

No. 670,761.

Patented Mar. 26, 1901.

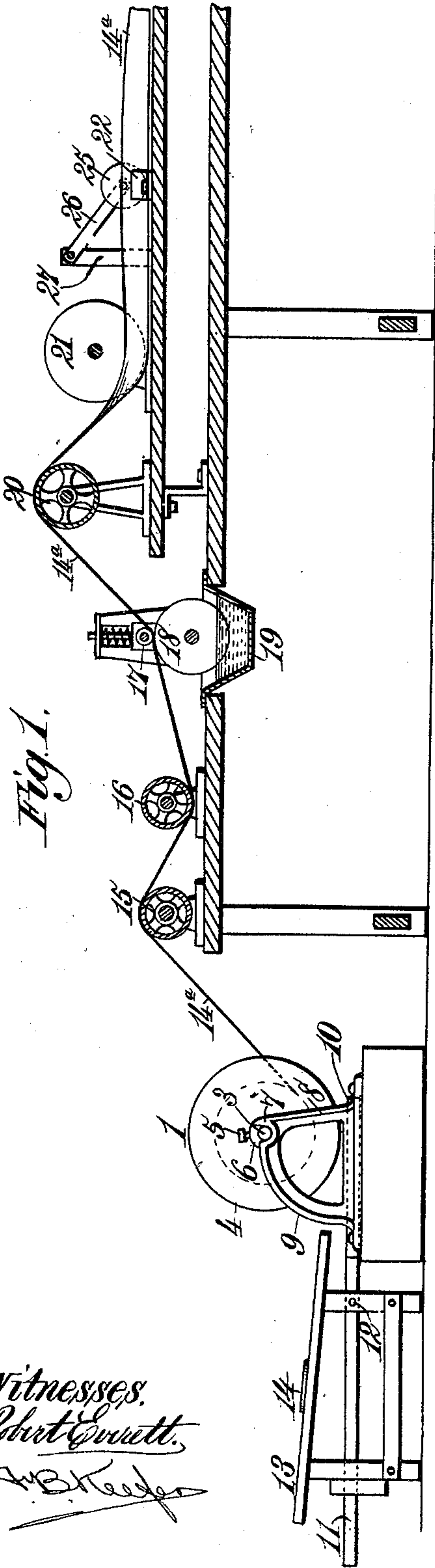
E. BOWEN.

MACHINE FOR MAKING PAPER WRAPPERS FOR BOTTLES.

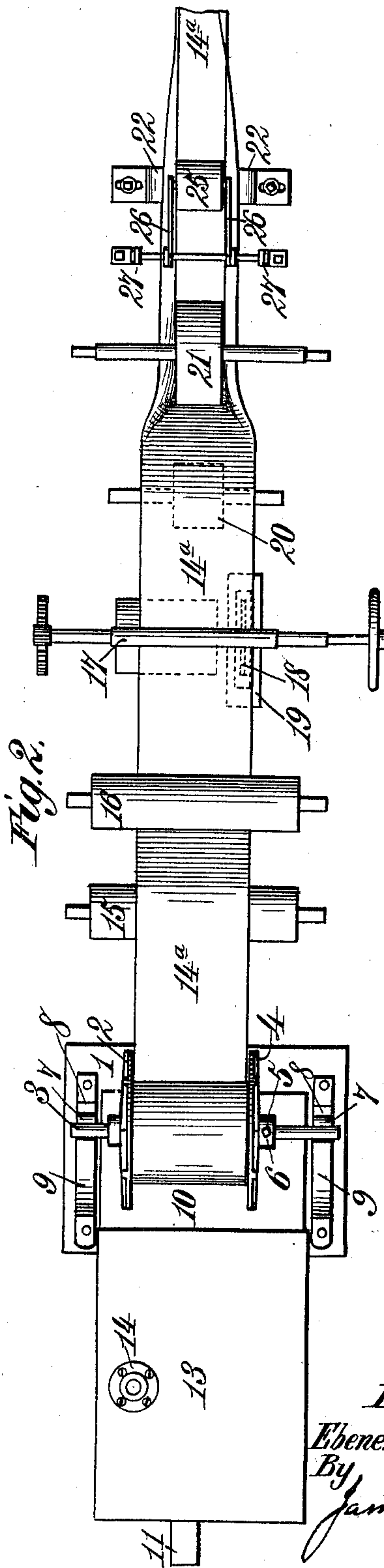
(No Model.)

(Application filed Oct. 15, 1900.)

