

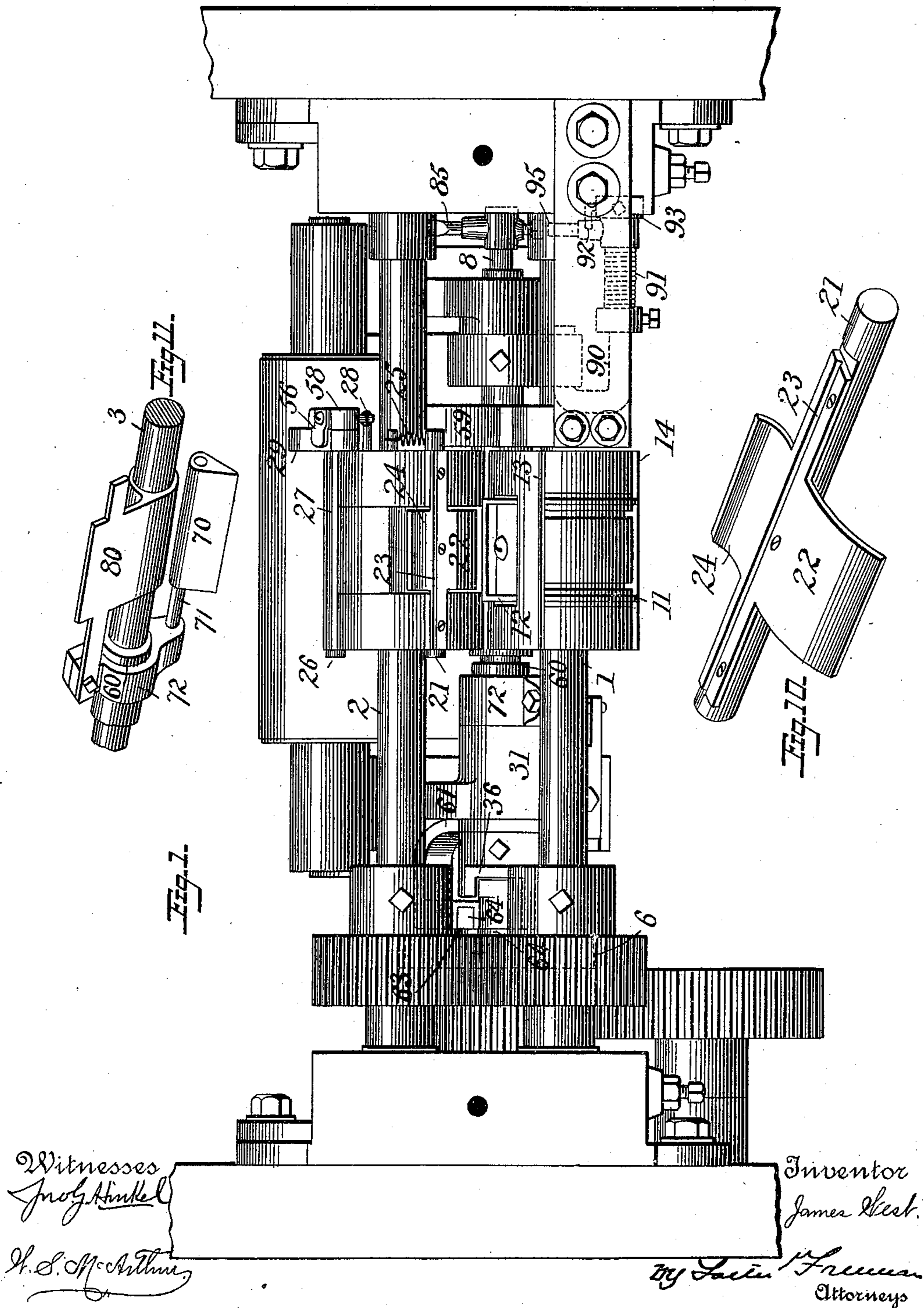
(No Model.)

5 Sheets—Sheet 1.

J. WEST.
BAG MACHINE.

No. 599,206.

Patented Feb. 15, 1898.



(No Model.)

5 Sheets—Sheet 2.

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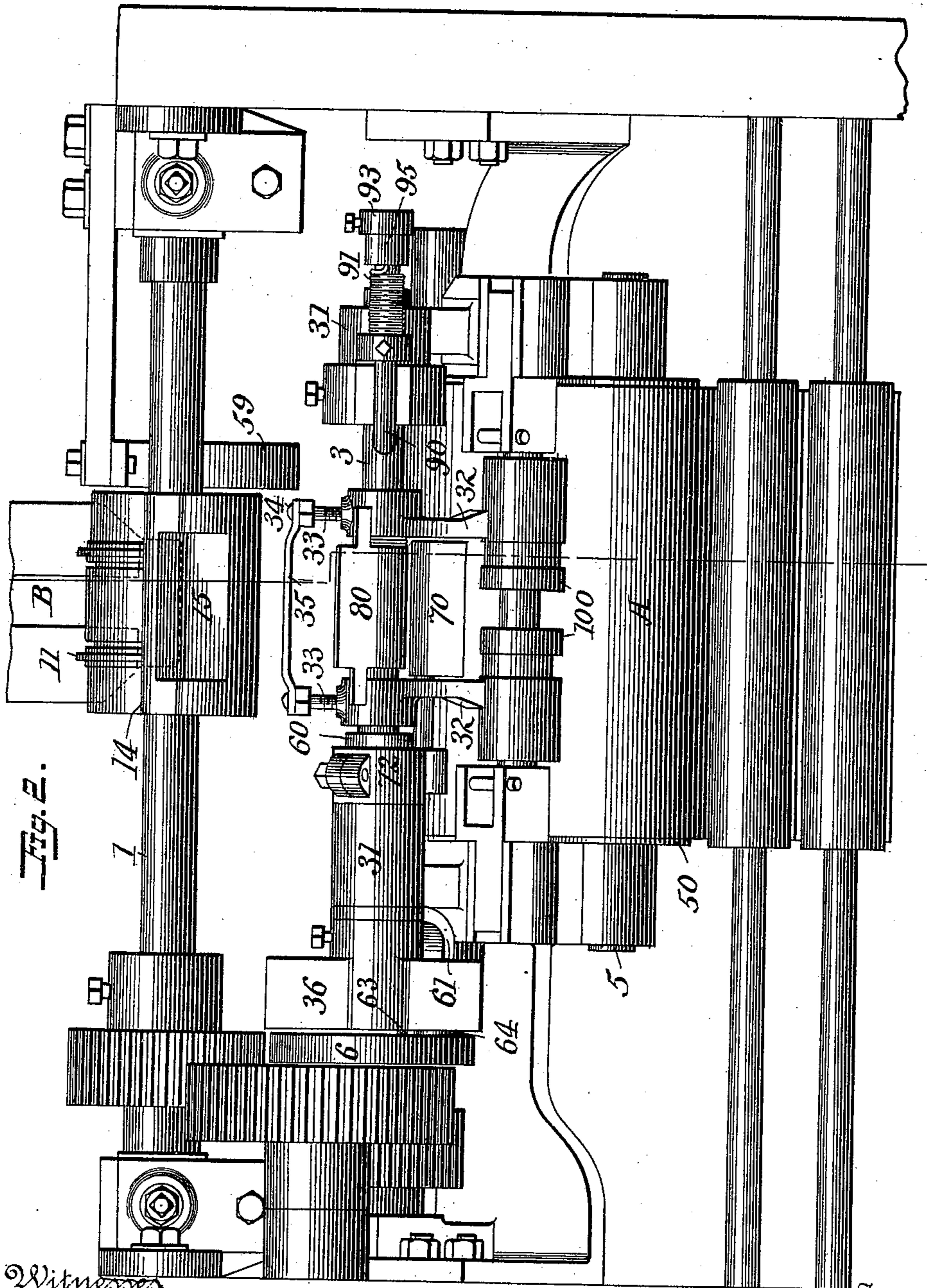


Fig. 2.

