

No. 847,532.

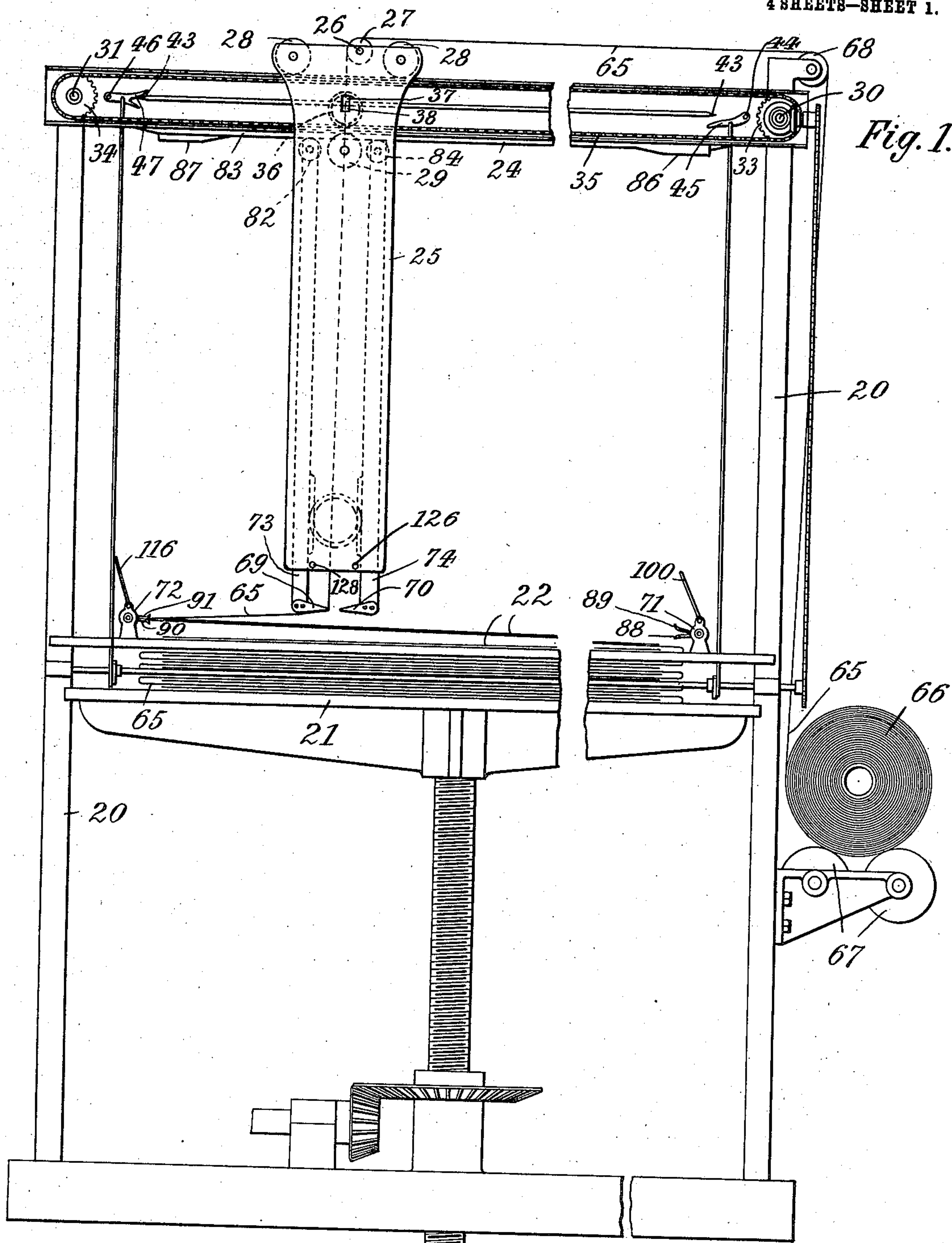
PATENTED MAR. 19, 1907.

J. WATZELHAN.

SLIP SHEET ATTACHMENT FOR PRINTING PRESSES.

APPLICATION FILED AUG. 29, 1906.

4 SHEETS—SHEET 1.



Witnesses
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Joseph Watzelhan
By his Attorney
Frank B. Brier