4 Sheets—Sheet 1.



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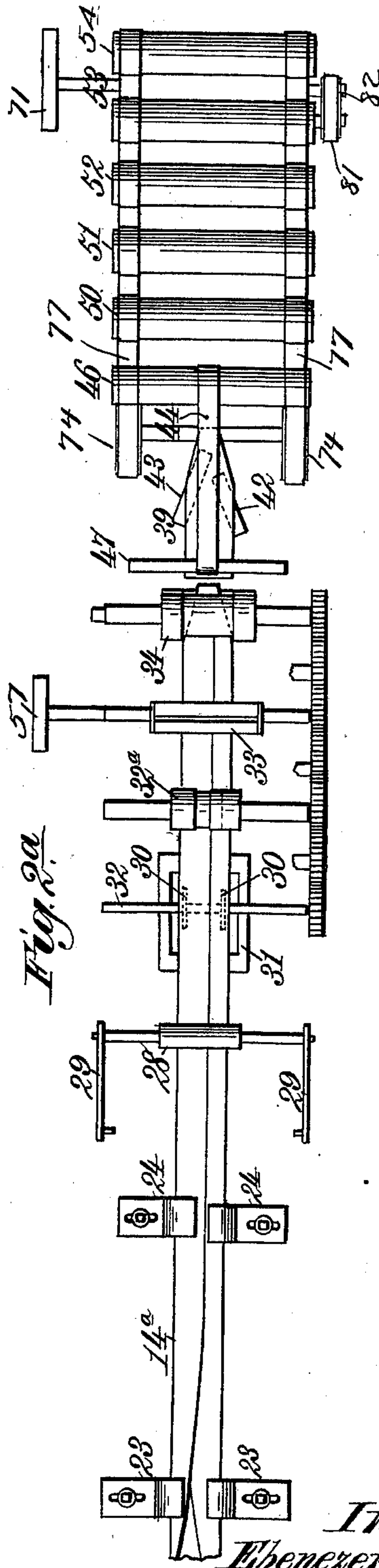
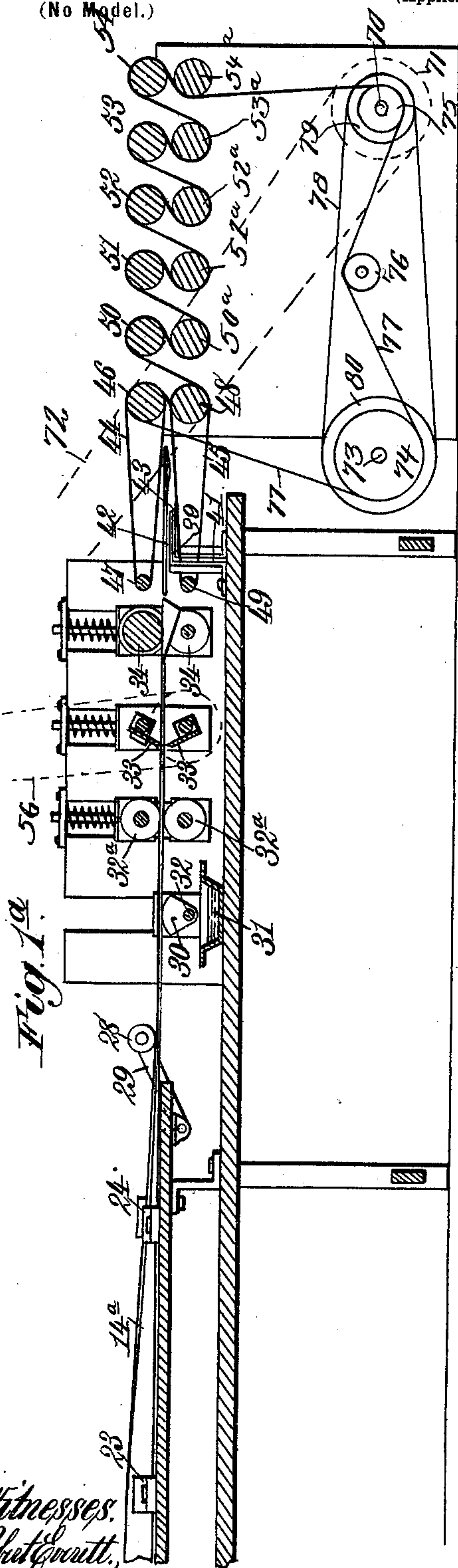
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4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

Fig. 3.

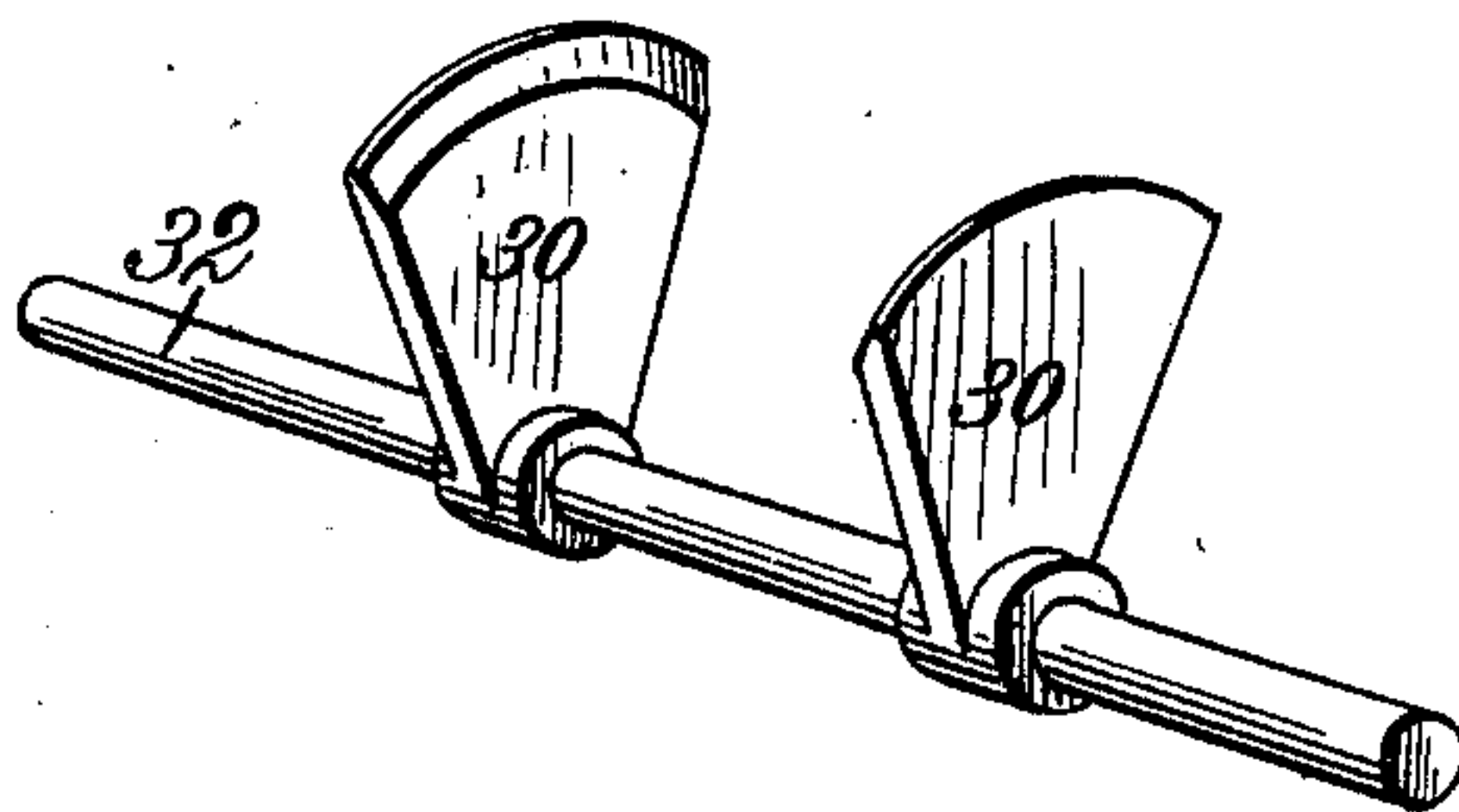


Fig. 4.

