

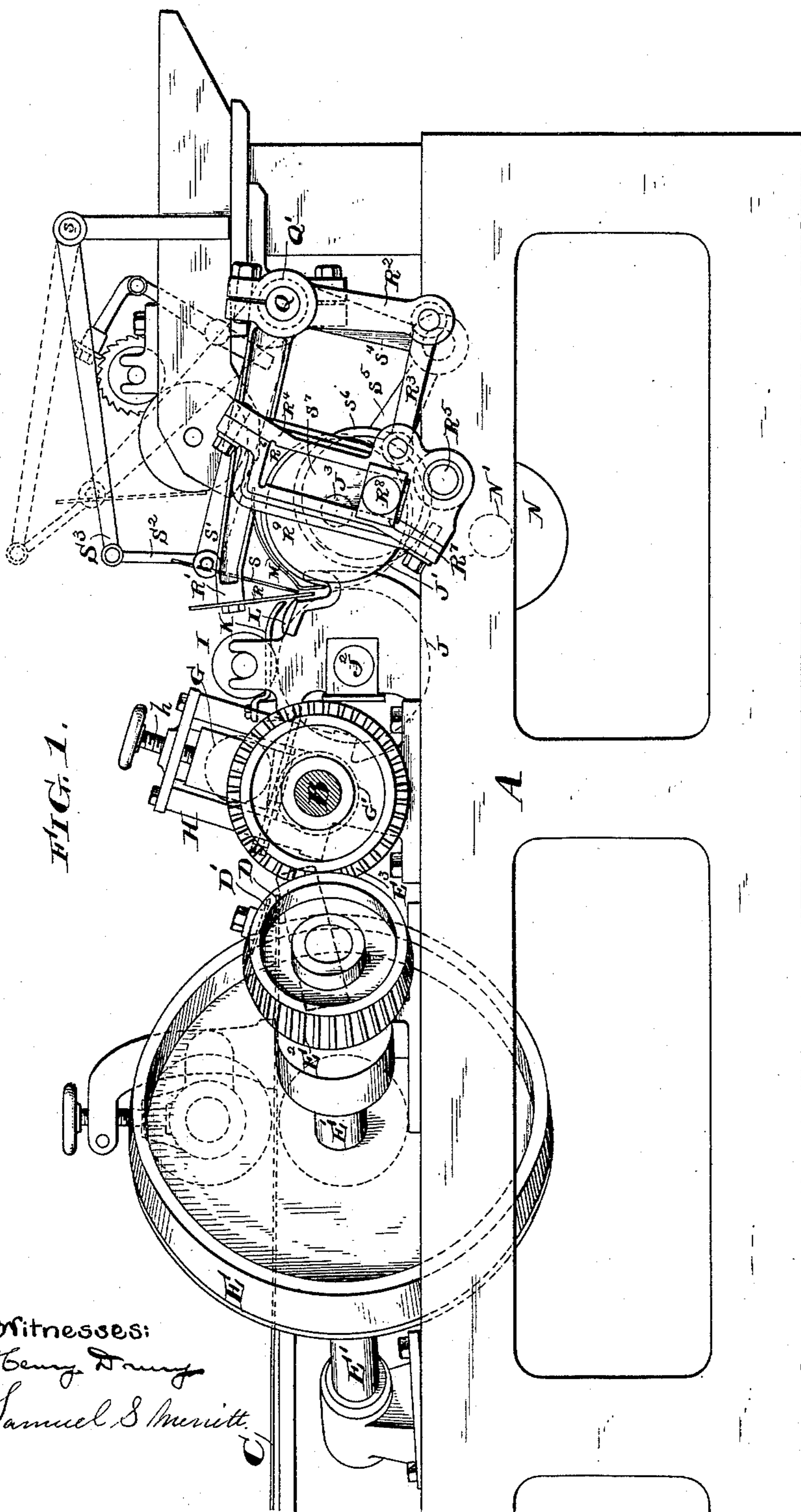
(No Model.)

5 Sheets—Sheet 1.

C. B. STILWELL.  
PAPER BAG MACHINERY.

No. 473,977.

Patented May 3, 1892.



Witnesses:  
Henry D. Dwyer  
Samuel S. Merritt.

