

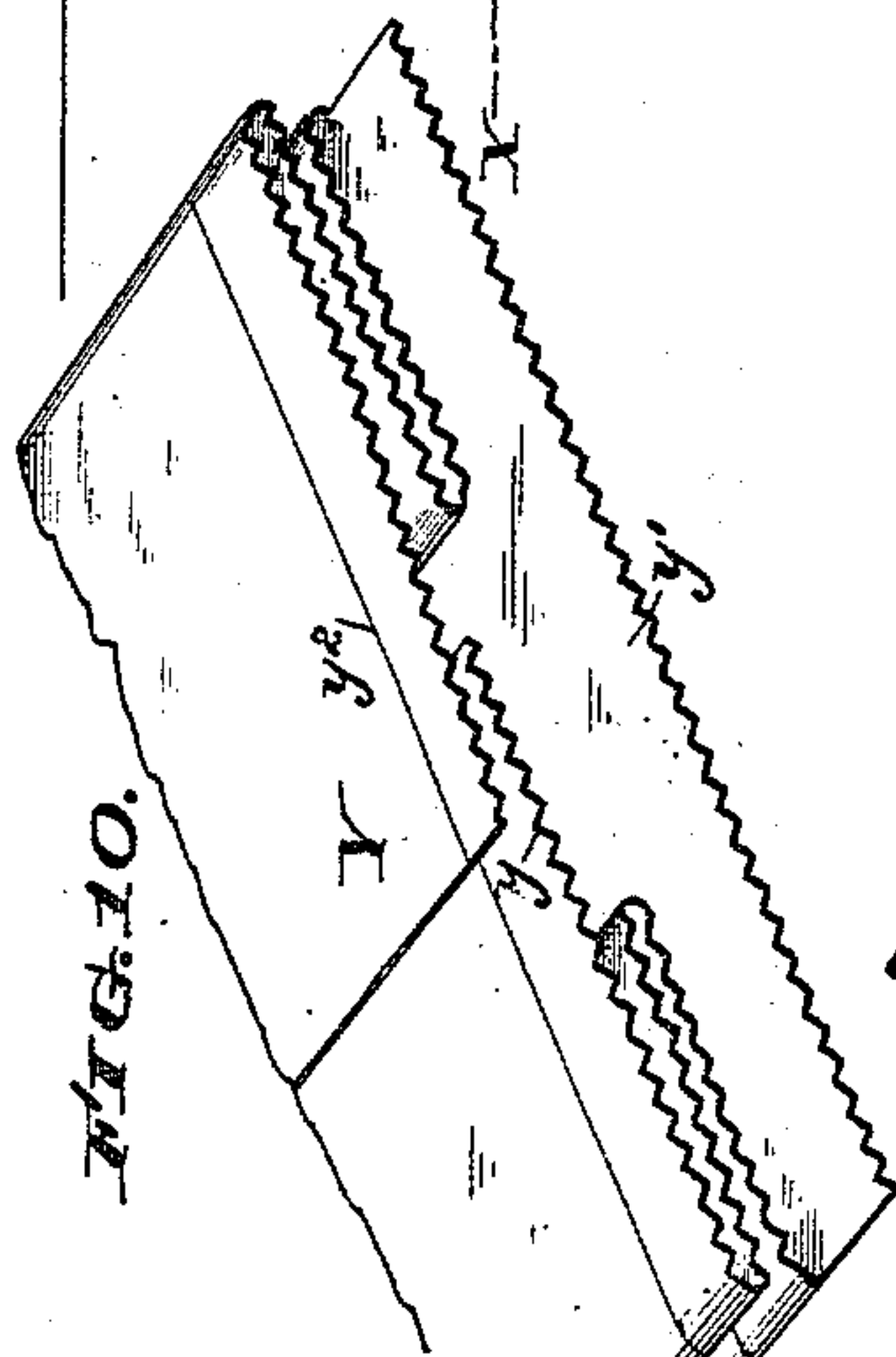