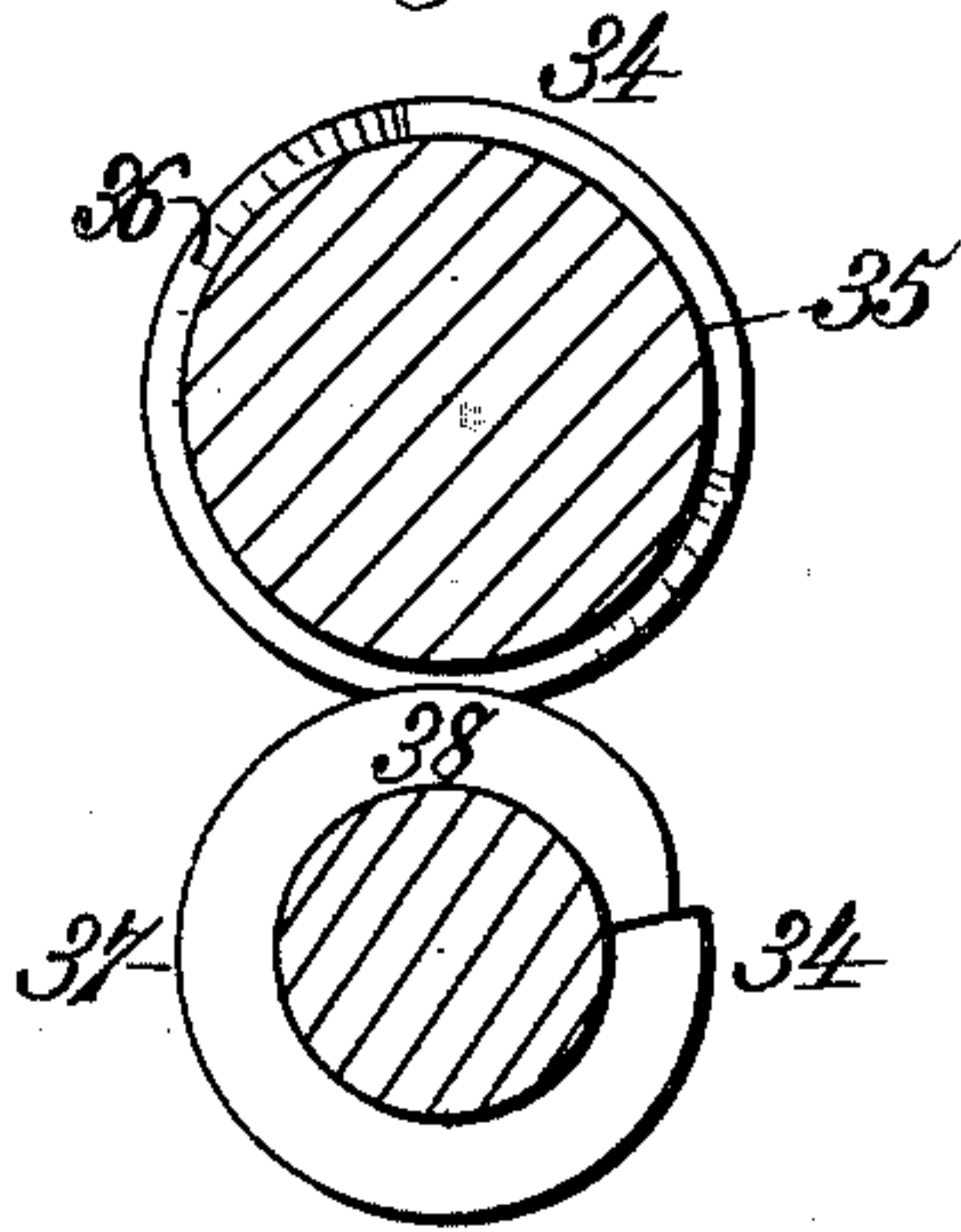


Fig. 5.

