

No. 626,369.

Patented June 6, 1899.

J. DOERING.

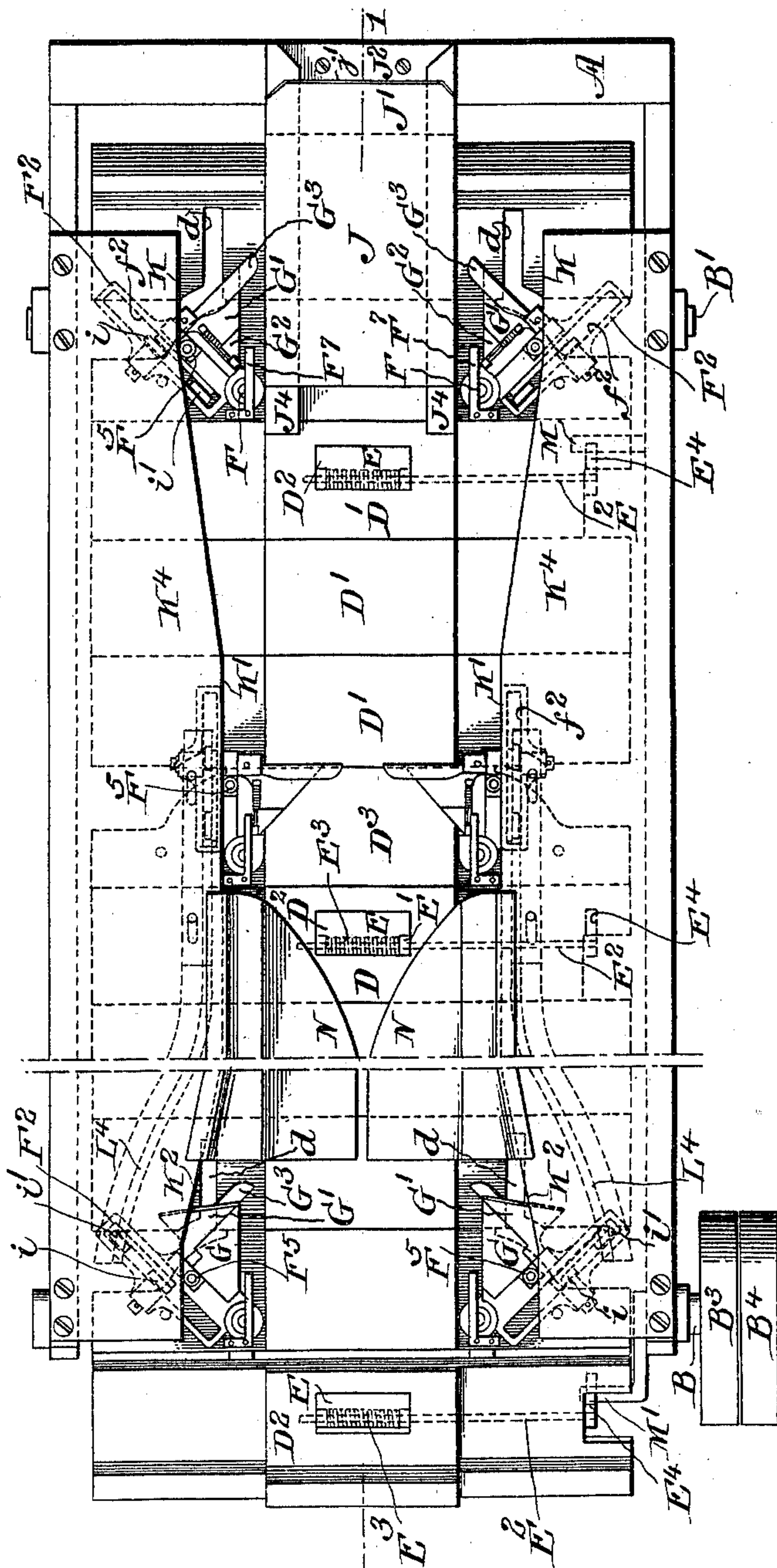
PAPER BAG MACHINE.

(Application filed Mar. 22, 1898.)

(No Model.)

4 Sheets—Sheet 1.

FIG. 1.



Witnesses.

