

No. 643,776.

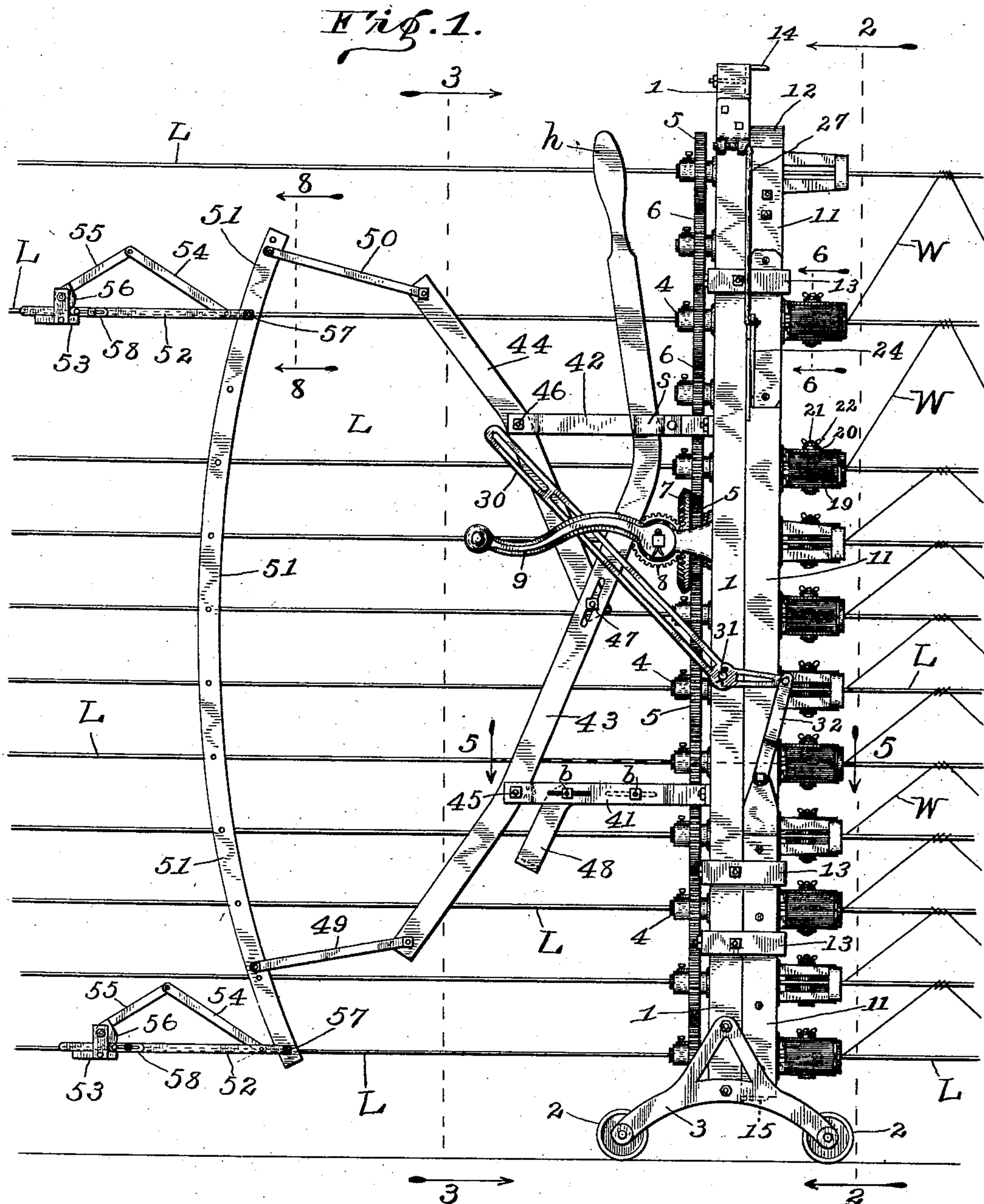
Patented Feb. 20, 1900.

J. & J. G. NIXON.
WIRE FENCE MACHINE.

(Application filed Sept. 1, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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Fig. 2.