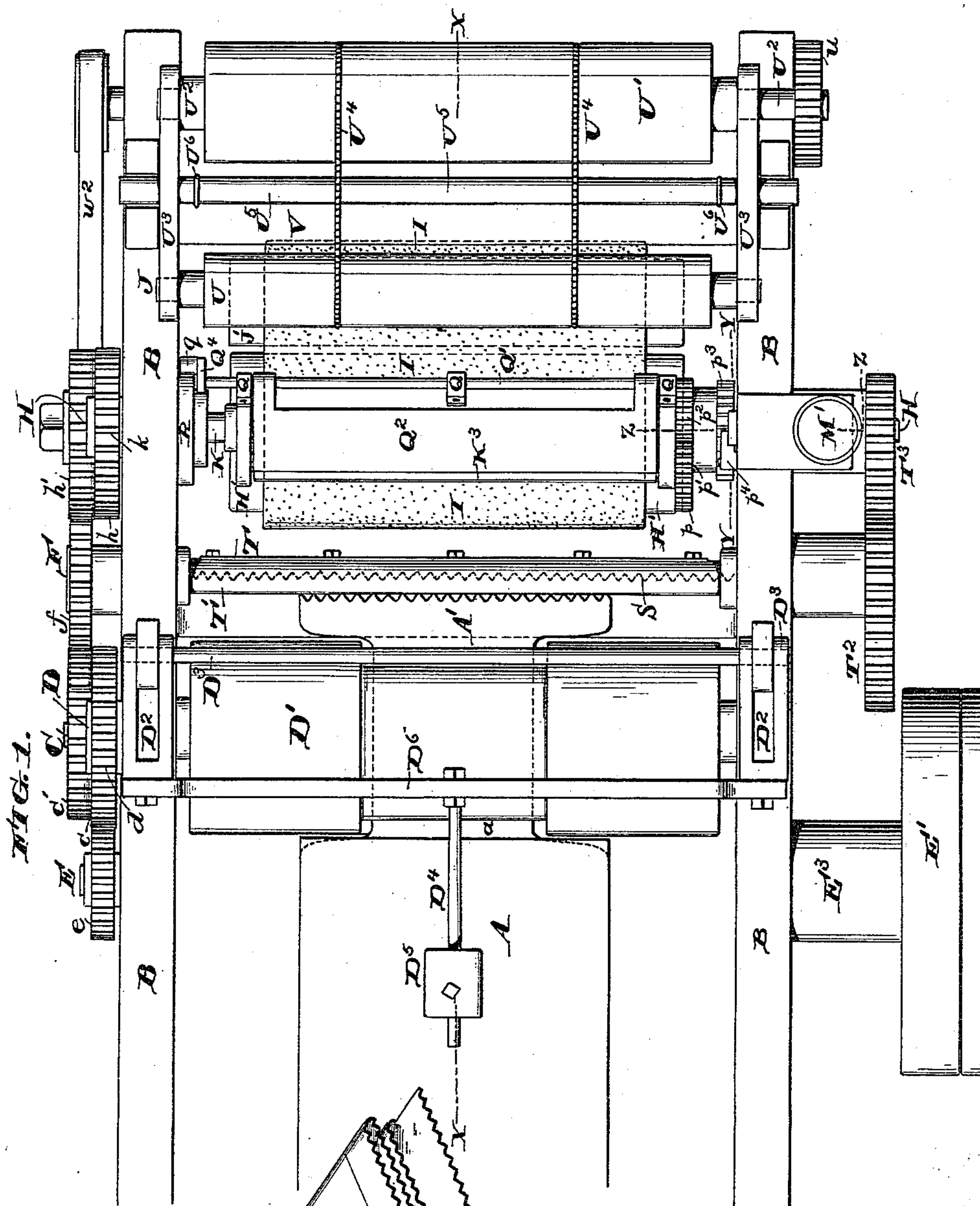
(No Model.)

