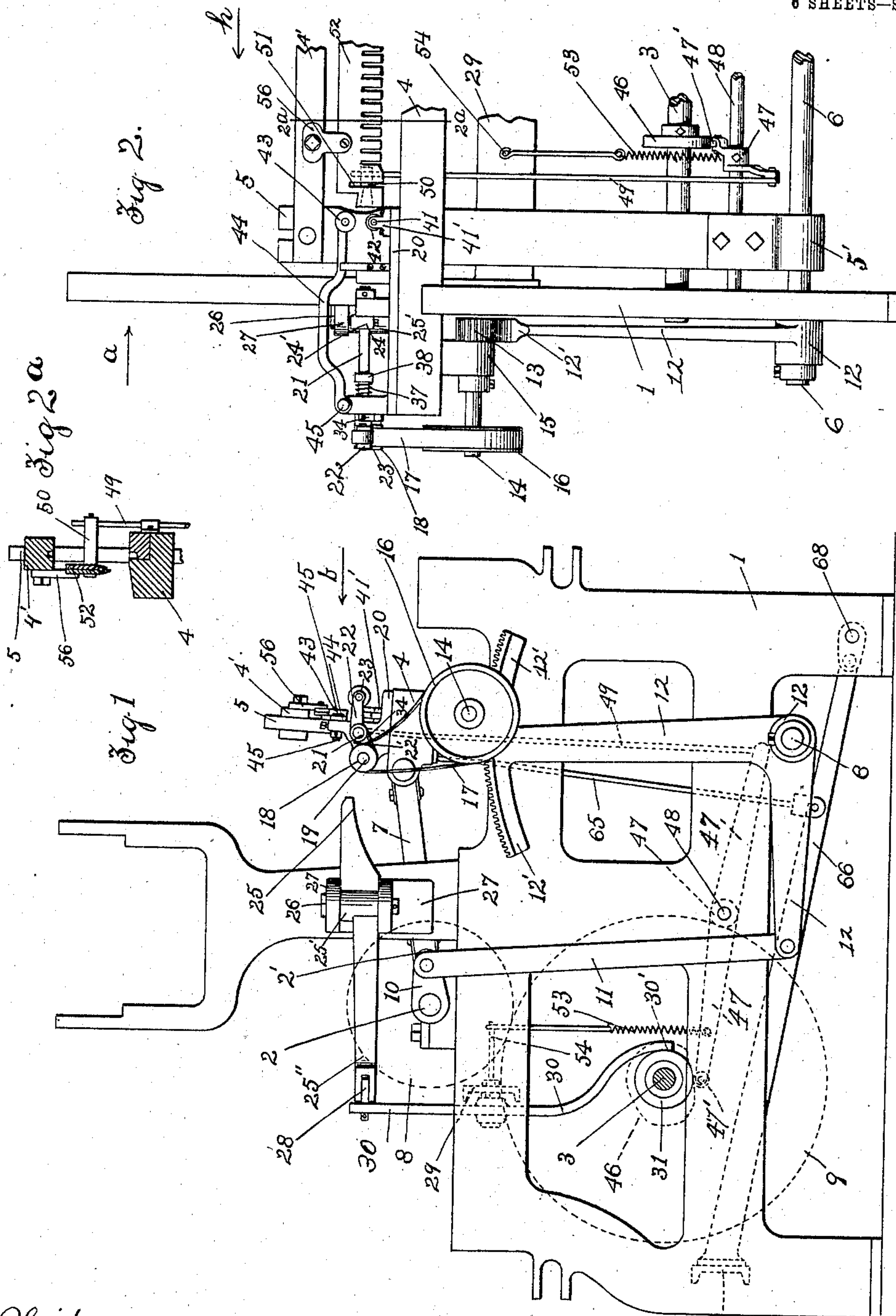


W. WATTIE.
LOOM FOR WEAVING SHORT WEFTS.

APPLICATION FILED MAY 2, 1902.

NO MODEL.

6 SHEETS—SHEET 1.



Witnesses
H. M. Rugg.
M. N. Conger.

