

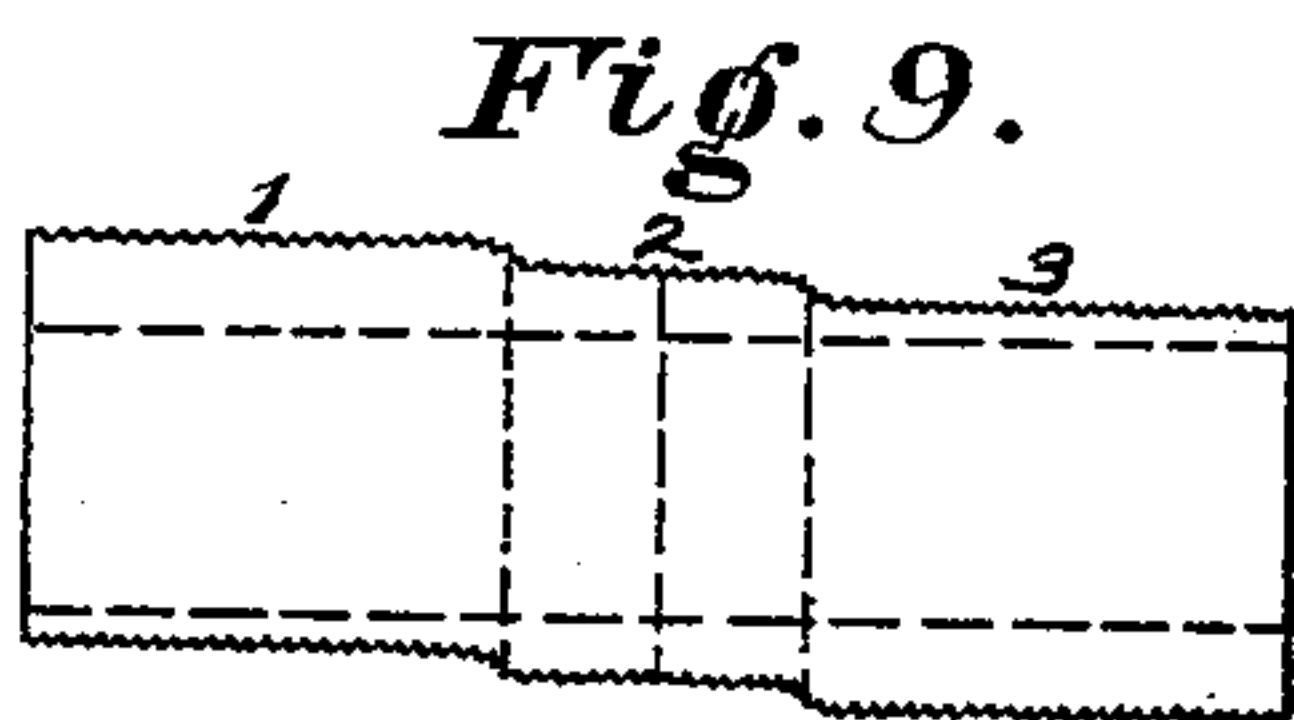
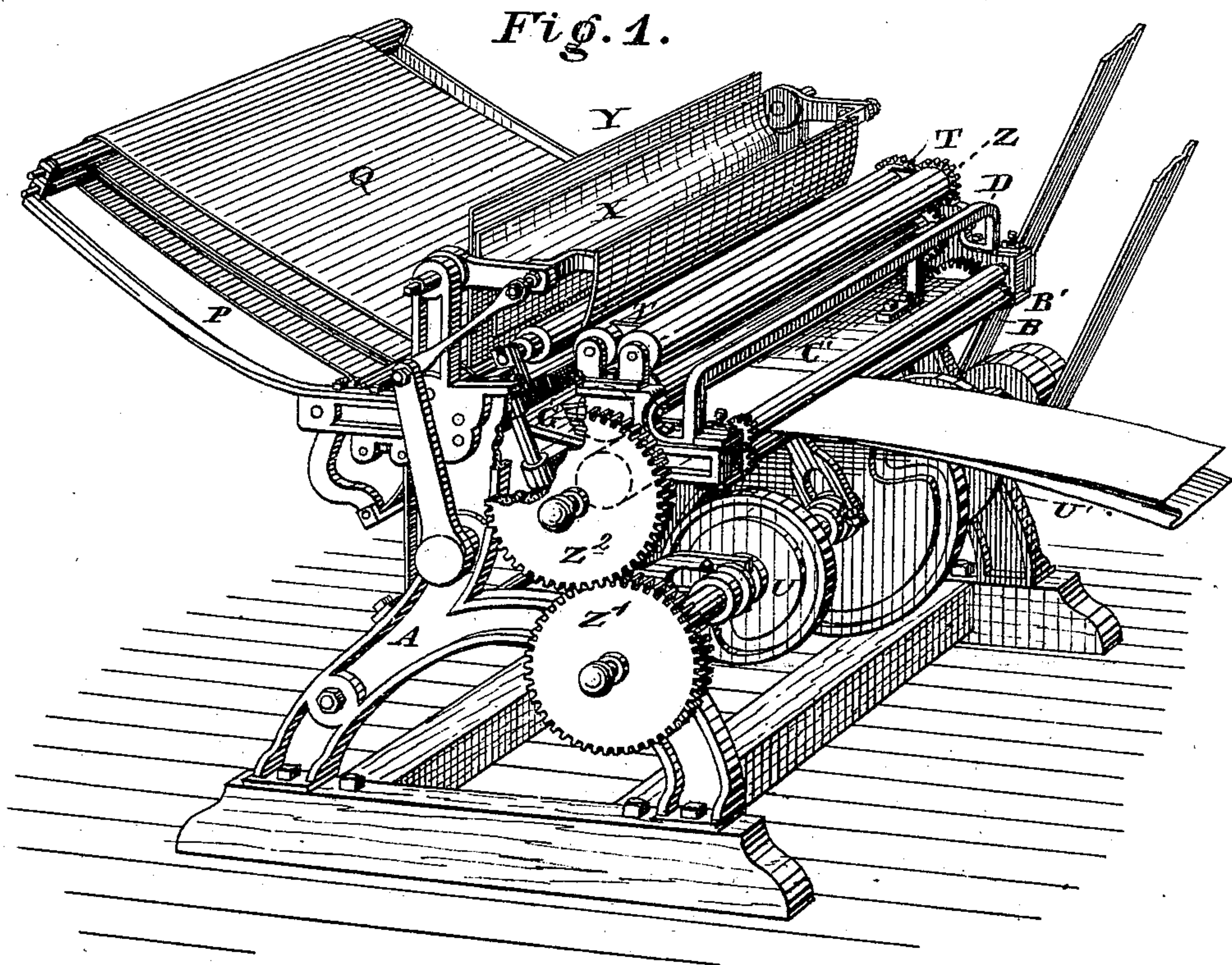
(No Model.)