4 Sheets—Sheet 1.

A. H. FIALA.
PAPER BAG MACHINE.

No. 439,058.

Patented Oct. 21, 1890.



Witnesses:

Henry Dunge
Joshua M. Black, Jr.

Inventor:

Andrew W. Fiala
by his attorney
Frank T. Chambers

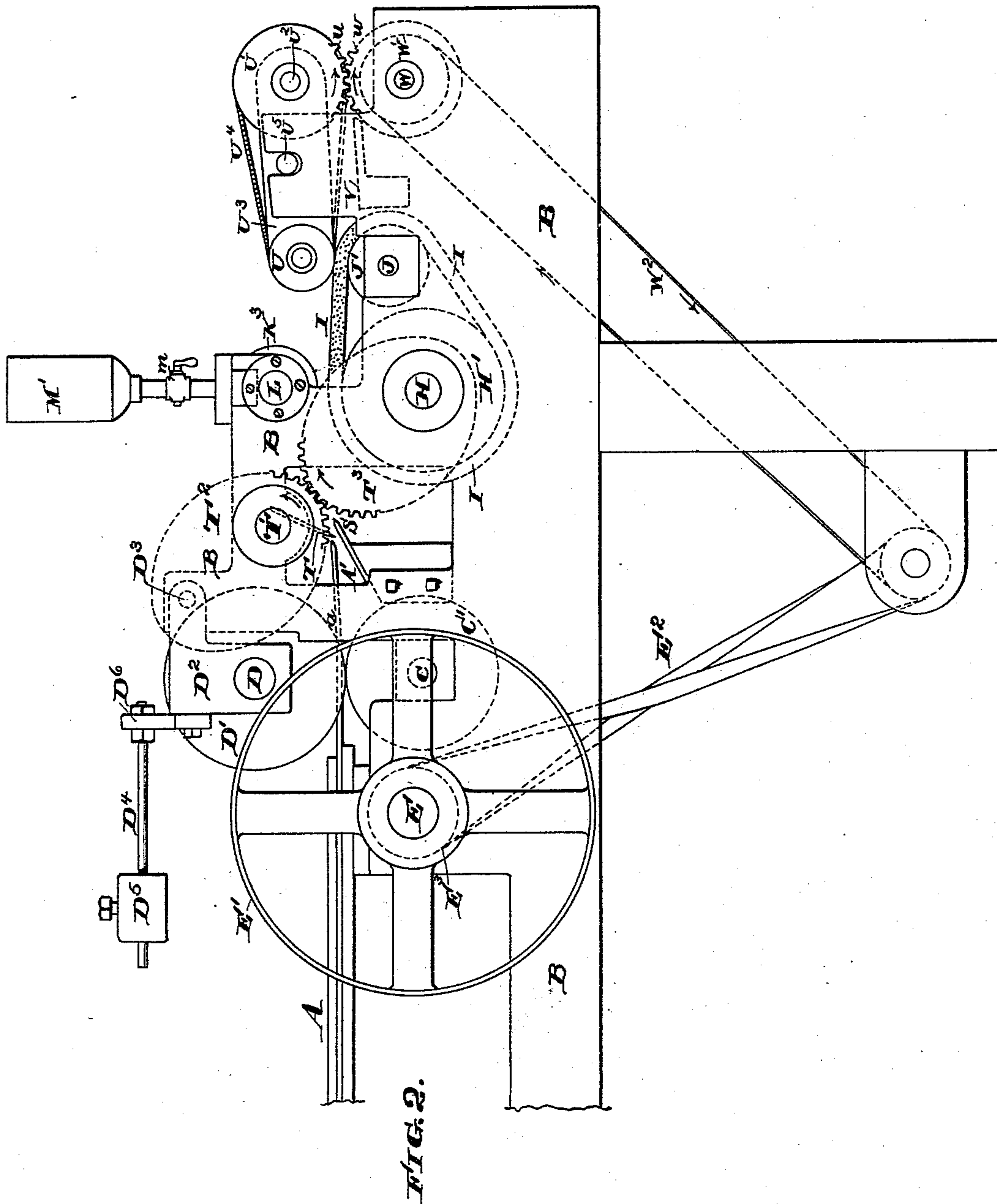
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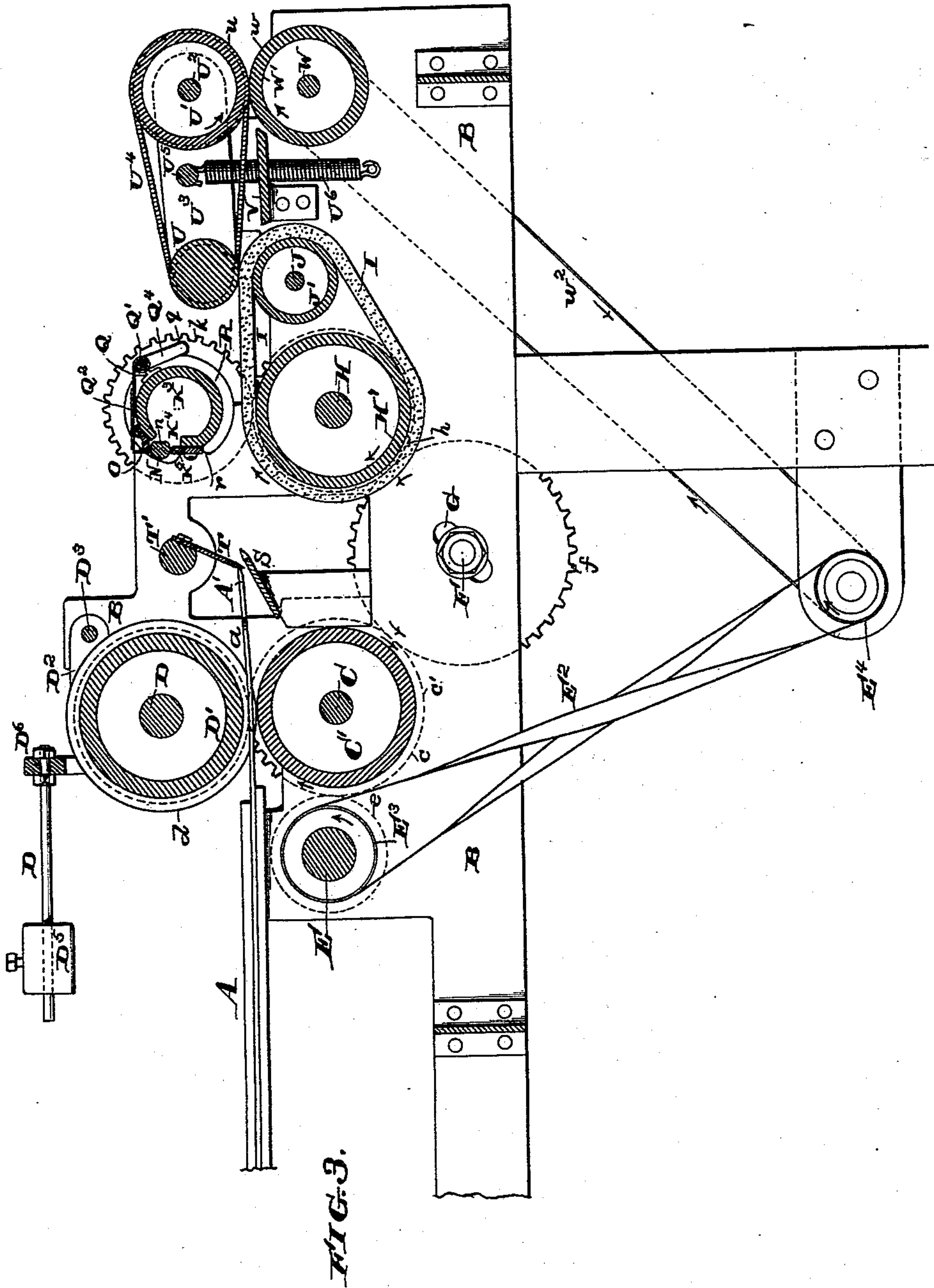
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