  
10 gaging the twist-ers and actuated by the driv- ing sprocket, and mechanism for actuating said sprocket, substantially as described.

16. In a wire fence machine, a frame sup-  
15 port mounted on a revolving frame, twisting devices journaled at graduated distances apart from each other in said frame, said twist-ers arranged with sprocket teeth and  
20 engaged by sprocket chains driven by suit- able means for actuating the twist-ers, and clamping devices attached to each independ- ent twister, all substantially as described.

17. In a wire fence machine, frame sup-  
25 ports mounted on a revoluble frame, a series of twisting devices journaled in said sup- ports, each twister comprising a pair of sprocket wheels having open slotted por- tions, and mechanism carried by the frame  
30 supports and suitably driven for actuating said twisting devices, substantially as de- scribed.

18. In a wire fence machine, frame sup-  
35 ports mounted on a revoluble frame, a series of twisting devices journaled in said sup- ports, each twister comprising a pair of sprocket wheels having open slotted portions and provided with hub sections on opposite faces, clamping devices supported by said  
40 twist-ers and carried between the matching sprockets thereof, and mechanism for actu- ating said twisting devices, substantially as described.

19. A twisting device, comprising two  
45 sprocket members having coinciding slots, duplicate frame parts supported between the members and pivotally arranged thereon, means for adjusting the said frame parts to- ward and from each other, and duplicate  
50 clamping devices pivotally arranged on the frame parts, substantially as described.

20. In a wire fence machine, frame sup-  
ports mounted in a revoluble frame, a series of twisting devices journaled in said supports,  
55 means for actuating said twist-ers, and clamp- ing devices carried upon opposite sides of the twist-ers and movable by the weight of wires engaging said clamping devices, substan- tially as described.

21. In a wire fence machine, the combina-  
60 tion of parallel frame supports, a series of twisting devices journaled between the sup- ports, power devices for actuating the twist- ers, and clamping mechanism supported on  
65 opposite sides of the frame supports a

movable when engaged by wires and in op- posite directions, substantially as described.

22. In a wire fence machine, the combina-  
tion of parallel frame supports, a series of twisting devices journaled in the supports, 70 power devices for actuating the twist-ers, fixed clamping devices secured upon the frame supports, and coacting clamping de- vices arranged to be moved toward and from said fixed clamping devices, substantially as 75 described.

23. In a wire fence machine, the combina-  
tion of parallel frame supports, a series of twisting devices journaled in the supports, power devices for actuating the twist-ers, 80 fixed clamping parts coincident with the twist-ers and carried by the frames, movable bars pivotally attached to the frame sup- ports and carrying coacting clamping de- vices with the aforesaid clamping parts, sub- 85 stantially as described.

24. In a wire fence machine, the combina-  
tion of parallel frame supports, a series of twisting devices journaled in the supports, mechanism for actuating the twist-ers, clamp- 90 ing devices carried by said twist-ers, fixed clamping parts upon the frames coincident with the twist-ers, parallel bars pivotally at- tached upon the frames on opposite sides of the twist-ers arranged for movement in oppo- 95 site directions and carrying clamping devices coacting with the aforesaid clamping parts, substantially as described.

25. A wire fence machine, comprising a  
revoluble frame of duplicate head sections, 100 journaled in a stationary base, a series of rows of twisting devices supported in the frame, mechanism arranged on said frame, whereby each row of twist-ers is intermit- tently actuated alternately in opposite direc- 105 tions, automatic wire shifting devices, and mechanism having a predetermined move- ment for actuating said shifters, substan- tially as described.

26. A wire fence machine, comprising a  
110 revoluble frame supported on a power shaft and journaled in a stationary base, a series of rows of twisting devices carried by said frame, and means for intermittently actu- ating said twist-ers, each alternate row in oppo- 115 site directions, clamping devices coacting with said twist-ers and actuated by pressure of wires engaging therewith, wire shifting mech- anism, and mechanism having a predeter- mined movement for shifting each alternate 120 shifter in an opposite direction, substantially as described.

27. A wire fence machine, comprising a  
revoluble frame mounted on a power shaft, journaled in a stationary base, a series of 125 rows of twisting devices carried in a circum- ferential line in said frame, power devices co- acting with the twist-ers, and means whereby, during the rotation of said frame, three of said rows are actuated simultaneously, and 130



during the continued rotation of said frame each row of twistors will in turn be successively actuated, substantially as described.

28. A wire fence machine, comprising a 5 revoluble frame carried by a power shaft, journaled in a stationary base, a series of rows of twisting devices arranged in a circumferential line in said frame, power devices coacting with the twistors, and means 10 engaged by said power devices, whereby when two or more rows of the twistors are actuated, the remaining rows of the series are inactive, and clamping devices coacting with each row 15 of twistors and connecting devices between the opposite rows in a series, all substantially as described.

29. A wire fence machine, comprising a rotating frame, supported by a power shaft, journaled in a stationary base, a series of 20 rows of twister sections arranged in said frame in a circumferential line, power devices coacting with each row of twistors and arranged in each alternate row at opposite ends thereof, mechanism whereby said power 25 devices are actuated for imparting a similar movement to the twistors, wire shifting devices arranged to be caused to alternately coincide with the twistors of each independent row, and mechanism whereby said 30 shifters are actuated, substantially as described.