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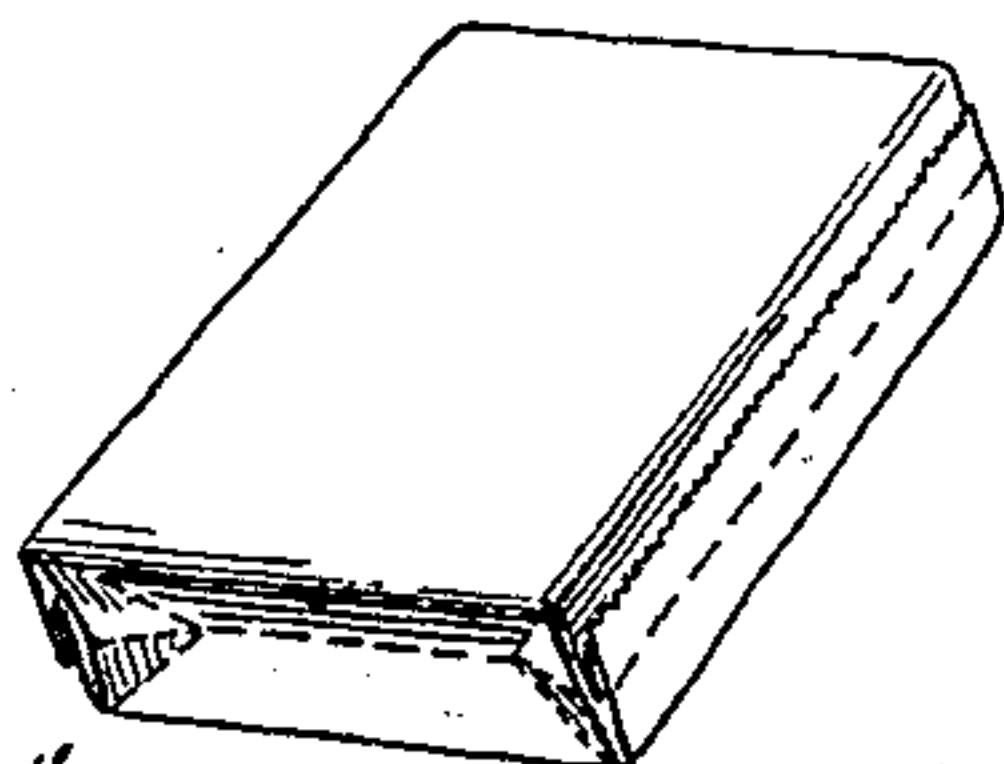
M. C. RUTHENBURG.  
Paper Bag Machine.

No. 236,633.

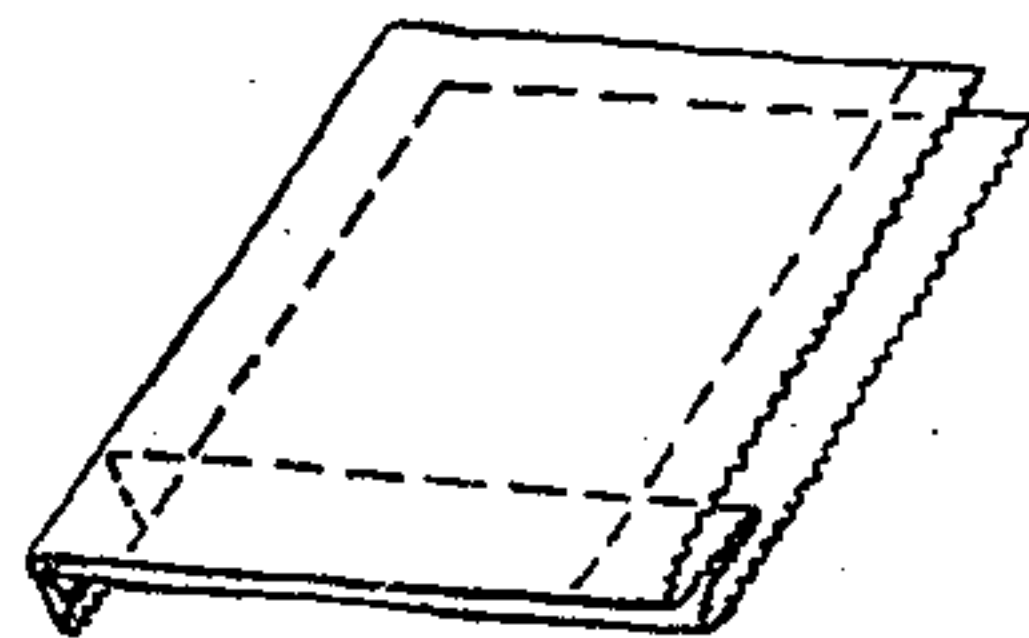
Patented Jan. 11, 1881.