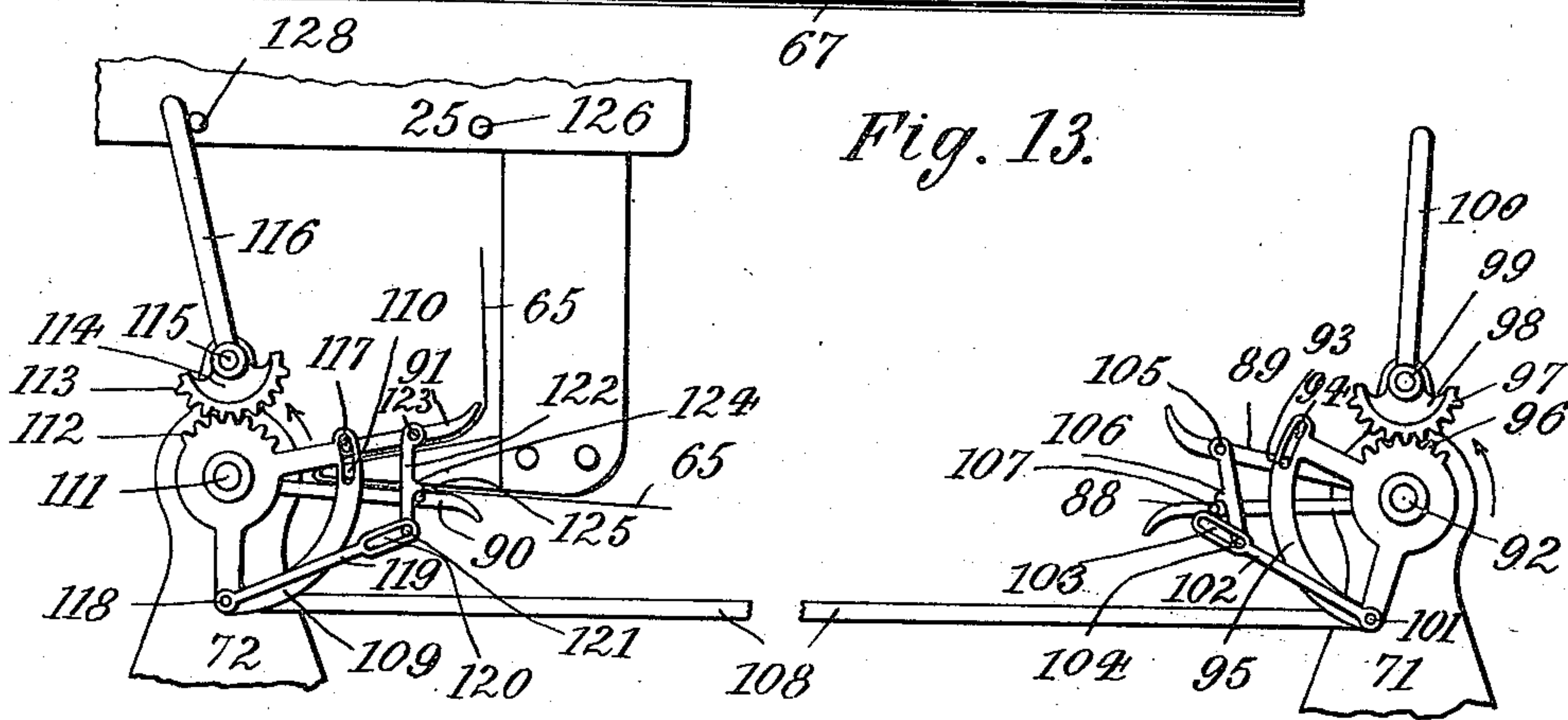
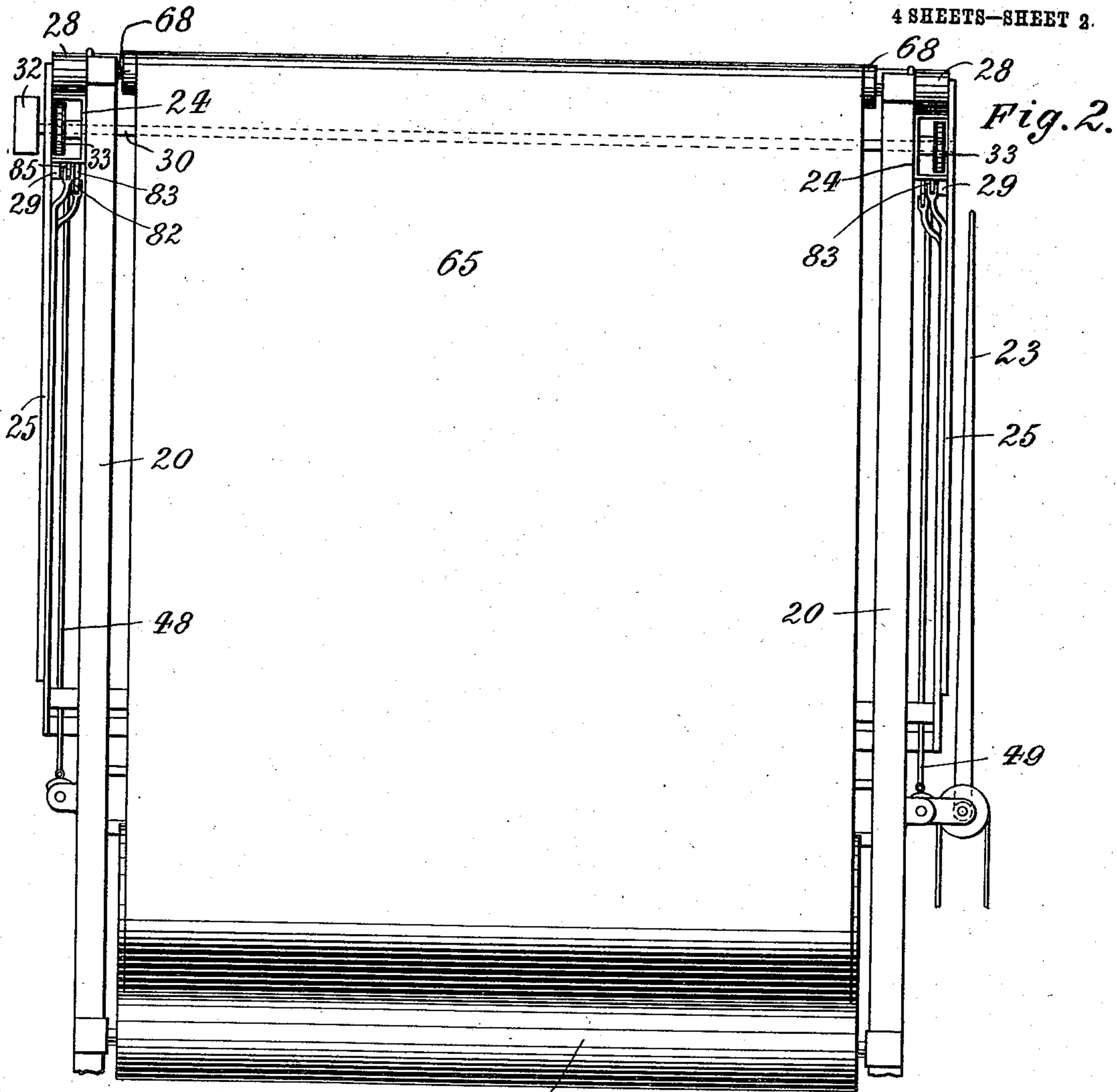
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