

No. 626,372.

Patented June 6, 1899.

C. E. DULIN.  
PAPER BAG MACHINE.

(Application filed Jan. 31, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

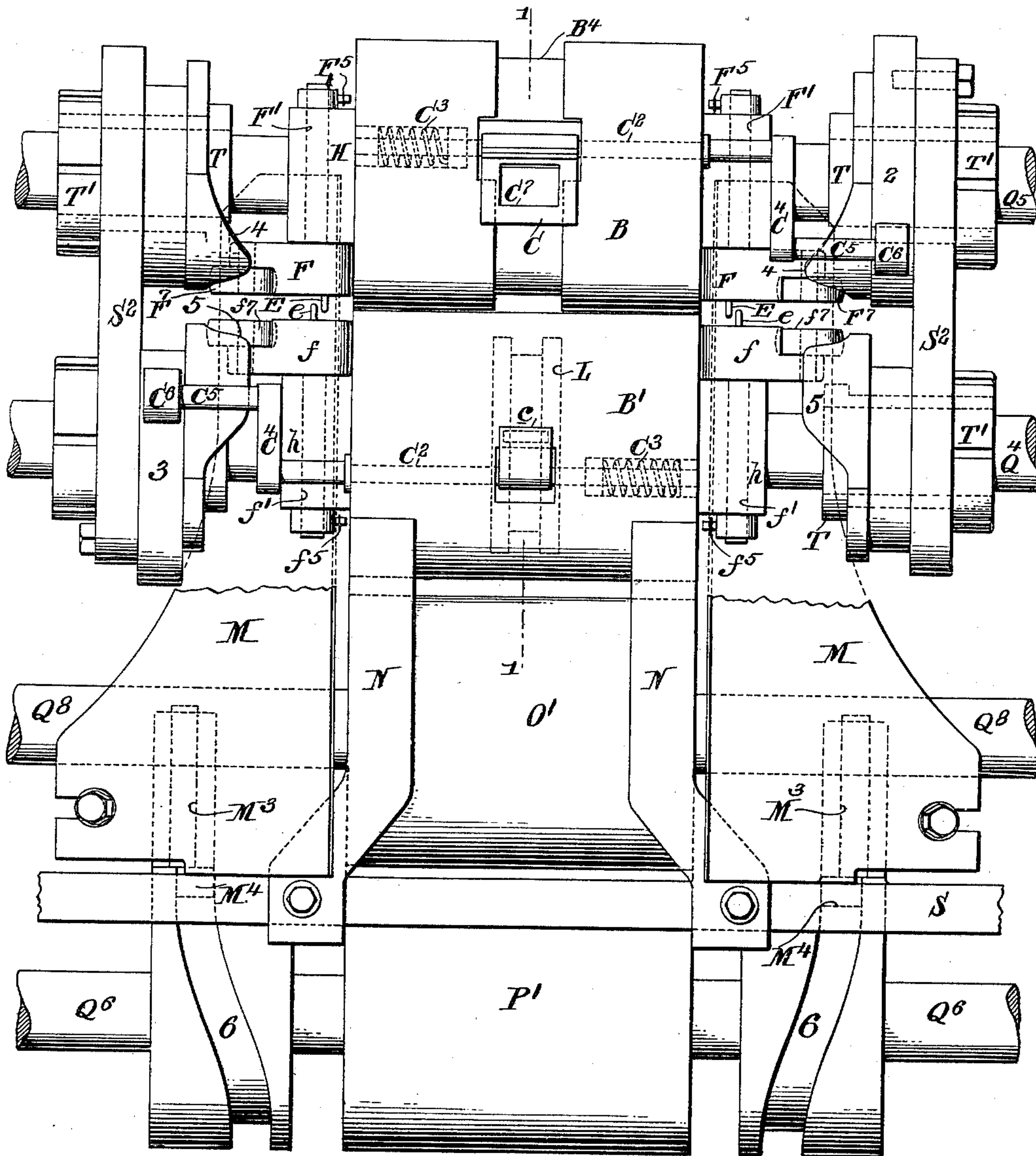


Fig. 6.

