

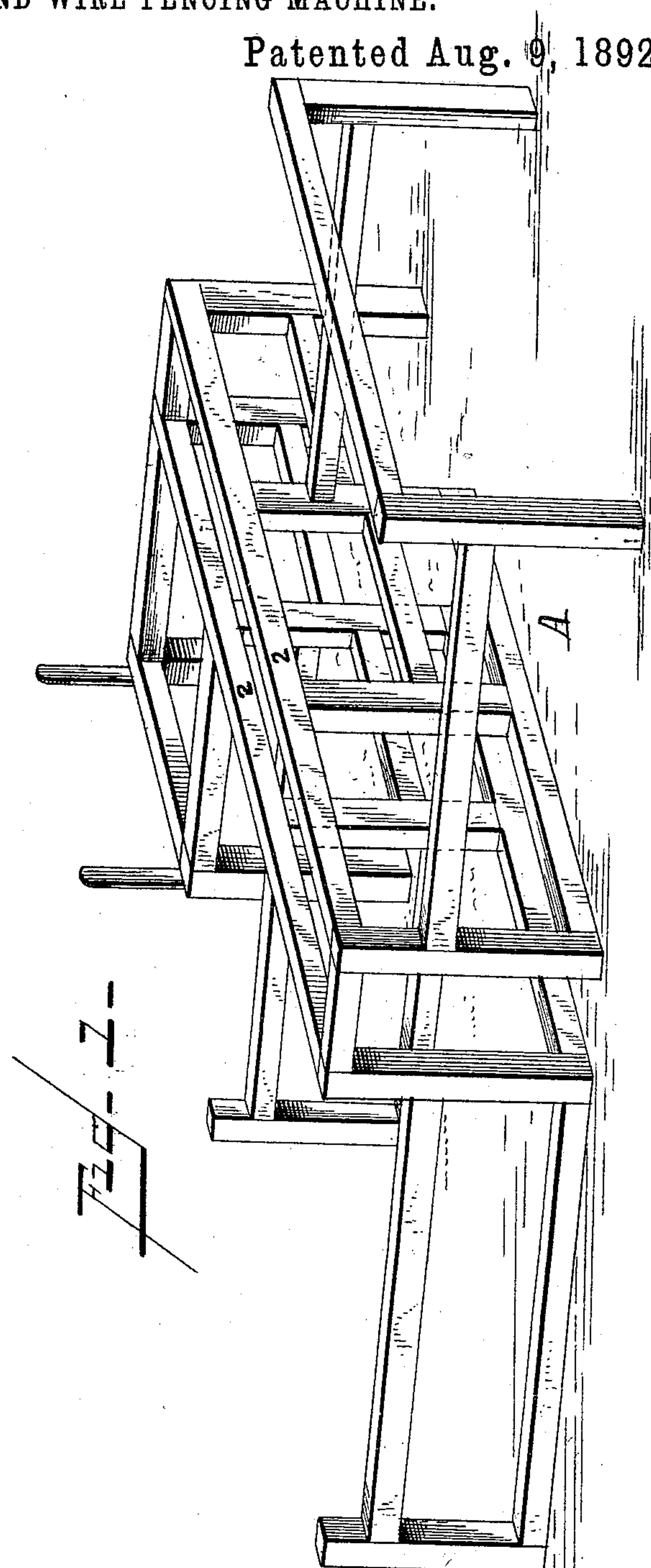
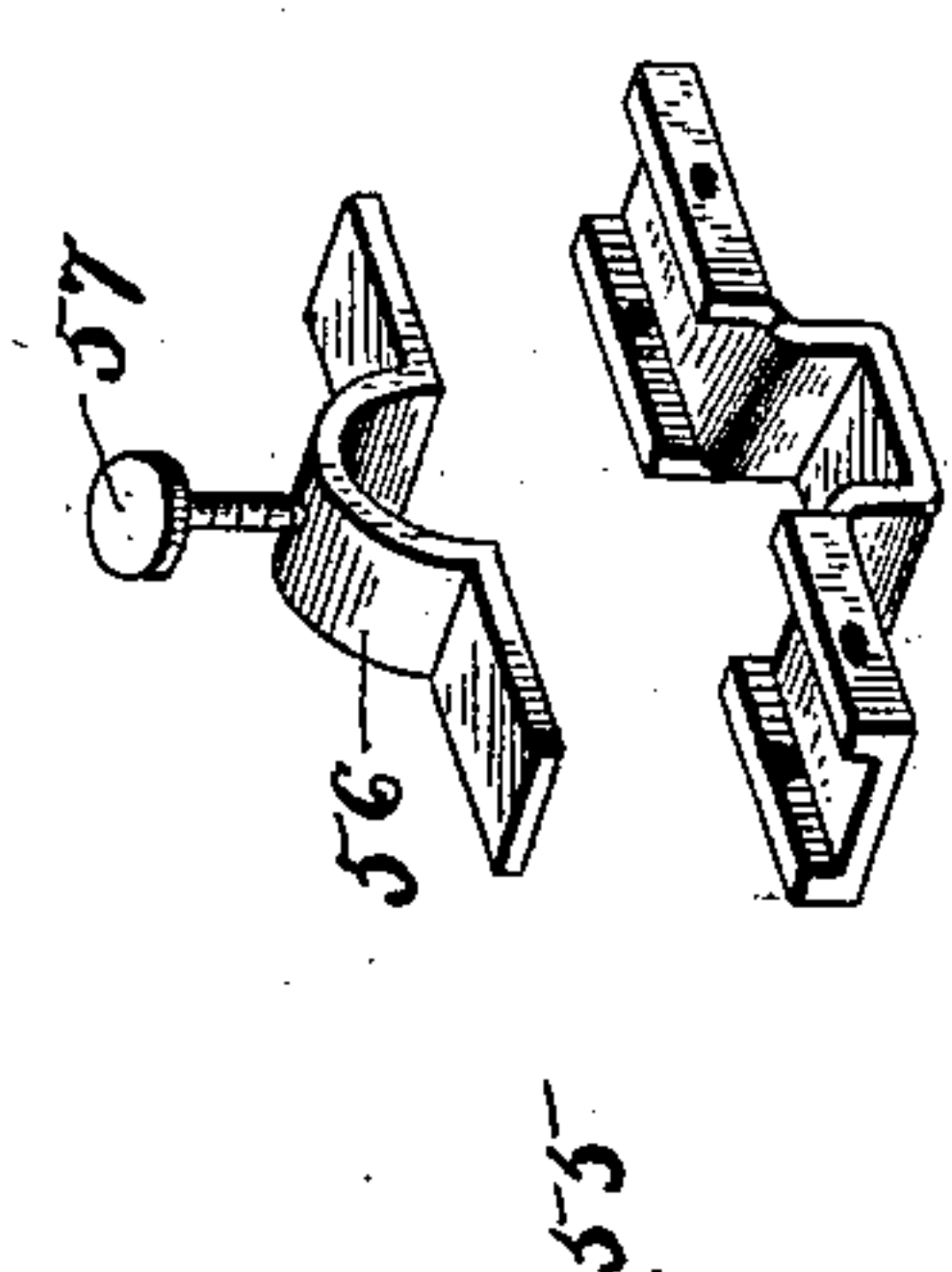
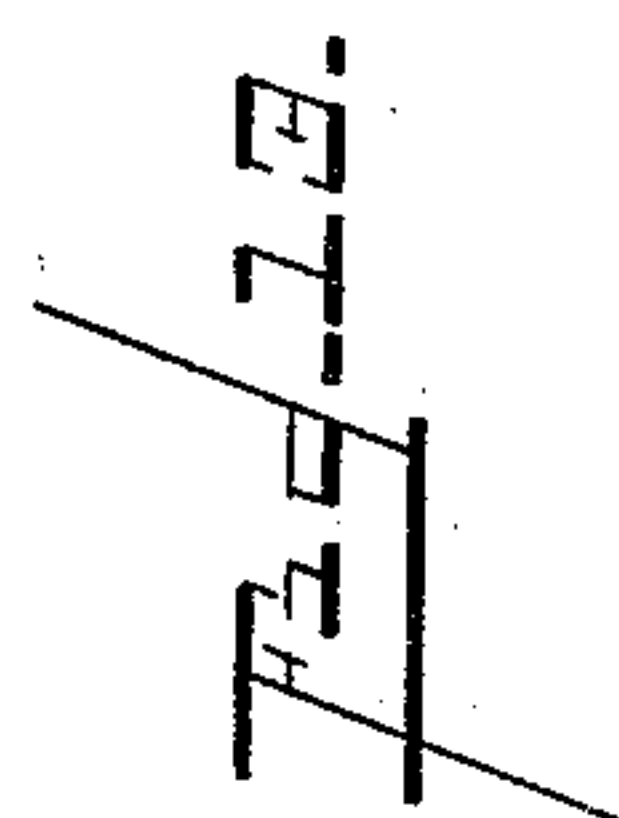
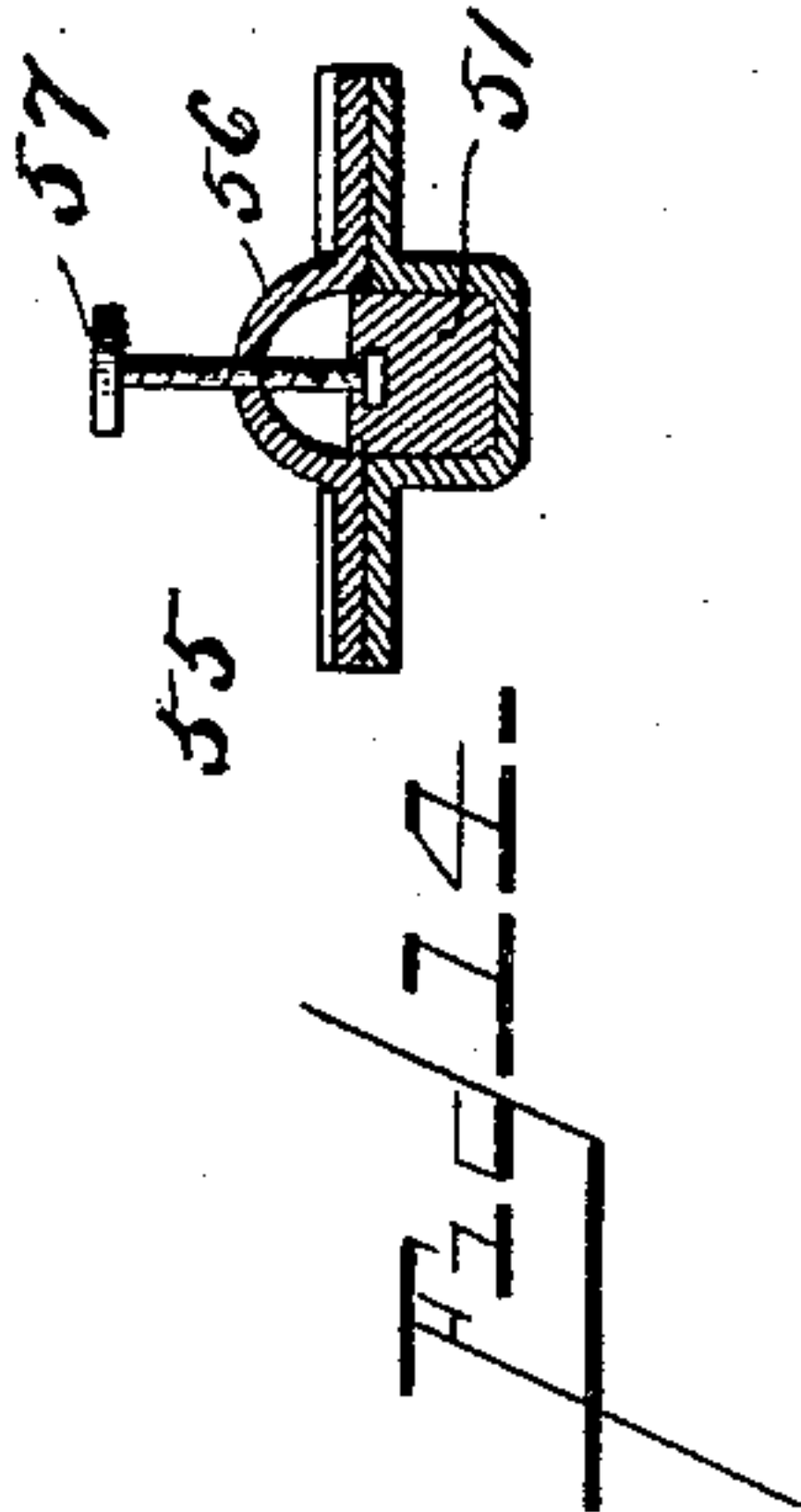
(No Model.)