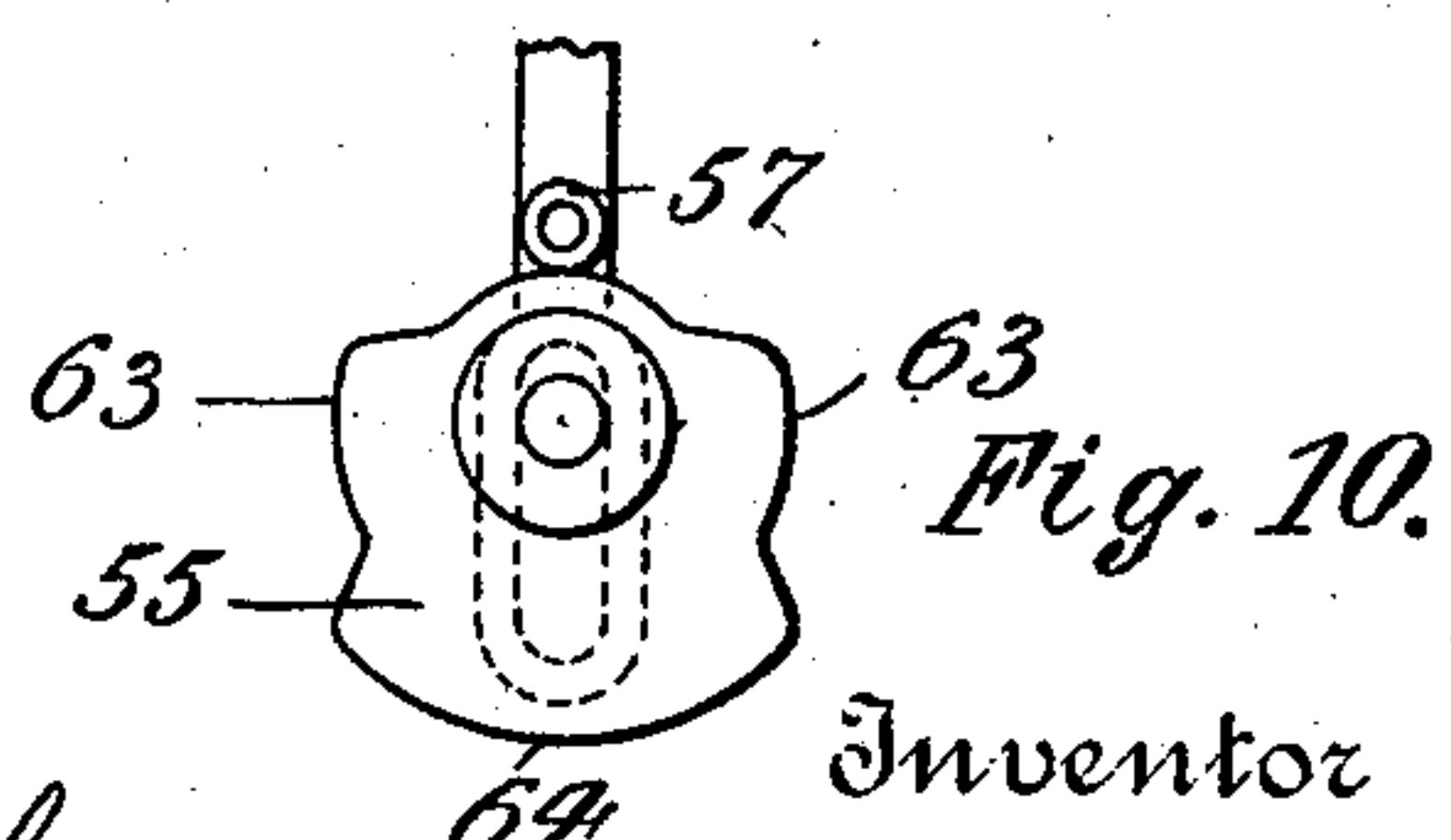
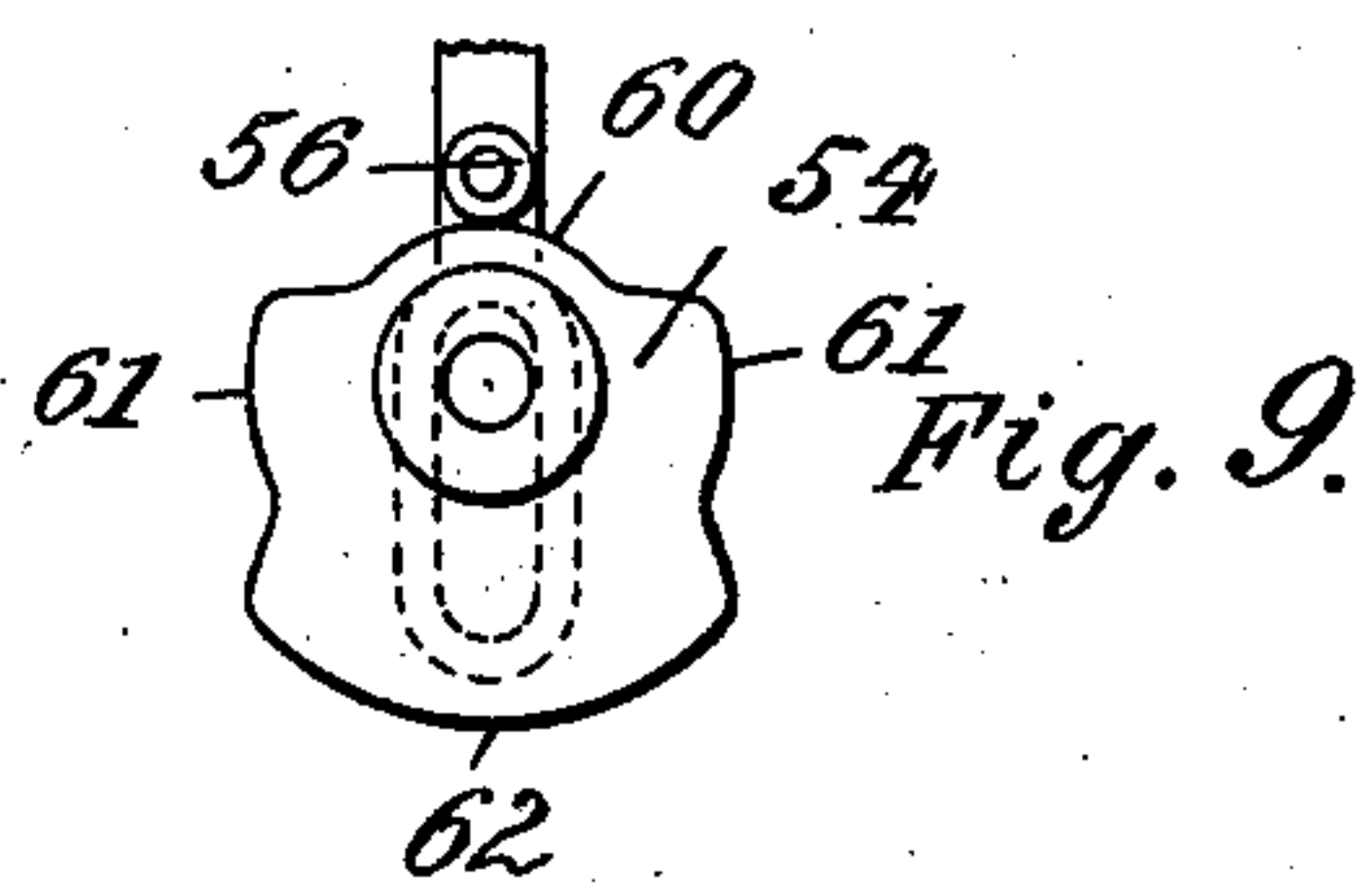
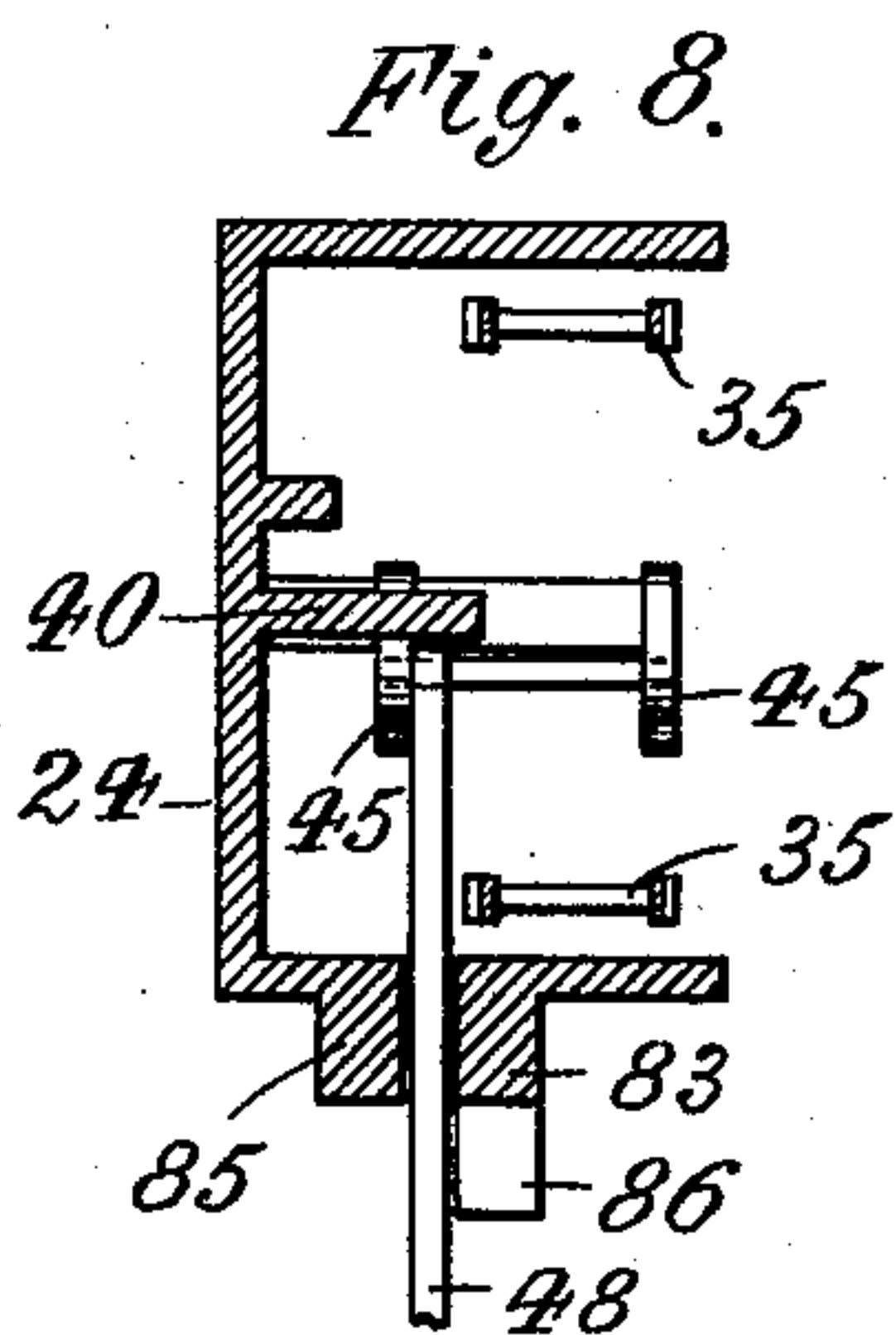
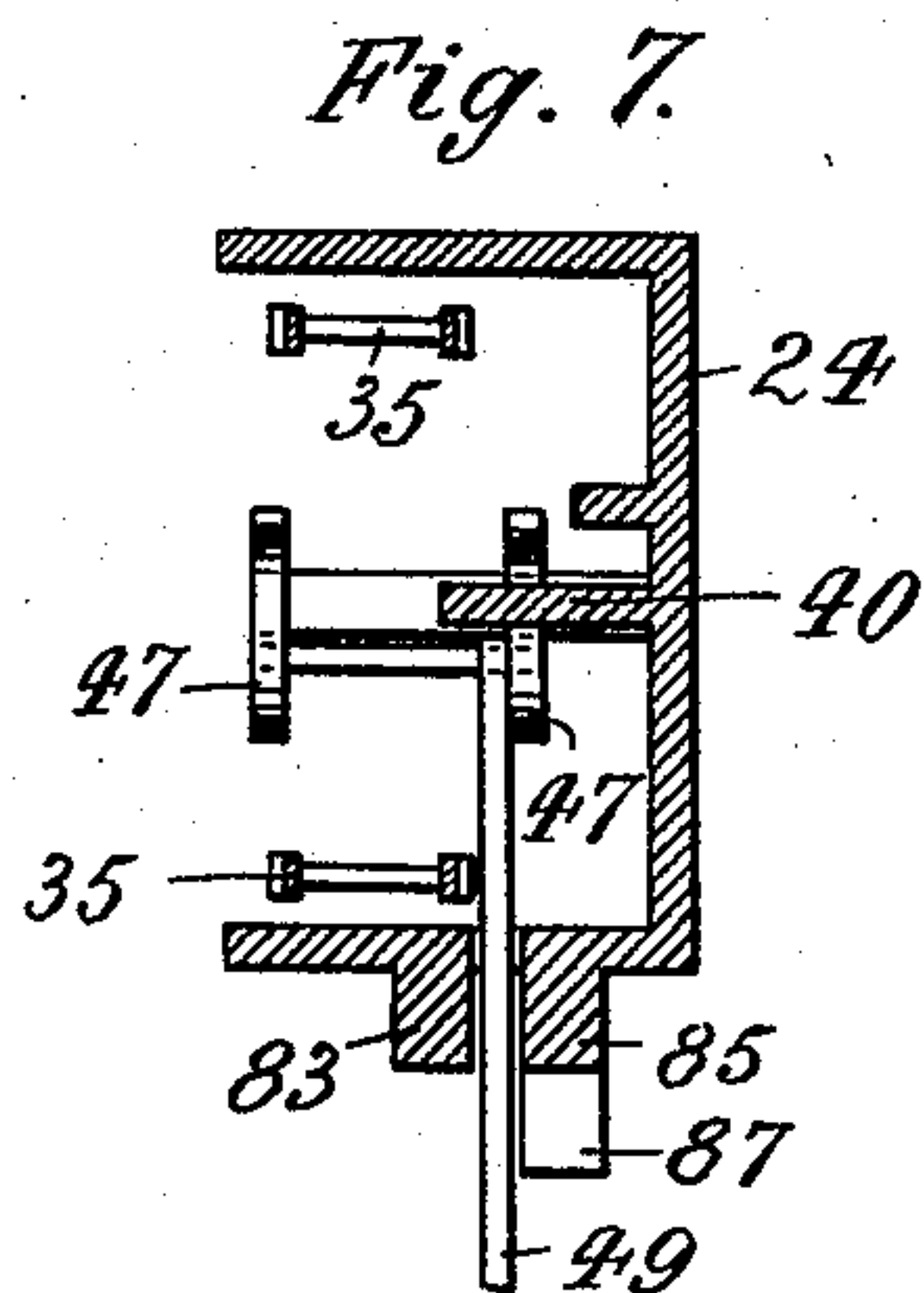
