

No. 673,006.

Patented Apr. 30, 1901.

J. L. & J. E. LEE.

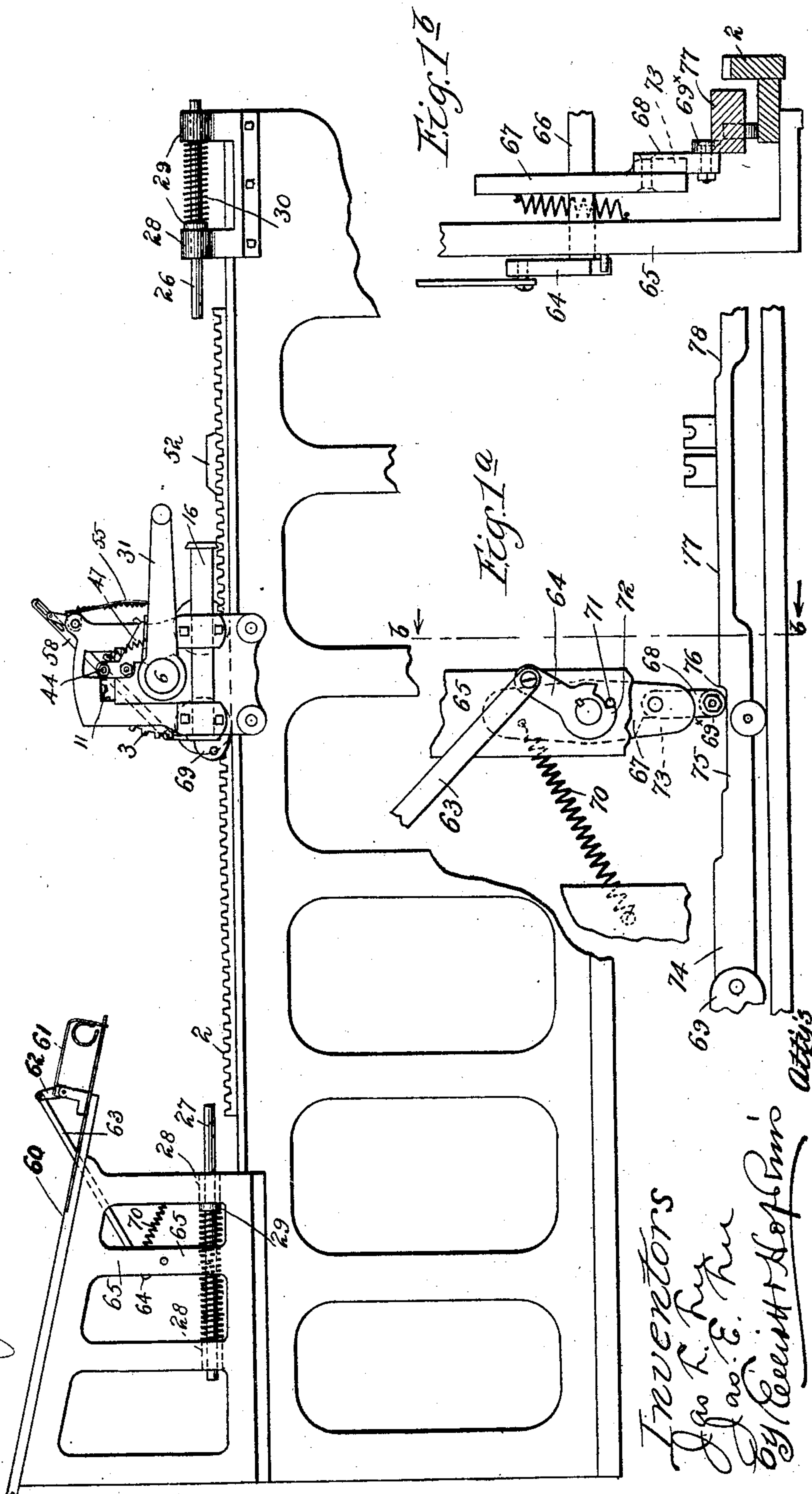
PRINTING PRESS.

(Application filed Sept. 19, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



Witnesses
Wm. M. Rye
Chas. E. Johnson

Inventors
Jas. E. Lee
Jas. E. Lee
By E. E. Lee

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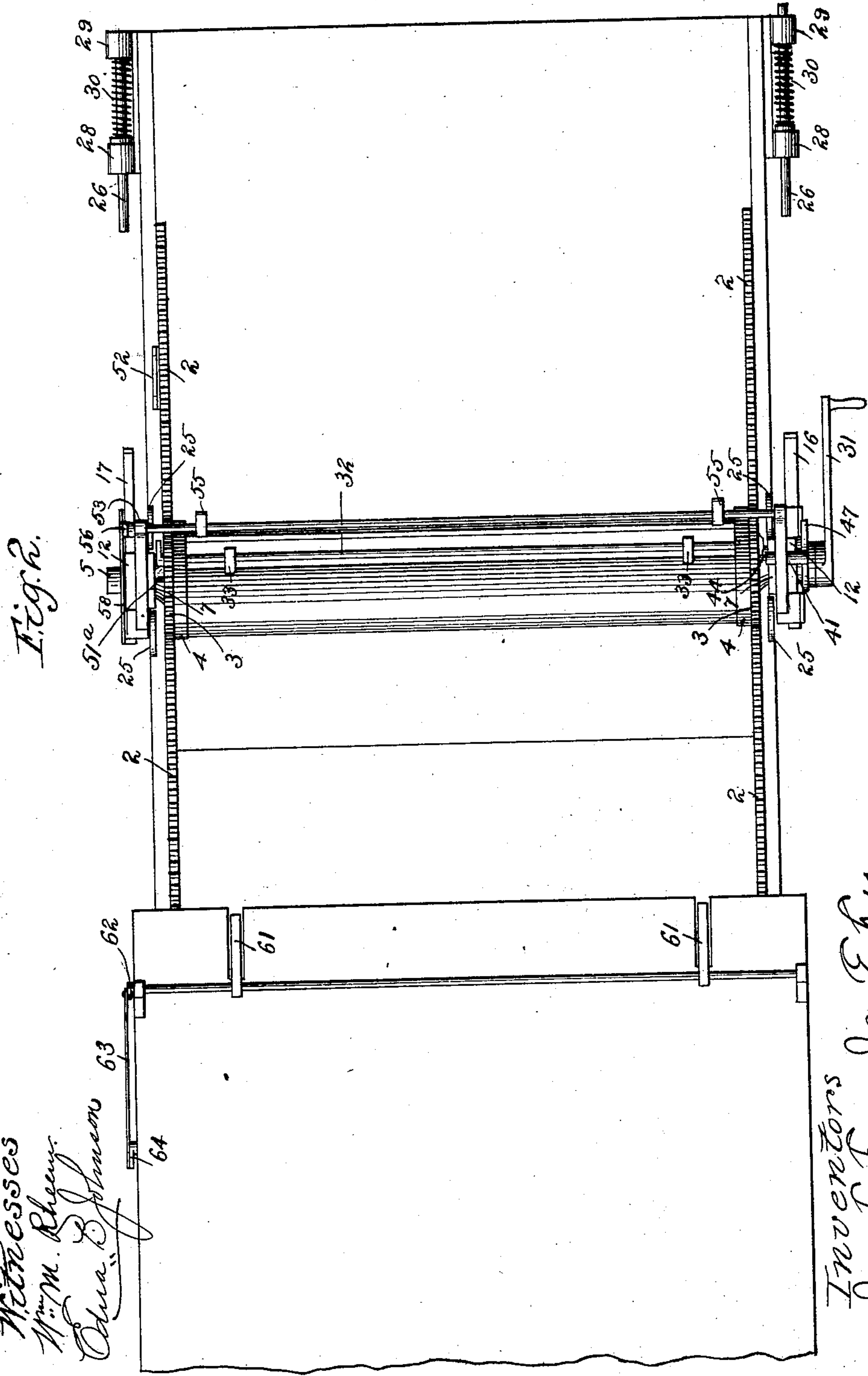
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J. L. & J. E. LEE.
PRINTING PRESS.

