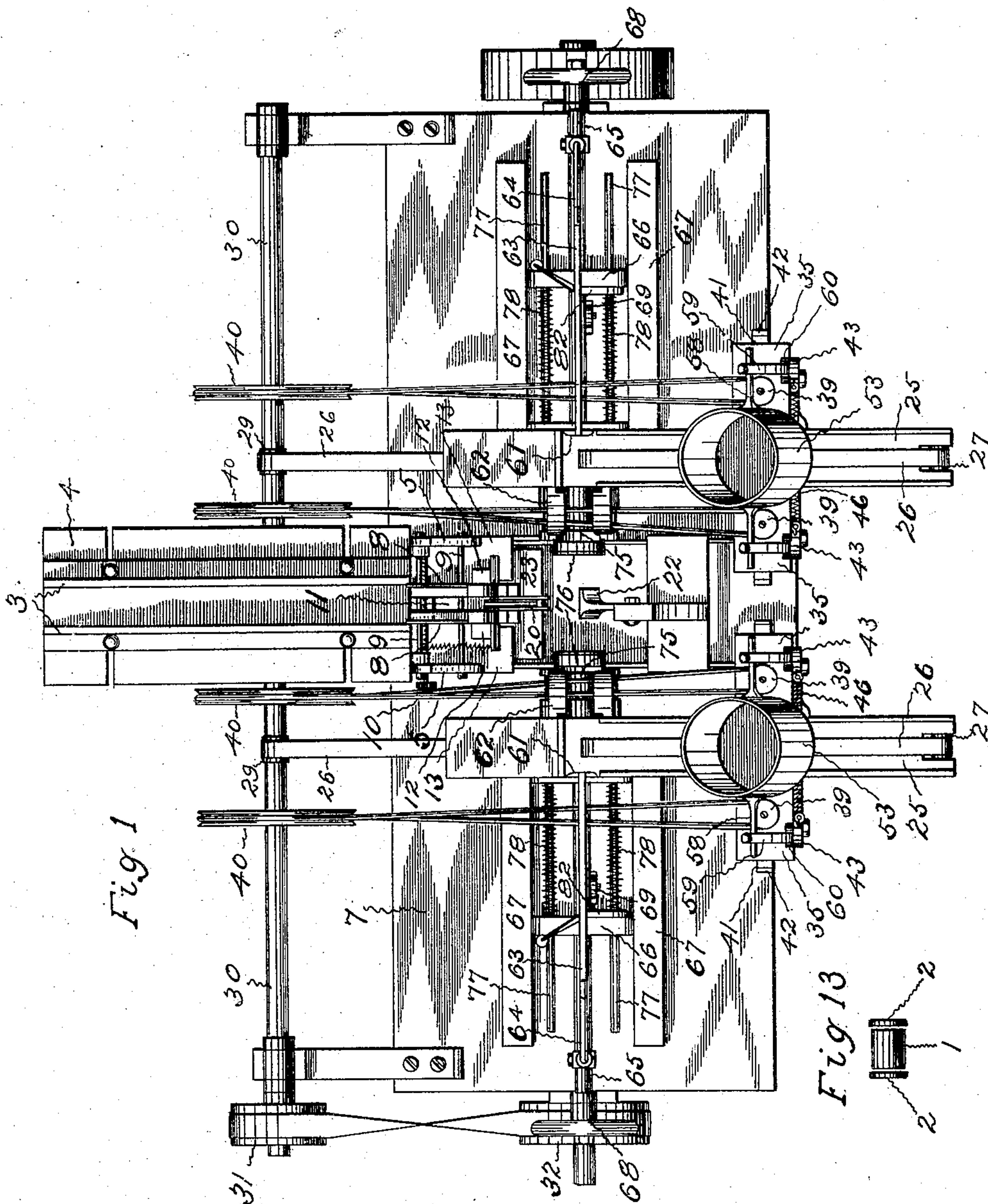


W. BARRETT.  
MACHINE FOR FORMING PAPER PACKAGES.  
APPLICATION FILED DEC. 8, 1909.

981,607.

Patented Jan. 17, 1911.

6 SHEETS—SHEET 1.



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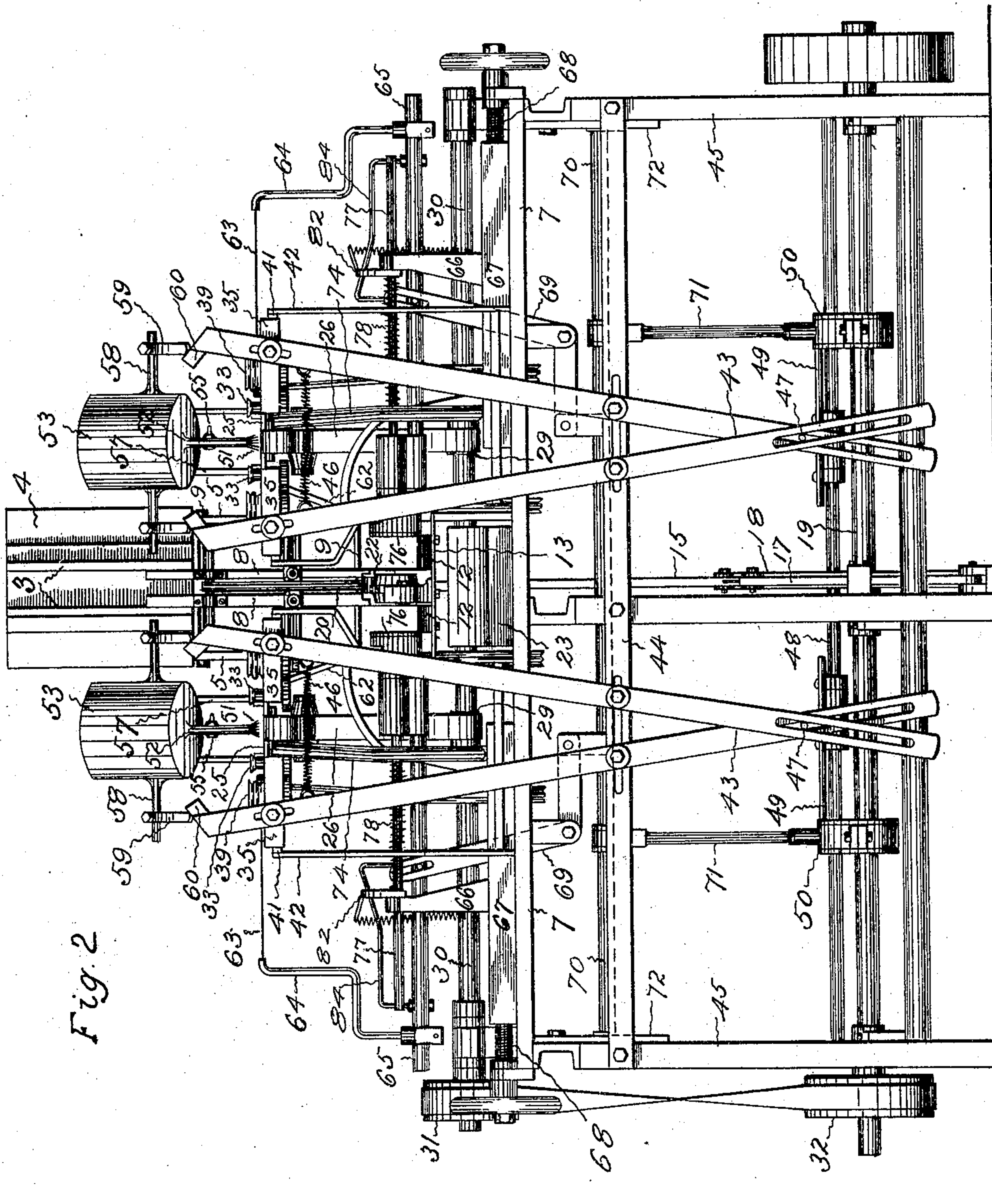