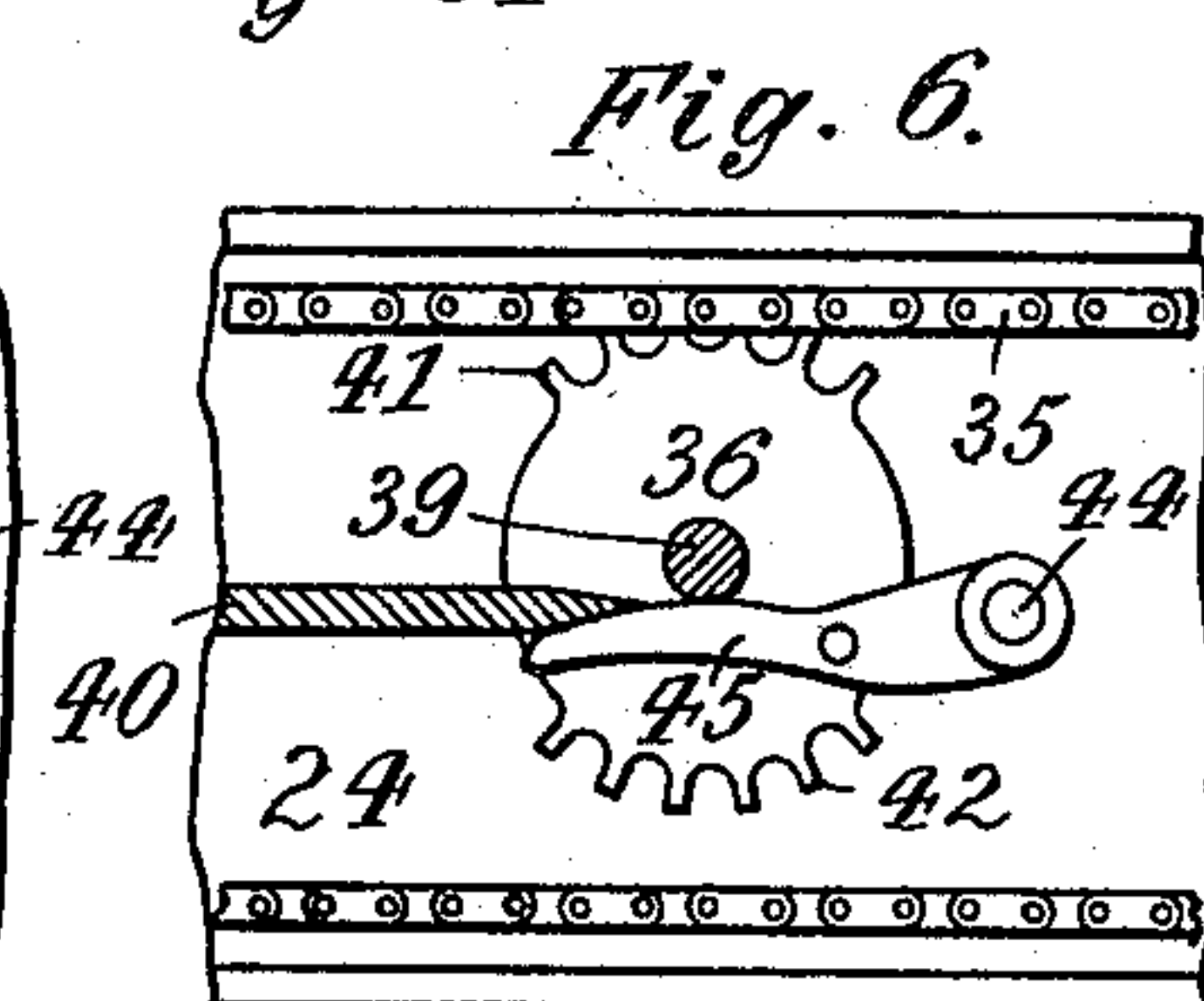
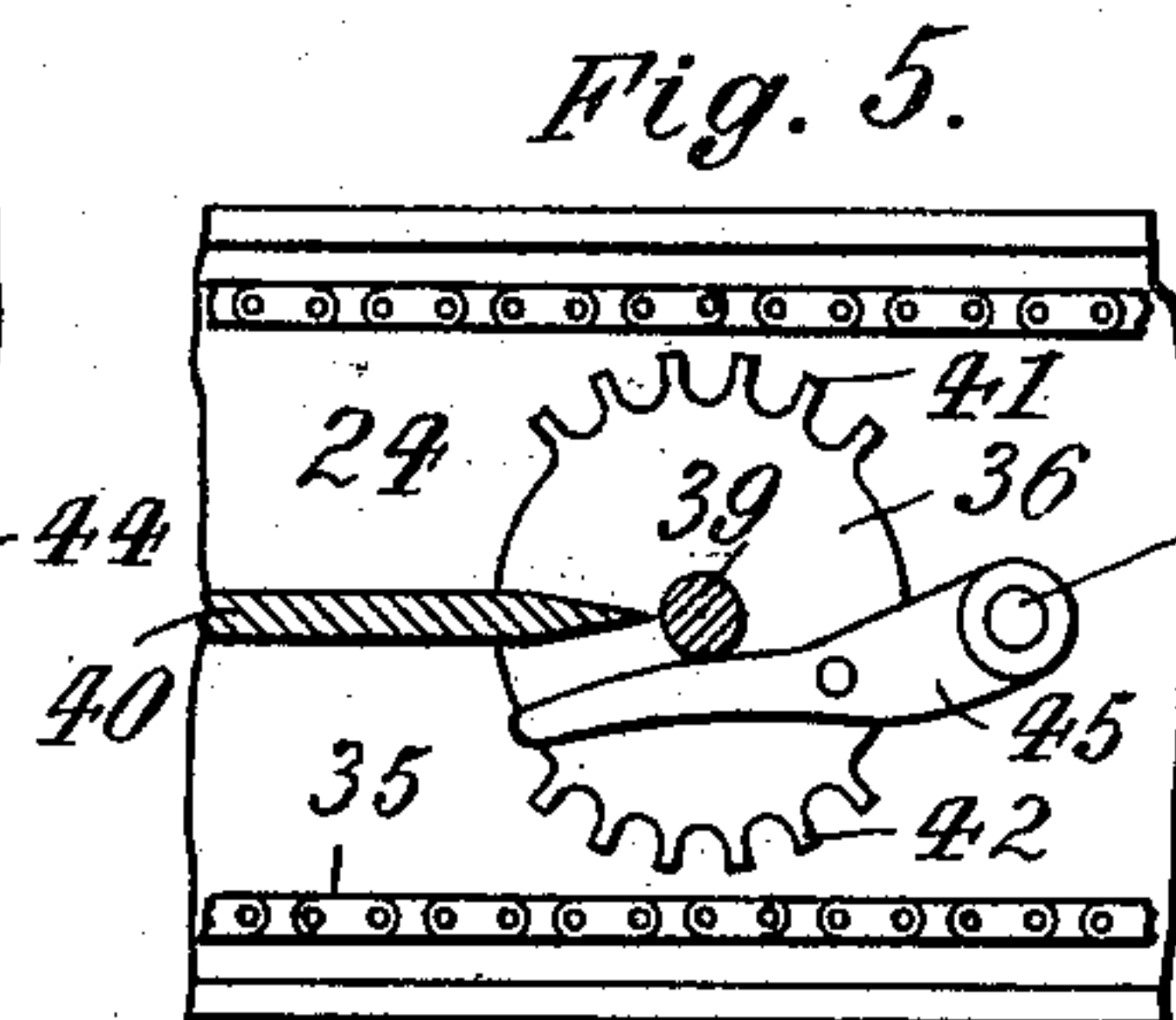
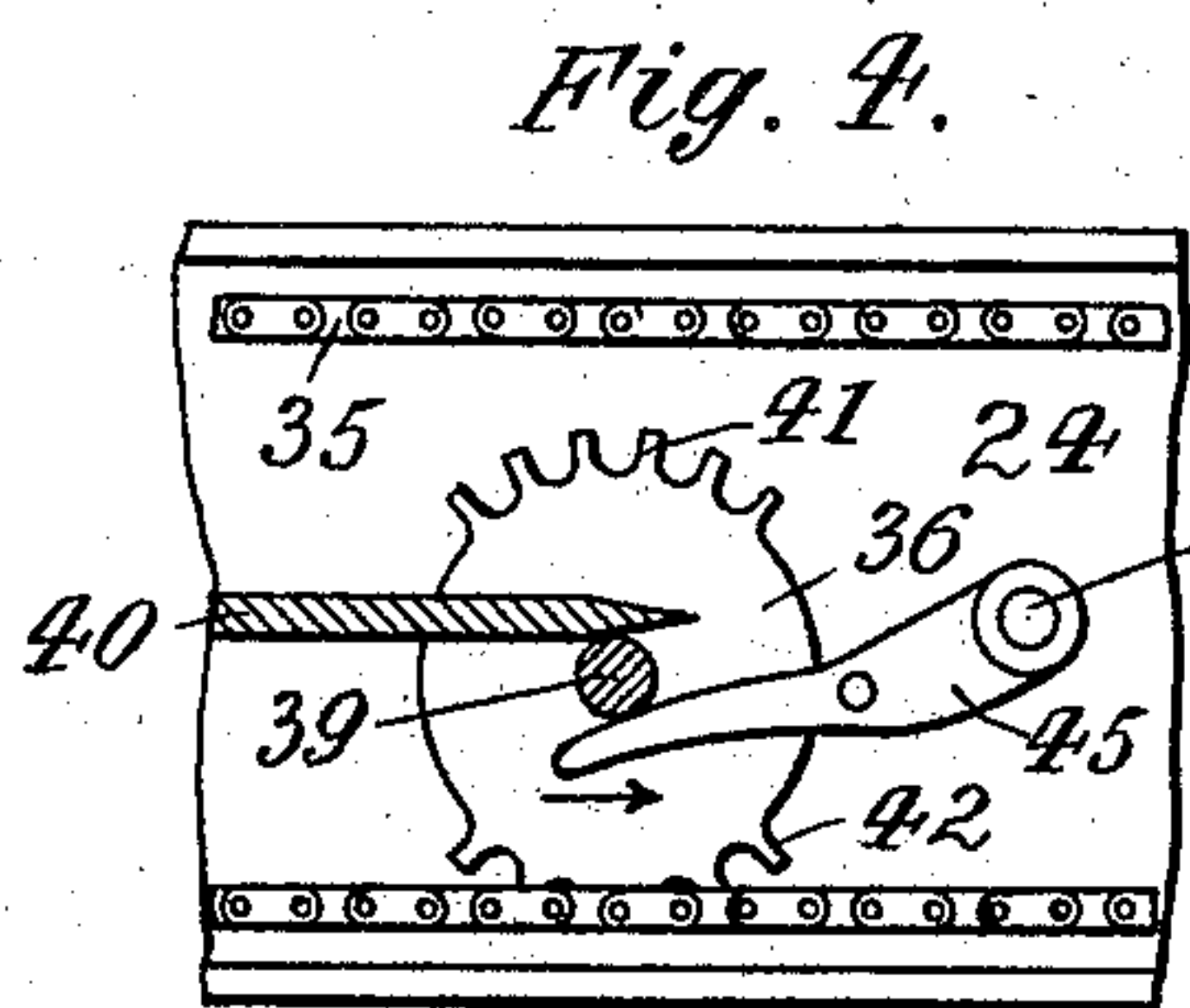