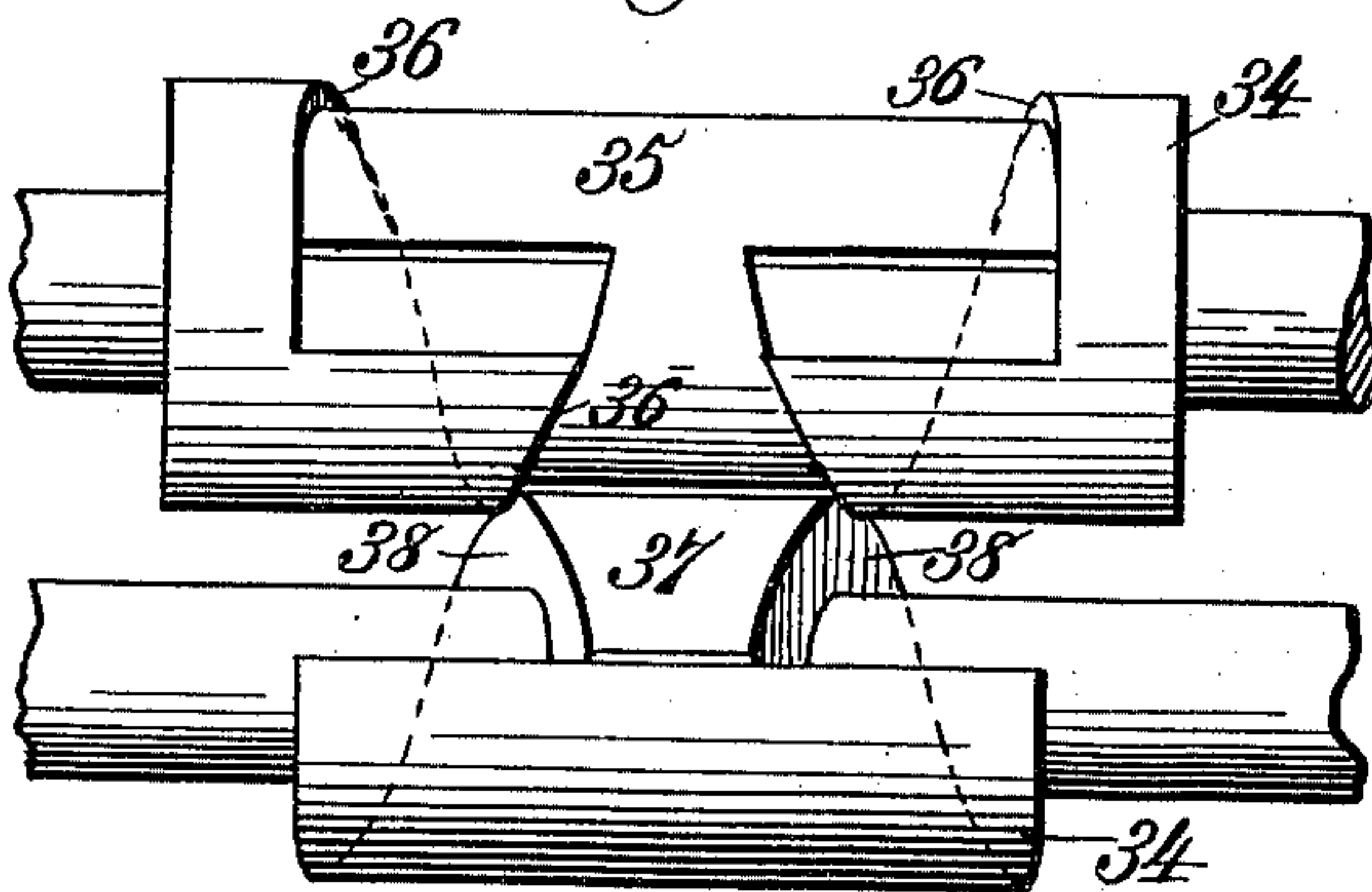


Fig. 6.

