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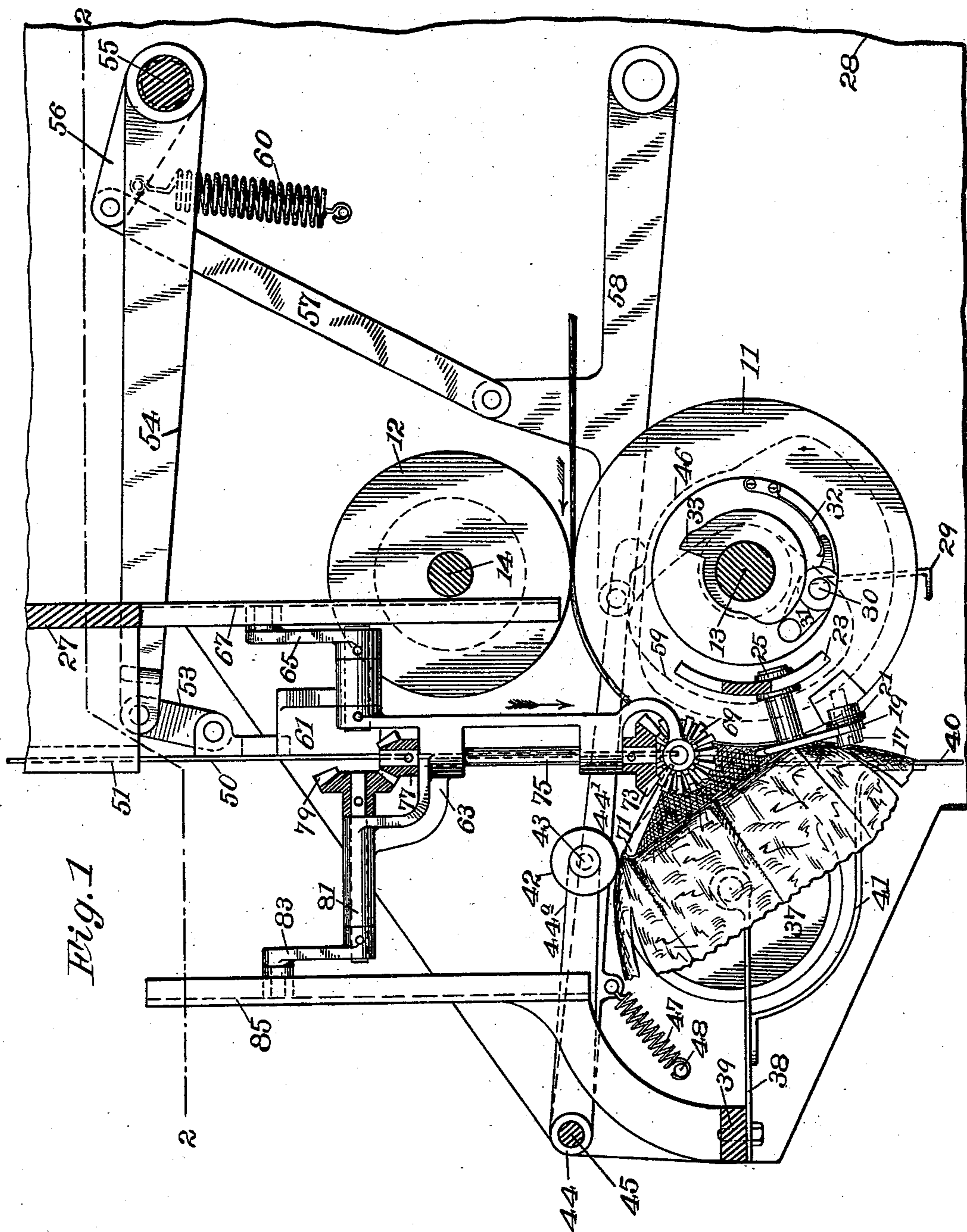
6 Sheets—Sheet 1.

W. A. LORENZ & E. E. CLAUSSEN.

PAPER BAG MACHINE.

No. 534,512.

Patented Feb. 19, 1895.



Witnesses:

W. H. Honiss

Elmer M. White

Inventors:

William A. Lorenz

Edward E. Claussen

6 Sheets—Sheet 2.

Patented Feb. 19, 1895.