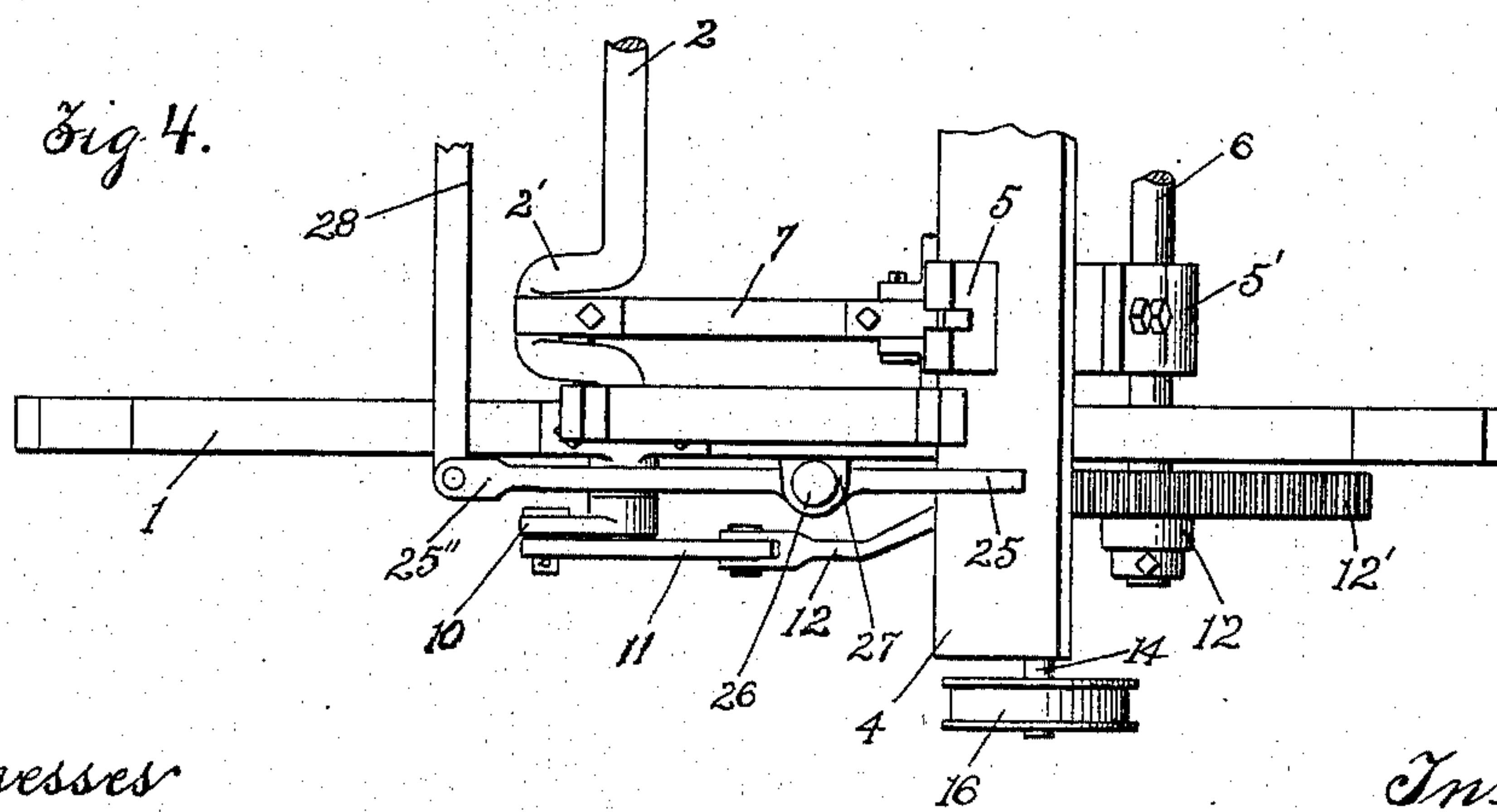
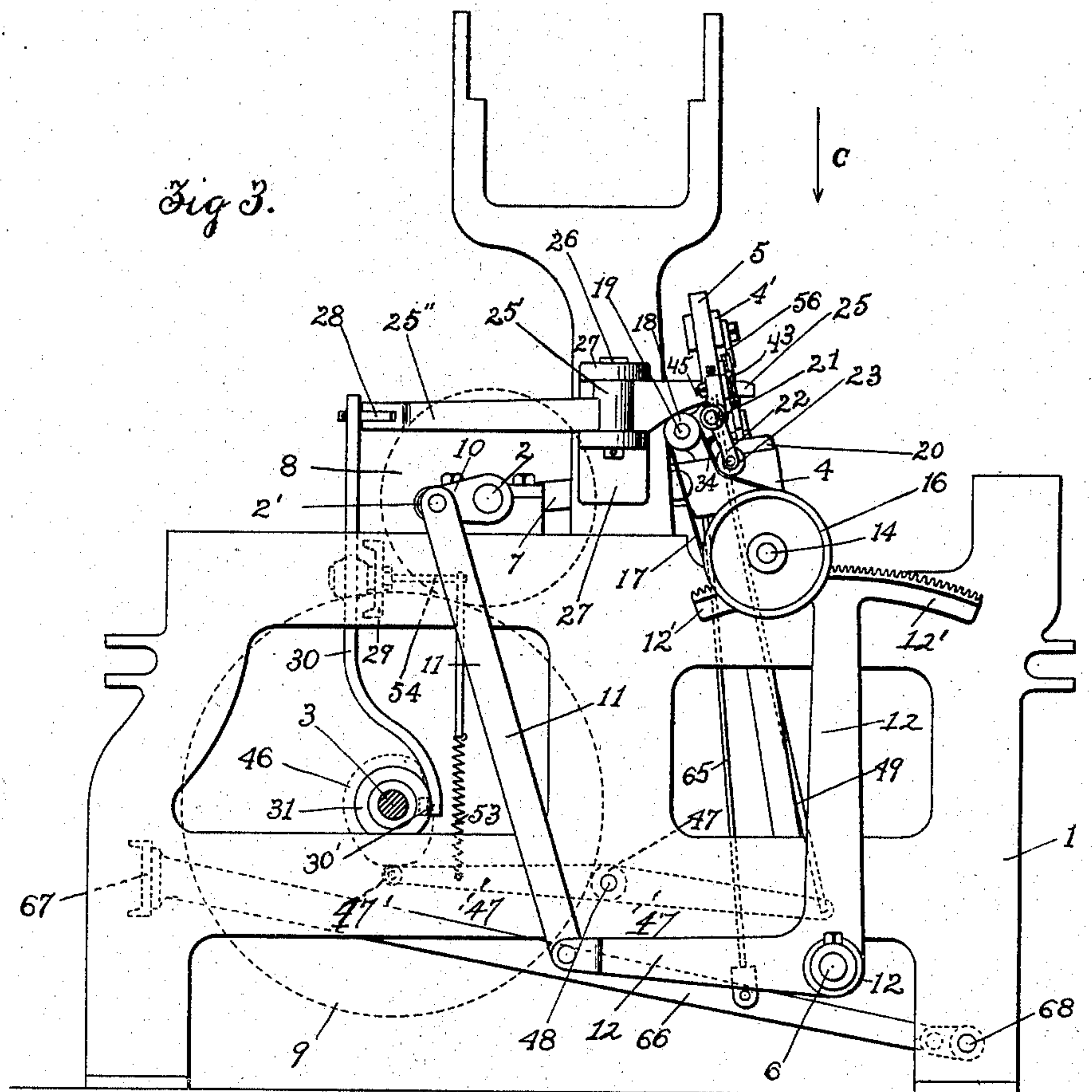
Inventor:
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6 SHEETS—SHEET 2.