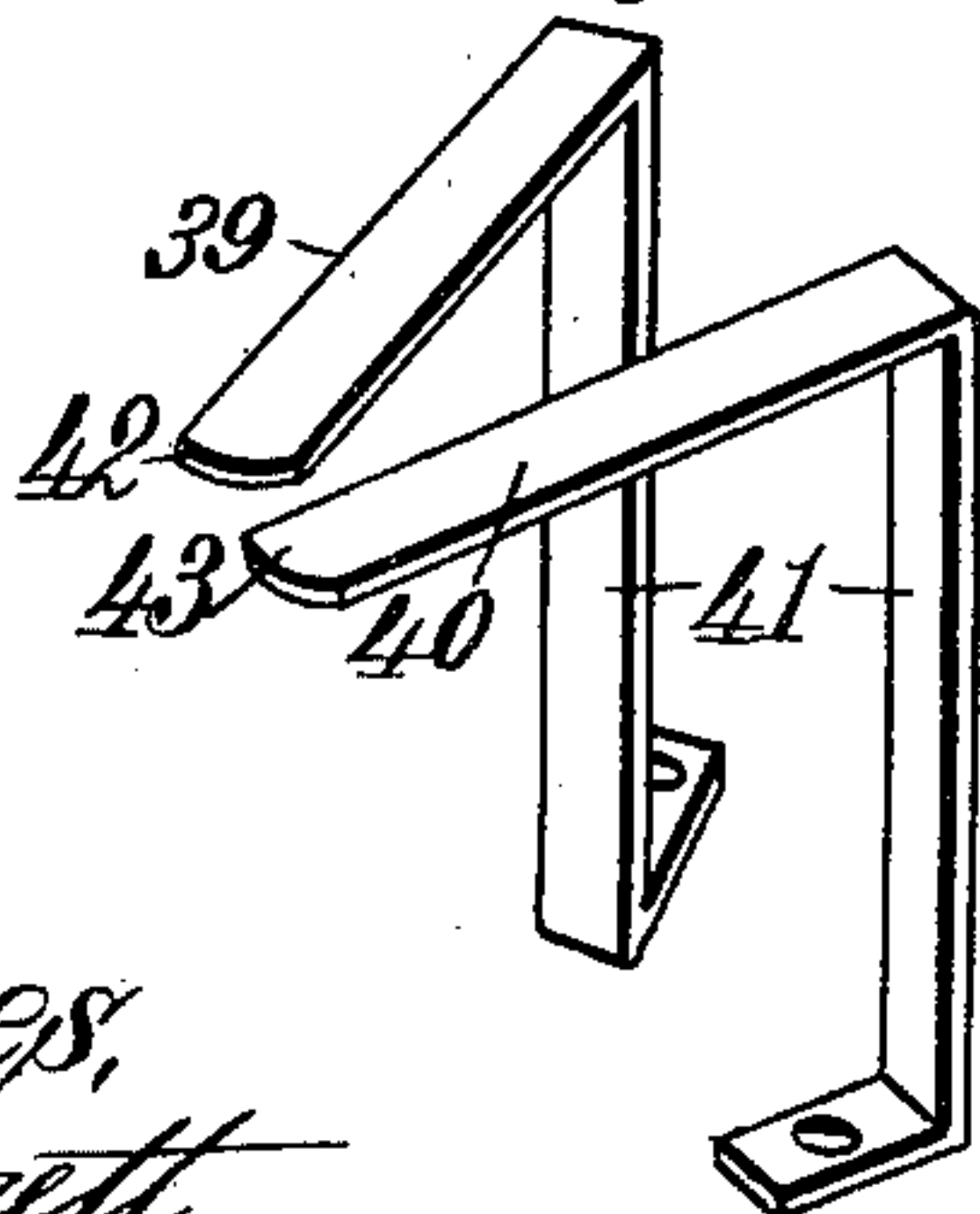
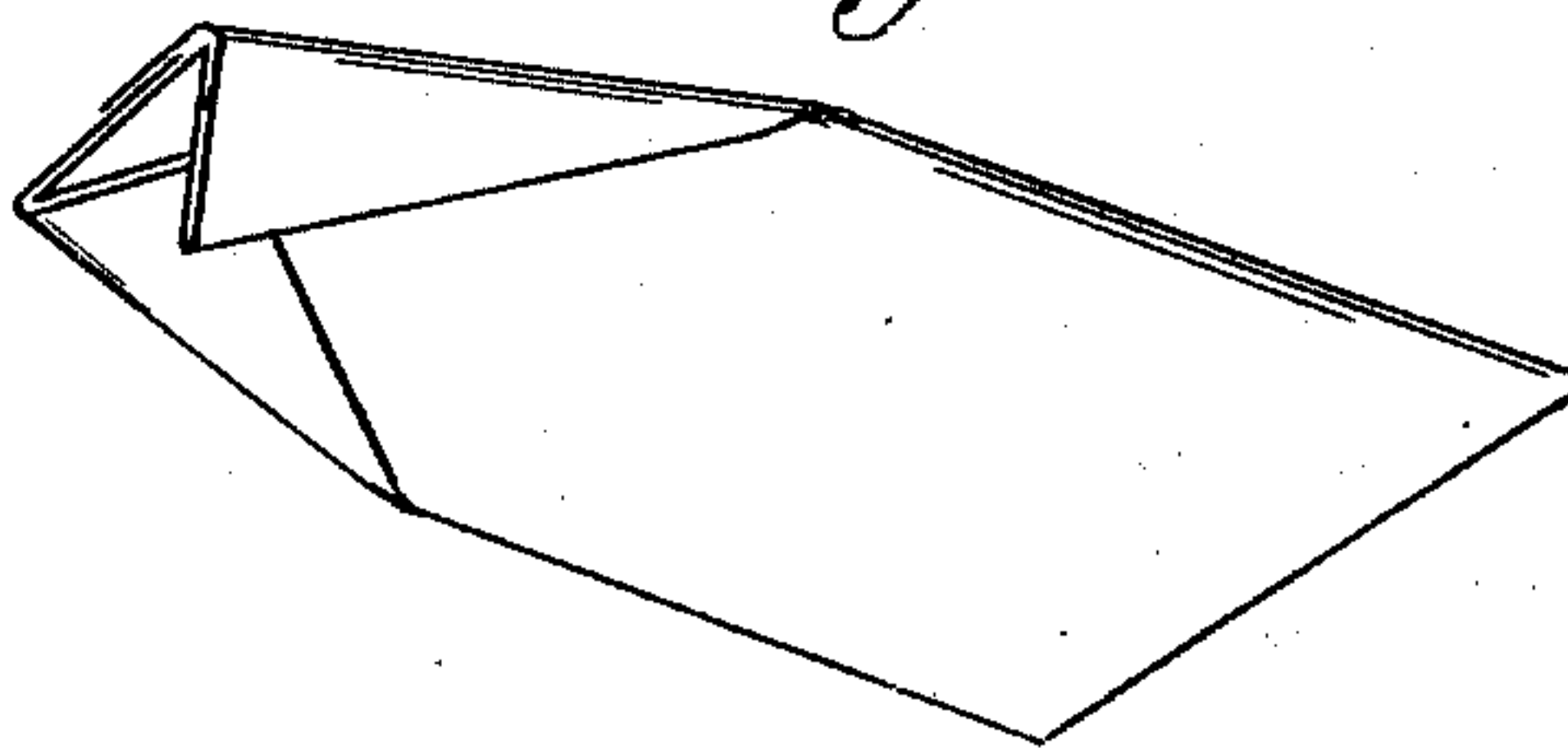


Fig. 7.