William A. Lorenz

Edward E. Gausson

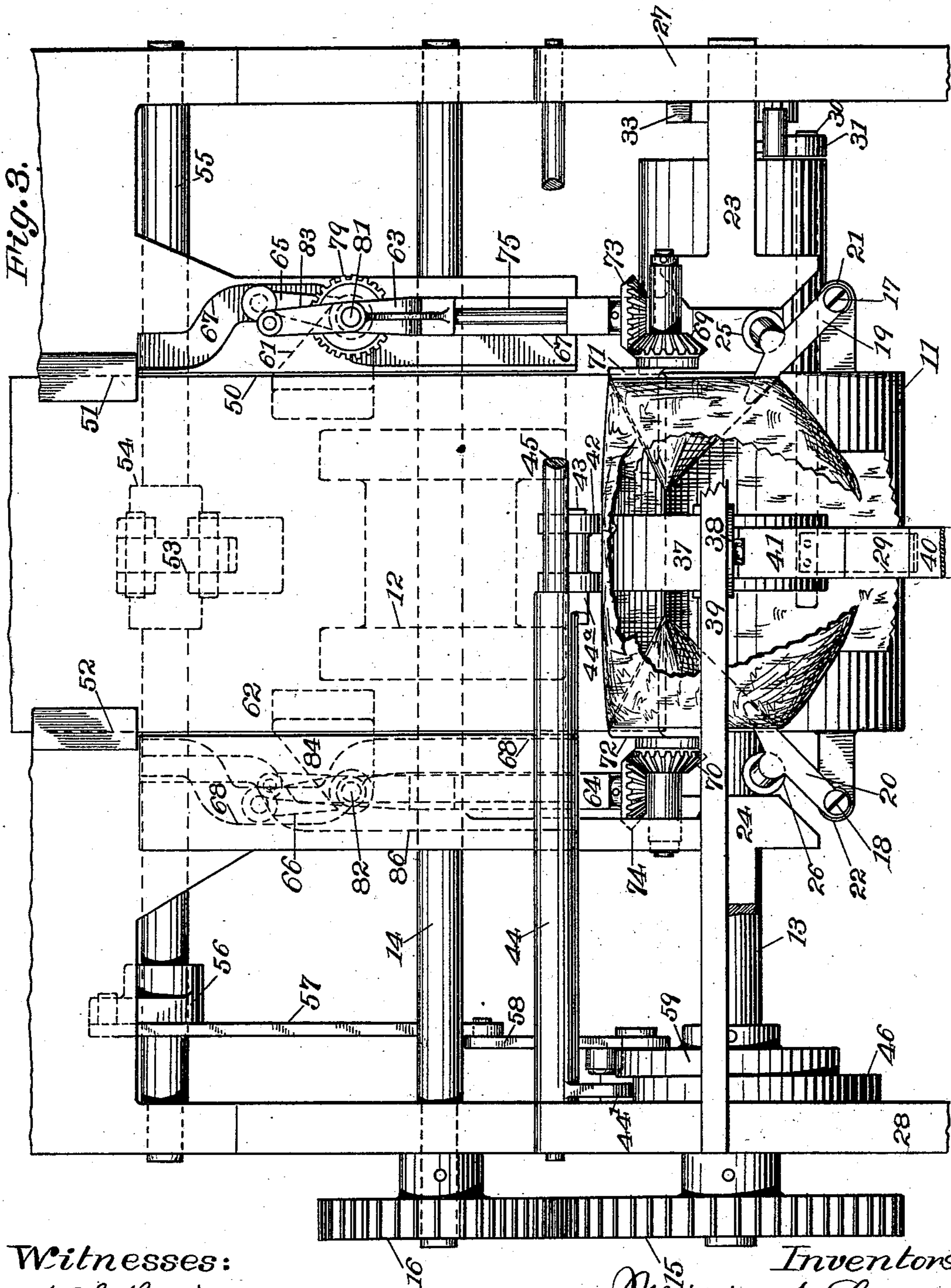
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