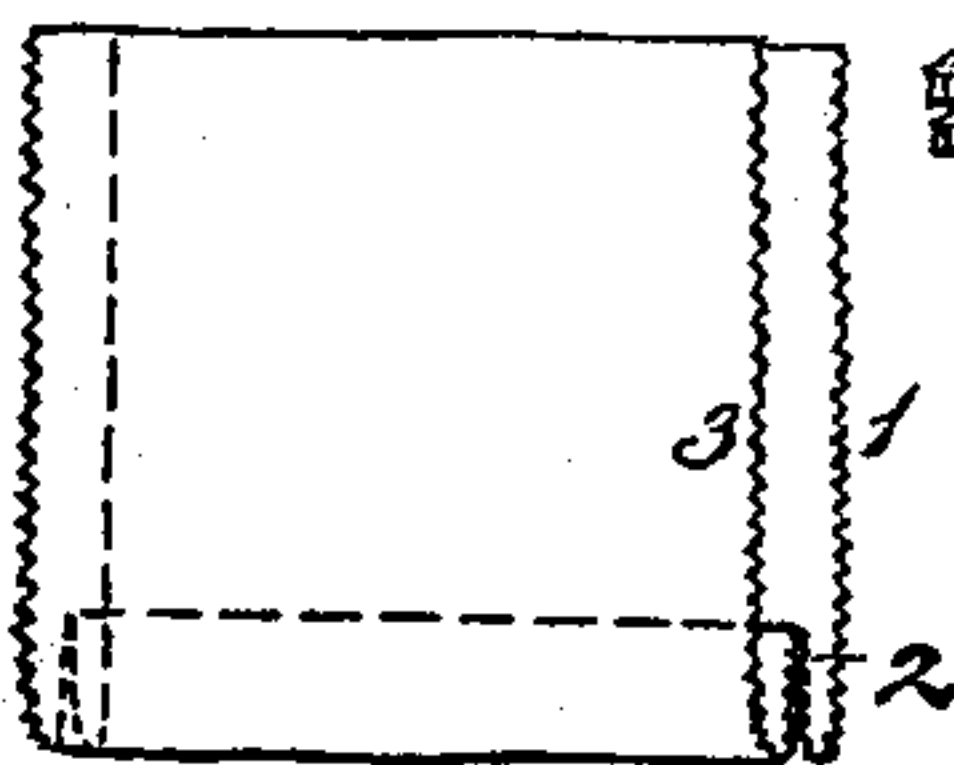
*Fig. 11.*



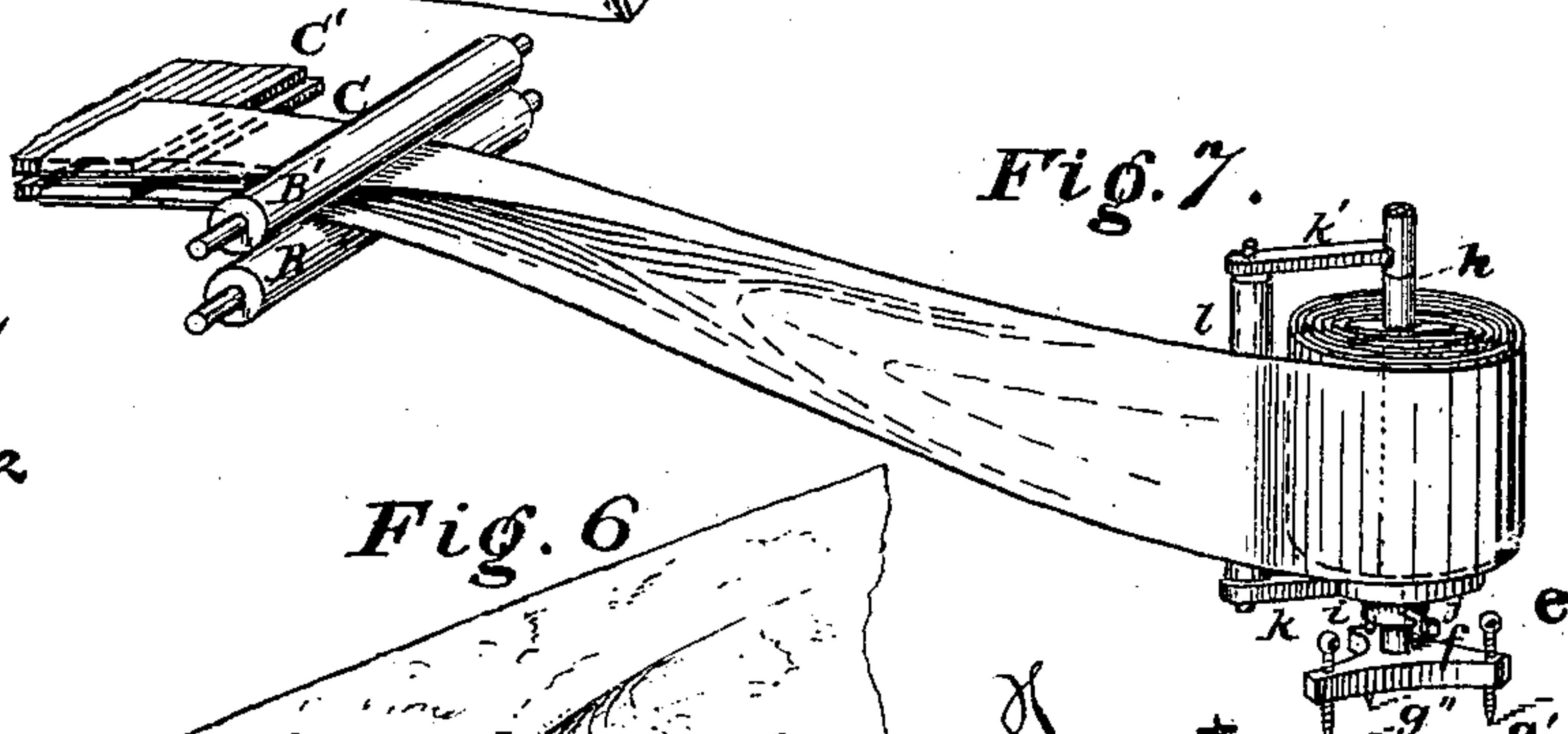
*Fig. 10.*



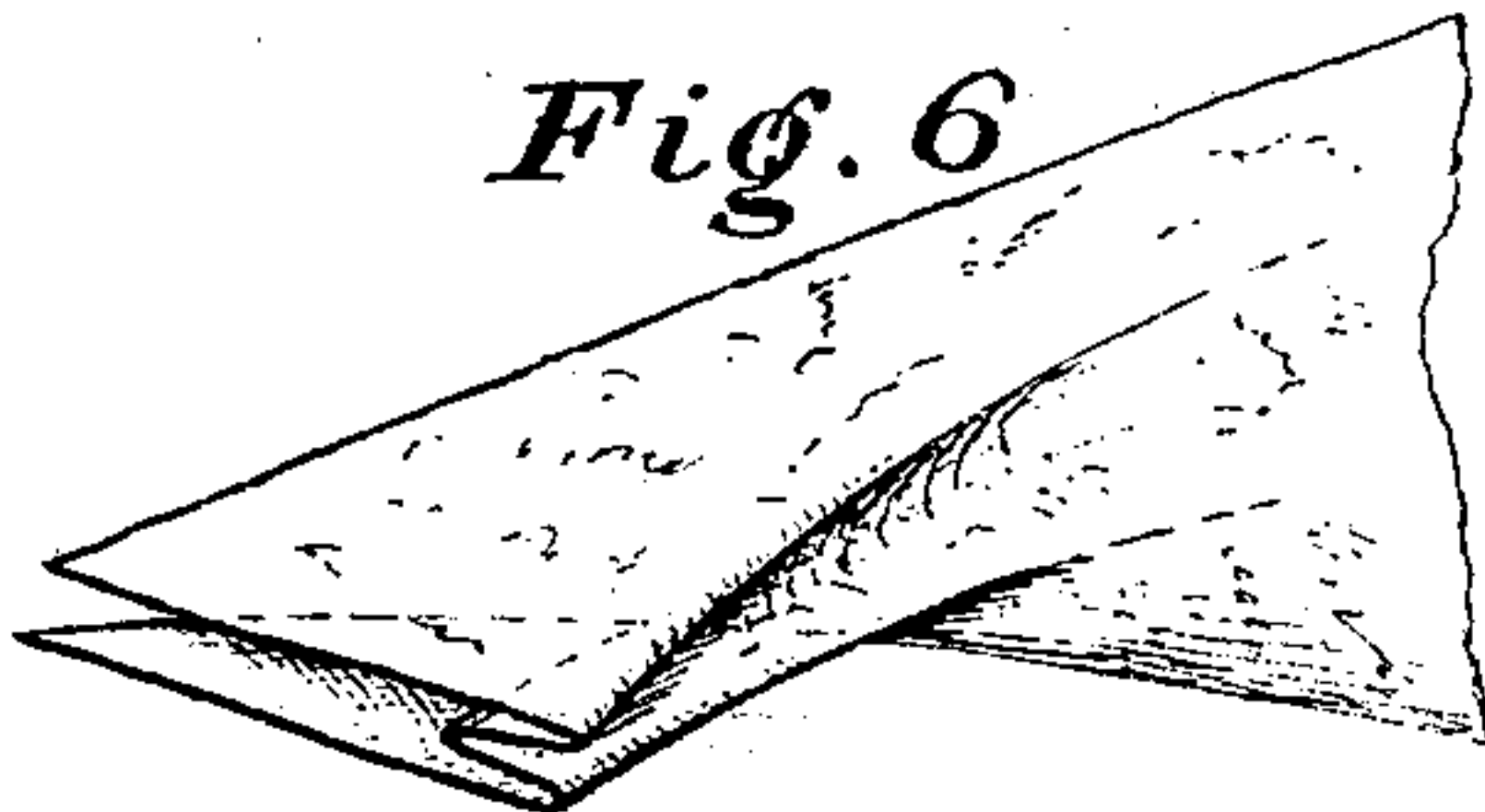
*Fig. 8.*



*Fig. 7.*



*Fig. 6.*



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By Knight Bros.  
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(No Model.)