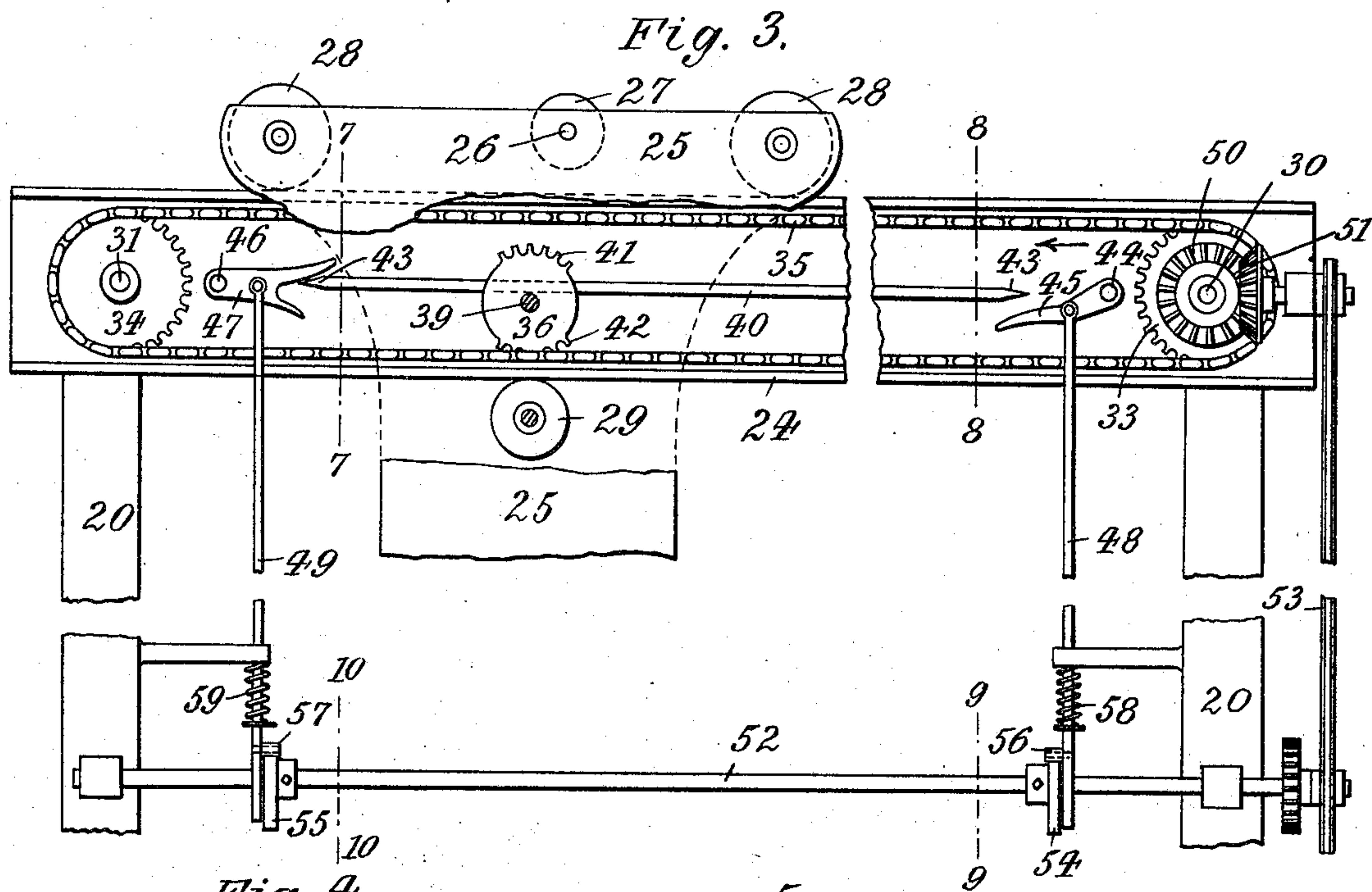
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SLIP SHEET ATTACHMENT FOR PRINTING PRESSES.