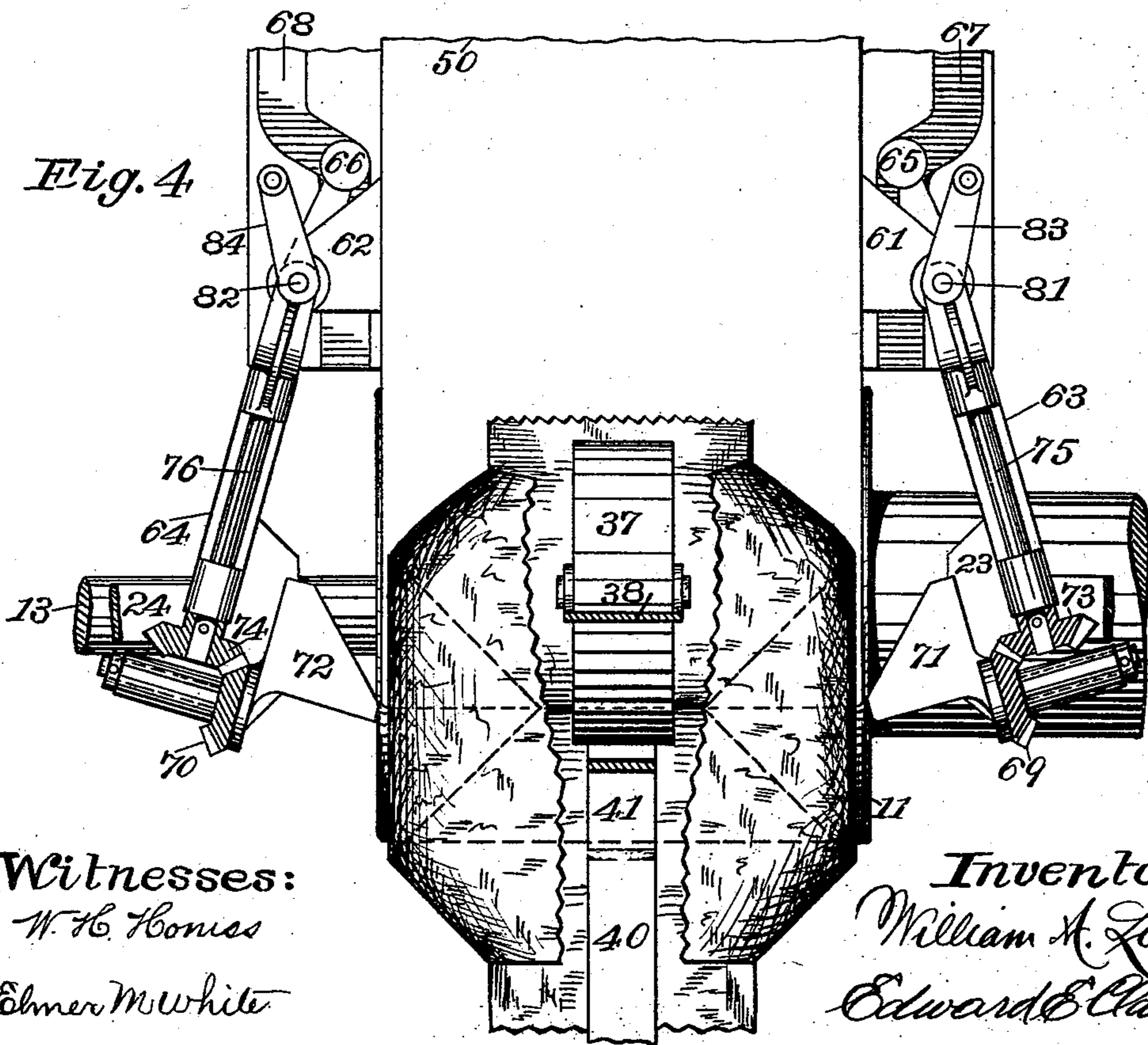
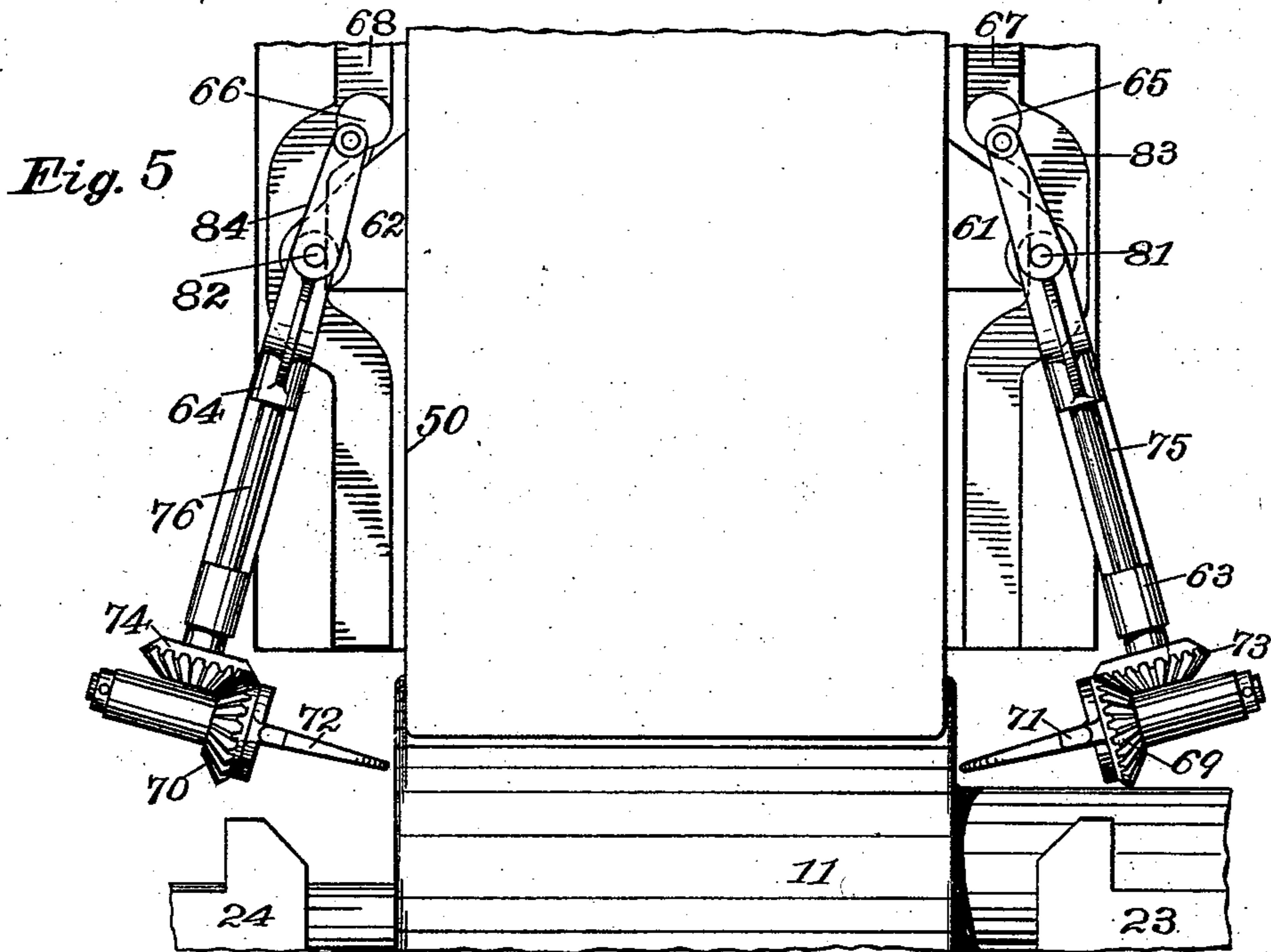
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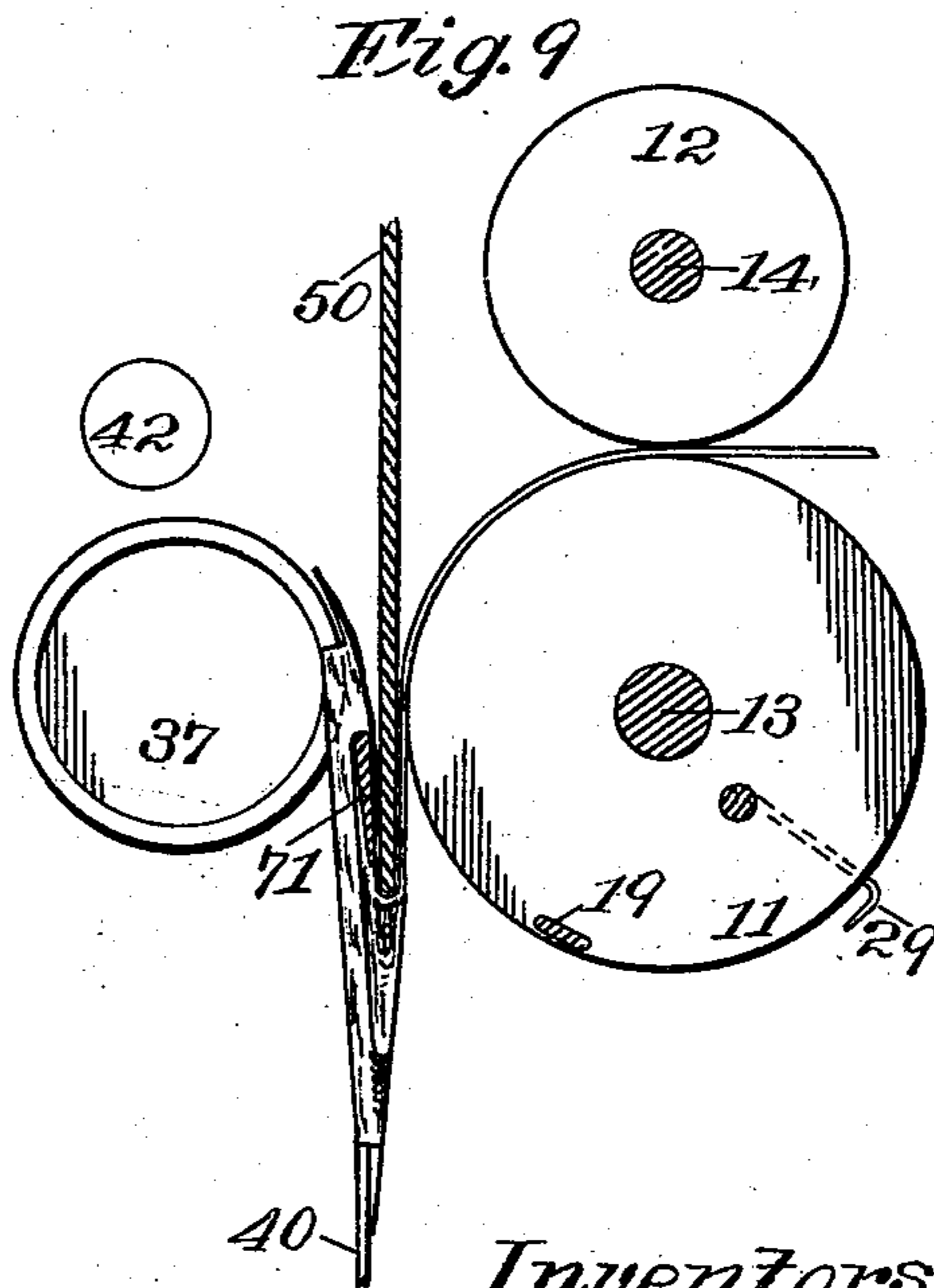