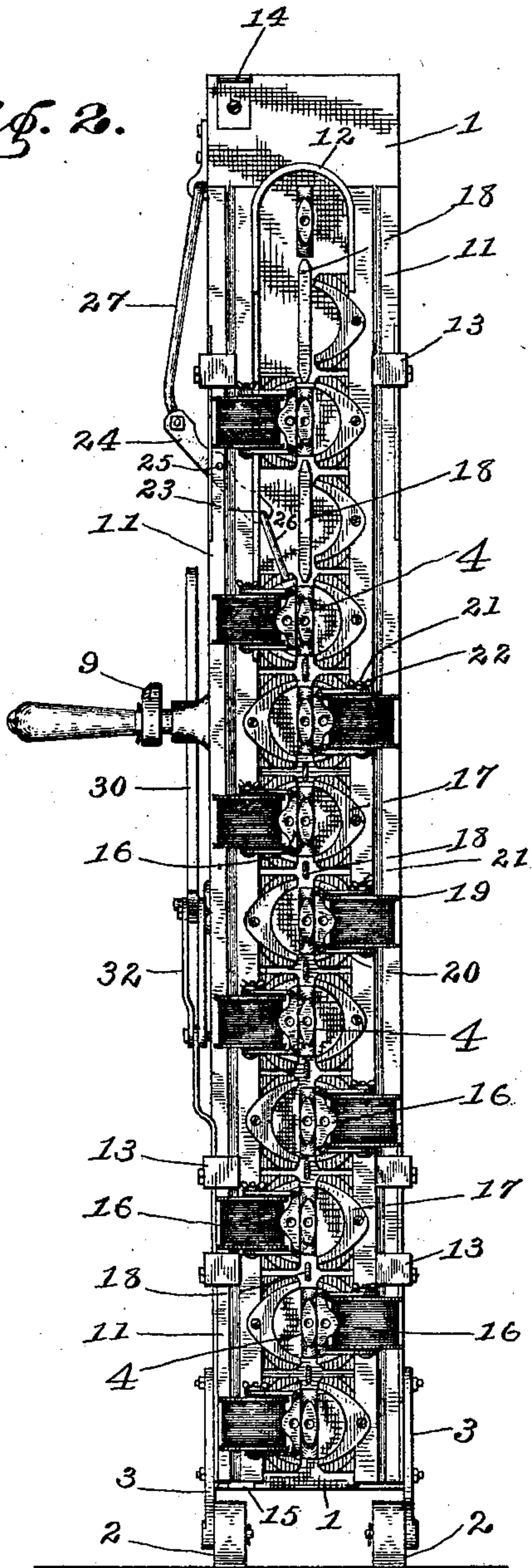
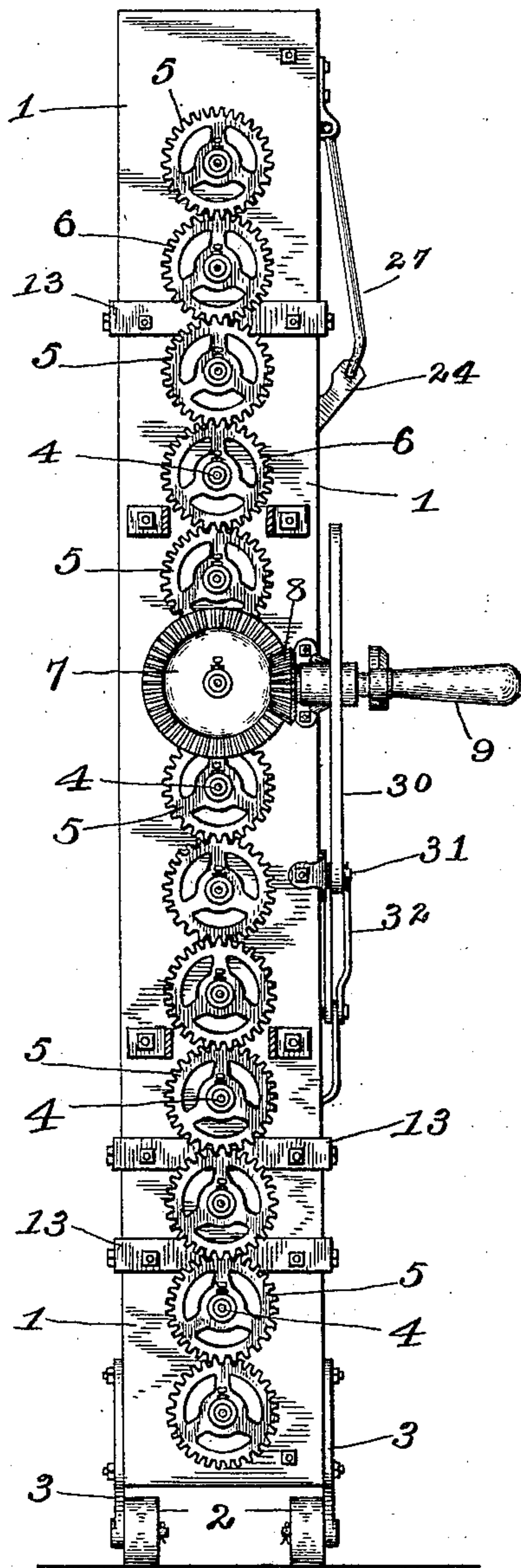


Fig. 3.



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Fig. 5.