30. In a wire fence machine, the combination with a revolving frame, of one or more rows of twisting devices, power devices co- 35 acting therewith, a semi-circular fixed internal ring gear lying in the path of movement of the power devices of the twistors, and means whereby the power devices are retained in proper position for engagement 40 with the internal gear and for imparting a preliminary starting movement thereto, substantially as described.

31. In a wire fence machine, the combination with a revoluble frame, of the internal 45 gearing 52, a series of frame supports 18 carrying twister sections, the power devices comprising the bevel gearing 24 and 25, the spur gear 27 arranged to coact with the gear 52, and the pin 28 of the spur gear arranged 50 to coincide with a split tooth 53 of the gear 52, substantially as described.

32. The wire shifting mechanism, comprising a series of shifters pivotally attached to a frame support, movable frame parts for en- 55 gaging said shifters, and mechanism having a predetermined movement for shifting the aforesaid frames, substantially as described.

33. A wire shifting mechanism comprising a series of shifters pivotally attached alter- 60 nately upon opposite sides of a support, movable frame supports engaging said shifters, whereby when one series of the shifters supported on one side of the frame is moved in one direction the shifters upon the opposite 65 side will be moved in an opposite direction,

and means for actuating said movable frames, substantially as described.

34. A wire shifting mechanism consisting of a series of shifters pivoted to a frame support, mechanism having a predetermined 70 movement for engaging said shifters, for moving each alternate shifter in opposite directions, a tubular body on each shifter, and a screw-threaded plug engaging said tubular body having a wire opening at its lower end, 75 substantially for the purpose described.

35. A wire fence machine, comprising a revoluble frame carried by a power shaft journaled in a stationary base, mechanism 80 for rotating said frame, twisting devices attached to and revolving with said frame and means for intermittently actuating said twistors, wire guiding devices, wire shifting devices, mechanism having a predetermined 85 movement for shifting the aforesaid devices, and means for moving the shifters in a direction opposite to that shifted by the mechanism having a predetermined movement, and wire winding devices for the finished fabric, 90 substantially as described.

36. A wire fence machine, comprising a revoluble frame mounted on a power shaft journaled in a stationary base, wire twisting devices rotating with said frame and means 95 whereby said twistors are intermittently actuated, wire guiding devices, wire shifting devices arranged to be automatically oscillated for shifting the wires intermittently to alternately arranged twistors in the frame as 100 they are moved into position, and wire winding devices for the finished fabric actuated substantially as shown, in the manner and for the purpose described.

37. The herein-described wire shifting devices, comprising the members 56 arranged 105 with the adjustable plugs 60 having the wire openings 61, movable frame parts 62 for moving the shifters, and the gear 7 with its series of cam faces for engaging parts of the frames 62 for shifting the members 56, sub- 110 stantially in the manner and for the purpose described.

38. A wire fence machine, comprising a revolving frame, a series of wire-connecting devices carried thereby, the arrangement of 115 the frame and connecting devices being such that as the frame is revolved said connecting devices will be operated to connect said wires the full width of a fabric.

39. A wire fence machine, comprising a 120 rotary frame, devices carried thereby for engaging a series of wires and arranged to interlock or twist said wires to form a polygonal mesh during the rotation of the frame, and means for actuating the aforesaid de- 125 vices, substantially as described.

40. A wire fence machine, comprising a rotary frame, devices carried thereby for en- 130 gaging a series of strand wires and arranged interlock or twist said wires to form a



polygonal mesh during the rotation of the frame, and means for actuating the afore-said devices in a manner to simultaneously twist together a series of wires in a line the width of the fabric, as and for the purposes set forth.

41. A wire fence machine, comprising a rotary frame, a series of twisters carried in and across the width of the frame, and means for actuating said twisters during the rotation of the frame to simultaneously twist together a series of wires engaged thereby, as and for the purposes set forth.

42. A wire fence machine, comprising a rotary frame, a series of revoluble wire-connecting devices arranged in rows across and circumferentially upon said frame, and means for operating said wire-connecting devices during the rotation of the frame to simultaneously and successively operate a row of such devices.

43. A machine for the manufacture of wire fabric, comprising a revoluble frame, means for feeding a series of wires to said frame, twisting devices carried by the revolving frame adapted to receive wires, twist the same and produce a finished fabric during the rotation of the frame, and clamping devices arranged on the twisters, as and for the purposes set forth.

44. A machine for the manufacture of wire fabric, comprising a revolving frame, means for feeding loose wires to said frame, revoluble wire-connecting devices adapted to engage said wires as they successively move into the path of the wires during the rotation of the frame, said connecting devices arranged to revolve in directions different from the rotation of said frame for connecting said wires and delivering a finished fabric during the rotation of the frame.

45. A wire fence machine, comprising a suitable frame support, twisting devices rotatably carried in said support and each provided with clamping parts, and clamping devices operatively carried adjacent to the twisters and movable by the weight of wires thereon, as and for the purposes set forth.

46. A wire fence machine, comprising a stationary base, a frame mounted for horizontal rotation on said base, a series of twisting devices journaled in said frame and provided with wire receiving grooves, clamping parts in said twisters, and shifting mechanism mounted above the frame, for the purposes set forth.