Fig. 2

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6 SHEETS—SHEET 3.

Fig. 12

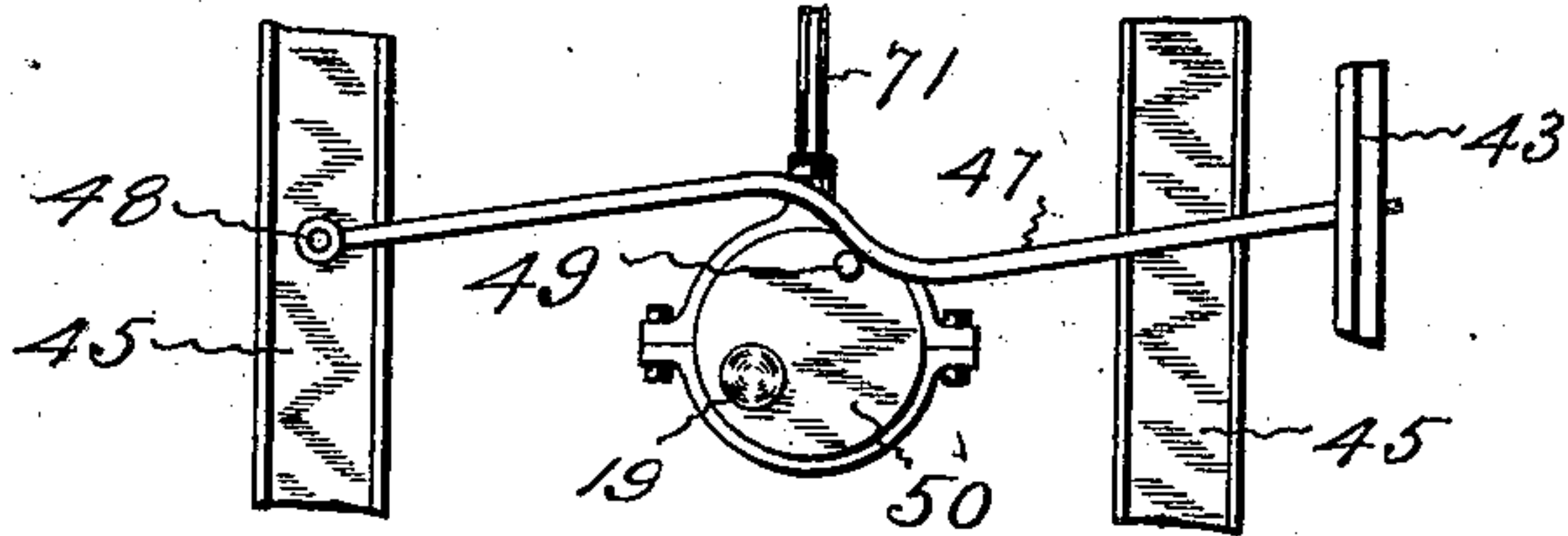
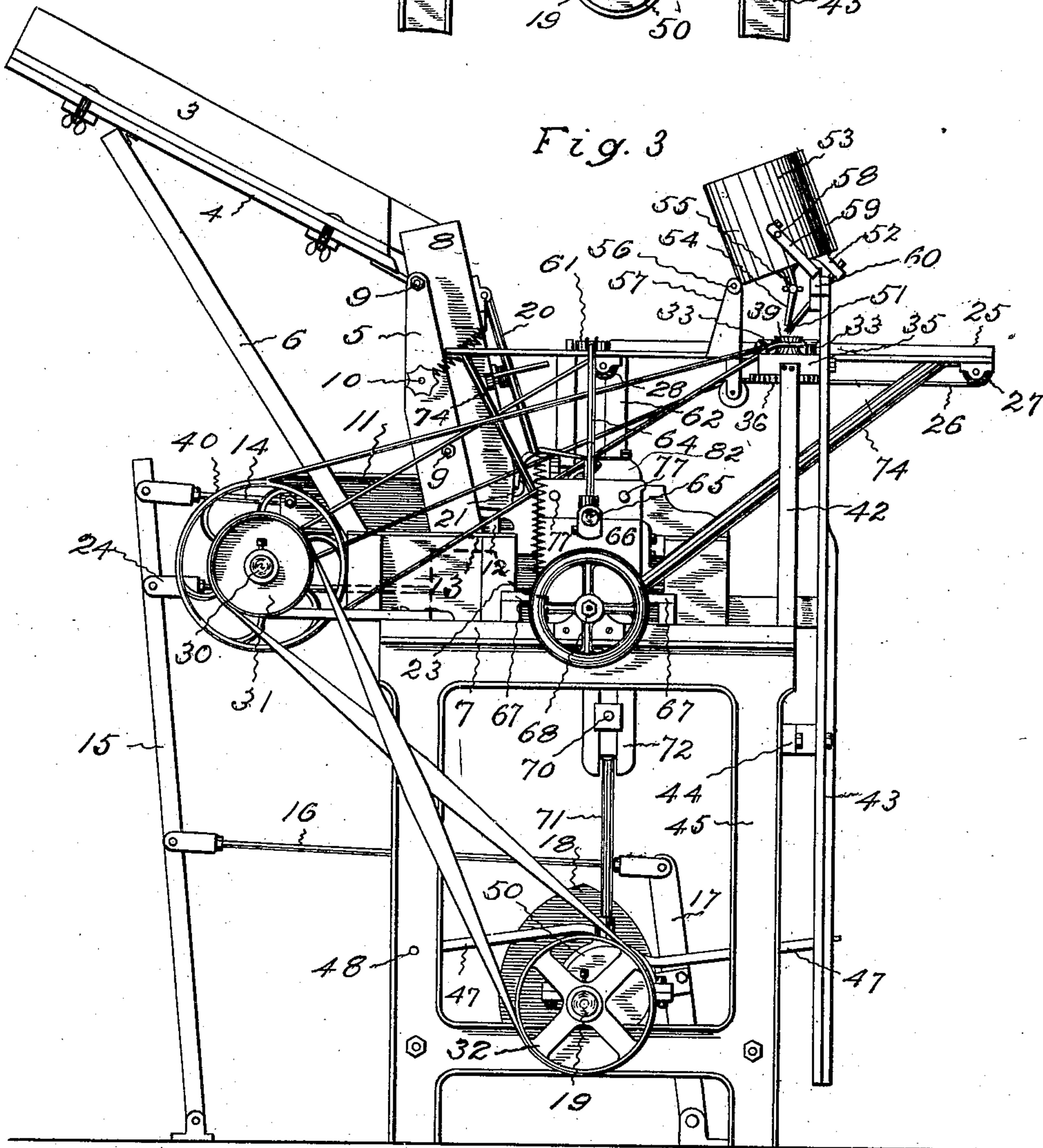