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(No Model.)

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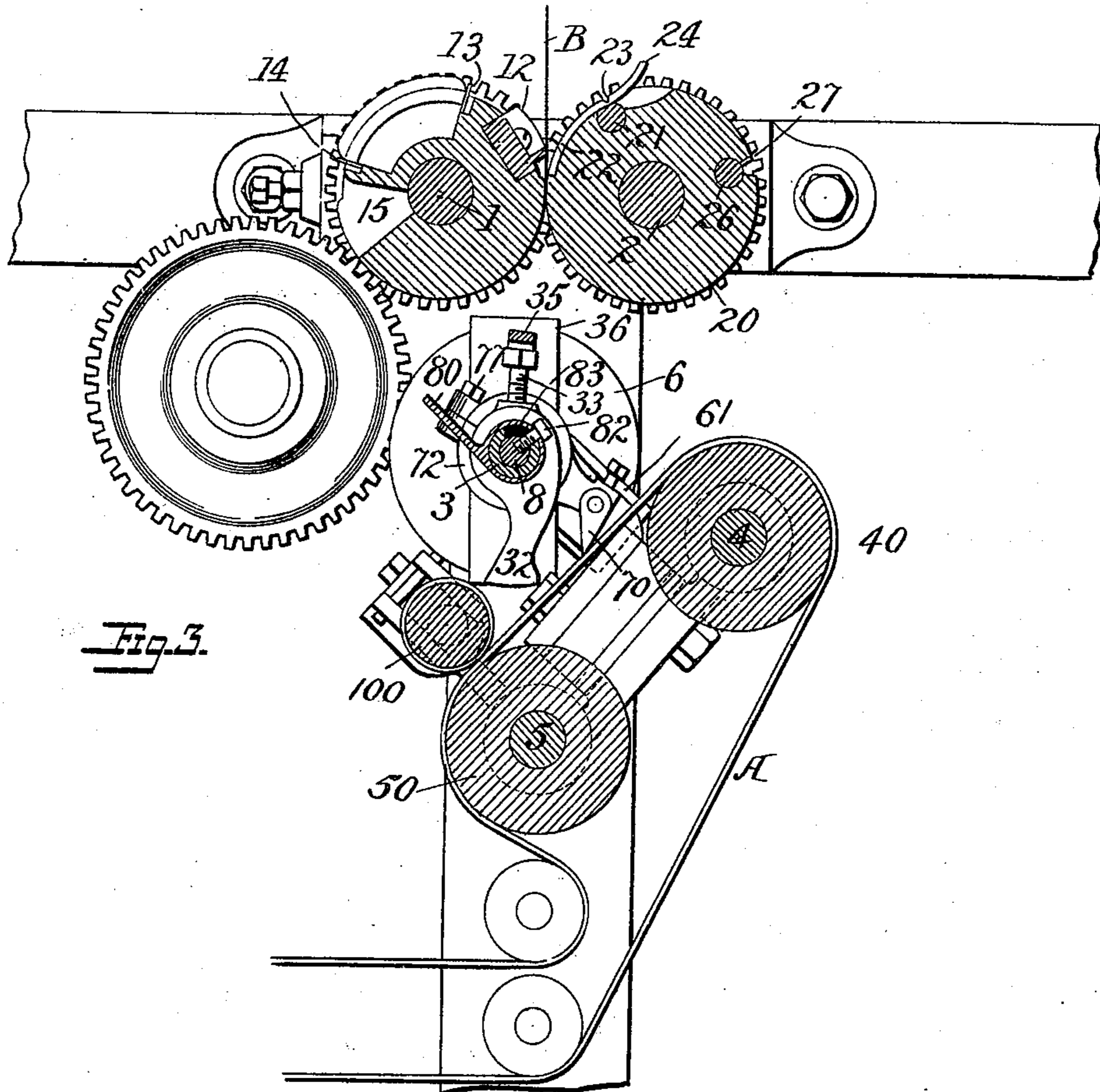


Fig. 3.

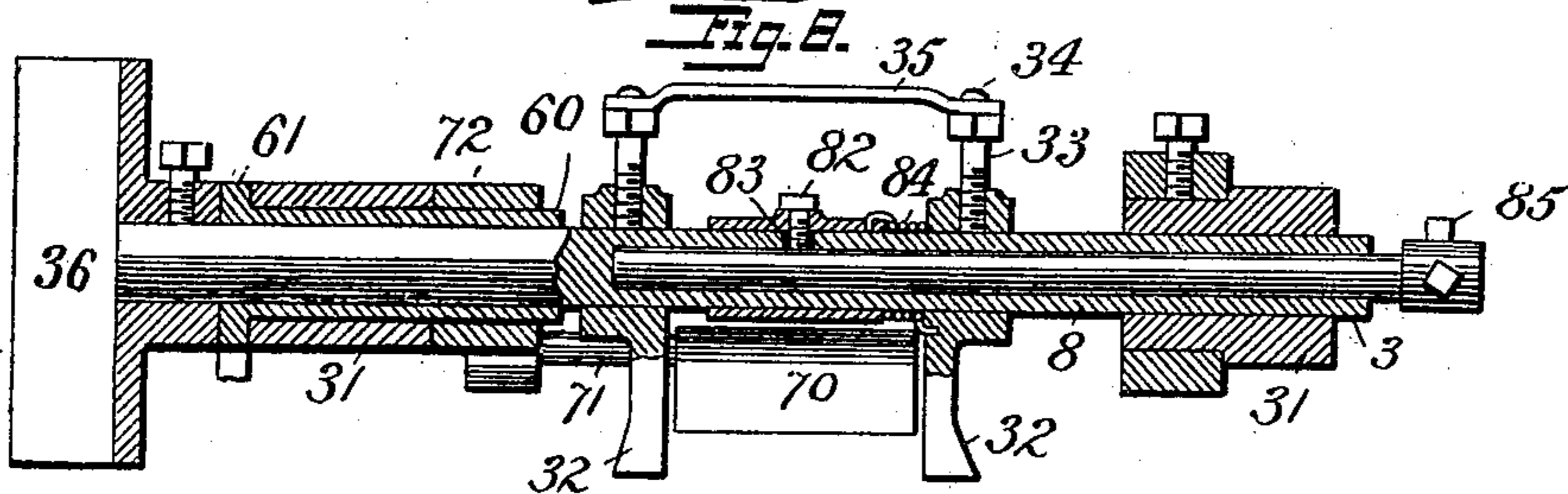


Fig. 4.

