

No. 773,631.

PATENTED NOV. 1, 1904.

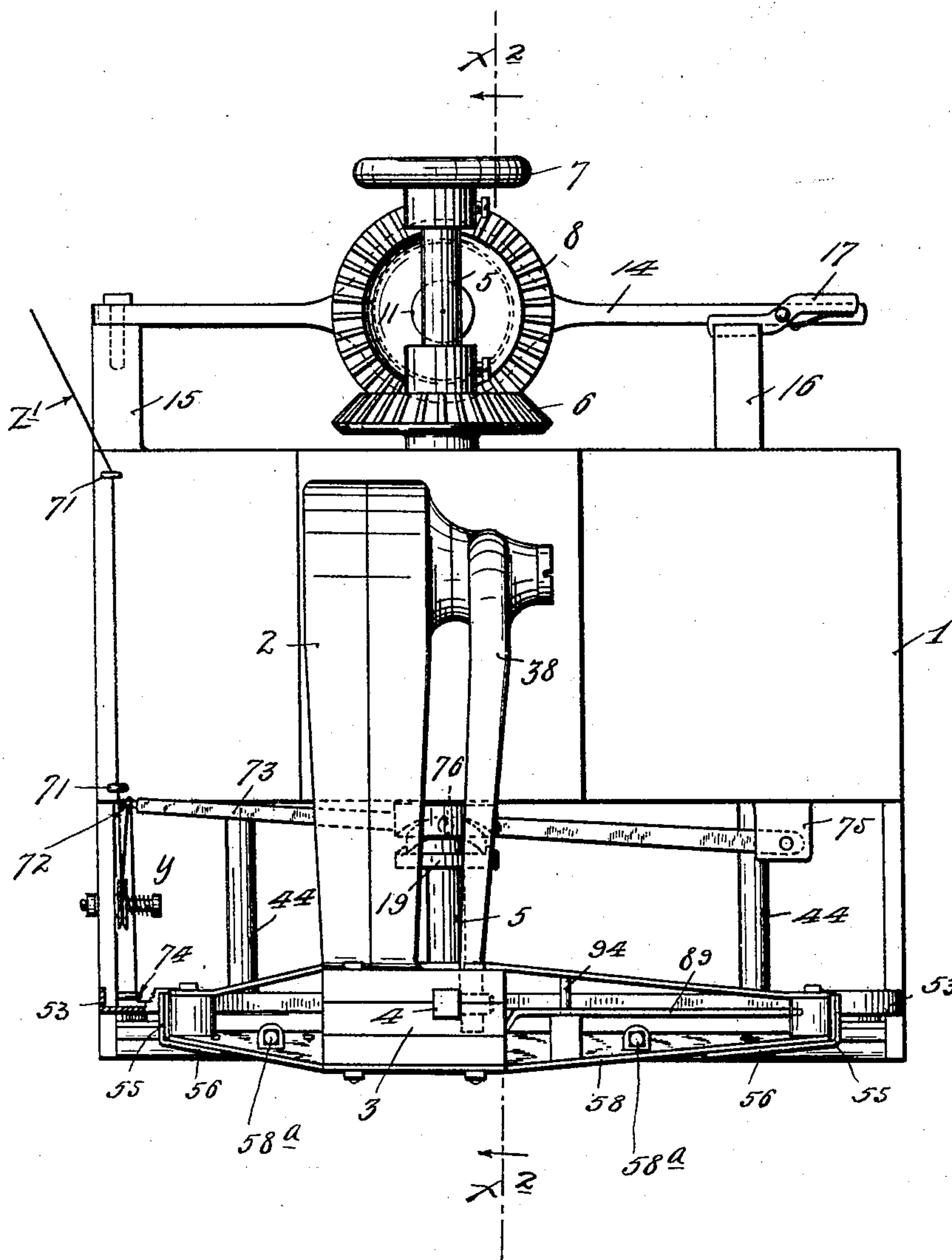
M. C. ELLISON.
FILLED BAG SEWING MACHINE.

APPLICATION FILED JUNE 1, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

N. D. Kilgore

A. H. Opahl

Inventor:

Milton C. Ellison.

By His Attorneys

Williams & Merdian

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4 SHEETS—SHEET 2.

Fig. 2.

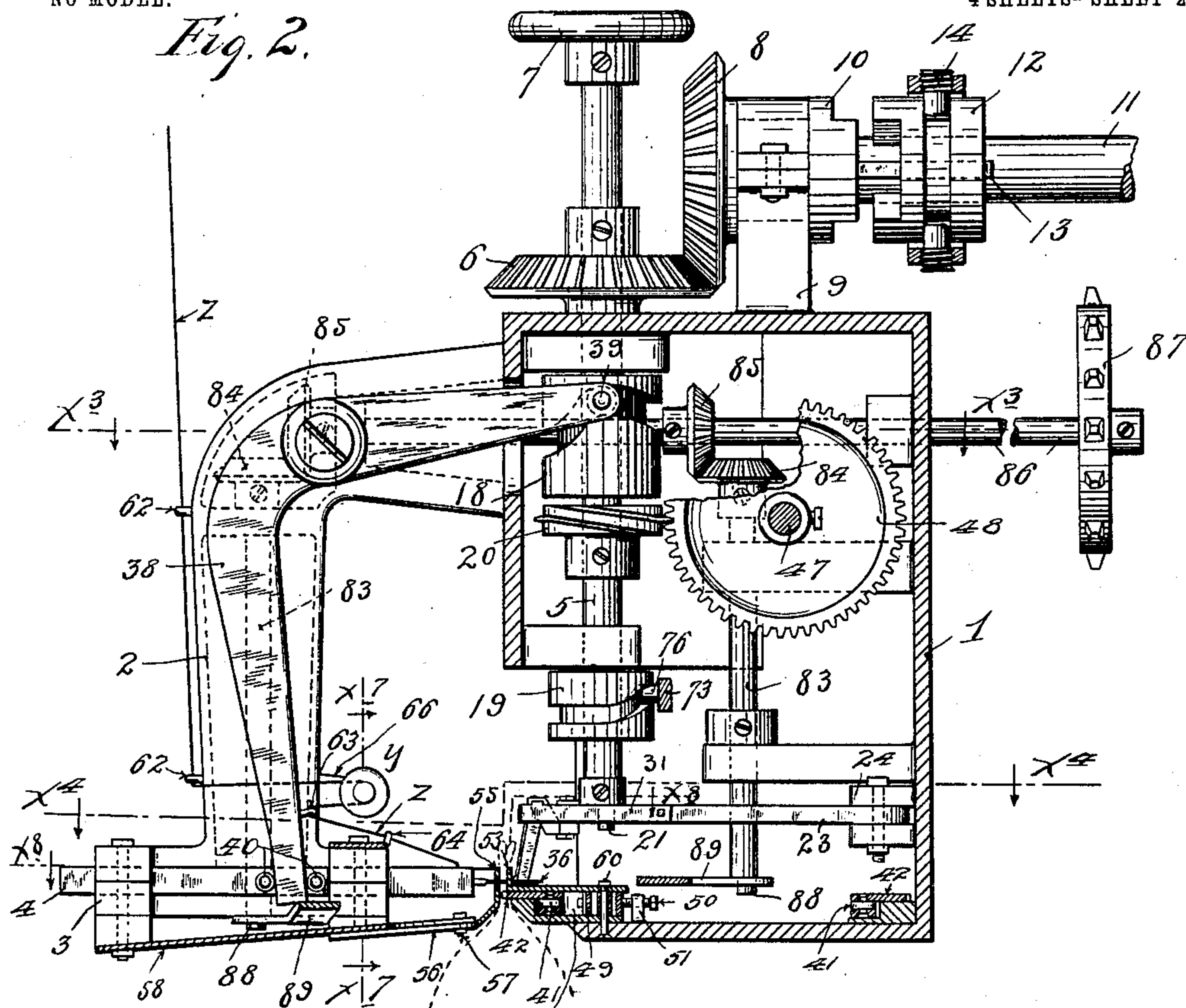
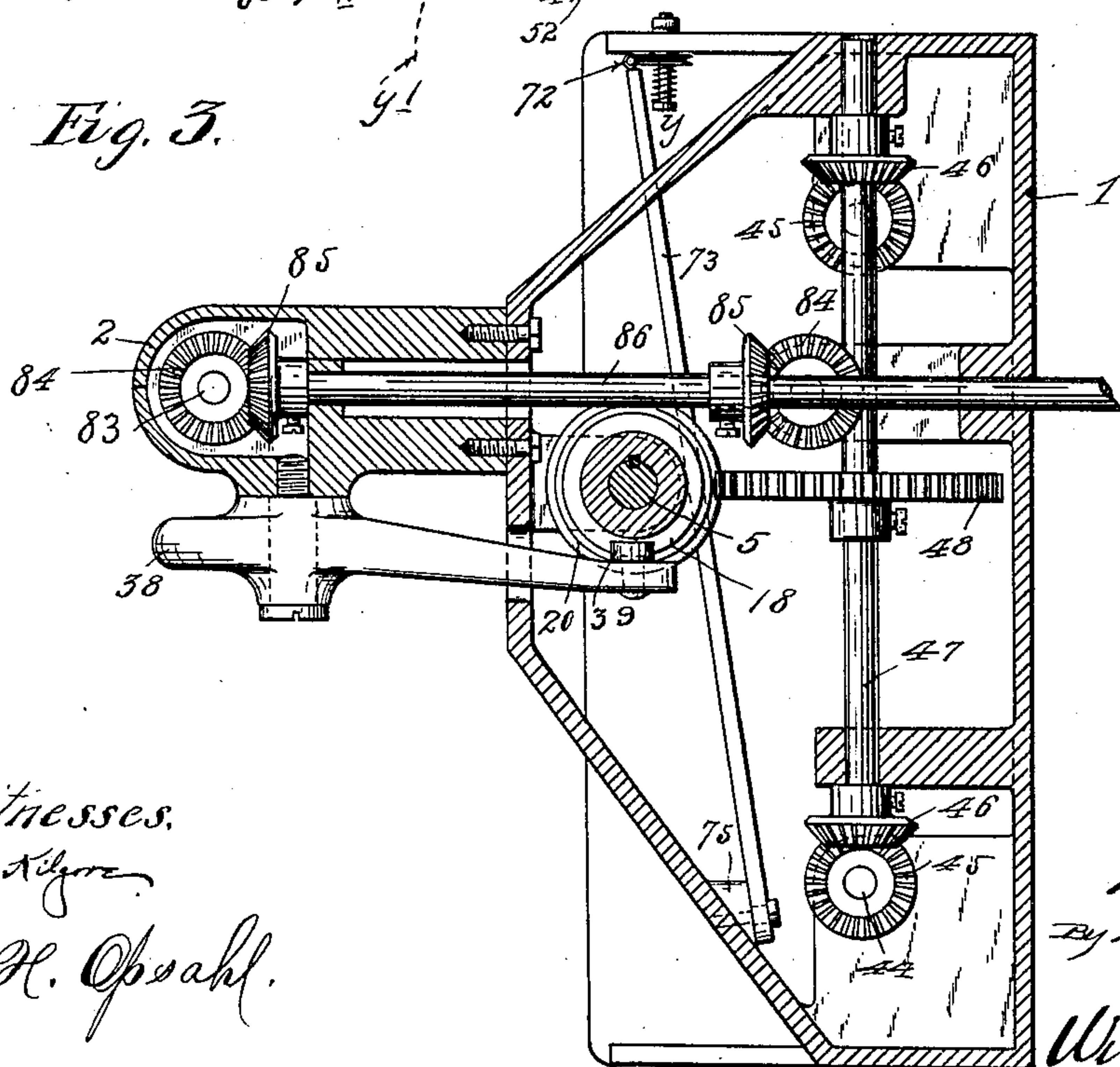