(Application filed Sept. 19, 1898.)

4 Sheets—Sheet 2.

(No Model.)



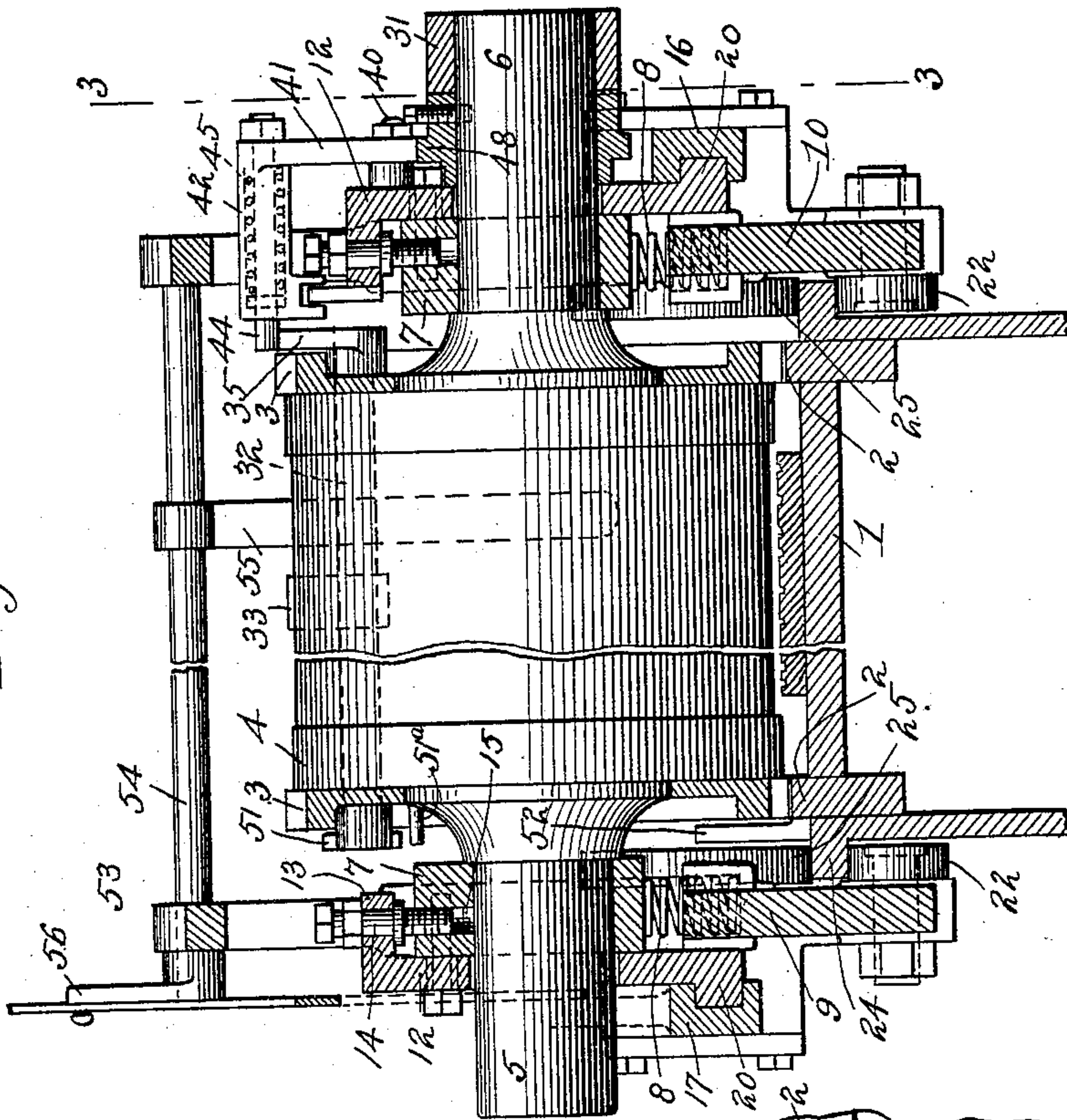
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4 Sheets—Sheet 3.

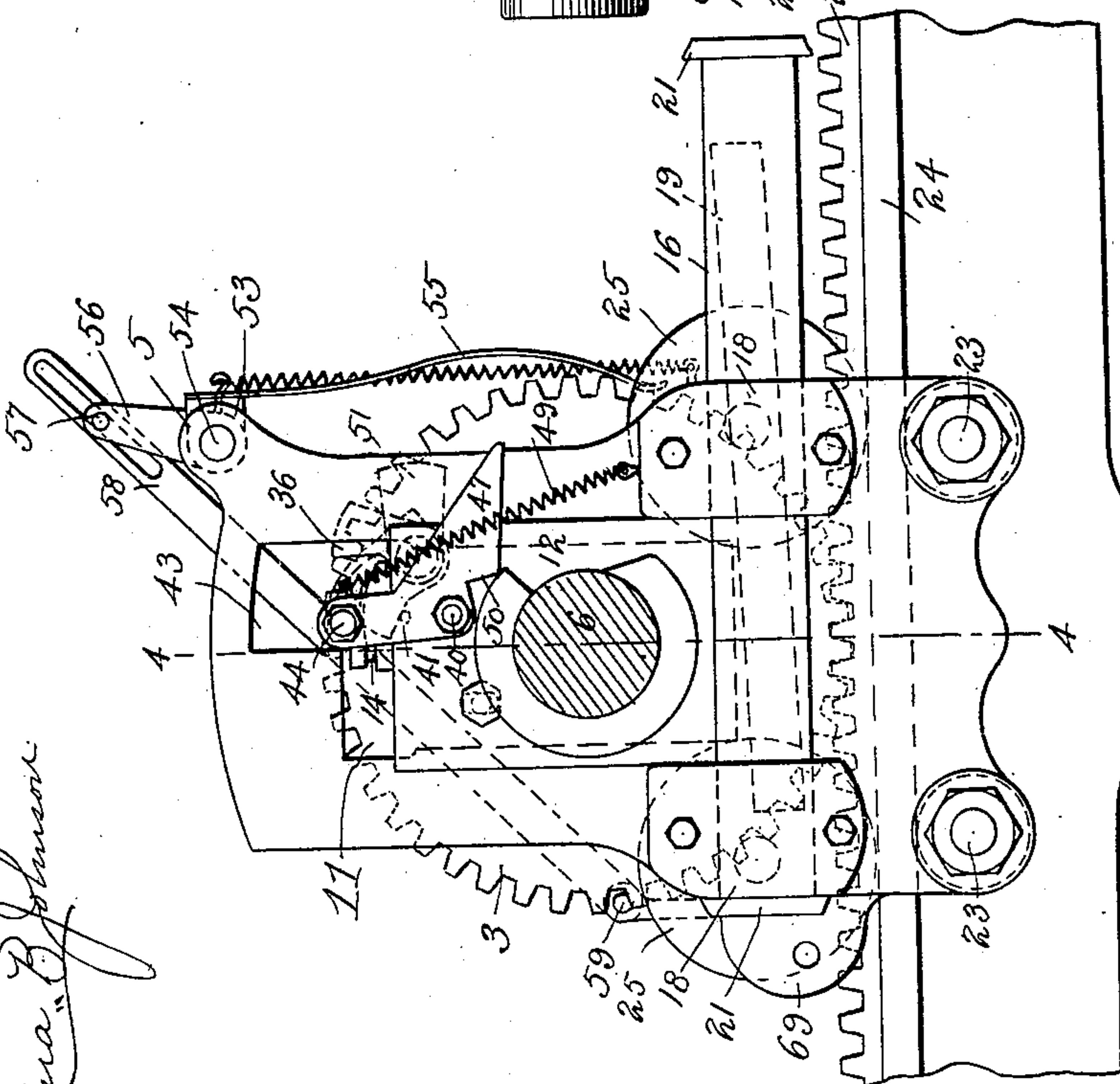
(No Model.)