APPLICATION FILED AUG. 29, 1906.

4 SHEETS—SHEET 3.



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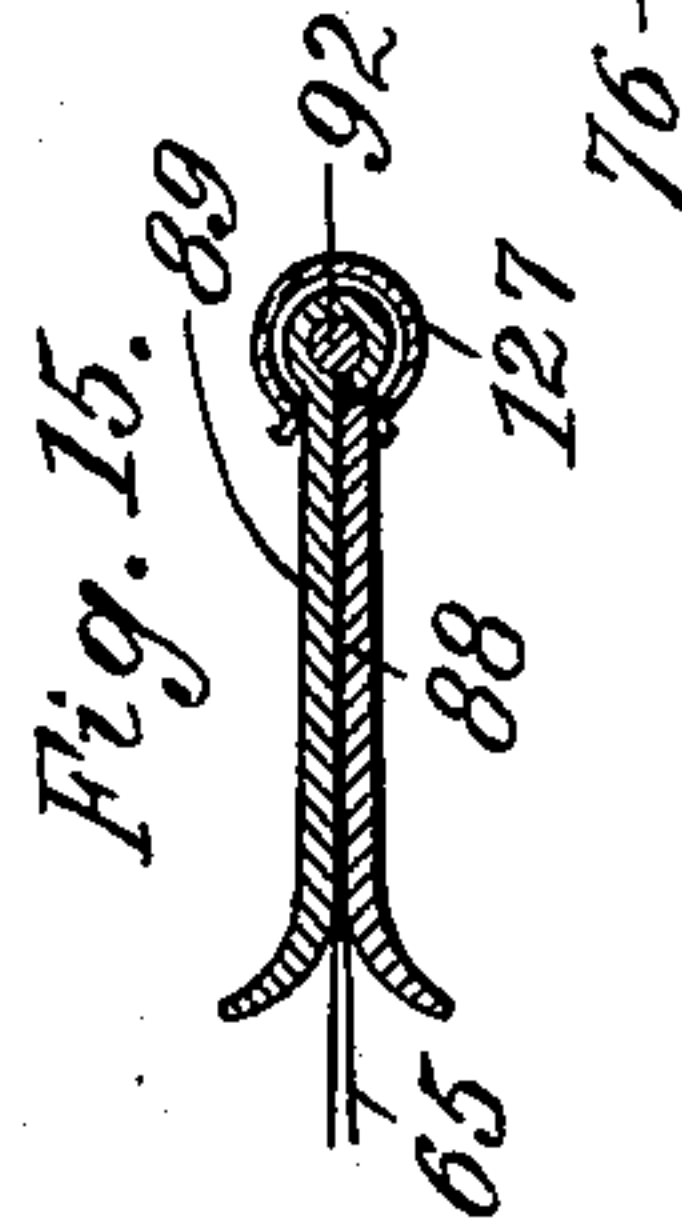
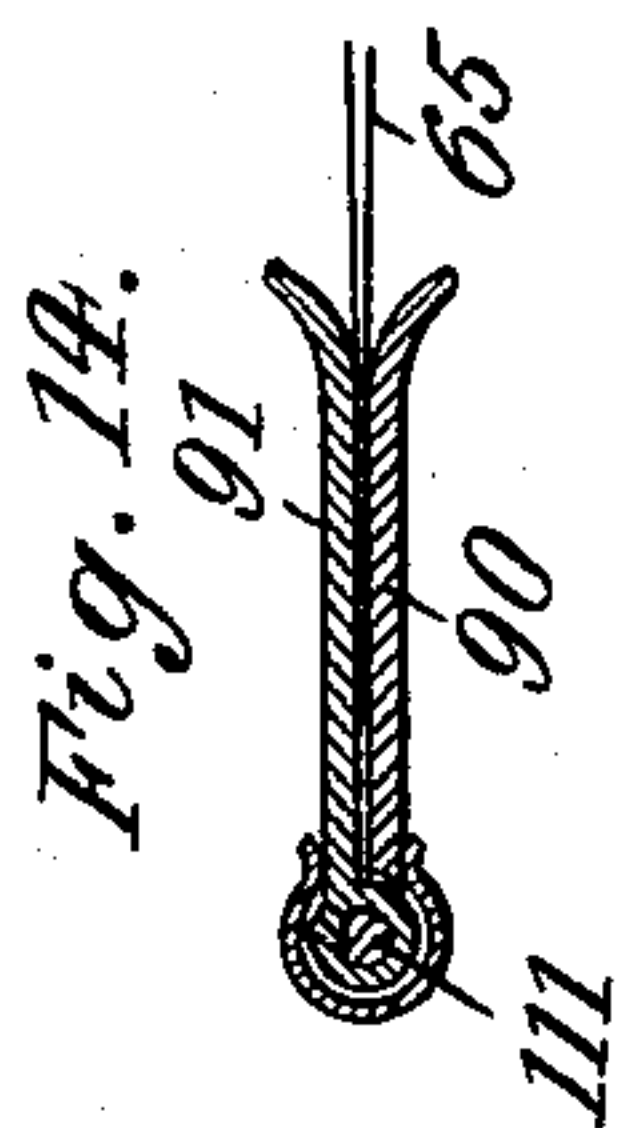
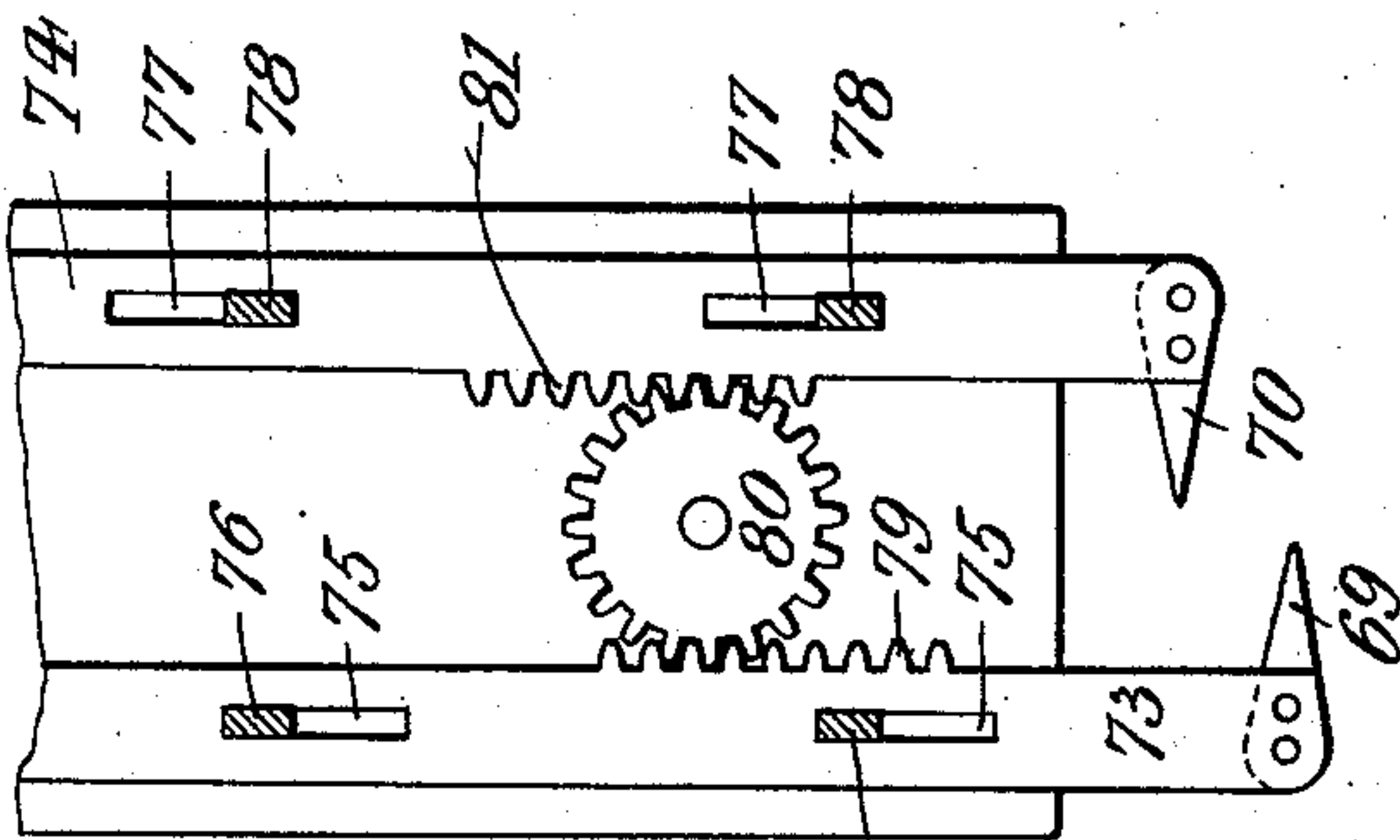
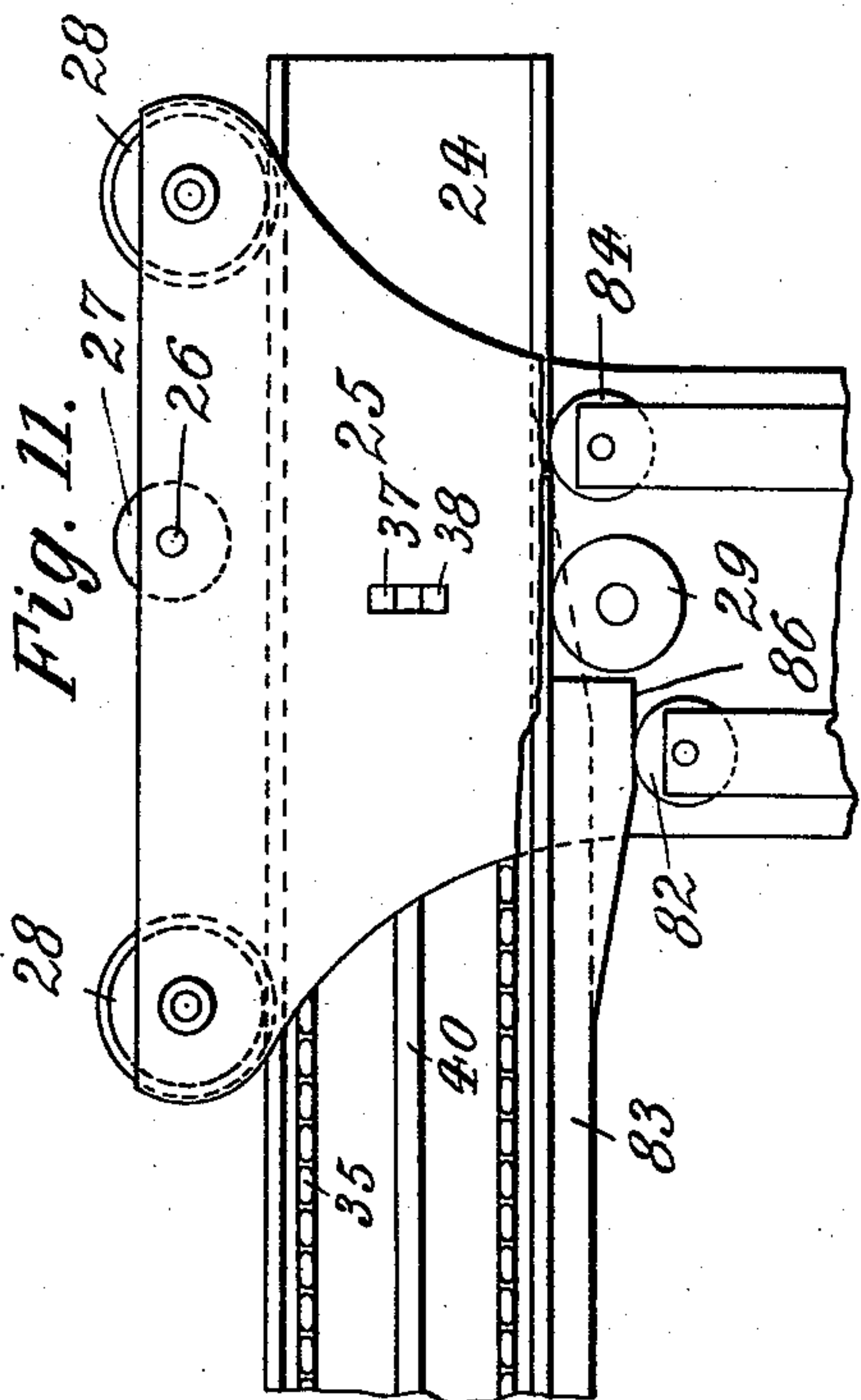
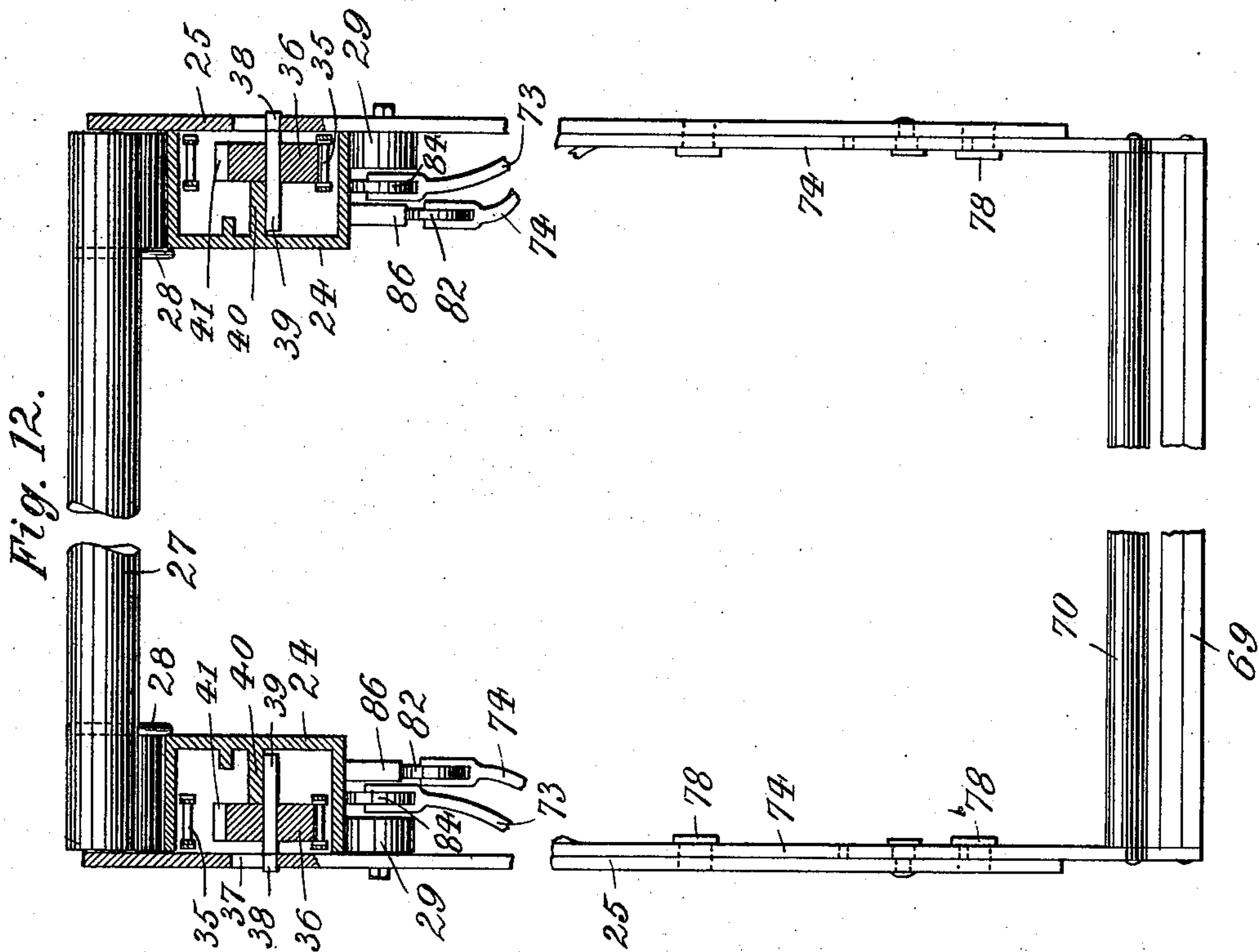
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SLIP SHEET ATTACHMENT FOR PRINTING PRESSES.