Inventor:  
Charles B. Stilwell  
by his atty.  
Francis J. Chambers

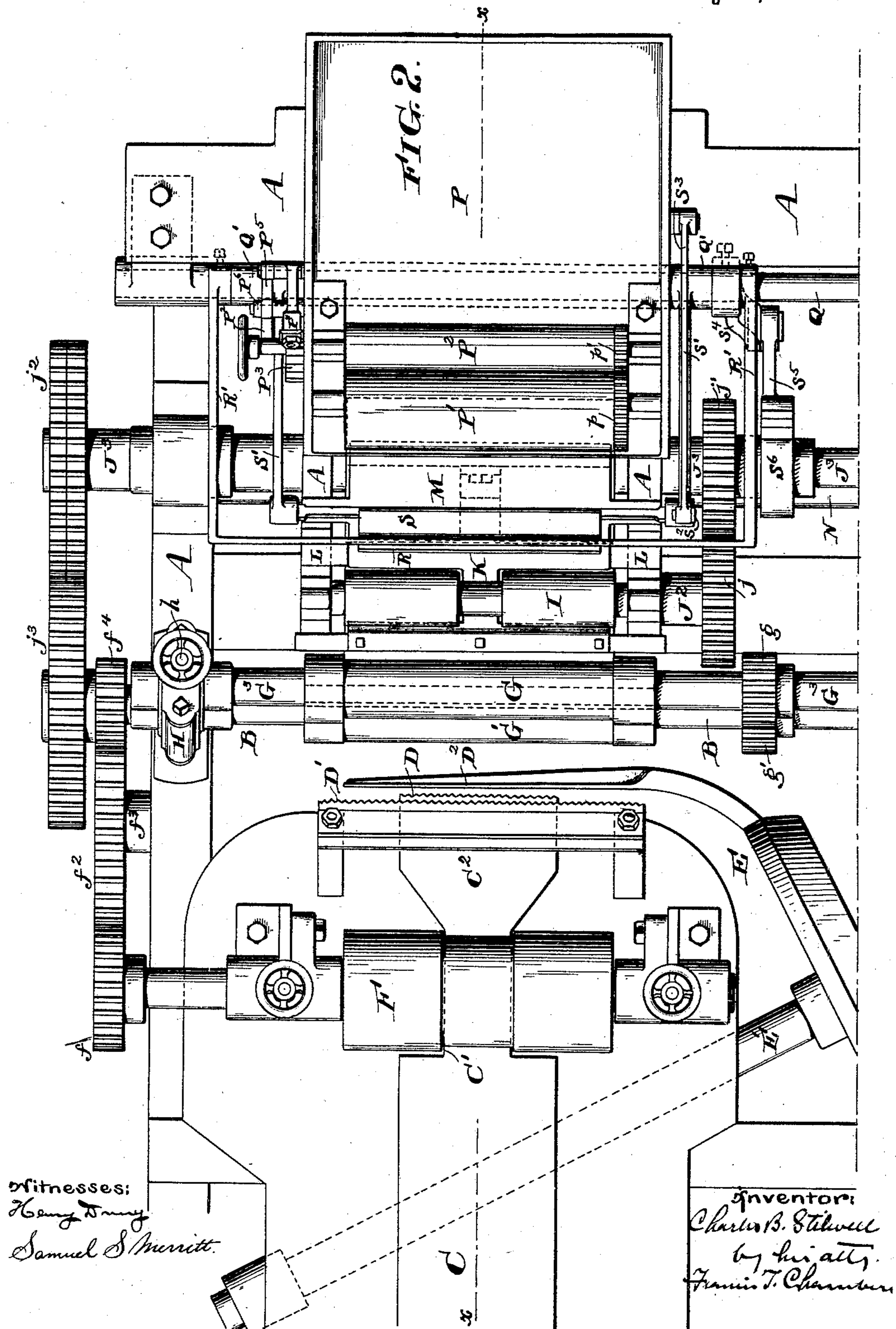
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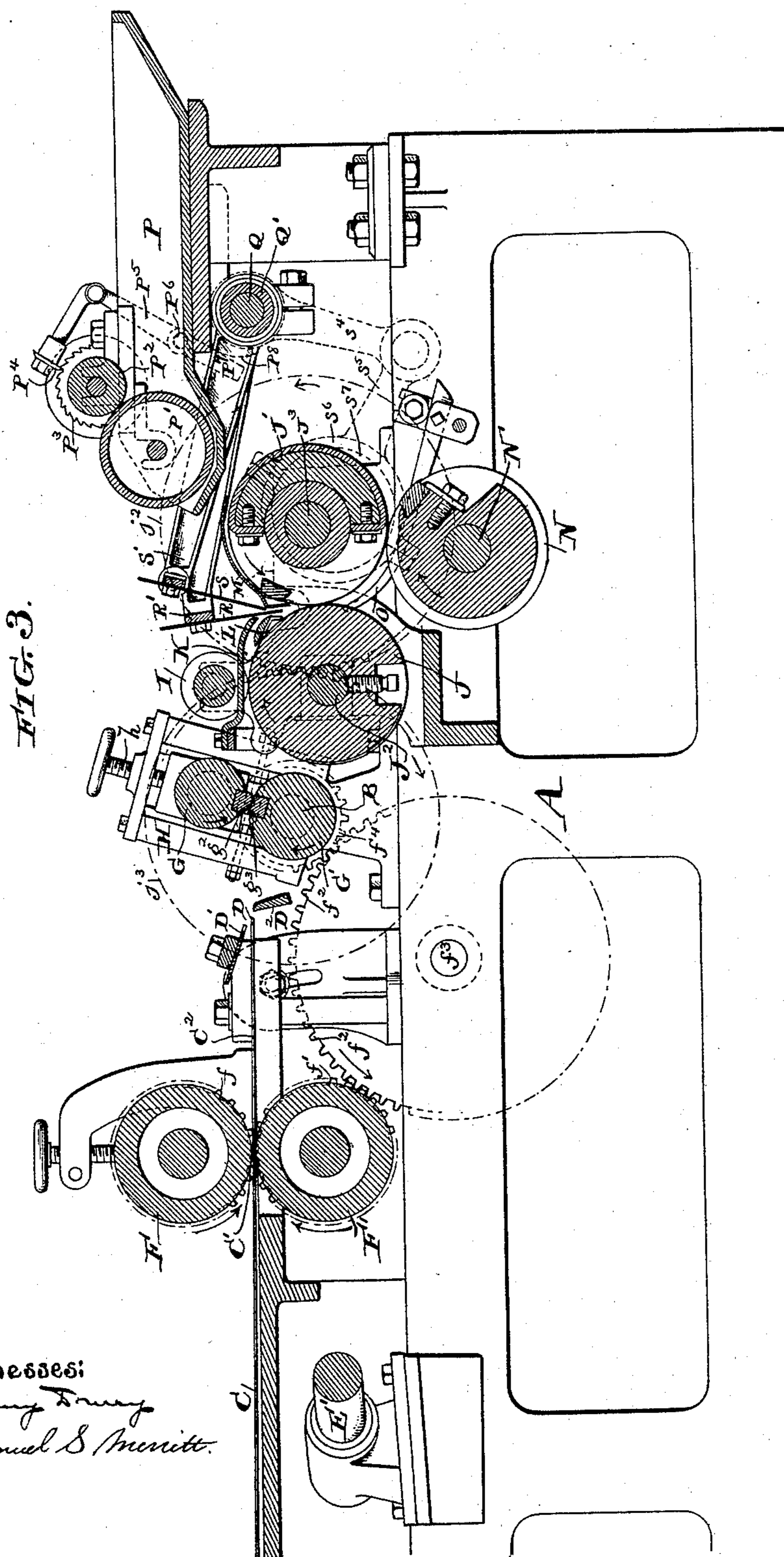