Witnesses
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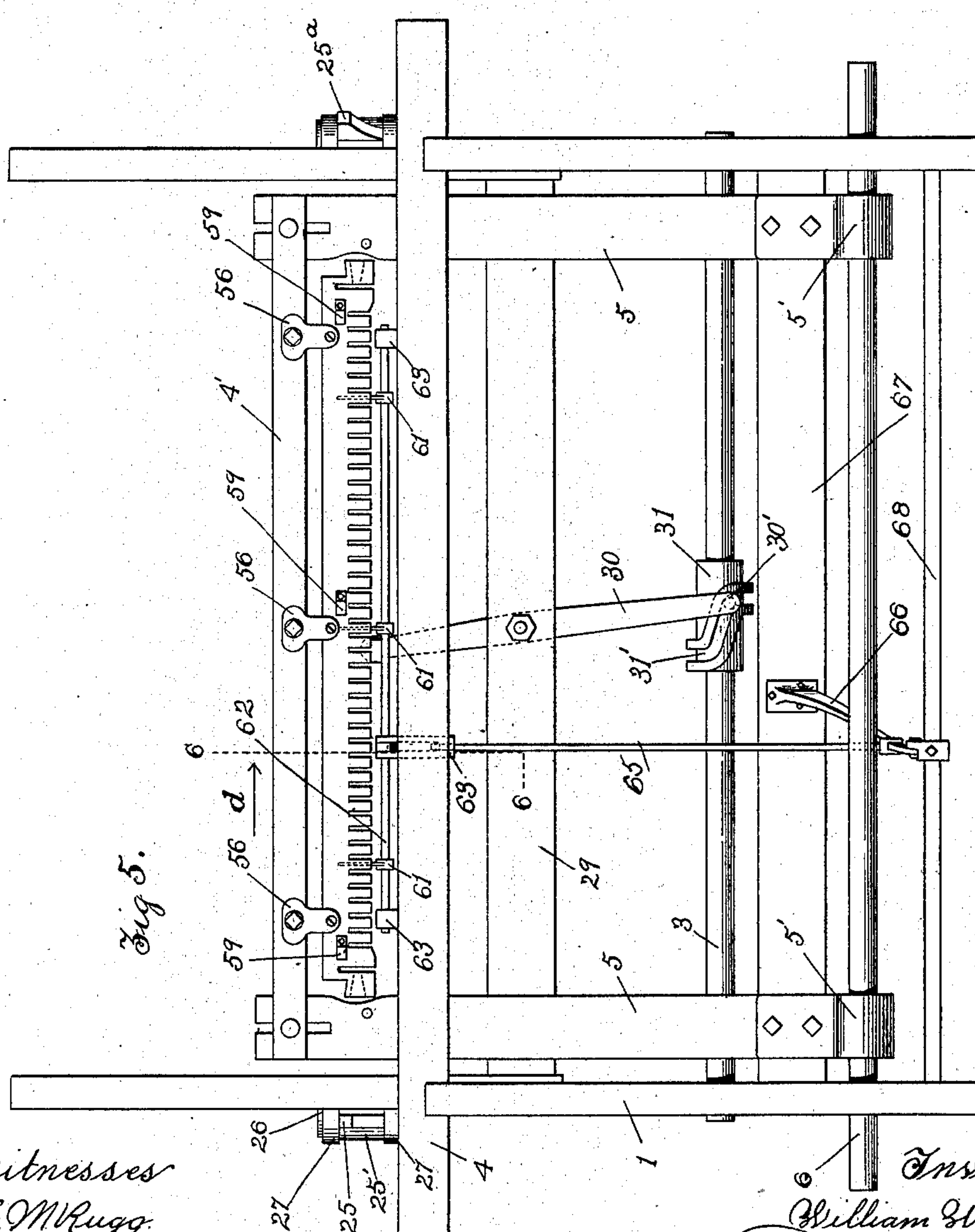
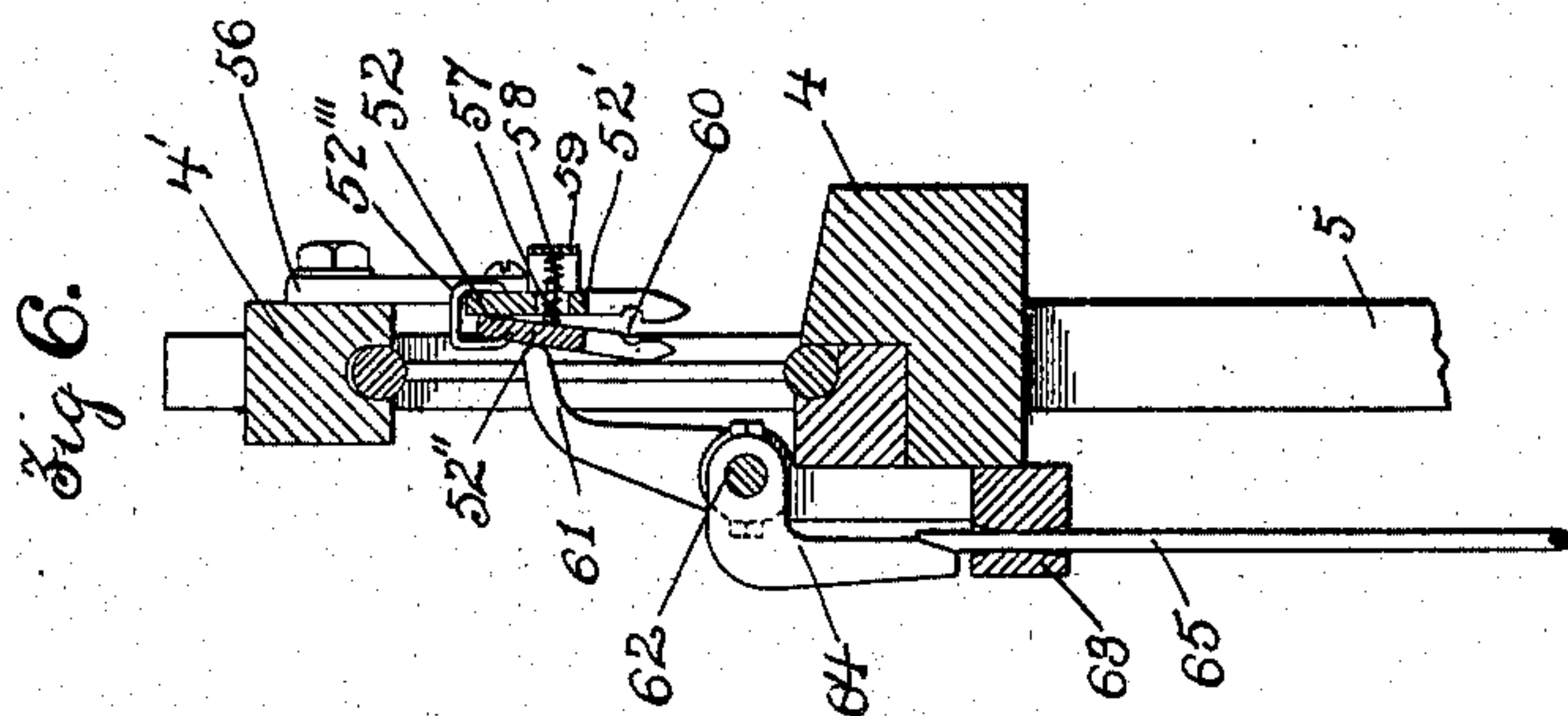
PATENTED OCT. 20, 1903.

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NO MODEL.

6 SHEETS—SHEET 3.



Witnesses
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6 SHEETS—SHEET 4.