47. A wire fence machine, comprising a stationary base, a frame mounted for horizontal rotation on said base, a series of twisters mounted in said frame, and means for intermittently actuating the twisters during the rotation of the frame, in combination with a series of oscillating wire shifters and means for oscillating the shifters just previous to the twisters coming into posi-

tion by the continued rotation of the frame, as and for the purposes set forth.

48. In combination, a revoluble frame, wire twisters mounted in said frame, means for intermittently actuating said twisters; a plurality of oscillating shifting members each of which has a wire opening, and means having a predetermined movement relative to the rotation of said frame for oscillating said shifters, substantially as specified.

49. A device of the class described, comprising a revoluble support, wire connecting devices mounted in a longitudinal row on said support, and means carried by said support and movable longitudinally beneath said connecting devices, adapted to operate the same at predetermined intervals during the rotation of said support.

50. A device of the class described, comprising a shaft, a series of twister supports supported to revolve with said shaft, revolving twister devices mounted on said supports, and means longitudinally movable through said supports and co-acting with said twisters for intermittently rotating said twisters during the rotation of the shaft and supports.

51. A device of the class described, comprising a shaft adapted to be continuously revolved, a series of twister supports mounted on said shaft, slotted twisting devices journaled on said supports, twister actuating devices movable through the said supports and beneath the twisters, and power devices disposed at one end of the supports adapted to drive the twister actuating devices, substantially for the purposes specified.

52. In a wire fence machine, the combination of a revoluble shaft, twister supports mounted on said shaft, and revoluble twisting devices journaled in said supports having their axes disposed in line with the travel of wires fed thereto, substantially as shown and described.

53. A device of the class described, comprising a shaft adapted to be continuously rotated, a series of twister supports mounted on said shaft, twisting devices journaled in the said supports having toothed peripheries and provided with wire grooves, and link-belt traveling through the said supports and co-acting with the toothed portions of the twisting devices, substantially for the purpose specified.

54. A device of the class described, comprising a shaft adapted to be continuously rotated, twister supports mounted on said shaft, a series of twisting devices journaled in said supports and provided with toothed peripheries and radial slots in their bodies, wire clamping parts on the said twisters, link-belt co-acting with and adapted to actuate the said twisters, and means disposed at the end of a series of twisters for intermittently actuating said link-belt.



55. A device of the class described, comprising a shaft adapted to be continuously rotated, a series of twister supports mounted on said shaft, twisting devices mounted on the said supports and composed of two pinions having slotted portions and suitably connected, and devices paralleling the axis of the shaft adapted to be intermittently actuated for imparting motion to a row of twist-  
ers during a partial rotation of the shaft, substantially as specified.
56. A wire fence machine, comprising a revoluble shaft, twister supports mounted on said shaft, and revoluble twisting devices journaled in said supports having their axes disposed in a line with the travel of wires fed thereto, means for feeding the wires to the twist-  
ers, and means combined therewith for shifting the wires previous to their engagement by the twist-  
ers.
57. In a machine for making wire fabric, the combination with a plurality of wire-connecting devices in staggered arrangement, of means for directing portions of the same wire to said devices.
58. In a machine for making wire fabric, the combination with a plurality of twist-  
ers in staggered arrangement, of wire guiding and deflecting means associated with the twist-  
ers.
59. In a machine for making wire fabric, the combination with several sets of twist-  
ers mounted to travel in unison, the twist-  
ers of adjacent sets having alternating arrangement, of wire guiding means associated with said twist-  
ers.
60. In a machine for making wire fabric, the combination with a plurality of traveling wire-connecting devices in staggered arrangement, of means for leading wires to said devices.
61. In a machine for making wire fabric, the combination with a plurality of traveling wire-connecting devices in staggered arrangement, of wire guiding and deflecting means associated therewith.
62. In a machine for making wire fabric, the combination with a traveling series of twist-  
ers in staggered relation, of means for advancing wires with the twist-  
ers, and means for deflecting certain of the wires to the twist-  
ers in transit.
63. In a machine for making wire fabric, the combination with a series of spaced sets of twist-  
ers, the twist-  
ers of adjacent sets being in alternating arrangement, of wire guiding and deflecting means associated with said twist-  
ers.
64. In a machine for making wire fabric, the combination with a series of wire-connecting devices movable in an endless orbit and having staggered arrangement, of wire guiding means associated therewith.
65. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of a series of wire connecting devices having staggered arrangement and movable in an endless orbit, and means for operating said devices to connect the wires in transit.
66. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of a series of twist-  
ers movable in an endless orbit and having staggered arrangement, and means for operating the twist-  
ers to connect the wires in transit.
67. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of several sets of wire-connecting mechanisms mounted to travel in unison in an endless orbit, the devices of adjacent sets having alternating arrangement, and means for operating said devices to connect the wires in transit.
68. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of several sets of traveling twist-  
ers movable in an endless orbit, the twist-  
ers of adjacent sets having alternating arrangement, wire guiding and deflecting means associated with the twist-  
ers, and means for operating the twist-  
ers to connect the wires in transit.
69. In a machine for making wire fabric, the combination with a rotary drum, of a series of wire connecting devices carried by the drum in staggered arrangement, and wire guiding means associated with said devices.
70. In a machine for making wire fabric, the combination with a rotary drum, of a series of staggered twist-  
ers distributed around the drum, and means for operating the twist-  
ers during the movement of the drum.
71. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of a rotary drum, twist-  
ers carried by the drum and having staggered arrangement, and wire guiding and deflecting means associated with the twist-  
ers.
72. In a machine for making wire fabric, the combination with a rotary drum, of several sets of twist-  
ers carried by the drum, means for advancing a series of wires with the drum, and means for laterally deflecting certain of the wires at intervals in their lengths to present them to twist-  
ers arranged out of alignment.
73. In a machine for making wire fabric, the combination with a rotary drum, of several sets of twist-  
ers distributed around the drum, the twist-  
ers of adjacent sets having alternating arrangement, and wire guiding and deflecting means associated with the twist-  
ers.
74. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of a rotary drum, several sets of twist-  
ers distributed about the drum,