Witnesses.  
Henry Dwyer  
J. H. Swann

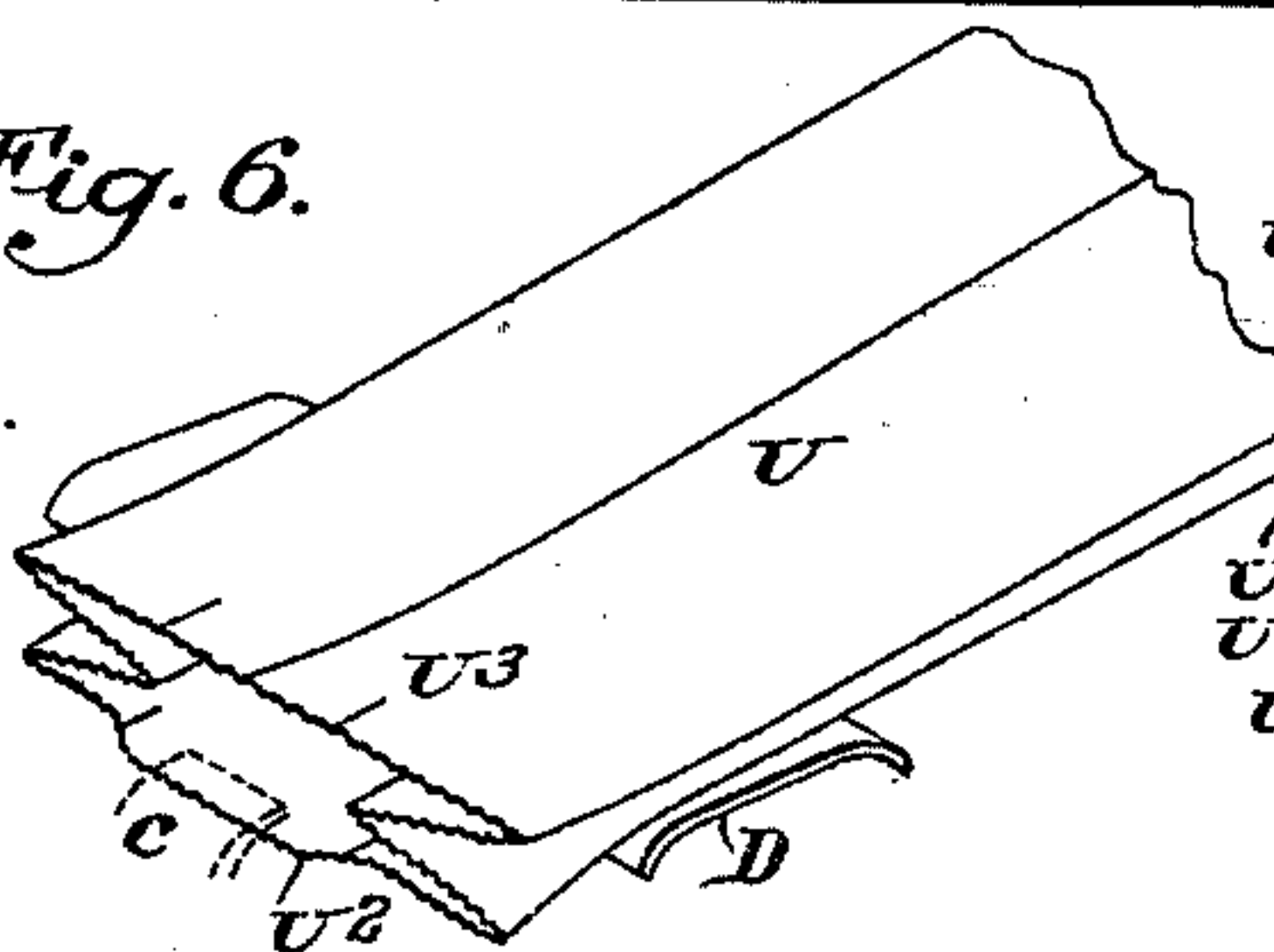