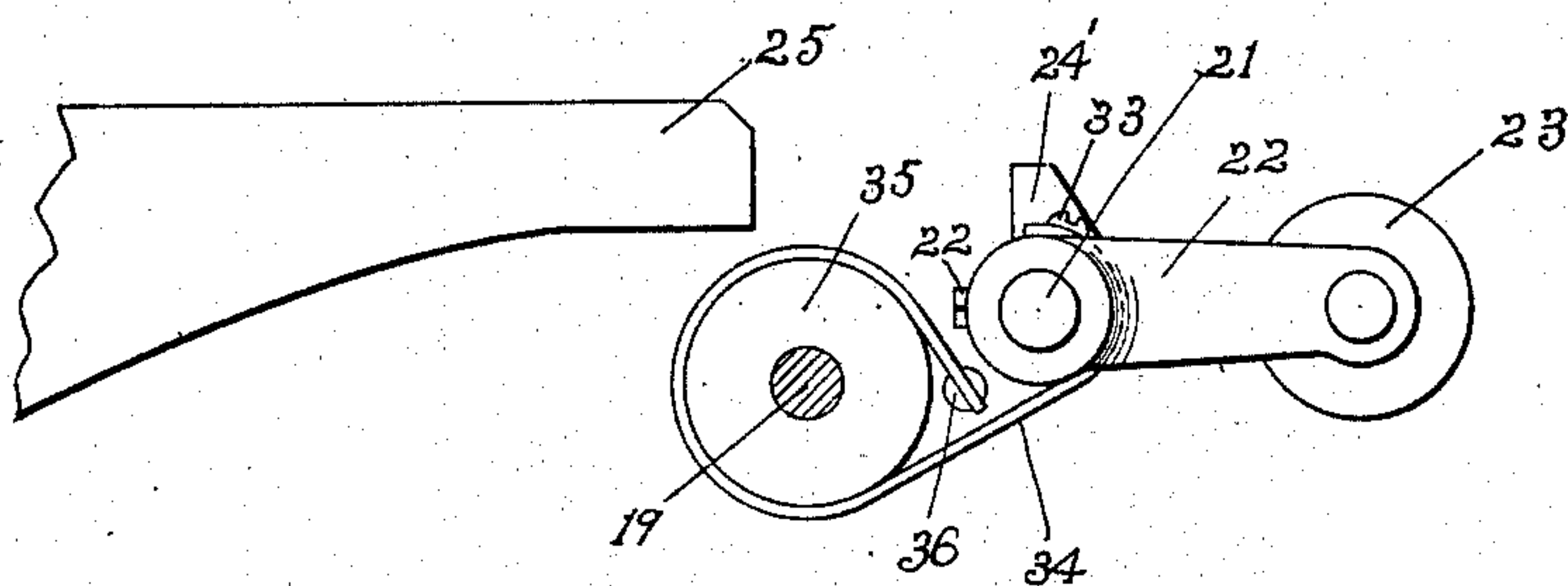
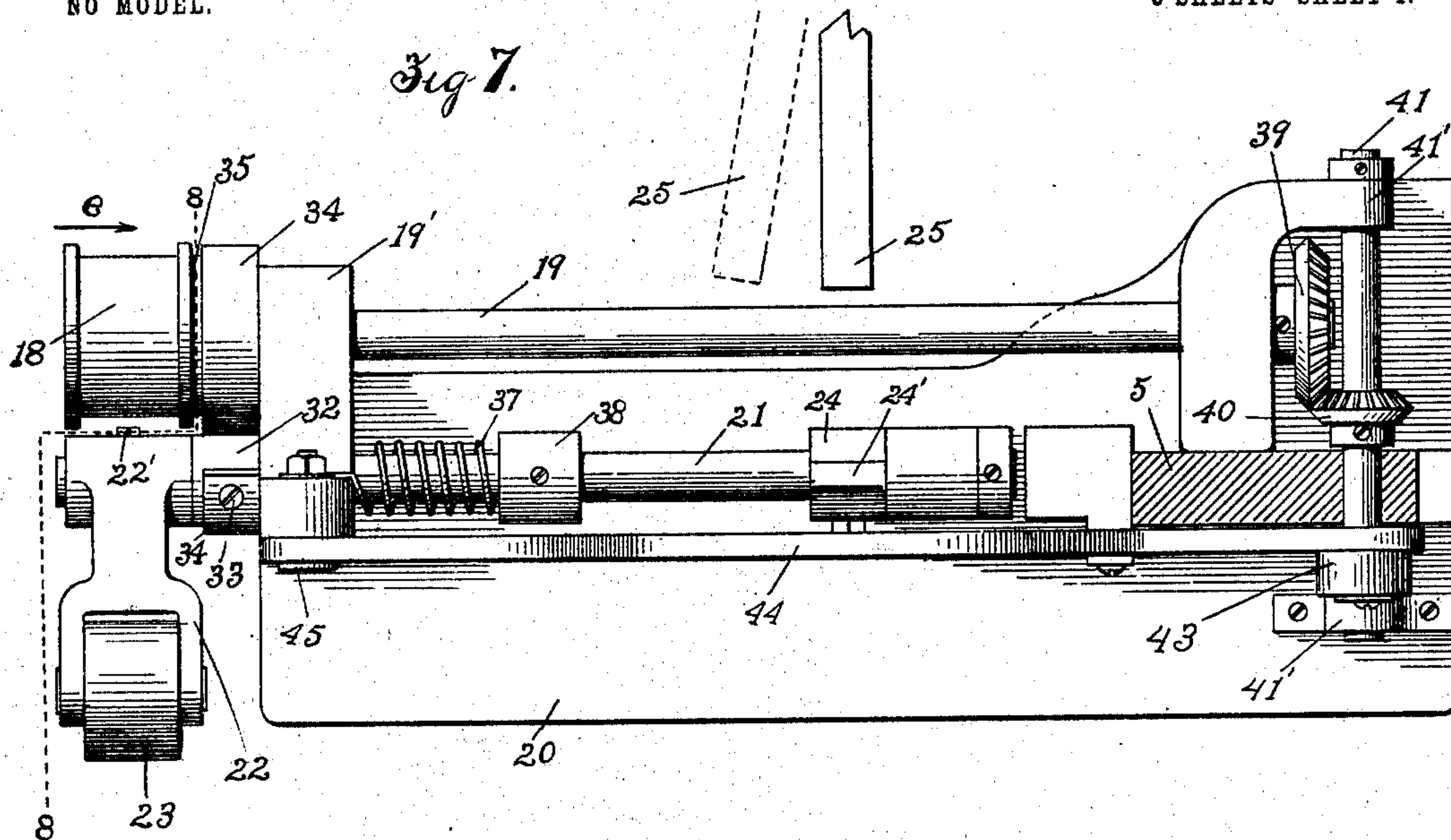


Fig 8.