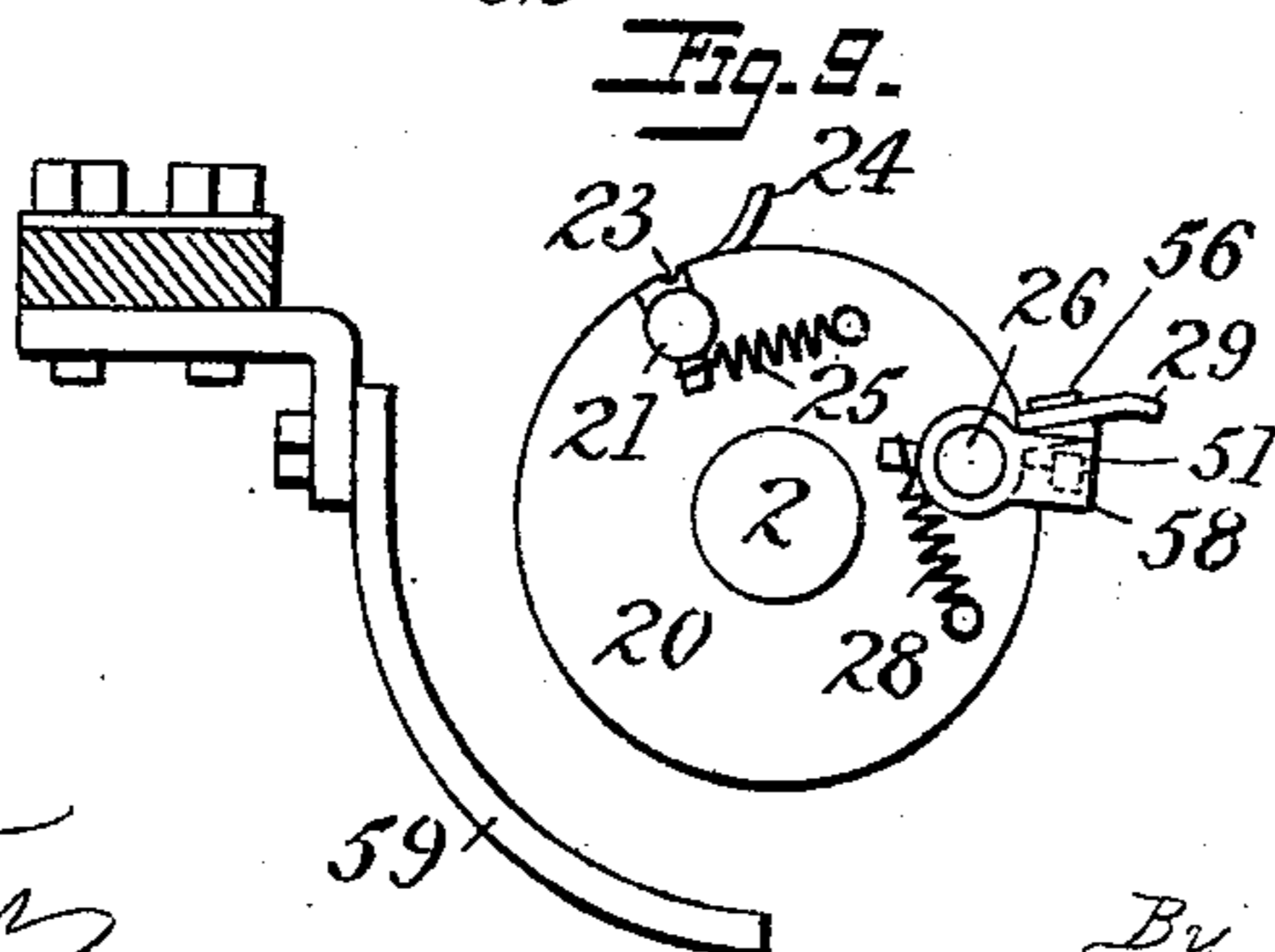


Fig. 5.