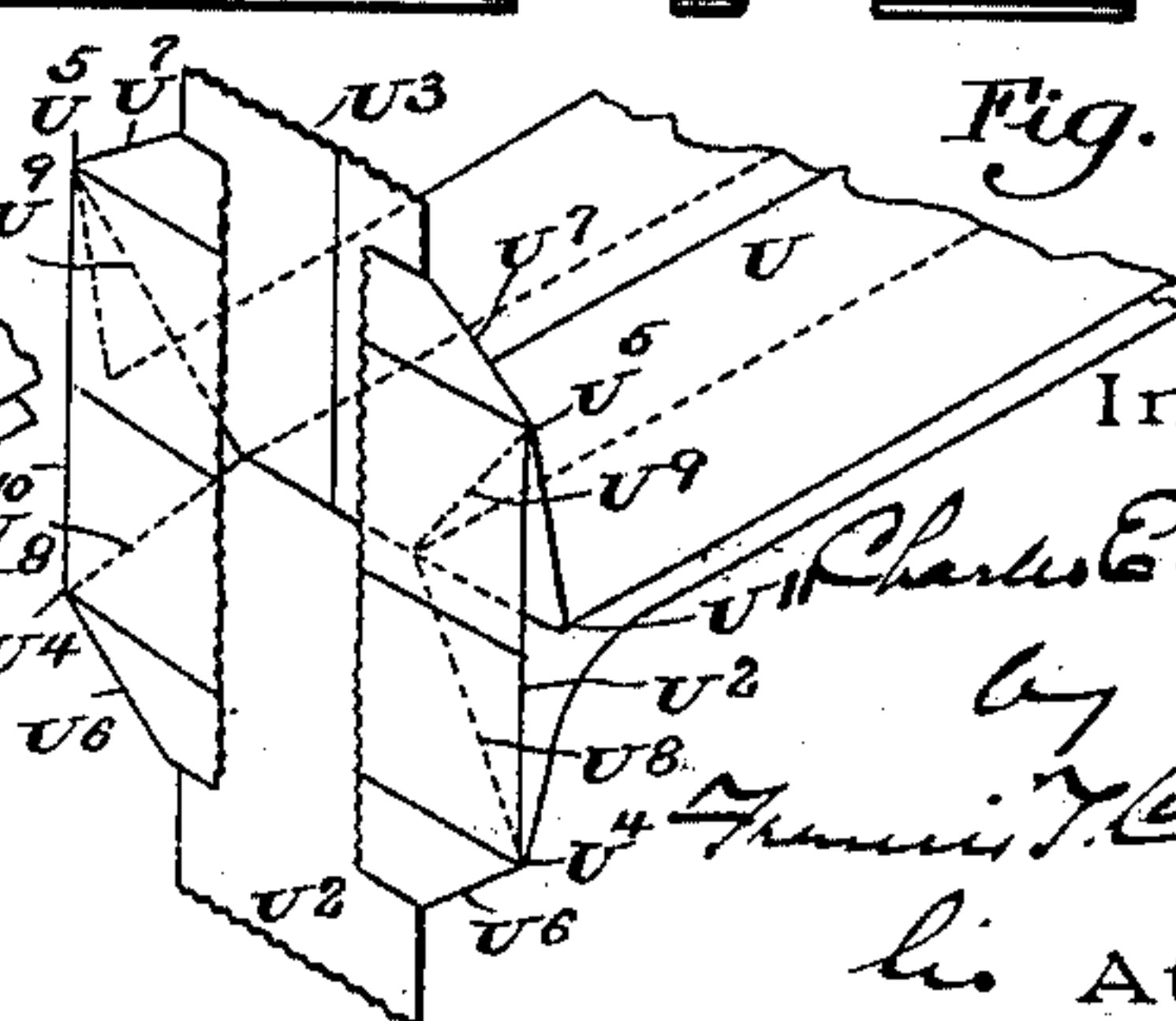


