

No. 616,116.

Patented Dec. 20, 1898.

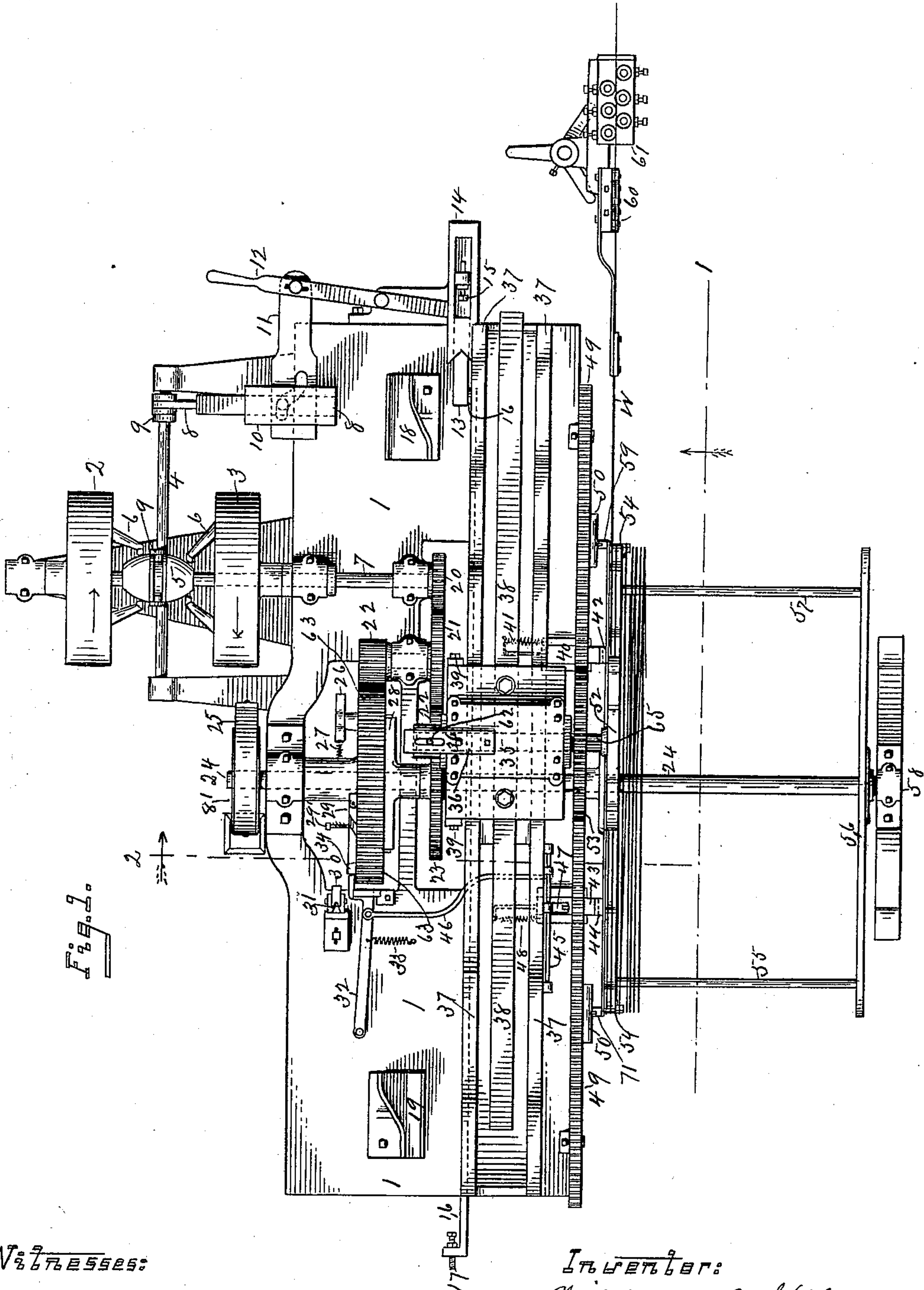
W. A. KILMER.

PICKET FORMING MACHINE FOR WIRE FENCES.

(Application filed Feb. 10, 1898.)

(No Model.)

6 Sheets—Sheet 1.



Witnesses:

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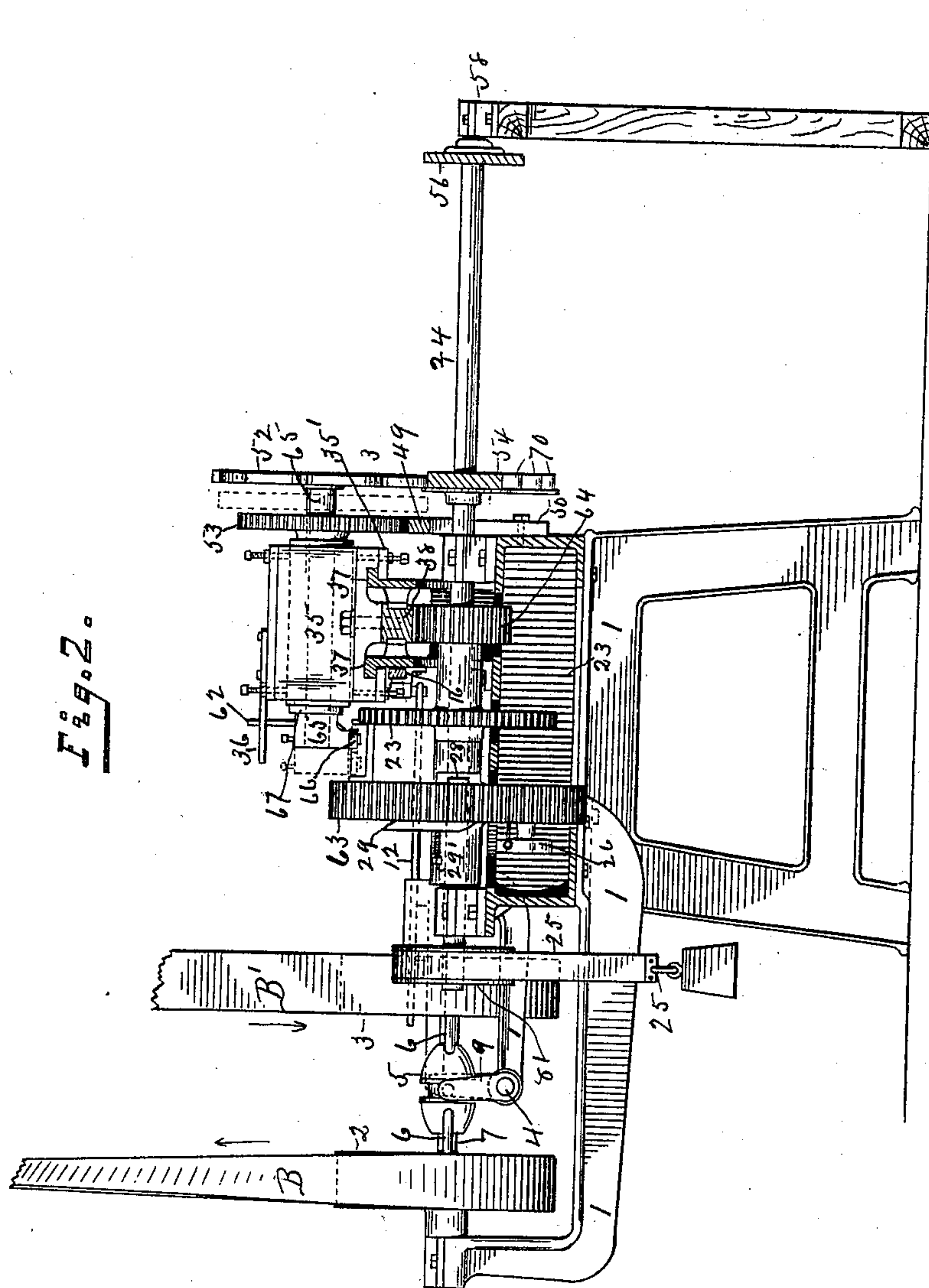
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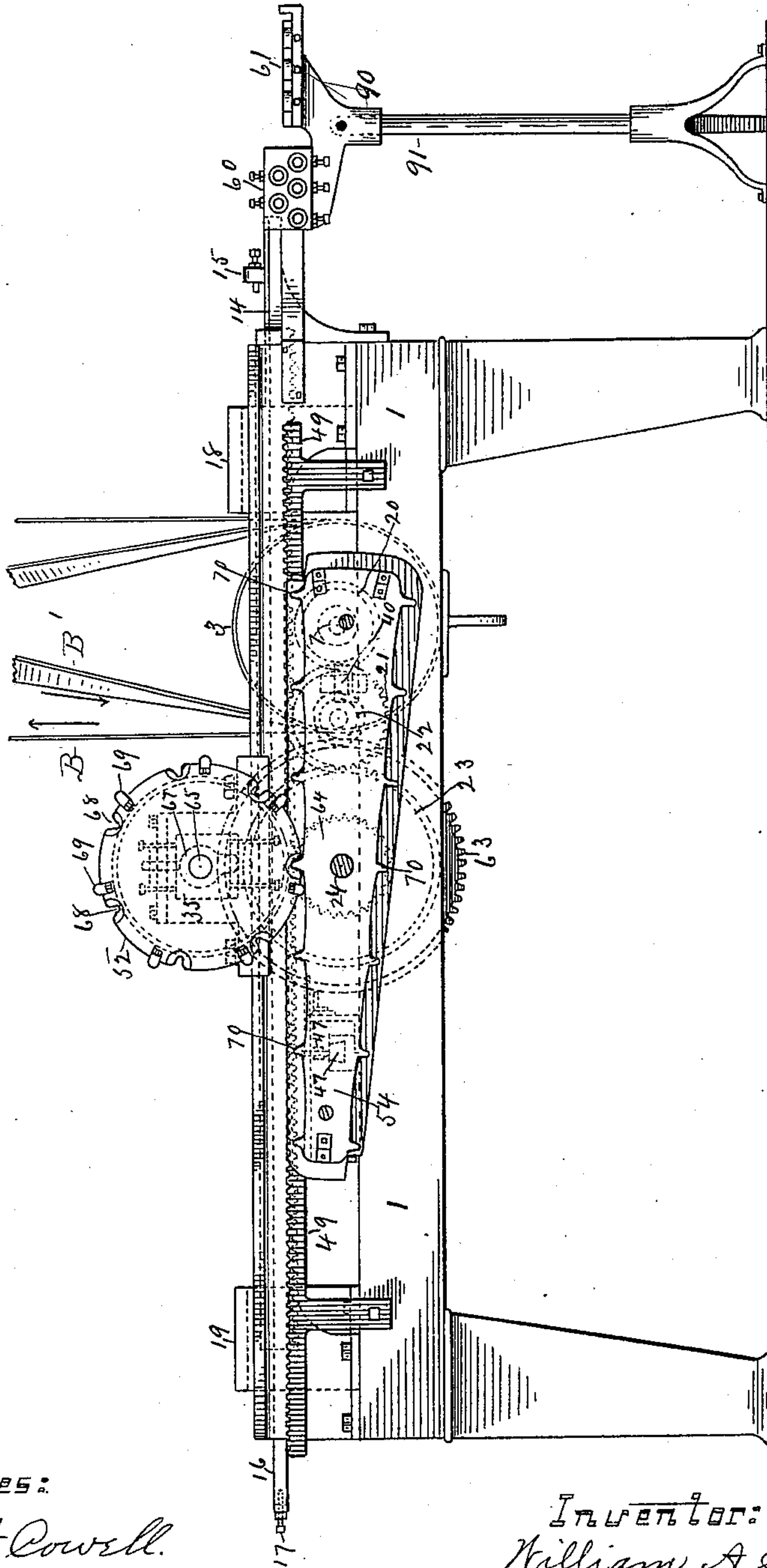
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Fig. 3.