Fig. 3



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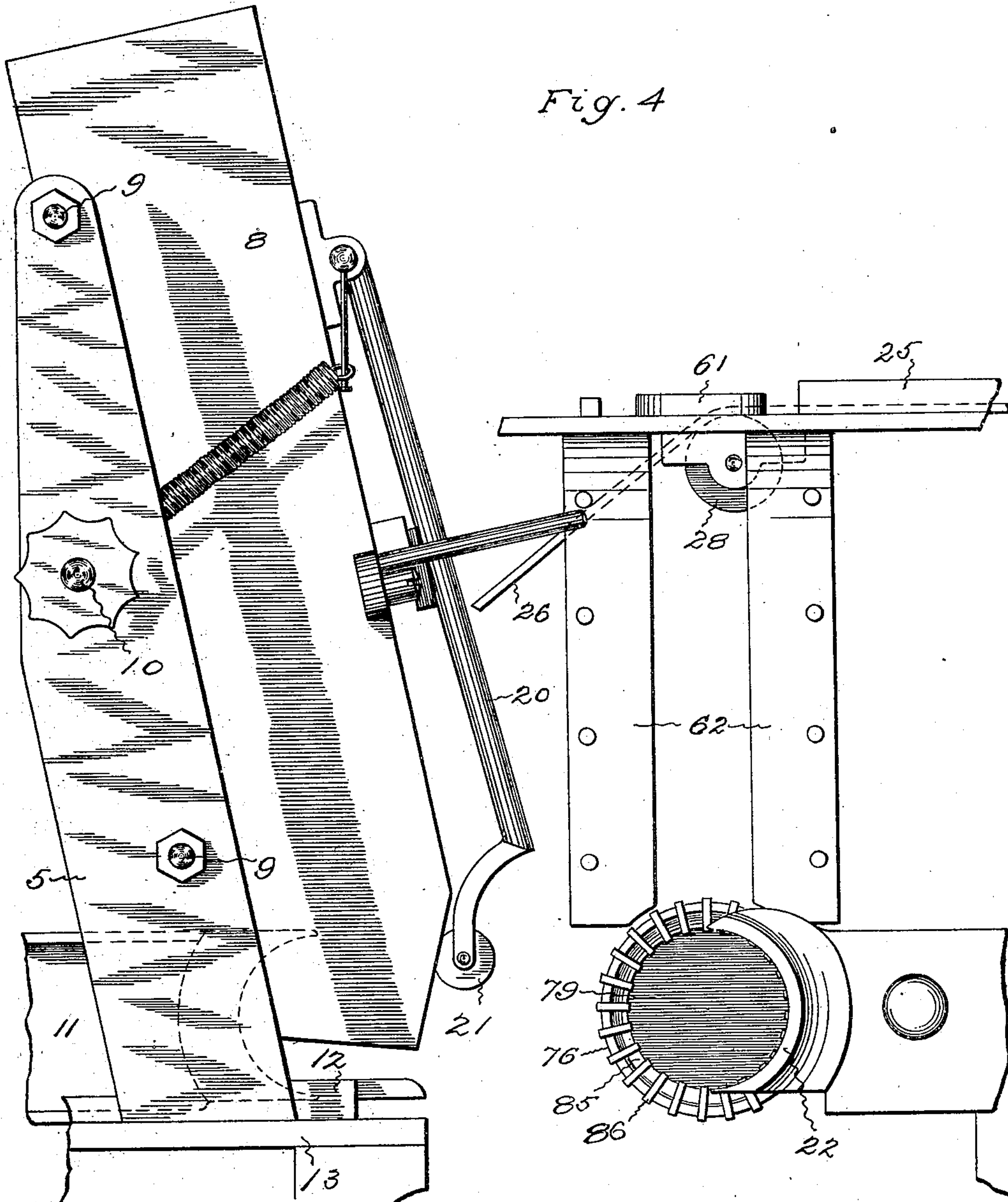
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6 SHEETS—SHEET 4.

Fig. 4



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6 SHEETS—SHEET 5.