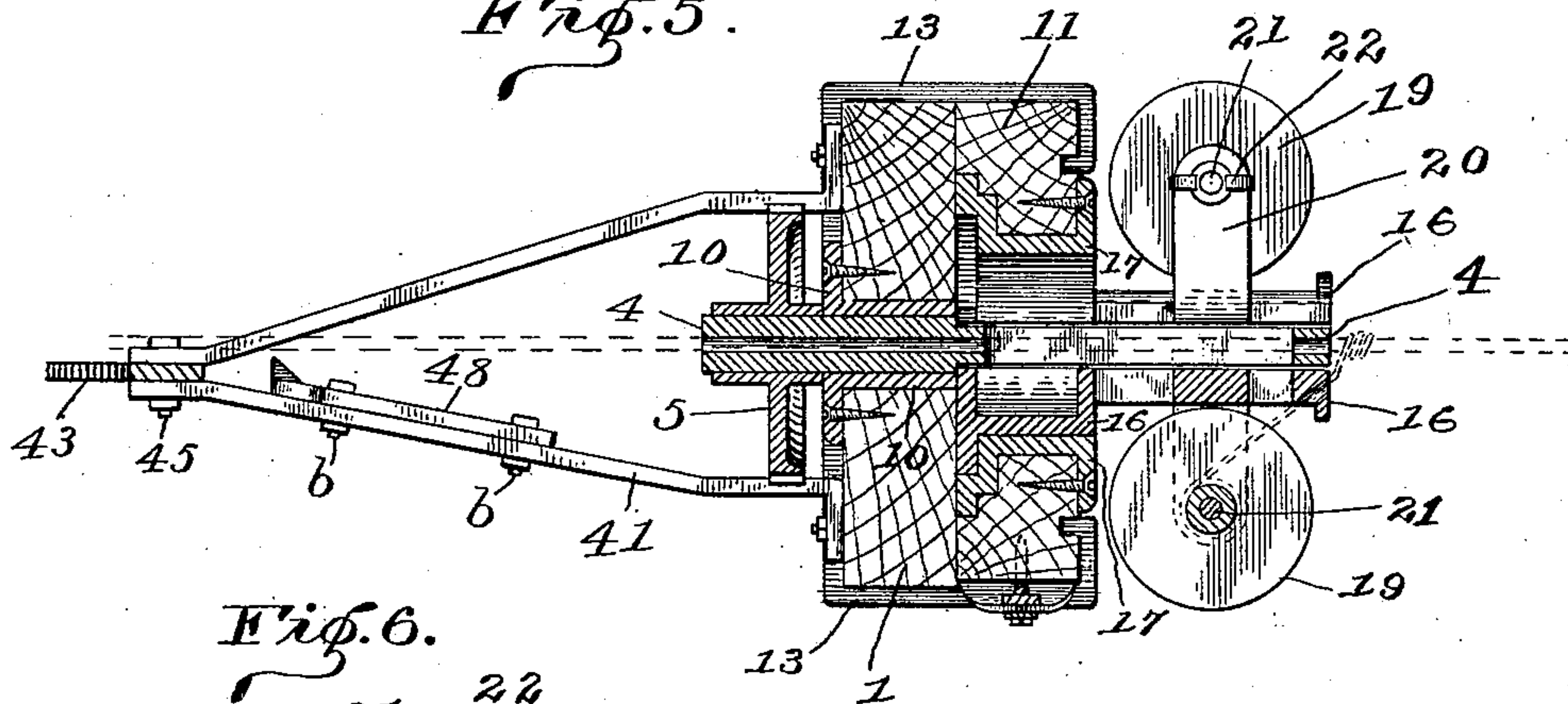


Fig. 6.

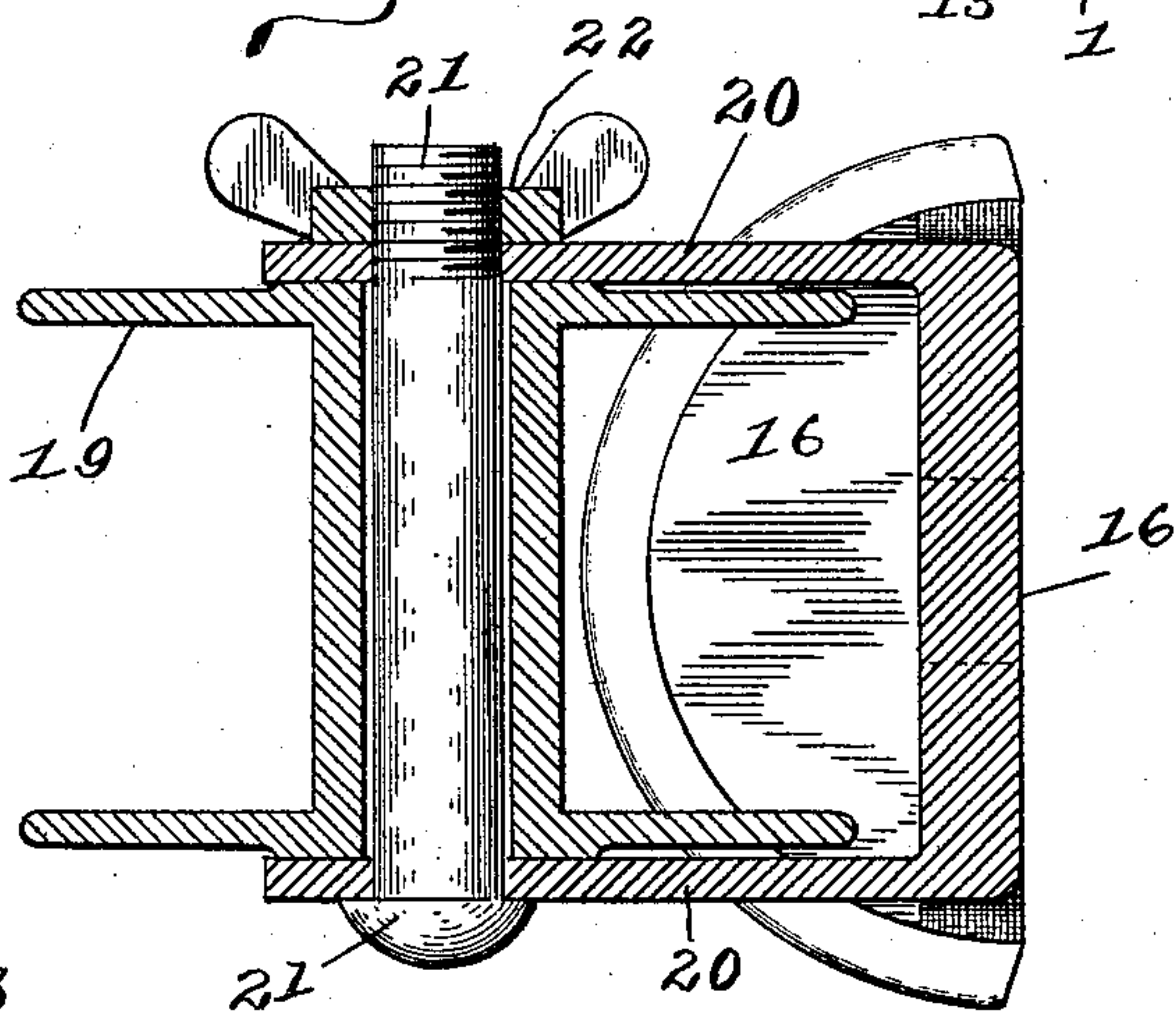


Fig. 4.