the twist-ers of adjacent sets having alternating arrangement, wire guiding and deflecting means associated with the twist-ers, and means for operating the twist-ers during the movement of the drum to effect the connection of the wires in transit.

75. In a machine for making wire fabric, the combination with a series of twist-ers having staggered arrangement, of means for operating successive twist-ers in opposite directions.

76. In a machine for making wire fabric, the combination with a series of traveling twist-ers in staggered arrangement, of means operated during the travel of said twist-ers for operating successive twist-ers in opposite directions.

77. In a machine for making wire fabric, the combination with a series of twist-ers mounted to travel in an endless orbit, of means operated during the travel of the twist-ers for operating certain of the same in one direction and certain others in the opposite direction to form reverse twists.

78. In a machine for making wire fabric, the combination with a series of twist-ers mounted to travel in an endless orbit, of means for operating alternate twist-ers in opposite directions to form reverse twists.

79. In a machine for making wire fabric, the combination with a series of twist-ers having staggered arrangement and mounted to travel in an endless orbit, of means for operating said twist-ers to form reverse twists during the travel thereof.

80. In a machine for making wire fabric, the combination with a rotary drum, of a series of twist-ers distributed around the drum, and means for operating different twist-ers in different directions to form reverse twists.

81. In a machine for making wire fabric, the combination with a rotary drum, of a series of twist-ers distributed around the drum and mounted to travel therewith, and means for inaugurating the movement of the twist-ers at the same point in their travel, said means serving to operate different twist-ers in different directions to form reverse twists.

82. In a machine for making wire fabric, the combination with a rotary drum, of a series of staggered twist-ers distributed around the drum, and means operated during the movement of the drum for operating different twist-ers in different directions to form reverse twists.

83. In a machine for making wire fabric, the combination with several sets of twist-ers, of means for operating adjacent sets of twist-ers in different directions to form reverse twists.

84. In a machine for making wire fabric, the combination with several sets of twist-ers

mounted to travel in unison, of means for operating adjacent sets of twist-ers in opposite directions to form reverse twists during the travel of the twist-ers.

85. In a machine for making wire fabric, the combination with several sets of twist-ers mounted to travel in unison, the twist-ers of adjacent sets having alternating arrangement, of means operating during the travel of the twist-ers for operating certain of the sets in one direction and the other sets in the opposite direction to form reverse twists.

86. In a machine for making wire fabric, the combination with several sets of twist-ers mounted to travel in an endless orbit, of means for operating alternate sets of twist-ers in opposite directions during the travel thereof.

87. In a machine for making wire fabric, the combination with a rotary drum, of a series of sets of twist-ers distributed around the drum, means for guiding wires to the twist-ers, and means for operating different sets of twist-ers in different directions to form reverse twists.

88. In a machine for making wire fabric, the combination with a rotary drum, of several sets of twist-ers distributed around the drum, the twist-ers of adjacent sets having alternating arrangement, and means for operating alternate sets of twist-ers in opposite directions to form reverse twists during the movement of the drum.

89. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a support, and mechanism carried by the support and movable with the wires in the direction of the feed thereof to connect said wires at intervals.

90. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a support, and twist-ers carried thereby and movable with the wires in the direction of the feed thereof to twist said wires together at intervals and thus form meshes.

91. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a support, wire flexing means mounted on the support and directly engaging the wires to flex certain or all of said wires for the purpose of forming meshes, and wire connecting means distinct from the flexing means and operating to connect the wires at their points of contact.

92. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a row of twist-ers disposed transversely of the wires and movable in unison in the direction of the feed thereof, and



means for operating the twistors during their movement with the wires to twist said wires together.

93. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, several rows of twistors disposed transversely to the series of wires and movable with the wires in the direction of the feed thereof, wire flexing means arranged to bring the wires together at intervals to form meshes, and means for operating the twistors during the movement thereof with the wires to twist said wires together at their points of contact.

94. In a loom adapted to produce wire fabric from a plurality of continuously moving wires, a support movable with the wires, and several rows of twisting devices mounted on and movable with the support and operated during such movement to connect the wires at intervals.

95. In a loom for producing wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a support, and several rows of twisting devices mounted on the support and movable in an endless orbit to present them in succession to the wires, and means for operating the twistors during a portion only of their travel.

96. In a machine for making wire fabric, the combination with a plurality of staggered wire-connecting devices mounted to travel in unison, of means for leading a plurality of wires to each of said devices, and means for deflecting certain of the wires laterally to form meshes.