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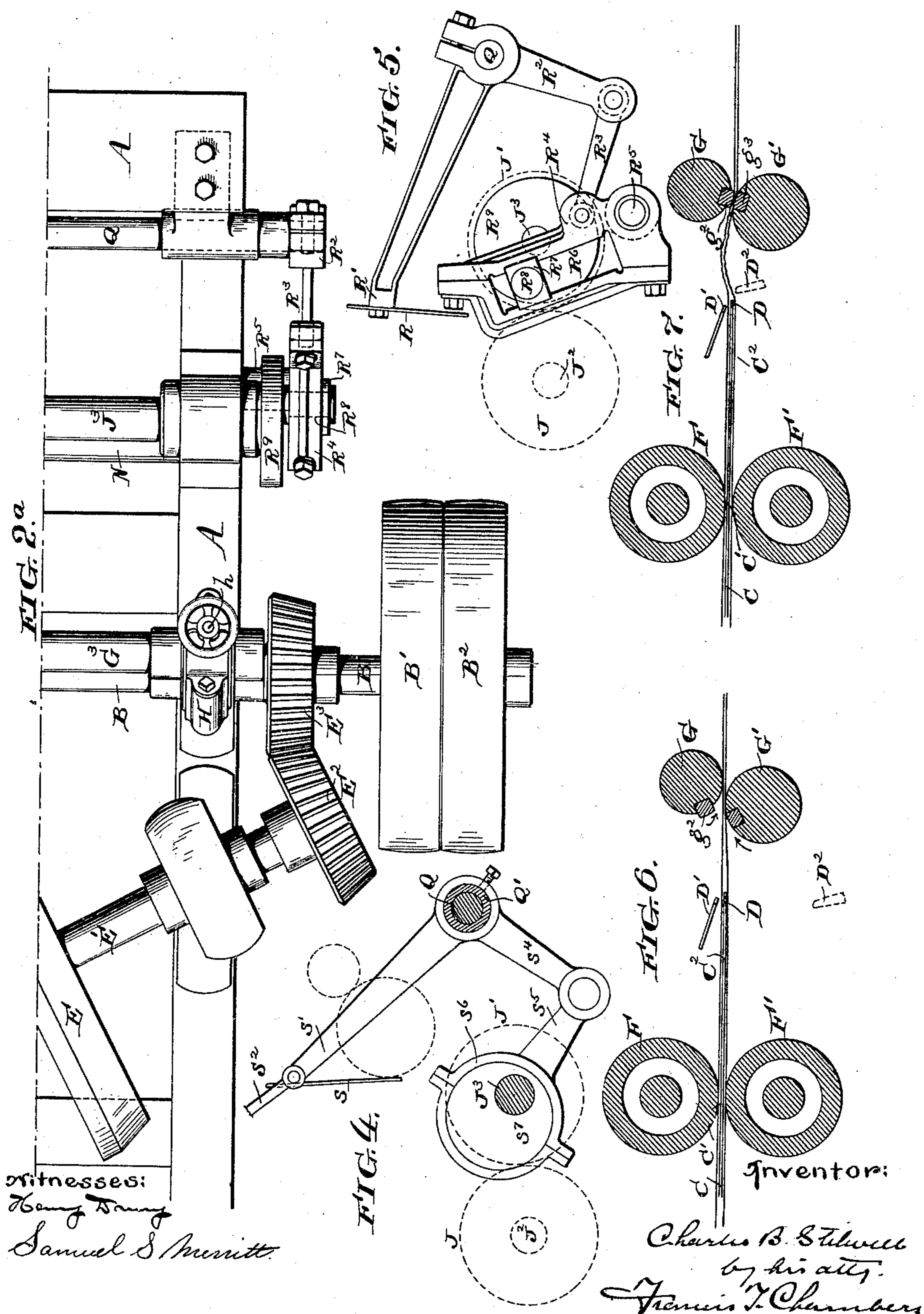
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5 Sheets—Sheet 5.