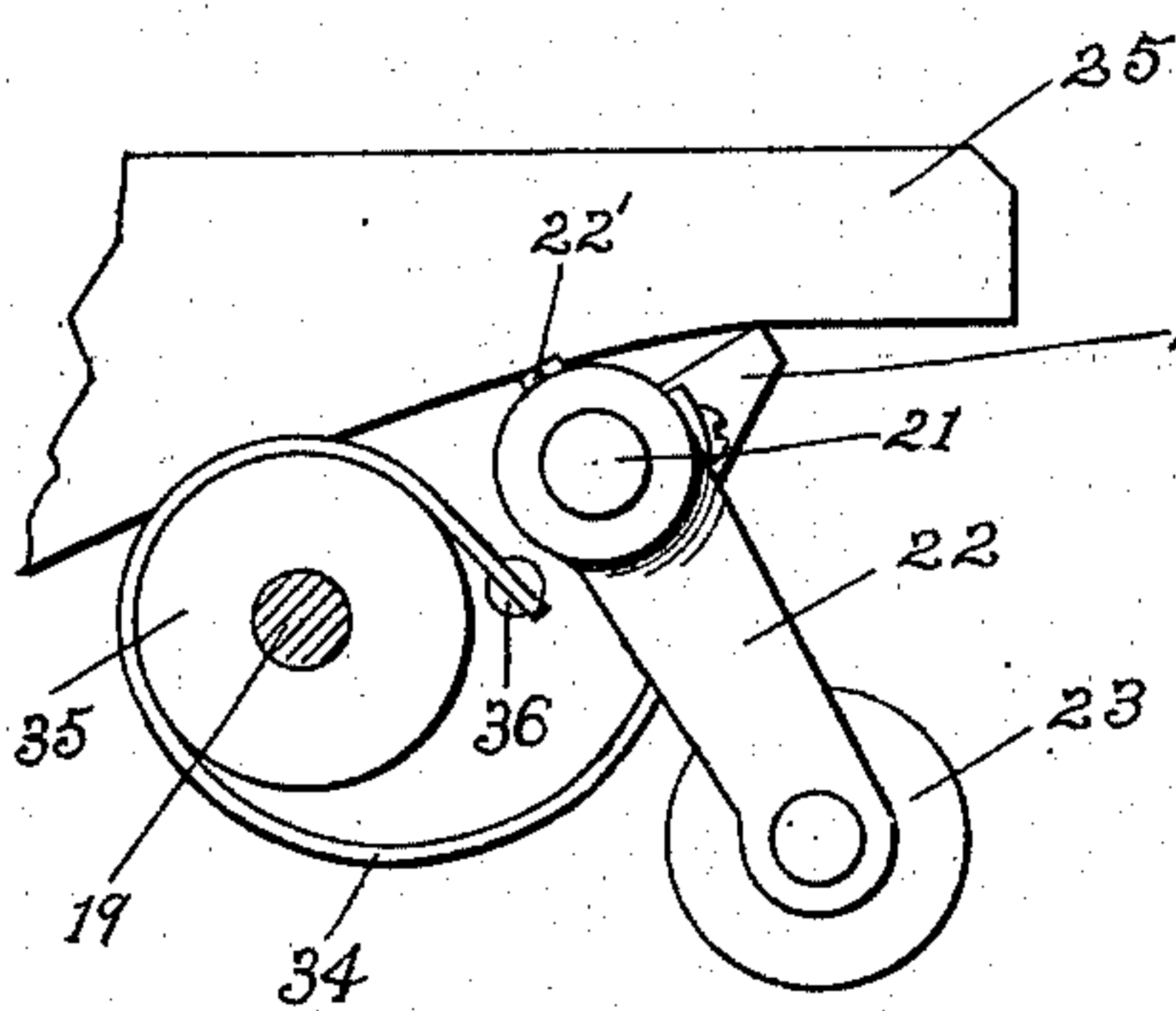


Fig 9

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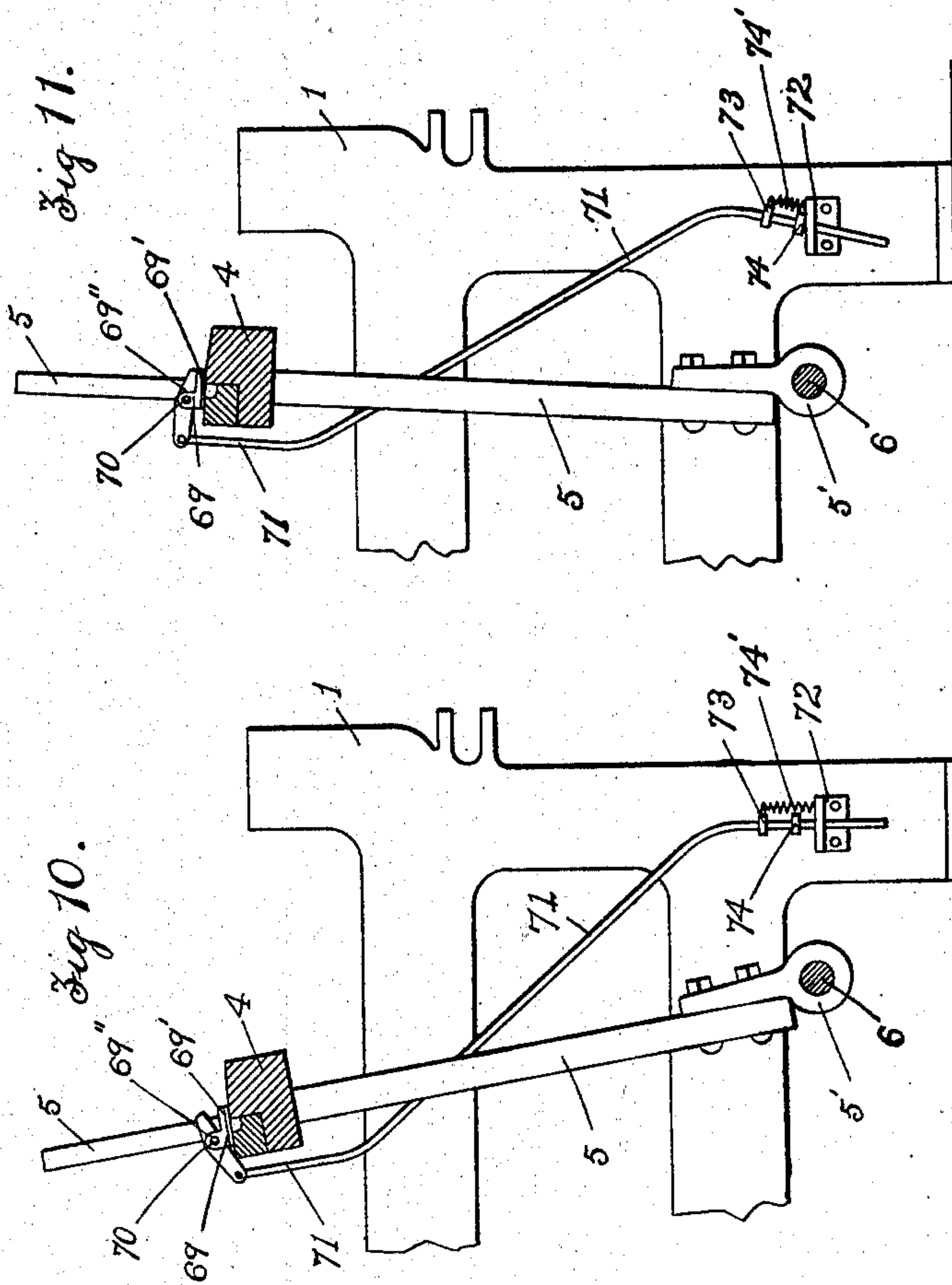
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NO MODEL.

6 SHEETS—SHEET 5.



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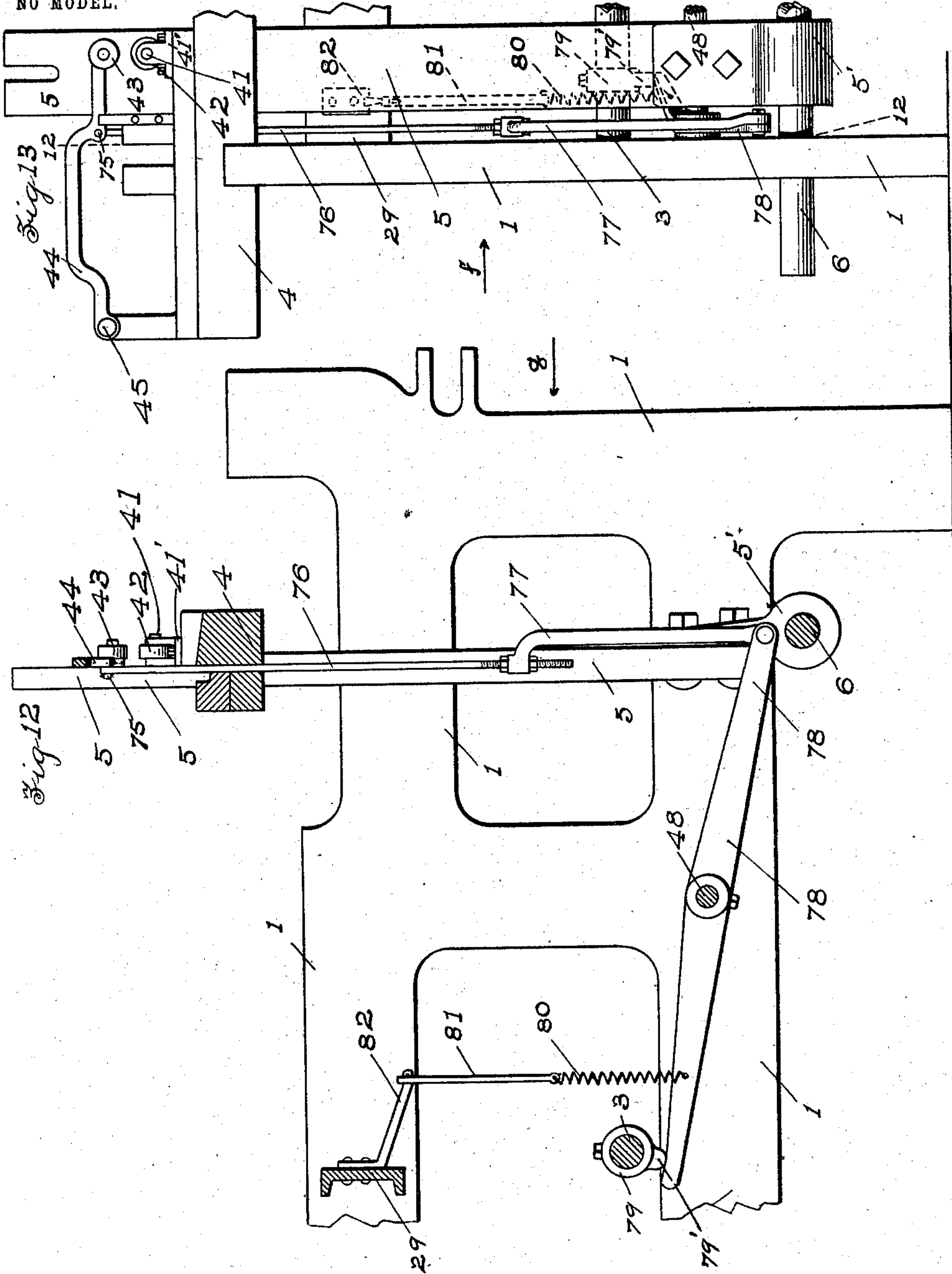
PATENTED OCT. 20, 1903.