Fig. 5

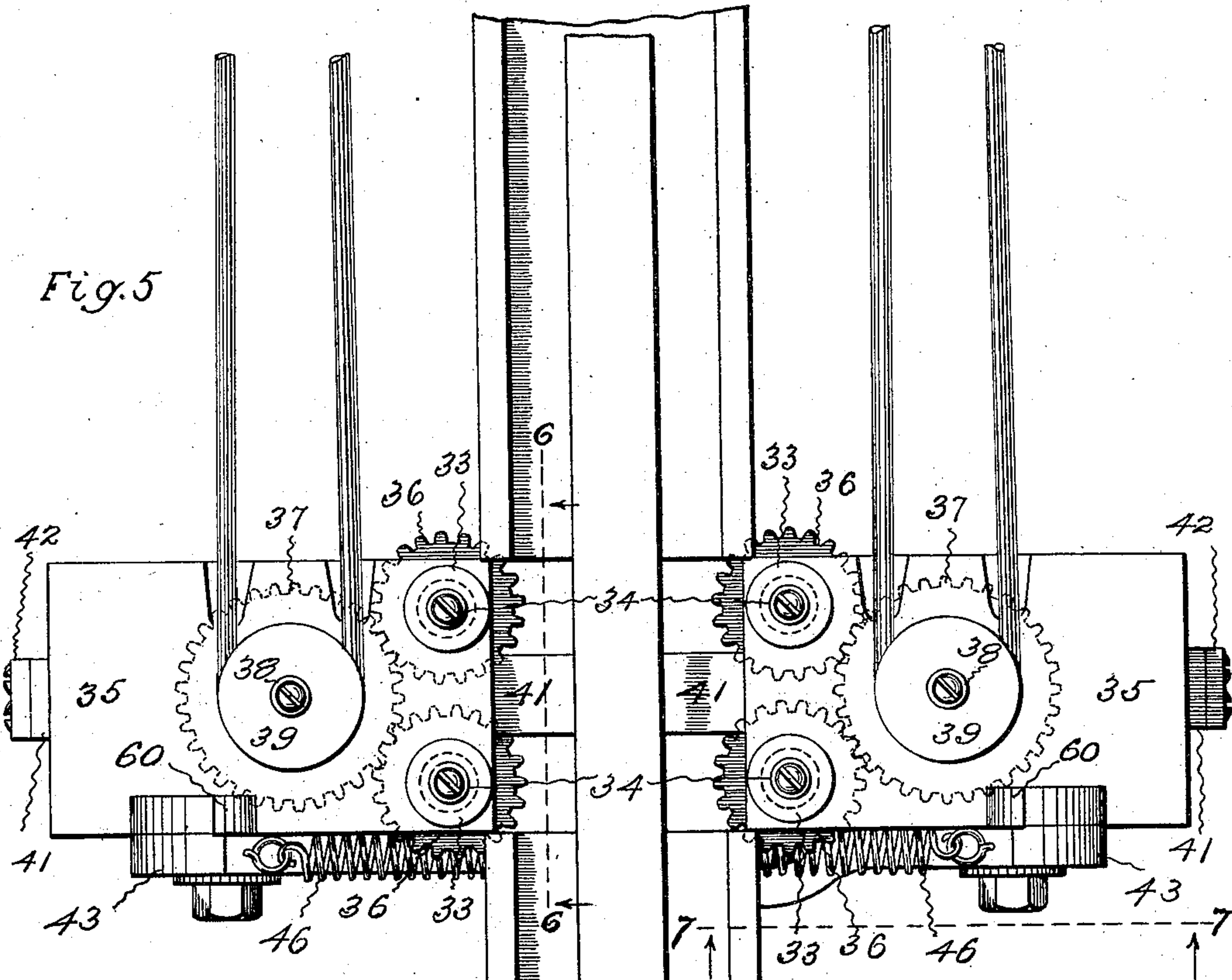


Fig. 6

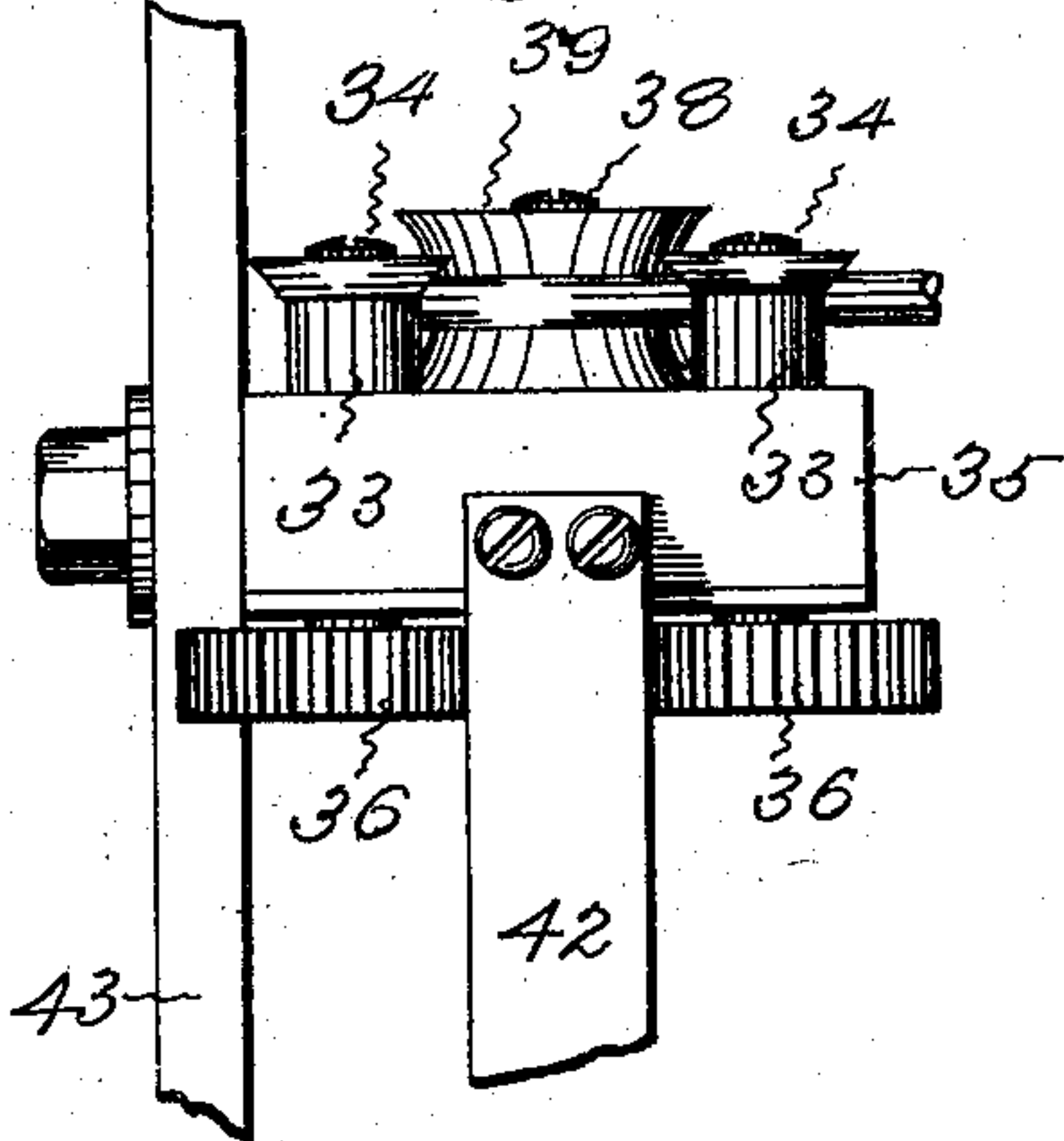
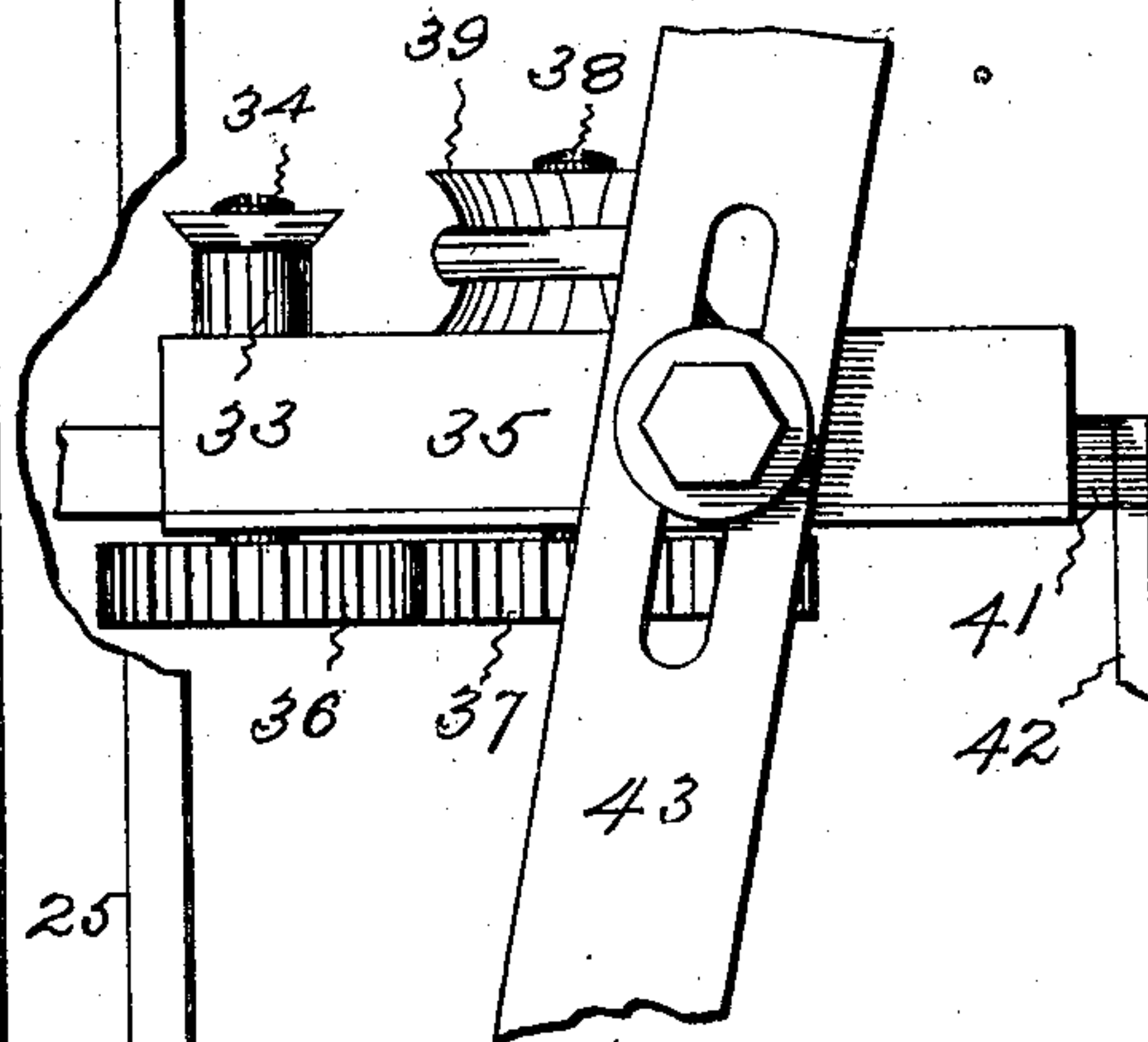


Fig. 7