6 Sheets—Sheet 1.

J. B. & J. E. SOLT.
SLAT AND WIRE FENCING MACHINE.

No. 480,391.

Patented Aug. 9, 1892.



WITNESSES
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G. F. Downing.

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(No Model.)

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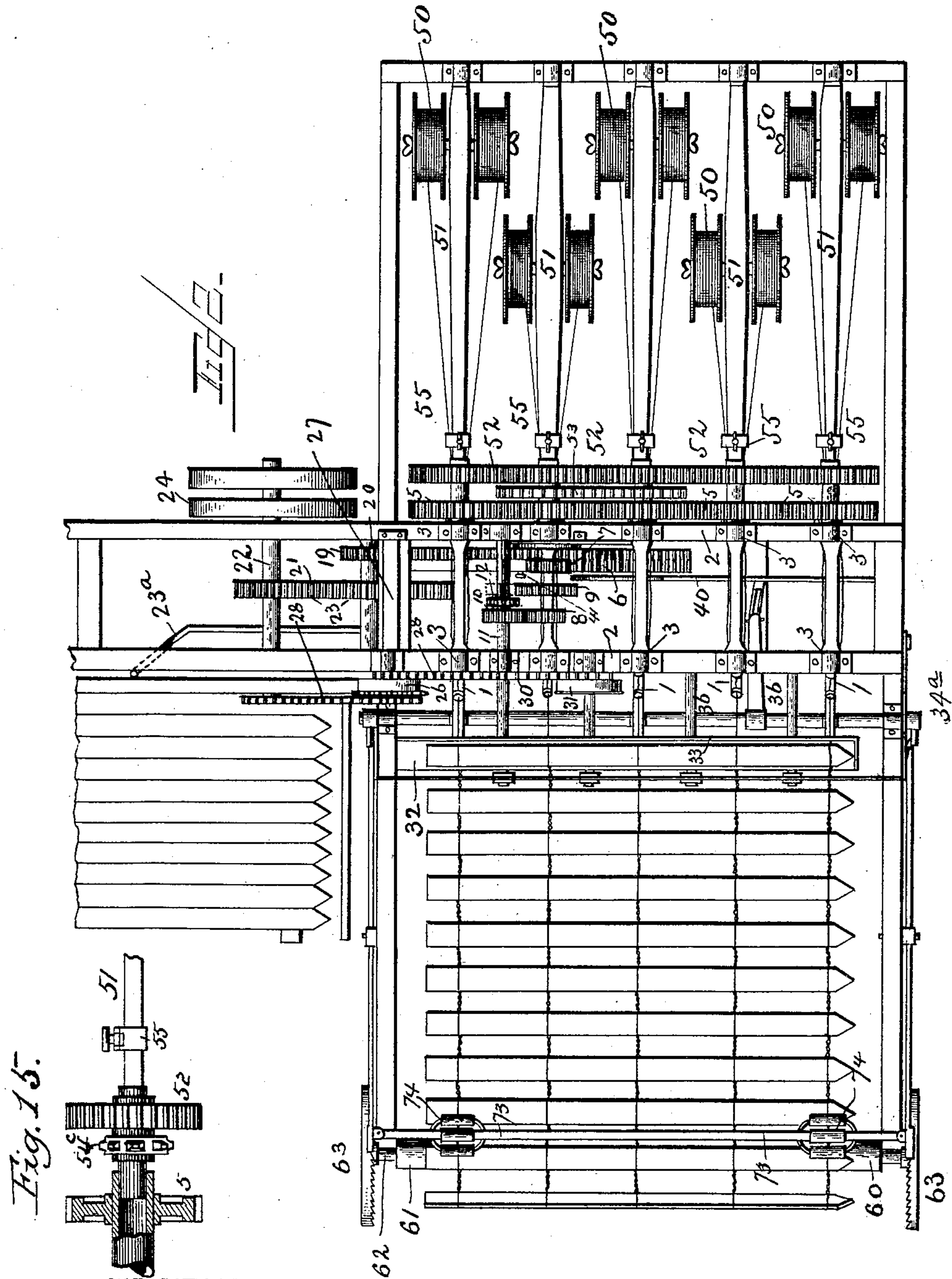