97. In a machine for making wire fabric, the combination with a traveling series of twistors in staggered relation, of means for advancing a plurality of wires with the twistors, means for deflecting certain portions of certain of the wires in transit to present them to the twistors, and means for operating the twistors during the travel thereof to intertwist the wires.

98. In a machine for making wire fabric, the combination with means for advancing a plurality of parallel wires in unison, of means operating through the transit of the wires to deflect certain of them laterally into engagement with adjacent wires, and a series of traveling twistors for intertwisting the wires at their points of engagement in transit.

99. In a machine for making wire fabric, the combination with a group of traveling twistors, of means for advancing a series of wires with the twistors, means for presenting certain of the wires to the twistors without lateral deflection of said wires, means for deflecting certain other wires laterally to present different portions thereof to different twistors arranged out of line, and means for

operating the twistors to intertwist the wires in transit.

100. In a machine for making wire fabric, the combination with a rotary drum, of a series of staggered twistors extending around the drum and arranged to connect a plurality of moving wires.

101. In a machine for making wire fabric, the combination with a drum, of a plurality of twister supports removable from the drum, and a set of twistors carried by each support and removable therewith.

102. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of means for connecting said wires in transit by reverse twists located at intervals.

103. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of twistors engaging a wire at intervals, and means for operating said twistors in different directions during the transit of said wires to connect the same to adjacent wires by reverse twists.

104. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a support, twistors carried thereby and movable with the wires in the direction of feed thereof to twist said wires together at intervals, and means disposed beneath the twistors and movable in lines transverse to the direction of feed of the wires for operating said twistors.

105. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a row of twistors disposed transversely of the wires and movable in unison in the direction of feed thereof, and means adapted to be moved with the twistors and disposed longitudinally beneath the same for operating said twistors during their movement with the wires to twist said wires together.

106. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, several rows of twistors disposed transversely to the series of wires and movable with the wires in the direction of the feed thereof, wire flexing means arranged to bring the wires together at intervals to form meshes, and means disposed longitudinally beneath each row of twistors and movable at predetermined intervals in lines transverse to the direction of feed of said wires, to operate the twistors and thereby twist said wires at their points of contact.

107. In a machine for making wire fabric, the combination with a plurality of staggered wire-connecting devices mounted to travel in unison, of means for leading a plurality of wires to each of said devices, means for deflecting certain of the wires laterally to form



meshes, and means movable longitudinally beneath the twistors adapted to actuate said twistors at predetermined intervals.

108. In a machine for making wire fabric, the combination with a rotary frame, of a series of staggered twistors extending around the frame and arranged to connect a plurality of wires, and means carried by the frame and beneath the twistors adapted at intervals to be moved in a direction transverse to the movement of said frame to actuate said twistors.

109. In a machine for making wire fabric, the combination of a drum, a plurality of twister supports removable from the drum, a set of twistors carried by each support and removable therewith, and means movable longitudinally through the supports and beneath the twistors, adapted at intervals to actuate such twistors.

110. In a machine for making wire fabric, the combination of a plurality of wire-connecting devices in staggered arrangement, means for directing portions of the same wire to said devices, and an endless chain in engagement with said devices for operating the same at predetermined intervals.

111. In a machine for making wire fabric, the combination of a plurality of twistors in staggered arrangement, wire guiding and deflecting means associated with the twistors, and means having longitudinal movement beneath the twistors and in operative connection therewith for actuating the same at predetermined intervals.

112. In a machine for making wire fabric, the combination with several sets of twistors mounted to travel in unison, the twistors of adjacent sets having alternate arrangement, of wire guiding means associated with said twistors, and a plurality of twister actuating devices longitudinally movable beneath each set of twistors adapted to actuate the same at predetermined intervals and in succession.

113. In a loom adapted to produce wire fence from a plurality of wires fed longitudinally in the same general direction, a support, twistors carried thereby and movable with the wires in the direction of feed thereof to twist said wires together at intervals, and means disposed beneath the twistors and movable in lines transverse to the direction of feed of the wires for operating said twistors.

114. In a loom adapted to produce wire fence from a plurality of wires fed longitudinally in the same general direction, a support, twistors mounted on the support in rows longitudinally of the support and movable with the wires in the direction of feed thereof to twist said wires together at intervals, and means for actuating the longitudinal rows of twistors in succession.

115. In a wire fence machine, a revoluble drum, twistors mounted on the surface of the

drum and in rows around the drum and also longitudinally of the drum, mechanism carried by the drum and movable longitudinally beneath the twistors adapted to actuate the rows of twistors in succession and at predetermined intervals, and means for inaugurating the movement of such mechanism at the same point in the travel of said twistors.

116. In a wire fence machine, a revoluble drum comprising a shaft, a head secured to said shaft at or near each end, a series of longitudinal bars attached to said head, twistors mounted in rows on said bars, and means carried by said bars and movable longitudinally beneath the twistors adapted to actuate said twistors at predetermined intervals.

117. In a wire fence machine, a revoluble drum comprising a shaft, a head secured to said shaft at or near each end, a series of longitudinal bars attached at their opposite ends to said heads, twistors mounted in rows on said bars, mechanism carried by said bars and movable longitudinally beneath said twistors at predetermined intervals, and means for inaugurating the movement of such mechanism at the same point in the travel of said rows of twistors.