Fig. 7.



Inventor.

Charles E. Dulin

by

Francis T. Chambers

Attorney.



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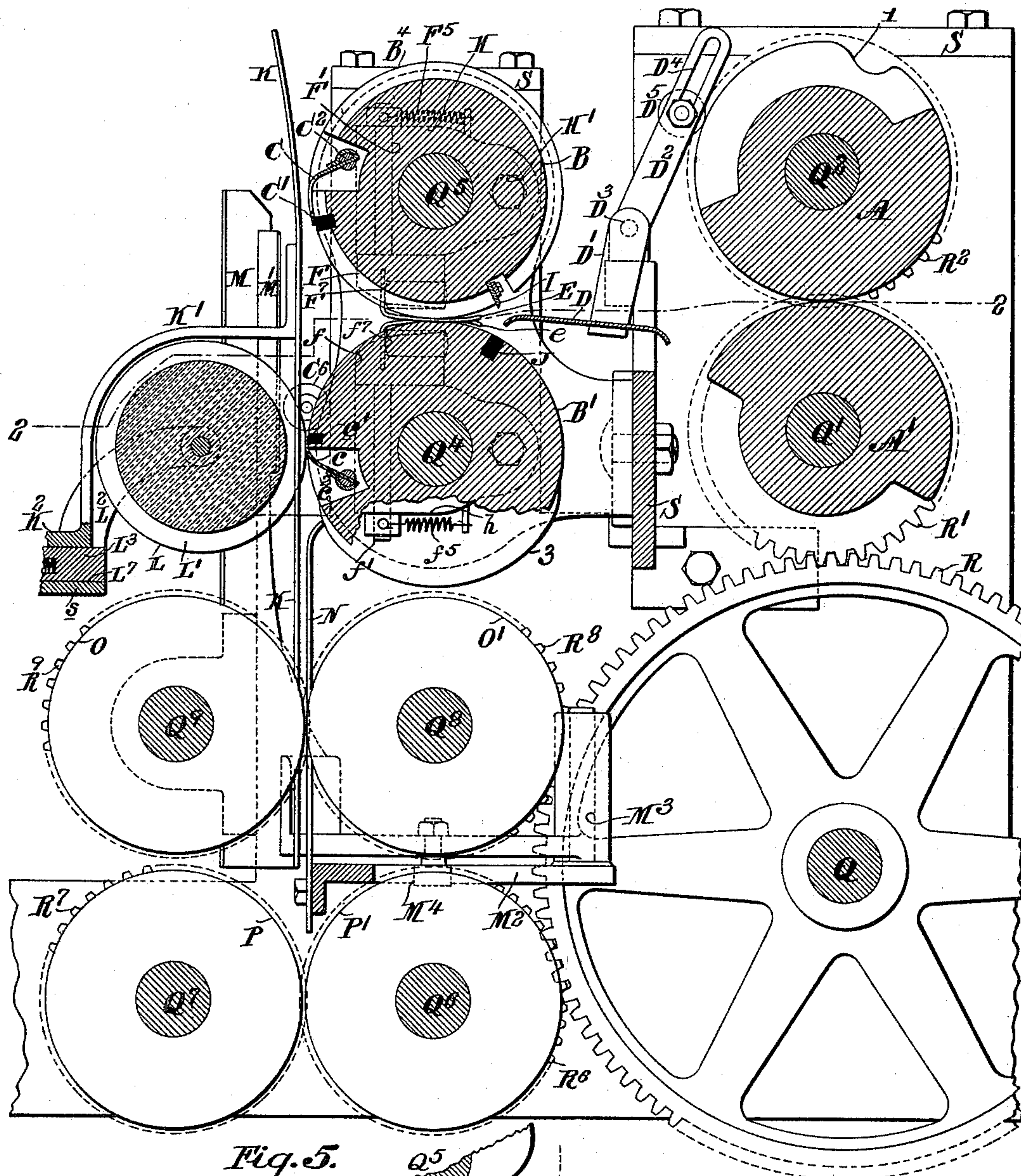
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**3 Sheets—Sheet 2.**

*Fig. 2.*



*Fig. 5.*

Witnesses.

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No. 626,372.