Fig. 1.



Witnesses
Wm. M. Rheam.
Chas. B. Johnson

Fig. 3.



Inventors
Jas. L. Lee
Jas. E. Lee
by Cecilio H. Hoffmann
Attys

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4 Sheets—Sheet 4.

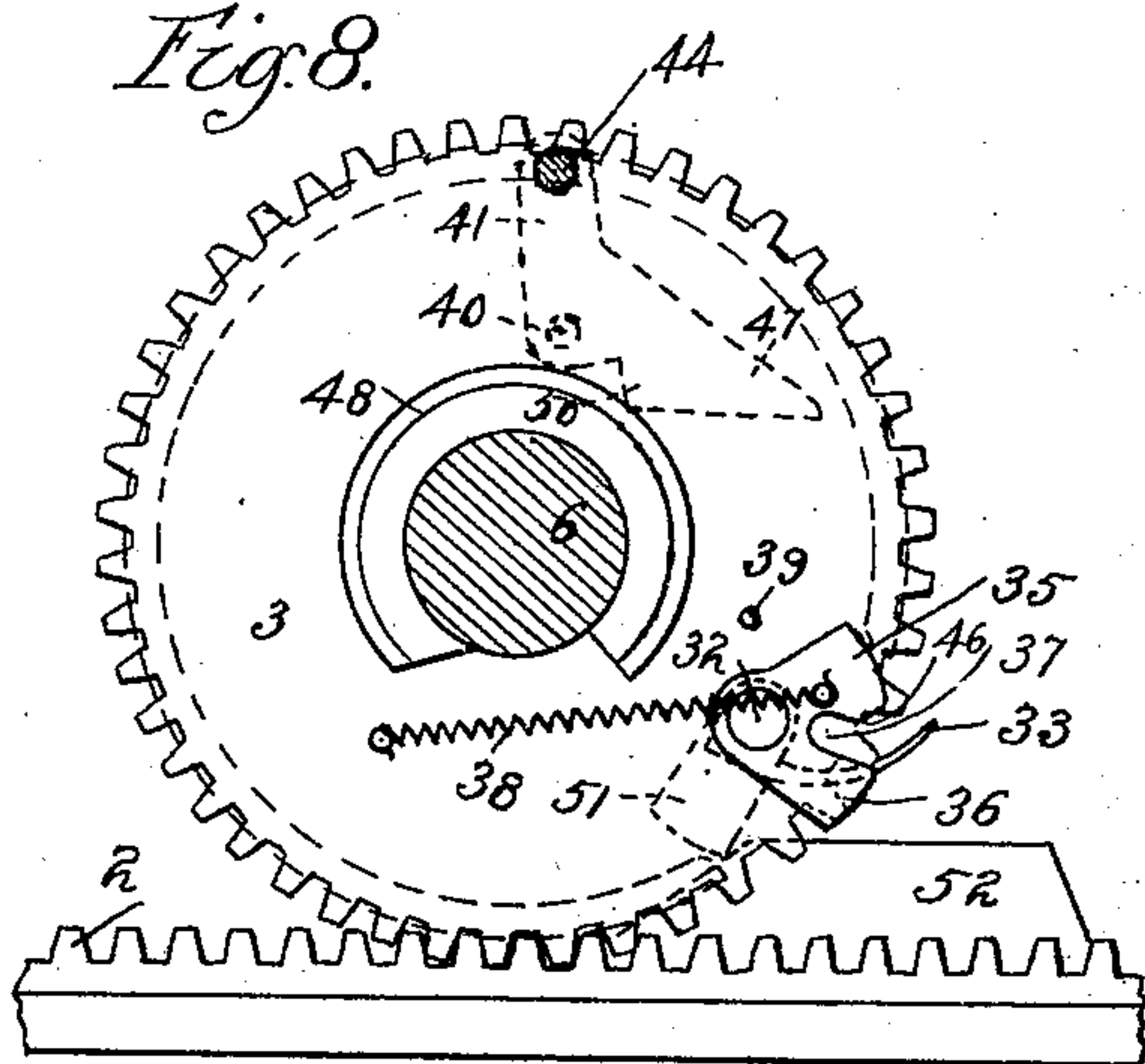
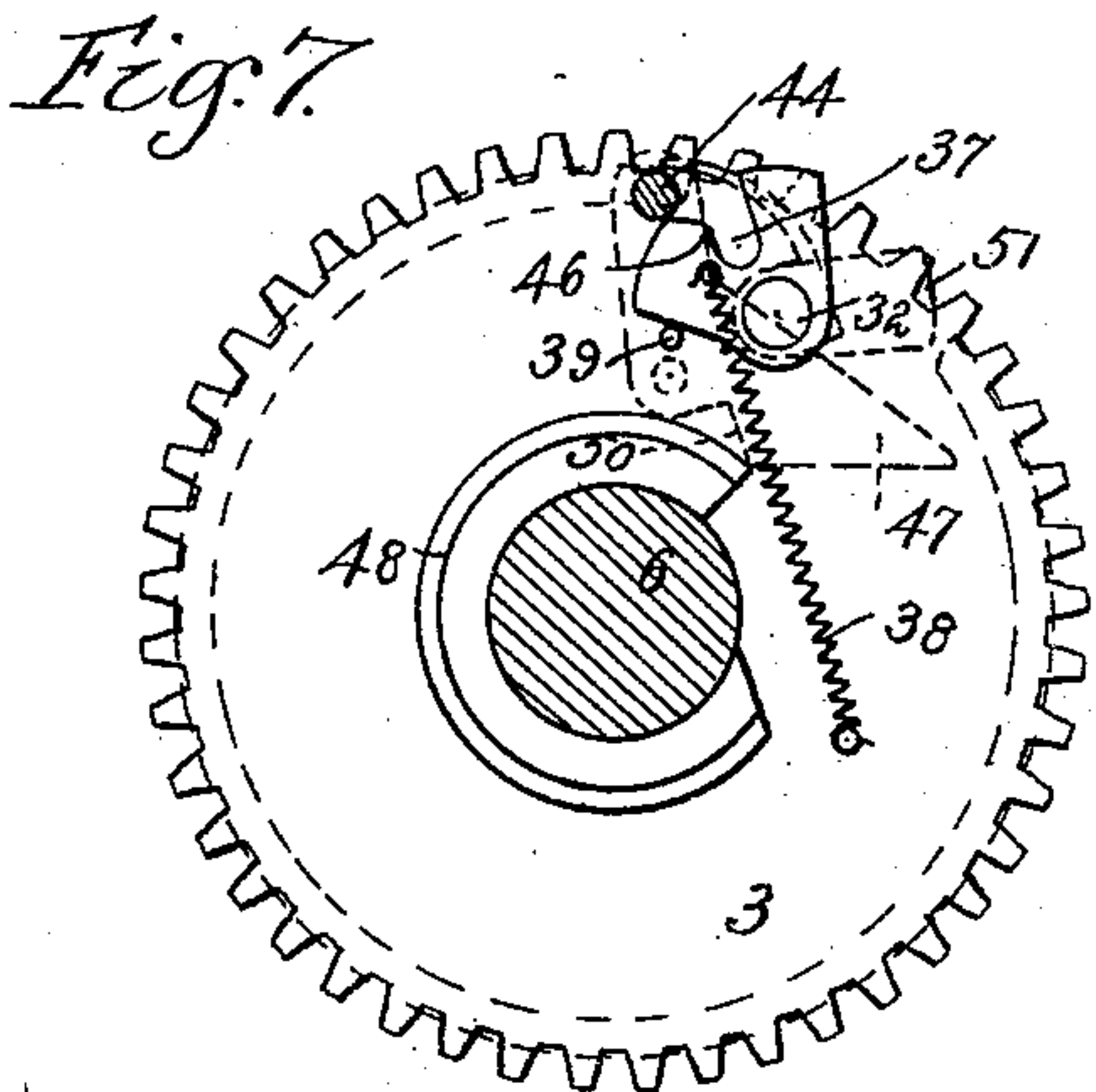
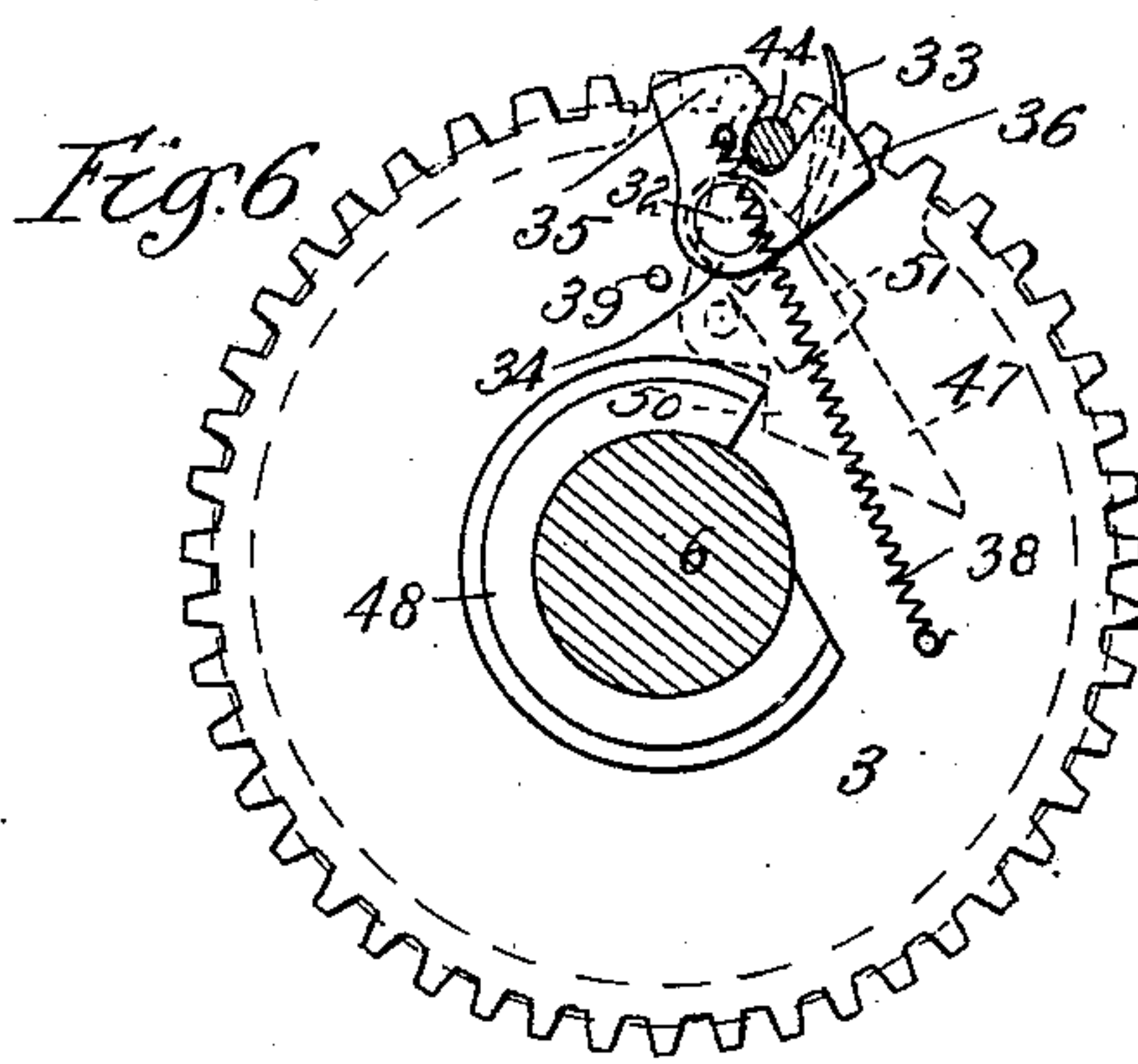
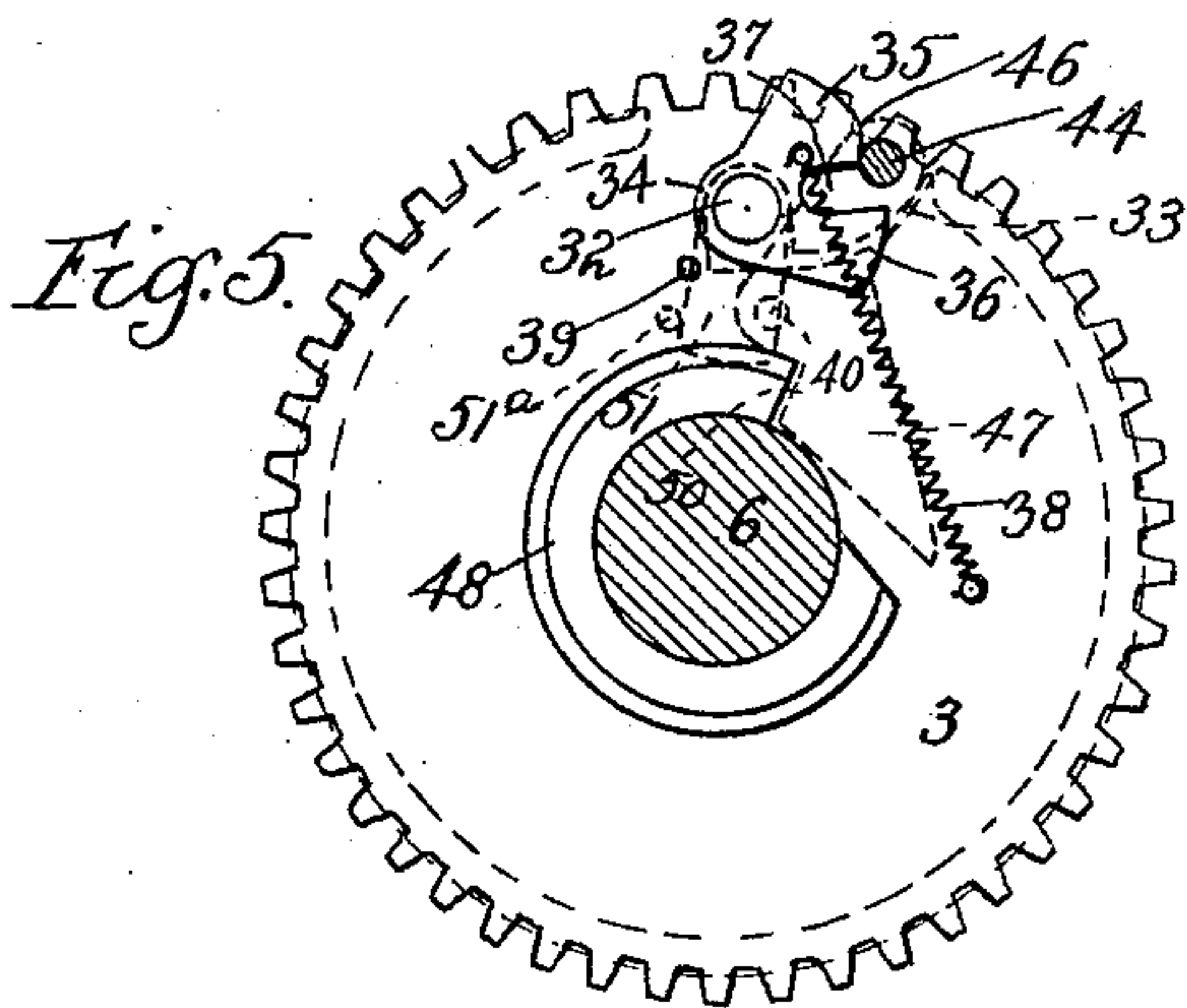