118. In a wire fence machine, a revoluble drum, twistors mounted on the surface of the drum and in rows around the drum and also longitudinally of the drum, and means for inaugurating the movement of each longitudinal row of twistors at the same point in their travel.

119. In a wire fence machine, a revoluble drum, slotted twister wheels mounted in rows around the drum and also longitudinally of the drum, and means for inaugurating the movement of each succeeding row of twistors at the same point in their travel.

120. In a wire fence machine, a revoluble drum, slotted twister wheels mounted in rows around the drum and also longitudinally of the drum, and mechanism disposed beneath each row of twistors and in mesh therewith adapted at a given point in the movement of the drum to be moved longitudinally for imparting movement to the twistors.

121. A wire fence machine, comprising a revoluble drum, a series of rows of twisting devices arranged on said drum, power devices engaging the twistors of each independent row, and means for imparting movement to such power devices at a given point in the movement of said drum for rotating the rows of twistors in succession.

122. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally in laterally spaced relation, of means for deflecting certain of the wires to form meshes, and other means for connecting the wires in transit.

123. In a machine for making wire fabric,



the combination with means for advancing a series of wires longitudinally in laterally spaced relation and in the same general direction, of means for laterally deflecting certain of the wires in transit to form meshes, and other means for connecting said wires in transit.

124. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally in the same general direction and in laterally spaced relation, of means for deflecting certain of the wires at intervals to form meshes, and other means for connecting the deflected portion of each wire to an adjacent wire during the transit of the wires.

125. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally in the same general direction and in laterally spaced relation, of means for deflecting certain of the wires laterally to form meshes, and twisting mechanism distinct from the deflecting means for directly connecting the deflected portions of said wires with adjacent wires during the advance of the several wires in unison.

126. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally and in laterally spaced relation, of means for deflecting certain of the wires laterally to form meshes, and additional mechanism for intertwisting the wires in transit to directly connect the same.

127. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally and in spaced relation, of means for deflecting certain of the wires in different directions, and other means for connecting the wires in transit.

128. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally and in spaced relation, of means for deflecting different portions of certain of the wires in opposite directions, and other means for connecting the deflected portions of adjacent wires in transit.

129. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally and in spaced relation, of means for deflecting certain of the wires in opposite directions at different points in transit, and twisting mechanism distinct from the deflecting means for connecting the wires to produce the fabric.

130. In a machine for making wire fabric, the combination with means for advancing a plurality of wires longitudinally in the same general direction, of means for laterally deflecting certain of the wires at inter-

vals during the transit thereof, and other means for intertwisting the deflected portions of adjacent wires during the continued transit of the latter.

131. In a machine for making wire fabric, the combination with means for advancing line wires and intermediate mesh-forming wires longitudinally in the same general direction in spaced relation, of means for deflecting the mesh-forming wires to form meshes, other means for connecting the mesh-forming wires at intervals during the transit thereof, and means for connecting the margin wires to the adjacent mesh-forming wires in transit.

132. In a machine for making wire fabric, the combination with means for advancing line wires and a plurality of intermediate mesh-forming wires longitudinally and in unison, of means for producing alternate opposite deflections in the mesh-forming wires in transit, other means operating during the transit of the wires for connecting the deflected portions of certain wires alternately with adjacent wires at opposite sides thereof, and means for connecting the margin wires to the adjacent mesh-forming wires at intervals.

133. In a machine for making wire fabric, the combination with means for advancing line wires and a plurality of intermediate mesh-forming wires longitudinally and in laterally spaced relation, of means for effecting opposite alternate deflections in the mesh-forming wires in transit, and other means for intertwisting the wires to effect their connection in transit.

134. In a machine for making wire fabric, the combination with a series of traveling twistors, of means for operating successive twistors in opposite directions to form reverse twists.

135. In a loom adapted to produce wire fabric from a plurality of continuously moving wires fed longitudinally in the same general direction, a support, wire flexing means, and separate wire-twisting means, one of said means being movable with the wires in the direction of the feed thereof.

136. In a wire fence machine, a revoluble drum, a series of longitudinal rows of twistors mounted on said drum, mechanism movable longitudinally beneath each row of twistors and in mesh therewith, and means disposed at alternate ends of adjacent rows of twistors adapted at intervals to operate the aforesaid mechanism.

137. In a wire fence machine, a revoluble drum, a series of longitudinal rows of twistors mounted on said drum, mechanism movable longitudinally beneath each row of twistors and in mesh therewith, and means disposed at alternate ends of adjacent rows of twistors adapted to be successively actuated for im-



parting movement to the longitudinal rows of twist-ers in succession, and in manner specified.

138. In a wire fence machine, a revoluble drum, twist-ers mounted on the drum in rows around the drum and also longitudinally of the drum, independent driving means for each longitudinal row of twist-ers, and power devices at alternate ends of adjacent rows adapted to be intermittently and successively put into motion for transmitting motion to the rows of twist-ers in succession, and in the manner specified.

139. In a wire fence machine, a fence-forming revoluble drum having at intervals longitudinally movable twister actuating devices, slotted wheels mounted in mesh with the said devices, and means disposed at alternate ends of adjacent twister actuating devices adapted to impart movement thereto.