W. WATTIE.
LOOM FOR WEAVING SHORT WEFTS.

APPLICATION FILED MAY 2, 1902.

NO MODEL.

6 SHEETS—SHEET 6.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM WATTIE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

LOOM FOR WEAVING SHORT WEFTS.

SPECIFICATION forming part of Letters Patent No. 741,749, dated October 20, 1903.

Application filed May 2, 1902. Serial No. 105,656. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WATTIE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Looms for Weaving Short Wefts, of which the following is a specification.

My invention relates to looms for weaving short wefts, and more particularly for weaving straw matting and similar fabrics; and the object of my invention is to improve upon the ordinary construction of certain parts of the loom referred to, and more particularly to provide improved mechanism for operating the mechanism which carries the filling-straws into the comb preparatory to their being placed in the shed and beaten up by the forward movement of the lay; also, to provide a stop-plate at each end of the comb mechanism through which the filling-straws pass, against which plate the end of the straw will strike; also, to provide a comb of improved construction and improved means for closing the comb during the passage of the filling-straw and for opening it to release the straw previous to the beating-up of the lay; also, to provide supplemental means for automatically trimming the edges of the fabric which is made on the loom without selvage edges.

My invention consists in certain novel features of construction of my improvements in looms for weaving straw matting and similar fabrics, as will be hereinafter fully described.

I have only shown in the drawings sufficient portions of a loom with my improvements applied thereto to enable those skilled in the art to which my invention belongs to understand the construction and operation of my improvements.

Referring to the drawings, Figure 1 is a side elevation of portions of a loom with my improvements applied thereto looking in the direction of arrow *a*, Fig. 2. The lay is in its forward position. Fig. 2 is a front view of the parts shown in Fig. 1 looking in the direction of arrow *b*, same figure. Fig. 2^a is a sectional detail through the lay, taken at a

point indicated by line 2^a 2^a, Fig. 2, looking in the direction of arrow *h*, same figure. Fig. 3 corresponds to Fig. 1, but shows the lay in its rear position. Fig. 4 is a plan view of some of the parts shown in Fig. 3 looking in the direction of arrow *c*, same figure. Fig. 5 is a front view of a portion of a loom, showing certain features of my improvements with some of the parts shown in Figs. 1, 2, and 3 left off. Fig. 6, is on an enlarged scale, a vertical section through the lay on line 6 6, Fig. 5, looking in the direction of arrow *d*. Fig. 7 is, on an enlarged scale, a plan view of the mechanism for carrying the filling-straw into the comb. Said mechanism is shown at the left in Fig. 2. Fig. 8 is a section taken at a point indicated by line 8 8, Fig. 7, looking in the direction of arrow *e*, same figure, showing the friction stop-belt, the rocking lever with roll, and a portion of the operating-dagger. Fig. 9 corresponds to Fig. 8, but shows the opposite position of the parts. Fig. 10 is a detached sectional view through the lay in its backward position, showing my supplemental shearing or trimming attachment for trimming the projecting ends of the filling-straws to make the edges of the fabric, which are without a selvage, even. Fig. 11 corresponds to Fig. 10, but shows the lay in its forward position. Fig. 12 is a detached sectional view through the lay and other parts, taken at a point indicated by line 12 12, Fig. 13, looking in the direction of arrow *f*, same figure, showing the means for operating the top feed-roll; and Fig. 13 shows a front view of the operating mechanism shown in Fig. 12 looking in the direction of arrow *g*, same figure.

In the accompanying drawings, 1 is the loom-frame; 2, the crank-shaft; 3, the bottom or driven shaft; 4, the lay; 5, the lay-sword, bolted at its lower end to a plate 5', mounted on the shaft 6. The lay 4 is operated through connector 7 from the crank 2' of the crank-shaft 2 by the gears 8 and 9. (Shown by broken lines in Figs. 1 and 3.)

The above parts may be of the ordinary construction.

I will now describe my improvements for operating the mechanism which feeds or car-

ries the filling-straws into the loom first from one side of the loom and then from the other in the usual way.

On the end of the crank-shaft 2, on the out-
 5 side of the loom-frame, is fast a crank 10, the end of which is pivoted to the upper end of a connector 11. The lower end of the connector 11 is pivoted to one arm of an angle-lever 12, loosely mounted on the end of the rock-shaft
 10 6. The other arm of the angle-lever 12 has at its upper end a segment-rack 12', which engages a pinion 13, fast on a shaft 14, journaled in a bearing 15, secured to the under side of the lay. (See Fig. 2.) On the outer end of
 15 the shaft 14 is fast a flanged pulley 16, carrying the loose endless belt 17, which passes around the flanged pulley 18, fast on a shaft 19, journaled in bearings 19' on the stand 20, (see Fig. 7,) bolted to the top of the lay at the
 20 end thereof. (See Fig. 1.) A rock-shaft 21 is also journaled in bearings on the stand 20 (see Fig. 7) and has on its outer end an arm 22, secured by a screw 22'. The arm 22 is forked at its outer end and has mounted therein a roll 23, (see Fig. 7,) which roll 23
 25 by the rocking of the shaft 21 is caused to engage the endless belt 17 on pulleys 16 and 18 to tighten said belt, as shown in Fig. 3. On the inner end of the rock-shaft 21, carrying
 30 the arm 22 and the roll 23, is fast a collar 24, having a lip or projection 24' thereon, extending in the path of and adapted to be engaged by the forwardly-projecting end of the dagger 25 on the backward movement of the lay
 35 when the dagger 25 is moved into position to engage the projection 24' on the collar 24, as shown in Fig. 3. The dagger 25 has a hub 25', pivotally mounted on a stud 26, supported in stands 27, secured to the loom side, (see
 40 Fig. 1,) to have a swinging motion in a horizontal plane. A rearwardly-extending arm 25'' on the dagger 25 is slotted at its end and has extending into said slotted end and pivotally connected therewith one end of a con-
 45 nector 28, (see Fig. 4,) which extends transversely across the loom and is pivotally connected at its other end (not shown) with the rearwardly-extending arm of a dagger 25^a, corresponding to the dagger 25, (see Fig. 5,)
 50 to cause the dagger 25^a to move with the dagger 25.

It will be understood that the mechanism shown on one end of the loom in Figs. 1 and 2 is duplicated on the other end of the loom.
 55 (Not shown.)