Fig. 9.

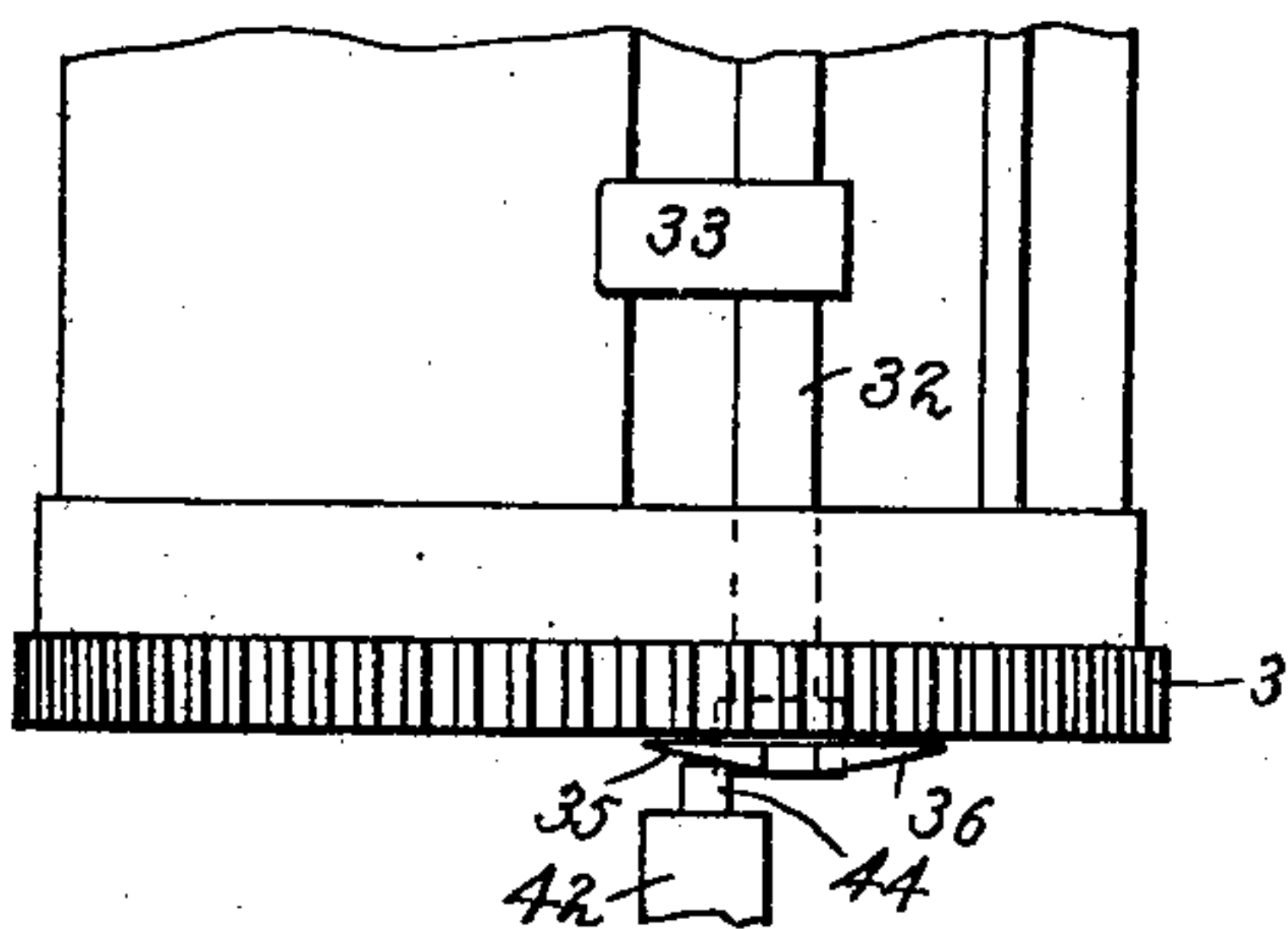
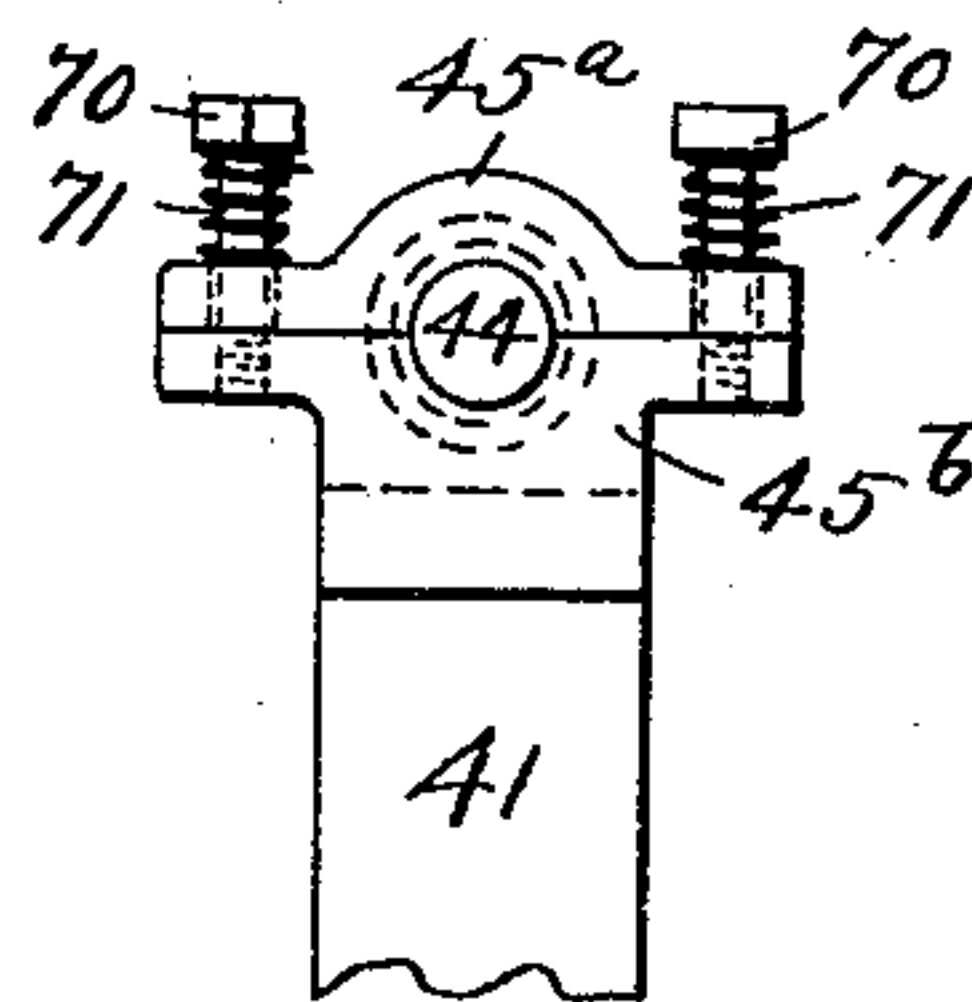