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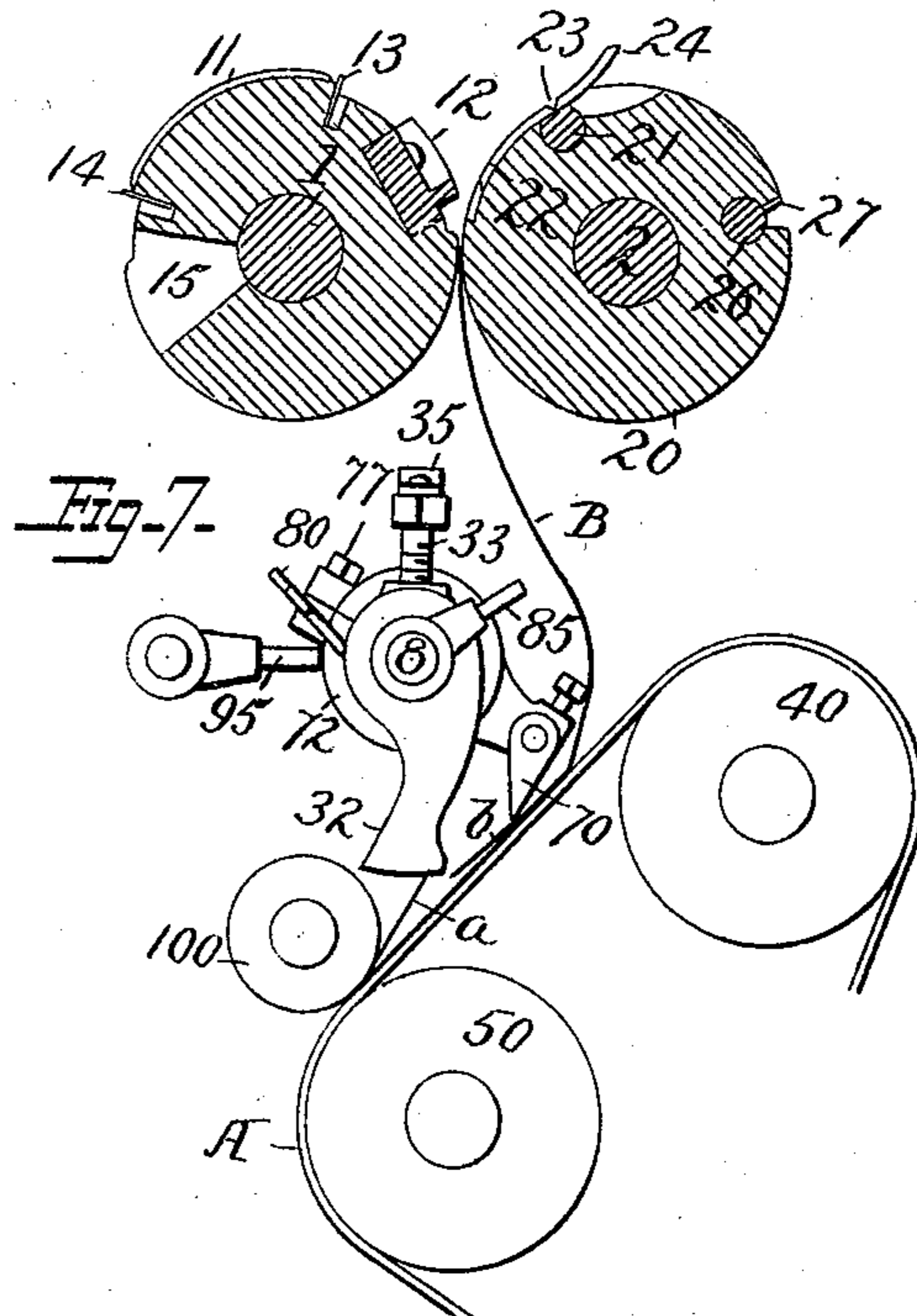
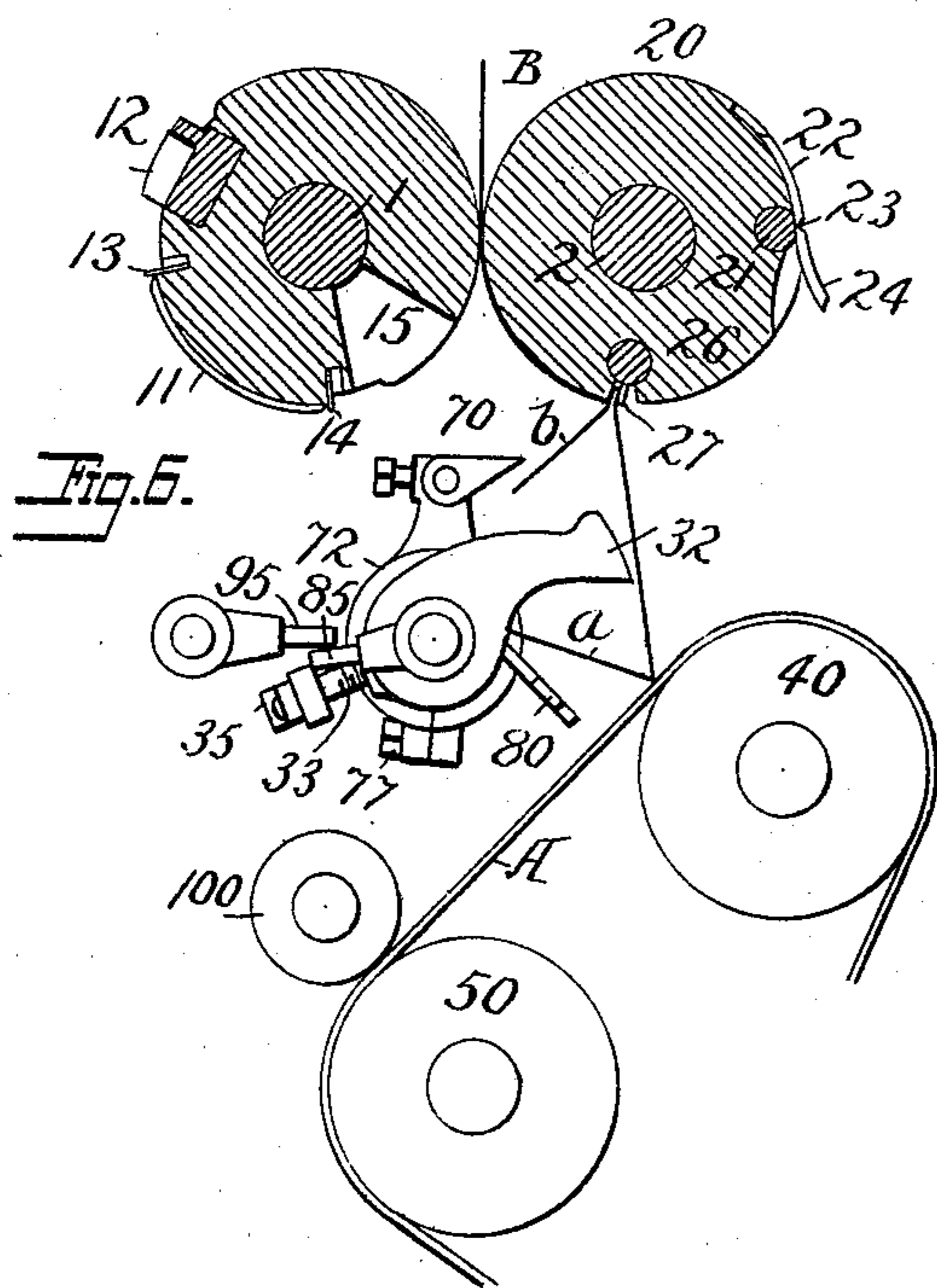
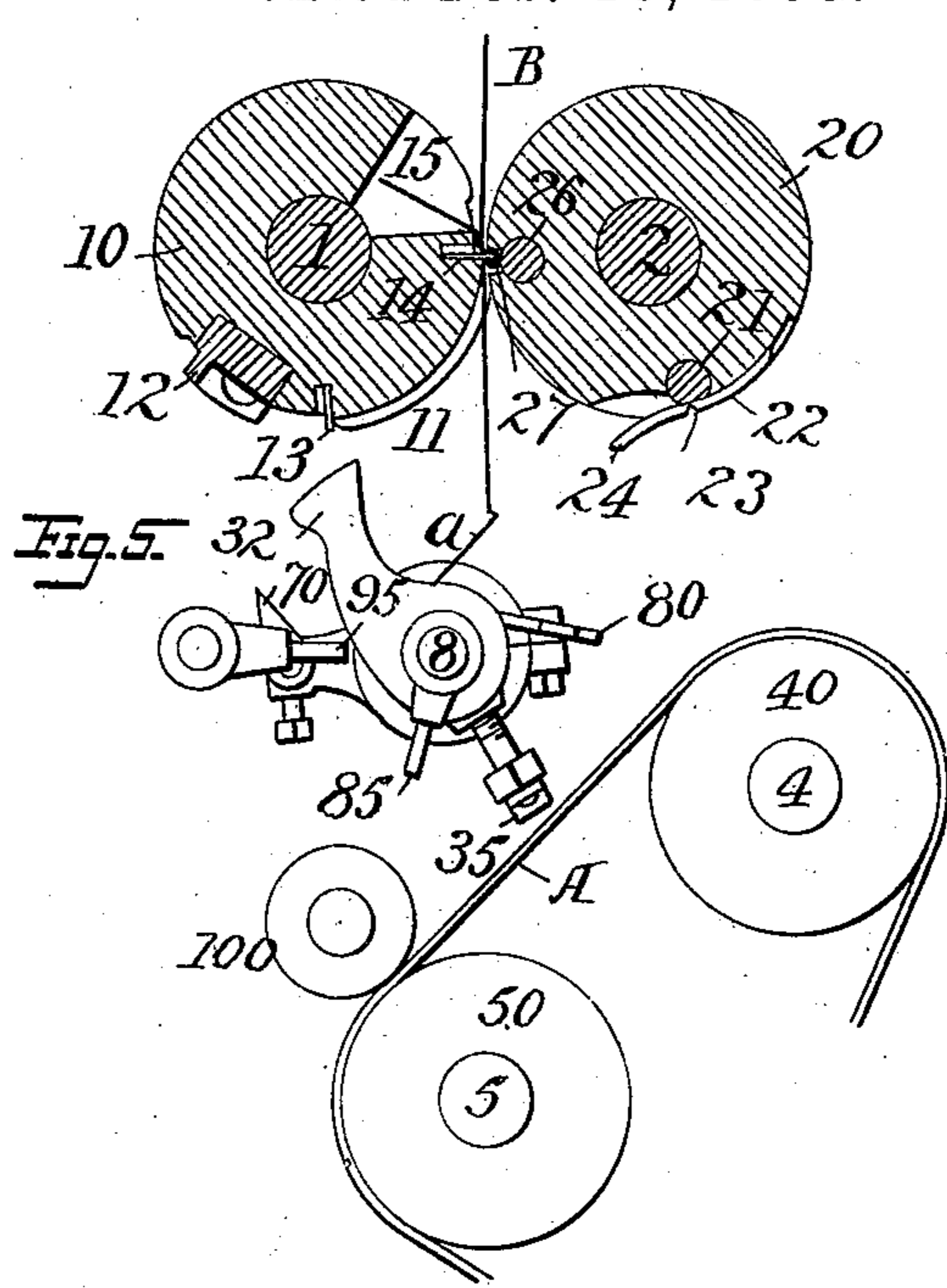
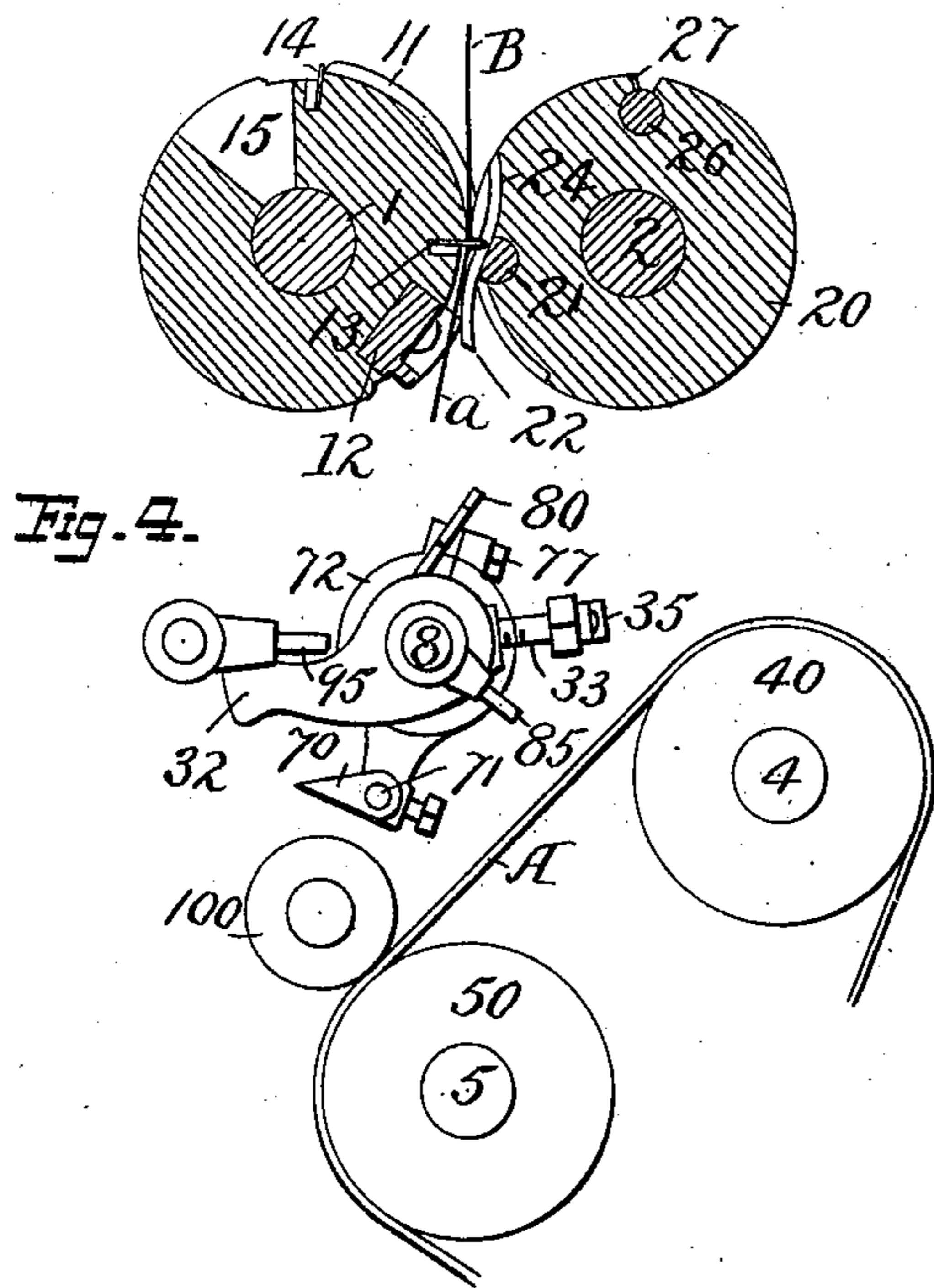
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5 Sheets—Sheet 5.