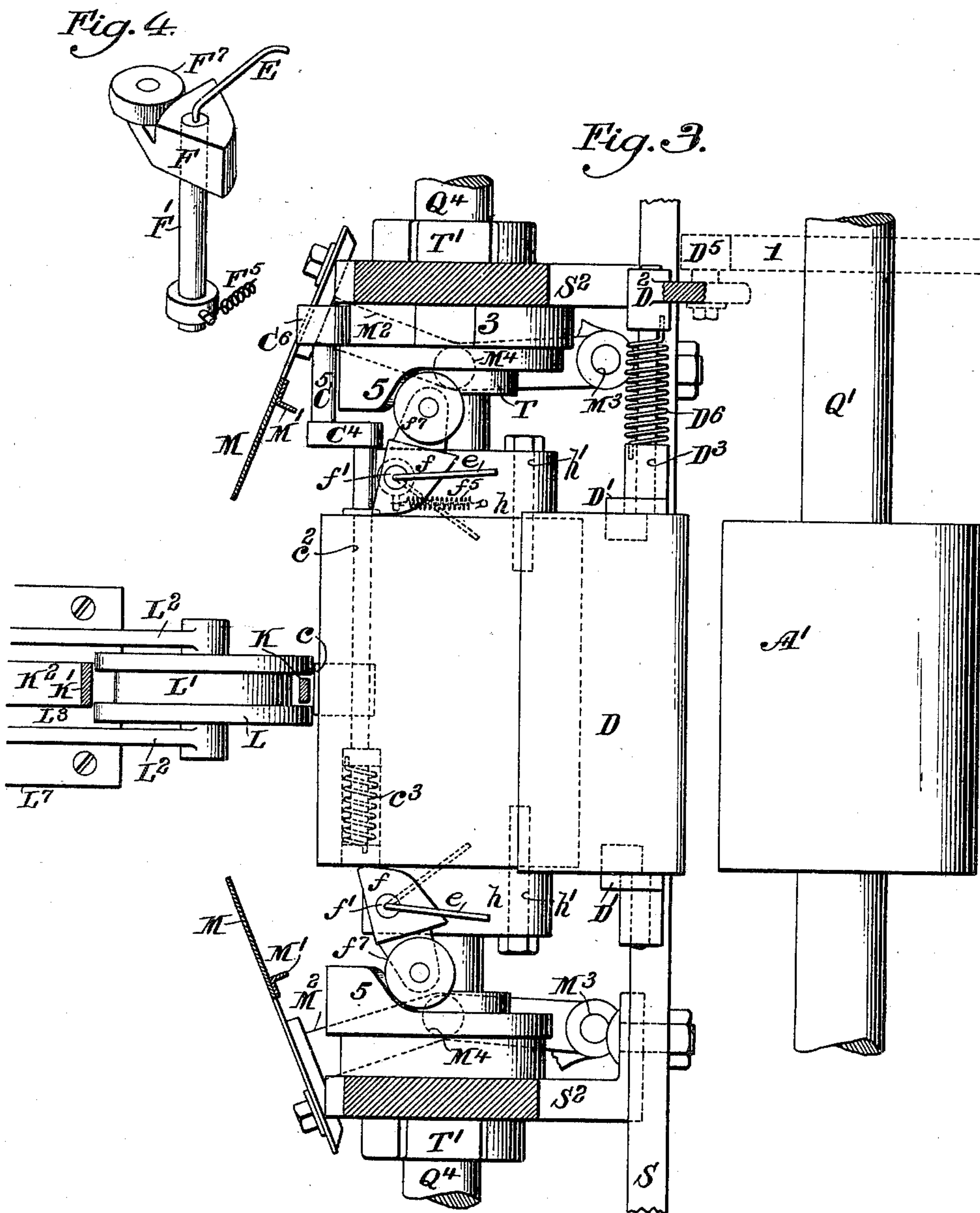
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(Application filed Jan. 31, 1898.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses.

Henry Dwyer  
Shaw

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# UNITED STATES PATENT OFFICE.

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## PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 626,372, dated June 6, 1899.

Application filed January 31, 1898. Serial No. 668,543. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. DULIN, a citizen of the United States, residing in Sandy Hill, in the county of Washington, in the State of New York, have invented a certain new and useful Improvement in Paper-Bag Machines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part hereof.

My invention relates to the construction of machinery for manufacturing paper bags, and particularly to machinery adapted to make what is known as the "square satchel-bottom bag"—that is to say, a bag made from a bellows-folded tube with a satchel-bottom formed on the end thereof.

My present invention is in the nature of an improvement upon the mechanism for making such bags shown and described in my former Letters Patent of the United States, No. 578,550, dated March 9, 1897, and has for its object particularly to provide an improved construction and mode of operation of the gripping-fingers which enter the bellows folds at the side of the blank and spread it open in the plane of the bottom to be formed.

Reference is now had to the drawings which illustrate my invention, and in which—

Figure 1 is a front view of a machine provided with my improvement; Fig. 2, a side elevation, partly in section, on the line 1 1 of Fig. 1. Fig. 3 is a plan view of the machine, taken on the section-line 2 2 of Fig. 2. Fig. 4 is a perspective view of one of the side grippers and the parts immediately connected therewith. Fig. 5 is a diagrammatic view showing the relative position of the side grippers as they revolve to the position in which they engage the blank, and Figs. 6 and 7 are views of the blank in various stages of the operation of opening the bottom.