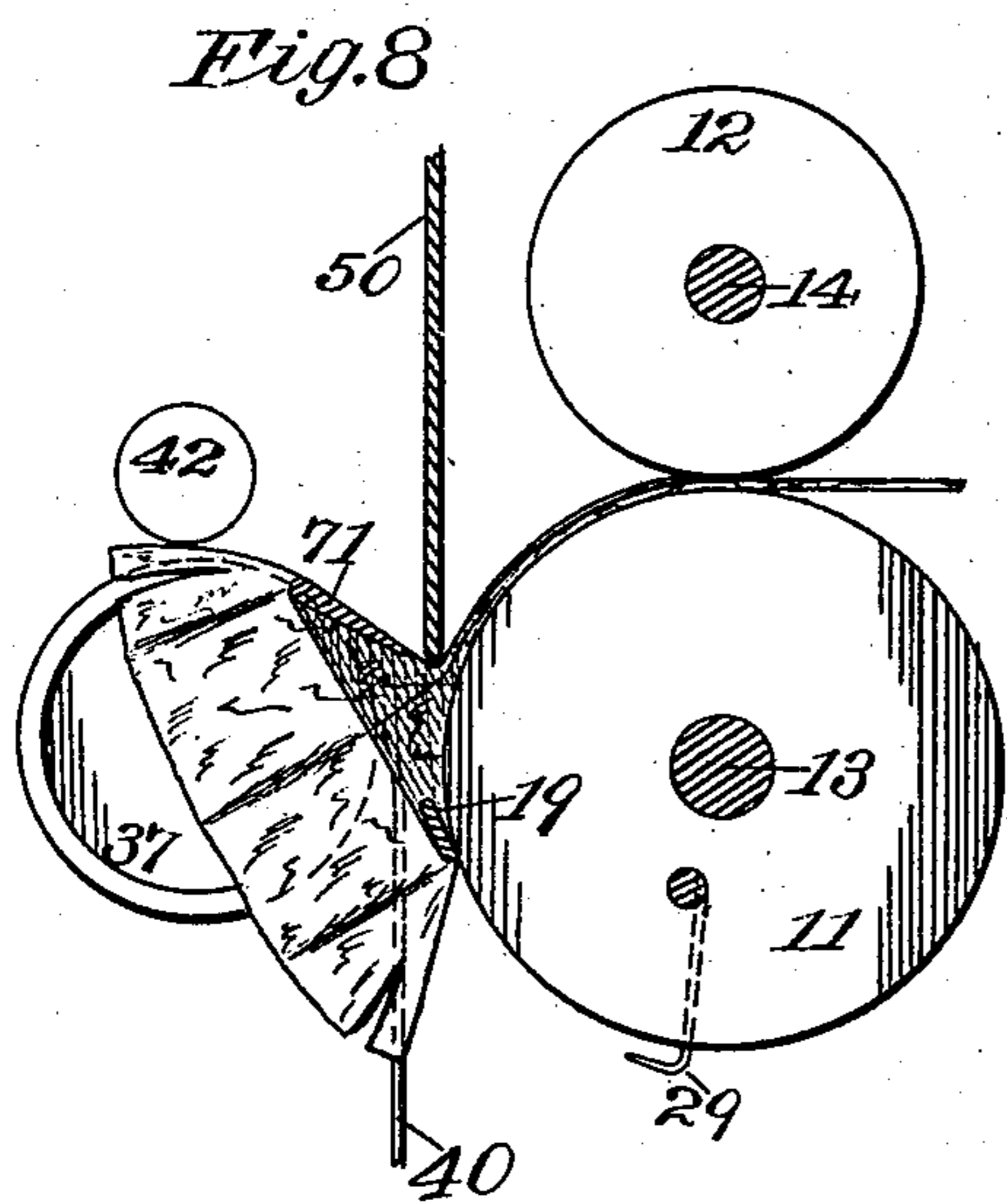
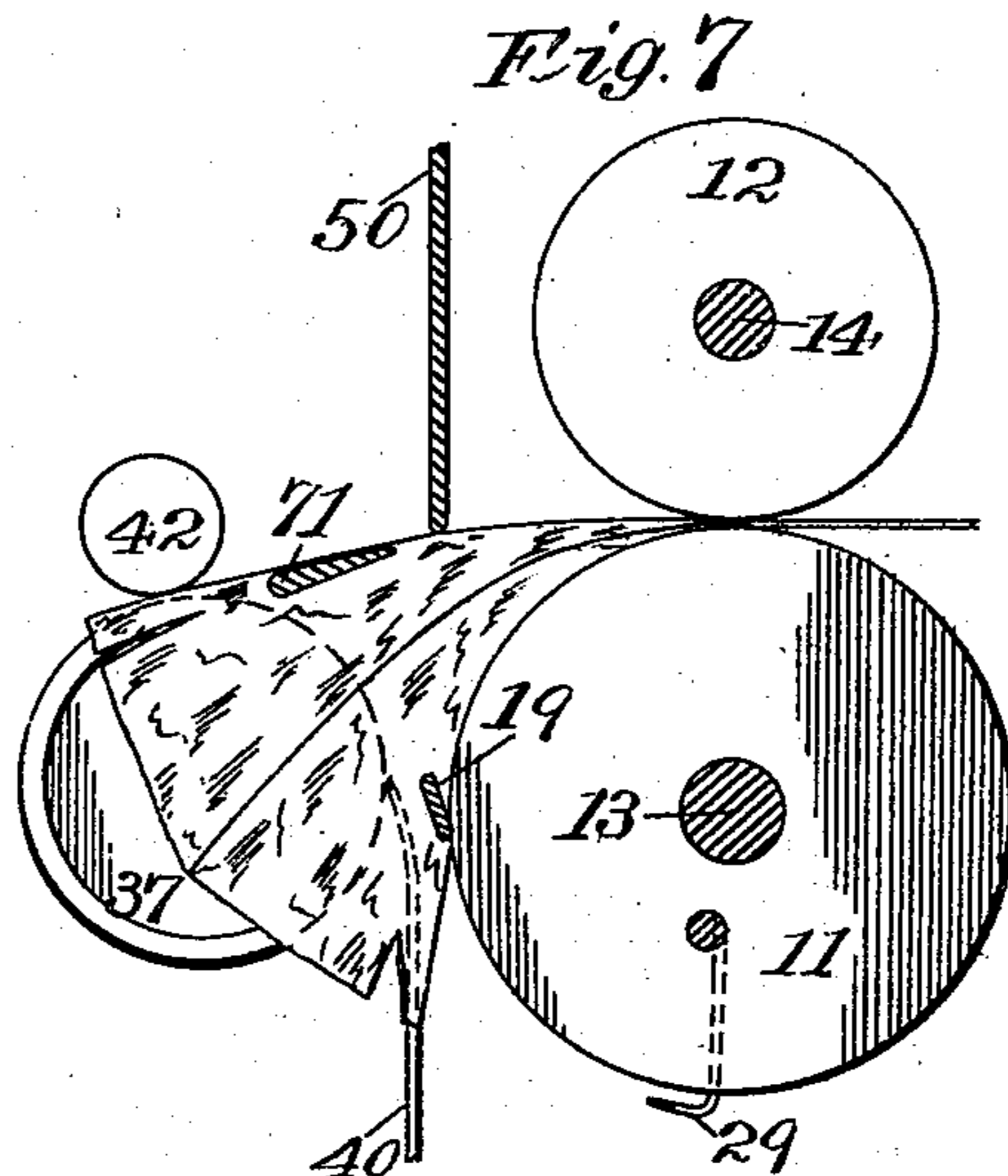
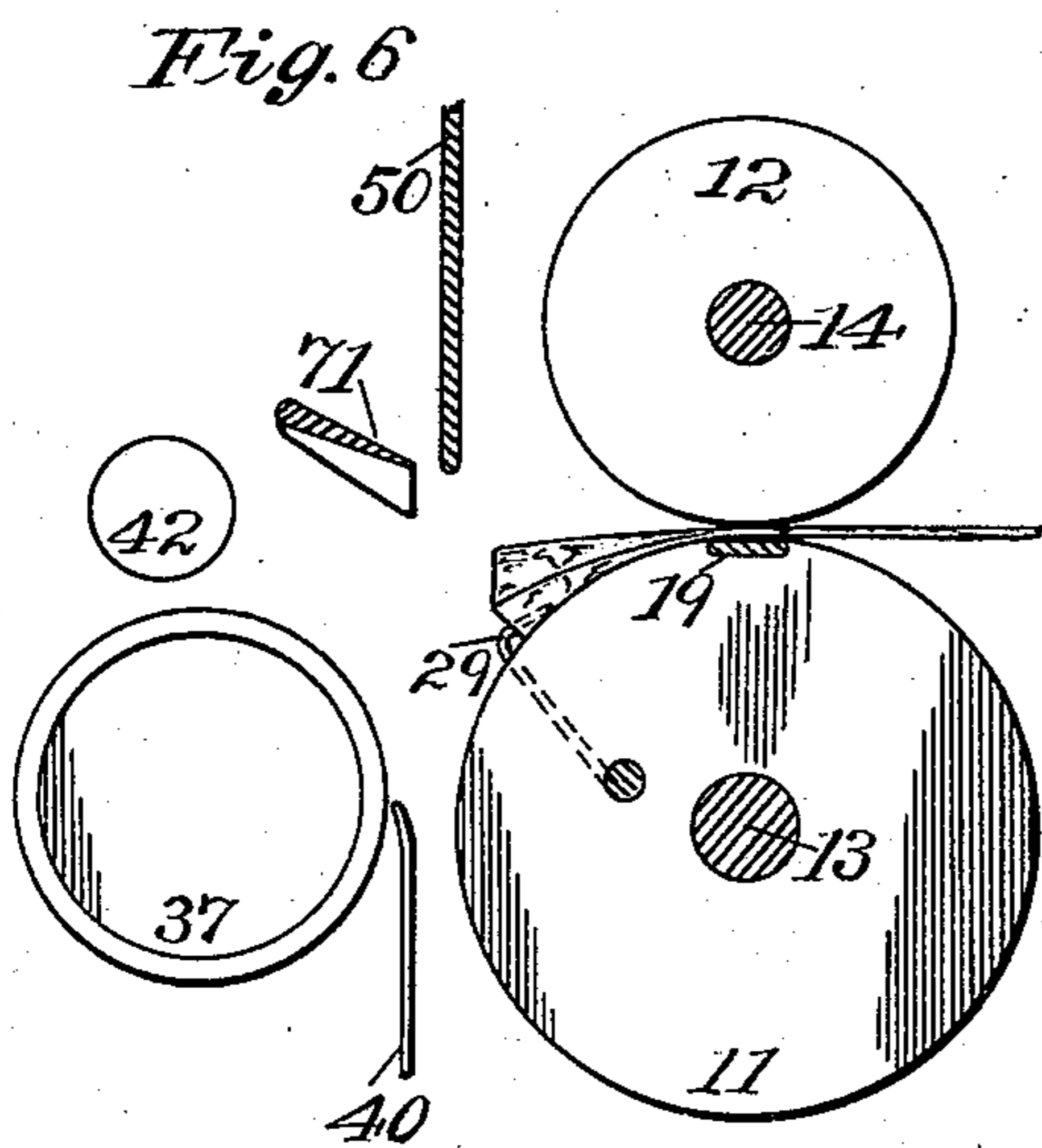