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Fig. 12.

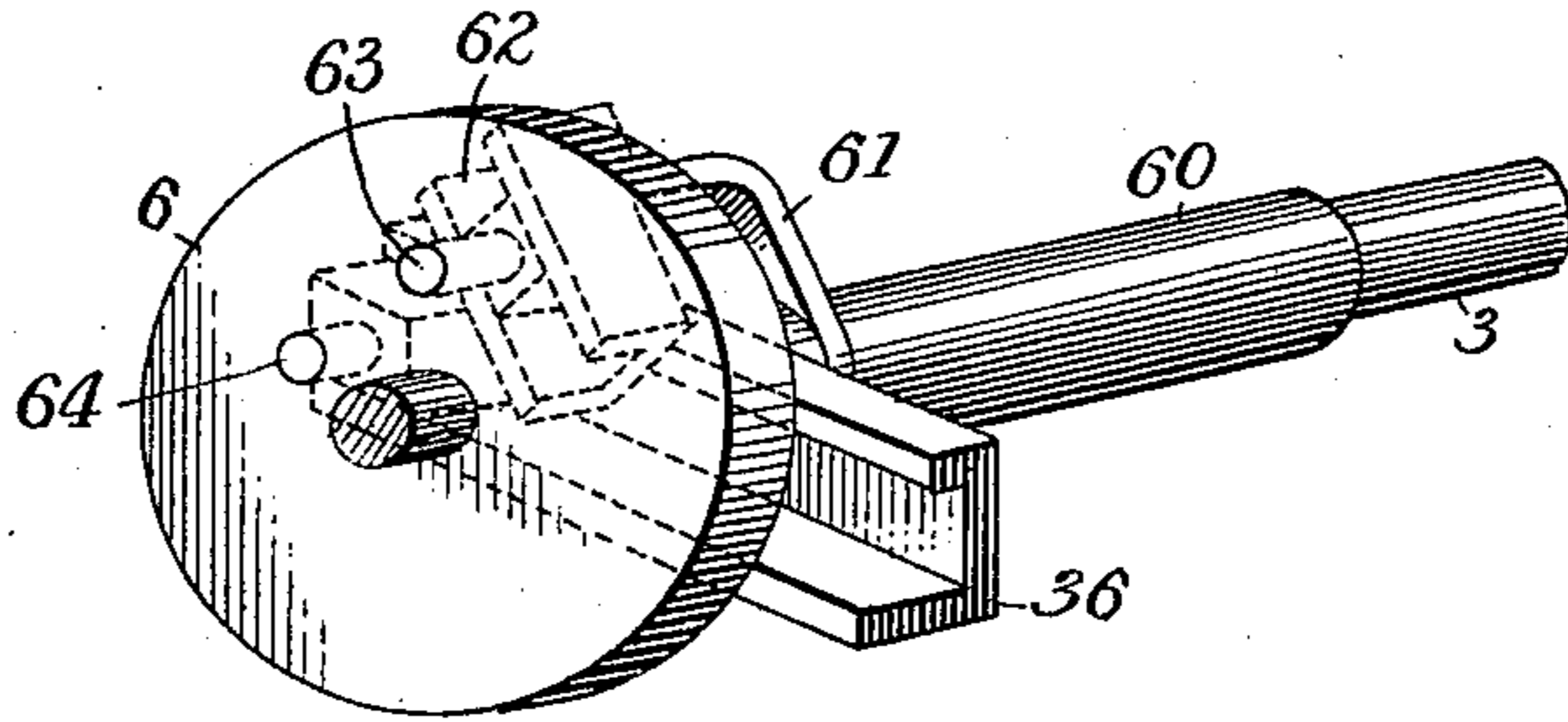


Fig. 13.