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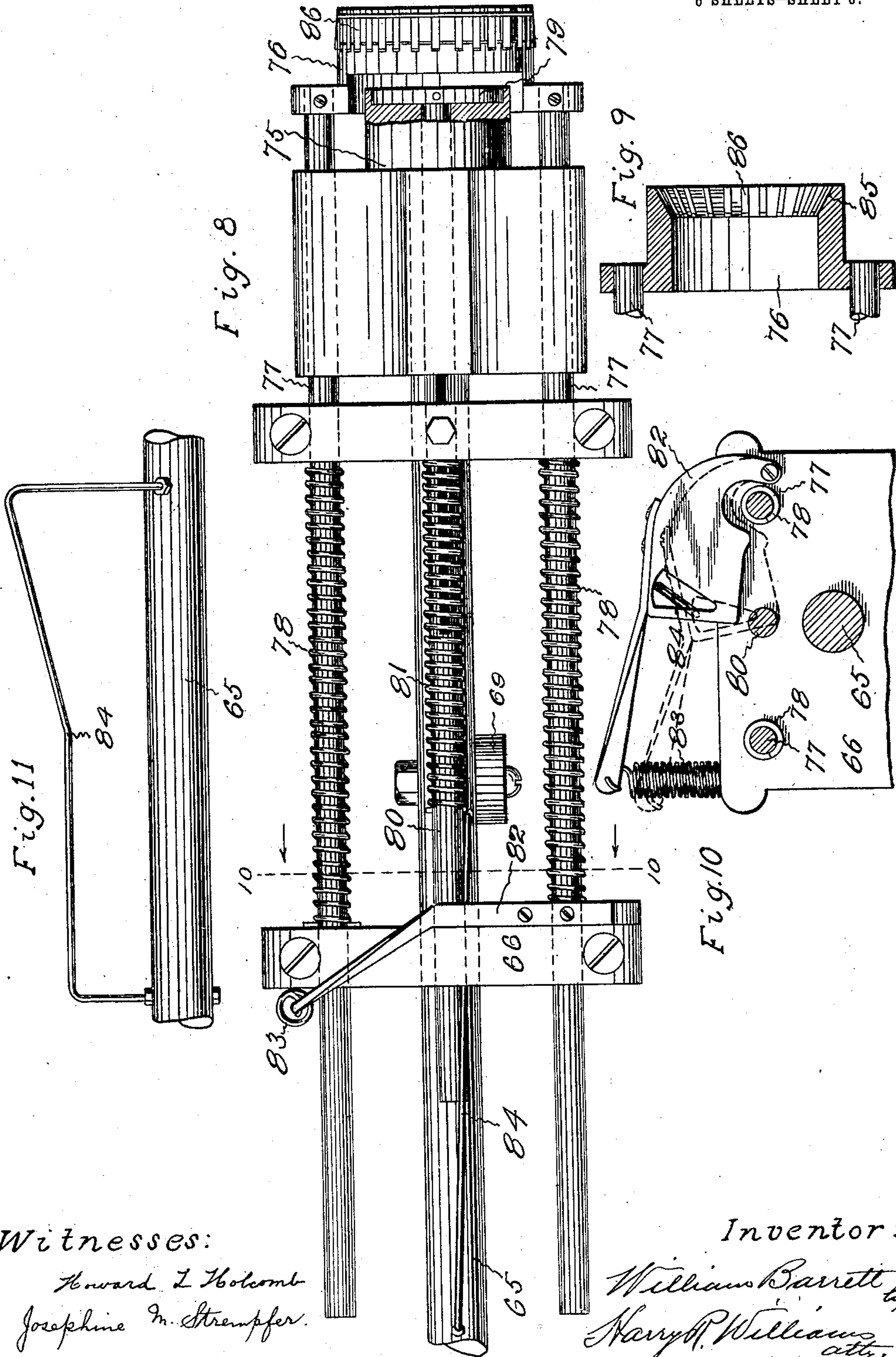
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6 SHEETS—SHEET 6.