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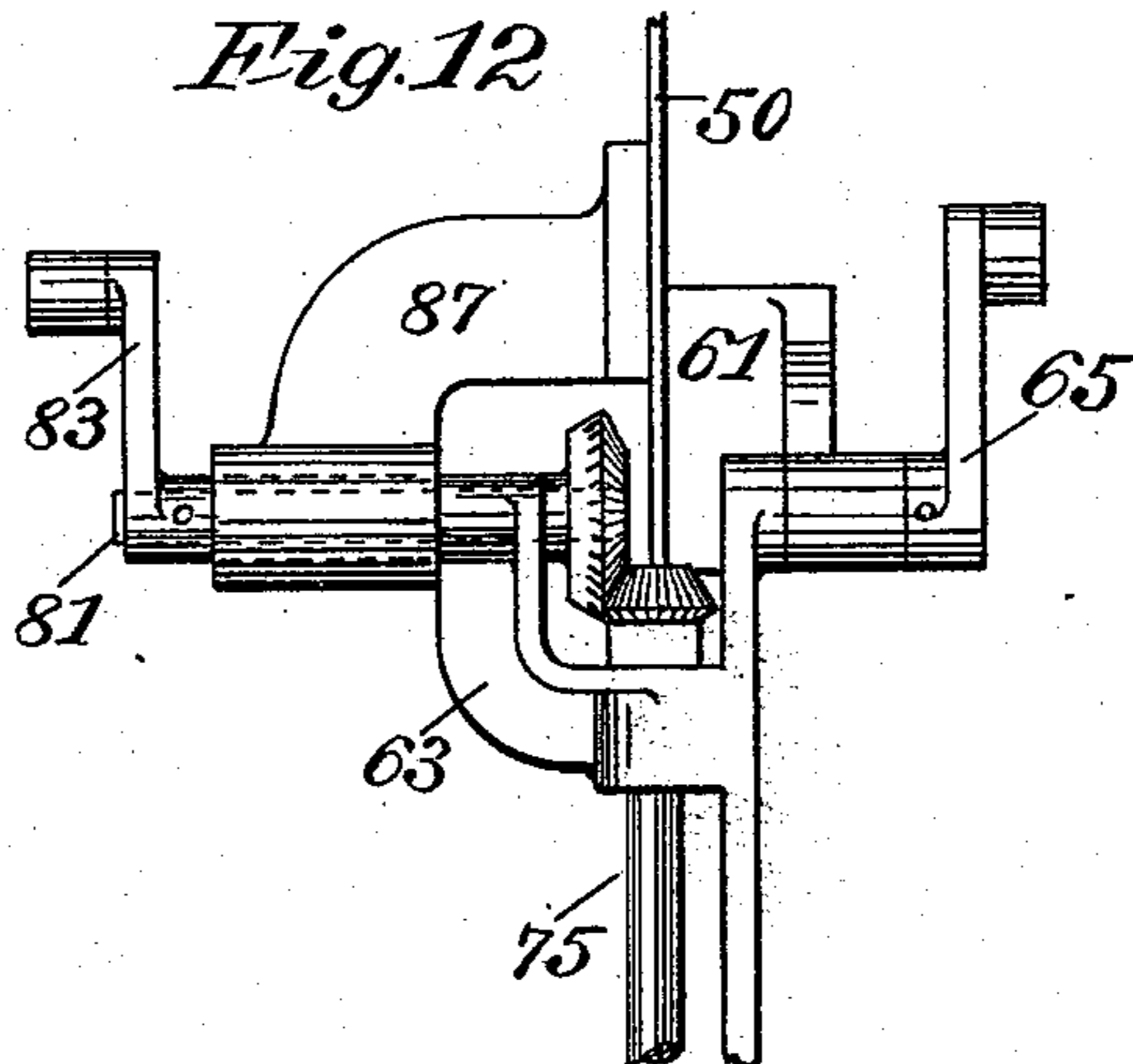
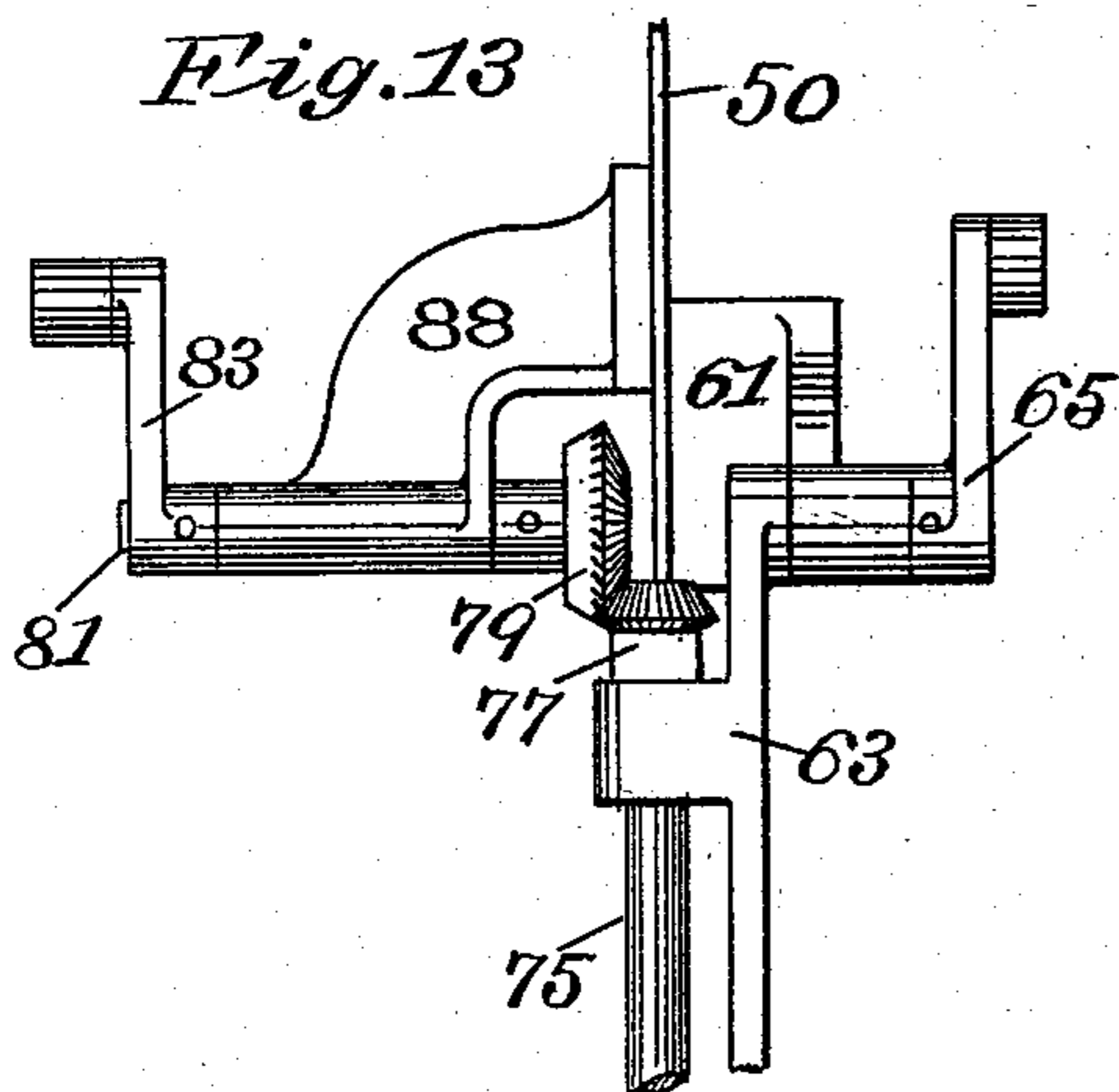