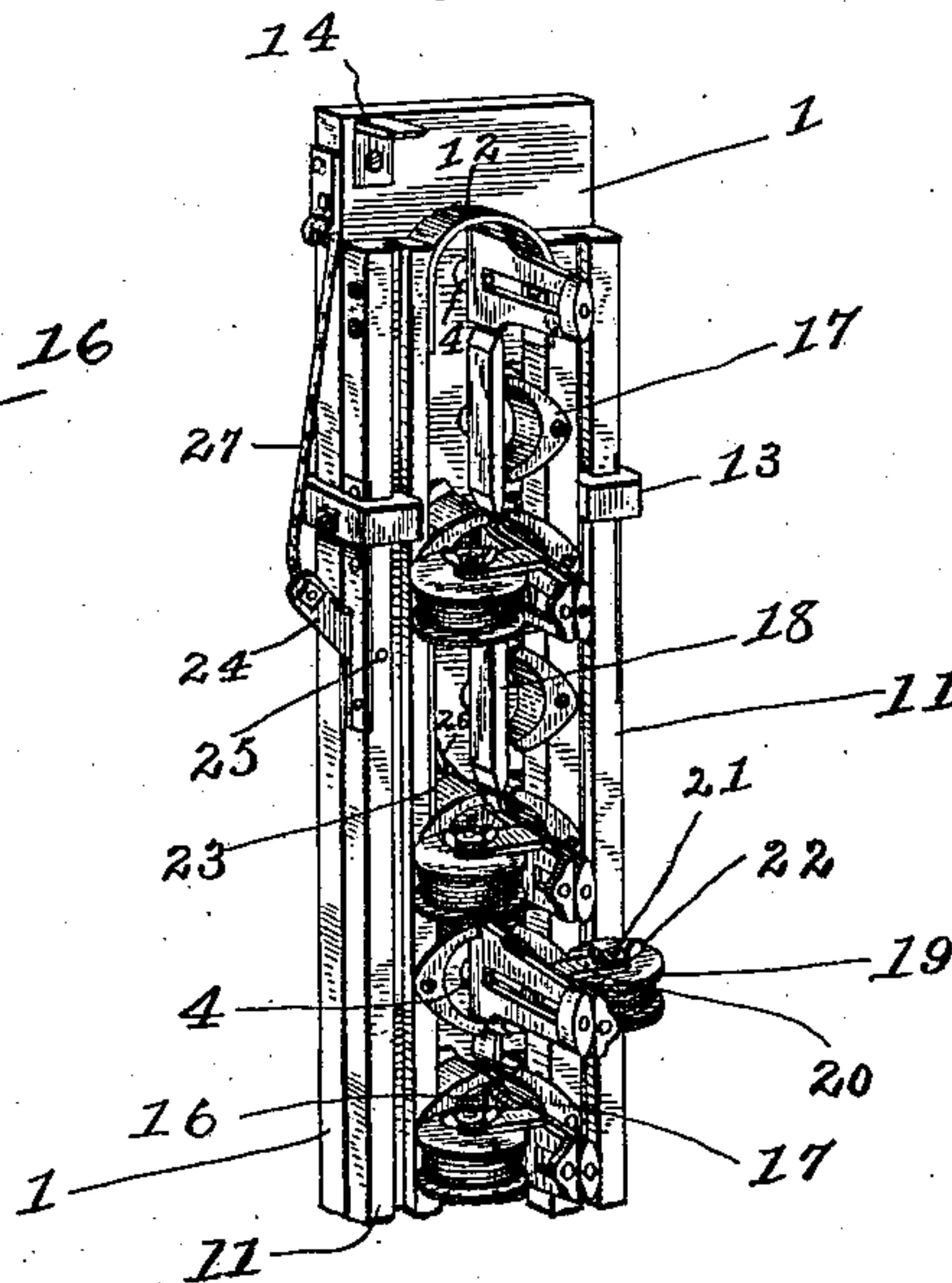


Fig. 7.