A. H. FIALA.
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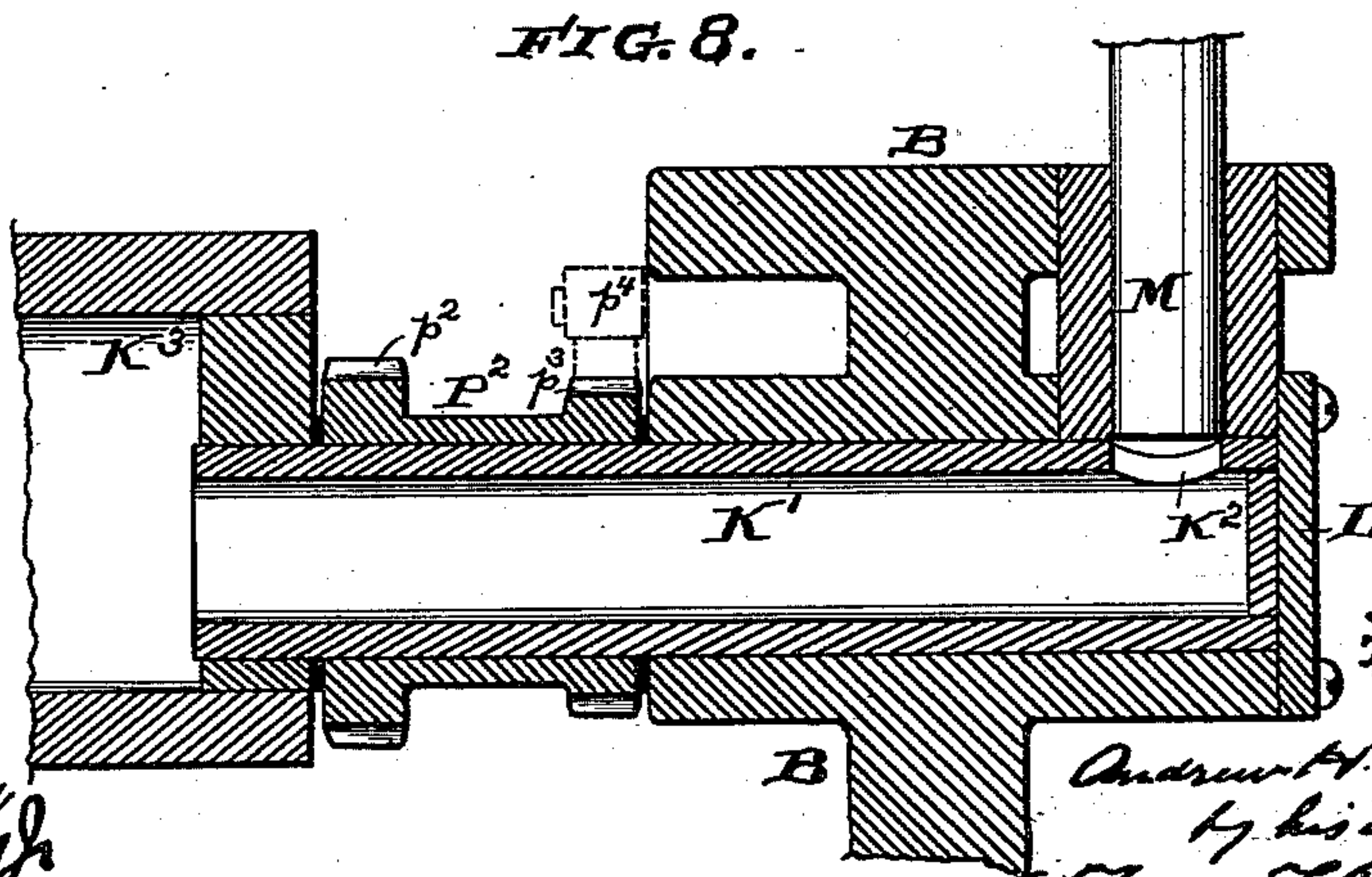
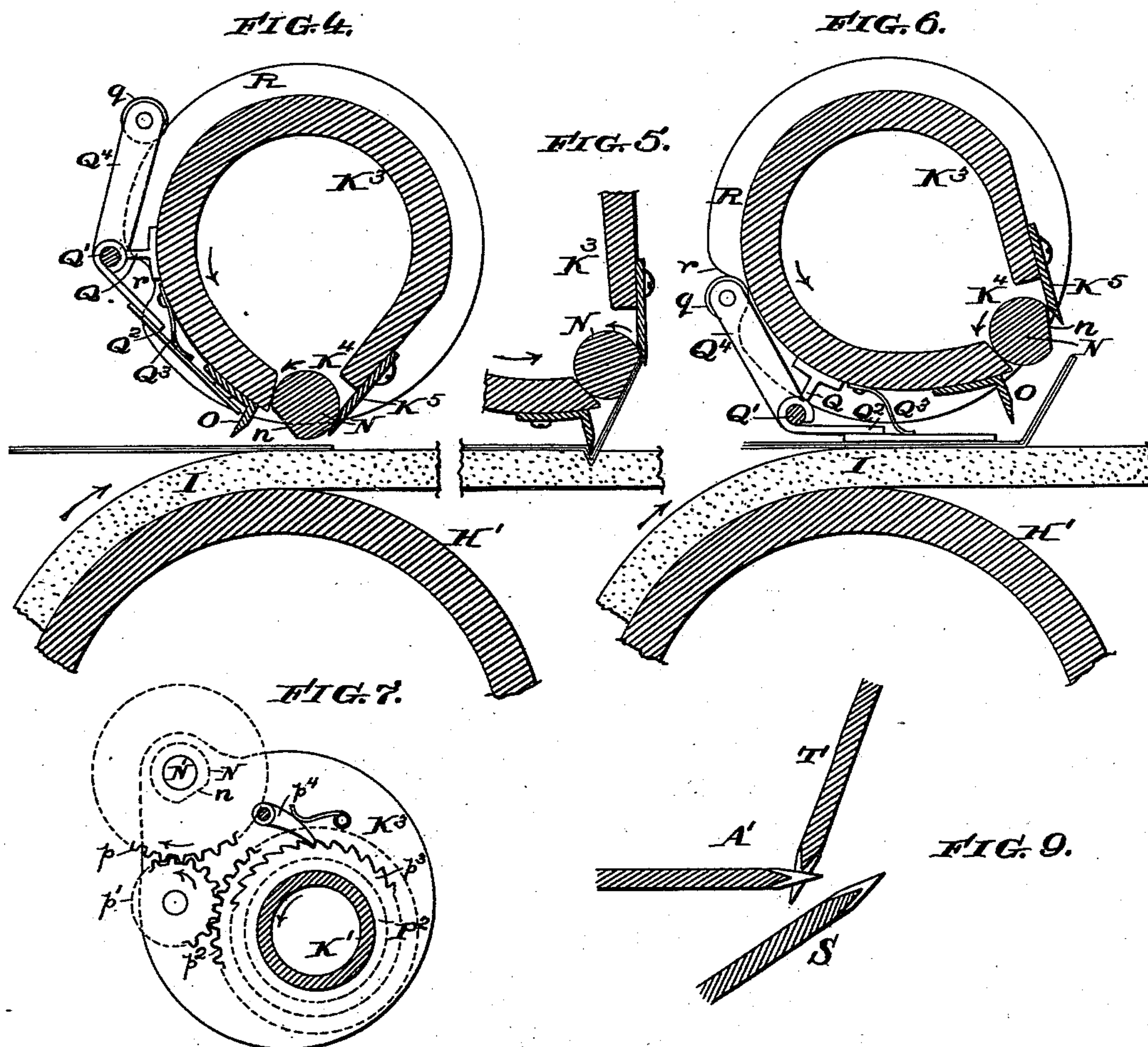
(No Model.)