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FIG. 8.

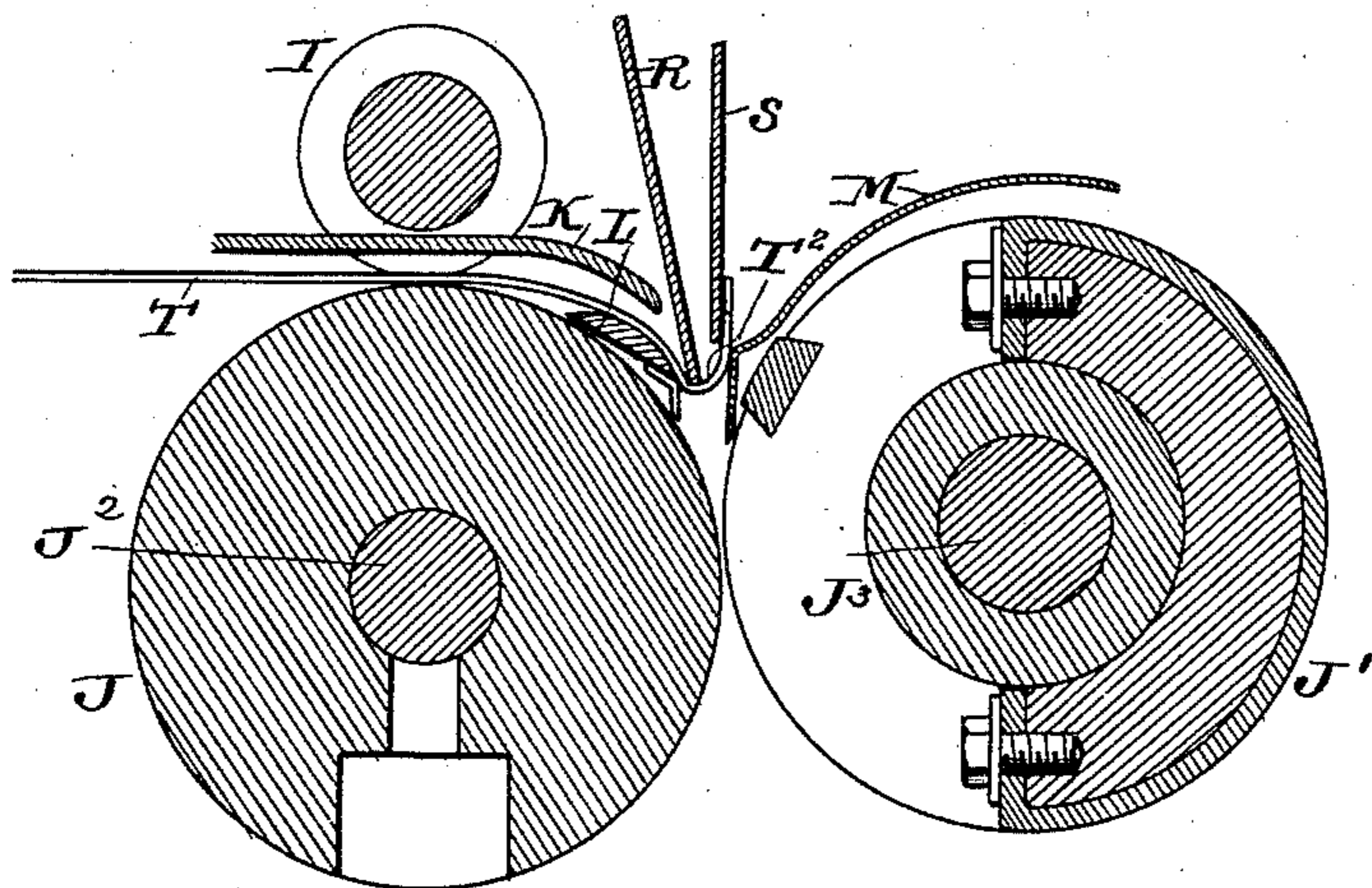


FIG. 9.