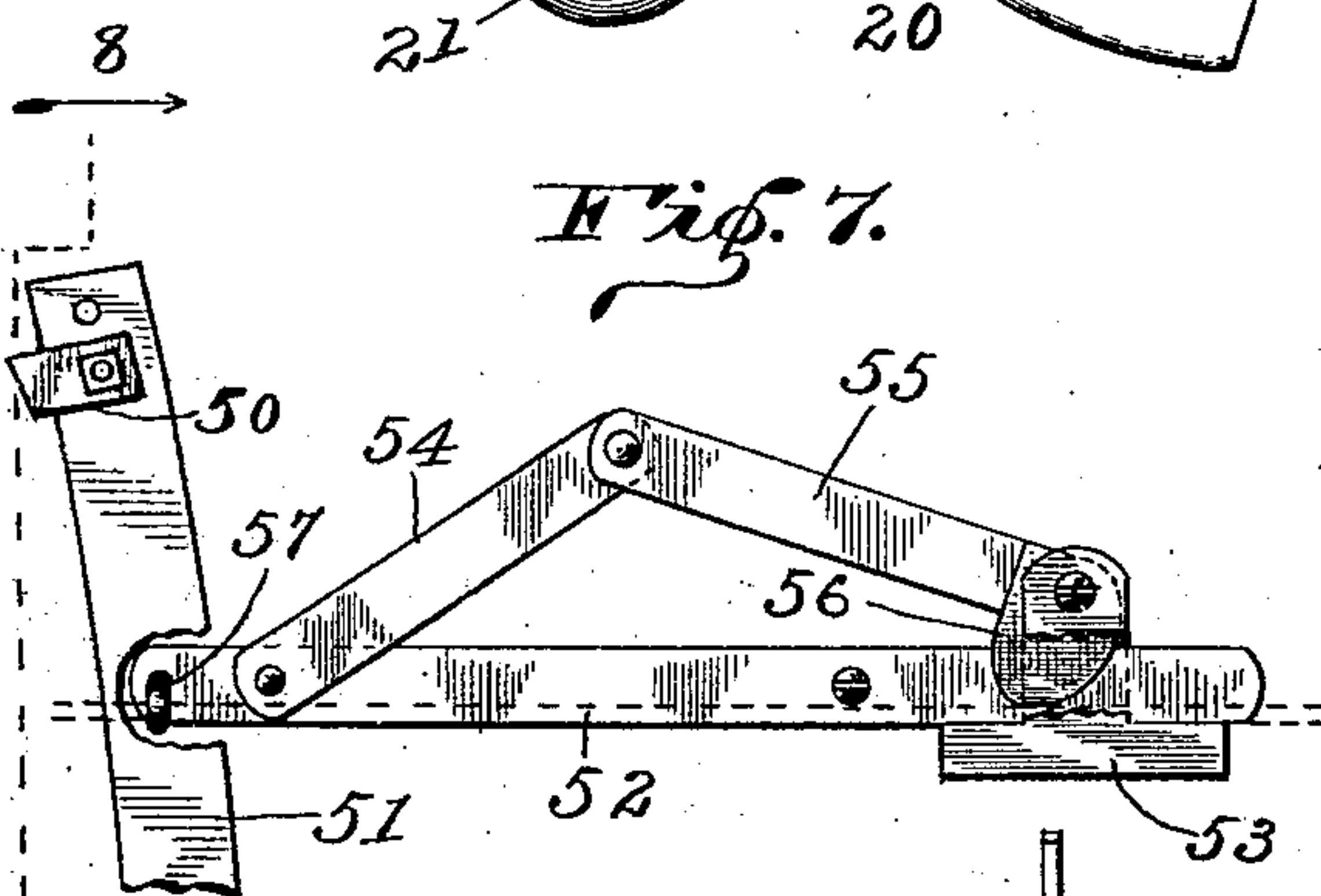


Fig. 8.

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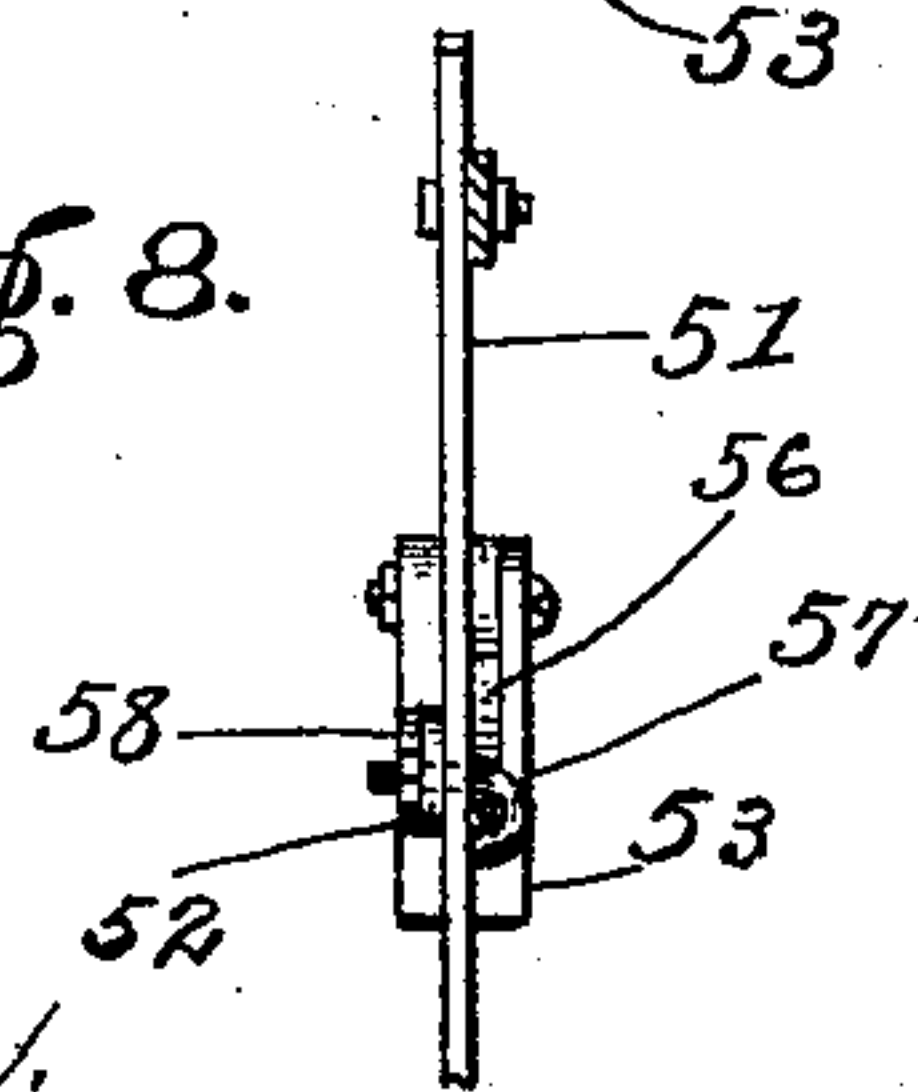
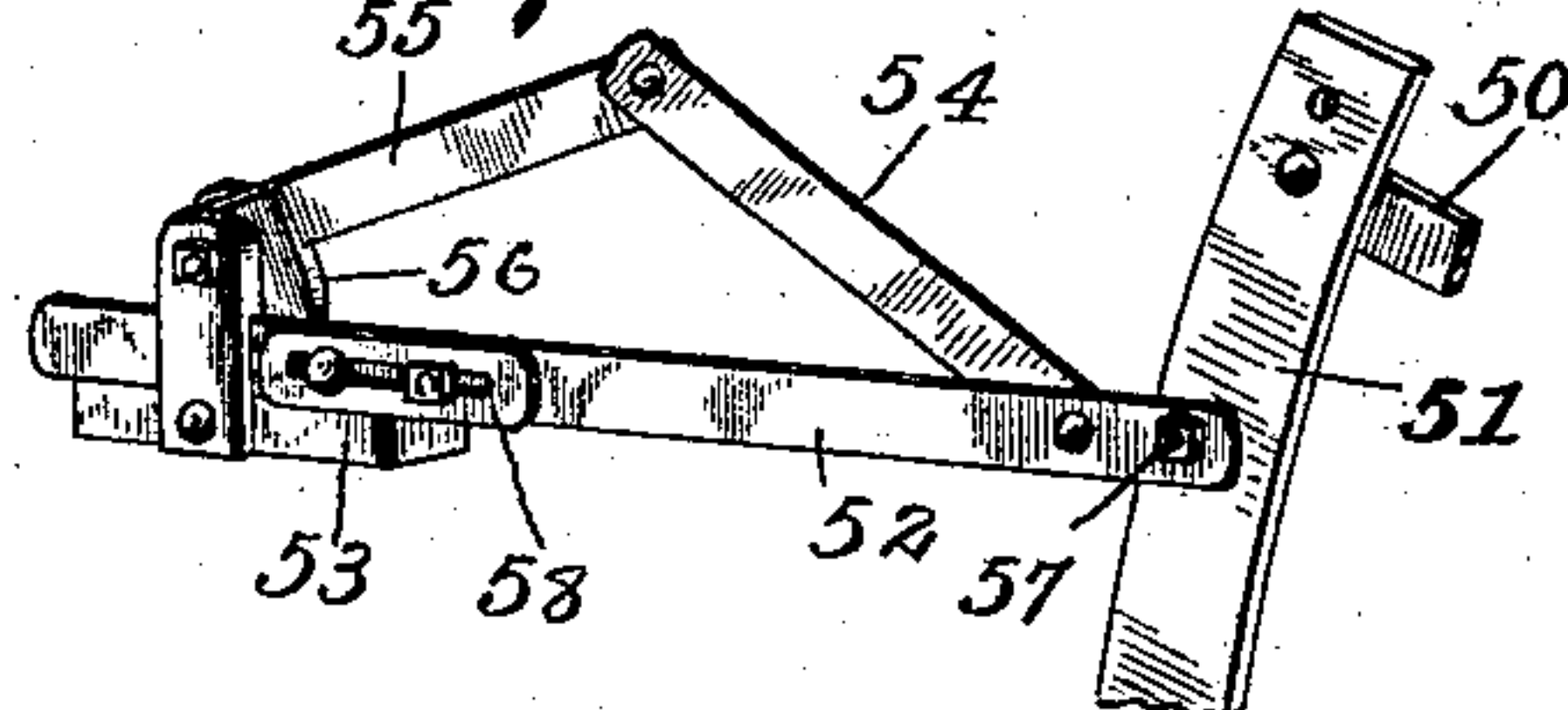