A and A' indicate segmental rolls through which the bellows-folded tubes pass on their way to the mechanism which distends the end of the blank and spreads out the diamond fold.

B and B' indicate a coacting pair of rollers between which the blanks pass and to which in the construction shown in the drawings the grippers which coact in the extension of

the diamond fold are secured. The upper roll B is, as shown, formed with a central peripheral slot B<sup>4</sup>, the function of which is to give clearance to the central gripper of the lower roll.

C c indicate the central grippers, secured, respectively, to the rolls B and B' and rotating with these rolls.

C' and c' indicate the portions of the rolls upon which the grippers C and c close, C<sup>2</sup> and c<sup>2</sup> indicating rods or shafts by which the grippers are attached and which rods have bearings in the rolls B and B', C<sup>3</sup> and c<sup>3</sup> indicating springs arranged to act on the shafts C<sup>2</sup> and c<sup>2</sup> so as to hold the grippers open.

C<sup>4</sup> and c<sup>4</sup> are crank-arms secured to the shafts C<sup>2</sup> and c<sup>2</sup>, and to the ends of which are attached, through pins C<sup>5</sup> and c<sup>5</sup>, the cam-rollers C<sup>6</sup> and c<sup>6</sup>.

2 and 3 indicate cams against which the cam-rollers C<sup>6</sup> and c<sup>6</sup> rest and the outline of which is such as will cause the central grippers to engage and disengage the blank at the proper time.

The upper gripper C is made broader than the lower gripper c and is provided with an opening C<sup>7</sup>, which permits the lower gripper c to pass through it as the two grippers revolve to the position in which they engage the blank.

D, Fig. 2, is a lifting device lying beneath the plane over which the blanks pass on their way to the rolls B and B'. It is secured upon lever-arms D', which are secured in turn to a pivoted shaft D<sup>3</sup>, from which shaft extends a lever-arm D<sup>2</sup>, having at its end a cam-roller D<sup>5</sup>, which should be adjustable in a slot D<sup>4</sup>, as indicated. The roller D<sup>5</sup> runs in contact with the cam 1, the contact being maintained, preferably, by a spring D<sup>6</sup>, Fig. 3, and the shape of the cam 1 being such as to throw the lifter D upward against the bag-blank once in each revolution of the rolls, the function of the lifter being to insure the proper entry of the upper and lower plies of the paper between the grippers C and c.

E E e e are the side grippers, which in my present invention are of slender finger-like construction. They are connected to blocks F and f, which blocks are pivotally attached by shafts F' and f' to stationary blocks or



posts H and h, secured at each end of the rolls B and B'. The fingers form two pairs E e at each end of the rolls B B', and they are attached to the blocks F and f, as shown best in Figs. 1, 2, and 5, so that the fingers E and e of each pair are out of alinement as they approach and pass to and from their operative position. Springs, as indicated at F<sup>5</sup>, Fig. 4, should be connected with the shafts F' in such wise as to normally turn the shaft in a direction to throw the fingers E outward from the rolls.

F<sup>7</sup> f<sup>7</sup> indicate cam-rolls attached to the blocks F and acted upon by the cams 4 and 5, the action of the cams being to turn the blocks F and f, and with them the fingers E and e, inward, so that the fingers will pass between the bellows folds and clamp the upper and lower folds against the upper and lower rolls, the engagement with the fingers and the surface of the rolls being at the corners of the bottom to be formed upon the tube and the fingers retaining their grip upon the blank until the rolls have revolved through a sufficient distance to substantially spread out the tube on the plane of the bottom to be formed, when the fingers are retracted and the distended blank withdrawn.

The essential feature of my present invention lies in the use of the finger-like grippers and in their arrangement as above described and as shown in Figs. 1, 2, and 5, so that as they revolve past each other the grippers do not come in contact, but lie side by side, as indicated, thus greatly simplifying the construction specifically described in my former patent, where the side grippers come in contact with each other as they revolve and in which it was necessary to provide for a yielding longitudinal movement.

I, Fig. 2, indicates a creasing-blade secured to the roll B and working against a pad J on the roll B', the function of this device being to crease the blank on the line about which the bottom is opened.