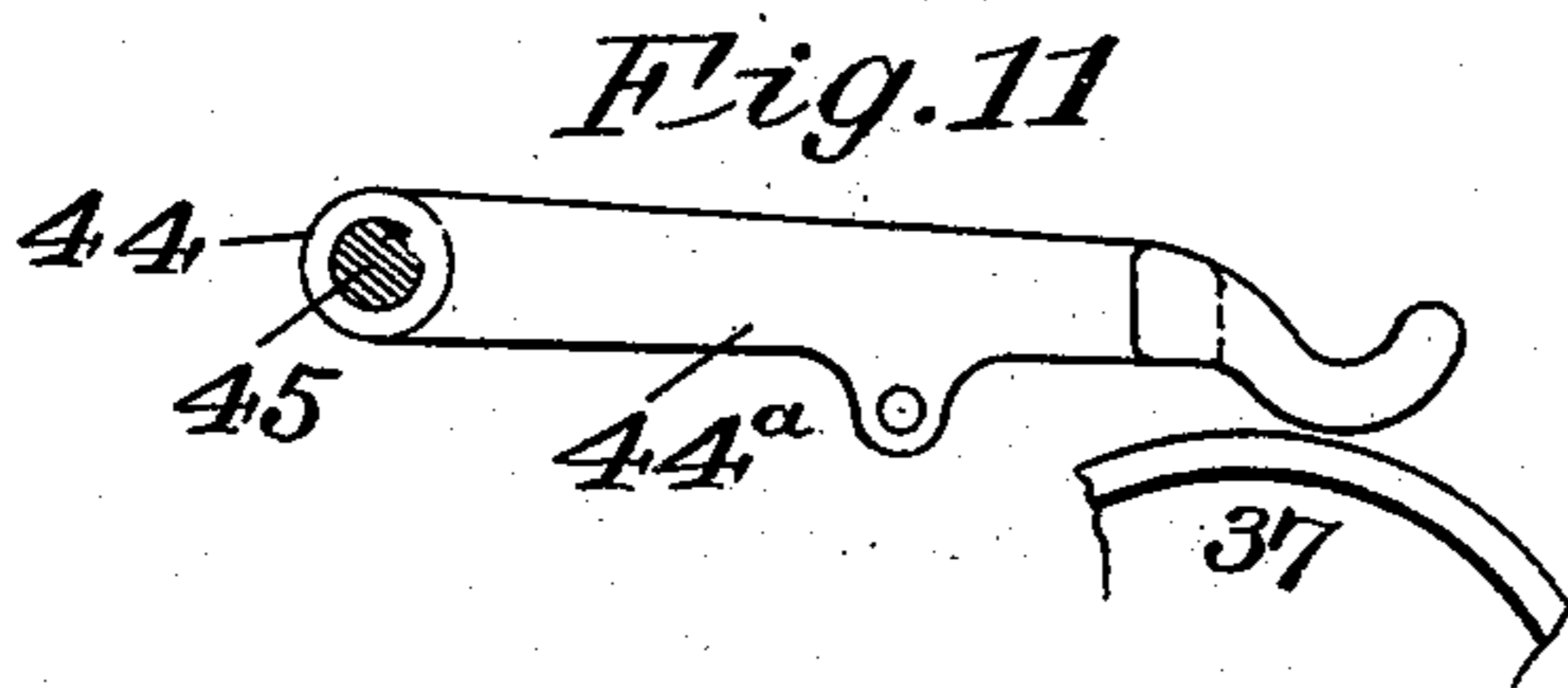
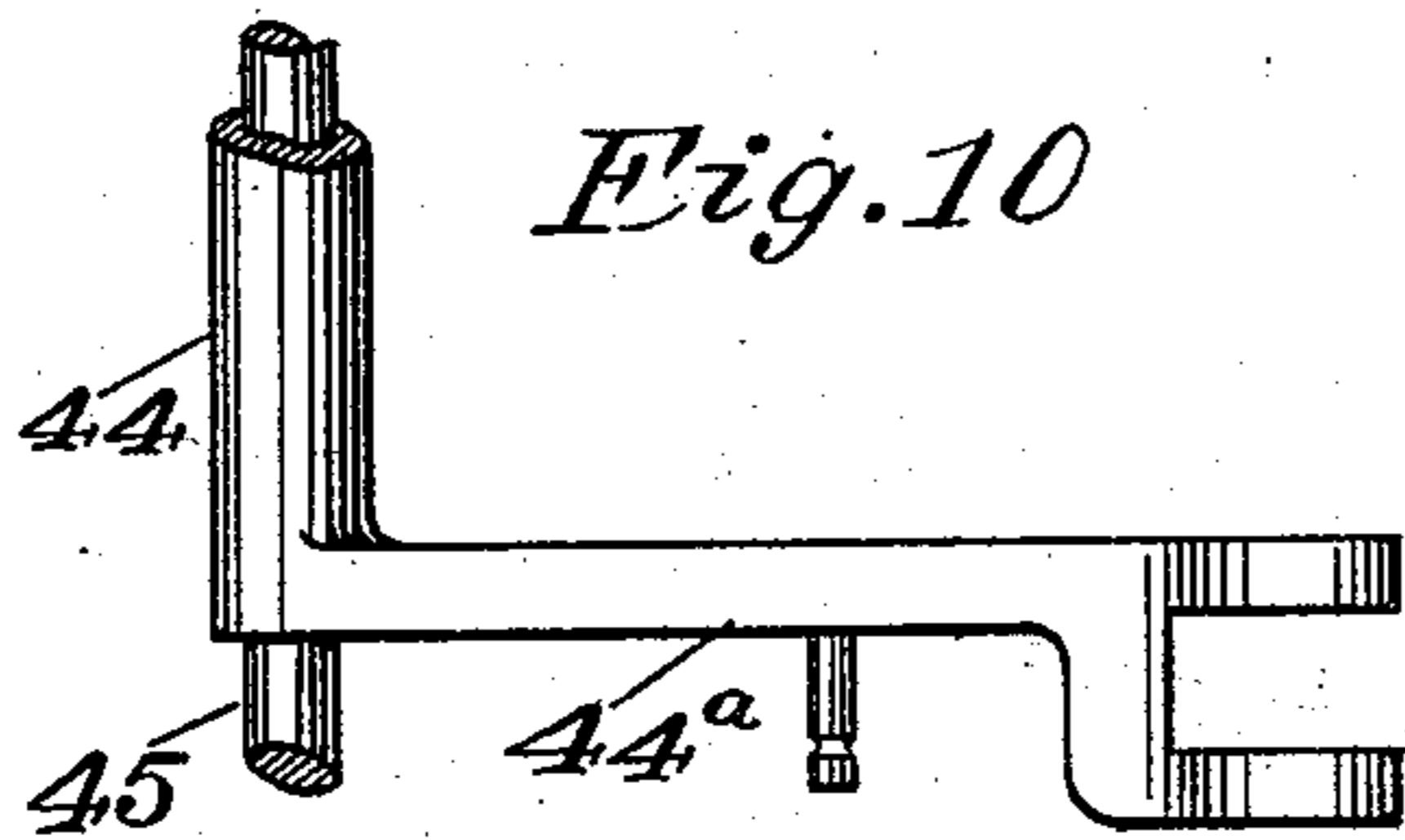
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6 Sheets—Sheet 6.