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN NIXON AND JAMES G. NIXON, OF FARMLAND, INDIANA, ASSIGNORS
TO THE FARMLAND WOVEN WIRE FENCE MACHINE COMPANY, OF SAME
PLACE.

WIRE-FENCE MACHINE.

SPECIFICATION forming part of Letters Patent No. 643,776, dated February 20, 1900.

Application filed September 1, 1899. Serial No. 729,187. (No model.)

To all whom it may concern:

Be it known that we, JOHN NIXON and JAMES G. NIXON, citizens of the United States, residing at Farmland, in the county of Randolph and State of Indiana, have invented certain new and useful Improvements in Wire-Fence Machines, of which the following is a specification.

Our said invention relates to that class of machines for weaving wire fabrics which are especially adapted to the use of making woven-wire fence in position in the field.

Said invention consists in various improvements in the construction and arrangement of parts of such machines whereby various advantages are attained, as will hereinafter be more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of a machine embodying our said invention as the same appears in position for use in building a woven-wire fence; Fig. 2, a front elevation of the fence-machine separately as seen from the dotted line 2 2 in Fig. 1; Fig. 3, a rear elevation thereof as seen from the dotted line 3 3 in Fig. 1, the position-shifting devices being removed; Fig. 4, a fragmentary perspective view of the upper portion of the machine; Fig. 5, a horizontal sectional view, on an enlarged scale, as seen from the dotted line 5 5 in Fig. 1; Fig. 6, a detail sectional view through one of the spools and immediately-adjacent parts as seen from the dotted line 6 6 in Fig. 1; Fig. 7, an elevation of the clamp portion of the position-shifting device as seen from the opposite side from that shown in Fig. 1, a fragment being broken away to show the clamping-cam more plainly; Fig. 8, a detail view of the same as seen from the dotted line 8 8 in Figs. 1 and 7; and Fig. 9, a perspective view of the parts shown in Fig. 7, but from the side shown in Fig. 1.

In this machine the main frame 1 carries the spindle and operating mechanism. It is usually and preferably provided with carrier-trucks 2, mounted on a suitable truck-frame 3, and in use the machine is supported and moves upon said trucks. On the rear ends

of the spindles 4 are spur-gears 5, which are arranged in train, and by which in the preferred arrangement most of the spindle-like spool-carrier drivers are revolved in reverse directions to each other. The upper two of said drivers are, however, in the arrangement shown, driven through idle or intermediate gears 6, so that the upper three drivers revolve in the same direction. It is a peculiarity or one feature of our invention that a certain number of the upper wire-carrying spools of the machine shall be spaced at greater distances apart than those below, and this is effected, as above stated, by the interposition of the idle or intermediate gears. The entire train of gearing is driven from a bevel-gear 7, connected to one of the other gears and the corresponding spool-carrier driver at or near the center of the machine. This in turn is driven by a bevel-pinion 8, and the whole is actuated by the operator through a crank 9. The drivers 4 are mounted and adapted to revolve in bearings 10 in the frame 1, as best shown in Fig. 5.