Fig. 3.



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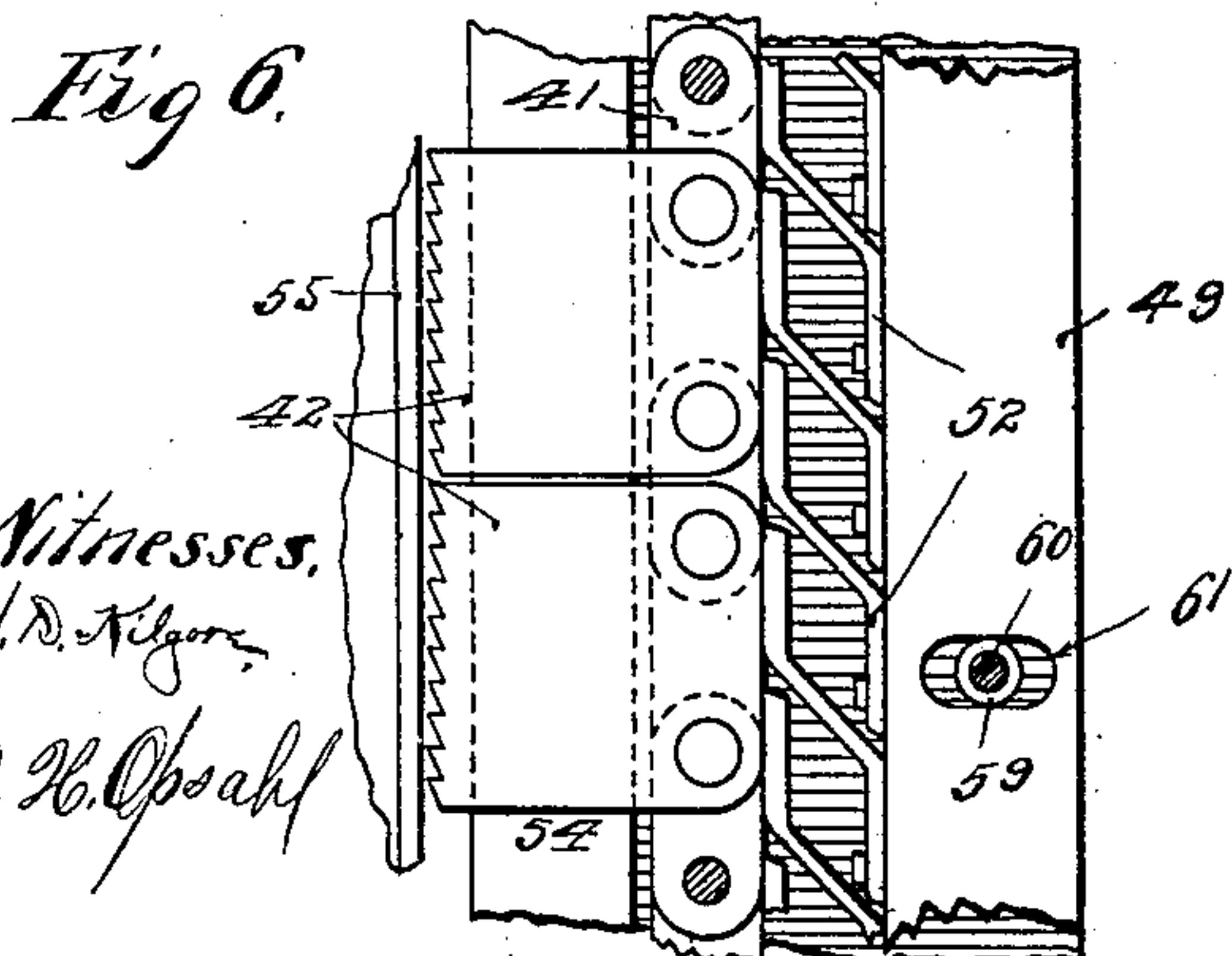
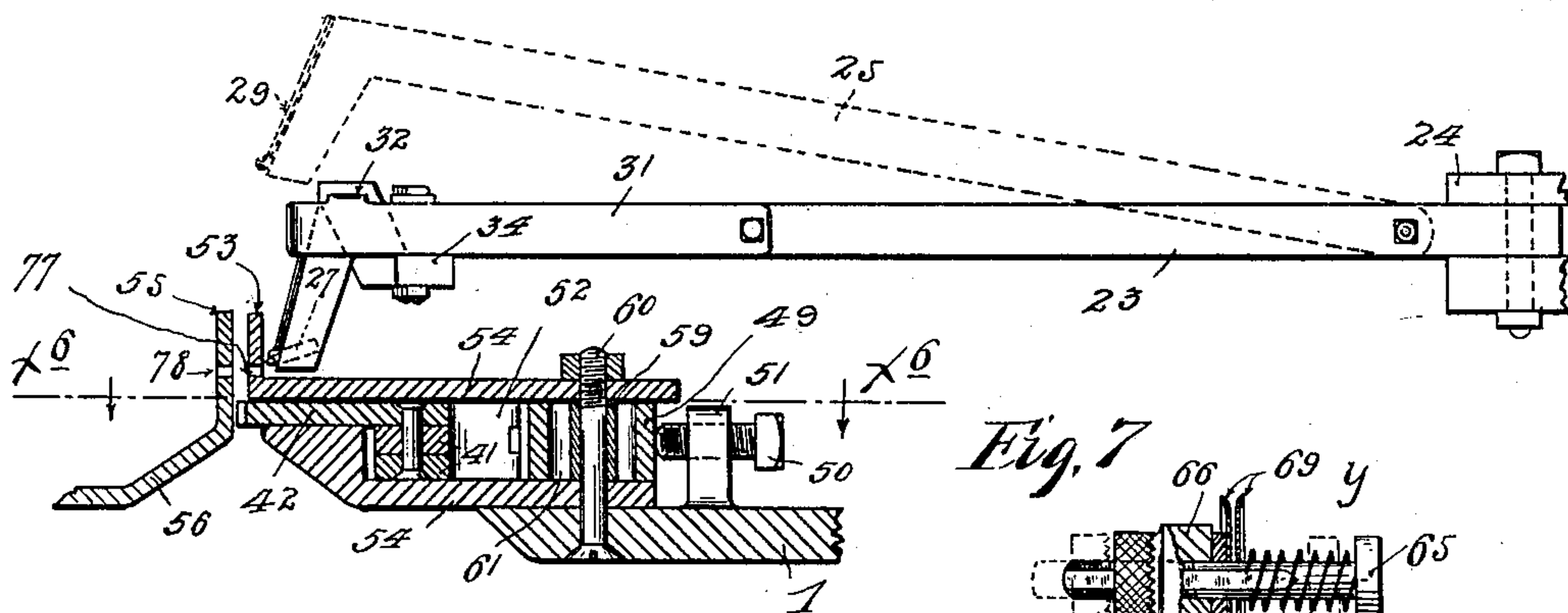
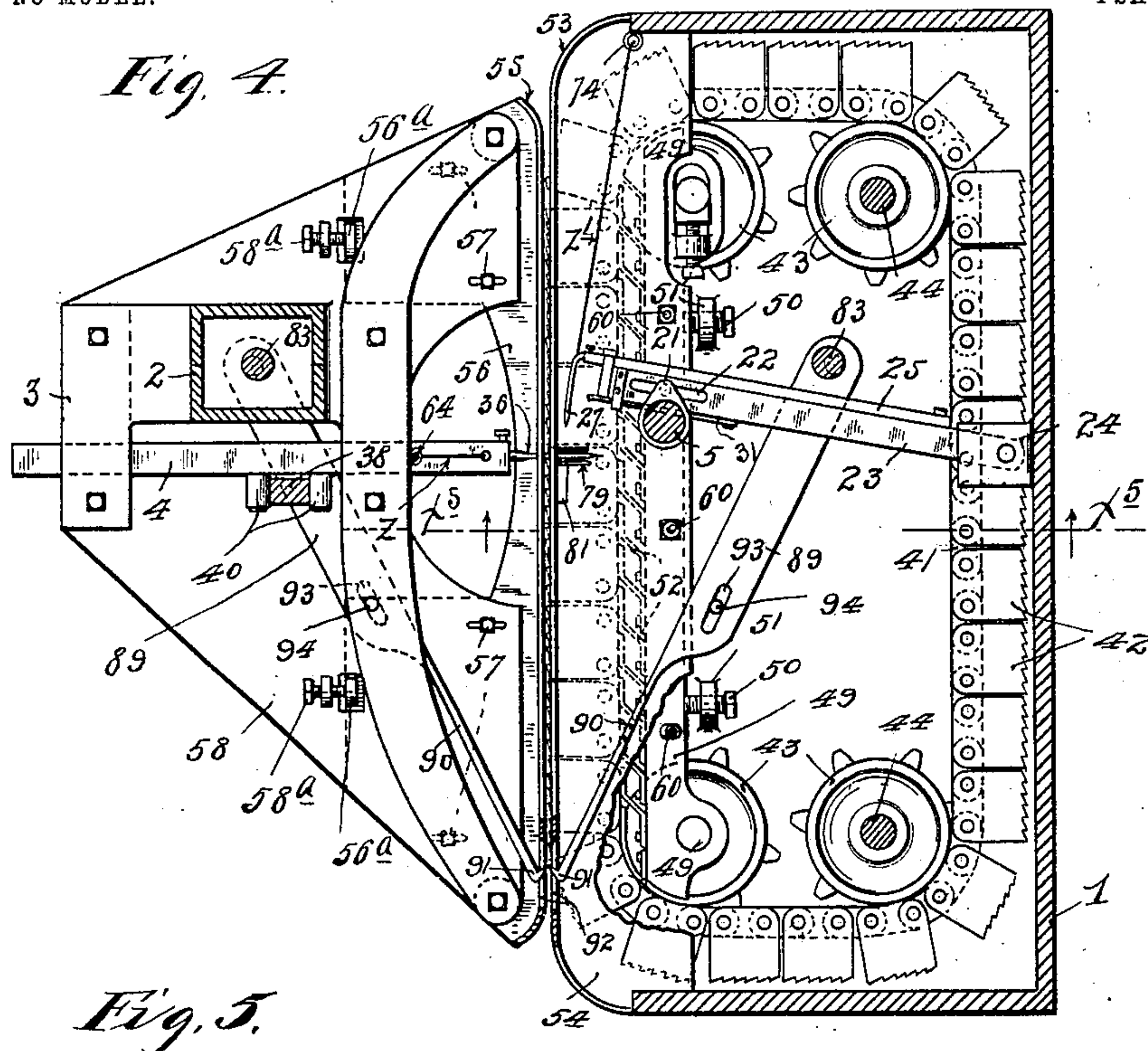
William M. Merdall

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NO MODEL.

4 SHEETS—SHEET 3.



Witnesses,
A. D. Kilgore,
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4 SHEETS—SHEET 4.

Fig. 8.