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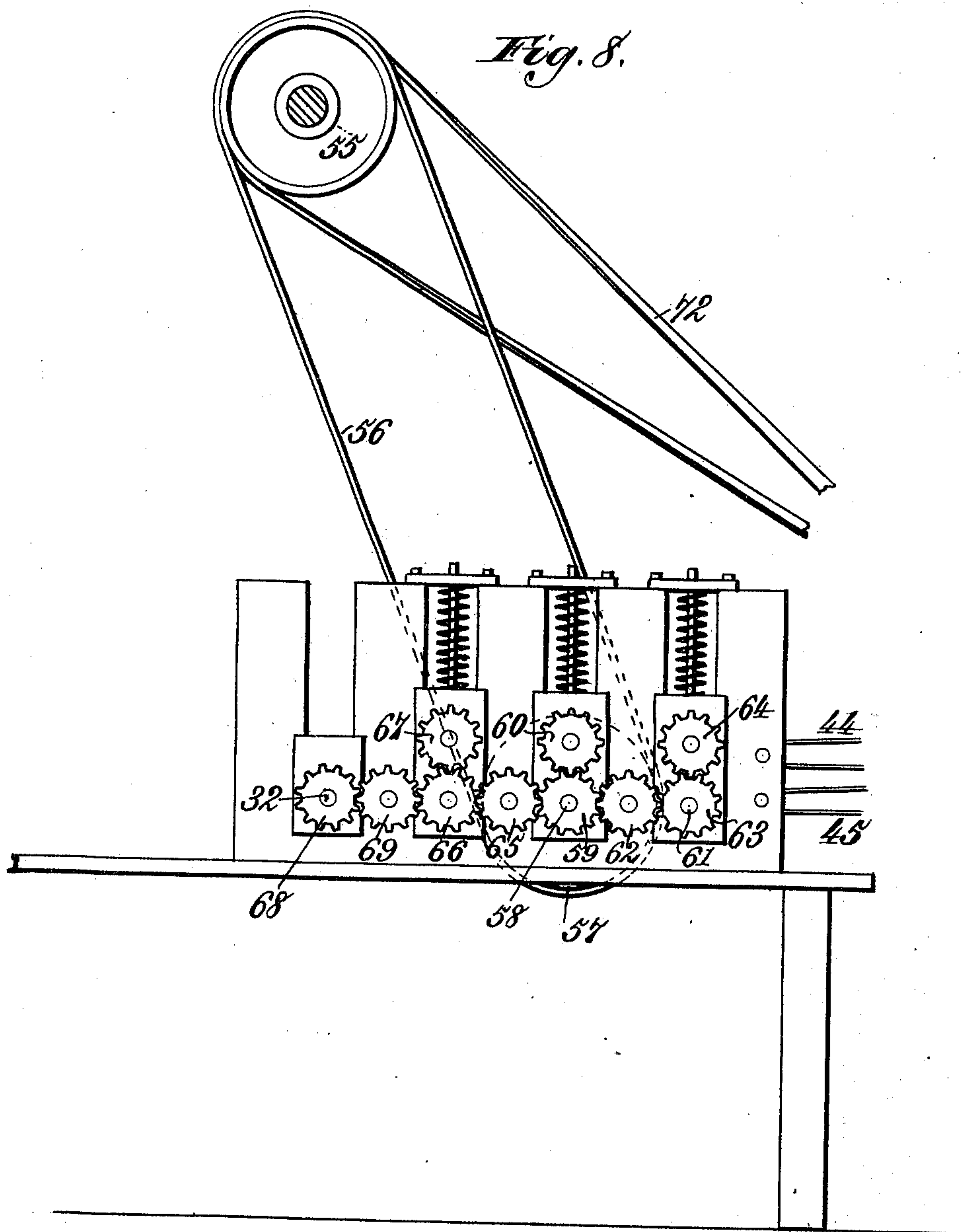
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(No Model.)

(Application filed Oct. 15, 1900.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

EBENEZER BOWEN, OF CINCINNATI, OHIO.

MACHINE FOR MAKING PAPER WRAPPERS FOR BOTTLES.

SPECIFICATION forming part of Letters Patent No. 670,761, dated March 26, 1901.

Application filed October 15, 1900. Serial No. 33,136. (No model.)

To all whom it may concern:

Be it known that I, EBENEZER BOWEN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Machines for Making Paper Wrappers for Bottles, of which the following is a specification.

My invention relates to machines for making paper wrappers for bottles, the same being designed as an improvement upon the machine shown and described in the patent to White, Cramer, and Gaines, No. 594,049, dated November 23, 1897, and that shown in the patent to Biedinger, No. 639,395, dated December 19, 1899.

One object of the invention is to provide means whereby the heavy reel containing the roll of paper to be operated upon may be readily removed from its bearings for the purpose of applying a new roll of paper thereto and may be readily reinserted into its bearings when full.

A further object of the invention is to provide novel means for creasing and folding the side flaps at the neck of the wrapper and for finishing the wrapper at the delivery end of the machine.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be set forth in the claims.

In the drawings forming a part of this specification, Figure 1 is a longitudinal sectional view of the forward end of my apparatus. Fig. 1^a is a similar view of the rear or delivery end of the machine. Fig. 2 is a plan view of the parts shown in Fig. 1. Fig. 2^a is a similar view of the parts shown in Fig. 1^a. Fig. 3 is a detail perspective view of the paste-segments. Fig. 4 is a cross-section of the creasing and bending rolls. Fig. 5 is a front elevation of the same. Fig. 6 is a detail perspective view of the corner-folders. Fig. 7 is a similar view of a completed wrapper as made by my machine. Fig. 8 is a side elevation showing the connections from the main drive-shaft to the rotary cutters, creasing-rollers, pressure-rolls, and paste-segments.

The reel 1 has one of its heads 2 secured to the central shaft 3 and its other head 4 removably and adjustably secured to the shaft 3 by means of a set-screw 5, extending through

the hub or collar 6. When the reel is in operative position, the ends of the shaft 3 have bearings in sockets 7 in the upper edges of two parallel brackets 8. The front edge 9 of each of the brackets 8 is curved outwardly, as shown, and ordinarily it is necessary in order to remove the reel 1 from its bearings in the brackets 8 when it is desired to insert a new roll of paper thereinto to lift the reel 1 bodily by hand and allow it to slide back on the curved edges 9 of the brackets 8. This is a difficult operation, as the reels employed in this class of devices are very heavy and require two or more men to move the same, particularly when it is desired to reinsert the shaft 3 of the reel 1 into its bearings after a new roll has been applied. By my invention I overcome this difficulty by providing means whereby the reel 1 may be conveniently handled by one man. Between the brackets 8 is a plate or board 10, to which is centrally secured a lever 11, fulcrumed at 12 to a stationary part of the apparatus. This lever 11 is located directly beneath the inclined feed-stand 13, and the latter is provided with a socket 14, designed to receive one end of the reel-shaft 3. When the reel 1 is in position, as shown in the drawings, it is merely necessary in order to remove the same to depress the free end of the lever 11. This action causes the elevation of the plate 10, secured to the opposite end of said lever, and as the latter is located directly beneath the flanges or heads 2 and 4 of said reel the latter is also raised and the ends of the shaft 3 are lifted from the sockets 7 in the brackets 8. When the plate 10 is elevated, the upper surface thereof is also slightly inclined by reason of the fact that the movement of said plate is upon the arc of a circle of which the pivotal point 12 of the lever 11 is the center. Upon this inclined surface the reel 1 is caused to roll by gravity until the end of the feed-stand 13 is reached. The said reel is now in convenient reach of the operator and may be rolled along the upper surface of said feed-stand by hand. It is then turned on end with the shaft 3 located in the socket 14 of the feed-stand 13 and with the removable head or flange 4 of said reel uppermost. By loosening the set-screw 5 in the hub 6 the head or flange 4 may be readily slipped off the upper