Fig. 15.

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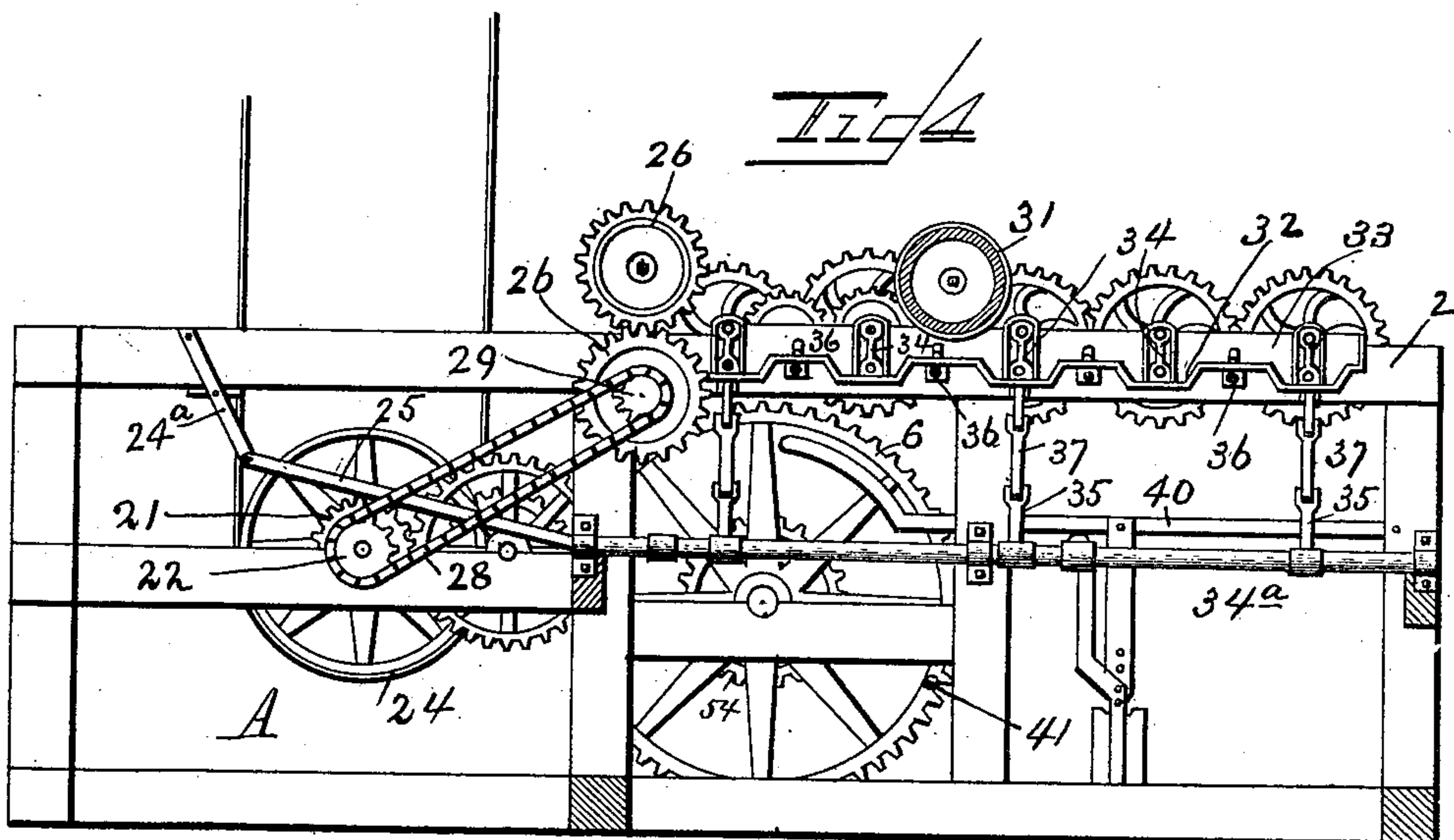
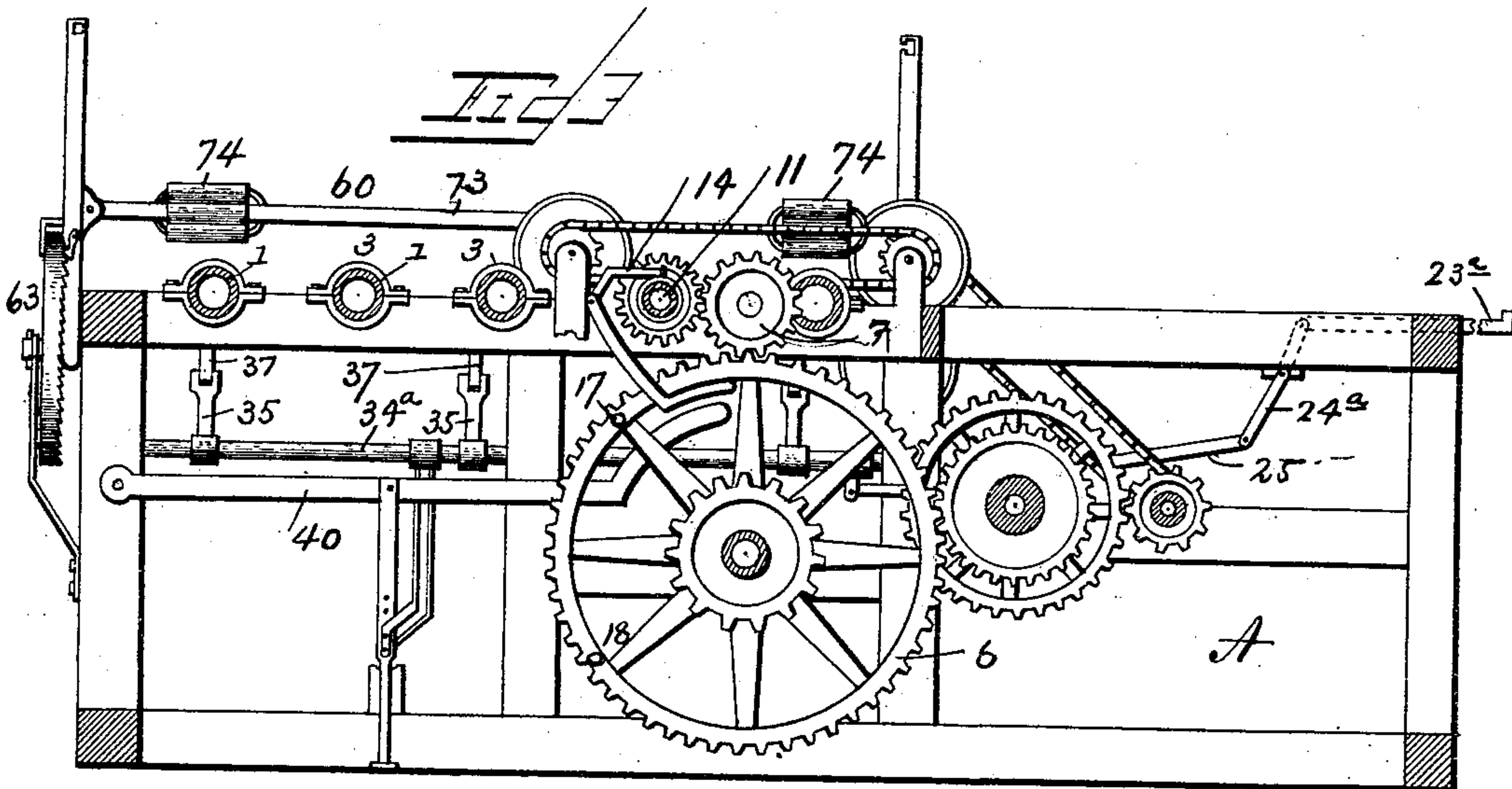
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