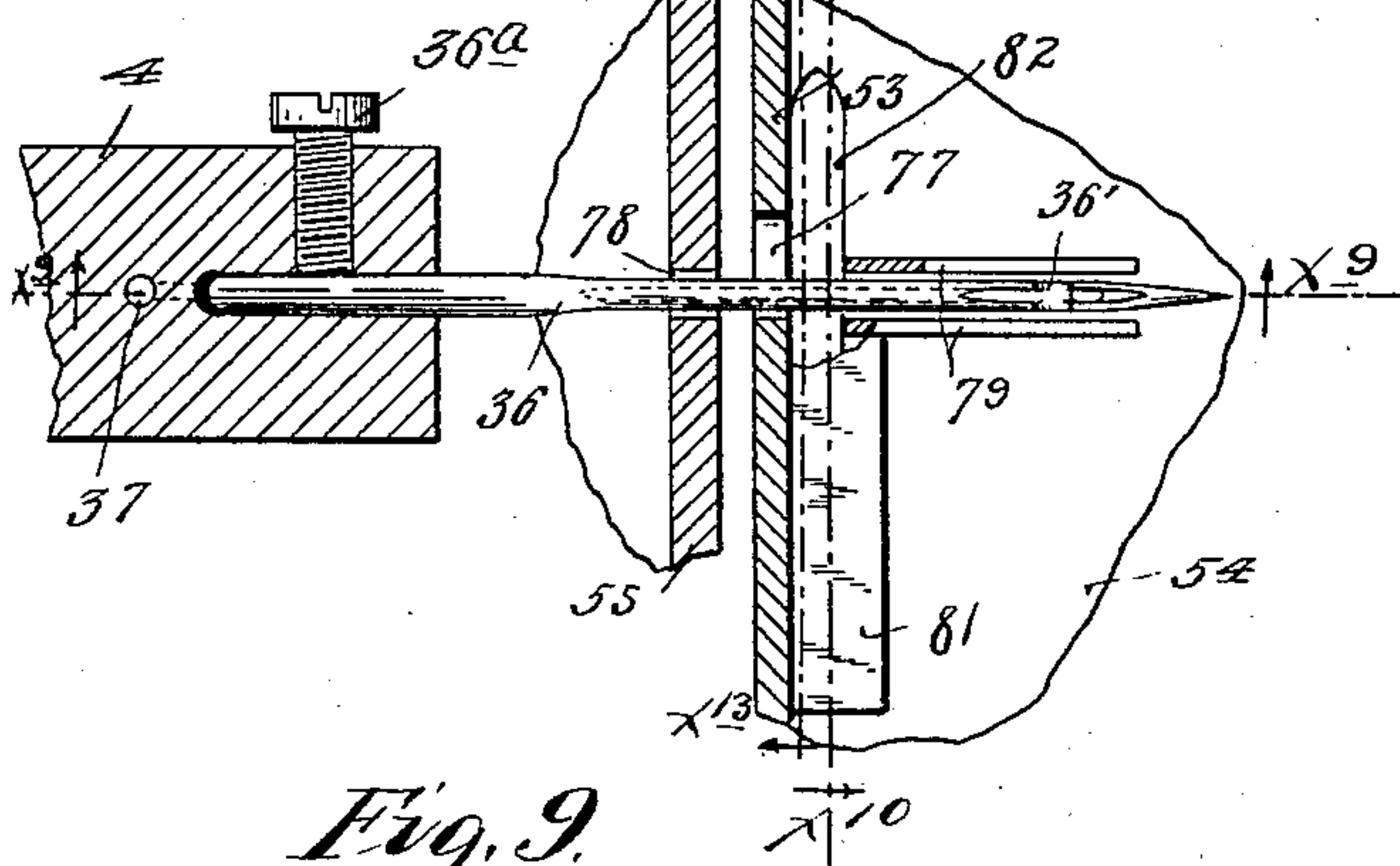
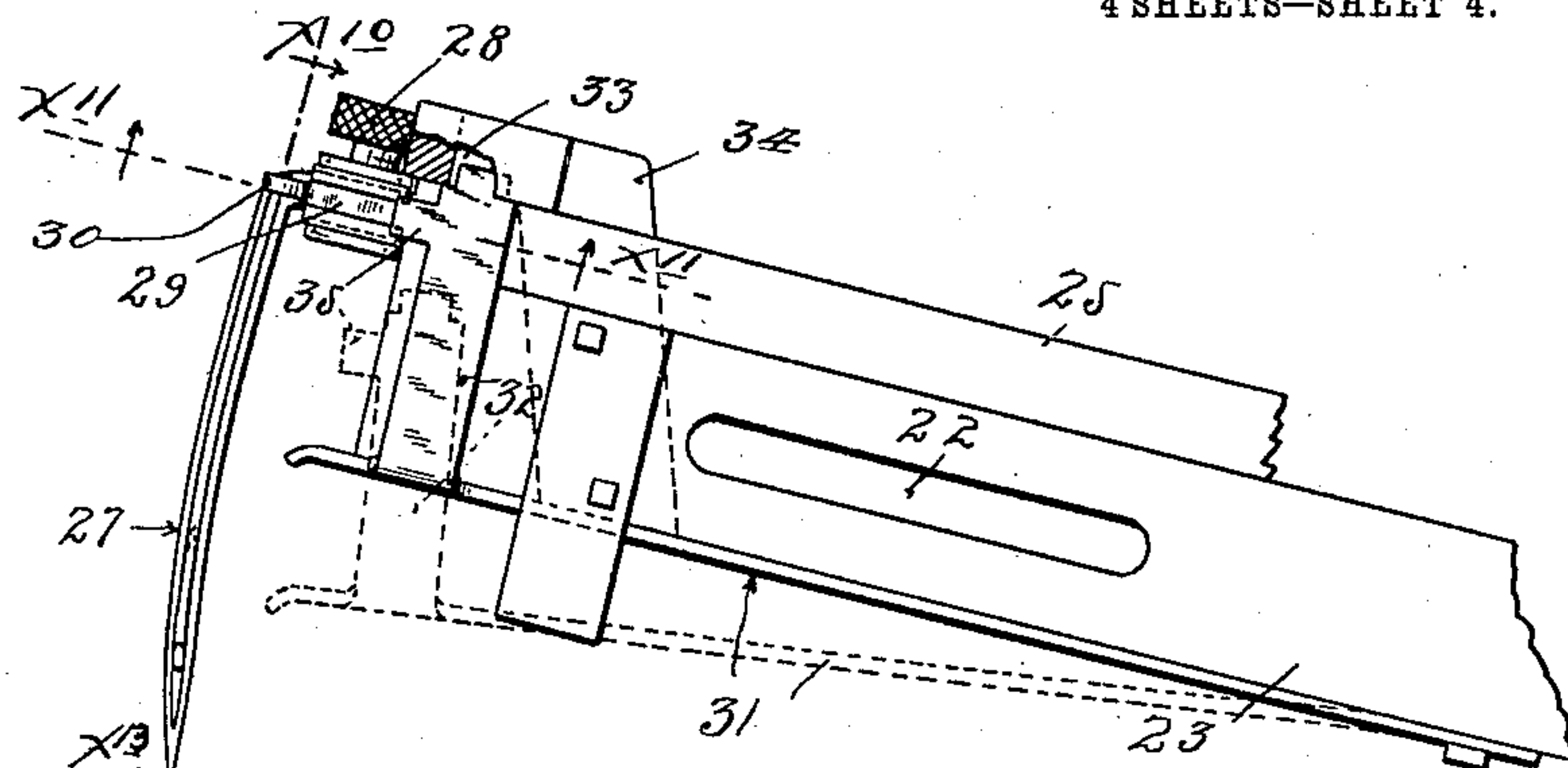