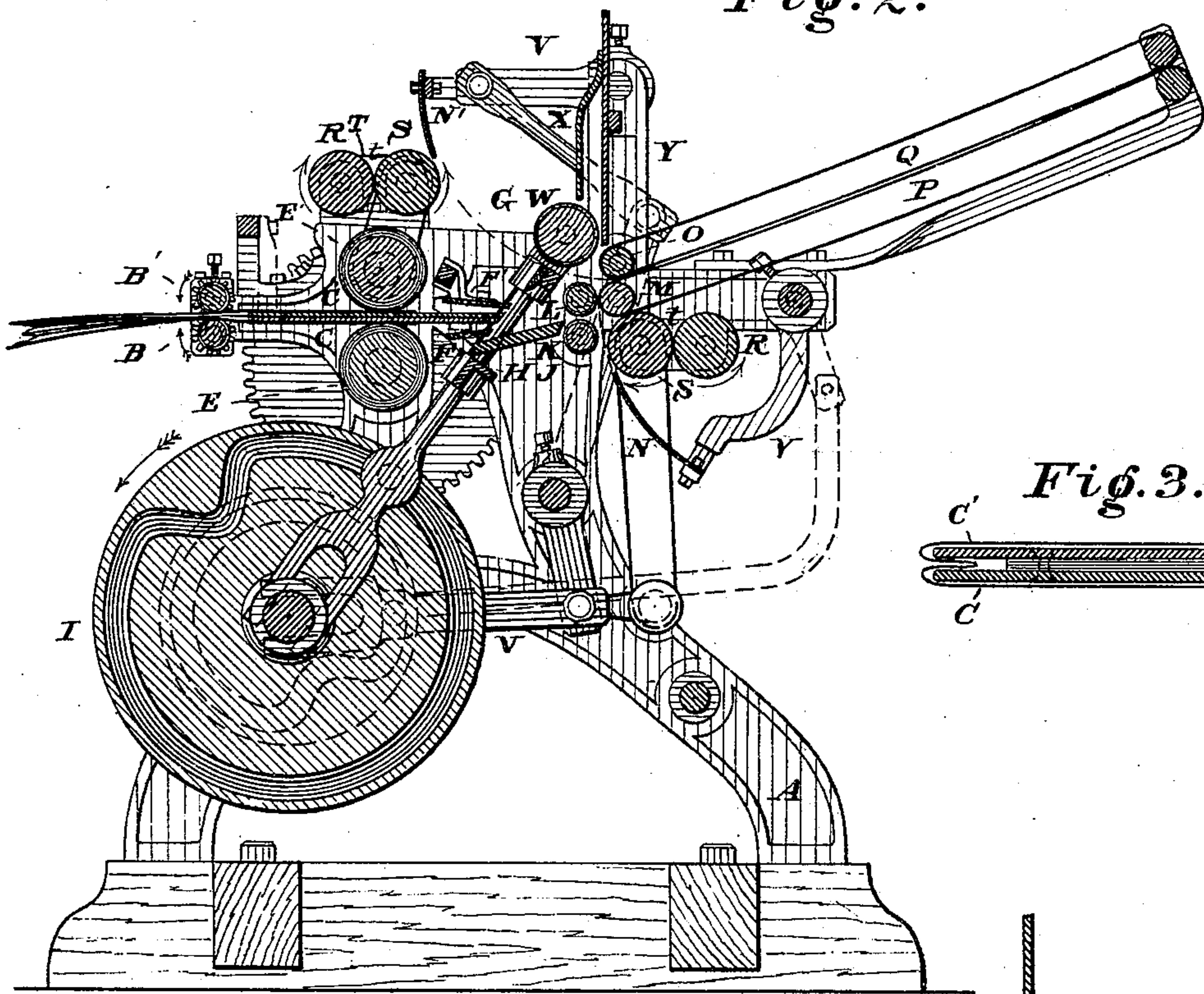
3 Sheets—Sheet 2.

M. C. RUTHENBURG.  
Paper Bag Machine.

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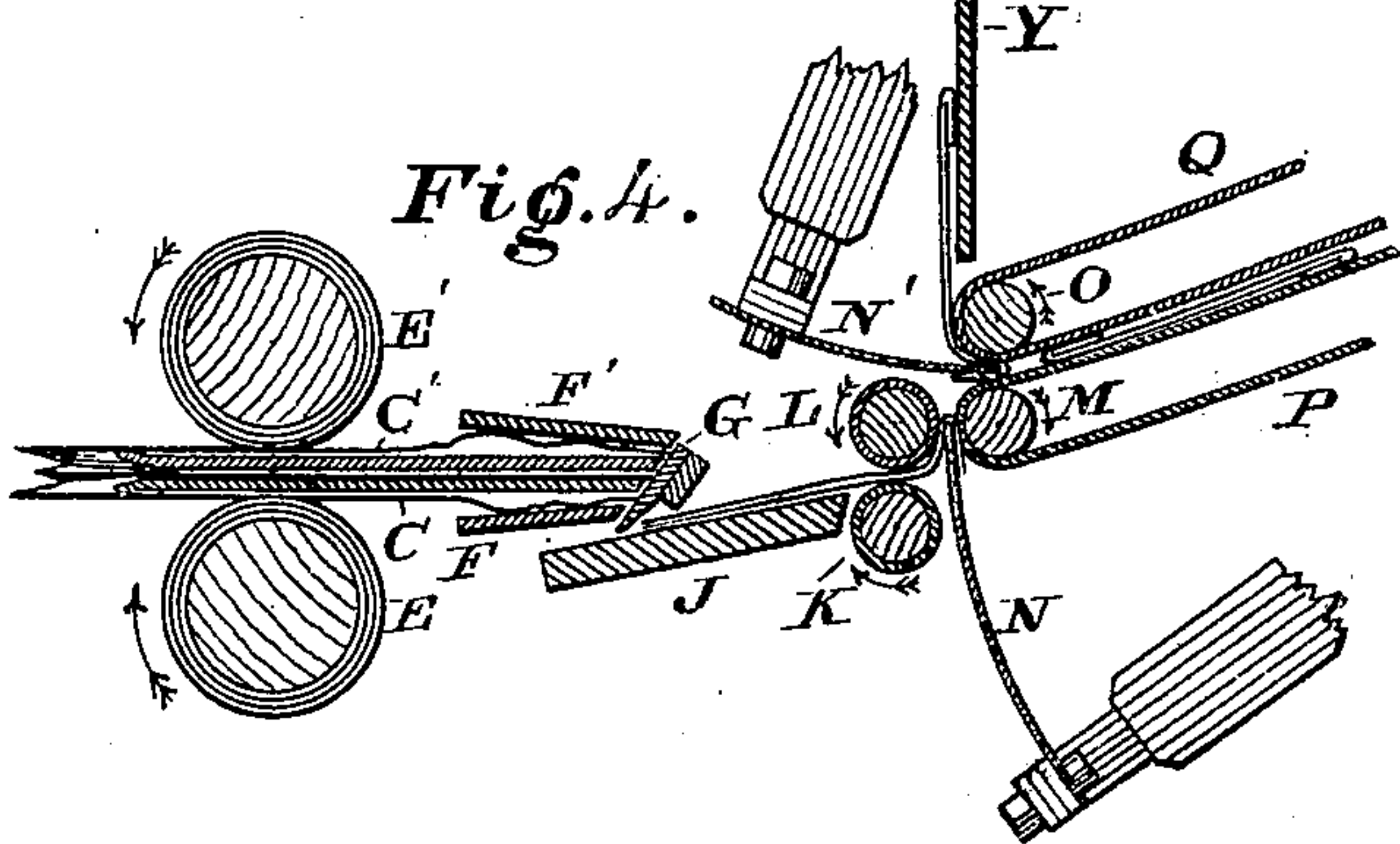
*Fig. 2.*