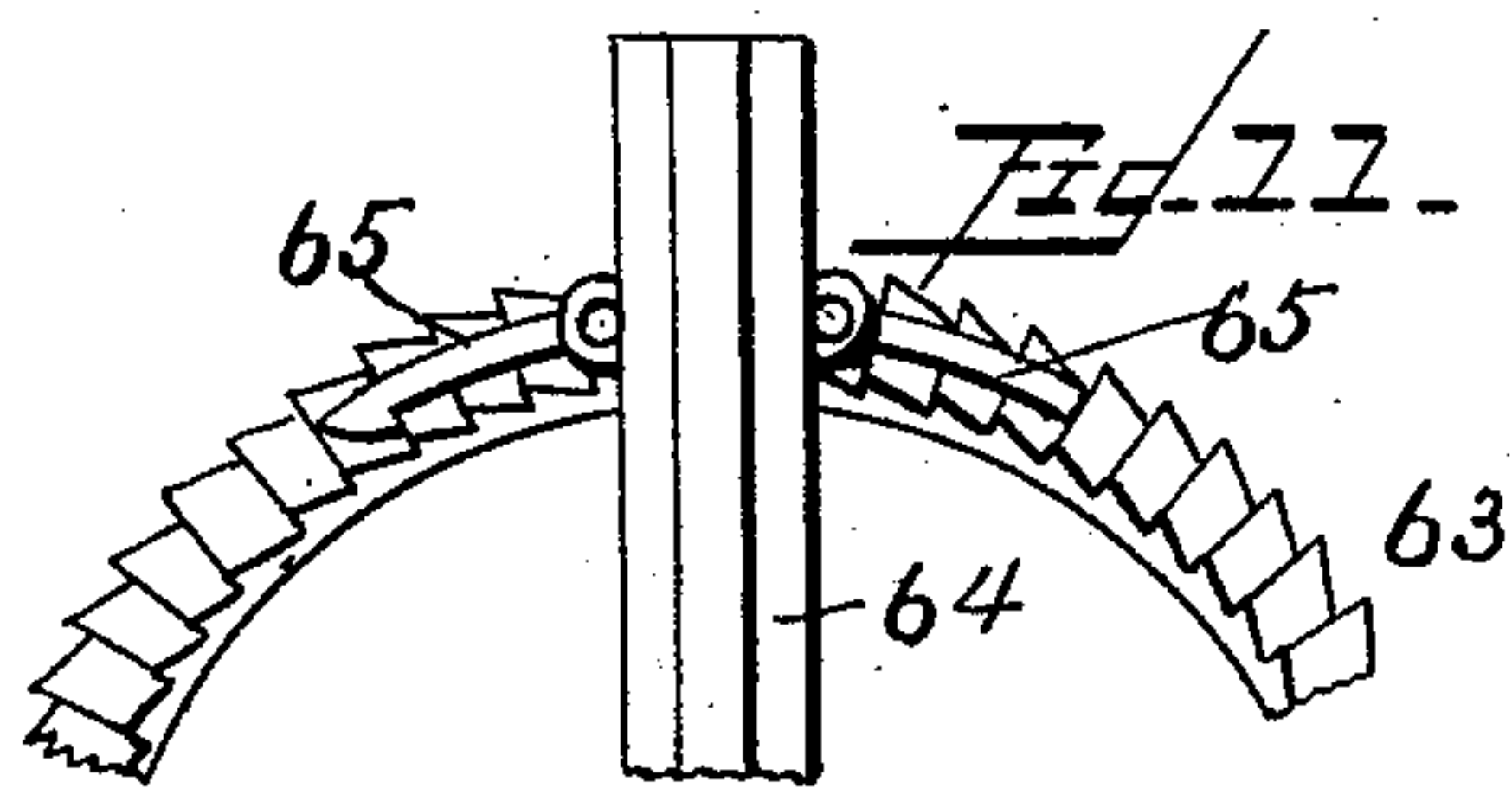
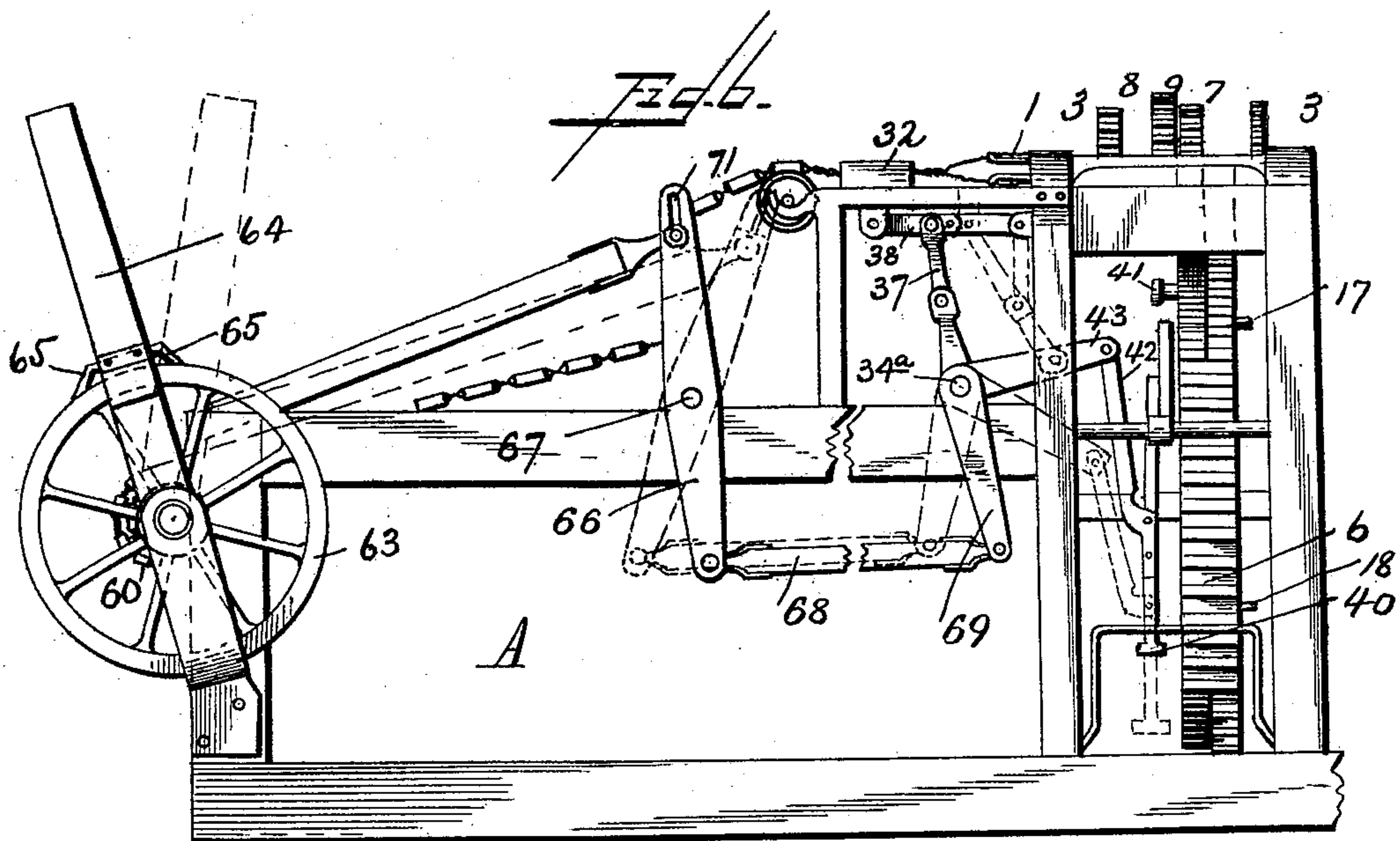
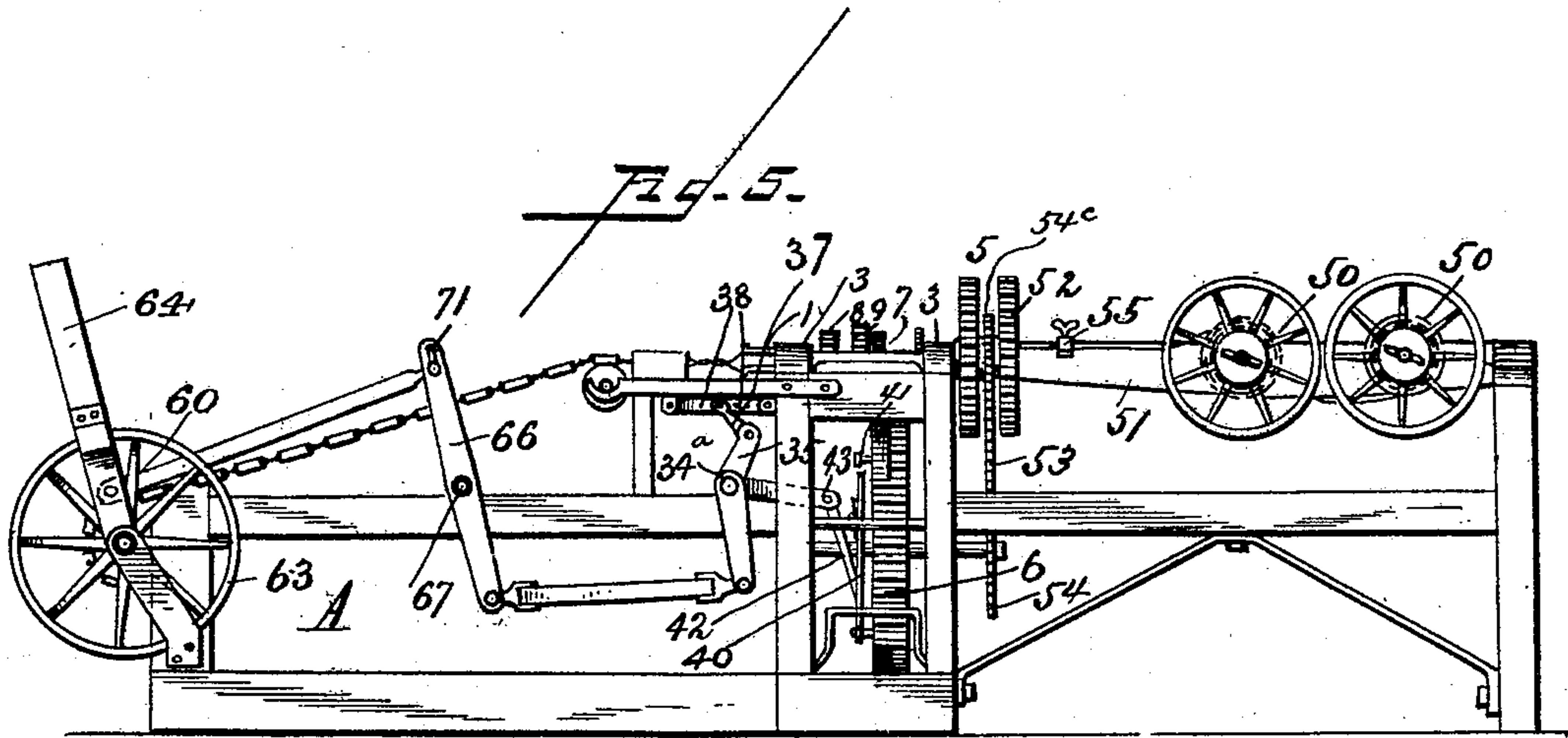
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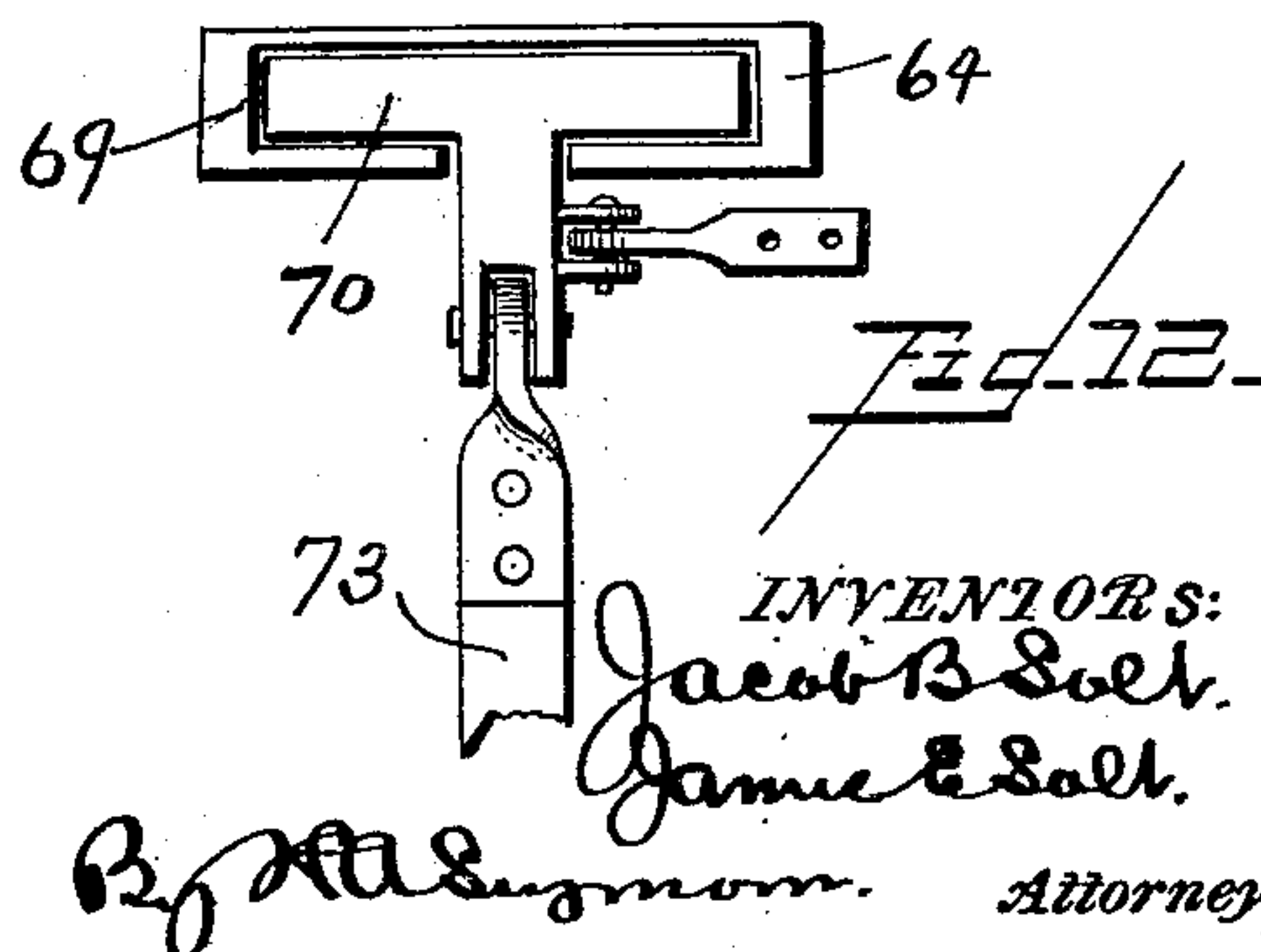