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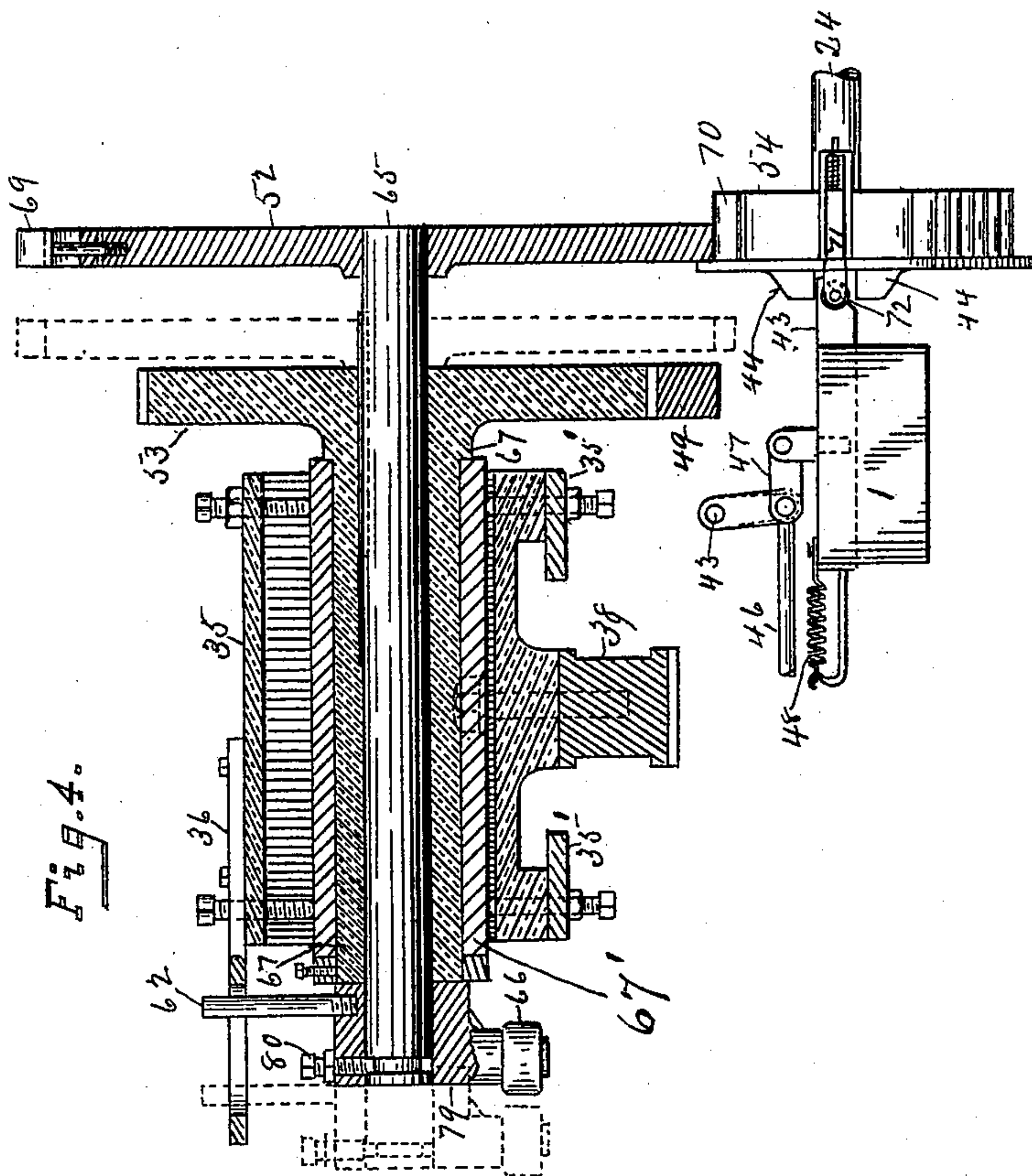
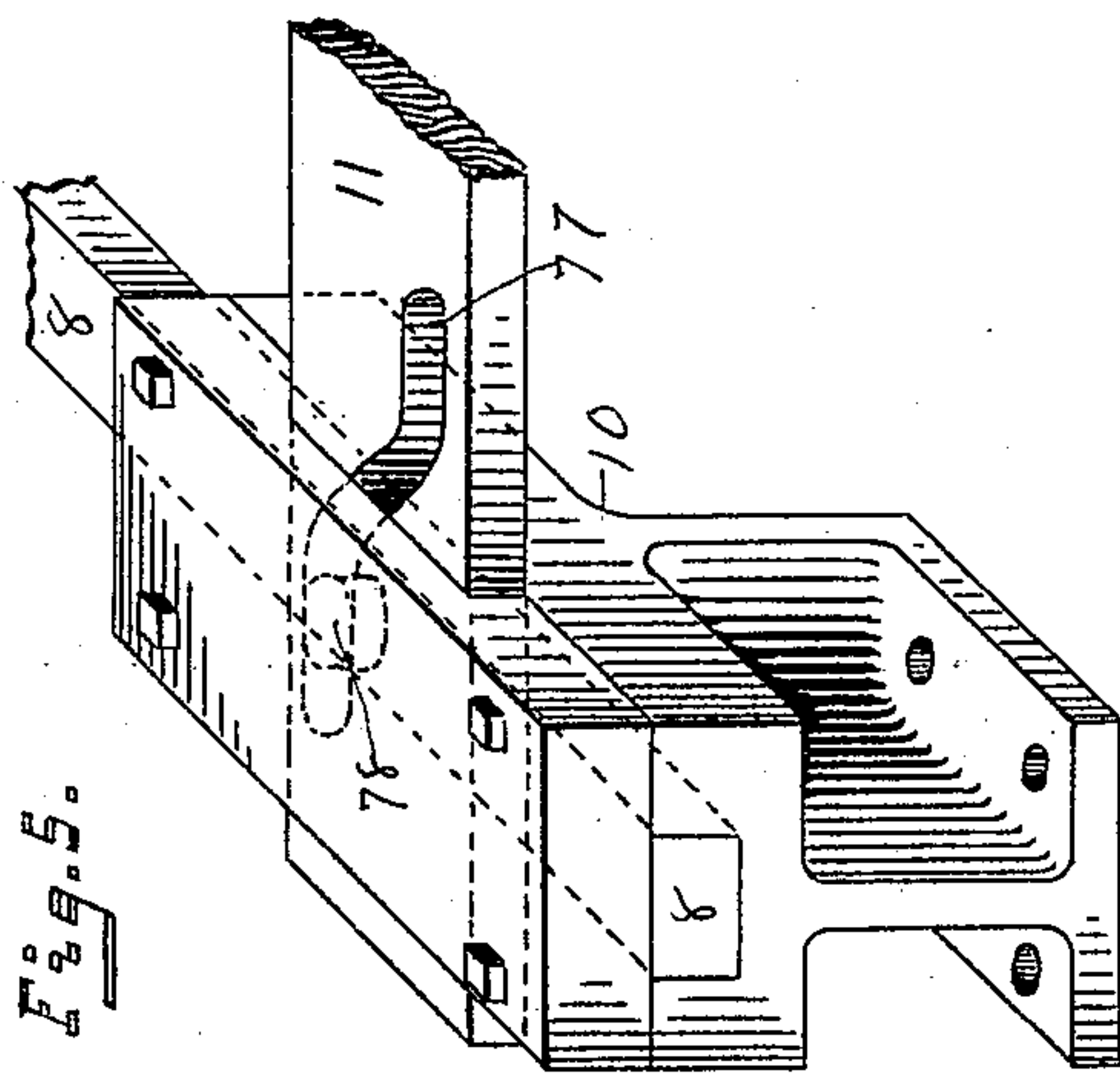
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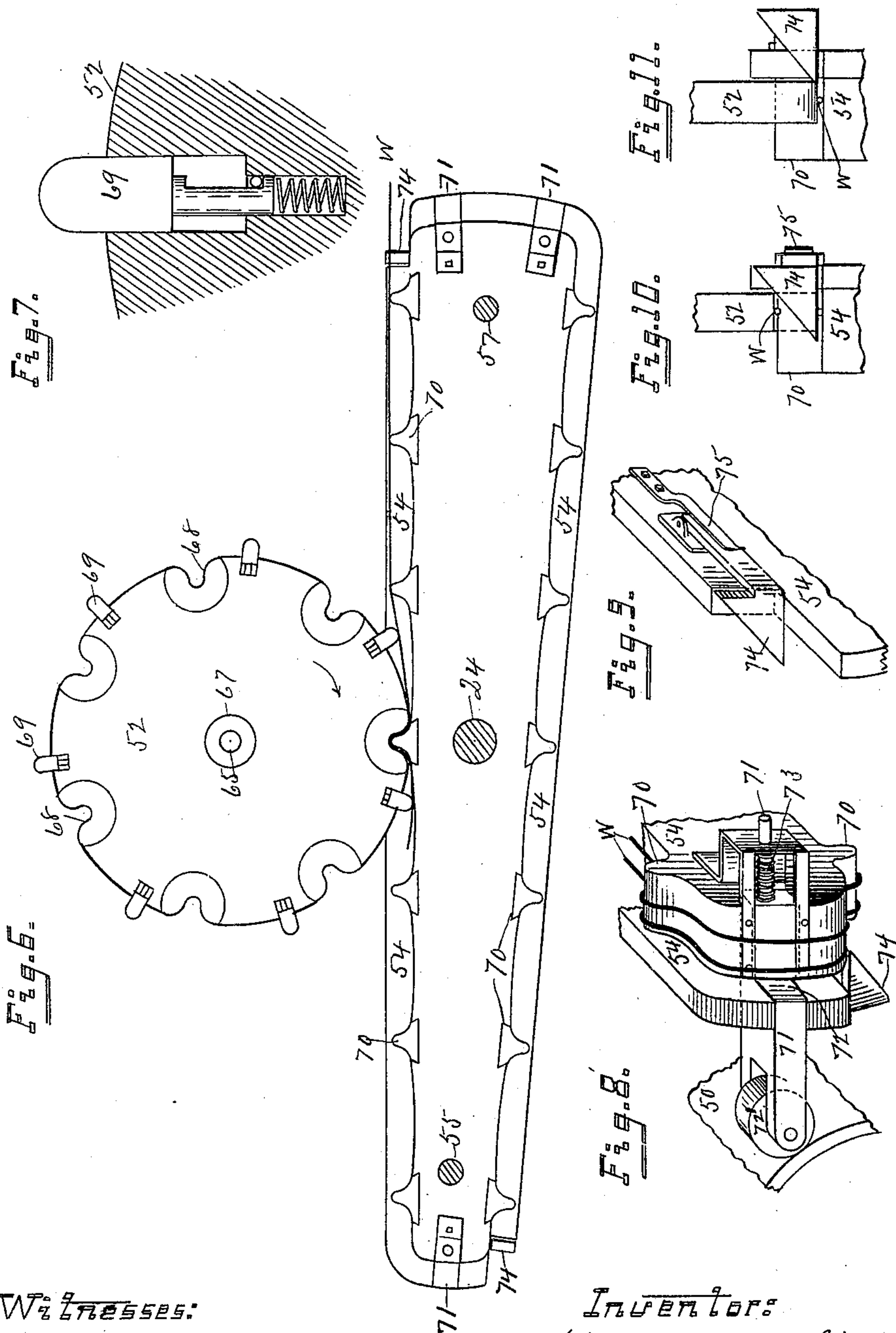
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Fig. 13.