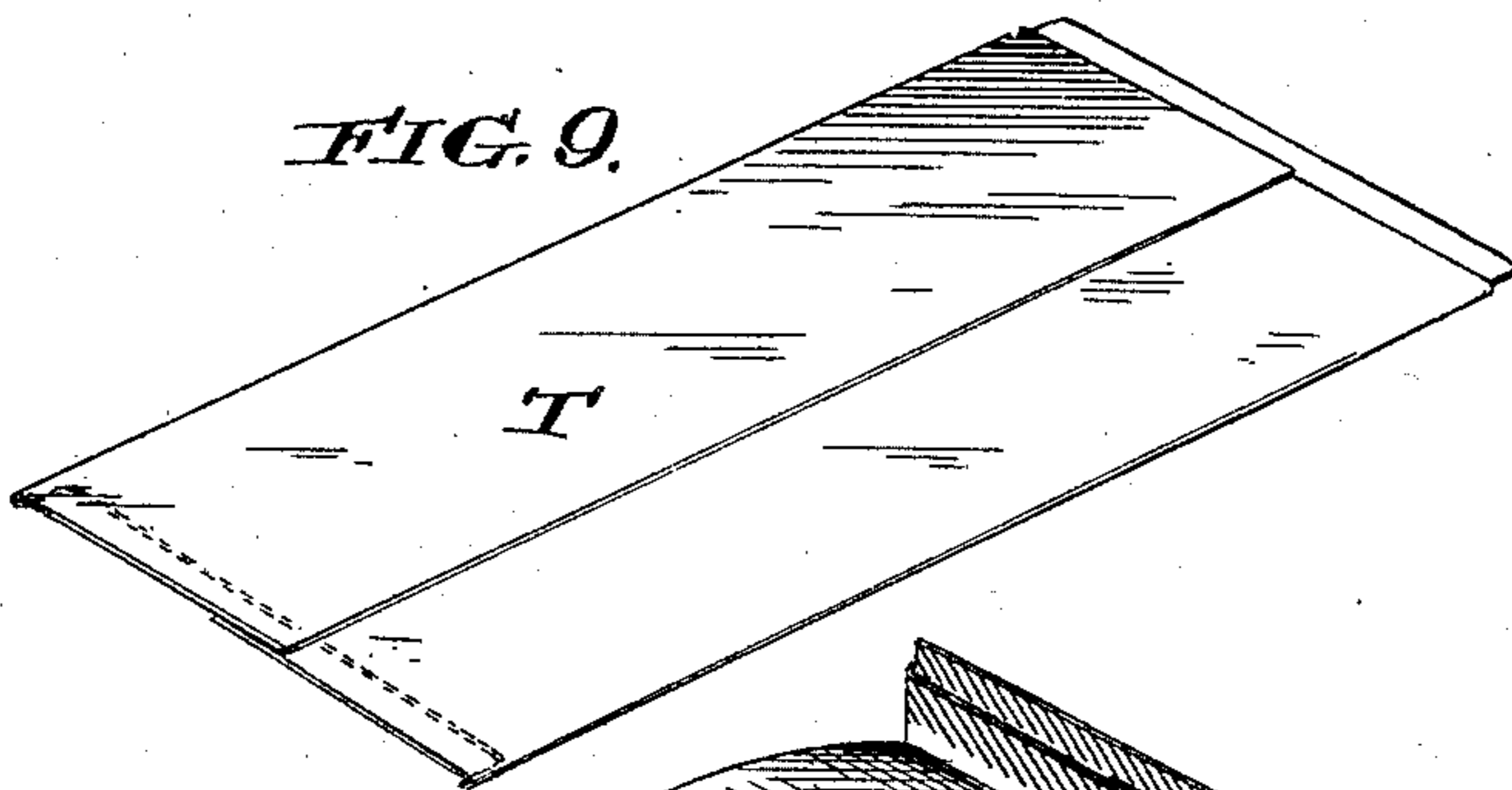


FIG. 10.