4 Sheets—Sheet 4.

A. H. FIALA.
PAPER BAG MACHINE.

No. 439,058.

Patented Oct. 21, 1890.



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UNITED STATES PATENT OFFICE.

ANDREW H. FIALA, OF NEW YORK, N. Y., ASSIGNOR TO THE UNION PAPER BAG MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 439,058, dated October 21, 1890.

Application filed February 27, 1890. Serial No. 341,971. (No model.)

To all whom it may concern:

Be it known that I, ANDREW H. FIALA, of the city and county of New York, State of New York, have invented a new and useful
5 Improved Paper-Bag Machine, 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 machinery for making paper bags, and particularly to machinery
10 adapted to make paper bags from bellows-folded tubes and by severing such tubes into bag-blanks, and then completing the bag by turning up and pasting one end of the blank
15 so as to close it.

The object of my invention is to provide a machine of simple and compact construction, and one which can be easily adjusted and
20 operated and readily adapted to make different sizes of bags.

The nature of my invention will be best understood as described in connection with the attached drawings, which illustrate a paper-bag machine constructed in accordance
25 with it, and in which—

Figure 1 is a plan view; Fig. 2, a side elevation; Fig. 3, a side elevation on the section-line $x x$ of Fig. 1; Figs. 4, 5, and 6, cross-sectional views taken through the paste-roll and
30 its attached and coacting mechanisms, showing the way in which the said devices operate in the manufacture of the bags. Fig. 7 is a cross-section taken on the line $y y$ of Fig. 1; Fig. 8, a longitudinal section taken on the line
35 $z z$ of Fig. 1; Fig. 9, an enlarged cross-sectional view of the three knife-blades used in severing the tube into blanks, and Fig. 10 a perspective view of the end of a tube or of a blank after it has been severed by the knives
40 shown in Fig. 9.

The parts of the machine shown in the drawings are those which operate upon the bellows-folded blank after it has been formed. The tube-forming mechanism may be of any
45 usual kind and is not shown in the drawings.

A indicates a tongue or extension from the former-plate, around which the tube is formed; a , a tongue extending between the recessed

feed-rolls C' and D' , and A' a knife sustained and held by the said tongue a . 50

$B B$, &c., indicates the frame of the machine.

C is the shaft on which the lower feed-roll C' is secured, and on the end of which are secured gear-wheels $c c'$.

D is the shaft on which the upper feed-roll D' is secured. Said shaft is journaled in blocks or arms $D^2 D^2$, which are pivoted to a shaft D^3 , so that the said journal-blocks, carrying the roll D' with them, can be thrown up and backward when it is desired to adjust the paper
55 in place or to remove the upper feed-roll for any other purpose. A brace D^6 connects the pivoted journal-blocks, and to it is attached a rod D^4 , upon which a weight D^5 is adjustably connected. By moving this weight the
60 degree of pressure with which the upper feed-roll shall bear upon the tube passing between the feed-rolls can be nicely regulated. Upon the end of the shaft D is secured a gear-wheel d of the same size as the gear-wheel c upon
70 shaft C . When the roll D' is in operative position, these gear-wheels are engaged, and the upper roll is thus driven at the same speed as the lower roll.

E is the main driving-shaft, to which is attached the driving-pulley E' , by which motion is communicated to it and a gear e , which engages and drives the gear-wheel c . A pulley E^3 is also attached to shaft E , and by means of belts E^2 and W^2 , connecting with
80 an intermediate pulley E^4 , the pressure-rolls $U' W'$ at the end of the machine are driven by it.

Besides the knife A' , attached to the tongue a , I also secure to the frame of the machine a
85 knife S , situated so that its cutting-edge will cut a little in front of the edge of knife A' , and above these knives I secure a cutter roll or shaft T' , to which a cutter or knife T is attached. All of these knives have serrated
90 edges, and the knife T is adjusted so that its teeth will pass between the teeth of the knives A' and S . (See Fig. 9.) The action of these knives is to sever the bellows-folded blank in the manner shown in Fig. 10. The upper ply
95 of the tube, together with its inwardly-folded

sides, passes above the knife A', and is severed, as is indicated at y , by the coaction of the knives A' and T. The lower ply of the paper is then severed, as is indicated at y' , by the coaction of the knives S and T, and the knife S being in advance of the knife A the lower ply is severed on a line in advance of the first cut, so as to form a projecting lap, to which paste is applied in the manner hereinafter described, and which is then folded up and pasted down upon the upper ply of the blank.

It is important that the action of the knife T should be quick at the times when it is co-acting with the stationary knives in severing the blank, and in order to obtain this quick action I secure upon the shaft T an elliptic gear-wheel T² and upon a driving-shaft H a similar elliptic gear-wheel T³, (see Fig. 2,) arranging them, as shown, so that the portion of the wheel T³ having the longest radius, shall engage a portion of the wheel T² having the shortest radius at the time when the cutting operation is being performed, the shaft T, of course, moving with varying speed and in the way which is well understood in connection with elliptic gears of the kind shown.