Fig. 9.

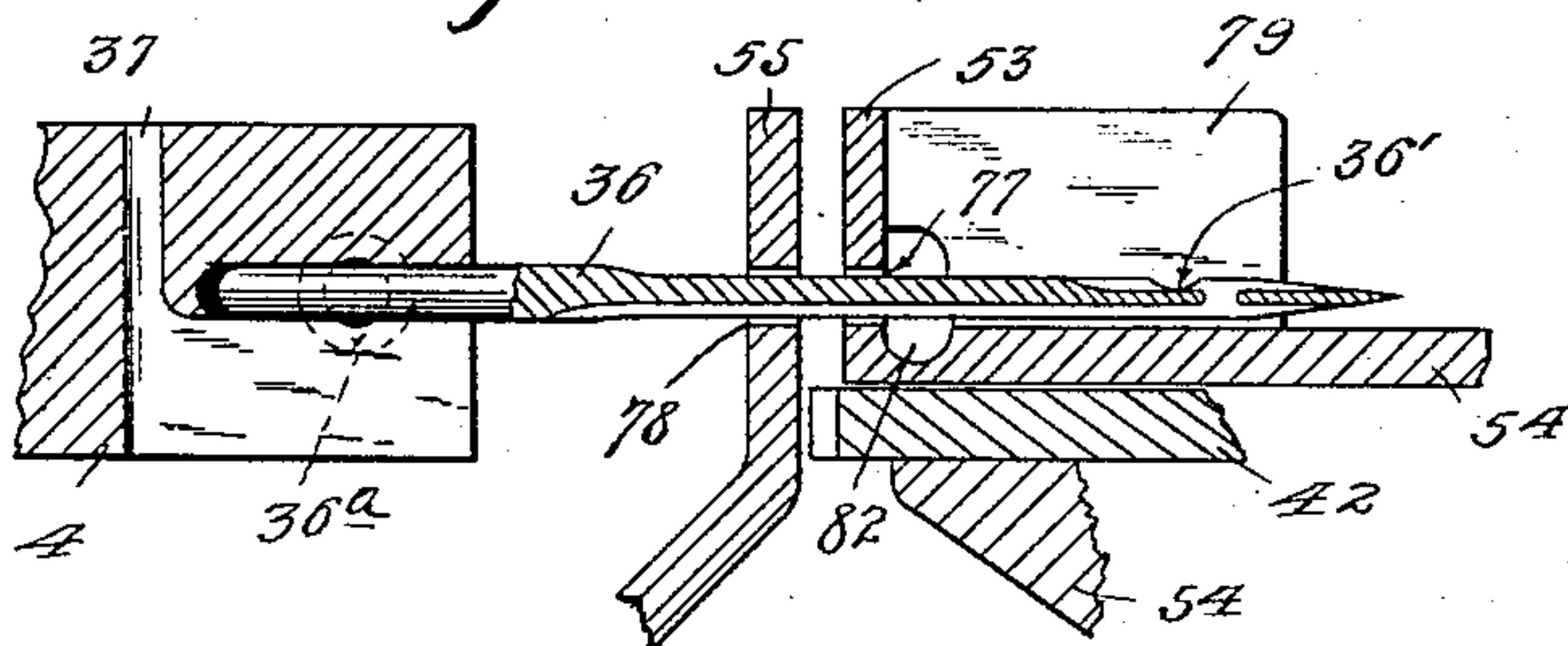
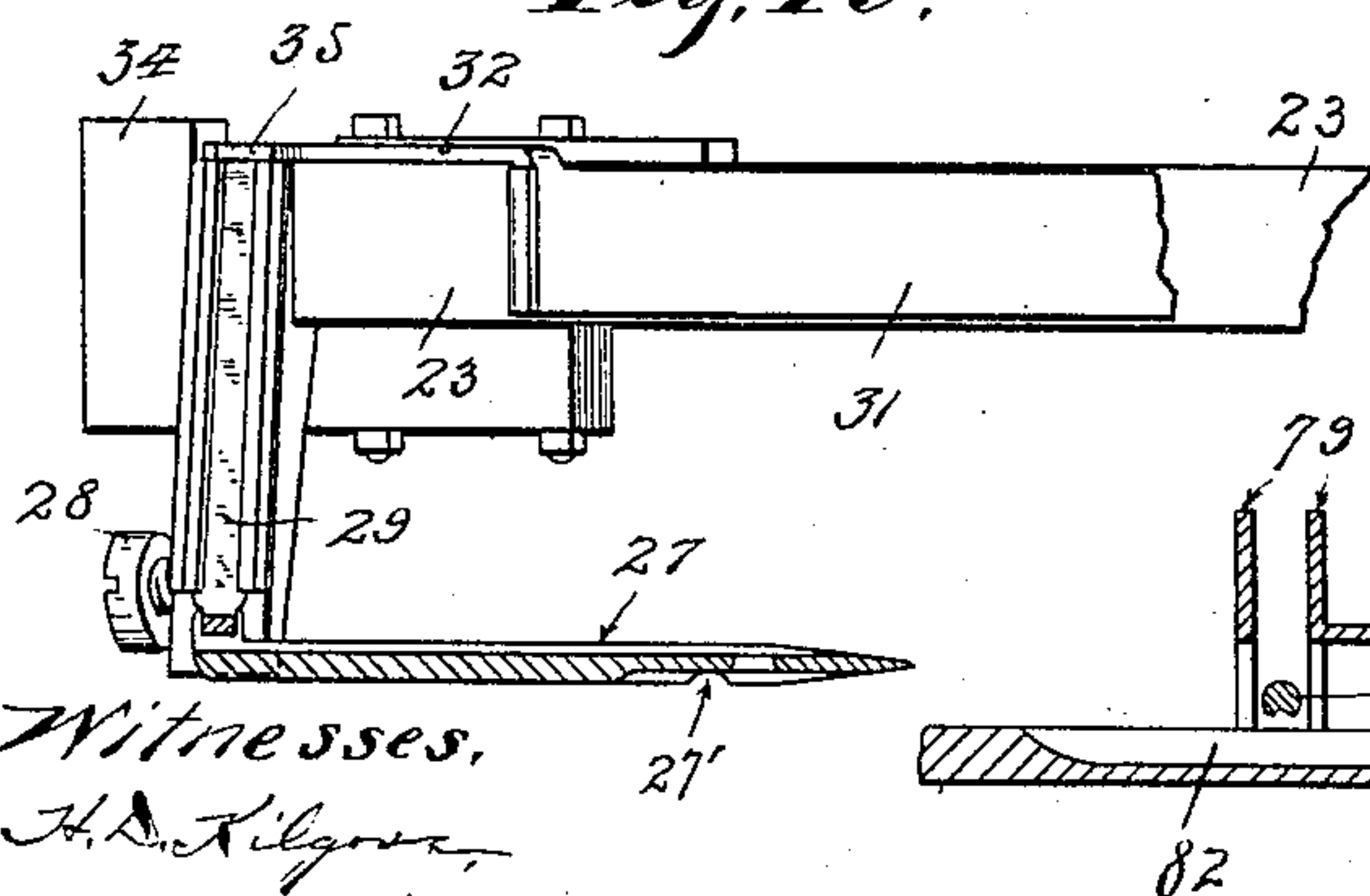