# UNITED STATES PATENT OFFICE.

WILLIAM BARRETT, OF MANCHESTER, CONNECTICUT, ASSIGNOR TO CHENEY BROTHERS, OF MANCHESTER, CONNECTICUT, A CORPORATION OF CONNECTICUT.

MACHINE FOR FORMING PAPER PACKAGES.

981,607.

Specification of Letters Patent.

Patented Jan. 17, 1911.

Application filed December 8, 1909. Serial No. 531,976.

*To all whom it may concern:*

Be it known that I, WILLIAM BARRETT, a citizen of the United States, residing at Manchester, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Machines for Forming Paper Packages, of which the following is a specification.

This invention relates to a machine for making packages from pasteboard and the like material.

The machine illustrated as embodying the invention is particularly designed for producing cylindrical paper packages or blocks, upon which ribbon is to be wound. The invention, however, is not limited to a machine for making this specific form of package, as the machine may be employed to make packages for holding various materials, such as cereals, powdered or granular food substances, and chemical compounds.

The machine shown receives and automatically feeds forward sections, of any length within the range of adjustment, cut from a pasteboard tube of any desired diameter. It also receives and automatically feeds cup-shaped ends or caps of the same or different material, and, after one or both have had their edges provided with a suitable quantity of glue, paste, cement, or other adhesive, applies such caps to the ends of the tubular body section for completing the package, which is then ejected from the machine.

The object of the invention is to provide a comparatively simple and cheap machine which will rapidly and accurately feed and bring together tubular bodies of any desired length and diameter, and caps of suitable size for closing the ends of the bodies, and then assemble these members so as to produce a complete package that is stiff and strong, and that has one or both ends tightly and permanently closed.

Figure 1 of the accompanying drawings shows a plan of a block forming machine which embodies the invention. Fig. 2 shows a front elevation of the same. Fig. 3 is a view looking at the left hand end of the machine. Fig. 4 shows, on larger scale, in their relative positions, a side elevation of a portion of the mechanism for feeding and holding the bodies, and a portion of the mechanism for feeding the caps and applying the caps to the bodies. Fig. 5 shows a

plan of a part of one of the cap feeds and the rolls employed to rotate the caps while glue is being applied. Fig. 6 shows a side elevation of one set of the cap rotating rolls, this view showing the parts as seen from the dotted line 6—6 on Fig. 5. Fig. 7 shows a front elevation of one set of cap rotating rolls looking from the dotted line 7—7 on Fig. 5. Fig. 8 shows a plan of a portion of one of the cap applying mechanisms, with a part cut in section. Fig. 9 shows a central section of one of the cap holding and applying chucks. Fig. 10 shows a side elevation, as seen from the dotted line 10—10 on Fig. 8, of the latch mechanism which causes a plunger to retain a cap on a body while the holding chuck is being withdrawn. Fig. 11 shows the latch releasing device. Fig. 12 shows a detail of one of the mechanisms employed to operate the cap applying means. Fig. 13 shows a body and its end cap, which when brought together by this machine, form the complete package.

The package bodies 1 are cut any desired length from paper or pasteboard tubes of required diameter, and the caps 2 are blanked from similar material in an ordinary press, to such size that they will fit onto the ends of the tubular bodies to complete the package. (Fig. 13). The bodies are placed between walls 3 that are adjustably mounted on an inclined shelf 4. This inclined race-way, with adjustable walls for accommodating bodies of different lengths, is supported by the upper ends of the upwardly extending standards 5 and braces 6 that are secured to the top of the bed 7. (Figs. 1, 2 and 3).

Supported by the standards beneath the race-way is a feed trough, the walls 8 of which are adjustably mounted on the rods 9 that connect the standards. A hand screw 10 supported by the standards, and having right and left threads, is arranged to adjust the walls of the feed trough from and toward each other in order to accommodate bodies of different lengths. (Figs. 2, 3 and 4).

Movable forward and back at the lower end of the body feed-trough is a slide 11. (Fig. 4). This slide is retained by guides 12 that are fastened to the top of a table 13 which is secured between the standards. The rear end of this slide is connected by a link 14 with a lever 15 that is connected by a rod 16 with a lever 17 which is oscillated



at the proper intervals by the cam 18 on the driving shaft 19. (Fig. 3). The front end of the slide is curved so as to fit and partially embrace the sides of the bodies. When the slide is drawn back a body drops from the feed trough in front of the curved end, and as the slide moves forward, this body is carried in front of it. The upper edge of the slide while it is moving forward and back, temporarily closes the lower end of the feed trough and holds up the tier of bodies therein. A spring retracted arm 20, pivotally connected with the walls of the feed trough and provided at its free end with a roll 21, retains the body that is being advanced in the curved end of the slide until it is carried sufficiently far forward to be clasped by the curved front end of the slide and the curved rear end of a holding bracket 22 that is mounted on the slide table. (Fig. 4). Here the body is held until the end caps are applied. After the slide is drawn back, the completed package is dropped onto the top of the bed in position to be thrust out at the front of the machine, at the next forward movement of the slide, by the pusher 23. (Figs. 1 and 2). This pusher is moved back and forth on the top of the body between the lower ends of the standards by a rod 24, which is connected with the slide operating lever 15 that is oscillated by the cam 18. (Fig. 3). The end caps are placed in horizontal guide-ways 25, (Fig. 1), and are fed toward the rear of the machine. After being glued the caps are dropped into line with the body, held by the slide and bracket, and applied to the ends of the body. As the two cap feeds and glue mechanisms, in the machine shown, are the same in all respects, only one is described.