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UNITED STATES PATENT OFFICE.

WILLIAM A. LORENZ AND EDWARD E. CLAUSSEN, OF HARTFORD, CONNECTICUT, ASSIGNORS TO ALBERT H. WALKER, TRUSTEE, OF SAME PLACE.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 534,512, dated February 19, 1895.

Application filed April 26, 1893. Serial No. 471,903. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. LORENZ and EDWARD E. CLAUSSEN, citizens of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a full, clear, and exact specification.

10 This invention consists in mechanism for performing one of the most difficult steps in the operation of making a square bottomed bag from bellows sided paper tubing, viz., the opening of one end of the tube into substantially the form shown in Figures 4 and 9, which may by other and well known devices be flattened down into the diamond shape, and be completed by pasting and cross folding the end flaps.

20 The mechanism herein shown and described represents this invention in its adaptation to that class of machines such as is shown and described in Letters Patent of the United States No. 417,346, of December 17, 1889; wherein the tube is carried by a rotating carriage or cylinder while the diamond folding operations are being performed.

30 The adaptation of this invention to machines having reciprocating or oscillating folding beds in place of a rotating cylinder, such as those shown and described in Letters Patent No. 331,722, of December 1, 1885, and in No. 361,951, of April 26, 1887, is a matter requiring only the exercise of mechanical skill.

35 Fig. 1 of the drawings of this specification is a side elevation, partly in section on the line 1—1 of Fig. 2, of our invention adapted to the machine of Patent No. 417,346 above referred to, showing also the blank partially opened. Fig. 2 is a plan view, also partly in section taken on the line 2—2 of Fig. 1, but without the paper blank. Fig. 3 is a left hand elevation of what is shown in Fig. 1. Fig. 4 is a view, looking from the left hand side of Fig. 1, of the blank, and of the devices which carry and operate the triangular folding blades, showing them in the position after withdrawing from the blank. Fig. 5 is a similar view of the blades and their operating devices in a position occupied by them on their way back to engage with the succeeding

blank. Figs. 6, 7, 8, and 9 are diagrams, showing the blank, the rolls, and the folding blades in four positions during the operation of folding. Figs. 10 and 11 are a plan and a front view respectively, of a modified form of the arm 44^a. Figs. 12 and 13 represent modified constructions of the supports for the oscillating brackets and their shafts.

No mechanism is herein shown for forming the bellows sided tubing, it being understood that the tubes may be formed and fed to the herein described mechanism by any of the well known methods, such for instance as those described in the patents referred to above.

The cylinder 11 and the roll 12 are fixed upon their respective shafts 13 and 14, which are connected by the gears 15 and 16 respectively, and are driven at suitable speeds from any convenient part of the machine. The side grippers 19 and 20 are mounted upon the pivots 17 and 18 on the cylinder, and are provided with springs 21 and 22 which hold the grippers in their outward position except when they are carried inwardly by the cams 23 and 24 acting against the rollers 25 and 26 respectively, causing the grippers to hold the paper upon the cylinder, and to release it again at suitable times. The cams 23 and 24 are attached to the frames 27 and 28 respectively. The front gripper 29 is attached to one end of the shaft 30, which is journaled in the cylinder and has fixed upon its opposite end the arm 31, by means of which the gripper is opened and closed. The spring 32 acting upon the arm 31 operates to keep the gripper closed upon the cylinder, excepting when it is opened by the action of the cam 33, which is fixed to the frame 27, as may be best seen in Figs. 1 and 3. The roll 37 turns freely on a pin held by the bracket 38 attached to the cross brace 39 between the frames. The bracket 38 also supports the extension 41 for the guide plate 40. The presser 42 is mounted on a pin 43 which is fixed in one arm 44^a of the frame 44, and that frame is free to oscillate upon the shaft 45, the amount of oscillation being governed by the cam 46 fixed upon the shaft 13, the arm 44' being held in engagement with that cam by its weight and by the action of the spring

47 attached between the arm 44' and one of the pins 48.

The folder plate 50 is fitted to slide vertically in the grooves 51, 52 in the frames 27 and 28, and is connected by the link 53 to the arm 54, which is fixed on the shaft 55. That shaft is journaled in the frames 27 and 28, and has also fixed upon it the arm 56, which is connected by the link 57 to the cam arm 58, the end of which is held in contact with the cam 59 by the action of the spring 60 attached to the arm 56. The cam 59 is fixed upon the shaft 13 and operates through the connecting links and arms to elevate the folder plate 50, and to allow it to drop at a suitable time and speed as it is pressed down by the action of the spring.