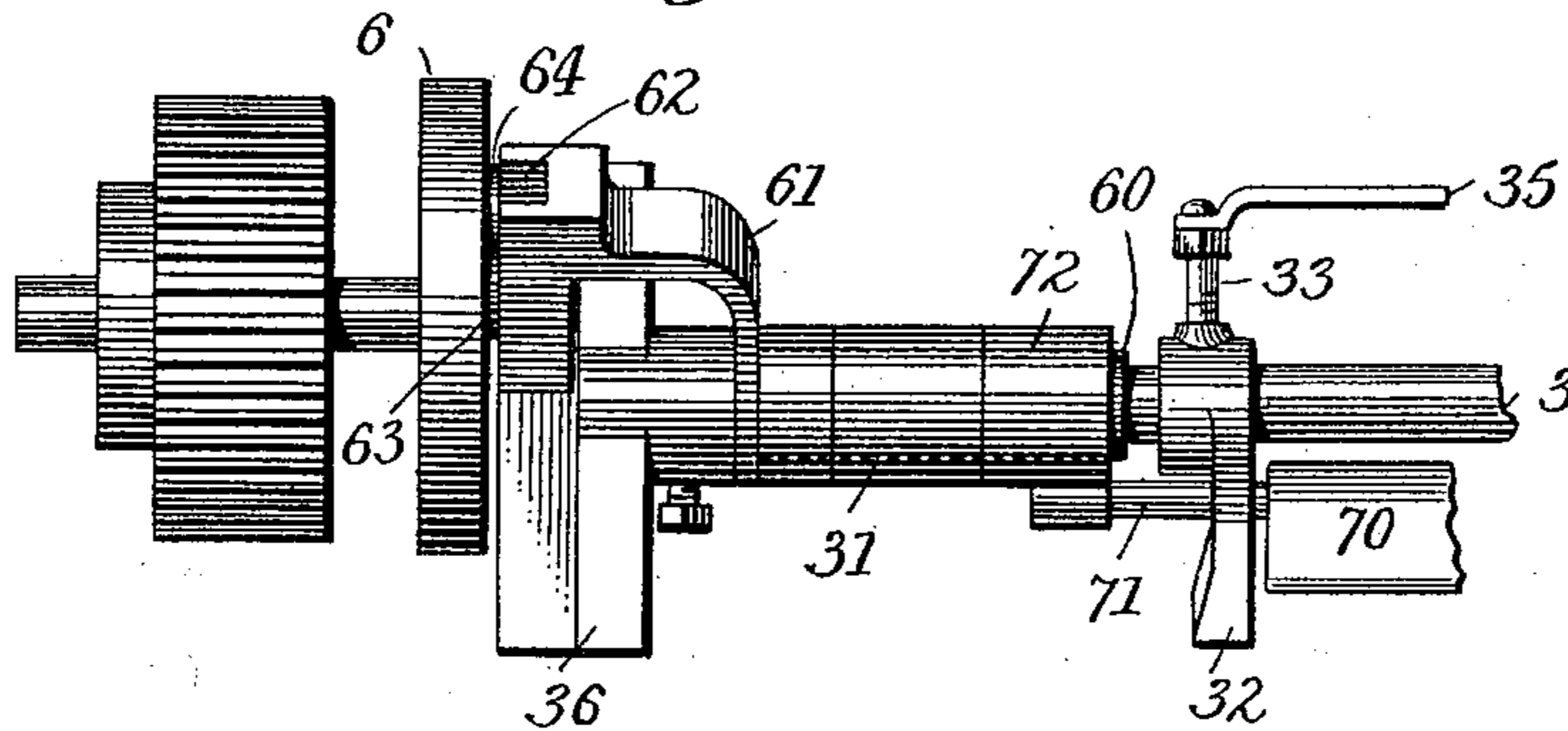
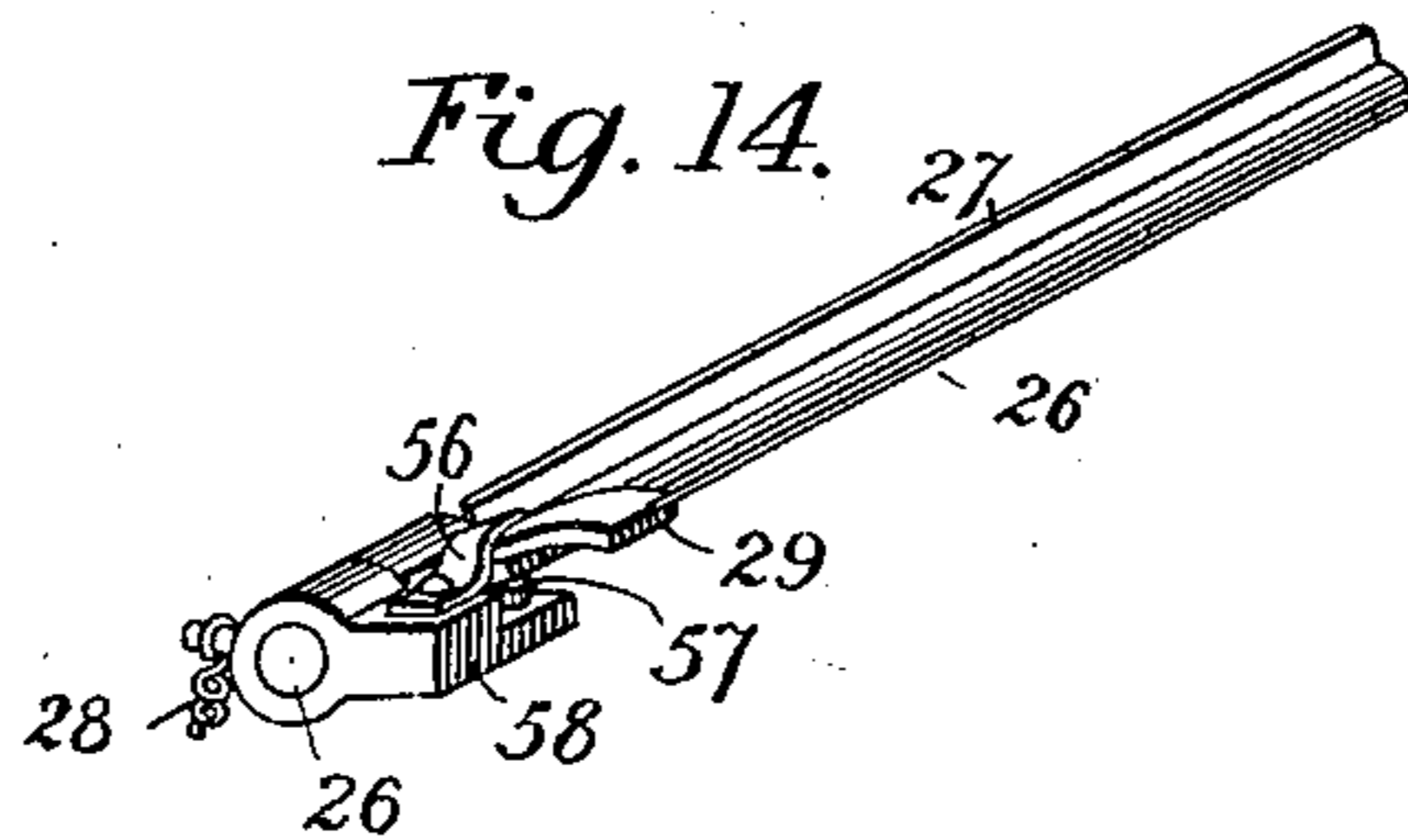


Fig. 14.



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UNITED STATES PATENT OFFICE.

JAMES WEST, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO SAMUEL CUPPLES, OF SAME PLACE.

BAG-MACHINE.

SPECIFICATION forming part of Letters Patent No. 599,206, dated February 15, 1898.

Application filed September 15, 1891. Renewed January 10, 1898. Serial No. 666,245. (No model.)

To all whom it may concern:

Be it known that I, JAMES WEST, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain
5 new and useful Improvements in Bag-Machines, of which the following is a specification.

My invention relates to paper-bag machines, and more particularly to what I generally term the "bottom-forming devices," whereby the final folds of the bottom of the bag are made and the completed bag delivered. It has for its object to improve the construction, arrangement, and mode of operation of such devices, whereby a simple,
10 cheap, and effective mechanism is produced.