Fig. 10.



Witnesses,

H. A. Kilgus.

A. H. Opsahl.

Fig. 11.

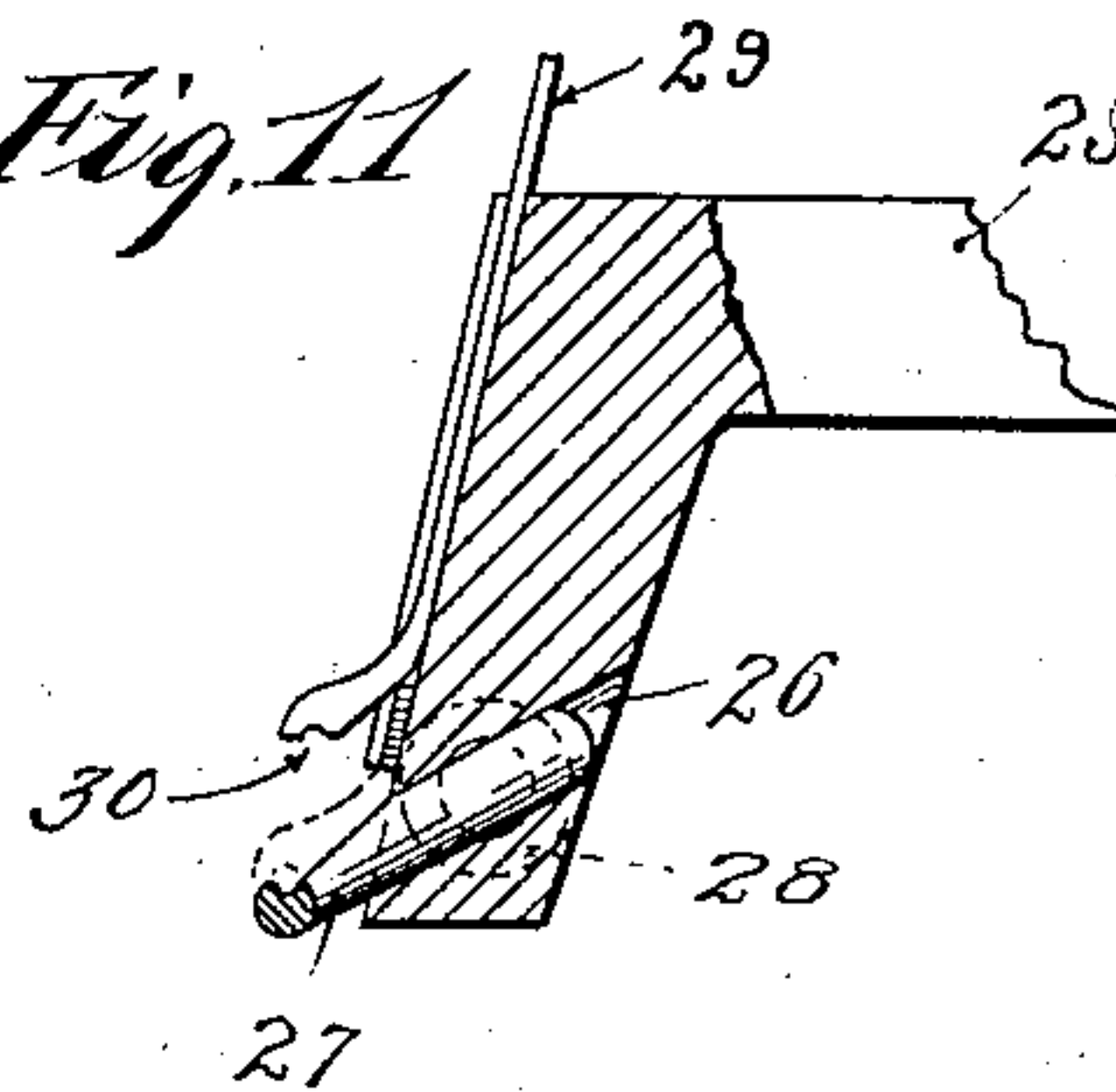


Fig. 12.