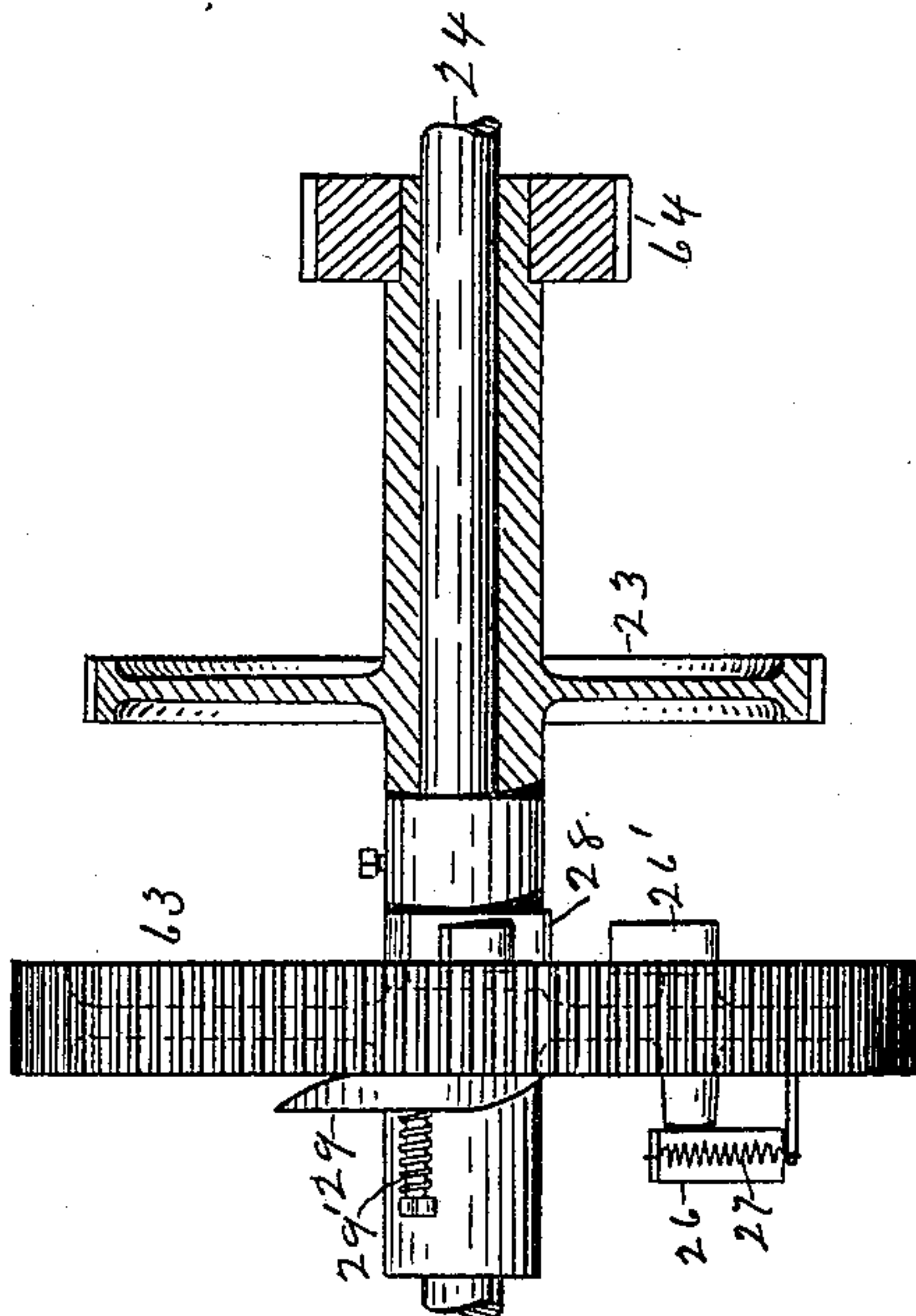


Fig. 12.