F is a stud adjustably secured to the frame. As shown, it is secured in a slot G, lying in a plane which passes through the center of shaft H. To the stud F is secured a gear-wheel f , which engages the gear-wheel c' on shaft C, and also a gear-wheel h' , secured on shaft H.

H' is a roll secured to shaft H, J a shaft situated in the rear of shaft H, and J' a roll secured to shaft J.

I is a belt or apron, formed of some elastic material—such as rubber—and running over the rolls H' and J', as shown. In place of this construction the elastic apron I might be secured around the periphery of a roll H'; but I prefer to make it run on the two rolls, as shown. In addition to the gear-wheel h' , another gear-wheel h is also secured to shaft H, which engages a gear-wheel k , attached to the shaft K, which actuates the paste-cylinder K³. The other end of this paste cylinder has a hollow shaft K' journaled in the frame of the machine, in the end of which an orifice K² is formed in line with a paste-supply tube M. (See Fig. 8.)

M' is the paste-reservoir, situated on the top of pipe M, and m a cock, situated in pipe M, and by which the paste supplied to the roll through its hollow shaft is regulated. The paste-roll K³ is eccentrically secured to the shafts or journals at its ends and is slotted, as shown, at K⁴, and in this slot a pasting-roll N, journaled at each end of the paste-roll K³, revolves, said roll having a light groove formed in it, as shown at n .

K⁵ is a plate, which is screwed onto the side of the slot, and pressing against the roll N it prevents the paste from escaping from the paste-trough. Mechanism is of course con-

nected with the shaft or bearing of roll N, so as to rotate it and cause its groove n , carrying a line of paste, to come to the desired position at the desired time. As shown in the drawings, I accomplish this by the device best shown in Figs. 7 and 8. Around the hollow shaft K', I secure a sleeve P², having formed or secured to it a ratchet p^3 and a gear-wheel p^2 . The sleeve turns freely upon the shaft K', and is held in place by means of a pawl p^4 , attached to some stationary portion of the frame. To the end of the shaft N' of paste-roll N, I secure a gear-wheel p , which is engaged so as to be driven by gear p^2 in any convenient way, as by an idler-gear p' , journaled on the end of the paste-roll. The operation of this device is easily followed. The sleeve P² and its gear-wheel p^2 are held stationary by the pawl p^4 , and the roll K³ revolving the idler-roll p' , which engages gear p^2 , revolves on its bearing and in turn revolves gear-wheel p , which turns the pasting-roll N. The adjustment of this mechanism is easily effected by turning the sleeve P², by which means the paste-carrying slot of the pasting-roll is made to come into play on any desired line as the paste-roll K³ revolves, changes of course being necessary from time to time as bags of different size are being made. A little in the rear of the pasting-roll N, I secure to the outside of the paste-roll K³ a creasing-blade O, which engages the blank on the line in which the bottom fold is to be made, as y^2 , Fig. 10, and creases it, as is shown in Figs. 4, 5, and 6, acting in connection with the elastic apron I and throwing the lap y' up against the paste-carrying groove of the roller N, as is shown in Fig. 5.

In order to prevent the end of the blank from sticking to the pasting-roll and being carried up, I secure to the outside of roll K³ a plate Q², which, as shown, is secured to a shaft Q', journaled in bearings q , said bearings being attached to the roll K³. To the end of this shaft Q', I attach an arm Q⁴, carrying a roller q' at its end, said roller running around a cam R, which normally keeps it pressed out and the plate in position with reference to roll K³, as indicated in Fig. 4. A depression r is formed in cam R, which permits the arm Q⁴ to move inward, as shown in Fig. 6, this inward motion occurring immediately after the creasing and pasting has been effected, and resulting in throwing the plate Q² downward, as is shown in Fig. 6, so as to prevent the blank from being raised off of the apron I.

Q³ is a spring arranged to keep the cam-roller q always in contact with the surface of the cam R.

As I have already noted, the machine is geared so that a cutting device is directly connected and actuated by the mechanism which creases and applies paste to the bag-blanks. Consequently any increase or diminution of the speed with which the rolls H' and K³ turn

is accompanied by a similar increase or diminution in the speed with which the knife T moves and the relative action of the parts always remains the same. The adjustment of the machine to bags of different size is effected by changing the idler-gear f and of course adjusting the spindle F to correspond with the idler-gear used. It will be seen that by putting a smaller gear on spindle F the action of the knife T will be hastened and shorter blanks cut from the tube, and by putting a larger gear upon spindle F the action of the knife will be made slower and longer blanks cut from the tube; but in either case the creasing and application of paste will be made at the proper time for the new size of blank.