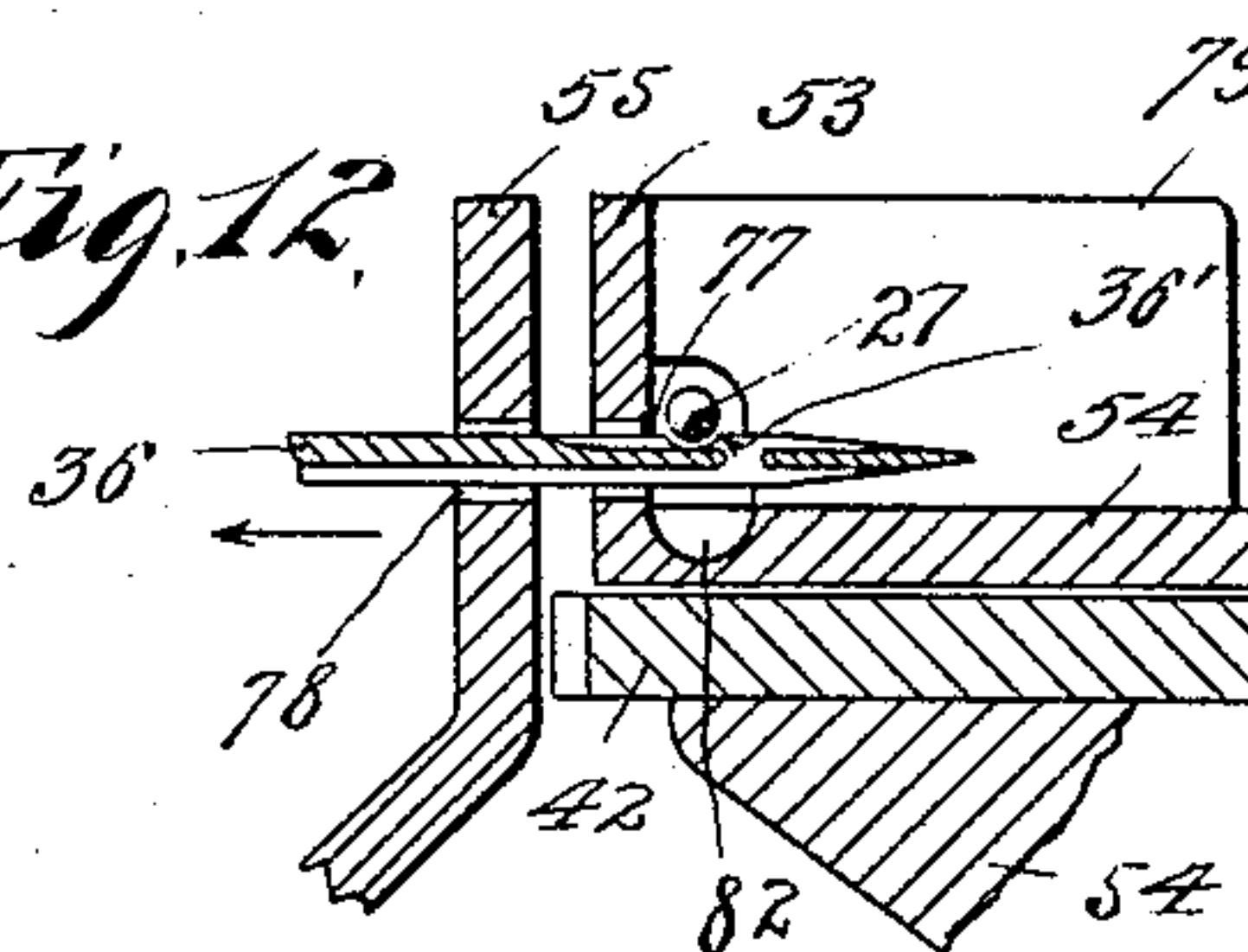
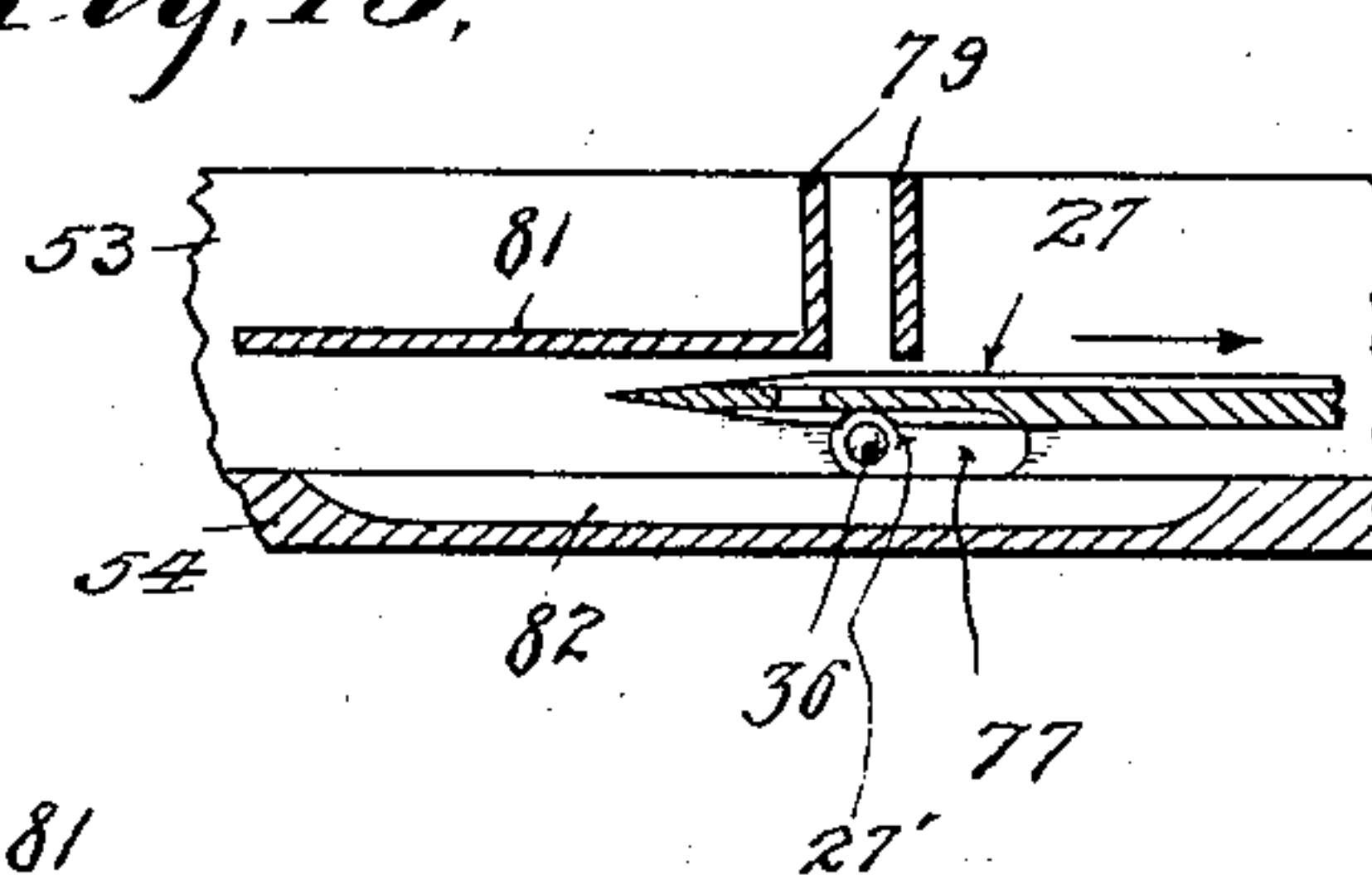


Fig. 13.



Inventor,

William C. Ellison.

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UNITED STATES PATENT OFFICE.

MILTON C. ELLISON, OF ST. PAUL, MINNESOTA.

FILLED-BAG-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 773,631, dated November 1, 1904.

Application filed June 1, 1903. Serial No. 159,397. (No model.)

To all whom it may concern:

Be it known that I, MILTON C. ELLISON, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Filled-Bag-Sewing Machines; and I 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 it appertains to make and use the same.

My present invention relates to what are known as "filled-sack-sewing machines," and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

One feature of this invention is directed to improved means for holding the gathered end of the filled sack and for feeding the same forward while it is being sewed.

Another feature is directed to improved means for gathering the closed mouth of the sack while it is being fed to the sewing mechanism, so that the sewed end of the sack will be contracted or made much smaller than the body of the sack.

Other features of the invention are directed to various improvements in the different parts of the machine, whereby improved results are obtained and whereby the machine may be more conveniently and rapidly prepared for action and subsequently operated with greater efficiency.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 shows the complete sewing-machine in side elevation. Fig. 2 is a transverse vertical section on the line $x^2 x^2$ of Fig. 1. Fig. 3 is a horizontal section on the line $x^3 x^3$ of Fig. 2. Fig. 4 is a horizontal section on the line $x^4 x^4$ of Fig. 2. Fig. 5 is a detail view in section on the line $x^5 x^5$ of Fig. 4, some parts being broken away. Fig. 6 is a detail in horizontal section on the line $x^6 x^6$ of Fig. 5. Fig. 7 shows in detail one of the tension devices, the same being a section on the line $x^7 x^7$ of Fig. 2. Fig. 8 is a frag-

mentary view with parts broken away, some parts being shown in plan and others being sectioned on the irregular line $x^8 x^8$ of Fig. 2. Fig. 9 is a vertical section on the line $x^9 x^9$ of Fig. 8. Fig. 10 is a vertical section taken approximately on the line $x^{10} x^{10}$ of Fig. 8. Fig. 11 is a detail in section on the line $x^{11} x^{11}$ of Fig. 8, some parts being broken away. Fig. 12 is a detail corresponding to Fig. 9, but showing the needles in different positions. Fig. 13 is a detail in vertical section on the line $x^{13} x^{13}$ of Fig. 8, but showing the needles in different positions than in said Fig. 8.