Fig. 10.



Witnesses.
H. M. Rheam.
Edna Johnson

Inventors
Jas L. Lee
Jas E. Lee
by Edith H. Lee Att'y's

UNITED STATES PATENT OFFICE.

JAMES L. LEE AND JAMES E. LEE, OF CHICAGO, ILLINOIS.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 673,006, dated April 30, 1901.

Application filed September 19, 1898. Serial No. 691,326. (No model.)

To all whom it may concern:

Be it known that we, JAMES L. LEE and JAMES E. LEE, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Printing-Presses, of which the following is a full, clear, and exact specification.

Our invention relates to cylinder printing-presses, and more particularly to that class in which the type-bed is stationary and the cylinder carrying the sheet rolls back and forth over it and presses the sheet against the type-surface when moving in one direction and passing out of contact with the type when moving in the other direction.

One of the objects of our invention is to provide improved means for causing the grippers to engage the sheet with a positive and uniform movement and at a shorter time after the cylinder begins to move than heretofore, whereby the time of gripping the sheet will be certain and the cylinder will not be uselessly rolled over the bed while the grippers are coming into engagement.

Another object of our invention is to mount the lug or trip which throws the grippers upon the cylinder-carriage whereby it will be out of the way and the mechanism simplified and to cause such lug or trip to move reversely of the forward movement of the cylinder at the time of throwing the grippers into engagement, whereby the grippers will be forced into engagement with the sheet at a shorter time after the cylinder begins to move than would be the case if such lug or trip were stationary.

Another object of our invention is to provide a simple, inexpensive, and durable arrangement for automatically lifting the cylinder on and off impression as it nears the ends of its movement.

A further object of our invention is to provide improved means for automatically throwing the smoothing-fingers into and out of engagement by the actuation of the cylinder-lifting mechanism.

With these ends in view our invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter appearing are at-

tained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of a printing-press constructed according to our improvements, the inking apparatus being removed for the sake of clearness. Fig. 1^a is a detail side elevation looking from the opposite side of the machine, illustrating the mechanism for opening the sheet gages or gates of the feed-table. Fig. 1^b is a transverse section thereof, taken on the line *b b*, Fig. 1^a. Fig. 2 is a plan view of the machine. Fig. 3 is a vertical sectional view looking toward the end of the cylinder, taken on the line 3 3, Fig. 4. Fig. 4 is a vertical transverse sectional view taken on the line 4 4, Fig. 3. Fig. 5 is a detail view of the end of the cylinder, showing the position of the parts at the beginning of the printing or forward stroke. Fig. 6 is a similar view showing the cylinder slightly advanced and the grippers about to engage the sheet. Fig. 7 is a similar view showing the cylinder still further advanced and the grippers in engagement. Fig. 8 is a similar view illustrating the grippers in the act of releasing the sheet. Fig. 9 is a plan view, partly broken away, illustrating the manner in which the trip-lug, hereinafter described, slides over the face of the tumbler; and Fig. 10 is a modification of the arm for holding the trip-lug.