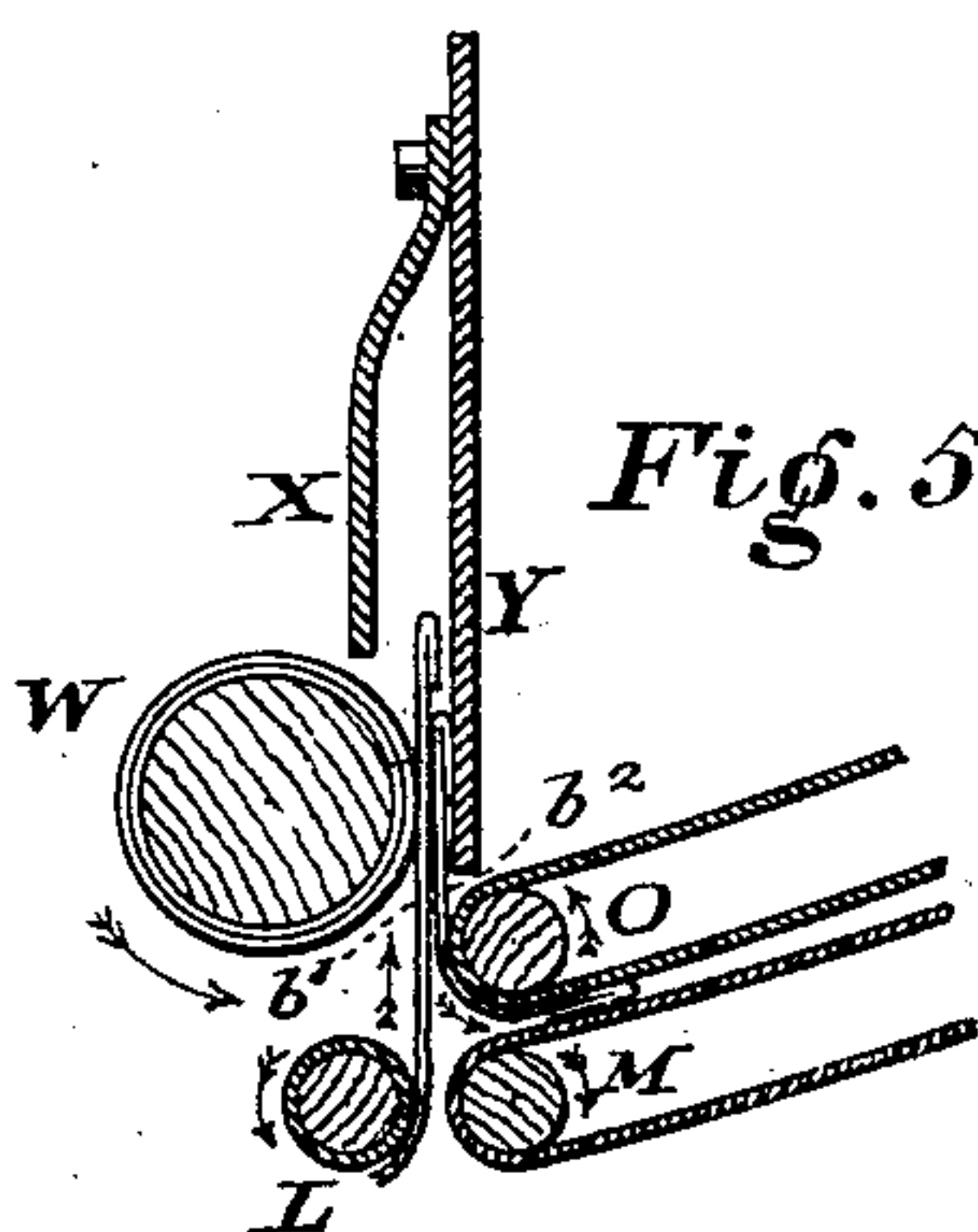
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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(No Model.)