end of the shaft 3 and a new roll of paper placed in the reel surrounding said shaft. The head or flange 4 is now reapplied and the reel turned over, so that it rests on the edges 5 of the heads 2 and 4 upon the upper surface of the feed-stand 13. The free end of the lever 11 is now depressed, throwing upwardly the plate 10 upon the opposite end of said lever, and by reason of the inclination of the 10 surface of the feed-stand 13 the reel 1 is caused to roll down toward the brackets 8 until it reaches the inclined plate 10, when the momentum it has causes it to roll up said inclined plate and the shaft 3 becomes seated 15 in the sockets 7 of said brackets. Were it not for the provision of the plate 10 and the lever 11 for operating the same the ends of the shaft 3 would in passing down the feed-stand 13 strike against the front curved edges 20 9 of the brackets 8. The reel would then have to be lifted up by hand until the shaft 3 reached the sockets 7. This is a difficult operation and requires the services of at least two men.

25 The machine in its general construction resembles the machine illustrated in the patent to White, Cramer, and Gaines above referred to and will be described only generally, except as to those features which constitute my 30 improvements as herein claimed. The web of paper 14^a, drawn from the reel 1, passes first around the guide-rollers 15 16 and thence beneath the downwardly-spring-pressed roll 17. The roll 17 is located directly above the 35 paste-wheel 18, which dips down into the paste-receptacle 19 and applies the paste or other adhesive to the under side of one edge of the web 14^a. The paste-wheel 18 applies the adhesive to the lower edge of the web 14^a 40 in a continuous strip, so that when said web 14^a is folded into tubular form the meeting edges of the two parts of the web will be sealed one to the other. From the paste-wheel 18 the web 14^a passes up around a guide-roller 45 20 and thence down beneath the roller 21, which commences the formation of the tube. By means of the roller 21, which is narrower than the web 14^a, the side edges of said web are turned upwardly at substantially right 50 angles to the body of the web. From the roller 21 the web 14^a passes beneath the tube-forming guides 22, 23, and 24 of substantially the same construction as is employed in the White, Cramer, and Gaines machine above 55 referred to. Between the two members of the tube-forming guide 22, however, is a heavy roller 25, mounted in a bail 26 and suspended from a bracket 27, to which said bail is pivoted. The roller 25 serves to maintain the 60 web of paper in proper position for the guides 22, 23, and 24 to complete the folding of the same into tubular form. When the web 14^a passes from the guide 24, it has been bent into tubular form, with the edges thereof 65 pasted together. At this point it is acted upon by a heavy roller 28, mounted in a pivoted bail 29, which roller operates upon the

upper surface of the tubular web for maintaining the same in proper position. With 70 the web of paper now in tubular form the next operation to be performed in order to complete the wrapper is to bend over the corners of the web to form the contracted neck of the wrapper, to seal or paste these bent-over corners to the body of the web, to cut the web 75 transversely into predetermined lengths, and to press out and finish the wrapper. The first step in this operation is to apply paste or other adhesive substance to the under side of the tube along its opposite side edges and 80 adjacent to one end. This is effected by causing the tube after leaving the roller 28 to pass in contact with a pair of paste-segments 30, said segments dipping into the paste-receptacle 31, mounted on a shaft 32, and de- 85 signed to engage with the side edges of the tube throughout a short distance. The distance along which the paste or adhesive is applied to the tube depends upon the circumferential lengths of the segments 30. It 90 will be observed, however, that by applying the paste to the tube by means of these segments the same will be applied not continuously, but at regular predetermined intervals. From the paste-segments 30 the tube is caused 95 to pass between two pressure-rolls 32^a 32^a, the upper of which is downwardly spring-pressed, said rolls being designed for the purpose of causing the paste to adhere to the tube along its longitudinal seam and also acting as grip- 100 ping or feed rolls. From the pressure-rollers 32^a the tube passes between the rotary cutters 33 33, which cut up the tube into certain predetermined lengths. The particular construction of cutter employed by me is illus- 105 trated in Figs. 11, 12, and 18 of the patent to White, Cramer, and Gaines above referred to. It now becomes necessary to crease and fold over the corners of the severed tubular strips to form the contracted neck for the completed 110 wrapper. After leaving the cutters 33, therefore, the severed tubular strips pass between the creasing-rollers 34 34. These rollers are the counterparts of each other, the upper of which has a circumferential recess 35 there- 115 in, provided with diagonal side walls 36, set at an angle to each other, and the lower of which is provided with a peripheral projection 37, having diagonal side edges 38, said projection 37 being designed to fit within the 120 recess 35 and to crease the corners of the tubular strips and bend the same downwardly at substantially right angles to the body of the strip. The creasing-rollers 34 are inter- 125 geared with each other, so that they rotate in unison and in opposite directions. After leaving the creasing-rollers 34 with the front corners creased diagonally and bent down into planes at right angles to the bodies of said strips the latter are brought into en- 130 gagement with the folders 39 40, the same consisting of upright portions 41, secured to and rising from the base of the machine, and angularly-extending folding-fingers 42 43 upon

the upper ends thereof. The fingers 42 43 are bent inwardly at an angle toward each other; but the free end of the finger 42 is located slightly below the free end of the finger 43. By this construction as the tubular strips are fed over the folders 39 and 40 one of the bent corner-pieces will be brought into engagement with the finger 42 and the other with the finger 43, with the result that both corner-pieces are bent up into contact with the body of the strip on which it is formed successively—that is to say, one of the corner-pieces is first bent up into place and immediately afterward the other one is bent up into contact with it and with the body of the strip. Passing from the folders 39 and 40 the strips enter the tapering space between two continuously-moving feeding-belts 44 45, which pass around rollers 46 and 47 and 48 and 49, respectively. The rollers 46 and 48 are intergeared one with the other, so that they rotate in unison, and the carrier-belts 44 and 45 serve to convey the strips rearwardly between the rollers 46 and 48 and thence between the finishing-rollers 50, 50^a, 51, 51^a, 52, 52^a, 53, 53^a, 54, and 54^a, whence the completed wrappers are delivered in succession from the machine. In passing between the carrier-belts 44 and 45 and between the finishing-rollers referred to all parts of the wrapper are pressed into shape and all portions thereof containing the adhesive substance previously applied are caused to stick together.