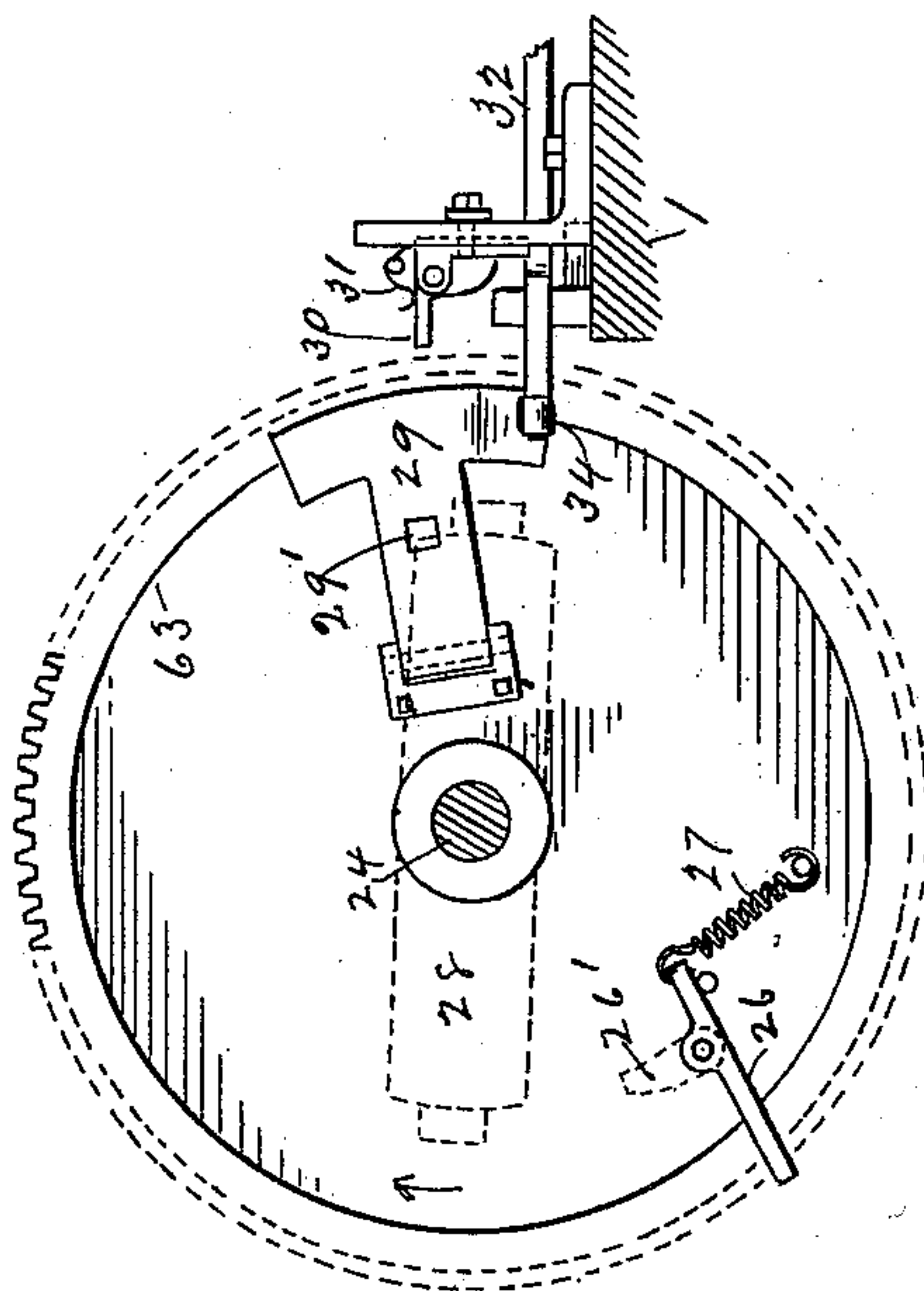
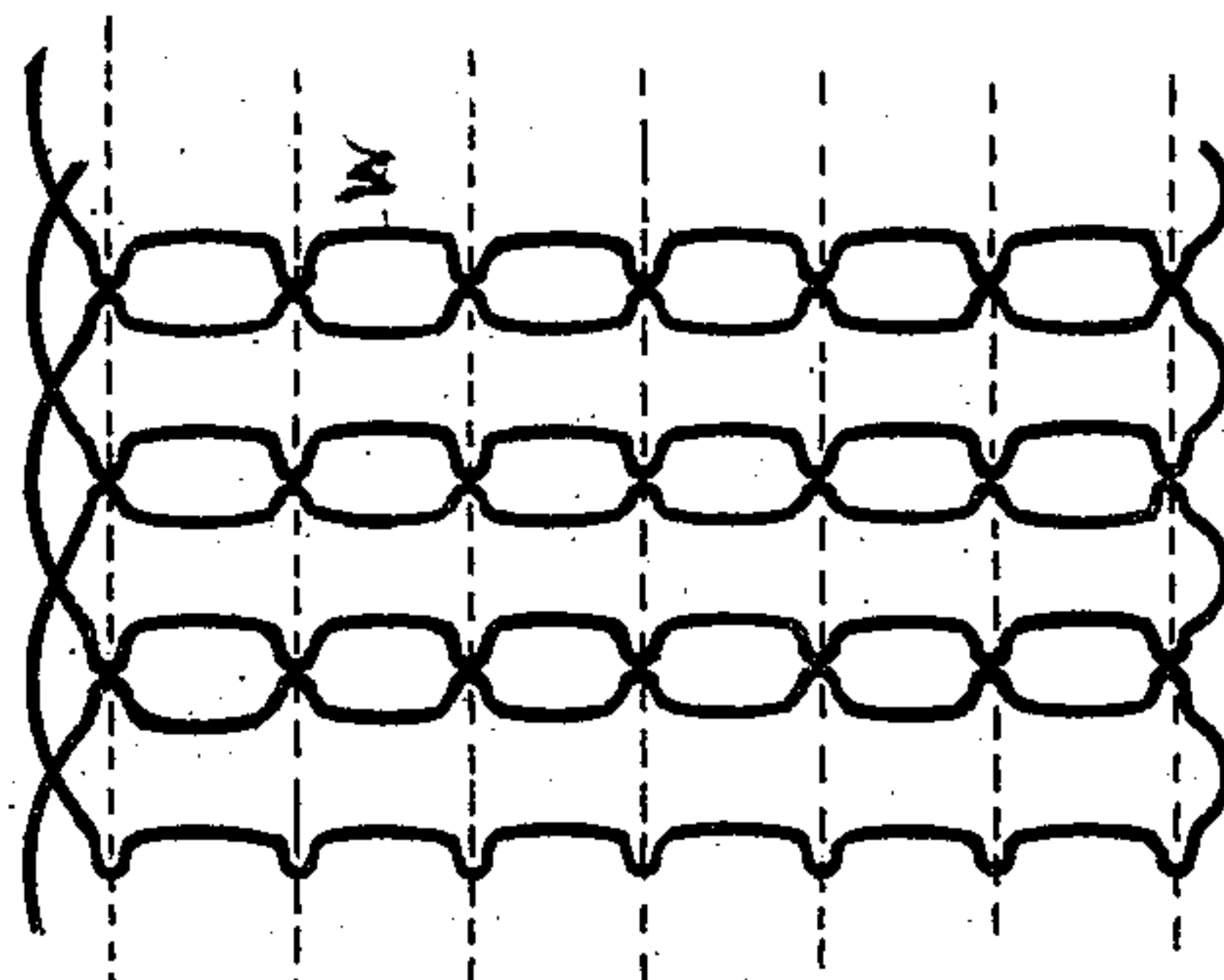