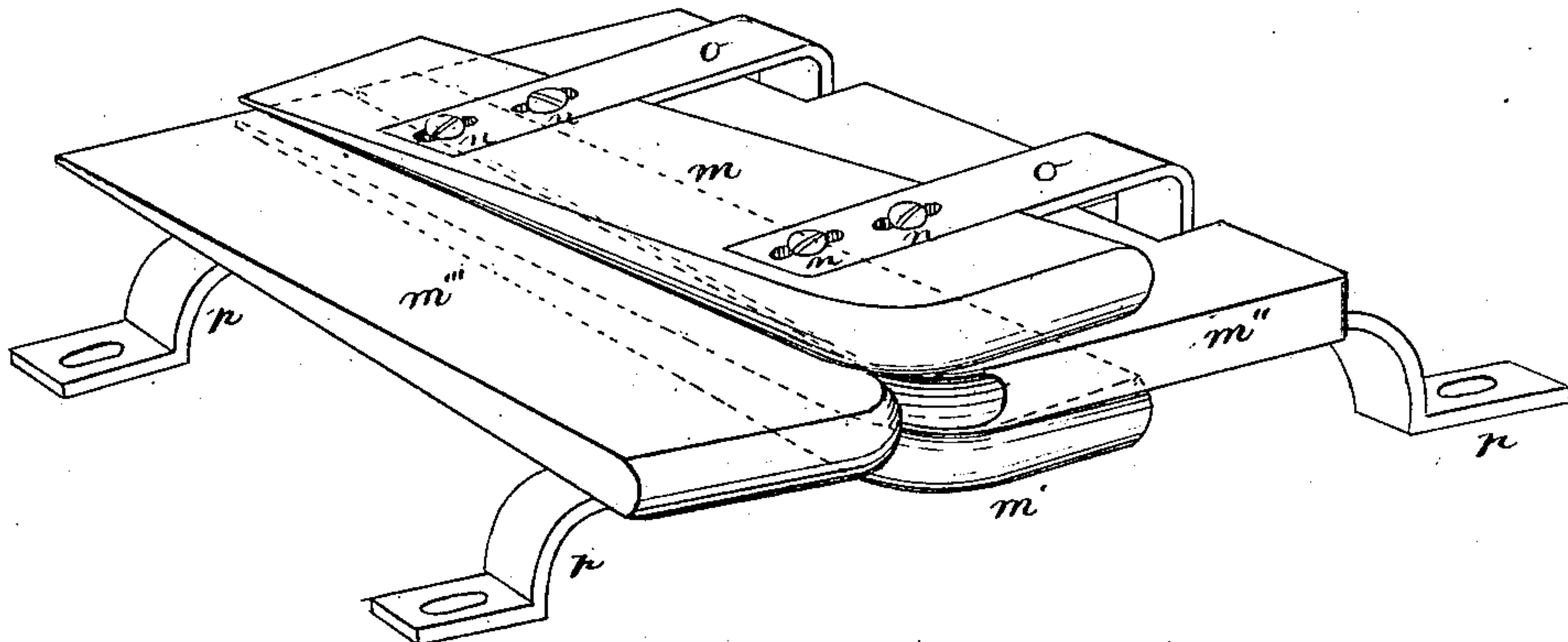
3 Sheets—Sheet 3.

M. C. RUTHENBURG.  
Paper Bag Machine.

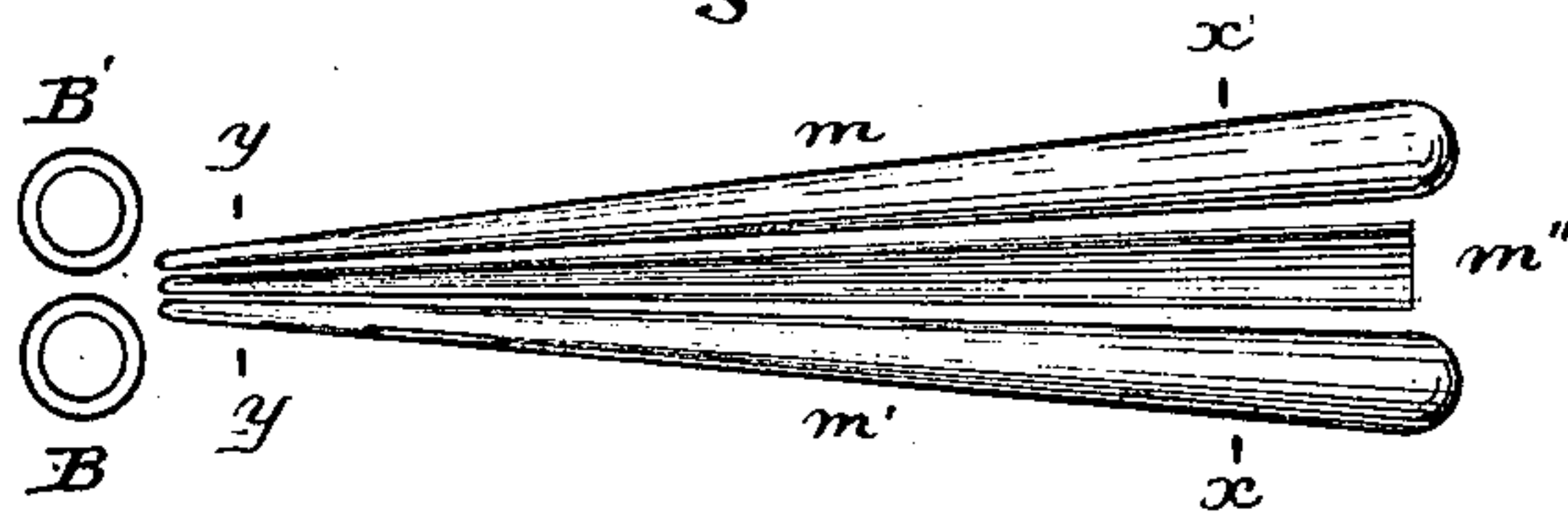
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*Fig. 12.*