Running along the bottom of each horizontal cap feeding guide-way is a belt 26. This belt passes over pulleys 27 and 28 arranged in the bottom of the guide-way passing through the bottom of the guide way adjacent to the latter pulley and then down and around a pulley 29 on the shaft 30 that extends across the back of the machine and has a pulley 31 which is belted to a pulley 32 on the driving shaft. (Figs. 1 and 3.) By this means the belts, which carry the caps rearwardly with the rims up, are always in motion. At one point during their backward movement on the belt, the caps are detained and rotated by four small rolls 33. These rolls are secured to the upper ends of vertical arbors 34 carried by slides 35. On the lower ends of these arbors are pinions 36. These pinions are engaged by gears 37 fastened to the lower ends of arbors 38, which arbors are carried by the slides, and on their upper ends have pulleys 39. (Figs. 5, 6 and 7.) These pulleys are belted to pulleys 40 on the shaft 30 at the rear

of the machine, and consequently by this mechanism the rolls are rotated continuously. (Fig. 1.)

The roll carrying slides 35 are movably mounted on a bar 41 that is supported by a frame 42 attached to the top of the bed. (Figs. 1 and 2). Levers 43 are adjustably pivoted to a bar 44 that is fastened to the front of the legs 45 that support the bed. These levers, near their upper ends are connected with the wheel slides. A spring 46 connecting these levers tends to draw the upper ends of the levers and the slides toward each other. (Fig. 2). The lower ends of each pair of the levers are slotted, and extending into the slots is the free end of a lever 47 that is pivotally mounted on a bar 48 supported by the legs near the back. (Figs. 2 and 3). This lever 47 is adapted to be lifted, at the proper time, by a long wrist-pin 49 that projects from the side of an eccentric 50, which is mounted on the driving shaft. (Figs. 2 and 12). By means of this mechanism, the slides are drawn apart, and the rolls separated to permit a cap to pass between them. When a cap, being carried rearwardly by the belt, is between them, the rolls are brought together so as to engage the rim of the cap and give it a rapid rotation. After the cap has been rotated sufficiently, the rolls are separated and the cap allowed to travel with the belt toward the rear of the machine, while another cap takes its place between the rolls. While the cap is being rotated, a brush 51 applies glue, paste, cement, or other adhesive substance to the inner surface of its rim. This brush is held by a bracket 52, attached to the bottom of a glue pot 53, so as to project obliquely into the cap and bear against the inside of the cap rim. A nozzle 54 leads from the bottom of the pot to the brush. This nozzle is provided with a cock 55 which is employed to regulate the flow of adhesive from the pot to the brush. (Figs. 2 and 3). The glue pot is mounted on an arbor 56 which is supported by a standard 57 that is secured to the side walls of the horizontal cap feeding guide-way. (Fig. 3). Extending outwardly from the sides of the glue pot are trunnions 58, which carry fingers 59. These fingers are engaged by wedge blocks 60 attached to the upper ends of the levers 43. When the levers move the slides so as to separate the cap rotating rolls, for the purpose of allowing the passage of a cap, the wedges engage the fingers and tip up the glue pot so as to lift the brush out of the path of the cap. As the levers close the slides and bring the rolls together, so that they will grip and rotate a cap, the wedges allow the pot to drop back and the brush to enter the cap for applying glue to the inner surface of the rim, while the cap is being rotated by the rolls. (Figs. 2 and 12)



3). When the caps reach the rear end of the horizontal guide-way, they are by a pusher 61, thrust transversely therefrom into a feed trough 62, down which they drop into the cap holder. (Figs. 1 and 4). This pusher is connected by a flat rod 63 with an arm 64 that is secured to a shaft 65. (Figs. 1 and 2). This shaft is mounted in a carriage 66 that is movable along the top of the bed between guides 67. A hand screw 68 is provided for adjusting the carriage along the bed. (Figs. 2 and 3). The upper slotted end of an angle lever 69, that is pivoted to the bed, is engaged with the shaft 65. The other end of this lever is connected with a bar 70 that is supported by the upper ends of rods 71 that extend from the straps about the eccentrics 50 on the driving shaft. (Fig. 2). The ends of this bar are guided by forks 72 that project downward from the ends of the bed. (Fig. 3). The cap feed trough 62, at its upper end, is attached to the horizontal cap guide-way 25, and at its lower end, is fastened to the carriage 66, (Fig. 1), and the horizontal guide-way is supported by braces 74 which are fastened to the carriage. (Figs. 2 and 3).

The lower end of the cap feed trough opens above a space between the inner end of the head 75, that is fastened to the inner end of the shaft 65, and the back edge of the cap holding chuck 76. (Figs. 1 and 8). The caps slide down the feed trough into this space. The chuck is fastened to the inner ends of rods 77 which extend loosely through the head and through the carriage frame. On these rods are springs 78 arranged to draw the chuck back. (Fig. 8). In the inner end of the head is a plunger 79, the stem 80 of which extends loosely through the head and carriage frame. On the plunger stem is a spring 81 arranged to draw the plunger back into the head. (Fig. 8). When the head is moved toward the middle of the machine, by means of the angle lever 69 and shaft 65, the plunger is carried with it. When the plunger and forward end of the head are moved up into the chuck, the enlarged part of the head engages the back of the chuck and pushes the chuck up with the plunger in it. As the head is moved back, the springs 78 draw the chuck back with it. The plunger stem is somewhat shorter than the chuck rods, and when the parts are moved in to their limit, the outer end of the plunger stem 80 is drawn from the opening in the outer frame of the carriage which is stationary, and a latch 82 pivoted to the wall of this frame drops down back of the end of the stem and temporarily prevents the plunger from returning with the head and chuck. This latch is drawn down into the path of the end of the chuck stem by a spring 83 and is lifted to release the plunger stem by the bent cam rod 84

that is carried by the shaft 65. (Figs. 8, 10 and 11.) When the latch releases the plunger rod, the spring 81 draws back the plunger.