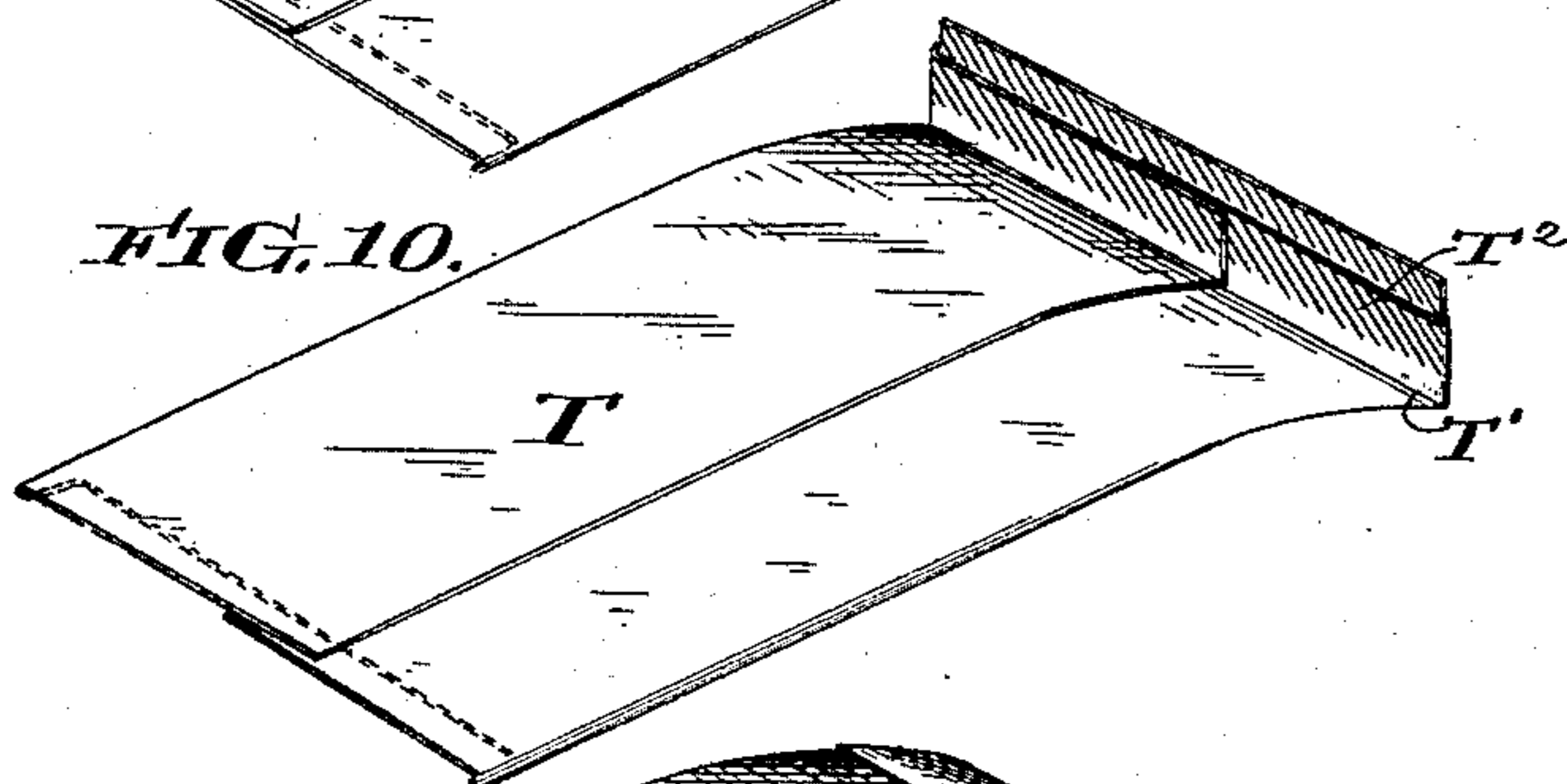
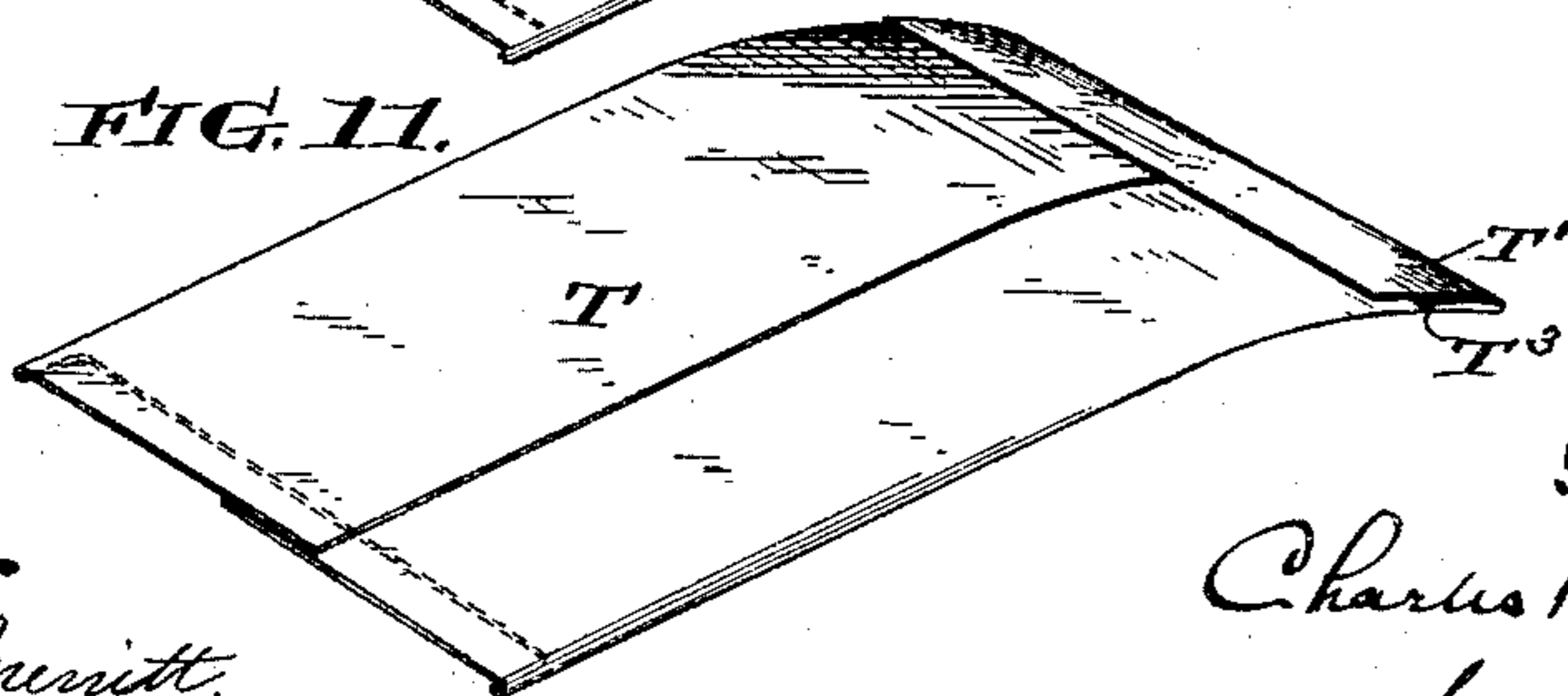


FIG. 11.



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# UNITED STATES PATENT OFFICE.

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## PAPER-BAG MACHINERY.

SPECIFICATION forming part of Letters Patent No. 473,977, dated May 3, 1892.

Application filed September 18, 1891. Serial No. 406,080. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES B. STILWELL, of Wayne, county of Delaware, State of Pennsylvania, have invented a certain new and useful Improvement in Paper-Bag Machinery, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the construction of machinery for making paper bags, and particularly to the devices for cutting a continuous tube into bag-lengths, and for forming the tuck or fold at the bottom of the bag-blank to close it and form a bag.