The body portion of the machine-frame is afforded by a rectangular box-like section 1, which is rigidly secured to any suitable support in any suitable way and is provided at one side with an outwardly and downwardly turned supporting-bracket 2, shown as formed at its depending end with a transversely-extended divided bearing 3 for a reciprocating needle-carrying plunger 4.

Mounted in suitable bearings on the frame 1 is a vertically-disposed shaft 5, which at its upwardly-projecting end is provided with a miter-gear 6 and preferably, also, with a hand-wheel 7. The miter-gear 6 meshes with a miter-gear 8, the hub of which is loosely journaled in a bearing 9 on the upper portion of the frame 1 and is provided with a half-clutch 10. A driving-shaft 11 is journaled within the hub of the gear 8 and in other suitable bearings. (Not shown.) On the shaft 11 is a sliding half-clutch 12, which coöperates with the half-clutch 10, being held to rotate with the shaft 11 by a key 13. The sliding half-clutch 12 is subject to a shipper-lever 14, which lever, as shown, is pivoted at one end to a lug 15 and is adapted to be locked at its free end to a lug 16 by means of a spring-latch 17. The two lugs 15 and 16 are shown as cast integral with the frame 1.

The shaft 5 carries two peripheral cams 18 and 19, the purposes of which will presently appear. Said shaft is also provided at its intermediate portion with a worm 20, the threads of which throughout the main portion of the length extend in a plane at a right angle to the axis of the shaft, but abruptly turn from

the plane of one thread to the plane of another, as shown in Fig. 2. At its extreme lower end the shaft 5 is provided with a short throw-crank 21, the crank-pin of which works in a longitudinal slot 22 of an oscillating looper-bar 23, which looper-bar is, as shown, pivoted at one end to lugs 24 of the frame 1, as best shown in Figs. 2, 4, and 5. The looper-bar 23 oscillates in a horizontal plane, and pivoted thereto for vertical movements is a supplemental bar 25, which at its free end is provided with a depending foot having a seat 26, in which is secured the laterally-bent shank of a slightly-curved looper 27. A set-screw 28, working through the foot of said supplemental bar 25, impinges on the shank of the looper 27 and securely holds the same. The looper 27 is of course provided with an eye at the sharp projecting end. The top of the looper is grooved to form a channel in which the thread may run, and to hold the thread in this channel a guide-clip 29 is mounted to slide vertically in the depending foot of the supplemental bar 25 and is provided at its lower end with a notched head 30, which when lowered, as indicated by dotted lines in Fig. 11, guides the thread through the groove of the looper 27. Secured at one end to the oscillating bar 23 is a quite strong leaf-spring 31, which at its free end is provided with a lock extension 32, which in turn normally overlies the free end of the supplemental bar 25 and enters into a notch 33 of a lug 34, formed as a lateral extension of the bar 23. In this way the bar 25 is normally locked to the main bar 23. A projection 35 from the lock extension 32 normally overlies the upper end of the guide-clip 29 and holds the same in its lower working position.

The needle-plunger 4, heretofore noted, carries a needle 36, which is secured in a suitable seat, at the inner end thereof, by a set-screw 36^a. (See Figs. 8 and 9.) At the inner end of the needle-plunger 4, just back of the needle-socket, is a vertical passage 37, which at its lower extremity is expanded, so that it splits the lower portion of the inner end of said plunger, as best shown in Fig. 9. This permits the thread, which is to be run down through the perforation 37 and through the eye of the needle 36, to be very readily threaded through the said passages. The needle-plunger 4 receives its reciprocating movements through a bell-crank lever 38, which is pivoted to the bracket 2 and is provided at its inner end with a roller-equipped stud 39, which works in the cam-groove of the peripheral cam 18. The depending arm of the bell-crank lever 38, as shown, works between a pair of roller-equipped studs 40 on the needle-plunger 4.

The gathered ends of the filled sacks are fed to the sewing mechanism by means of an endless feed-chain 41, to the links of which are secured serrated feed-clips 42. The chain 41

runs over four sprockets 43, two of which are positively driven, being rigidly secured to the lower ends of vertical shafts 44, suitably journaled in bearings on the frame 1 and provided at their upper ends with miter-gears 45. The miter-gears 45 mesh with miter-gears 46 of a horizontal counter-shaft 47, mounted in suitable bearings on the frame 1 and provided at its intermediate portion with a worm-gear 48, carried by the horizontal shaft 47. The two idle or loose sprockets 43 are journaled in a laterally-adjustable presser-bar 49, which is subject to set-screws 50, that work through lugs 51 of the frame 1 and press against the adjacent edge of said bar. On its outer edge the presser-bar 49 is provided with a series of overlapping spring-fingers 52, the outer ends of which afford an approximately straight and continuous surface over which the inner surface of the chain 41 runs for a purpose which will hereinafter more fully appear. The gathered and closed end of the sack is passed through a narrow channel formed between the vertical flange 53 of a two-part guide 54 and an opposing vertical flange 55 of a breastplate 56, which breastplate is rigidly but adjustably secured by bolt-and-slot connections 57 to a bearing-plate 58, which in turn is rigidly secured to the lower portion of the bearing 3 of the bracket 2. By reference to Figs. 5 and 6 it will be noted that the horizontal sections of the guide 54 are spaced apart vertically by spacing-thimbles 59 and are held together and to the lower plate of the frame 1 by nutted bolts 60. It will also be noted that the thimbles 59 pass through slots 61 in the presser-bar 49 and that the said presser-bar, its spring-fingers 52, and the feed-chain 41 work freely between the vertically-spaced sections of the guide 54, with the serrated edges of the feed-clips 42 projecting into the feed-channel formed between the parallel flanges 53 and 55, substantially as shown in Figs. 4, 5, and 6. The extremities of the flanges 53 and 55 are rounded, so that they flare from each other. This is important, especially at the extremity of the feed-channel, which is to receive the end of the sack under the action of the feed devices. The thread for the needle 36 passes from a spool (not shown) through guide-eyes 62 on the bracket 2, thence through a tension device presently to be described, thence through a guide-eye 63, carried by the depending end of the bell-crank 38, thence, as shown, through a guide-eye 64 on the bearing 3, and from thence through the perforation 37 in the needle-plunger 4 and through the eye of the needle.

The tension device referred to above is illustrated in detail in Fig. 7, wherein the numeral 65 indicates a headed bolt which is free to slide through a projection 66 of the bracket 2, but is held against rotation therein preferably by being flattened at one side. At its threaded end the bolt 65 is provided with a

nut 67, which on its inner face is serrated and engages with a serrated boss 68 on the said projection 66. On the intermediate portion of the bolt 65 is a pair of cooperating tension-disks 69, which are yieldingly pressed together and the inner member thereof against said projection 66 by means of a coiled spring 70, compressed between the outer disk and the head of said bolt. When the bolt 65 is moved endwise against the spring 70, as indicated by dotted lines in Fig. 7, the nut 67 may be turned so as to vary the tension of the spring 70, and whenever the bolt is released spring 70 throws the serrated surface of the nut against the serrated boss 68 and locks the tension device in its set adjustment.

The tension device above described is not herein claimed, the same being the subject-matter of my copending application, Serial No. 204,158, filed April 21, 1904, entitled "Thread and twine tension device."

The thread z' for the looper 27 passes from a spool (not shown) through guide-eyes 71 on the frame 1, thence through a tension device like that described, thence through a guide-eye 72, carried by an oscillating slack-arm 73, thence through a guide-eye 74 on the frame 1, and from thence through the groove and eye of the looper 27. This second tension device or tension device for the thread z' is identically like that provided for the thread z , previously described, and hence in the drawings is indicated as an entirety with the character y . The slack-arm 73, which is provided for cooperation with the oscillating looper-bar 23 to produce slack for the looper 27, is shown as pivoted to a lug 75 of the frame 1. At its intermediate portion it is provided with a roller-equipped stub 76, which works in the cam-groove of the peripheral cam 19, which, as previously noted, is carried by the shaft 5.