Upon the side extensions 61 and 62 of the folder plate are journaled the oscillating brackets 63 and 64, with their axes of oscillation parallel, so as to allow the brackets to oscillate toward and from each other, and they are rigidly connected with their respective cam arms 65 and 66. The ends of these arms are adapted to engage in the cam grooves 67 and 68 made in extensions of the frames 27 and 28; these grooves being so formed as to cause the brackets to oscillate at the required times. At the lower ends of the brackets 63 and 64 are journaled the bearings of the bevel gears 69 and 70 respectively, so arranged that when the brackets are in their inward or operative position as seen in Figs. 1 and 3, the axes of the gears are substantially in line with each other and with the lower front edge of the folder plate 50. Attached to the inner ends of the bevel gears 69 and 70 are the folder blades 71 and 72 respectively; the function of these blades being to enter the side tucks of the blank and to fold back the upper plies thereof over the edge of the folder plate 50. A suitable oscillatory motion is communicated to the bevel gears 69 and 70 by the bevel gears 73, 74, fixed on the shafts 75 and 76 respectively. These shafts are journaled in the brackets 63 and 64, and have fixed upon their upper ends the bevel gears 77 and 78 respectively, which engage with the bevel gears 79 and 80, fixed on the shafts 81 and 82 respectively. The shafts 81 and 82 are also journaled in the brackets 63 and 64 with their axes substantially in line with the axes of the bearings on which these brackets oscillate, and have fixed on their outer ends the arms 83 and 84, the ends of which are adapted to engage in the cam grooves 85 and 86 respectively, made in extensions of the cross brace 39 between the frames 27 and 28. These grooves are so formed as to cause the blades 71 and 72 to oscillate as required. These portions of the brackets 63, 64, which form the bearings for the shafts 81 and 82, may be journaled in brackets attached directly to the folder plate 50, as shown by the bracket 87 in Fig. 12, or

these shafts may be journaled in independent bearings similar to the bracket 88 of Fig. 13.

The operation of the machine is as follows: A suitable length of tuckd tubing is fed between the cylinder 11 and the roll 12, and as the leading end passes the line of contact of the cylinder and roll, the front gripper 29 closes upon the center of the lower ply, and as the tube advances separates it from the upper ply, which passes forward over the roll 37 and under the presser 42, which is slightly elevated for that purpose as shown in Fig. 6. The side grippers 17 and 18 are then turned inward, so as to grip to the cylinder the edges of the lower plies at the points where the corresponding corners of the bottom of the bag are subsequently to be. As the tube advances the folder plate 50 moves downward, bringing its lower edge in contact with the blank substantially at the line on which the primary transverse fold is to be made. At the same time the brackets 63 and 64 oscillate toward each other, bringing the blades 71 and 72 into the tucks, at which time the various parts are in the position shown in the diagram Fig. 7, the front gripper 29 having released its hold after bringing the front lower ply of the tube under the guide 40. The presser 42 is now allowed to drop upon the lower ply to keep the pasted longitudinal seam from spreading or opening during the operation of folding. Passing to the position shown in Figs. 1 and 8, the blades 71 and 72 are caused to oscillate on their bearings to the extent therein shown, which operates to stretch out the side tucks of the tube between those four points upon the edges of the tube which are engaged by the edges of the side grippers and the blades, and which are to form the bottom corners of the resulting bag. The angular edges of the blades serve also to define the corresponding edges of the well known inward triangular folds peculiar to this form of bag. Continuing the operation from the position shown in Figs. 1 and 8, to that shown in Fig. 9 the folder plate moves down with the tube, and the blades continue to turn, which action in conjunction with that of the roll 37 flattens the blank into substantially the form shown in Figs. 4 and 9. At a point intermediate the positions of Figs. 8 and 9 the side grippers 19 and 20 are withdrawn. At the position shown in the latter figure the blades 71 and 72 are withdrawn, as also shown in Fig. 4, and the diamond folded blank, flattened and guided by the roller 37 and the guide plate 40 is delivered to any suitable mechanism for pasting and completing the bag. The folder plate and its appurtenances are then elevated, and the blades are turned back to a position suitable for engaging the succeeding blank.

The presser 42 operates to hold back the upper ply and to bend it more sharply and evenly against the edge of the folder plate,

and also operates to hold together the longitudinal pasted seam of the tube, when that seam is made in the upper ply; all of which is highly desirable especially when folding heavy paper.

The amount of tension imparted to the upper ply may be altered by varying the tension of the spring 47. The presser 42 may be fixed on the arm 44^a, or the end of that arm may be adapted to perform the function of that presser as shown in Figs. 10 and 11.

We claim as our invention—

1. A folding bed, provided with grippers which engage one ply of the blank substantially at the points which are to be the bottom corners of that side of the bag, a folder plate having an edge adapted to define the line of the primary transverse fold in the other side of the blank, and a pair of oscillating blades connected with the folder plate and arranged to oscillate upon axes substantially in line with the folding edge of the plate; all substantially as described.

2. A folding bed, provided with grippers which engage one ply of the blank substantially at the two points which are to be the bottom corners of that side of the bag, a pair of angular folding blades which engage the corresponding corners of the other ply, a folder plate for defining the primary cross fold line, and a pair of arms pivoted on that plate and operating to carry those blades into and out of the side tucks of the blank; substantially as described.

3. A folding bed provided with a gripper for opening the mouth of the blank, a roller 37 for entering and distending that mouth, a folder plate adapted to define the primary transverse crease in the blank, and a presser with its cam, all arranged and operating to open the mouth of the blank and to fold the upper ply thereof sharply against the edge of the folder plate; substantially as described.

4. A cylinder 11 and the roll 12 for bringing the blank into the machine, a folder plate

adapted to define and travel with the primary transverse crease in the upper ply of the blank, the roll 37, the presser 42 and its cam 46, all arranged and operating to fold the upper ply sharply against the edge of the folder plate; substantially as described.

5. A folder plate having one edge adapted to define the primary transverse crease in a bag blank, a pair of arms pivoted thereon, a pair of oscillating folding blades pivoted upon these arms with their axes of oscillation substantially in line with each other and with the folding edge of the plate when in their operative position, with cams and connecting mechanism for causing these arms to oscillate at the desired times and to the required extent; substantially as described.

6. The combination of the folder plate 50, the blade carrying arms 63, 64, journaled thereon, the cam arms 65, 66, and the cams 67, 68, arranged and operating to carry the blades into and out of the tucks at suitable times; substantially as described.

7. The combination of the blade 50 and the arms 63, 64, adapted to reciprocate in a constant plane, the blades 71, 72 respectively journaled thereon, the cam arms 65, 66, 83, 84, and the cam grooves 67, 68, 85, 86, located in planes parallel with the plane of reciprocation of the blade, substantially as described.

8. The combination of the folder plate 50, the arms 63, 64, journaled thereon, the cams 85, 86, the cam arms 83, 84, journaled substantially in line with the journals of the arms 63, 64, respectively, the blades 71, 72, journaled on these arms, and connecting mechanism between these blades and their respective arms, all arranged and operating to communicate the desired oscillatory motion to the blades; substantially as described.

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