Referring now to the end of the machine, W' and U' are presser-rolls secured to shafts W and U^2 . The shaft W is driven by means of belt W^2 , and has upon it a gear-wheel w , which engages a gear-wheel u on shaft U^2 and drives it with a corresponding speed. Pivoted to shaft U^2 are arms U^3 U^3 , in the ends of which is journaled a roll U , the arms being braced by a cross-bar U^5 and a spring U^6 , attached to said cross-bar and arranged so as to draw the roll U down into close contact with the elastic apron I and above the roll J' , around which said apron passes. Around the rolls U' and U are secured tapes U^4 ; or, of course, an apron may be used in place of tapes. The construction described, by which the roll U is secured on the pivoted arms U^3 , is advantageous, because it enables the said rolls and arms to be thrown up out of the way, enabling the operator to get at the lower parts of the machines and to arrange the blanks upon them.

The action of the above described parts is as follows: The blank having been creased and pasted is fed along upon the apron I with its creased ends standing up, as shown in Fig. 6, and this end coming in contact with roll U is bent back, overlying the upper side of the blank, and then carried along over table V between the presser-rolls W' U' , which press down the pasted seam and complete the bag.

I believe that the construction of the machine as shown in the drawings will be found best adapted for practical use; but it will be understood that many of my improved devices are capable of independent as well as conjoint use, and I do not wish to be understood as limiting my claims on the presence of any elements of the machine shown and described, except those specifically referred to in them.

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 of a serrated knife A' , secured to a tongue extending from the former-plates, a serrated knife S, secured a little in front of knife A' , and a revolving serrated knife T, secured to

a shaft T' and arranged so that its teeth will pass between the teeth of knives A' and S as it revolves, all substantially as and for the purpose specified.

2. In a paper-bag machine, a hollow paste-roll, as K^3 , having a longitudinal slot K^4 through its side, in combination with a paster-roll N, journaled at the ends of the paste-roll so as to extend along and fill slot K^4 , and having a paste-slot n , a gear-wheel p , attached to the shaft of paster-roll N, a sleeve P^2 , loosely journaled on the shaft of the paste-roll, a ratchet-wheel p^3 , secured to said sleeve, a gear-wheel p^2 , also secured to said sleeve and arranged to drive gear p , a pawl p^4 , attached to a stationary part of the machine-frame and arranged to engage ratchet p^3 , and mechanism arranged to rotate the paste-roll, all substantially as and for the purpose specified.

3. In a paper-bag machine, the combination of an elastic belt I or its equivalent, as described, with the hollow paste-roll K^3 , having a grooved paster-roll N, arranged in it as described, and a creasing-blade O, secured to the roll K^3 in the rear of the paster-roll and arranged to press against the elastic belt and crease the paper carried thereon, all substantially as and for the purpose specified.

4. In a paper-bag machine, the combination of an elastic belt I or its equivalent, as described, with the hollow paste-roll K^3 , having a grooved paster-roll N arranged in it, as described, a creasing-blade O, secured to the roll K^3 in the rear of the paster-roll and arranged to press against the elastic belt and crease the paper carried thereon, a plate Q, pivoted to the roll K^3 , as described, an arm Q^4 , secured to said plate, and a cam R, arranged to act on said arm as the roll K^3 revolves, all substantially as and for the purpose specified.

5. In a paper-bag machine, the combination of a cutter-roll T and stationary knives arranged to coact with it in severing a tube into bag-blanks with a roll K^3 , having creasing and pasting devices connected with it, as described, and gearing connecting the rolls K^3 and T' , as described, so that their relative movements remain the same irrespective of their joint change in speed with respect to the feed-rolls.

6. In a paper-bag machine, the combination of a cutter-roll T and stationary knives arranged to coact with it in severing a tube into bag-blanks with a roll K^3 , having creasing and pasting devices connected with it, as described, and gearing connecting the rolls K^3 and T' as described, so that their relative movements remain the same, feed-rolls acting to feed the tube to the cutters, a roll H' , arranged to coact with the roll K^3 , and the creaser thereon, a gear c' , attached to the shaft of a feed-roll, a gear h' , attached to shaft of roll H' , an adjustable idler-spindle F, arranged between said gears, and an idler-gear f , arranged on said spindle to connect

gears c' and h' , all substantially as and for the purposes specified.

7. In a paper-bag machine, the combination, with rolls H' and J' , carrying elastic apron I, of paste-roll K^3 , carrying paste-roll N and creaser O, the presser-rolls U' and W' , the pivoted journal-arms U^3 , the roll U, journaled

on said arms, and the tapes U^4 , running on rolls U and U' , all substantially as and for the purpose specified.

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Witnesses:

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