On a transverse girth 29, secured to the loom side, is centrally pivoted a rocking lever 30, the lower end of which carries a pin or roll 30', which extends into and travels in a cam
 60 groove or track 31' in the cam 31, fast on the bottom shaft 3. (See Fig. 5.) The rotation of the cam 31 through the lever 30 communicates a reciprocating motion in a horizontal plane to the transverse connector 28, attached
 65 at its ends to the rearwardly-extending arms of the daggers 25 and 25^a, as above described,

to simultaneously move said daggers in the same direction and to bring them alternately into engagement with the projection or lip 24' on the collar 24, fast on the rock-shaft 21, on
 70 the backward movement of the lay to rock the shaft 21 and move the arm 22 and cause the roll 23 to engage and tighten the endless belt 17, as shown in Fig. 3. On the rock-shaft 21, adjoining the arm 22, (see Fig. 7,) is fast
 75 a collar 32, which has secured thereto by a screw 33 one end of a friction-belt 34, which passes around the pulley 35, fast on the shaft 19, and is secured to a pin 36 in the stand 20. (See Fig. 8.)
 80

A coiled spring 37, (see Fig. 7,) fast at one end to a stationary part on the stand 20 and secured at its other end to a collar 38, fast on the rock-shaft 21, acts to rotate said shaft 21
 85 to tighten the belt 34 around the pulley 35 and apply friction thereon to stop the rotation of the shaft 19 on the forward movement of the lay when the projection 24' on the collar 24 moves out of engagement with the dagger 25. The rotation of the shaft 21 by the
 90 spring 37 raises the arm 22 and roll 23 to release the endless belt 17, as shown in Fig. 1.

On the inner end of the shaft 19 is fast a bevel-pinion 39, (see Fig. 7,) which meshes with a bevel-pinion 40, fast on the cross-shaft 41,
 95 having bearings 41' on the stand 20. On the outer end of the shaft 41 is fast a roll 42 (see Fig. 2) of the usual construction, on which rests the end of the filling-straw, and which roll, in connection with the roll 43, carried on
 100 one end of a lever 44, (see Fig. 2,) pivoted at its other end on a pin 45 on the stand 20 and moved into engagement with the roll 42 at the proper time in the usual way by mechanism shown in Figs. 12 and 13, acts to feed in
 105 the filling-straw in the usual way.

In Figs. 12 and 13 is shown one form of mechanism for moving the upper feed-roll 43 at the proper time out of and into engagement with the lower feed-roll 42. To a stud
 110 75 on the lever 44 is pivotally attached the upright end of a rod 76. The lower end of said rod is adjustably connected to the upper end of a bar 77. The lower end of said bar is pivotally connected to one end of a lever
 115 78, centrally pivoted on the transverse shaft 48. The other end of the lever 78 is held in engagement with the cam 79, fast on the bottom shaft 3, by a spring 80, attached at one
 120 end to said lever 78 and at its other end to a link 81, said link being attached to a bracket 82, secured to the cross-girth 29. (See Fig. 12.) The revolution of the cam 79 through the engagement of the cam-surface 79' with the lever 78 and through the bar 77, rod 76,
 125 and lever 44 communicates a positive upward motion to the feed-roll 43 at regular intervals to cause it to be moved out of engagement with the lower feed-roll 42. As the cam-surface 79' on the cam 79 passes out of engage-
 130 ment with the lever 78 the spring 79 and the weight of the lever 44 act to move down-

wardly the lever 44 and bring the roll 43 into engagement with the roll 42 to feed in the straw in the usual way.

The operation of the mechanism above described for feeding the filling-straw into the loom during the backward movement of the lay is briefly as follows: From the crank-shaft 2 through the crank 10, connector 11, and angle-lever 12 a continuous and regular reciprocating motion is communicated to the segment-gear 12' and through pinion 13 and shaft 14 to the pulley 16 and through the endless belt 17 on the tightening of the belt, as shown in Fig. 3, to the pulley 18, the shaft 19, the beveled pinions 39 and 40, the shaft 41, and the roll 42, on which roll rests the end of the filling-straw to be fed into the loom, held thereon by the roll 43 on the end of the lever 44, which is lowered into engagement with the roll 42 at the proper time, as above described. On the backward movement of the lay either the projecting dagger 25 or the projecting dagger 25^a, according to which side of the loom the filling-straw is fed in, engages the projection 24' on the collar 24 to rock the shaft 21 and release the friction-belt 34 and at the same time move the roll 23 into engagement with the endless belt 17, as shown in Fig. 3, and cause through said belt the rotation of the shaft 19 and the roll 42 through intermediate mechanism. On the forward beat of the lay the disengagement of the projection 24' on the collar 24 from the dagger 25 allows the coil-spring 37 to operate to rotate the shaft 21 and to move the arm 22, carrying the roll 23, out of engagement with the endless belt 17 to leave said belt loose. At the same time the friction-belt 34 is tightened on the pulley 35 to stop the rotation of the shaft 19. When the filling-straw is fed in from the opposite side of the loom, this same operation is repeated by mechanism (not shown) on that side of the loom.

It will be seen that by means of the segment-gear 12' a continuous positive motion is communicated first in one direction and then in the other to the pinion 14 and the pulley 16; but this motion is communicated by the endless belt 17 to the pulley 18 and the shaft 19 only in one direction on the tightening of the belt 17 to feed in the filling-straws.

The daggers 25 and 25^a are simultaneously moved by one mechanism to bring one dagger into position to engage the projection 24' on the collar 24 on the rock-shaft 19 and the other out of position, and vice versa.

I will now describe the stop-plate and operating mechanism which acts as a stop at each end of the comb through which the filling-straw is guided and against which the end of the straw strikes and is stopped.

On the bottom shaft 3 is fast a cam 46, on the periphery of which travels a pin or roll 47' on one end of a lever 47, centrally mounted on a transverse shaft 48. (See Fig. 2.) The other end of said lever 47 has piv-

otally attached thereto the lower end of an upright rod 49, on the upper end of which is secured a plate 50, which has a vertical motion in a vertical slot 51 in the end of the comb 52. (See Fig. 2 and Fig. 2^a.) A spring 53, connected at one end to the lever 47 and at its other end to a pin 54, extending from the girth 29, acts to hold the lever 47 in engagement with the cam 46. (See Fig. 1.)

It will be understood that the mechanism above described is duplicated on the other end of the loom.

The operation of the stop-plate for the filling-straw is as follows: As the filling-straw passes through the comb 52 from the other side of the loom the stop-plate 50, through the action of the cam 46 on the lever 47 and the rod 49, moves up into the longitudinal groove or opening in the comb 52 (see Fig. 2 and Fig. 2^a) and into the path of the filling-straw, passing through said groove and stops the filling-straw when it reaches the end of the comb. As the lay moves forward the comb 52 opens, operated by mechanism to be hereinafter described, and allows the filling-straw to drop down into the shed preparatory to the beating up of the lay. As the lay returns to its rearward position the stop-plate 50 is moved downward through the operation of the cam 46, lever 47, and rod 49 preparatory to the feeding in of the straw on that end of the loom, while the stop-plate (not shown) at the opposite end of the comb 52 is moved up into the longitudinal opening in the comb 52 to engage the end of the filling-straw fed in from the opposite side of the loom.

The stop-plate 50 for the filling-straw has three movements. When the stop-plate 50 is in an extreme lowered position, the stop-plate (not shown) at the other end of the comb dwells in its extreme upward position. As the stop-plate 50 is raised to the center of the longitudinal opening in the comb 52 and dwells there the stop-plate on the other end of the loom drops to its lowest position. As the stop-plate 50 completes its upward movement the stop-plate on the opposite side of the loom dwells in the center, and so on—that is, each stop-plate has a complete downward movement and two upward movements.

I will now describe the construction of the comb 52.