Fig. 14.



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UNITED STATES PATENT OFFICE.

WILLIAM A. KILMER, OF DES PLAINES, ILLINOIS.

PICKET-FORMING MACHINE FOR WIRE FENCES.

SPECIFICATION forming part of Letters Patent No. 616,116, dated December 20, 1898.

Application filed February 10, 1898. Serial No. 669,780: (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. KILMER, a citizen of the United States of America, residing at Des Plaines, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Picket-Forming Machine for Wire Fences, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain improvements in a picket-forming machine for wire fences, which improvements are fully set forth and explained in the following specification and claims, reference being had to the accompanying drawings, and the letters and figures of reference thereon, forming a part of this specification, in which—

Figure 1 is a plan view of the machine. Fig. 2 is a vertical section of the machine, taken on line 2 of Fig. 1, looking in the direction of the arrow. Fig. 3 is a side elevation of the machine, taken on line 1 of Fig. 1, looking in the direction of the arrow. Fig. 4 is a vertical section through the center of the reciprocating carriage. Fig. 5 is a detail perspective view of a part of the mechanism for reversing the drive-pulleys. Fig. 6 is a detail view showing a side view of the reel and of the wire-crimping disk. Fig. 7 is a detail view showing one of the spring-plungers of the wire-crimping disk. Fig. 8 is a perspective view of one end of the reel, showing the mechanism for moving the coils of crimped wire out of the way of the next incoming coil. Figs. 9, 10, and 11 are detail views of a latch mechanism on the forward end of the reel for holding the wire in proper place while the reel is rotated. Fig. 12 is a side view of the gear-wheel and its attachments for intermittently rotating the reel. Fig. 13 is a face view of said gear-wheel and its attachments, also showing its shaft and a section of the pinion thereon for engaging the rack of the reciprocating carriage and of the gear-wheel and its hub having said rack-pinion attached thereto; and Fig. 14 is a view of the crimped wire, being the product of the machine and forming the vertical pickets of a wire fence, said pickets all being formed of one continuous wire.

Referring to the drawings, 1 represents the

bed of the machine, which is supported on suitable legs, as shown in Figs. 2 and 3.

7 is the drive-shaft, journaled in suitable boxes on the top of the bed. Said shaft has secured on its inner end a drive-pinion 20, and has loose near its outer end a pair of drive-pulleys 2 and 3, respectively, which drive said pinion intermittently in opposite directions. 5 is a sliding cone arranged loosely on said shaft between said drive-pulleys, and is caused to slide in either direction on said shaft by means of a forked arm 9, working in an annular groove in said cone, said forked arm being attached to the rock-shaft 4, which is connected with the reversing mechanism hereinafter described. Said drive-shaft 7 has secured on it a pair of clutches arranged between said drive-pulleys, one at the side of each pulley, which clutches may be of any construction, (not necessary to be shown,) but having the extending arms 6 respectively and pivotally connected with the clutch mechanism in such manner that when the cone 5 is moved in either direction, so as to enter between said arms, they will be spread apart and cause the clutches to engage the inner sides of the rims of the pulleys respectively, and thus cause the said shaft to turn in either direction for the purpose of reciprocating the carriage, as will be more fully described herein.

24 is a shaft arranged across the upper side of the bed 1, parallel with shaft 7 and about the center of the machine and supported in proper boxes, as shown in Figs. 1 and 2. Said shaft 24 extends far enough at one side of the machine to carry a reel formed of the heads 54 and 56, connected near their outer ends by means of cross-rods 55 and 57, the outer end of said shaft being journaled in a pillow-block 58, said reel being for the purpose of carrying the wire W, that is reeled thereon. Said shaft 24 has a brake-wheel 81 secured on its inner end, provided with a brake-strap and weight 25, and has also secured thereon a drive-arm 28. It has loosely placed thereon the gear-wheels 63 and 23, which are driven by drive-pinion 20 on drive-shaft 7 through the medium of the intermediate gear-wheels 21 and 22, the said gear-wheels 21 and 22 each being secured to a short shaft journaled in a box on the upper side of the bed 1, as shown

in Fig. 1. The hub of gear-wheel 23 has secured on its inner end a pinion 64, which meshes with a toothed rack 38, secured to a carriage 35, supported on a pair of ways 37, to which it is connected by suitable gibs, as shown more particularly in Fig. 2, and on which said ways the said carriage is reciprocated by means of said pinion 64. The gear-wheel 63 is provided near its periphery with a short cross-shaft properly journaled therein and having secured on one end a dog 26', and having secured on its opposite end a trip-arm 26, held in proper position by means of a coil-spring 27, as shown in Figs. 1, 2, 12, and 13. Said gear-wheel 63 has hinged to its side having the said trip-arm a cam 29, having its outer free end held against the side of said gear-wheel by means of a coil-spring 29'. Said cam is for the purpose of operating the latch 43 (shown in Figs. 1 and 4) to withdraw it from contact with the reel-head 54, so it can turn as soon as the dog 26' engages the drive-arm 28. In Fig. 12 the cam 29 is shown as just engaging lever 32 through the medium of a friction-roller 34 on its outer end, which lever is connected with said latch 43 through the medium of rod 46, shaft 43, and its arm and link 47, as shown in Figs. 1 and 4 particularly. Said gear-wheel 63 turns in the direction of the arrow shown in Fig. 12 one half-revolution and then turns backward one half-revolution by means of the shifting-clutch mechanism hereinbefore described. Movement of said gear-wheel in the direction indicated by the arrow in Fig. 12 will cause cam 29 to pass under the extending end of lever 32 and move it outward from said gear-wheel and cause it to withdraw latch 43 from contact with the reel, so that it will be free to turn with its shaft 24 as soon as the dog 26' comes in contact with drive-arm 28 to carry it and shaft 24, to which it is secured, forward. The surface of cam 29 is great enough so it will hold the latch 43 disengaged from the reel until the drive-arm 28 is so engaged by the dog 26' and turns the reel when free from contact with said latch 43. After the cam 29 has passed from under the end of lever 32 and permitted latch 43 to return to its first position the dog 26' is tripped and released from its contact with drive-arm 28 by means of the trip lever or arm 26, engaging the trip 30, pivotally connected to a standard attached to the top of bed 1, and thus cause said drive-arm 28 and its shaft 24, with the reel secured to it, to turn one half-revolution, when the reel is arrested from further revolution by means of the latch 43 at or near one end and a spring-latch 40 (shown in Fig. 1) near its opposite end. The reel-head 54 is provided with laterally-extending lugs 42 and 44, (shown in Figs. 1 and 4,) that engage said latches, respectively, and hold the reel in a horizontal position while the wire-crimping disk is traveling along on said reel-head to crimp the wire. The machine is so timed that the shifting-clutch mechanism will then cause gear-wheel