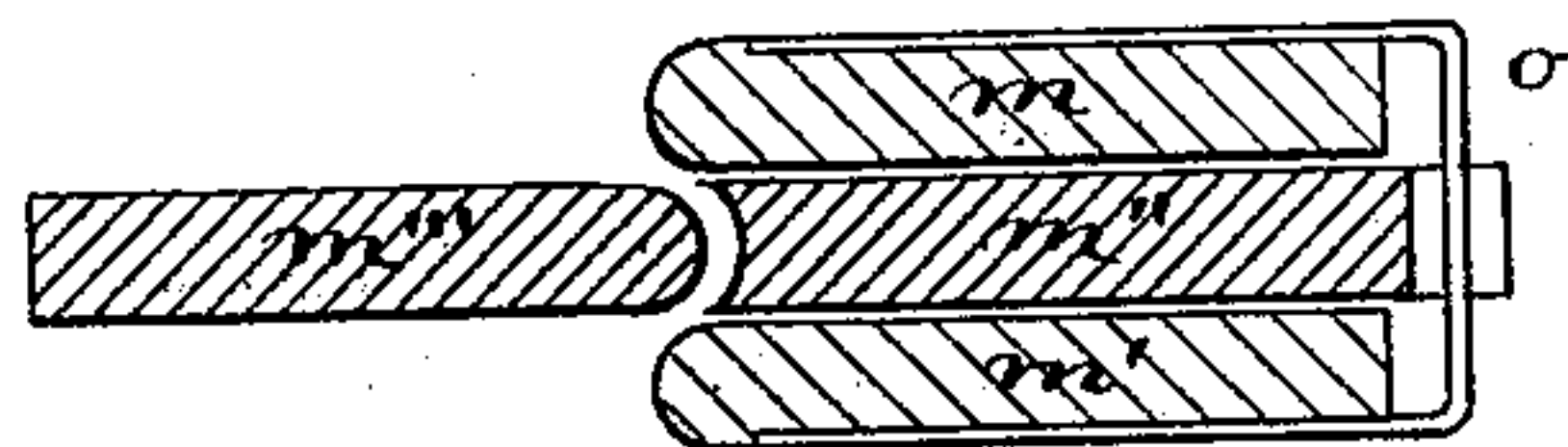
*Fig. 13.*



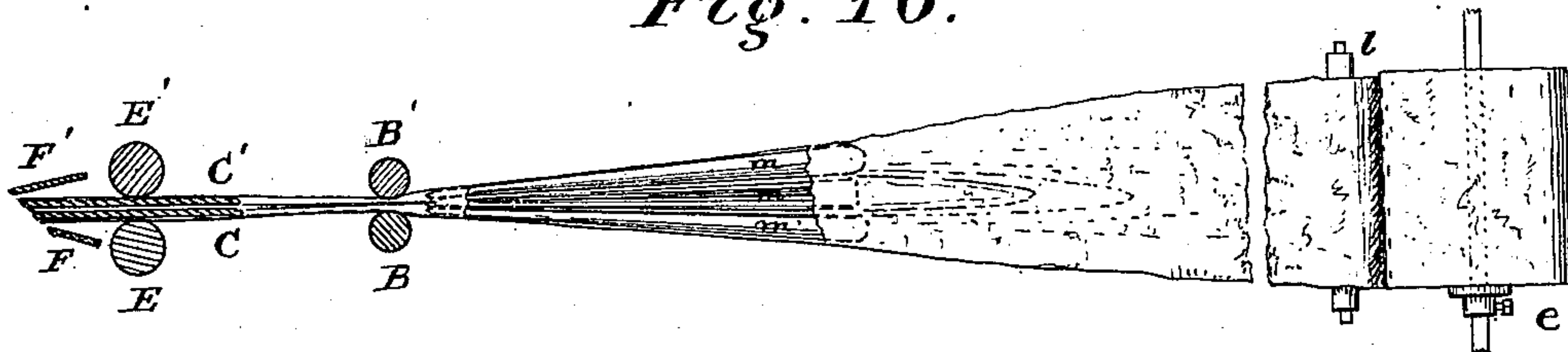
*Fig. 15.*



*Fig. 14.*



*Fig. 16.*



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# UNITED STATES PATENT OFFICE.

MARCUS C. RUTHENBURG, OF CINCINNATI, OHIO.

## PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 236,633, dated January 11, 1881.

Application filed May 3, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, MARCUS C. RUTHENBURG, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Paper-Bag Machine, of which the following is a specification.

My invention relates to improvements in machines which manufacture paper bags with two opposite side seams and a seamless bottom direct from a continuous sheet or roll, and comprises the following automatic characteristics, to wit: means for enabling the use of a reciprocating severing-blade upon a continuously-advancing sheet; means for the continuous and even feeding, creasing, severing, folding, and pasting of a side-seam bag direct from the roll, without the previous formation of a blank; a novel construction of paper support or mandrel, in the manufacture of a side-seam bag with seamless satchel-bottom; means for securing the passage in opposite directions of two consecutive and impinging bag-slips for the simultaneous completion of the last seam on one bag and the first seam on the other; means for securing a uniform and economical delivery of paste to the folding-blades.

The rotation of each revolving member of my machine is continuous and uniform.

In the accompanying drawings, Figure 1 is a perspective view of a paper-bag machine embodying my invention, a portion of the frame and gearing being broken away. Fig. 2 is a vertical section in the plane of the feed. Fig. 3 is a transverse section of a portion of my paper support or mandrel. Fig. 4 shows, by transverse section, the stretching, severing, folding, and seam-completing mechanism. Fig. 5 is a transverse section, showing the action of the traction-roller to lift one bag-slip while its finished predecessor is passing down and out. Fig. 6 illustrates the initiation of the bottom crease preparatory to the introduction of the sheet to the machine. Fig. 7 shows the continuous sheet of paper passing from the roll to the creasing-rollers and supporting-mandrel. Fig. 8 represents a creased and severed bag-width. Fig. 9 shows the shape such bag-width would present if opened out. Fig. 10 shows the bag-width with one seam folded. Fig. 11 represents a finished bag in its distended condition. Fig. 12 is a perspective

view of a crimp-guide or regulator, which, in the preferred form of my invention, is interposed between the roll-stand and the feed-rollers. Fig. 13 is a side view of the portions of said regulator which guide the outside of the crimp. Figs. 14 and 15 are sections of said regulator at the lines *x x* and *y y*, respectively. Fig. 16 is a side elevation, in their consecutive order, of the paper roll, the tension-roller, crimp-regulator, feed-rollers, grooved mandrel, forwarding-rollers, and throat, a portion of the paper being broken away.

*e* represents my stand for supporting the roll. This stand consists of a tripod base, *f*, provided with three leveling-screws, *g g' g''*. From the base *f* rises a vertical stud, *h*, having an adjustable collar, *i*, that is secured at any desired height upon the said stud by means of a set-screw, *j*. Projecting horizontally from stud *h* are two rigid arms, *k k'*, in which is journaled a vertical roller, *l*, which I call the "tension-roller." The collar *i* is adjusted to such a height upon the stud as to bring the mid-height of the roll on a level with the bite of the first pair of feed-rollers. The stand *e* is so placed upon the floor as to insure the proper pressure of the roller *l* against the continuous sheet, so as to flatten it out and cause it to maintain the same relation to the feed-rollers whether the paper roll be of its full diameter or more or less reduced diameter from the unwinding of its contents.

Where it is desired to preserve absolute uniformity of crimp in the entire batch of bags formed from a single roll, I prefer to introduce between the roll-stand and the feed-rollers a crimp guide or regulator, consisting of four wedge-shaped slabs or plates, *m m' m'' m'''*, with the represented rounded and hollowed edges, and of which the two exterior boards, *m m'*, are fixed with the represented obliquity to the two interior ones, *m'' m'''*, so as to overlap most toward the thin or feather edges of the regulator. Screws *n*, occupying slotted braces *o*, enable the regulator to be adjusted and held to the desired crimp. The regulator is secured by any suitable lugs *p* to the frame.

*A* may represent a suitable supporting-frame. *B B'* are two feed-rollers, which, receiving one end (see Figs. 6 and 7) of the crimped continuous sheet from the roll, pass it forward to the



grooved mandrel or paper-supporter. Said supporter may be of one piece, but is preferably composed of a pair of polished plates, C C', which are firmly held by a bracket, D, in the represented slightly-separated parallel, or nearly parallel, position. The front, rear, and left-hand edges of the said mandrel are absolutely free, to permit the entrance, passage, and transmission of the crimped sheet as it comes from the rollers B B'. Located one above and the other below the mandrel C C' are forwarding-rollers E E', geared to run at slightly greater peripheral speed than the rollers B B', in order that in the act of forwarding they shall subject the paper to a moderate tension, so as to insure evenness. Firmly secured one above and the other below the rear portion of the mandrel, and converging rearward, are two polished plates, F F'. The plates C C' F F' terminate in an oblique plane, as clearly shown in Figs. 1 and 4, and constitute at their said oblique rear edges a triple throat, which serves to hold the portions 1, 2, and 3 of the crimped and folded sheet properly separated for the action of the serrated blade or knife G, which severs the paper. The knife G is fixed in a gate, H, which is guided in a rectilinear path parallel to the oblique throat C C' F F', and at the proper juncture is drawn suddenly downward and as quickly retracted by the grooved cam I.