1 represents the type-bed, having at the sides thereof the usual rack-bars 2, upon which the cog-wheels 3 of the impression-cylinder 4 are mounted. The journals 5 6 of the impression-cylinder are mounted in journal-boxes 7, which are supported by cushions or springs 8 upon carriages 9 10 at each end of the cylinder, the carriages being provided with vertical slots or openings 11, in which the boxes 7 are guided. Each of the journals 5 6 also passes through a sliding block 12, having an inwardly-projecting flange 13, which overhangs the box 7, contiguous thereto, and is provided with a downwardly-extending adjusting-screw 14, engaging in a threaded cavity 15 in the upper side of the box 7, the screw 14 passing loosely through the flange 13, but held against vertical movement, so that by turning it the box 7 may be adjusted and the impression thereby varied at will. Each of

these blocks 12 is adjustably supported on one of the carriages 9 10 and slides in the slot 11 therein, and each of the carriages is provided with a device for raising and lowering the block 12 at opposite ends of the movement of the cylinder. This device for lifting and lowering the blocks 12 may be conveniently constructed of a slide arranged on each of the carriages and having spline-and-groove connection with each of the blocks 12 and adapted to strike an abutment at opposite ends of the bed, so that in moving in one direction the slide will be pushed one way and the cylinder raised, while moving in the other direction the slide will be pushed the other way and the cylinder lowered. These slides consist of bars 16 17, sliding in bosses 18, formed on the outer side of each of the carriages 9 10, and each bar having in its inner face an inclined groove 19, in which fits a spline 20, formed on or secured to the outer face of each of the blocks 12, the bars 16 17 being limited in their sliding movement by end flanges or heads 21. Thus it will be seen that when the slides or bars 16 17 are pushed in one direction the cylinder will be raised and will remain in its raised position without danger of "working on impression" until the slides are given a return movement, the carriages 9 10 themselves being held against vertical movement by rollers 22, journaled on suitable studs 23, supported on the lower ends of the carriages and engaging under flanges 24 of the frame or bed, downward movement of the carriage being prevented and the carriage afforded easy movement by wheels or rollers 25, supported upon the upper sides of the flanges 24. These slides or bars 16 17 are moved in opposite directions by abutments 26 27, arranged at opposite ends of the type-bed and on both sides in line with the bars 16 17. These abutments 26 27 are preferably of a yielding character, so as to avoid shock, and to this end they are each mounted in guides 28, between one of which and a collar 29 on the abutment is arranged a spring 30, which spring tends to project the abutments normally toward the slides 16 17. When the cylinder reaches the limit of its printing movement away from the feed-board, the slides 16 17 come into engagement with the abutments 26, and the cylinder is thereby raised out of impression, so that it may roll back over the type, and it remains off impression until the slides 16 17 encounter the abutments 27, whereupon it is lowered or thrown "on impression." The cylinder may be operated to travel back and forth by any suitable means. We have shown one of its journals 6 provided with a crank 31 for this purpose.

Journaled in the ends of the cylinder, as usual, is the gripper-shaft 32, upon which are secured the ordinary grippers 33. One end of this shaft 32, where it projects through the end of the cylinder, is provided with a bifurcated tumbler 34, having two wings 35 36, forming a slot 37 and being connected to a

spring 38, which tends to hold the grippers in or out of engagement, accordingly as the tumbler is tilted to one side or the other of the center, as will be understood, the movement of the grippers being limited in their closing movement by a stop-pin 39, projecting from the end of the cylinder and arranged to be engaged by the wing 35 of the tumbler 34, and in their releasing movement by a pin 51^a in the outer end of the cylinder and arranged to be engaged by an arm 51 on the shaft 32. Pivoted at 40 to one of the blocks 12 is an arm 41, having a lateral projection 42, which extends inwardly through the opening 43 on the carriage 10 and carries a trip-lug 44, whose end is in the line of movement of the tumbler 34 and in such a position as to engage with the tumbler and enter the slot 37 thereof, and thereby move the grippers from the position shown in Fig. 5 to their engaging position shown in Fig. 7. As the cylinder returns to receive another sheet the grippers are of course in their released position, as shown in Fig. 5, and as the pin or lug 44 comes into engagement with the side of the wing 36 the lug 44, which is deflectable in the projection 42, slides outwardly in such projection 42 by reason of the face of the wing 35 being beveled transversely or toward its outer edge—that is, from the edge of the slot 37 outwardly. After the lug 44 has arrived at the position shown in Fig. 5 it is forced toward the cylinder by a coil-spring 45, arranged in the projection 42 in any suitable way, and the lug 44 is then in position to engage a cam 46, formed on the wing 35, adjacent to the slot 37. The movement of the cylinder being now reversed, the wing 35 will come in contact with the relatively-fixed lug 44 and the tumbler 34 will be tilted until such lug enters the slot 37, and the grippers will consequently be thrown into engagement with the sheet by positive movement, the tumbler 34 continuing to turn until it has passed sufficiently beyond the pin or lug 44 to pull the slot away from the latter, as shown in Fig. 7. This operation of the lug 44 and tumbler 34 would result even though the arm 41 were not pivoted; but in order that the movement of the cylinder required for thus tilting the tumbler may be materially shortened and the grippers thrown into engagement at a sooner period the lug 44 is moved reversely of the forward movement of the cylinder at the time of its engagement with the shoulder 46. This is accomplished by providing the arm 41 below its pivot with a tailpiece 47, which is engaged by a cam 48, rotating with the cylinder and being secured to the journal 6 thereof, the tailpiece 47 being pressed normally toward the cam 48 by a spring 49. When the cylinder is at the limit of its return movement in readiness to receive a sheet, as shown in Fig. 5, the tailpiece 47 is in engagement with the minor part of the cam 48; but as soon as the cylinder begins to revolve forwardly the major portion of the cam strikes against an ab-

rupt shoulder 50 on the tailpiece 47 and very quickly throws the lug 44 to the left or in the opposite direction to the direction in which the cylinder moves, thus causing the grippers to engage the sheet with a quick but positive and uniform movement and before the cylinder has moved any considerable distance. As the cylinder rolls forward and after having made about one and a half revolutions, an arm 51 on the opposite end of the gripper-shaft 32 comes into engagement with a projection or trip 52 on the side of the type bed or frame, and this throws the grippers out of engagement with the sheet, the cylinder continuing to roll until the second revolution is almost completed, so as to drop the sheet onto the piling-table at the end of the type-bed, as usual. When the cylinder is about to make one complete revolution in going forward, the grippers are of course still in engagement in the position shown in Fig. 7; but the wing 36 of the tumbler 34 being inclined or beveled like the wing 35—viz., transversely or outwardly from the slot 37—it does not engage in going in this direction with the lug 44, but deflects such lug outwardly or axially and passes on, the lug passing over the shoulder 46 of the wing 35, as shown in Fig. 7. It will also be seen that by pivoting the arm 41 and tumbler 34 on different arcs, the arc of the arm 41 being greater than that of the tumbler and so arranged that the arc of the tumbler will be described in an upward direction relatively to the arc of the arm, the lug 44, while out of the slot 37 at the beginning of the forward movement of the cylinder, will relatively descend into such slot before the lug and tumbler pass out of engagement.

Mounted in ears 53 on the upper ends of the carriages 9 10 is a shaft 54, which carries the smoothing-fingers 55. Upon one end of this shaft is a crank-arm 56, which is connected by pin-and-slot connection 57 to a rod 58, extending downwardly and having pivotal connection at 59 with the slide 17, so that when the latter encounters the abutment 26 the fingers 55 will be thrown out of engagement with the sheet, and when the slide 17 encounters the abutment 27 at the other end of the bed the fingers will be thrown down into operative position.