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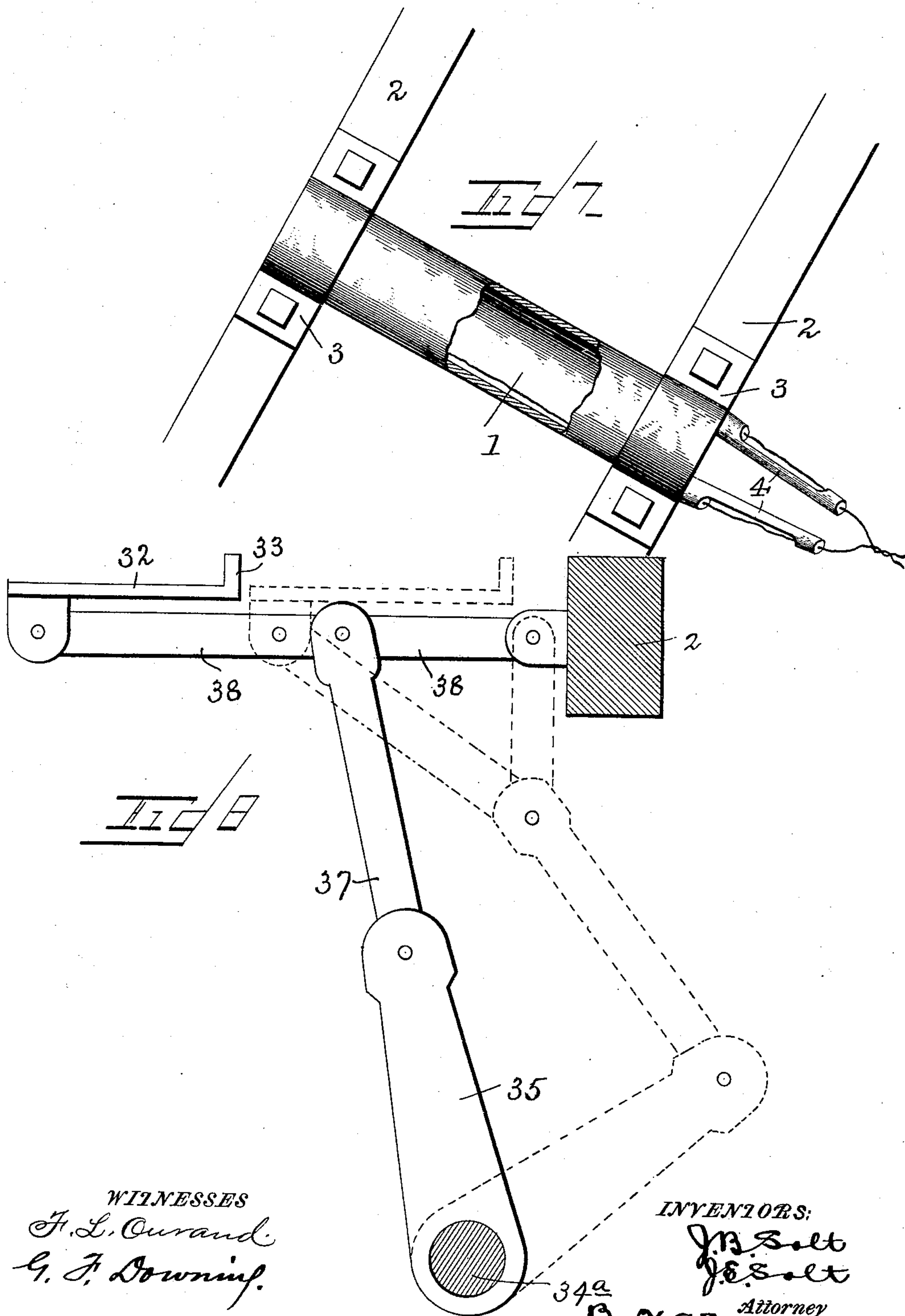
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J. B. & J. E. SOLT.