Inasmuch as the severing-blade, however rapid its stroke, necessarily consumes some time in descending and ascending, and as during this time the cut edge of the advancing sheet is unavoidably arrested, I provide room for the momentary crowding and consequent wrinkling of the paper by giving the plates F F' the forwardly diverging or flaring presentation shown in Fig. 4. By this expedient I have rendered practicable the association of a reciprocating severing-blade with a continuously-moving sheet.

A shelf, J, supports the severed slip or partially-formed bag and conducts it between two rollers, K L, which, revolving a little faster than the rollers B B', subject the paper a second time to tension and facilitate its separation by the knife G, in the manner already stated. From the rollers K L the slip passes forward until its edge extends a short distance beyond the bite of the rollers L M, where it encounters the first folding and pasting blade, N, which first tucking the paper into the bite of rollers L M and then retreating, the now folded and pasted advancing edge of the slip is carried upward by said rollers, and on its following edge reaching a similar position with reference to the rollers M and O said edge is in like manner tucked between said rollers M and O and folded by the second folding and pasting blade, N', and said rollers, so as to complete the bag, which is then discharged by the aprons P Q. Each folding-blade, in its forward stroke, sweeps paste from the periphery of a paste-carrying cylin-

der, which has such location relatively to the blade as to charge that side of it which comes in contact with the inner lap-surface of the paper, as clearly shown in Figs. 2 and 4. For this purpose each folding-blade is accompanied by two cylinders, R S, placed in such contiguity that the adjacent upper portions of their peripheries constitute a trough, *t*, for containing paste. This paste, by the constant rotation of said containing-cylinders, is kept uniformly tempered and moistened, and all not appropriated is promptly returned to the main body, thus preventing waste and enabling the utilization of every particle of the paste. The paste-cylinders are brought with their peripheries in such proximity as, while preventing leakage of paste down through the interstice, to nevertheless permit the return of all unappropriated paste into the main body at each revolution. Leaden curbs T, which fit the inter-cylindrical trough *t*, are employed to confine the paste to so much of the length of the cylinders as is needed for the work in hand. The stroke of the folding-blades is produced by two similar grooved cams, U U', which operate through a suitable system of rods and vibratory arms, V.

To insure the temporary ascent of one slip (see *b'*, Fig. 5) while its predecessor (see *b''*, Fig. 5) is passing down and out, I provide a traction-roller, W, which revolves at somewhat greater peripheral speed than the roller L, and two guide-plates, X Y. The peripheries of the several rollers are of india-rubber or other suitable elastic and adhesive material, preferably roughened on its surface.

The component members of such parts as the grooved mandrel and the paste-holders may be made readily adjustable both as to proximity and angle.

Suitable gearing Z is employed to transmit motion from one shaft to another. By a change of the gears Z' Z<sup>2</sup> to others of different ratio bags of a less or greater width may be produced.

The operation of my machine may be understood from the foregoing description, and may be briefly summarized as follows: The machine having been supplied with paste and set in motion, and the stand *e* having been set to the proper relative elevation and angle, the outer end of the continuous sheet is unrolled and its crimp initiated, as indicated in Fig. 6, if it be desired to manufacture satchel-bottom bags. The upper feed-roll being temporarily lifted, the crimped end is introduced between the feed-rollers and led forward to the mandrel, the crimped portion 2 being inserted between the plates C C' and the sides 1 and 3 above and below them. As soon as the edges of the sides 1 3 reach the rollers E E' the tractional power of these rollers causes the rapid advance of the sheet, such power being much in excess of the friction arising from the contact of the paper with the polished surfaces of the plates constituting the mandrel. The action from this



point is wholly automatic, and has been sufficiently explained in the description of the parts.

While my machine is especially designed and adapted for the manufacture of satchel-bottom bags, it can nevertheless obviously be used for making plain bags, either by substituting a common single mandrel for my grooved one or by simply omitting the bottom crimp, and, of course, making no use of the central throat.

I claim as new and of my invention—

1. The paper-roll stand *e*, consisting of adjustable base *f g g' g''*, vertical stud *h*, bracket *k k'*, vertical roller *l*, and adjustable supporting-collar *i j*, substantially as set forth.

2. In combination with the continuously-revolving feed-rollers *B B'* and the crimping mechanism *m m' m'' m''' n o p*, the vertical guide-roller *l* upon the adjustable stand *e*, for automatically imparting the proper crimp to the entering sheet, substantially as set forth.

3. The combination, with the mandrel *C C'* and the continuously-revolving feed-rollers *B B'*, (in front of the mandrel,) of the continuously-revolving forwarding-rollers *E E'*, of greater peripheral speed, between which and the mandrel the paper is grasped and continuously advanced, in the manner set forth.

4. In the described combination, the adjustable roll-supporting and sheet-guiding stand *e*, the crimp-regulator *m m' m'' m''' n o p*, the continuously-revolved gathering and feeding rollers *B B'*, the mandrel *C C'*, and the continuously-revolved high-speed forwarding and stretching rollers *E E'*, between which and the inclosed mandrel *C C'* the paper is grasped and forwarded, in the manner explained.

5. In a paper-bag machine, the paper support or mandrel *C C'*, grooved on one side and attached to the frame by its other side, and beveled on its rear edge, in combination, substantially as described, with the pair of continuously-revolved traction-rolls *E E'* and an obliquely-reciprocating severing-blade, *G*.

6. In combination with a paper support or mandrel, continuously-revolving forwarding-rollers *E E'* and *K L*, and a severing-blade

which reciprocates in the immediate rear of the mandrel, the forwardly-diverging throat-plates *F F'*, for guiding, and at the same time permitting the momentary wrinkling of the advancing sheet, substantially as set forth.

7. In combination with paste-supplies and with the respectively vertically and horizontally operating folding and pasting blades *N N'*, the set of four continuously-rotated seam-closing rollers *K L M O*, arranged in two vertical pairs and one horizontal pair, and operating substantially as set forth.

8. In combination with the continuously-rotated seam-closing rollers *K L M O*, the continuously-rotated traction-wheel *W* and the stationary guide-plates *X Y*, arranged and operating substantially as and for the purpose set forth.

9. In combination with the tucking, folding, and pasting blades *N N'*, the paste trough and feeder composed of the pair of oppositely-rotated cylinders *R S* and the curbs *T T'*, substantially as set forth.

10. The four continuously-revolved seam-closing rollers *K L M O* and delivering-aprons *P Q*, arranged and operating as described—that is to say, rollers *K* and *L* and rollers *M* and *O* forming two vertical and rollers *L* and *M* one horizontal pair, and rollers *M O* also serving as pulleys for the endless aprons *P Q*, as set forth.

11. The crimp-regulator *m m' m'' m''' n o p*, substantially as set forth.

12. In the described combination, the roll-stand *e*, tension-roller *l*, crimp-regulator *m m' m'' m''' n o p*, feed-rollers *B B'*, and duplex mandrel *C C'*.

13. In combination with the rollers *l* and *B B'*, the interposed crimp-regulator *m m' m'' m''' n o p*, constructed substantially as described.

In testimony of which invention I hereunto set my hand.

MARCUS C. RUTHENBURG.

Attest:

GEO. H. KNIGHT,  
J. L. LOGAN.