63 to turn backward to its first position, and to permit it to do so said cam 29 is so formed that it will pass the outer side of the outer end of lever 32 and permit it to remain stationary, while the trip 30 will turn up against its spring 31 when engaged by the trip-arm 26 and permit said trip-arm to pass, when the shifting-clutch mechanism will cause said gear-wheel 63 to turn forward again in the direction shown by the arrow in Fig. 12 and perform another like operation, so that the gear-wheel 63 and its cam, lever, and trip attachments serve simply to rotate the reel intermittently one half-revolution to take up the wire after a section has been crimped. The reel has its inner head 54 formed, as shown in Figs. 1, 2, 3, and 4, and particularly in Fig. 6, with a series of equidistant detachable forming-dies 70 along each side, over which dies the wire W is coiled, as shown in Figs. 1, 6, and 8, as it comes through straightening-rolls 60 61 from a reel. (Not necessary to be shown.)

35 is a reciprocating carriage having a toothed rack 38 and resting on the ways 37 and maintained on said ways by means of gibs 35', as shown in Figs. 2 and 4. Said rack is in mesh with the pinion 64 on the hub of gear-wheel 23, and the said carriage receives its reciprocating motion from said gear-wheel 23 through the medium of said rack and pinion as the said gear-wheel is turned in opposite directions by means of the shifting-clutch mechanism. Said carriage 35 is provided with a central transverse box 67', in which is journaled the shaft 67, said shaft having integral with its outer end a pinion 53, which meshes with the stationary rack 49, secured to the machine-bed shown in Figs. 1, 2, 3, and 4. The shaft 67 of said pinion 53 is bored out through its center, in which bore is placed a shaft 65, having secured on its outer end a wire crimping or bending disk 52. The inner end of shaft 65 carries a box 79, attached to said shaft by means of a set-screw 80, which enters an annular groove of said shaft 65 near its inner end, as shown in Fig. 4. Said box 79 is maintained in a perpendicular position by means of a stem 62, which passes through a slot in an extending arm 36, secured on the top of the carriage 35, and said box is provided on its under side with a friction-roller 66. The shaft 65 is splined in the shaft 67, so that it may have end movement in shaft 67, as indicated by the broken lines in Fig. 4, caused by its friction-roller 66 coming in contact alternately with the cams 18 and 19, secured on the top of the bed 1 and shown more particularly in Fig. 1, so that the shaft 65 reciprocates within shaft 67 and turns with it by reason of their spline connection, as shown in Fig. 4, such reciprocation of shaft 65 and its crimping-disk 52 being for the purpose of moving said crimping-disk laterally, as shown in broken lines in Fig. 4, after it has rolled along on the reel-head 54 on the wire to crimp it over the dies 70 and passed off the said reel-head and permit the said crimp-

ing-disk to return at the side of said reel-head to its opposite end, but not in contact therewith, the machine being so timed that as soon as the said crimping-disk passes off the reel-head it is moved by means of cam 18 to one side out of the way, so the reel may turn one half-revolution, while the carriage 35 returns, and the crimping-disk is moved back in line with the reel-head by means of cam 19, so that when the carriage 35 moves forward again the crimping-disk 52 will roll along on the wire W as it lies on the dies 70 of the reel-head to crimp the wire, as shown more particularly in Fig. 5. The periphery of said crimping-disk is provided with a series of equidistant recesses 68, corresponding with the conical-shaped dies 70 of the reel-head, so that as the said disk rolls along in the direction of the arrow in Fig. 5 on the wire as it lies on said dies it will be bent or crimped, as shown in said figure and also in Figs. 1, 3, 8, and 14. The periphery of said crimping-disk is provided with a series of equidistant spring-plungers 69, (shown in Figs. 3, 6, and 7,) arranged between the recesses 68, which plungers are for the purpose of bearing upon the wire between the forming-dies 70 and hold it in place while the crimping of the wire is being done. The reel-head 54 is provided at each end with a latch 74, (shown in Figs. 6, 8, 9, 10, and 11,) said latch being held forward to its work by means of a spring 75 at its back. This latch is for the purpose of holding the wire in proper place while the reel is being turned and after the crimping-disk has passed off the reel-head. Fig. 10 shows the said latch in its first position. Fig. 11 shows it as it would appear pressed backward by the crimping-disk engaging its inclined surface and having carried the wire down, so that when the said crimping-disk moves off the reel and out of contact with said latch the said latch will return over the wire and hold it while the reel is being turned, and thus prevent the wire from becoming tangled. After the reel has been turned to reverse its position and the wire has been crimped, as stated, it is necessary to move the wire laterally toward the outer end of the reel on the cross-rods 55 and 57. For this purpose the ends of the reel-head 54 are provided with a spring-plunger 71. (Shown particularly in Fig. 8.) Said plunger is provided on its outer end with a friction-roller 72' for engaging a cam 50, secured to the side of the bed 1, as shown in Fig. 1. The body of the said plunger fits in a recess in the end of the reel-head 54 and is held in proper position by a coil-spring 73, arranged on its extending stem 71, passing through a guide-frame. The plunger 71 is formed with a shoulder 72, and the wire is coiled on the reel-head over the plunger 71. Immediately after the reel starts to rotate the friction-roller of said plunger engages the cam 50, causing the shoulder 72 of said plunger to

move the wire along on the cross-rods 55 and 57 of the reel out of the way of the new portion of the wire to be crimped.

16 is a rod arranged in proper boxes so it may be reciprocated by the carriage 35 as it engages, respectively, the set-screws 15 and 17. (Respectively shown in Figs. 1, 2, and 3.) The heads 39 of said carriage engage said set-screws 15 and 17 alternately, and thus move said rod 16 alternately in either direction. The set-screw 15 is attached to a slide 13, which is connected to rod 16 and moves in a box 14. Said slide 13 is pivotally connected to the inner end of lever 12, and which is connected with the clutch mechanism hereinbefore described for reversing the motion of the machine, so that when the carriage comes in contact alternately with the set-screws 15 and 17 the rod 16 will be moved and, through its connection with the clutch mechanism, will reverse the motion of the machine and cause the carriage to return, and thus reciprocate the carriage for the purpose set forth.