The looper 27 and needle 36 are operated in alternate order, so that the former will pass through the loop of the thread left by the latter, and vice versa, to produce the stitch. In forming this stitch it is the needle 36 that passes through the work—to wit, the gathered end of the sack—while the looper 27 locks the loops formed by the thread delivered by the said needle 36. The needle 36 works through perforations 77 and 78, formed, respectively, in the channel-forming flanges 53 and 55, as best shown in Figs. 8 and 9. The said needle also works between parallel vertically-disposed webs 79 on the upper section of the guide 54. These parallel webs 79 hold upward the loop in the thread z left by the needle 36 as it recedes, and thus holds the loop in such position that the looper 27 will pass therethrough. (For the disposition of the webs or flanges which hold the loops left by the needle and looper see Figs. 8, 9, 12, 10, and 13.) The looper 27 passes over the needle 36 and at the time that it takes up the loop left by the latter engages a depression 36' in said

needle 36. The depression 36' permits the point of the looper 27 to pass very close to the eye of the needle 36 in picking up the loop. The looper 27 likewise, as shown, is provided with a notch 27', into which the point of the needle 36 may pass in picking up the loop of thread left by said looper 27. The needle and looper will of course spring slightly to permit them to pass readily out of engagement with each other after having been engaged, as described. The looper 27 works under a horizontal web 81 of the vertical flange 53, as best shown in Figs. 10, 12, and 13. The horizontal web 81 prevents the loop from rising and insures the same dropping into a groove 82 of the upper section of the guide 54, so that the needle 36 will be sure to pass through the said loop. As shown, the breastplate 56 has lugs 56^a, that work through perforations in the bearing-plate 58 and are subject to set-screws 58^a, which in turn are rigid on said plate 58.

It will be noted that the passage 77 in the flange 53 is elongated. This is important, for it permits the sack to be fed one step at a time without drawing on the thread, and hence without taking up any of the formed loops which are necessary in producing the stitch.

The so-called "gathering device," which is in the nature of an auxiliary feed device operating to feed the sack at a more rapid rate than the normal or primary feed device, will now be described, and for the details thereof attention is particularly called to Figs. 2, 3, and 4. A pair of vertically-disposed shafts 83 are suitably mounted, the one in the bracket 2 and the other in suitable bearings on the frame 1. At their upper ends these shafts 83 are provided with miter-gears 84, that mesh with miter-gears 85 on a driving-shaft 86, suitably mounted in the frame 1 and bracket 2 and, as shown, provided at its outer end with a sprocket 87. At their extreme lower ends the shafts 83 are provided with crank-pins 88, which have a very slight throw or eccentricity. On the cranks 88 are pivoted the inner ends of a pair of so-called "gathering-pawls" 89, the free ends of which are in the form of spring-sections 90, having at their extreme ends teeth 91, that work through suitable slots 92 in the flanges 53 and 55 and directly engage with the mouth of the sack at that portion which has not as yet been taken hold of by the serrated clips of the feed-chain. At their intermediate portions the gathering-pawls 89 are slotted at 93 and work on fulcrum-pins 94, supported one by the bottom plate of the frame 1 and the other by the bearing-plate 58. In Fig. 2 a sack is indicated by dotted lines and marked with the character y' .

Operation: The stitching mechanism of the machine is thrown into an outer action at will by connecting or disconnecting the sliding half-clutch 12 with the half-clutch 10 on the hub of the gear 8. As heretofore indicated,

the cam 18 and the crank 21 on the driven shaft 5 are so timed that the needle 36 and looper 27 will be operated in alternate order and caused to take up the loops of thread formed in succession by the needle and looper. The worm 20 on the said shaft 5 is so timed that it will impart a step of movement to the worm-gear 48, and hence to the feed-chain 41, while the needle 36 is in a retracting position — that is, is withdrawn from the head of the sack. As is evident, the serrated edges of the clips 42 are brought into action on the gathered head of the sack in succession and when thus engaged with the sack press the same against the straight and smooth surface afforded by the guide-flange 55. The tension under which the said clips of the chain will be pressed against the sack may, as already indicated, be varied by adjusting the presser-bar 49. At the same time the spring-fingers 52 yieldingly hold the said clips 42 to their work, but permit them to yield, and hence to follow any irregularities in the folds of the sack.

The gathering-pawls 89 may be driven at any desired relative speed with respect to the speed of the feed movement of the chain 41. In the illustration given the shaft 86 would receive motion from a sprocket-chain, (not shown,) but which would run over the sprocket 87 and be driven from a source independent of the shaft 11. Consequently the shafts 11 and 86 receive independent movements the relative speed of which may be varied, as just stated. As evident, by varying the relative speeds of the gathering-pawls the amount of gather which may be given to the mouth or head of the sack may be correspondingly varied. This is an important feature. It is important to here note, however, that the chain-clips 42, just as they are engaged with the head of the sack, are swung with a pivotal movement, so that their serrated edges at such time receive not only the traveling movement of the chain, but an additional movement due to their pivotal swing, so that they will of themselves gather to a considerable extent the engaged mouth of the sack. This feature is also important, as in some cases additional gathering means will not be necessary.

The guide-eye 63, carried by the arm of the bell-crank 38, serves to draw the slack for the needle 36, and this of course takes place while the said needle is being withdrawn from the work and while the loop of the stitch is being drawn up by the cooperating tension device.

The slack-arm 73 receives its upward movement from the cam 19, while the looper 27 is being retracted or withdrawn from the loop left by the needle 36, so that slack is thereby given to the thread carried by the said looper 27. It will be noted that the eye of the looper at all times lies quite close to the guide-flange 53, so that while in such position it could not be easily threaded. The looper may be easily

threaded, however, whenever the supplemental bar 25 is released from the primary bar 23 in the manner already described and turned upward into the position indicated by dotted lines in Fig. 5.

The "smooth" bearing-surface with which the clips of the endless feed connection cooperate need not necessarily be a continuous or unbroken bearing-surface, but should be smooth in the sense that the work may freely slip over the same.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a machine of the character described, the combination with a guide-channel, for the work, having a smooth bearing-surface, of an endless feed connection having serrated clips engageable with the work to feed the same through said guide-channel and pressing the same against the smooth bearing-surface thereof, and stitch-forming mechanism for action on the work while in said guide-channel.

2. In a machine of the character described, the combination with an endless chain having serrated guide-clips projecting therefrom, of means for intermittently moving said chain, a smooth bearing-surface cooperating with the serrated edges of said clips to hold the work, and stitch-forming mechanism operating on the work while held by said clips and cooperating bearing-surface.

3. In a machine of the character described, the combination with an endless chain having serrated feed-clips projecting therefrom, means cooperating with said clips to hold and carry the work, means for moving said feed-chain, a yielding device pressing the said clips against the work, and stitch-forming mechanism operating on the work while subject to said clips, substantially as described.

4. In a machine of the character described, the combination with an endless chain and guides therefor, of serrated feed-clips secured to and projecting from said chain, a relatively fixed bearing-surface cooperating with said clips to hold the work, a presser-bar having spring projections acting on said chain to yieldingly force said clips against the work, and stitch-forming mechanism acting on the work while subject to said clips.

5. In a machine of the character described, the combination with an endless chain and cooperating guide-sprockets, certain of which are positively driven, of serrated feed-clips secured to and projecting from said chain, a relatively fixed bearing-surface cooperating with said chain to hold and feed the work, an adjustable presser-bar having a plurality of spring-fingers affording an approximately continuous and yielding bearing pressing the said clips to their work, and stitch-forming mechanism acting on the work while subject to said clips.

6. In a machine of the character described, the combination with an endless chain having

serrated feed-clips, of means for coöperating with said clips to hold and guide the work, of a gathering device comprising a pair of reciprocating toothed pawls engageable with the opposite sides of the work, said pawls having spring-sections and a pair of simultaneously-moving cranks driving the said pawls at a proper speed to cause them to gather the work.

7. In a machine of the character described, the combination with a guide-channel forming a smooth bearing-surface, of an endless feed-chain having serrated feed-clips coöperating with said bearing-surface to feed and guide the work, of a reciprocating plunger, a needle carried by said plunger and passing through the work, an oscillating looper-bar provided with a laterally-projecting looper working at an angle to said needle and coöperating therewith, a rotating shaft having a cam and a crank, the said crank operating on the said looper-bar and connections subject to said

cam and operating said needle-plunger, substantially as described.

8. In a machine of the character described, the combination with a needle and a looper and means for alternately moving the same, the one transversely of the line of travel of the other, of guide webs or flanges between which the needle and looper work in the vicinity of the point of their intersection, the said webs closely embracing the said needle and looper and serving to hold the thread-loops left by the said needle and looper, in upright positions, so that they may be readily taken up in alternate order, the one loop by the needle and the other loop by the looper.

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

MILTON C. ELLISON.

Witnesses:

ELIZABETH H. KELIHER,
F. D. MERCHANT.