My invention consists in the various features of construction and arrangement of the parts, substantially as more particularly hereinafter set forth.
20

Referring to the accompanying drawings, wherein I have illustrated the preferred embodiment of my invention, Figure 1 is a plan view of the bottom forming, folding, and creasing rolls and connecting devices. Fig. 2 is an end elevation of the same. Fig. 3 is a vertical cross-section on the lines $x x$, Fig. 2. Figs. 4, 5, 6, and 7 are diagrammatic views showing the relative position of the various devices in the operation of the machine. Figs. 8, 9, and 10 are detail views. Fig. 11 is a modification. Fig. 12 is a perspective view of a portion of the Whitworth gear-motion device. Fig. 13 is a detail side view of said device, and Fig. 14 is a perspective view showing the gripper mechanism.
30 35

I have not deemed it necessary to illustrate the tube-forming and bottom-folding devices, as they form no essential part of my invention and may be of any desired and proper construction and arrangement, and I have chosen to illustrate my invention as applied and arranged in the manufacture of what is generally known in the art as a "bellows-folded square-bottom bag;" but it is evident that the principles of construction and arrangement, as well as mode of operation, may be adapted to other forms of bags—as, for instance, what is known as a "diamond-folded
40 45

satchel-bag." I do not, therefore, limit my invention to the particular construction and arrangement of parts herein set forth.

I have assumed that the web of paper has been properly formed into a tube, the side folds of the bottom have been made, and the bag is delivered by any suitable mechanism to the bottom pasting and creasing rolls, with the side folds of the bottom lying parallel to the side edges of the bellows folds of the bag and the front and back bottom folds of the bag lying practically in the plane of the body of the bag, the position of the bag being clearly indicated in Fig. 2.
50 55 60

Mounted in any suitable framework, which may be part of the frame of a machine carrying the tube and bottom forming devices, are the shafts 1 2, carrying, respectively, the rollers 10 20, which perform the pasting and creasing operations necessary to complete the bag, in connection with other auxiliary devices hereinafter specified. Also mounted in the frame and below the pasting and creasing rollers is a shaft 3, carrying what I term the "bottom-finishing devices," and below and to one side of the finishing devices are mounted the shafts 4 and 5, carrying guide-rollers 40 and 50, which support the traveling apron A, which may lead to the usual drying apparatus, delivering the completed bag thereto, but which is not shown in the drawings.
65 70 75 80

The roll 10, which for convenience I designate the "paster-roll," is provided with the segmental paster-type 11 and the U-shaped paster-type 12, which are arranged to receive paste from a suitable paste-delivering apparatus and apply it to the edge of the front flap of the bottom and the side folds of the bottom in a manner well understood in the manufacture of this particular shape bag and therefore needs no further illustration or description. Also mounted on the paste-roller are the creasing-blade 13 and folding-blade 14. These are shown as arranged at substantially ninety degrees from each other; but their relative positions on the roll of course vary according to the relations of the bottom folds to the full length of the bag. This roll is also provided
85 90 95

with a recess 15 to permit the back flap of the bottom to turn over within the roll in a manner more particularly hereinafter pointed out.

The roll 20 is recessed in its periphery for the reception of a rock-shaft 21, carrying the front-fold-creasing plate and deflector, the deflector 22 in the present instance being shown more particularly in Fig. 10, which deflector is provided with a recess or V-shaped groove 23, forming the creasing-groove, and with an extension 24, adapted to come in contact with the roll 10 for throwing the deflector outward in the manner hereinafter described. The shaft 21 is normally under stress of a spring 25, which holds the deflector snugly in a recess in the periphery of the roll 20 when not operated upon by the adjoining roll. Also mounted in the roll 20 is a shaft 26, carrying a gripping jaw or blade 27, and this operates with the edge of the roller to form nippers or grippers to receive the bag at the point of the rear fold of the bottom. This gripping jaw or blade is normally held open under the stress of a spring 28 and is closed at the proper time by the finger 29 coming in contact with the fixed arm 59, secured to the frame of the machine. This finger 29 is loosely mounted on the shaft 26 and bears on a head 58, between which and the finger is interposed a spring device, as a block of rubber 57, while a finger 56, connected to the head 58, prevents the finger 29 from moving too far. By this arrangement it will be seen that when the gripper-blade is closed by the finger 29 coming in contact with the projection 59 the shaft 26 is rocked to close the gripper jaw or blade carried thereby against the fixed gripper-jaw; but the spring 57 allows a certain degree of elasticity, so that the parts will not be liable to injury by forcing the gripper-jaws too closely in contact.

The finishing devices are mounted on the shaft 3, which is supported in suitable bearings 31 upon the frame of the machine. Mounted on this shaft are the toes 32, and these are secured in position by the screws 33, upon the heads of which is carried the wiper 35, being connected thereto by the screws 34, and the toes and wiper therefore rotate in unison with the shaft 3. Also mounted on the shaft 3 is a sleeve 60, and this sleeve is provided with an arm 61, extending parallel to the sleeve, provided with a slot 62 in its end into which a stud 63 on the face of disk wheel 6 engages. Another stud 64 on the same wheel engages a straight grooved bearing-piece 36 on the shaft 3, so that it will be seen that the shaft 3 and the sleeve 60 are driven from the same wheel 6, the shaft rotating at one varying rate of speed, while the sleeve carried by the shaft rotates at another varying rate of speed, this being accomplished by what is known as a "double Whitworth gear-motion" and which need not be more particularly described herein.

Mounted on the sleeve 60 is a back-flap

folder 70, it being supported on an arm 71, which in turn is adjustably supported in the adjustable collar 72, mounted on the sleeve 60.

One portion of the shaft 3 is made hollow, and passing through the hollow portion of the shaft is another shaft 8, and this shaft carries the holdback-plate 80, the plate being attached to a sleeve-bearing 81, mounted on the shaft 3 and connected to the shaft 8 by a screw 82, passing through a slot 83 in the shaft 3, which permits the holdback-plate to move independently of said shaft. The holdback-plate is normally under the stress of a spring 84. Attached to the end of the shaft 8 is a projecting arm 85, which is adjustably secured thereon. Carried by an arm 90, mounted in the bearing 31, is another projecting arm 95, which is normally under the stress of a spring 91, which is opposed by a stop 92 on the collar 93, and when the arm 85 in its rotation impinges upon the arm 95 the motion of the holdback-plate is arrested until the screw 82 has passed through the extent of the slot 83 in the shaft 3 and bears against the edge thereof, and then the arm 85 being forcibly carried onward by the shaft 3 overcomes the tension of the spring 91 and the arm 85 slips by the arm 95, allowing the holdback-plate to move rapidly forward, releasing the front flap of the bag and moving out of its way, so that it can be closed over onto the bottom by the finishing-roller 100.

Instead of operating the front-flap holdback 80 by the means above described I find in some instances that it can be connected to the collar 72 on the sleeve 60, which operates the back-flap folder, and I have indicated in Fig. 11 the folder 80 as having an extended arm, which is secured to the binding-screw 77 of the collar 72, the folder being loosely mounted on the shaft 3 and the internal shaft and connections being dispensed with. Under these conditions the front-flap holdback receives a variable motion similar to the motion given to the back-flap-folding device. This construction is more simple than that previously described and performs the desired operation, but not as effectively as the former means, and I therefore prefer the arrangement first above described.