140. In a wire fence machine, a fence-forming revoluble drum having at intervals longitudinally movable twister actuating devices, slotted twister wheels disposed in longitudinal rows in mesh with said devices, and means disposed at alternate ends of adjacent rows of twist-ers adapted to be successively actuated and at the same point in their travel for imparting movement to said twist-ers through the devices aforesaid.

141. In a wire fence machine, a revoluble drum, a series of longitudinal rows of twist-ers mounted at intervals on said drum, means for feeding wires to said twist-ers, means for laterally deflecting certain of said wires, mechanism longitudinally movable beneath each row of twist-ers and in mesh therewith, and means disposed at opposite ends of alternate rows of twist-ers for actuating the mechanism aforesaid of each row in succession and at predetermined intervals.

142. In a machine for making wire fabric, the combination with a series of rows of traveling twist-ers, of mechanism disposed beneath each row of twist-ers and in operative connection with the same, and means disposed at opposite ends of alternate rows of twist-ers adapted to operate the mechanism aforesaid of adjacent rows in reverse directions.

143. In a machine for making wire fabric, the combination with a series of rows of traveling twist-ers, of means for moving said rows of twist-ers in unison, and means disposed at opposite ends of alternate rows of twist-ers adapted to impart movement to said rows of twist-ers in succession and operate the twist-ers of adjacent rows in opposite directions.

144. In a machine for making wire fabric, the combination with means for advancing a series of wires, of a rotary drum, several sets of twist-ers mounted on the drum, means for guiding certain of the line wires to cer-  
tain of the twist-ers without lateral deflection,

means for deflecting and guiding certain other of the wires to twist-ers arranged out of alinement, and means for operating the twist-ers during the movement of the drum to connect the wires in transit.

145. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of a rotary drum, several sets of twist-ers distributed about the drum, twist-ers of adjacent sets having alternating arrangement, means for guiding certain of the line wires without lateral deflection to twist-ers of alternate sets, and means for deflecting other of the wires and for guiding each of the deflected wires to a twister of each set.

146. In a machine for making wire fabric, the combination with means for advancing a plurality of wires, of a rotary drum, several sets of twist-ers distributed about the drum, twist-ers of adjacent sets having alternating arrangement, means for guiding certain of the line wires without lateral deflection to twist-ers of alternate sets, means for deflecting other of the wires and for guiding each of the deflected wires to a twister of each set, and means for operating the twist-ers to connect the wires in transit.

147. In a fence machine, a plurality of twisting wheels arranged about an axis of revolution in a plurality of circumferential series and adapted to receive a pair of wires in each circumferential series, means for revolving said twister wheels about the axis of revolution, and means for rotating the twister wheels in circumferential succession.

148. In a fence machine, the combination, with a plurality of twister wheels arranged in several circumferential series about an axis of revolution, said twister wheels each having an open radial slot adapted to receive a pair of wires, of means for supporting said wheels to permit rotation thereof, means for revolving said wheels about the axis of revolution, and means for rotating said wheels in circumferential succession.

149. In a fence machine, the combination with a rotatable element, of means carried by said element for rotatably supporting a plurality of twisting wheels arranged on said rotatable element in a plurality of circumferential and axial series for rotation about their own axes and for revolution about the axis of the supporting rotatable element, the circumferential series of twister mechanisms being adapted to engage a pair of wires, means for simultaneously operating axial series of twister mechanisms in circumferential succession, and means for rotating the rotatable element.

150. In a fence machine, a plurality of twisting wheels arranged about an axis of revolution in a plurality of circumferential series and adapted to receive a pair of wires in each circumferential series, means for re-



volving said twister wheels about the axis of revolution, and means operating during such movement to rotate the twister wheels in circumferential succession.

5 151. In a fence machine, the combination with a plurality of twister wheels arranged in several circumferential series about an axis of revolution, said twister wheels each having an open radial slot adapted to receive a plurality of wires, of means for supporting said wheels to permit rotation thereof, means for continuously revolving said wheels about the axis of revolution, and means for rotating said wheels in circumferential succession.

15 152. In a fence machine, the combination with a rotatable element, of means carried by said element for rotatably supporting a plurality of twisting wheels arranged on said rotatable element in a plurality of circumferential and axial series for rotation about their own axes and for revolution about the axis of the supporting rotatable element, the circumferential series of twister mechanisms being adapted to engage a plurality of wires, means for simultaneously operating axial series of twister mechanisms in circumferential succession, and means for rotating the rotatable element during such operation of the twisters.

30 153. In a machine for making wire fabric, the combination with means for advancing longitudinally and in unison margin wires, intermediate line wires, and mesh-forming wires, of means for deflecting the mesh-forming wires in transit, and other means for connecting the several wires to produce the fabric.

40 154. In a machine for making wire fabric, the combination with means for advancing margin wires, intermediate line wires, and mesh-forming wires longitudinally and in unison, of means for deflecting the mesh-forming wires to form meshes, and other means for connecting the several wires in transit to produce the fabric.

45 155. In a machine for making wire fabric, the combination with means for advancing margin wires, intermediate line wires, and mesh-forming wires, longitudinally and in unison, of means for deflecting the mesh-forming wires into engagement with each other, with the intermediate line wires, and with the margin wires, and twisting mechanism for effecting the connection of the wires at their points of engagement and during the transit of the wires.