The different parts of the machine are driven from a suitable source of power through gearing such as that which will now be described.

Upon the main drive-shaft is mounted a pulley 55, around which passes a belt 56, said belt also passing around a pulley 57 on the shaft 58, to which the lower rotary cutter 33 is secured. On the shaft 58 is a gear 59, which meshes with a gear 60 on the shaft of the upper cutter 33, so that both of said cutters 33 are operated simultaneously and in opposite directions. Through the gear 59 the motion of the shaft 58 is transmitted to the shaft 61 of the lower creasing-roller 34. For this purpose an intermittent gear 62 is employed, which meshes with the gear 59 and with a gear 63 on the shaft 61. Said gear 63 is in mesh with a corresponding gear 64 on the shaft of the upper creasing-roller 34, so that both of said creasing-rollers are operated from the same source in opposite directions. The gear 59 also meshes with an intermediate gear 65, in mesh with a gear 66 on the shaft of the lower pressure-roll 32^a, and the gear 66 meshes with a gear 67 on the shaft of the upper pressure-roll 32^a, by which construction both of said pressure-rolls 32^a are operated from the same source of power simultaneously and in opposite directions. On the shaft 32, to which the paste-segments 30 are secured, is mounted a gear 68, which through the intermediate gear 69 meshes with the gear

66. In this way the paste-segments 30 are rotated from the main drive-shaft.

Beneath the finishing-rollers above referred to is mounted a counter-shaft 70, on one end of which is a pulley 71, around which and the pulley 55 on the main drive-shaft passes a driving-belt 72. By this construction the shaft 70 is rotated by the main drive-shaft. Also located beneath the finishing-rollers above referred to and parallel to the shaft 70 is a shaft 73, having a pulley 74 thereon, as clearly shown. The shaft 70 is also provided with a supplemental pulley 75, and between the pulleys 74 and 75 is an idle pulley 76. Around the pulleys 74, 76, and 75 and around the ends of each of the finishing-rollers above described passes a belt 77. From the pulley 75 the belt 77 passes first inside the roller 54^a, thence up and around the outside of the roller 54, thence down beneath and around the roller 53^a, thence up and around the outside of the roller 53, and so on around the ends of each of the finishing-rollers until it passes from the upper side of the roller 46 down and around the pulleys 74 and 76. By this construction it will be observed that as the shaft 70 is rotated from the main drive-shaft the finishing-rollers will be in turn rotated through the action of the belt 77, which passes around the same. The upper of said rollers will all be rotated in one direction, while the lower of said rollers will be rotated in the opposite direction. To equalize the movements of these parts, a driving-belt 78 is employed, which passes around a pulley 79 on the shaft 70 and around the pulley 80 on the shaft 73. Furthermore, one or more belts 81 pass around pulleys 82 on the shaft 70 and around one or more of the finishing-rollers, as clearly shown. It should be noted in this connection that the driving-belt 77 passes around the ends of the finishing-rollers, whereas the feeding-belts 44 and 45 pass around the central portions of the rollers 46 and 48. The driving-belt 77 cannot, therefore, interfere with the feeding-belts 44 and 45.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making paper wrappers for bottles, the combination with a pair of brackets having sockets therein and a reel for containing the roll of paper to be operated upon, the shaft of which has bearings in said sockets, of an inclined feed stand or table in advance of said reel, a plate located between said bracket and beneath said reel, and a lever for raising and lowering said plate, as and for the purpose set forth.

2. In a machine for making paper wrappers for bottles, having contracted necks, the combination with means for converting a flat web of paper into tubular form, and means for sealing the meeting edges of said web to form a seam, of a pair of creasing-rollers between which said tube is passed, one of said rollers having a recess therein with diagonally-ar-

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 ranged side edges set at an angle to each other and the other of said rollers having a projection thereon with diagonally-arranged side edges set at an angle to each other, the
 5 said projection adapted to fit within said recess whereby the corners of the tube are creased along diagonal lines and bent downwardly, as and for the purpose set forth.

3. In a machine for making paper wrappers
 10 for bottles, having contracted necks, the combination with means for converting a web of paper into tubular form, means for sealing the meeting edges of said web to form a seam, and means for creasing the corners of said
 15 tube along diagonal lines and bending said corners downwardly, of folders for turning said bent corners up into contact with the body of said tube, one above the other, the same comprising two uprights, each having a
 20 folding-finger upon its upper end, said fingers extending inwardly at an angle toward each other, with the free end of one of said fingers located slightly above the free end of the other of said fingers, as and for the purpose
 25 set forth.

4. In a machine for making paper wrappers for bottles, having contracted necks, the combination with means for converting a web of paper into tubular form, means for sealing the meeting edges of said web to form a seam, 30 means for applying an adhesive to the under side of the tube throughout a portion of its length adjacent to one end, means for creasing the corners of said tube along diagonal lines and for bending said corners downwardly, 35 and means for folding said bent corners back into contact with the body of the tube, of a pair of carrier-belts having an inclined space between them located adjacent to said folding means, and finishing-rolls arranged in pairs 40 adjacent to said belts, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EBENEZER BOWEN.

Witnesses:

CLYDE P. JOHNSON,
 WM. H. JONES.