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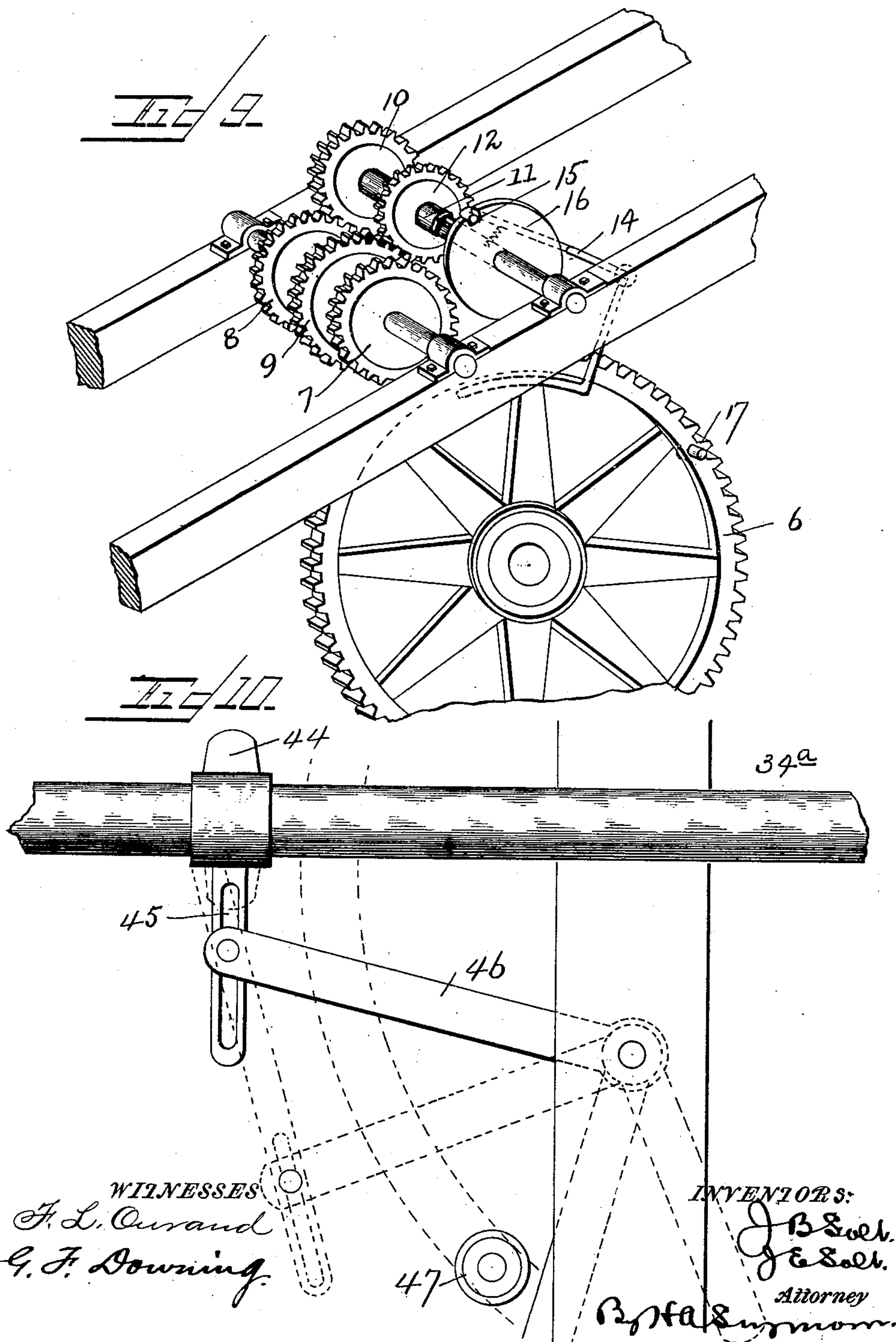
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J. B. & J. E. SOLT.
SLAT AND WIRE FENCING MACHINE.