50 156. In a machine for making wire fabric, the combination with means for advancing margin wires, intermediate line wires, and mesh-forming wires, longitudinally and in unison, of means operating during the advance of the wires to deflect corresponding portions of adjacent mesh-forming wires in opposite directions to present such deflected

portions to intermediate line wires, and means for intertwisting in transit said deflected portions of the mesh-forming wires and the intermediate line wires engaged thereby.

157. A wire fence machine, comprising a rotary frame, a series of wire-connecting devices arranged on said frame, each row of said devices successively actuated during the rotation of said frame for continuously weaving together a series of wires engaging said devices.

158. A wire fence machine, comprising a revolving frame, a series of intermittently revolved wire-connecting devices carried thereby, the arrangement of the frame and connecting devices being such that as the frame is revolved said connecting devices will be operated to twist the width of a fabric.

159. A wire fence machine, comprising a rotating frame, a series of rows of twisters on said frame, adapted to connect wires from the center of their respective bodies, and mechanism for operating the twisters of one or more rows during a partial rotation of said frame.

160. A machine for the manufacture of wire fabric, comprising a supporting shaft, a series of longitudinal supports mounted on said shaft, a row of wire-connecting devices having gears, mounted for rotation on said support, and means geared to said connecting devices for operating the same.

161. A machine for the manufacture of wire fabric, comprising a supporting shaft, a series of spaced supports mounted on said shaft, wire-connecting devices arranged with gears, mounted for rotation on each of said supports, and means geared to said connecting devices for operating the same.

162. A machine for the manufacture of wire fabric, comprising a supporting shaft, supports mounted on said shaft, a plurality of rows of wire-connecting devices revolubly mounted on said supports, gears attached to each of said connecting devices, mechanism in constant mesh with the gears of the connecting devices, and means for operating said mechanism.

163. A wire fence machine, comprising a revoluble drum, a series of rows of revolubly supported wire-connecting devices on said drum, each of said devices arranged with gears encircling the body thereof and provided with wire-receiving grooves, means for feeding a series of wires to each of said connecting devices to be operated upon by said devices, and means for operating said connecting devices.

164. A device of the class described, comprising a shaft, a series of supports mounted to revolve with said shaft, a plurality of revoluble wire-connecting devices in uniform spaced relation on said supports, and means movable through said supports and in engagement with said connecting devices for



intermittently rotating said devices during the rotation of the shaft and supports.

165. A wire fencing machine, comprising a rotary frame adapted to receive and advance a series of strand wires, means for feeding mesh-forming wires to said frame, and a plurality of simultaneously actuated twist-  
ers mounted on said frame and adapted to connect the mesh-forming wires to said strand  
wires during the rotation of such frame.

166. A woven wire fence machine, comprising a frame, a rotary horizontal drum mounted therein, said drum carrying weaving mechanism and forming a support for strand wires which are moved concentrically with said drum, and mechanism arranged to rotate the drum and weaving mechanism.

167. A woven wire fence machine, comprising a frame, a rotary horizontal drum against which strand wires lie and are moved concentrically therewith, and adapted to have the strand wires placed at intervals thereon, so that the drum supports said strand wires, and mechanism whereby continuous rotary movement is imparted to said drum.

168. A rotary woven wire fence machine, comprising strand and mesh-forming wire feeding and guiding devices, mesh-forming wire weaving mechanism, a horizontal rotary device for supporting said weaving mechanism, means for operating the mesh-forming wire guiding devices for moving a mesh-forming wire alternately from one strand to the next succeeding strand, and weaver rotating mechanism whereby the mesh-forming and strand wires are woven together.

169. A rotary woven wire fence machine, comprising strand and mesh-forming wire feeding and guiding devices, a horizontal drum over which said strand wires are passed concentrically of its axis, weavers supported thereon, means for placing the mesh-forming wires across the intervening spaces between the strand wires whereby they may be woven with said strand wires, and mechanism whereby the weavers are rotated when said weavers coincide and receive the mesh-form-

ing and strand wires for weaving said wires during the movement of said drum. 50

170. A rotary woven wire fence machine, comprising strand and mesh-forming weaving wire mechanism, a rotary device for advancing said strand wires, means associated with said rotary device for placing the mesh-forming wires across the intervening space between the strand wires, whereby they may be woven with said strand wires, and weaver rotating mechanism whereby the mesh-forming wires are woven with strand wires when they coincide. 55 60

171. A woven wire fence machine, comprising strand and mesh-forming wire feeding and guiding devices, a rotary weaver and strand wire carrying drum, against which said mesh-forming wires lie, said strand wires and said mesh-forming wires moving concentrically with the drum, said mesh-forming wires during their movement being laid across the intervening spaces between the strands to be connected with the strand wires during the rotation of the drum, mechanism for rotating the drum, and mechanism for operating the weavers at proper intervals during the rotation of said drum. 65 70 75

172. In a machine for making wire fabric, the combination with a weaving drum, of weaving mechanism mounted therein and arranged to be operated by the movement of the drum. 80

173. In a machine for making wire fabric, in combination, wire connecting mechanism movable in an endless orbit, consisting of a series of connecting devices extending across the width of the fabric, means for feeding a plurality of wires to the connecting devices, and means disposed within the field of movement of the wire connecting devices to operate the same during the orbital travel. 85 90

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

JOHN L. CLAUDIN.

Witnesses:

CHRISTIAN MAY,  
CHAS. W. LA PORTE.