Mounted on the front side of the main frame 1 is a second frame 11, which is adapted to move vertically on said main frame a distance equal to the distance between centers of those spool-carrier drivers which are arranged closest to each other. This frame 11 is composed of two parts rigidly united at the top by a bridge-bar 12 and is secured to the frame 1 by heavy inclosing guides 13, the ends of which enter grooves in the faces of the two sides of said frame 11, and thus retain said frame 11 in position and guide its movements. The vertical movement of said frame 11 is limited by stops 14 and 15 at the top and bottom, which stops are rigidly secured to the frame 1. Revolvable spool-carriers 16 are secured to the two sides of the frame 11 in such position that they register with the spindles mounted in the frame 1 and are arranged alternatively on opposite sides of said spindles, as clearly shown in Fig. 2, except that at the upper end, where the double spacing occurs, the intermediate spool-carriers being left out, those which remain are upon the same sides of the drivers with which they operate. These upper spool-carriers also, as they are required to have a

greater movement than the others, are mounted on a separate slide, as will be presently described. Said spool-carriers are adapted to revolve with the drivers, and thus wrap
 5 the wires W coming from the spools thereon around the wires L, passing through the orifices in the spindle-like drivers. The rear ends of these spool-carriers are semicylindrical in form and rest in similar bearings
 10 on the frame 11. They are held into said bearings when opposite the drivers by means of said drivers, and when passing from one driver to another as the frame 11 is shifted up or down they are prevented from dropping
 15 out of their bearings by suitable projections 18, which are arranged intermediate the spindles 4. It will be noticed, especially by an examination of Fig. 2, that the spool-carriers which are mounted directly on the frame 11
 20 are arranged to register with the spindle-like spool-carrier drivers mounted in the frame 1, one spool-carrier to each driver, but that they are alternatively upon opposite sides—that is, the lower spool-carrier is upon one side and in
 25 registry with the lowest spool-carrier driver, while the second spool-carrier driver is upon the other side and in registry with the second spool-carrier driver, and so on. The two sides of the frame being rigidly connected together,
 30 it moves as a whole, with the result that as it is moved up the lower spool-carrier comes into registry with the second spool-carrier driver, but on the opposite side of said driver from that where the second spool-carrier was
 35 positioned when in registry therewith. This peculiar arrangement results in a fabric having V-shaped meshes, as indicated at the right of Fig. 1 of the drawings, without any special
 40 adjustment of the machine, so that a fabric having a very great degree of elasticity, as well as strength, is regularly produced.

It may here be remarked that the longitudinal wires L, of which the fabric is composed, run straight through the machine, passing
 45 through the orifices in the spool-carrier drivers, and of themselves are unaffected by the operation of the machine. The wires W, carried by the spools, are usually smaller wires and are in operation wrapped around
 50 the wires L in the manner shown at the right hand of Fig. 1.

The spools 19 are held between the arms 20 of the spool-carriers 16, which arms extend out transversely to the main portion of said
 55 spool-carriers. Bolts 21, passing through said arms and said spools, serve both as axles on which said spools may turn and as tension devices by which their movement may be retarded to the desired extent and the wires W
 60 thus put under proper tension. For the latter purpose the arms 20 should be made somewhat flexible, and the bolts 21 should be provided with thumb-nuts 22.

As heretofore stated, it is desirable, particularly for purposes of economy, to make fences
 65 with the upper longitudinal wires wider apart than those nearer the ground. The lower

wires being near together prevent the passage of small animals through the fence, while the upper wires may be spaced wider apart, in
 70 reaching the desired height to prevent larger animals from vaulting over the fence, without any loss of efficiency, while the saving in material is considerable. In our machine, therefore, as heretofore explained, we have dou-
 75 bled the space between so many of the upper wires as is permitted by the use to which the fence is to be put, (we have shown in Fig. 1 a fence in which two wires are omitted, but obviously three or more may be similarly omit-
 80 ted when desired,) and we therefore double the movement of the spool-shifting mechanism for the remaining upper spools. These two upper spools in the arrangement shown, it will be observed, instead of being upon op-
 85 posite sides of the spool-carrier drivers, are both upon the same side. They are immediately attached to a sliding bar 23, which rests upon and moves against one side of the frame 11 and which is actuated by a lever 24, car-
 90 ried by a pivot 25 in said frame side, which lever is connected at its inner end to one of the spool-bearings attached to the bar 23 by means of a link 26, the other end of said lever being connected to a rigid bearing on the
 95 frame 1 by means of a link 27. These parts are so proportioned that the movement of the frame 11 will multiply the movement of the bar 23, so that said bar and the spool-carriers and spools carried thereby will move twice as
 100 far at each movement of the frame 11 as those spool-carriers and spools which are mounted directly upon said frame 11.

The frame 11 and the various parts carried thereby are moved in relation to the frame 1
 105 by a lever 30, which is mounted on a fulcrum-pivot 31 on the frame 1 and is connected by a (double) link 32 to the frame 11, as best shown in Fig. 1. The frame 11 is shown in the drawings as positioned at its lowest point
 110 and resting upon the stop 15. By depressing the lever 30 it is raised to its highest point, where it comes in contact with the stop 14. When in the latter position, that portion of the lever 30 between the fulcrum-pivot 31 and
 115 the point to which it is attached to the link 32 will stand substantially vertical, so that it serves to lock the frame 11 and the parts carried thereby in their uppermost position until said lever 30 is again purposely moved.
 120