My improvements will be best understood as described in connection with the drawings, in which they are illustrated as embodied in a paper-bag machine, and in which—

Figure 1 is a side elevation of the machine with the driving-pulley on the end of the main shaft removed. Figs. 2 and 2<sup>a</sup> constitute together a plan view of the machine; Fig. 3, a side elevation on the section-line *xx* of Fig. 2. Fig. 4 is an elevation showing the paste-blade and the mechanism for actuating it. Fig. 5 is a similar elevation showing a tucker-blade and its actuating mechanism. Figs. 6 and 7 are diagrams illustrating the mechanism for severing the tube into bag-lengths and its mode of operation. Fig. 8 is a side elevation, on an enlarged scale, showing the manner and means by which the bottom fold is formed and pasted. Fig. 9 is a perspective view of the bag-blank; Fig. 10, a similar view showing the bottom fold in the course of forming, and Fig. 11 a similar view showing the bottom fold closed on the bag completed.

A is the frame of the machine, and B the driving-shaft, B' and B<sup>2</sup> being, respectively, fast and loose pulleys upon said shaft.

C is the former about which the continuous paper tube is formed. The mechanism for forming the tube is not, however, illustrated.

F and F' are feed-rolls cut away to permit the passage of a neck C' of the former, which broadens out, as shown at C<sup>2</sup>, on the delivery side of the feed-rolls and is provided with a knife-edge D at its extreme end.

D' is also a knife-edge permanently secured slightly above and behind the knife-edge D.

D<sup>2</sup> is a striker, which operates in the well-known way in connection with the knife-edges D and D' to sever the tube into bag-lengths. The striker D<sup>2</sup> is secured to a head E, which in turn is secured to and rotates with an obliquely-set shaft E'. This shaft, by means of the miter-wheels E<sup>2</sup> and E<sup>3</sup> is rotated by the shaft B, to which the wheel E<sup>3</sup> is secured.

The feed-rolls F and F' are geared together by means of their respective gear-wheels *f* and *f'*, so that they will rotate with the same speed. The wheel *f'* is engaged and driven by the gear *f*<sup>2</sup>, journaled on the stud *f*<sup>3</sup>, and driven in turn by the gear *f*<sup>4</sup>, secured to shaft B.

G' is a segmental roller secured on shaft B, the active segment of which is indicated by the letter *g*<sup>3</sup>. Above and somewhat backward or to the delivery side of shaft B is the shaft G<sup>3</sup>, to which is secured the segmental roller G, the active segment of which is indicated by *g*<sup>2</sup>. The shaft G<sup>3</sup> is made adjustable in oblique guides H, *h* indicating the adjusting-screws by which the bearings of shaft G<sup>3</sup> are adjusted in the guides, so that the segment *g*<sup>2</sup> shall, in the rotation of the shafts G<sup>3</sup> and B, come in contact and operate with the segment *g*<sup>3</sup>, as shown in diagram, Fig. 7. The shaft G<sup>3</sup> is driven through the pinion *g*, which is engaged by the pinion *g'* on shaft B, and this gearing, together with the diameter of the rolls G and G', is such that their active segments move with a peripheral velocity slightly less than that of the feed-rolls F, F'. The inactive portions of the rolls G and G' are of such diameter and so placed that the paper will pass freely between the rolls without deflection until the active segments come into operation. On coming into operation the action of the rolls G and G' upon the paper is to retard its advances, since they are moving with less velocity than the feed-rolls F, F', and the effect of their oblique arrangement is to cause the paper to bulge upward, as shown in diagram, Fig. 7. This upward bulge is made to take place immediately before the striker D<sup>2</sup> comes in contact with the tube and greatly facilitates the action of the striker in severing the blank against the knife-edges D and D'. The arrangement of these obliquely-set rolls G and G', in combination with the striker, knife-edges, and feed-rolls F and F', as de-

scribed, constitutes one feature of my improvement.

J is a roller secured to shaft  $J^2$  and driven by means of the gear-wheel  $j$ , which is in engagement with the gear  $j'$  on shaft  $J^3$ . The shaft  $J^3$  is driven by means of its gear-wheel  $j^2$ , which is engaged by the gear  $j^3$  on shaft B.

I is a loosely-journaled roller situated above and operating by frictional contact with the roller J.

K is a guide arranged to deflect the end of the blank downward after it has passed between the rollers I and J. Below the guide K is situated a bar L, and slightly in front of bar L is another bar M, a transverse opening or slot being formed between the two bars, as shown, this opening being substantially in line with the rearmost edge of the roller J.

J' is a roller secured to shaft  $J^3$ , its operative face being supplemental in character, so that it only acts at intervals, in combination with the roller J and with the roller N. This last-mentioned roller is situated below it and secured to a shaft  $N'$ , which shaft is driven from shaft  $J^3$ .

O is a guide by which the blanks are directed into the bight of the rollers J' and N.

The construction and mode of operation of the parts described are well understood and form no part of my present invention, and I will therefore not describe them in detail, saying, merely, that they act as feed-rolls to deliver the completed blank and compact the seam at its bottom.