APPLICATION FILED AUG. 29, 1906.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOSEPH WATZELHAN, OF NEW YORK, N. Y.

SLIP-SHEET ATTACHMENT FOR PRINTING-PRESSES.

No. 847,532.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed August 29, 1906. Serial No. 332,421.

To all whom it may concern:

Be it known that I, JOSEPH WATZELHAN, a subject of the German Emperor, residing at New York city, Manhattan, county and State of New York, have invented a new and Improved Slip-Sheet Attachment for Printing and Lithographing Presses, of which the following is a specification.

This invention relates to an attachment for printing and lithographing presses by means of which the printed sheets are separated from each other by the folds of a continuous slip-sheet. This slip-sheet is delivered from a roller and passed alternately forward and backward over the printed sheets as the latter are successively placed upon the table by the fly.

In the accompanying drawing, Figure 1 is a front elevation of my improved slip-sheet attachment; Fig. 2, a side elevation, partly broken away and with some of the parts omitted; Fig. 3, a detail side view of the carriage-operating means. Figs. 4, 5, and 6 are detail views showing consecutive positions of the toothed disk. Fig. 7 is a section through one of the rails on line 7 7, Fig. 3; Fig. 8, a similar section on line 8 8, Fig. 3; Fig. 9, a section on line 9 9, Fig. 3; Fig. 10, a section on line 10 10, Fig. 3; Fig. 11, a front view of the carriage; Fig. 12, an end view, partly in section, thereof; Fig. 13, a detail of the jaw-operating means, and Figs. 14 and 15 are sections through the jaws.

The frame 20 of my improved slip-sheet attachment is adapted to be secured to a printing or lithographing press. (Not shown.) This frame is provided with a vertically-movable table 21, that receives the printed sheets 22, which are delivered to table 21 from the printing-press by a fly 23. Table 21 is gradually lowered to compensate for the increasing height of the pile of printed sheets successively delivered upon it, so that the uppermost sheet is always placed at or about the same level. The fly and receiving-table are of well-known construction and are therefore illustrated only diagrammatically.

At the top of frame 20 there are arranged a pair of parallel U-shaped rails 24, adapted to support the means for feeding or laying the slip-sheet. These means consist of a carriage which is composed of a pair of parallel end plates 25, connected at their top by a fixed axle 26, which is loosely surrounded by a roller 27.

Each end plate 25 is provided with a pair

of wheels 28, engaging the upper side of rail 24, and with a lower guide-roller 29, engaging the lower side of such rail.

The carriage receives reciprocating movement in the following manner: In rails 24 are journaled a pair of parallel transverse axles 30 and 31, of which axle 30 receives motion by pulley 32 from a power-shaft. (Not shown.) Axle 30 carries at its ends chain-wheels 33, while axle 31 is provided with similar chain-wheels 34, the chain-wheels being received within the hollow of rails 24. Chain-wheels 33 and 34 are operatively connected by endless chains 35, which receive continuous motion from pulley 32. This motion is utilized for reciprocating the carriage by means of a pair of toothed disks 36, which may either be brought into operative engagement with the upper or the lower run of the chains.

Each end plate 25 is provided with a vertical slot 37, adapted to receive the outer squared end 38 of a spindle 39, to which disk 36 is rigidly secured. The inner end of spindle 39 is adapted to engage either with the lower side or upper side of a longitudinal central rib 40 of rail 24, while the disk 36 is prevented from rotation by the engagement of squared end 38 of spindle 39 with slot 37. The parts are so dimensioned that when spindle 39 is caused to engage the upper side of rib 40 upper teeth 41, formed on disk 36, will mesh into the upper run of chain 35. When spindle 39, however, engages the lower side of rib 40, lower teeth 42, formed on disk 36, mesh into the lower run of chain 35. In this way the carriage will either travel to the left or to the right, the chain 35 traveling continuously in the direction of the arrow shown in Fig. 3.

After the carriage has arrived in one of its terminal positions it remains at rest for a certain length of time in order to allow the fly to place a new sheet upon the receiving-table. As soon as the fly on its return movement has arrived at or about the position shown in Fig. 2 the carriage starts its movement toward the other end of rails 24, so as to superpose a part of the slip-sheet in manner hereinafter described upon the print previously laid upon the table. After the carriage has completed its run it is again arrested to permit the fly to place the next print upon table 21 without interfering with the means for placing the slip-sheet between the prints. To obtain this result, rib 40 is knife-

edged at both ends, as at 43, and terminates at a certain distance from chain-wheels 33 and 34 to provide sufficient space for the necessary vertical movement of disks 36. In
 5 proximity to chain-wheel 33 there is pivoted to rail 24 at 44 a first-curved double finger or tappet 45, while in proximity to chain-wheel 34 there is pivoted to such rail at 46 a second double finger 47. Fingers 45 and 47 are
 10 adapted to engage the spindle 39 of disk 36, and when the fingers are swung on their pivots in manner hereinafter described disk 36 will participate in their movement when engaged by the same.

15 Fingers 45 and 47 are operated in the following manner: To shaft 30 is fastened a bevel-wheel 50, engaging a bevel-wheel 51, that transmits continuous rotary motion to a cam-shaft 52 by transmission 53. Upon
 20 shaft 52 are mounted a pair of cams 54 55 of like shape and size. Cam 54 is engaged by a roller 56, pivoted to lifter 48, which engages finger 45. Cam 55 is engaged by a roller 57, fulcrumed to lifter 49, which engages finger
 25 47. Rollers 56 57 are held in permanent engagement with cams 54 55 by springs 58 59, respectively. Cam 54 is so shaped that when roller 56 engages the reduced section 60 of such cam finger 45 will assume the position
 30 shown in Fig. 4. Disk 36 being taken along by chain 35 in the direction of the arrow will travel along finger 45 until its axle clears rib 40. After the disk has arrived in this position roller 56 will engage one of the steps 61 of
 35 cam 54, so that the finger is lifted to bring disk 36 out of engagement with chain 35 and to thereby arrest the carriage. During this period fly 23 deposits a new printed sheet upon table 21. After the fly is turned
 40 half-way back roller 56 will engage the raised portion 62 of cam 54, so as to further raise finger 45 and to thereby bring disk 36 into engagement with the upper run of the chain, Fig. 6. After this engagement has taken
 45 place disk 36, and consequently the carriage, will move toward the left, Fig. 3, to place part of the slip-sheet over the print in manner hereinafter described.