The openings 85 in the front ends of the chucks are tapered so that when they are pushed forward with the caps, the edges of the body, held by the holder between the chucks, will center themselves as the chucks pass upon them and will be guided into the glued caps that are located in and carried up to the body by the chucks. (Fig. 9). In radial slots in the front end of each chuck are small pivoted jaws 86. (Figs. 4, 8 and 9). The inner ends of these jaws project slightly into the cavities in the chucks and form gages for the front edges of the rims of the caps, and also guides for the edges of the body, onto which the rims of the caps are forced when the chucks are brought together. After a body that has rolled down the race-way and dropped through the body feed trough has been brought forward by the slide and is retained by the slide and holder in the middle of the machine, the chucks and heads, holding the caps, are moved toward each other so as to carry the glued caps onto the ends of the body. As the heads and chucks are drawn apart, the plungers are held up against the caps by the latches that engage the plunger stems until after the chucks have been withdrawn from the caps. Then as there is no danger of pulling the caps from the body, the latches are lifted, allowing the springs to withdraw the plungers. By this means the caps are held so that they will not be pulled off the ends of the body by the withdrawal of the chucks. If closed packages are to be produced, the caps on both sides are provided with glue and applied to the opposite ends of the bodies as the parts come together. If it is desired to produce open packages, that is, to glue but one cap to a body, to form a bottom for the package, and leave the other cap free to be removed, as a cover, one glue receptacle can be taken off or left empty. For longer or shorter bodies the side walls of the race-way and body feed-trough are adjusted from or toward each other, according to the conditions, in the manner described. And to apply the caps to the ends of bodies of varying lengths, the carriages are adjusted from or toward each other by the screws mentioned. Turning the screws moves the carriages, and as the carriages support the cap chucks, heads and plungers, and also the cap feed troughs, horizontal guide-ways, feed belts, glue pots and the other parts of the gluing mechanism, the necessary adjustments can be quickly made according to the size of the package to be formed. If it is desired to leave one end of the package entirely open, caps may be fed to one side only.



The invention claimed is:

1. In a machine for forming packages, the combination of mechanism for feeding tubular bodies into the machine from the rear, means for carrying caps into the machine from the front, means for delaying the caps while they are being thus carried, means for applying adhesive material to the caps while they are delayed, and mechanism for applying the caps to the opposite ends of the tubular bodies.

2. In a machine for forming packages, the combination of mechanism for feeding tubular bodies into the machine from the rear and carrying them forward, mechanism for carrying caps into the machine from the front and carrying them rearwardly, and then sidewise toward the body, means for delaying the caps during their rearward travel, means for applying adhesive material to the caps while they are delayed, and mechanism for applying the caps to one end of the tubular bodies.

3. In a machine for forming packages, the combination of mechanism for feeding tubular bodies into the machine from the rear, mechanism for carrying caps into the machine from the front, mechanism for detaining and rotating the caps while they are being carried into the machine, means for applying adhesive to the caps while they are being rotated, mechanism for forcing the caps from the said carrying means and allowing them to drop, chucks for receiving the caps as they drop, and mechanism for moving the chucks carrying the caps, toward each other and applying the caps to the ends of the tubular bodies.

4. In a machine for forming packages, the combination of mechanism for feeding tubular bodies into the machine from the rear, mechanism for carrying caps into the machine from the front, means for delaying the caps while they are being thus carried, means for applying adhesive material to the caps which are applied to one end of the bodies while said caps are delayed, and mechanism for applying the caps to the opposite ends of the bodies.

5. In a machine for forming packages, the combination of mechanism for feeding tubular bodies, mechanism for feeding caps, mechanism for rotating the caps, means for applying adhesive material to the caps while they are being rotated, and mechanism for applying the caps to the ends of the tubular bodies.

6. In a machine for forming packages, the combination of a slide for feeding tubular bodies forward, a holder cooperating with the slide for holding the bodies, continuously moving means for feeding caps rearwardly, means for temporarily detaining the caps during their rearward movement, means for applying adhesive material

to the caps while they are being temporarily detained, means for pushing the caps off from said feeding means, chucks for receiving and holding caps, and mechanism for moving the chucks toward and from each other for applying the caps to the ends of the bodies held by the slide and holder.

7. In a machine for forming packages, the combination of mechanism for feeding tubular bodies downwardly and forwardly, continuously moving mechanism for feeding caps rearwardly, mechanism for rotating the caps while on the continuously moving feeding means, means for applying adhesive to the caps while they are rotated, means for forcing the caps sidewise from said continuously moving cap feed, means for directing said caps downward, chucks for receiving the dropping caps and applying them to the ends of the tubular bodies, plungers for holding the caps on the bodies while the chucks are being withdrawn from the caps, and springs for withdrawing the chucks and plungers independently.

8. In a machine for forming packages, the combination of an adjustable feed trough for feeding bodies downwardly, a slide movable back and forth beneath the end of the feed trough for removing the bodies one at a time from the trough and carrying them forward, a holder cooperating with the end of the slide for holding the bodies, means for feeding caps rearwardly, means for feeding the caps downwardly, means for delaying and applying adhesive material to the caps while they are being fed rearwardly, and mechanism for applying the caps to the ends of the bodies held by the slide and holder.

9. In a machine for forming packages, the combination of mechanism for feeding and holding tubular bodies, a cap feeding mechanism, mechanism for rotating the caps while they are being fed, mechanism for applying adhesive material to the caps while they are rotated, and mechanism for applying the caps to the tubular bodies.

10. In a machine for forming packages, the combination of a cap feed-way, means for feeding the caps through said feed-way, means for rotating the caps while in the feed-way, and means for applying adhesive material to the caps while they are being rotated.

11. In a machine for forming packages, the combination of a cap feed-way, a feed belt movable along said feed-way, slides movable transversely of the feed-way, rotating rolls carried by said slides, and means above said rolls for applying adhesive material.

12. In a machine for forming packages, the combination of a carriage, a head movably supported by said carriage, a chuck for receiving caps, said chuck having a tapered



opening at its front end, rods supporting the chuck, said rods passing loosely through said head and carriage, a plunger movable into and out of the chuck, a rod attached to the plunger, said rod passing loosely through said head and carriage, means for reciprocating said head and causing it to first move the plunger forward and then the plunger and chuck forward together, and springs for moving the chuck and plunger backward independently.

13. In a machine for forming packages, the combination of a carriage, a head movably supported by said carriage, a chuck for receiving caps, said chuck having a tapered opening in its front end, rods supporting the chuck, said rods passing loosely through

said head and carriage, a plunger movable into and out of the chuck, a rod supporting the plunger, said rod passing loosely through said head and carriage, means for reciprocating said head and causing it to first move the plunger forward and then the plunger and chuck forward together, springs for moving the chuck and plunger backward independently, and a latch adapted to hold the plunger forward until it is released from the plunger by the backward movement of the head moving means.

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