The comb 52 consists of two transverse bars or parts 52' and 52'', connected at their upper edges, as is customary, and extends directly in front of the reed 55. (See Fig. 6.) The front part 52' of the comb 52 is secured to the front of the hand-rail 4' on the lay 4 by means of the three brackets 56. (See Figs. 5 and 6.) The back part 52'' of the comb 52 is movably connected at its upper edge to the front part 52' by metal loops 52''' (see Fig. 6) and has extending out therefrom in this instance three pins 57, which pass through openings in the front part 52' and are encircled by spiral springs 58, which bear at one end against the

front face of the back part 52'' of the comb 52 and at their other ends against the plates 59, secured to the front part 52' of the comb 52. (See Figs. 5 and 6.) The action of the springs 58 is to spread apart the lower ends of the comb 52, as shown in Fig. 6, to release the filling-straw held in the longitudinal grooved or recessed portion 60 in the comb 52 and allow the filling-straw to drop into the shed to be beaten up on the forward beat of the lay. The outer ends of the groove 60 in the comb 52 are preferably made flaring, as shown by broken lines in Fig. 5. The back part 52'' of the comb 52 is pressed against the front part 52' against the action of the springs 58 to hold the two parts of the comb together and form the inclosed longitudinal groove or opening 60 to receive the filling-straw as it is fed into the loom by means of three arms or fingers 61, fast on a rock-shaft 62, mounted in bearings on the stands 63, secured to the rear of the lay. (See Fig. 6.) Also fast on the rock-shaft 62 is a downwardly-extending arm 64, having its lower inner end beveled to be engaged by the upper beveled end of a vertically-moving rod 65, which at its upper end is adapted to extend loosely through an opening in the lower part of the stand 63. The lower end of the rod 65 is pivoted on a bar 66, extending between the rear girth 67 and the transverse rod 68 at the front of the loom. (See Figs. 3 and 5.)

The operation of the mechanism above described for closing and opening the comb 52 to release the filling-straw is as follows: On the backward stroke of the lay the upward movement of the rod 65, engaging the lower end of the arm 64, will move said arm and rock the shaft 62 and cause the fingers 61 to bear against the back part 52'' of the comb 52 and press it at its lower end against the front part to form the closed opening or groove 60 in the lower part of the comb to receive the filling-straw as it is fed into the loom. On the forward stroke of the lay the withdrawal of the rod 65 from engagement with the arm 64 will allow the springs 58 to act to move the back part 52'' of the comb 52 away from the front part 52' to open the lower part of the comb, as shown in Fig. 6, and release the filling-straw.

I will now describe the supplemental shearing or trimming attachment (shown in Figs. 10 and 11) for trimming the ends of the filling-straws or the edges of the fabric when a selvage is not made on the fabric by mechanism (not shown) of ordinary and well-known construction.

At each end of the lay and outside of the ends of the comb 52 one member 69' of the shears 69 is secured upon the top side of the lay. The other member 69'' of the shears 69 is pivotally mounted on a pin 70 on the stationary member 69', and said member 69'' has attached thereto the upper end of a rod 71. The lower end of said rod 71 extends loosely through the stand 72, secured to the loom-

frame. Fast to the lower end of the rod 71 are the two collars 73 and 74. To the collar 73 is secured one end of a spiral spring 74'. The other end of said spring 74 is fast to the stand 72.

The operation of the shears is as follows: As the lay moves forward the rod 71 moves down upon the stand 72 until the lower collar 74 strikes the top of the stand 72. Then the rod 71 moves the member 69'' of the shears 69 down onto the other member 69', as shown in Fig. 11, to cut off the end of the straw extending between the members 69' and 69'' of the shears 69. As the lay moves back the spiral spring 74' acts to draw on the rod 71 and open the shears, as shown in Fig. 10.

It will be understood that where the selvage is formed on the edges of the fabric, as in the ordinary construction of straw-matting, the shear mechanism will not be used; but where a selvage is not formed on the edge of the fabric and the fabric is used for curtains, &c., the shears may be used to automatically trim the edges of the fabric.

The operation of my improvements will be readily understood by those skilled in the art from the above description, in connection with the drawings, and briefly is as follows: The loom is started and a filling-straw is placed on the feed-roll 42 on one side of the loom. The roll 43 is then brought into engagement with the roll 42 to hold the straw down on the roll 42, and the revolution of the roll 42 by the mechanism described herein feeds the filling-straw into the recessed part of the closed comb and against the stop-plate at the opposite end of the comb. As the lay moves forward the comb opens and the filling-straw drops into the shed preparatory to the beating up of the lay. As the lay returns to its rearward position the stop-plate which was engaged by the filling-straw is lowered and the stop-plate at the opposite end of the comb is raised preparatory to engaging the end of the filling-straw fed in from the other side of the loom. The filling-straw is then fed in from the opposite side of the loom, and the operation is repeated, filling-straws being fed in alternately first from one side of the loom and then from the other side of the loom in the usual way, the comb being closed to receive the straw within the recess therein and being opened to release the straw preparatory to the beating up of the lay.

In case the supplemental shearing or trimming attachment is used the projecting ends of the filling-straws on each side of the loom are cut off by the shearing mechanism as the lay moves forward.

The advantages of my improvements will be readily appreciated by those skilled in the art.

I have simplified the construction of some of the parts ordinarily used in the class of looms referred to and have rendered their operation more positive and accurate.

It will be understood that the details of construction of my improvements may be varied, if desired.

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

1. In a loom for weaving short wefts, rolls for feeding in the short wefts, a shaft carrying one of said rolls, gear connection to a second shaft, and said second shaft, a pulley thereon, belt connection to a pulley on another shaft, and said pulley and shaft, a pinion on said shaft, a gear-segment meshing with and rotating said pinion, first in one direction and then in the other, and means for communicating motion to said gear-segment, and means for tightening the belt connection, substantially as shown and described.

2. In the feed-roll mechanism of a loom for weaving short wefts, the combination with a segment-gear and pinion, for operating a belt-pulley, and means for operating the segment-gear, of said belt-pulley, loosely belted to a second pulley, and said second pulley, and intermediate connections to one of the feed-rolls, and means for tightening the belt, between the two belt-pulleys, at regular intervals, to cause the feed-rolls to operate, substantially as shown and described.

3. In a loom for weaving short wefts, the combination with the feed-rolls, at each side of the loom, and mechanism for communicating a positive rotary motion to one of said feed-rolls, said mechanism comprising as a part thereof, two pulleys loosely belted together, of means for tightening the belt between said two pulleys, said means comprising a rocking arm, at each side of the loom,

two daggers, a connection between said daggers, and means for simultaneously moving the daggers, to bring one into operative position to operate one rocking arm, and the other into inoperative position, substantially as shown and described.

4. In a loom for weaving short wefts, the combination with the comb made in two parts and having a longitudinal opening or recess therein to receive the weft, of a stop-plate at each end of the comb, and means for moving said stop-plates to carry one into, and the other out of the path of the weft, as it is fed into the longitudinal opening or recess in the comb, substantially as shown and described.

5. In a loom for weaving short wefts, the combination with the comb made in two parts, and having a longitudinal opening therein to receive the weft, of means for positively bringing together the two parts of the comb, to close the opening therein on the backward movement of the lay, substantially as shown and described.

6. In a loom for weaving short wefts, the combination with the comb made in two parts, and having a longitudinal opening therein for the weft, of means for positively bringing together the two parts of the comb to close the opening therein on the backward movement of the lay, and means for moving apart the two parts of the comb to open the opening therein on the forward movement of the lay, substantially as shown and described.

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Witnesses:

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