Near the end of its travel to the left spindle
 50 39 of disk 36 will engage finger 47, which (as both cams 54 and 55 are set in like manner upon shaft 52) has participated in the movement of finger 45 and will therefore be in its raised position. As soon as spindle 39 has
 55 cleared rib 40 cam-roller 57 will engage one of the steps 63 of cam 55 to correspondingly lower finger 47 and to bring disk 36 out of engagement with chain 35. The parts will remain in this position until fly 23 has placed
 60 the next printed sheet upon table 21, whereupon roller 57 will engage the reduced section 64 of cam 55 to bring disk 36 into engagement with the lower run of chain 35.

During the intermittently-reciprocating
 65 movement of the carriage, the slip-sheet 65

is placed in zigzag form between the printed sheets that are successively laid upon the table by fly 23. To this effect slip-sheet 65 is delivered from a roller 66, supported upon
 70 idlers 67, whence it passes over roller 68 to roller 27 of the carriage hereinabove referred to. From roller 27 the slip-sheet passes downward between end plates 25 and out between a pair of tapering rails or guides 69
 75 and 70. These guides receive vertically-reciprocating movement in manner hereinafter described and are adapted to bring the slip-sheet alternately into engagement with grippers 71 and 72. These grippers are arranged at opposite ends of the carriage-run
 80 and are adapted to engage the slip-sheet alternately at opposite edges of the printed sheet, so as to fold the same around the latter. The guides 69 and 70 extend across the
 85 entire width between end plates 25 and are secured to a pair of slides 73 and 74, respectively. Slides 73 have each a pair of slots
 90 75, engaging studs 76 of plate 25. Slides 74 are similarly provided with slots 77, engaging studs 78. Each slide 73 has a rack 79, that engages a pinion 80, which in turn meshes with the rack 81 of slide 74. It will thus be
 95 seen that when slides 73 move upward slides 74 will move downward, and vice versa, by a mangle movement. Slide 73 carries at its
 100 upper end a roller 82, which engages a cam-rail 83 of rail 24. Likewise slide 74 carries at its upper end a roller 84, which engages a cam-rail 85, parallel to rail 83. Rail 83 has
 105 at one end a raised section 86, while its other end gradually merges into the lower side of rail 24. Rail 85 has a raised section 87 on one end, its other ends also merging into the lower surface of rail 24. As the raised sections 86 and 87 are arranged at opposite ends
 110 of the rails, it will be seen that when, say, roller 82 engages raised section 86, Fig. 11, roller 84 will have left rail 85 and will engage the lower side of rail 24, and vice versa.

During the main part of the travel of the
 110 carriage guides 69 and 70 are in the same horizontal plane, Fig. 1. When the carriage arrives near the end of its run toward the right, the parts will assume the position
 115 shown in Fig. 11—i. e., guide 70 will be raised, while guide 69 will be lowered to such an extent that it arrives opposite the center of gripper 71. When the carriage arrives
 120 near the end of its run toward the left, guide 70 will be lowered, while guide 69 will be raised. The parts are so set that when the carriage arrives at its terminal position at the right guide 69, together with slip-sheet
 125 65, will have entered between the jaws 88 and 89 at gripper 71. So, also, when the carriage arrives at its terminal position at the left guide 70, together with the slip-sheet, will enter between the jaws 90 and 91 of gripper
 130 72, Fig. 13.

Grippers 71 and 72 are constructed to re-

tain the slip-sheet that has been inserted between their jaws for a certain length of time, after the expiration of which the jaws are opened to release the said sheet. To produce this result, the lower jaw 88 of gripper 71 is fixed, while the upper jaw 89 of such gripper is movable and may be oscillated on a spindle 92. Jaw 89 is provided with a pin 93, received within a curved slot 94 of a sector 95, loosely mounted upon spindle 92. Sector 95 is provided with teeth 96, that mesh into corresponding teeth 97 of a sector 98, loosely mounted on a stud 99 and provided with a lever 100. To sector 95 is pivoted at 101 a link 102, slotted, as at 103, and engaging a lever 104. The latter is fulcrumed to jaw 89 at 105 and is provided with a nose or catch 106, adapted to engage a stud 107 of jaw 88. Sector 95 is by a rod 108 connected to a sector 109, slotted, as at 110, and loosely mounted upon spindle 111. Sector 109 is provided with teeth 112, that mesh into teeth 113 of a sector 114, fulcrumed at 115 and having a lever 116. Slot 110 of sector 109 receives a pin 117 of upper jaw 91, loosely mounted upon spindle 111. To sector 109 is pivoted at 118 a link 119, slotted, as at 120, and engaging a pin 121 of a lever 122. The latter is pivoted to jaw 91, as at 123, and is provided with a nose 124, adapted to engage a stud 125 of fixed jaw 90.

When the carriage travels to the right, Fig. 1, the slip-sheet 65 is held in manner herein-after described by closed jaws 90 91, and the sheet while passing over guide 69 is placed upon the upper printed sheet that has been received upon table 21. Near the end of the travel of the carriage guide 69 is lowered, while guide 70 is raised, and guide 69, together with the slip-sheet, will enter between the open jaws 88 89. During the last part of the travel of the carriage a pin 126 of plate 25 comes into contact with lever 100 and will thereby tilt sector 95 in the direction of the arrow, Fig. 13, to finally withdraw nose 16 from stud 107. In this way spring 127, that acts upon jaw 89, will cause the latter to close upon the guide 69 and the slip-sheet carried by such guide. As the jaws are slightly roughened at their inner side, while the surface of the guide is smooth, it will be seen that the slip-sheet is retained at its fold within the gradually-closing jaws 88 89, while the carriage, with guide 69, moves toward the left.

The movement hereinabove referred to of sector 95 has, besides releasing jaw 89, also opened jaws 90 91 by means of rod 108. During the rotation of sector 95 sector 109 has also made a rotation in the direction of the arrow, Fig. 13, so that jaw 91 is raised by the engagement of the lower edge of slot 110 with pin 117. After jaw 91 has been raised to its full extent nose 124 will be brought into engagement with stud 125 by link 119, so that jaw 91 is held open against the action

of a spring 128 engaging such jaw. After jaw 91 has been opened the slip-sheet previously sustained by the same will drop out of the gripper, owing to the weight of the superposed print, so that the jaw is ready to receive the next fold of the slip-sheet and to retain the same for the desired length of time.

The operation just described will be repeated for jaws 88 89 and 90 91 when the carriage arrives at the end of its travel toward the left and engages with its pin 128 lever 116, so that the slip-sheet will alternately be held by grippers 71 and 72. While the carriage is at rest at the end of each stroke, the fly of the printing-press places a printed sheet upon the uppermost layer of the slip-sheet. The carriage will then travel to the other end of its race to place another layer of the slip-sheet upon the printed sheet. In this way the slip-sheet is folded in zigzag form, and the printed sheets are automatically placed between the layers or folds of the slip-sheet.

After the prints have sufficiently dried they are taken out from between the folds of the slip-sheet, and the latter may be rewound upon roller 66 to be used upon the next batch of prints.

What I claim is—

1. A device of the character described, comprising means for folding a slip-sheet, and means for alternately grasping said sheet at opposite folds, substantially as specified.

2. A device of the character described comprising a reciprocating carriage adapted to engage a continuous slip-sheet, grippers at the ends of the carriage-run adapted to grasp said sheet, and means for operating said gripper, substantially as specified.

3. A device of the character described comprising a reciprocating carriage adapted to engage a continuous slip-sheet, grippers at the ends of the carriage-run adapted to grasp said sheet, and means for automatically operating said grippers, substantially as specified.

4. A device of the character described comprising a reciprocating carriage, grippers at the ends of the carriage-run adapted to grasp a slip-sheet, a pair of guides carried by the carriage and adapted to alternately engage the sheet, and means for alternately lowering and raising said guides to aline the sheet alternately with opposite grippers, substantially as specified.

5. A device of the character described comprising a carriage adapted to engage a slip-sheet, means for imparting an intermittent reciprocating movement thereto, and grippers at the ends of the carriage-run adapted to grasp said sheet, substantially as specified.

6. A device of the character described comprising a carriage adapted to engage a slip-sheet, means for imparting an intermittent reciprocating movement thereto, grip-

pers at the ends of the carriage-run adapted to grasp said sheet and means for automatically operating the grippers, substantially as specified.

5 7. A device of the character described comprising a carriage adapted to engage a slip-sheet, means for imparting an intermittent reciprocating movement thereto, grippers at the ends of the carriage-run adapted
10 to grasp said sheet, and means actuated by the carriage for alternately opening and closing the grippers, substantially as specified.

8. A device of the character described comprising an endless chain having an upper
15 and lower run, a carriage adapted to engage a slip-sheet, and means for operatively connecting said carriage with said upper or lower run, substantially as specified.

9. A device of the character described comprising an endless chain having an upper and
20 lower run, a carriage, a toothed disk carried thereby, and means for alternately throwing

said disk into engagement with said upper and lower run, substantially as specified.

10. A device of the character described 25 comprising a reciprocating carriage, grippers at the end of the carriage-run adapted to grasp said sheet, means on the carriage for actuating the grippers, and means for operatively connecting the grippers, substantially 30 as specified.

11. A device of the character described comprising a reciprocating carriage, a pair of vertically-movable guides carried thereby, a pair of operatively-connected grippers at the 35 ends of the carriage-run adapted to grasp said sheet, and means on the carriage for actuating the grippers, substantially as specified.

Signed by me at New York city, New York, this 28th day of August, 1906.

JOSEPH WATZELHAN.

Witnesses:

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