60 represents the feed-board, having the usual pivoted sheet gages or gates 61. Connected to the crank-arm 62 of the shaft which operates these gages, however, is a special mechanism for opening them just as the grippers return to receive the sheet and which mechanism we will now describe. The crank-arm 62 is connected by rod 63 with a crank-arm 64, pivoted on a shaft 66, journaled in a portion 65 of the feed-board frame. At the other side of the portion 65 the shaft 66 has secured to it a lever 67, whose lower end is provided with a pivoted pawl 68, carrying an antifriction-roller 69, pivoted at its lower end. The upper end of the lever 67 is attached to a spring 70, which tends to throw the lever in

one direction, the movement thereof being limited by a pin 71, projecting from the frame 65 and engaging with a tooth or lug 72, formed on the hub of the arm 64, so as to prevent the spring 70 from forcing the gages 61 downward beyond a certain point. The pawl 68 may be deflected in one direction, but is held rigid with the lever 67 when moving in the other direction by a stop-lug 73, formed on the lever 67, as clearly shown in Figs. 1^a and 1^b.

The antifriction-roller 69 of the pawl 68 is arranged over and adapted to be engaged by the upper edge of the ink-roller carriage 74, which is partially illustrated in Figs. 1^a and 1^b, it being omitted from the other figures of the drawings and some of the roller-brackets being omitted from Figs. 1^a and 1^b for the sake of clearness. The carriage, however, may be of the usual construction, excepting that its upper edge is provided with a depression 75, forming a shoulder 76, which engages with the roller 69 at or about the time the cylinder starts forward, and thus forces the pawl 68 against the stop 73 and deflects the lever 67 and the crank-arm 64, thereby opening the gages 61 and permitting the sheet to slip into the grasp of the grippers. As the cylinder advances with the ink-roller carriage the roller 69^x remains in contact with the elevated edge 77 of the inking-carriage until a second depression 78 therein comes under the roller 69, whereupon the spring 70 returns the parts to their normal position, as shown in Fig. 1^a, allowing the gages 61 to descend until checked by the stop 71.

The inking apparatus has been omitted for the sake of clearness; but it may be of the usual or any suitable construction and its carriage secured to the ears or lugs, projecting from the rear sides of the carriages 9 10.

If the grippers are properly set, there will be no danger of injury to the trip-lug 44; but through carelessness they may be so set that when they come into engagement with the sheet the wing 35 of the tumbler 34 will not be sufficiently depressed to permit the lug 44 to pass over the shoulder 46, and in that event injury to the lug 44 would occur. In order to guard against this, the projection 45 may be formed, like a journal-box, of two parts 45^a 45^b, as shown in Fig. 10, yieldingly secured together by bolts 70 and spring 71, so that when the lug 44 strikes the shoulder 46 the lug may yield transversely or upwardly if the shoulder is not sufficiently low when the tumbler is in the position shown in Fig. 7.

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

1. A cylinder printing-press having in combination a type-bed, a vertically and horizontally movable cylinder supported thereover and having grippers, an independently-movable trip-lug for closing the grippers, said trip-lug being also movable bodily vertically and horizontally with the cylinder, means for

moving said trip-lug reversely of the forward movement of the cylinder and means for imparting said reverse movement of the trip-lug to the grippers, substantially as set forth.

5 2. A cylinder printing-press having in combination a type-bed, a cylinder having grippers, a bifurcated tumbler having a slot and beveled transversely of said slot, carried with the cylinder for actuating said grippers, a carriage for the cylinder and an axially-deflectable trip-lug for turning said tumbler adapted to strike said beveled surface and engaging in said slot, substantially as set forth.

15 3. A cylinder printing-press having in combination a type-bed, a cylinder having grippers, a bifurcated tumbler having a slot and being longer on one side of the slot than on the other so as to form a cam-shoulder, said tumbler being pivotally mounted and revolving with the cylinder, a carriage for said cylinder, and a trip-lug mounted upon the carriage and adapted to engage with said cam-shoulder and enter said slot of the tumbler, substantially as set forth.

25 4. A cylinder printing-press having in combination a type-bed, a cylinder having grippers, a bifurcated tumbler having a slot and beveled on each side of said slot transversely thereof for actuating said grippers, a carriage for the cylinder, and an axially-deflectable trip-lug supported by the carriage and adapted to be struck by the beveled surfaces of said tumbler and to engage in said slot, substantially as set forth.

35 5. A cylinder printing-press having in combination a type-bed, a cylinder having grippers, a carriage for said cylinder, a pivoted arm moving with the carriage, a cam on the cylinder-shaft for engaging with said pivotal arm and deflecting it reversely of the forward movement of the carriage, and means for imparting the said reverse movement of said arm to the grippers, substantially as set forth.

45 6. A cylinder printing-press having in combination a type-bed, a cylinder having grippers, carriages for said cylinder, vertically-movable boxes for the journals of said cylinder, mounted upon said carriages, vertically-adjustable blocks mounted upon said carriages respectively and adjustably secured to each of said boxes, an arm pivoted to one of said blocks, a cam actuated by the movement of the cylinder for deflecting said arm and means for imparting the movement of said arm to the grippers, substantially as set forth.

55 7. A cylinder printing-press having in combination a type-bed, a cylinder, a carriage for said cylinder in which said cylinder is vertically movable, vertically-sliding blocks mounted in said carriage and having adjustable connection with the journals of the cylinder, lifting-slides having inclined spline-and-groove connection with said blocks, and

means for shifting said slides, substantially as set forth. 65

8. A cylinder printing-press having in combination a type-bed, a vertically-movable cylinder, a carriage for said cylinder, a lifting device carried by the carriage for lifting said cylinder and cushioned abutments at opposite ends of the bed for engaging and actuating said lifting device, substantially as set forth. 70

9. A cylinder printing-press having in combination a type-bed, a cylinder, a carriage for said cylinder, a lifting device for said cylinder, sheet-smoothing fingers having operative connection with said lifting device, and abutments at opposite ends of the type-bed for engaging and actuating said lifting device, substantially as set forth. 75

10. A cylinder printing-press having in combination a type-bed, a cylinder, a carriage for said cylinder, a lifting device for said cylinder, carried by said carriage and consisting of a slide having spline-and-groove connection with the cylinder, abutments at opposite ends of the bed for reciprocating said slide, the sheet-smoothing fingers, a crank for actuating said fingers and a connecting-rod connecting said crank with said slide, substantially as set forth. 80 85 90

11. A cylinder printing-press having in combination a type-bed, a traveling cylinder, a feed-board, gages for holding the sheet on said board, a pivoted lever having operative connection with said gages for opening them, a pawl pivoted to said lever and means moving with said cylinder for engaging said pawl and oscillating said lever, substantially as set forth. 95 100

12. A cylinder printing-press having in combination a type-bed, a traveling cylinder, a feed-board, gages for holding the sheet on said board, a lever having operative connection with said sheet-gages for opening them, a pawl pivoted to said lever and being independently deflectable in one direction, a stop for limiting the movement of said pawl in the other direction and means moving with the said cylinder for forcing said pawl against said stop, substantially as set forth. 105 110

13. A cylinder printing-press having in combination a type-bed, a traveling cylinder, an inking-carriage moving with said cylinder and having the depressions 75 78, the feed-board, sheet-gages for holding the sheet on said board, a lever having operative connection with said gages for opening them, and a deflectable pawl pivoted to said lever and being arranged to engage in said depressions in the inking-carriage, substantially as set forth. 115 120

JAMES L. LEE.
JAMES E. LEE.

Witnesses:

FRED. SHOLES,
JOHN W. SCHROEDER.