No. 480,391.

Patented Aug. 9, 1892.



UNITED STATES PATENT OFFICE.

JACOB B. SOLT AND JAMES E. SOLT, OF NORTHBROOK, PENNSYLVANIA.

SLAT-AND-WIRE-FENCING MACHINE.

SPECIFICATION forming part of Letters Patent No. 480,391, dated August 9, 1892.

Application filed August 26, 1891. Serial No. 403,826. (No model.)

To all whom it may concern:

Be it known that we, JACOB B. SOLT and JAMES E. SOLT, of Northbrook, in the county of Chester and State of Pennsylvania, have
5 invented certain new and useful Improvements in Fence-Making Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which
10 it appertains to make and use the same.

Our invention relates to an improvement in fence-making machines; and it consists in certain novel features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.
15

In the accompanying drawings, Figure 1 is a view in perspective of the frame. Fig. 2 is a plan view. Fig. 3 is a right-side elevation in section. Fig. 4 is a left-side elevation in section. Fig. 5 is a view in front elevation. Fig. 6 is an enlarged view of a portion of the machine. Fig. 7 is an enlarged view of one of the twisters. Fig. 8 is an enlarged view in elevation of the table and table-operating
20 mechanism. Fig. 9 is a view of the gearing regulating the twists of wire between the slats. Fig. 10 is a view of the mechanism for throwing the table back into place. Figs. 11 and 12 are detail views of the reeling mechanism; and Figs. 13, 14, and 15 are views of the tension device.
30

A represents the frame of the machine, upon which the various parts of the machine are supported. A series of wire-twisters 11 extend
35 transversely across the longitudinal beams 2 2, they being revolvably supported in boxes 3 3. One of these wire-twisters is shown in detail in Fig. 7, and it consists in a hollow tubular piece of metal, preferably cut away through
40 the middle in order that the wires may be observed from the outside, and it terminates at one end in a pair of converging fingers 4 4, through which the wire passes and by means of which they are twisted together in the usual
45 manner. The several twisters are provided with gear-wheels 5 5, intermeshed with one another, whereby motion is communicated from one to another. These twisters are rotated periodically by a large rotary gear-wheel
50 6. The latter is provided with a continuous series of teeth on its periphery, and about one-third of these teeth are wider than the re-

maining two-thirds, and the widened parts of these teeth are in the same vertical plane with a gear-wheel 7 on one of the twister-shafts
55 and are adapted to rotate the twisters to twist the wires together between the slats. Provision is made, which will now be described, for regulating the number of twists between the slats, accordingly as the spaces are to be wide
60 or narrow. Small and large gear-wheels 8 and 9, respectively, are secured on one of the twisters. A wheel 10, corresponding in size to wheel 8, is located on a shaft 11 to one side, and this wheel is adapted to be meshed with wheel 8,
65 the size of these two wheels 8 and 10 being such that they make just three revolutions while the large rotary gear-wheel 6 makes a third of a revolution. This results from the fact that there are three times as many wide
70 teeth on wheel 6 as there are teeth on wheel 7. In other words, when the wheels 8 and 10 are in engagement with each other three twists are given to the wires between each two slats of the fencing. There is also a small gear-
75 wheel 12 on shaft 11, adapted to be thrown into engagement with wheel 9 when it is desired to make only two twists in the wires between the slats. So the gear-wheels 10 and
80 12 may be arranged to slide on the shaft 11 when desired to increase or decrease the width of the spaces between slats, and it will be noticed that when either wheel 10 or 12 is meshed with its fellow on the twister the other one is out of engagement.
85

In order that the twisters may be stopped at exactly the right position, a pivoted spring-actuated catch 14 is provided. This catch is located in position to drop automatically into a notch 15 in the periphery of the wheel 16 on
90 shaft 11 when the notch is opposite the catch. This catch locks the shaft while in this engagement, and the catch is removed by a pin 17 on the wheel 6, striking the lower end of the catch just prior to the engagement of the
95 wide teeth on said wheel with the teeth of wheel 7, and to prevent the catch from dropping into the notch 15 again before shaft 11 has made the required number of revolutions another pin 18 is provided to control the
100 catch. Motion is communicated to the large gear-wheel 6 through a small gear-wheel 19 on the shaft 20, and motion is imparted to the latter shaft by a small gear-wheel 21 on drive-

shaft 22, meshing with a large gear-wheel 23 on shaft 20. Shaft 22 is driven in the usual way by a power-belt passed around pulley 24.

The slats are fed into the machine in the following manner: They are caught one at a time by a lower feed-arm 23^a, which latter is connected by a rocking lever 24^a, and the latter is vibrated at the required intervals by the pitman 25, and this pitman is operated by a bell-crank lever 45, to be described. The arm 23^a simply carries the slats forward far enough to force one end between the feed-rollers 26 26. These rollers are provided with long gear-teeth, which are intermeshed for the purpose of communicating motion from one to the other, and in order that the feed-wheels may separate slightly to allow for slats of different thicknesses one of them is supported on the outer end of a yielding arm 27, the length of the teeth being sufficient to allow of this movement without stopping the motion. The feed-wheels are driven by an endless chain 28, extending from a sprocket-wheel on the shaft 22 to a similar wheel 29 on the hub of one of the feed-wheels. A similar chain 30 also extends from the hub of this wheel to the hub of the central feed-wheel 31.

In addition to the feed mechanism described there is a table 32, arranged to receive each slat preparatory to its being woven between the wires and adapted to carry it outward as fast as necessary to supply a new slat in the construction of the fence. This table is provided on its inner edge with a flange 33, and slots 34 34 are formed in this flange to allow the wires to pass through and to receive the ends of the twisters when the table moves inward. This table moves inward and outward automatically on the rods 36 36 in the following manner: A rock-shaft 34^a is supported in suitable boxes at a point below the table. Said shaft has affixed thereon a number of arms 35 35, and the latter are connected by links 37 37 with a toggle-joint 38, and the outer ends of the latter are connected, respectively, to the table and the frame. The toggle-joint is so constructed that it may be shortened or lengthened at any time to increase or decrease the throw of the table, accordingly as the distance between slats is narrow or wide.

It will be noticed from the description and from the drawings, especially Fig. 8, that the toggle-joint will hold the table outward rigidly locked and against accidental displacement until the lock is broken by means provided for this purpose, and which will be described hereinafter. When in this outward position, the slat is forced outward tight against the twisted wires and held in this position while the wires are being twisted back of it.