K, Fig. 2, is a rod or plate lying in front of the rolls B and B' and extending down between the feed-rolls O and O', the function of this rod being to prevent the closing of the spread end of the tube as it is released by the gripping-fingers.

L is a gripping-roll lying in front of the roller B' and grooved at L' to permit the passage of the roll K. This roll is, as shown, supported on arms L<sup>2</sup>, extending out from a slide L<sup>3</sup>, which in turn moves in a guide L<sup>7</sup> and is pressed outward by the action of a spring, (not shown,) so as to hold the roll L in contact with the roller B' with a yielding pressure. The bar L<sup>3</sup> also, as shown, supports the rod K by means of the arm K<sup>2</sup> K'.

M M indicate wing-folders lying in front of the rolls B and B' and secured on the ends of levers M<sup>2</sup>, which are pivoted to the frame of the machine at M<sup>3</sup> and provided with cam-rolls M<sup>4</sup>, which run in the grooves of cams 6 6. The function of these wing-folders is to

press the distended blank out flat against the rolls, and, as shown, they are provided with outwardly-projecting plates M', the function of which is to hold and guide the bag-blank against lateral movement or spreading.

N N are stationary plates against which the blanks are pressed by the wing-folders. O O' are feed-rolls, as are also P and P'.

Q indicates the main driving-shaft of the part of the machine illustrated and carries the driving-pinion R, and this pinion drives the pinion R' on the shaft Q', to which shaft is secured the segmental roller A', and the pinion R' drives the pinion R<sup>2</sup>, secured to the shaft Q<sup>2</sup>, to which shaft are secured the roller A and the cam 1. Through any convenient intermediate gearing motion can be imparted to the shafts Q<sup>4</sup> and Q<sup>5</sup>. As shown, the main gear R engages and drives the gears R<sup>8</sup> and R<sup>6</sup>, secured, respectively, to the shafts Q<sup>8</sup> and Q<sup>6</sup>, and the gears R<sup>8</sup> and R<sup>6</sup>, respectively, engage and drive the gears R<sup>9</sup> and R<sup>7</sup> on the shafts Q<sup>9</sup> and Q<sup>7</sup>.

In Figs. 6 and 7 I have illustrated a blank and the folds which my improved mechanism is designed to form in the blank. The blank is first distended by the engagement of its upper and lower plies with the upper and lower rolls and the central grippers. Then the side grippers, moving in, engage the blank at the corners U<sup>5</sup> and U<sup>4</sup> and spread it open, as shown in Fig. 7, the plies turning about the line U<sup>11</sup>, which is that defined by the creaser I. This throws the paper into the form shown, causing the formation of folds at U<sup>7</sup> and U<sup>6</sup>, at U<sup>2</sup> and U<sup>10</sup>, and U<sup>9</sup> and U<sup>8</sup>, these folds being the characteristic folds of a diamond formed on a bellows-folded blank.

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

1. In a paper-bag machine having mechanism for spreading out the diamond fold on the end of a bellows-folded paper tube comprising mechanism for opening the end of the bellows-folded tube and two pairs of rotating side grippers as E e E e, the members of each pair being out of alinement with each other and said grippers being arranged as specified to pass between the bellows folds of the blank, engage its corners and spread it out in the plane of the bottom to be formed thereon without interfering with each other.

2. In a paper-bag machine having mechanism for spreading out the diamond fold on the end of a bellows-folded paper tube comprising mechanism for opening the end of the bellows-folded tube and two pairs of rotating elastic side-gripper fingers as E e E e, the members of each pair being out of alinement with each other and said grippers being arranged as specified to pass between the bellows folds of the blank engage its corners and spread it out in the plane of the bottom to be formed thereon without interfering with each other.

3. In a paper-bag machine having mechanism for spreading out the diamond fold on the



end of a bellows-folded paper tube comprising rotating fingers as C c adapted to engage the upper and lower plies of the blank and open the tube as described, and two pairs of  
5 rotating side grippers as E e E e, the members of each pair being out of alinement with each other and said grippers being arranged as specified to pass between the bellows folds of

the blank engage its corners and spread it out in the plane of the bottom to be formed 10 thereon, without interfering with each other.

CHAS. E. DULIN.

Witnesses:

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ALBERT C. GETTEN.