Referring now to the mechanism for forming and pasting the bottom seam, R is a tucker-blade secured on the end of a lever  $R'$ , which lever is secured to the shaft Q, to which also is secured a lever  $R^2$ , the two levers and the shaft constituting in effect a bell-crank lever. By means of a connecting-rod  $R^3$  the lever  $R^2$  is operatively connected with a pivoted oscillating link  $R^4$ , of which  $R^5$  is the pivot, and which link is given an oscillatory movement upon its pivot by means of the crank-pin  $R^8$ , which enters the slide  $R^7$ , said slide moving in a slot  $R^6$  of link  $R^4$ . The crank-pin  $R^8$ , as shown, is attached to a disk  $R^9$  on the end of shaft  $J^3$ ; but it will of course be understood that the desired oscillating movement can be given to the link by means of an eccentric, which is a well-recognized equivalent for the crank-pin in such constructions. The action of the shaft J in causing the upward and downward movement of the tucker-blade R through the devices described will be readily understood, and it will be seen that by means of this device for communicating motion I am enabled to secure a very rapid movement of the tucker-blade during the period in which it is acting upon the paper, while its motions when not in active operation are slow and gradual, and this device constitutes another important feature of my present invention. The timing of the machine is such that the edge of the paper blank, marked T, (see Figs. 9, 10, and 11,) passes over the opening be-

tween the bars L and M, while the tucker is above that opening. The tucker then moving rapidly downward engages the blank on the line T' and presses its end down between the bars L and M, forming the fold indicated at T' in Fig. 10.

Considering next the mechanism for applying paste to that portion of the bag lying beyond the line T', I will state that P indicates a paste-trough, at the end of which is situated the paste-roller  $P'$ . Above the roller  $P'$  is situated the roller  $P^2$ , which acts to smooth and evenly distribute paste on the roller  $P'$ . The roller  $P^2$ , and through it the roller  $P'$ , is actuated by means of a ratchet  $P^3$  and a pawl  $P^4$ , attached to the end of a lever  $P^5$ , pivoted at  $P^6$ , and the end  $P^7$  of which is acted upon by a cam  $P^8$  on shaft Q.

S is the paster-blade pivotally connected to the end of a lever  $S'$ , which lever is secured on a sleeve  $Q'$ , situated on shaft Q, and from which extends the lever-arm  $S^4$ . The parts  $S'$ ,  $Q'$ , and  $S^4$  constitute, substantially, a bell-crank lever. The lever thus formed is pivotally connected to an arm  $S^5$ , extending out from an eccentric-ring  $S^6$ , secured on an eccentric  $S^7$ , which in turn is attached to the shaft  $J^3$ . Of course a crank can be used in place of the eccentric, if it is desired. The operation of the rotating shaft  $J^3$  in giving an up-and-down motion to the paster-blade through the mechanism described is obvious. The motion is such that the paster comes to the position shown in Fig. 3 at the time when the tucker-blade comes in action on the blank. The bottom fold formed by the tucker is thrown up against the side of the paster-blade, receiving its paste from it, and is then carried downward by the rapidly-moving tucker to form the pasted fold. The pivoted paste-blade is also acted upon by the device, consisting of the rod  $S^2$ , which is rigidly attached to the paste-blade, and the lever  $S^3$ , which is pivotally attached to the top of rod  $S^2$  and permanently pivoted at its other end at a point indicated at s. The action of these rods in connection with the lever-arm  $S'$  is to alternately bring the paste-blade against the paste-roller  $P'$ , as shown in dotted lines in Fig. 1 and in full lines in Fig. 4, and then to bring it down to the position it occupies when operating on the blank, as shown in full lines in Fig. 1.

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

1. In a paper-bag machine, the combination, with feed-rolls  $F F'$ , of a knife edge or edges, and a striker coacting therewith to sever the tube, as described, and situated on the delivery side of said rolls, and a pair of intermittently-acting rolls  $G G'$ , set with their axes in a plane extending obliquely backward to the plane of the former and geared to rotate at less surface speed than rolls  $F F'$ , all substantially as and for the purpose specified.
2. In a paper-bag machine, the combination

of a tucker R, a supporting bell-crank lever, as R', Q, and R<sup>2</sup>, a pivoted slotted link R<sup>4</sup>, a rotating pin R<sup>8</sup>, working on the slot of link R<sup>4</sup> and arranged to give an oscillating movement of varying speed to the link R<sup>4</sup>, and a connecting-bar R<sup>3</sup>, arranged between the link and bell-crank lever, substantially as and for the purpose specified.

3. In a paper-bag machine, the combination of the concentrically-pivoted bell-crank levers R' Q R<sup>2</sup> and S' Q' S<sup>4</sup>, a shaft J<sup>3</sup>, a pivoted link R<sup>4</sup>, and a crank-pin or its equivalent R<sup>8</sup>, secured to shaft J<sup>3</sup> and connected to the link R<sup>4</sup>, so as to give it an oscillatory movement,

a connecting-rod R<sup>3</sup>, operatively connecting link R<sup>4</sup> and lever R' Q R<sup>2</sup>, an eccentric or its equivalent S<sup>7</sup>, secured to shaft J<sup>3</sup> and operatively connected with lever S' Q' S<sup>4</sup>, a tucker-blade R, secured on the arm R' of lever R' Q R<sup>2</sup>, a paster-blade S, pivoted on the arm S' of lever S' Q' S<sup>4</sup>, and levers S<sup>2</sup> S<sup>3</sup>, connected and arranged, as described, with reference to the paster-blade, all substantially as and for the purpose specified.

CHAS. B. STILWELL.

Witnesses:

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