The reel-head 54 is wider at one end than at the other for the purpose of leaving alternately between the crimped portions of the wire short and long sections, so that when used as pickets for a wire fence they may be arranged and connected as shown in Fig. 14. As the pinion 53 of the carriage 35 is driven or turned by means of the stationary rack 49, on which it travels, it necessarily turns the crimping-disk 52 with it, so that it may not drag on the wire and fail to do its work, as stated. The wire-straightening rolls 60 61 are supported on a frame 90, pivotally connected to the upper end of standard 91, so that said rolls and frame may oscillate when the reel rotates, so as not to bend the wire after it leaves the straightening-rolls.

The operation of the machine is as follows: The drive-belts B and B' on drive-pulleys 2 and 3 run constantly in opposite directions, so as to turn said pulleys in opposite directions, the carriage 35 being at the extreme left end of the machine, looking at Fig. 1, and the crimping-disk 52 in line with the reel-head 54, so that when it moves forward it will roll along over said reel-head on the wire W. Figs. 1, 3, and 5 show said carriage and its crimping-disk as they would appear when having moved about half-way from one end of the machine to the other. To start the machine, the operator will move the hand-lever 12 in the proper direction to cause the proper clutch to engage the proper drive-pulley to cause the carriage to travel forward. The machine then becomes automatic by reason of the carriage engaging alternately the set-screws 15 and 17, attached to the bar 16, which attaches to lever 12 and slide 13, and which are connected with the clutch mechanism, so that the carriage 35 as it reciprocates automatically operates the clutch mechanism and changes or reverses the motion of the machine to reciprocate the carriage and rotate

the reel. After the crimping-disk 52 has passed along over the reel-head 54 and off, so as to be free from it, and been moved laterally out of its way, the machine is so timed as to turn the reel one half-revolution, when it is arrested by the spring-latches, so that the crimped portion of the wire has been taken up on the reel and a plain portion taken its place ready to have the crimping-disk, which returned while the reel was being turned, pass over the reel-head on the wire and crimp another section, as before, to form a crimped wire for use as pickets of a wire fence, the pickets being all one continuous wire.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows, to wit:

1. In the wire-crimping machine shown and described, the combination of the reciprocating carriage, the wire-crimping disk carried by said carriage, the means for turning and shifting said disk, the means for reciprocating said carriage and for reversing the motion of the machine, the reel for carrying the wire and having its head provided with dies fitting the recesses of said crimping-disk, the means for supporting said reel during the wire-crimping process, and the means for rotating said reel intermittently, substantially as and for the purpose set forth.

2. In the wire-crimping machine shown and described, the combination of the reel having its head provided with the series of crimping-dies 70, the wire-crimping disk having peripheral recesses fitting said dies and adapted to travel on the wire on said head, the means for driving and shifting said crimping-disk and for turning said reel intermittently, substantially as and for the purpose set forth.

3. In the wire-crimping machine shown and described, the combination of a reciprocating carriage, a crimping-disk carried by said carriage, the means for reciprocating said disk laterally, and the intermittently-rotating reel having its head forming a track for said crimping-disk, and having a series of equidistant projecting dies fitting the corresponding peripheral hollows in said disk, all arranged to operate substantially as and for the purpose set forth.

4. In the wire-crimping machine shown and described, the combination of the reciprocating carriage 35, ways 37, hollow shaft 67 having the pinion 53 integral therewith, stationary rack 49, shaft 65 arranged within said hollow shaft and adapted to reciprocate therein and turn therewith, the wire-crimping disk 52 secured on shaft 65 and having the peripheral recesses 68 and spring-plungers 69, box 79 attached to shaft 65 and having the friction-roller 66 and stem 62, arm 36 having a slot for receiving said stem, cams 18, 19, reel-head 54 having the series of equidistant dies 70, and the means for reciprocating said carriage and for intermittently rotating said

reel, all arranged to operate substantially as and for the purpose set forth.

5. In the wire-crimping machine shown and described, the combination of the shaft 24, the reel secured on said shaft and comprising the heads 54, 56 and cross-rods 55, 57, gear-wheel 23 loose on said shaft, pinion 64 secured on the hub of said gear-wheel 23, gear-wheel 63 loose on said shaft, cam 29 hinged to the side of said gear-wheel 63, dog 26' and trip-arm 26 and their shaft, and coil-spring carried by said gear-wheel 63, spring-trip 30, 31, drive-arm 28 secured on said shaft and adapted to be alternately engaged and released by said dog, lever 32, latch 43 and the means for connecting said lever and latch, brake-wheel 81 secured on said shaft 24 and its brake-strap and weight 25, and the means for driving said gear-wheels in opposite directions alternately substantially as and for the purpose set forth.

6. In the machine shown and described for crimping wire, the combination of the reel-head 54, spring-slide 71 having the shoulder 72, and having the friction-roller 72', and the cam 50, all arranged to operate substantially as and for the purpose set forth.

7. In the machine shown and described for crimping wire, the combination of the reel-head 54, crimping-disk 52, and the spring-latch 74 and its spring 75, all arranged to operate substantially as and for the purpose set forth.

8. In the wire-crimping machine shown and described, the combination of the reciprocating carriage, the wire-crimping disk carried by said carriage the means for shifting and driving said disk, the means for reciprocating said carriage, the reel for carrying the wire and having its head forming a track for said disk and having its track portion provided with dies fitting the hollows in the periphery of said disk, the means for supporting said reel during the crimping process, and the means for intermittently rotating said reel, all arranged to operate substantially as and for the purpose set forth.

9. In the wire-crimping machine shown and described, the reel-head 54 provided with the dies 70, the wire-crimping disk having peripheral recesses corresponding with said dies and adapted to travel over said head over the wire coiled thereon, and the means for driving and shifting said disk and for turning said reel, substantially as and for the purpose set forth.

10. In the wire-crimping machine shown and described, the combination of the intermittently-rotating reel, having dies arranged to have the wire coiled thereon, and the means for compressing the wire over said dies, substantially as and for the purpose set forth.

11. In the wire-crimping machine shown and described, the combination of the intermittently-rotating reel having dies arranged

to have the wire coiled thereon, the means
for holding the reel stationary while the wire
is being crimped, and the means for com-
pressing and crimping the wire over said dies,
5 substantially as and for the purpose set forth.

12. In the wire-crimping machine shown
and described, the combination of the inter-
mittently-rotating reel, and the wire-straight-

ening rolls having their frame pivotally at-
tached to a standard, substantially as and for 10
the purpose set forth.

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