Having thus described in detail the construction of the various parts of the device, it will be observed that all of the operative motions of the parts are positive and the details of operation in the process of folding and completing the bottom of the bag will now be described, referring more particularly to Figs. 4 to 7. In these figures the body of the bag and the side folds of the bottom are represented by the line B, while the front bottom flap is represented by the line a and the rear bottom flap is represented by the line b. In Fig. 3 the parts are shown with the front flap just entering the bite of the rollers 10 and 20, and in Fig. 4 the rollers are shown as moved forward, so that the creasing-blade

13 coöperates with the groove 23 in the creasing-plate to determine the position of the fold between the front flap and the main or body portion of the bottom. It will be seen that this groove 23 is eccentric of the shaft 21, and the pressure of the creasing-blade 13 into the groove on the plate causes the shaft 21 to rotate against the stress of the spring 25 and the deflector-plate 22 is thrown outward to a certain degree, causing the flap *a* to be deflected toward the roller 10, while on the further rotation of the rollers 10 and 20 the projection 24 of the deflector-plate impinges upon the periphery of the roll 10, and the deflector is further extended, so as to give the front flap a slant substantially in the direction shown in Fig. 5, permitting the holdback-plate to pass by the front flap without contact therewith. As the rolls rotate the folding-blade 14 forces the bag and its bottom into the bite of the gripper 27, which is then closed by the finger 29 coming in contact with the arm 59, holding the bag in the gripper under spring tension. While thus gripped, the bag is carried into the position shown in Fig. 6, and the toes 32 assume a position practically in contact with the bottom of the bag between the front and rear folds. From this position the toes 32 pass downward and strike the front flap *a* near its line of crease and carry it onto the apron A, the front-flap holdback 80 being held in the position shown in Fig. 6 by the arm 85 coming in contact with the arm 95 and remaining at rest until the shaft 3 has rotated sufficiently to carry the arm 85 positively forward in the manner before described. At the same time the back-flap folder 70, moving forward at a speed greater than the travel of the bag, in the manner previously described, folds the back flap *b* down onto the bottom of the bag, to which it adheres from the paste previously applied. When the shaft 3 has rotated sufficiently to positively overcome the tension of the spring acting on the arm 95, said arm is rotated sufficiently to allow the arm 85 to slip by it, and as soon as this occurs the spring 84 causes the front-flap holdback to move quickly forward out of the way of the said front flap *a*, and the said flap is folded down onto the bottom of the bag and over the back flap, as shown in Fig. 7, by the finishing-roll 100. The motion of the back-flap folder 70 is retarded about this time, so that it will not interfere with the movement of the front flap *a*. The wiper 35 then comes in contact with the body of the bag B and throws it over from the rollers 10 and 20, and the finished bag is passed onto the drier by means of the apron A and finishing-roll 100, the latter pressing the folds together in a manner to secure the desired adhesion of the parts, and the same series of operations are repeated on the next succeeding bag-blank.

From the above it will be seen that I am enabled to accomplish the folding and pasting of the front and rear flaps of the bottom

by the aid of the simple and positively-acting devices shown, the line of fold of the front flap being indicated and determined by the creasing-blade, and the line of fold of the rear flap being determined by the folding-blade and gripping-jaws, while the finishing devices coöperate in laying the flaps in proper order and causing them to adhere together to form the finished bottom.

What I claim is—

1. In a paper-bag machine, the bottom-forming rollers, one of which rollers is provided with a creasing-blade, and the other of which rollers is provided with a rocking creasing-plate, substantially as described.

2. In a paper-bag machine, the bottom-forming rollers, one of which is provided with a creasing-blade, and the other of which is provided with a rocking creasing-plate eccentrically mounted, substantially as described.

3. In a paper-bag machine, the bottom-forming rolls, one of which is provided with a creasing-blade, and the other of which is provided with a rocking creasing-plate and a deflector, substantially as described.

4. In a paper-bag machine, the bottom-forming rollers, one of which rollers is provided with a creasing-blade, and the other of which is provided with a rock-shaft carrying a creasing-plate, substantially as described.

5. In a paper-bag machine, the bottom-forming rollers, one of which rollers is provided with a creasing-blade, and the other of which is provided with an eccentrically-arranged rock-shaft which carries a creasing-plate, substantially as described.

6. In a paper-bag machine, the bottom-forming rollers, one of which rollers is provided with a creasing-blade, and the other of which is provided with a rock-shaft carrying or supporting a combined creasing-plate and deflector, substantially as shown and for the purpose described.

7. In a paper-bag machine, the bottom-forming rolls, one of which carries a creasing-blade and the other of which carries an eccentrically-mounted rocking creasing-plate, a deflector and an extension attached to said plate, and a spring for holding the plate in its normal position, substantially as described.

8. In a paper-bag machine, the combined pasting and creasing rolls, one of which rolls carries the paster-type, and the creasing-plate, and the other of which carries the eccentrically-mounted rocking creaser-plate, substantially as described.

9. In a paper-bag machine, the combined pasting and creasing rolls, one of the rolls carrying the segmental and U-shaped paster-type, and a creaser-blade arranged between said type, and the other roll carrying a rocking creasing-plate having a deflector attached thereto, substantially as described.

10. In a paper-bag machine, the combined pasting, creasing, and folding rolls, one of which carries a pasting-type, a creasing-blade, and a folding-blade, and the other of

which carries a creasing-plate and gripping-jaws, substantially as described.

11. In a paper-bag machine, the bottom pasting, creasing and folding rolls, one of which
5 rolls carries the segmental and U-shaped pasting-type, a creasing-blade arranged between the type and a folding-blade, and the other of which carries a combined creaser-plate and deflector, and the gripping-jaws, substantially
10 as described.

12. In a paper-bag machine, the bottom-forming roll carrying a gripping-jaw, a spring for holding said gripping-jaw normally open, an arm for closing the jaw, a head and a
15 spring interposed between said arm and head to allow the gripping-jaw to be held under spring tension, substantially as described.

13. In a paper-bag machine, the roll provided with a spring-retained gripping-jaw, an arm for closing the jaw, and a spring interposed between said arm and jaw, substantially as described.

14. In a paper-bag machine, the combination of the bottom-forming rolls, one of which
25 is provided with a creasing-blade, a folding-blade, and a recess for the rear flap, the other of which is provided with a creasing-plate, a deflector for the front flap and gripping-jaws, substantially as described.

15. In a paper-bag machine, the combination with the hollow shaft carrying the finishing devices, of an internal shaft mounted in said hollow shaft, a holdback loosely mounted on the hollow shaft, a slot in said shaft, and
35 a connection between the holdback and internal shaft, substantially as described.

16. The combination with the hollow shaft carrying the finishing devices, of the internal shaft, a holdback device loosely mounted on
40 the hollow shaft, and connected to the internal shaft, contacting arms, one carried by the internal shaft, and the other supported with relation thereto, a spring for controlling the holdback, substantially as described.

17. The combination with the hollow shaft 45 carrying the finishing devices, a holdback loosely mounted on the shaft, a spring controlling the holdback, an internal shaft and connections between the holdback and internal shaft, a fixed spring-actuated shaft carrying an arm, and an arm on the internal shaft
50 cooperating therewith, substantially as described.

18. In a paper-bag machine, the combination with the bottom-forming rolls, of a shaft 55 carrying a wiper device, substantially as described.

19. In a paper-bag machine, the combination with the bottom-forming rolls, of a holdback device operating on the front flap, and
60 wiper operating on the body of the bag, substantially as described.

20. In a paper-bag machine, the combination with the bottom-forming rolls, of a shaft carrying the bottom-finishing devices comprising a holdback device operating on the
65 front flap, a wiper operating on the body of the bag, a back-flap-folding device, substantially as described.

21. In a paper-bag machine the shaft carrying the finishing devices comprising the toes, the back-flap-folding device and the front-flap-holdback device, the latter having a variable speed of rotation, substantially as described.
70

22. In a paper-bag machine, the bottom-forming rollers, one of which is provided with a creasing-blade, and the other of which is provided with a grooved creasing-plate supported to yield under pressure of the creasing-blade, substantially as described.
75

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES WEST.

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