The means for sliding the table outward is as follows: A lever 40 is pivoted at one end to the frame of the machine, and its free end is curved, as shown in Fig. 3, and lies in position to be struck by a pin 41 on the wheel 6

just previous to the engagement of the wide teeth with the teeth of wheel 7. This lever 40 is connected by a rod 42 with an arm 43 on shaft 34^a. By this means when the lever is raised the shaft is rocked, and the table by virtue of its connection therewith, as described, is forced outward. To provide for regulating the throw of the shaft the rod 42 may be connected at different points with the lever. The rock-shaft 34^a is returned to its normal position to bring the table back by the following mechanism: An arm 44 is secured on the rock-shaft and provided with a link 45. A bell-crank lever 46 is pivoted on the frame and one end is pivotally connected with the link, while the other end is in position to be struck by a button 47 on the gear-wheel 6 to force the bell-crank lever into the position indicated in dotted lines in Fig. 10. This rocks the shaft back into position. To arrange for the proper throw of this shaft, the link is provided with an elongated slot, by means of which the point of connection between the lever and link is regulated, a set-screw or other device being employed for this purpose; also, in case any of the parts should bind by means of this connection after a certain amount of pressure is applied, rather than break this joint will slip and thus furnish relief.

The wire is supplied from the spools 50 50, and these spools are located on the spindles 51 51. The latter may be round or square, and when round they are square at their inner ends and fitted in corresponding holes in the hubs of the gear-wheels 52 52. These several wheels are intermeshed, and the speed of all is alike. Motion is communicated to these spindles by means of a sprocket-chain 53, which passes over a sprocket-wheel 54 on the shaft which carries gear-wheel 6 and a similar wheel 54^c on the hub of one of the wheels 52. From this arrangement it will be observed that the rotation of the spindles is constant and uniform, whereas the motion of the twisters is necessarily periodical. Consequently the parts are so geared that the speed of the twisters is enough greater than that of the spindles to catch up to them each time, and thus straighten the wires at every rotation which become twisted inside of the twisters owing to the constant rotation of the spindles, so that notwithstanding the periodical motion of the twisters and the constant rotation of the spindles their ultimate travel is the same, and hence the wires are kept in condition to feed freely through the twisters as fast as required. When the revolution of the twisters is changed, another sprocket-wheel smaller than the one on the hub of wheel 6 is employed in lieu thereof to lessen the speed of the spindles.

The wires in feeding from the spools pass through tension devices 55 55, located on the inner ends of the spindles 51 51. These tension devices consist of bracket-arms having

flanges on their edges, the spring-plates 56 56, which span the spindles and bear at their ends between the flanges of the brackets, and the set-screws 57 57, by which the tension is increased or decreased. The wires pass through holes in the flanges and between the brackets and the ends of the springs, as shown. By means of a tension device of this character the tension on each wire is the same at all times, whether one spool be full, or nearly so, and the other nearly empty.

The completed fencing is wound on a reel 60 as fast as it is made, in the following manner: A piece of piping 61 is carried on a shaft 62. The latter passes through the piping and through the hubs of the toothed wheels 63 63 at each end of reel. The fencing is wound on this piping, and to remove the reel the shaft is pulled out and the entire reel may then be removed and the piping be taken out. The reel is turned periodically by means of levers 64 64. The latter swing from the axle of the reel as a center, and they are each provided with a pair of pawls 65, one of which is provided with a hook at the end, the advantage of this construction being that if one of the pawls misses a tooth the other will strike one at the proper time, so that with each swing of the levers 64 64 the reel is turned far enough to wind the fencing which has been constructed.

The reel is turned at the required intervals in the following manner: Rocking levers 66 66 are fulcrumed on the frame at points 67, and one end, preferably their lower ends, are connected by pitmen 68 68 to the outer end of the crank-arms 69 69 on the ends of shaft 34^a, so that each time the shaft 34^a rocks in order to move the table the levers 66 66 are swung, and as the latter are connected at their opposite ends with the levers 64 64 the reel is turned a notch. The pitmen 68 68 which connect these levers are connected in the following manner: The levers 64 64 are hollow and provided in one side, preferably the inner side, with a slot 69, extending the length of the lever. In these hollow levers sliding heads 70 70 are placed. To these heads the pitmen 68 are pivotally attached at one end. At the opposite ends these pitmen are adjustably connected to the rocking levers 66 66. To this end said levers are provided with elongated slots 71 71, so as to admit of the pitmen being connected to them at different points, the object being to allow for the difference of swing required for the levers 64 64 in reeling, for the reason that less swing is required as the reel increases in size. To compensate for this the ends of the pitmen joined to the rocking levers are set toward the pivot of the lever. When a greater swing is required, these ends are of course set farther out from the center. In a large measure the extent of swing of the levers 64 64 is automatically regulated, and this is done by means of the sliding heads, they being constructed to move outward toward the free ends of the levers 64 64 as fast

as the fencing is reeled or as fast as the size of the reel increases. This sliding is effected by a rod 73, which connects the heads, and this rod is provided with rollers 74 74, adapted to bear on the fencing over the reel and thus be forced outward as fast as required. In this way it only becomes necessary to set the pitmen at the slots 71 71 about once during the formation of a reel. The reel thus constructed and operated does not pull the fencing to any great extent, but simply winds it and carries it out of the way as fast as the table forces it outward in the formation of the fence.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of our invention, and hence we do not wish to limit ourselves to the exact construction herein set forth; but,

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

1. The combination, with wire-twisters, one of which is provided with different-sized gear-wheels, of a shaft in proximity to said twister having different-sized gear-wheels thereon, said wheels adapted to be shifted, whereby to change the speed and number of rotations of the twisters, substantially as set forth.

2. The combination, with twisters, one of which is provided with gear-wheels of different sizes, of a shaft having different-sized gear-wheels adapted to be shifted to change the speed of the twisters, and means for locking the twisters temporarily when they have made the requisite number of revolutions, substantially as set forth.

3. The combination, with twisters and means for regulating the number of their revolutions, of a pawl for automatically locking the twisters when they have made the required number of revolutions, and means for automatically unlocking the twisters, substantially as set forth.

4. The combination, with a series of twisters, of a constantly-rotating gear-wheel having a portion of its teeth widened, and a gear-wheel arranged to communicate motion to the twisters, said wheel located in position to be operated periodically by the widened teeth of the large gear-wheel, substantially as set forth.

5. The combination, with the main frame and a sliding table, of a rocking shaft having crank-arm thereon, a toggle-joint extending from the main frame to the sliding table, and a link extending from the crank-arm to the toggle-joint, substantially as set forth.

6. The combination, with a frame and table constructed to slide thereon, of a rocking shaft having arms thereon, means for rocking the shaft, toggle-joints connecting the sliding table and the frame, and links extending from the toggle-joints to the arms on the rocking shaft, substantially as set forth.

7. The combination, with a sliding table and

gearing, of a rocking shaft connected with the table and adapted to slide the latter, a lever connected with the shaft, and means on the gearing for swinging the lever whereby the shaft is rocked, substantially as set forth.

8. The combination, with a sliding table and means for sliding it outward and locking it, of independent lever mechanism for swinging the shaft in the opposite direction at a predetermined interval, whereby the table is returned to its normal position, substantially as set forth.

9. The combination, with a sliding table, means for sliding same outward, of a rocking shaft, a bell-crank lever connected therewith, and independent lever mechanism for swinging the latter, whereby the shaft is rocked to its normal position, substantially as set forth.

10. In a fence-making machine, a tension device consisting of a support, a plate secured thereto and provided with outwardly-projecting ends, said ends having upturned flanges at

their edges, a spring-plate having ends adapted to lie between the upturned flanges of the ends, and a screw swiveled in the support and passing through a threaded hole in the spring-plate, substantially as set forth.

11. The combination, with a reel, levers, pitmen having sliding connection with the levers, and a shaft for automatically sliding the pitmen with the increased size of the roll, said shaft having rollers thereon, of rocking levers with which the pitmen are adjustably connected, a rocking shaft, and pitmen connecting the latter with the rocking levers, substantially as set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

JACOB B. SOLT.
JAMES E. SOLT.

Witnesses:

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WILLIAM S. WINDLE.