As heretofore stated, our machine is supported by and moves upon suitable trucks or wheels 2. It is desirable that a mechanical means shall be employed for shifting its po-
 125 sition which will operate to move the machine the same distance at every operation. In building fences with this machine the wires L are stretched and secured to posts and are thus held strongly in place and constitute a
 130 convenient means to which to connect the position-shifting mechanism. As best shown in Fig. 1, we place rigid arms 41 and 42 on the rear side of the frame 1, and on these we mount levers 43 and 44 by means of pivots 45

and 46. The lever 43 is continued to a greater length than the lever 44 and has a suitable handle *h* at its upper end. It is slotted in the center, and the two levers are connected together by a stud or bolt 47, secured on the lower end of the lever 44 and passing through this slot in the lever 43, the arrangement being such that said levers move coincidentally and uniformly on their pivots. A limiting-stop 48 is adjustably secured to the arm 41 by means of bolts *b* passing through suitable slots, as indicated in Fig. 1, and said stop serves to limit the movement of the levers, as may be predetermined. Links 49 and 50 are pivoted to the operating ends of the levers 43 and 44 and are in turn connected to a bar 51, which extends from near the bottom to near the top of the machine. To this bar 51 two clamp-catches are secured at suitable points to engage with two of the fence-wires *L*. These clamp-catches are preferably both alike, and so we will describe but one of them. It consists of a bar 52, pivoted to the bar 51, a sliding yoke 53, mounted on the bar 52, and links 54 and 55, one pivoted to the bar 52 and the other to the yoke 53 and which are pivoted together like a toggle. The bar 55 has a cam 56 upon its end, which when the yoke 53 is moved along the bar 52 will impinge upon and tightly grip the wire *L* which is at the time arranged to pass through this clamp. The wire should be held in position by a suitable device, as the eyebolt 57, said eyebolt being shown as also forming the pivot-bolt connecting the clamp as a whole to the bar 51.

The operation, as will readily be seen, after the parts are arranged in position and the clamp-catches are moved outwardly by the forcing of the lever 43 back against the stop *s* on the arm 42, is that the movement of the lever in the opposite direction will straighten the toggle-links 54 and 55, so that the clamp will first grasp the wires *L* tightly and the continued movement will serve to draw the machine along toward the clamp-catches, which movement will be continued until the lever 43 strikes the stop 48. The distance through which this movement shall continue is controlled by the adjustment of said stop 48, and the size of the mesh of the fence is thus determined and kept uniform, the movement, of course, in each case being the distance horizontally that the points where the wires *W* wind around the wires *L* are apart. The movement of the yoke 53 on the bar 52 is controlled and prevented from being too great by the adjustable stop 58 on the bar 52.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a machine for making wire fabrics, of a suitable frame, a set of revolving spool-carrier drivers through which longitudinal wires pass mounted in said frame, a second frame mounted upon and movable in relation to said first frame, spool-carriers mounted on said second frame and

adapted by the motion thereof to be shifted back and forth to and from the spool-carrier drivers and to be operated alternatively by said drivers, other spool-carriers mounted on a bar arranged adjustably to said shifting frame, said bar, a lever mounted on a pivot in said shifting frame and connected at one end to the structure embodying said bar and said spool-carriers and at the other by a link to a stationary point, whereby the motion of the spool-carriers mounted on said bar is multiplied and the spool-carriers mounted on said bar caused to move a greater distance than those mounted on the shifting frame.

2. The combination, in a machine for making wire fabric, of a stationary frame, a series of spindle-like spool-carrier drivers mounted therein, a train of gears connecting the shafts of said several spool-carrier drivers, a shifting frame mounted upon and adapted to move in relation to said stationary frame, spool-carriers mounted on said shifting frame and arranged alternatively on opposite sides of the row of spool-carrier drivers, and a lever whereby the entire shifting frame is moved up or down at one motion and the spools thus shifted all together to the spool-carrier drivers which were above or below them, respectively, substantially as shown and described.

3. The combination, in a machine for making wire fabric, of a stationary frame containing a series of spindle-like spool-carrier drivers, a train of gearing by which said spool-carrier drivers are connected together and caused to operate simultaneously, a series of projections arranged between the several spool-carrier drivers and forming guides for the spool-carriers as they are shifted, a double frame the parts whereof are rigidly connected to move in the same direction together and containing bearings for the spool-carriers, spool-carriers arranged alternatively upon one side and then upon the other in said bearings in said frame, and means whereby said frame and all the spool-carriers carried thereby are simultaneously moved up and down, whereby said spool-carriers are caused to operate in connection with the spool-carrier drivers just previously above or below them, substantially as set forth.

4. The combination, in a machine for making wire fabric, of the stationary frame containing the spindle-like spool-carrier drivers, the two-part frame the parts whereof are firmly united by the yoke piece 12 to move together in the same direction, guides 13 by which said movable frame is held to said stationary frame, stops 14 and 15 by which the movement of said movable frame on said stationary frame is limited, spool-carriers mounted on said movable frame, and spools mounted on said spool-carriers, and means for moving said movable frame in relation to said stationary frame, substantially as set forth.

5. The combination, in a machine for making wire fabric, of a stationary frame carrying the spindle-like spool-carrier drivers, a

second frame carrying several spool-carriers and movable on the first, a bar carrying other spool-carriers and moving relatively to said frame, a motion-multiplying lever pivoted to said movable frame, and connections from said lever to said movable bar and its carriers and to a stationary part, whereby, as said movable frame is shifted, said bar and the spool-carriers mounted thereon are moved a greater distance, substantially as set forth.

6. The combination, in a machine for making wire fabric, of the arms 41 and 42 connected to said machine, the levers 43 and 44 pivoted to said arms and connected together by a slot and pin, the bar 51 connecting the outer ends of said levers, and the clamping devices mounted on the wires L and connected to said bar 51, all substantially as described and for the purposes specified.

7. The combination, with a machine for making wire fabric, of arms on said machine, levers pivoted to said arms, clamps adapted to engage with the horizontal wires of the fabric being formed, connections between said levers and said clamps, and stops on the arms with which the levers will come in contact as they are shifted, whereby the distance to which the machine is shifted at each motion of the levers may be adjustably predetermined, substantially as set forth.

In witness whereof we have hereunto set our hands and seals, at Farmland, Indiana, this 21st day of August, A. D. 1899.

JOHN NIXON. [L. S.]

JAMES G. NIXON. [L. S.]

Witnesses:

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RUSSELL P. BRANSON.