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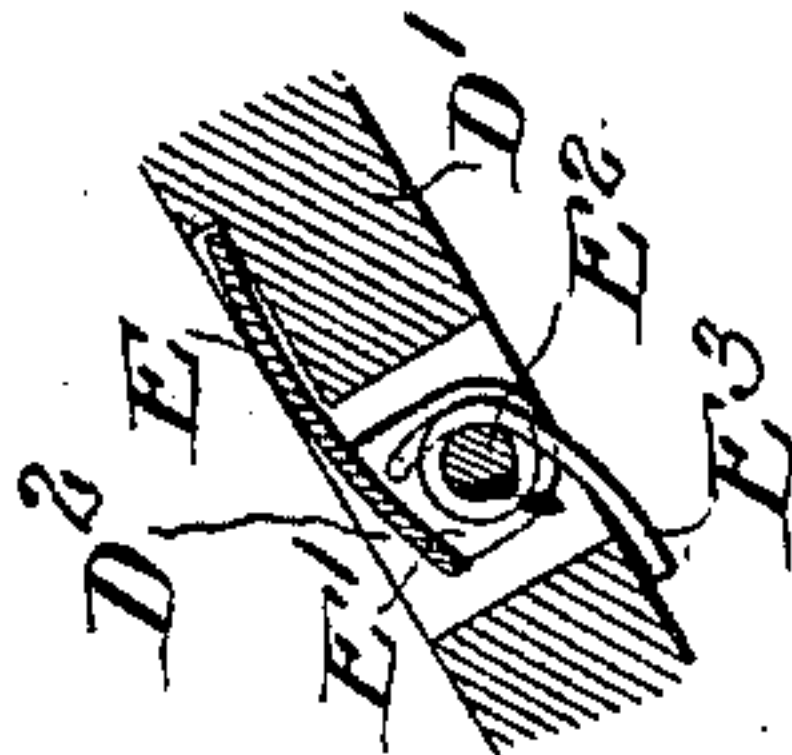
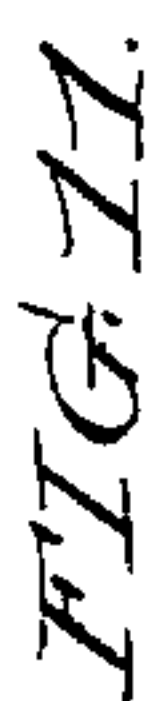
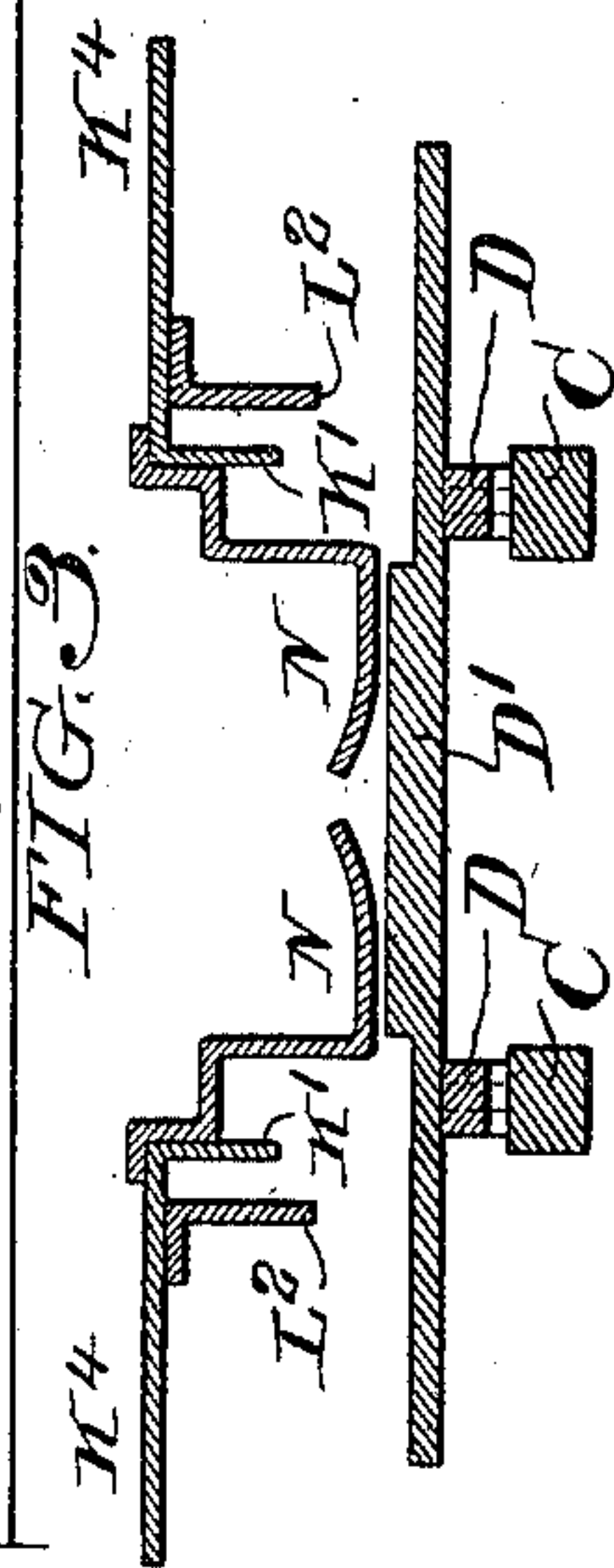
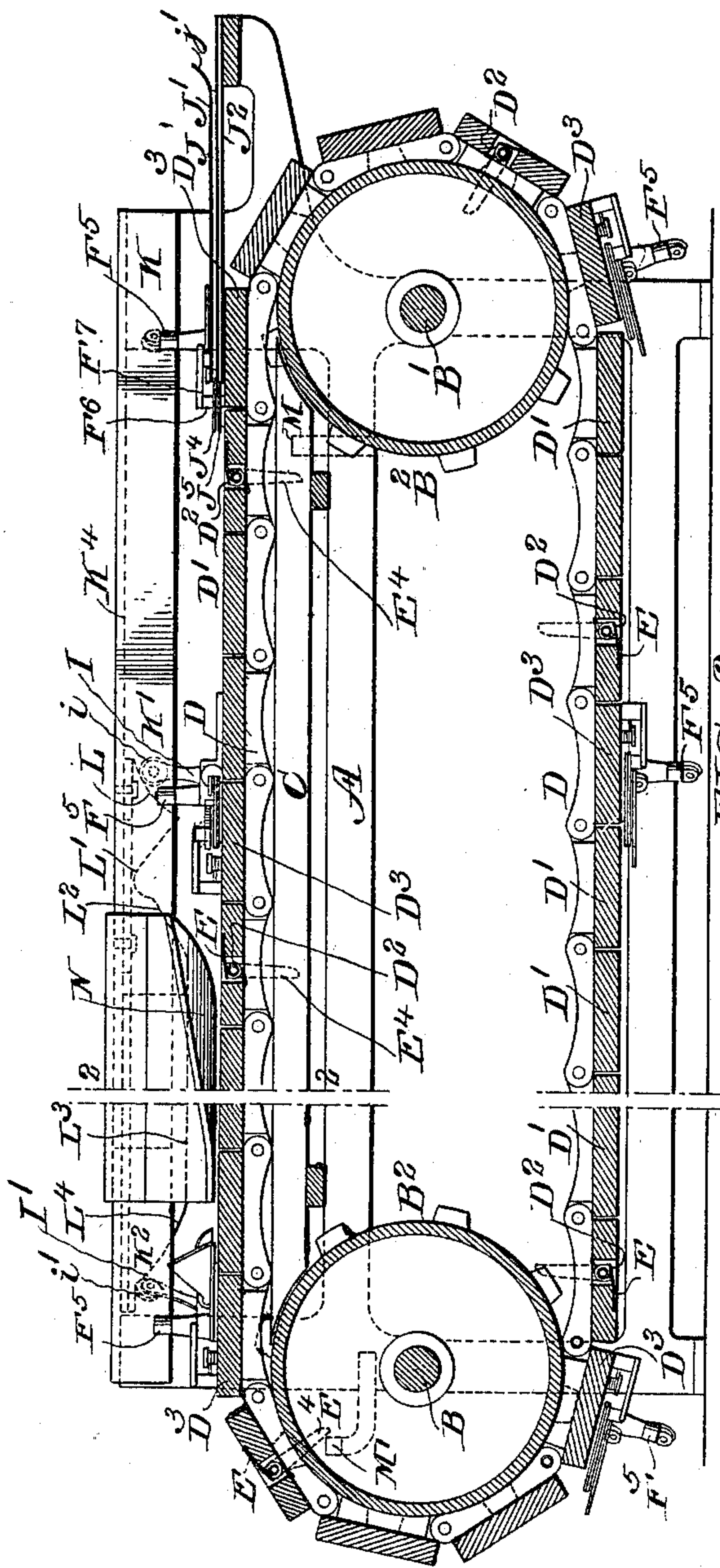
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PAPER BAG MACHINE.

(Application filed Mar. 22, 1898.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses.
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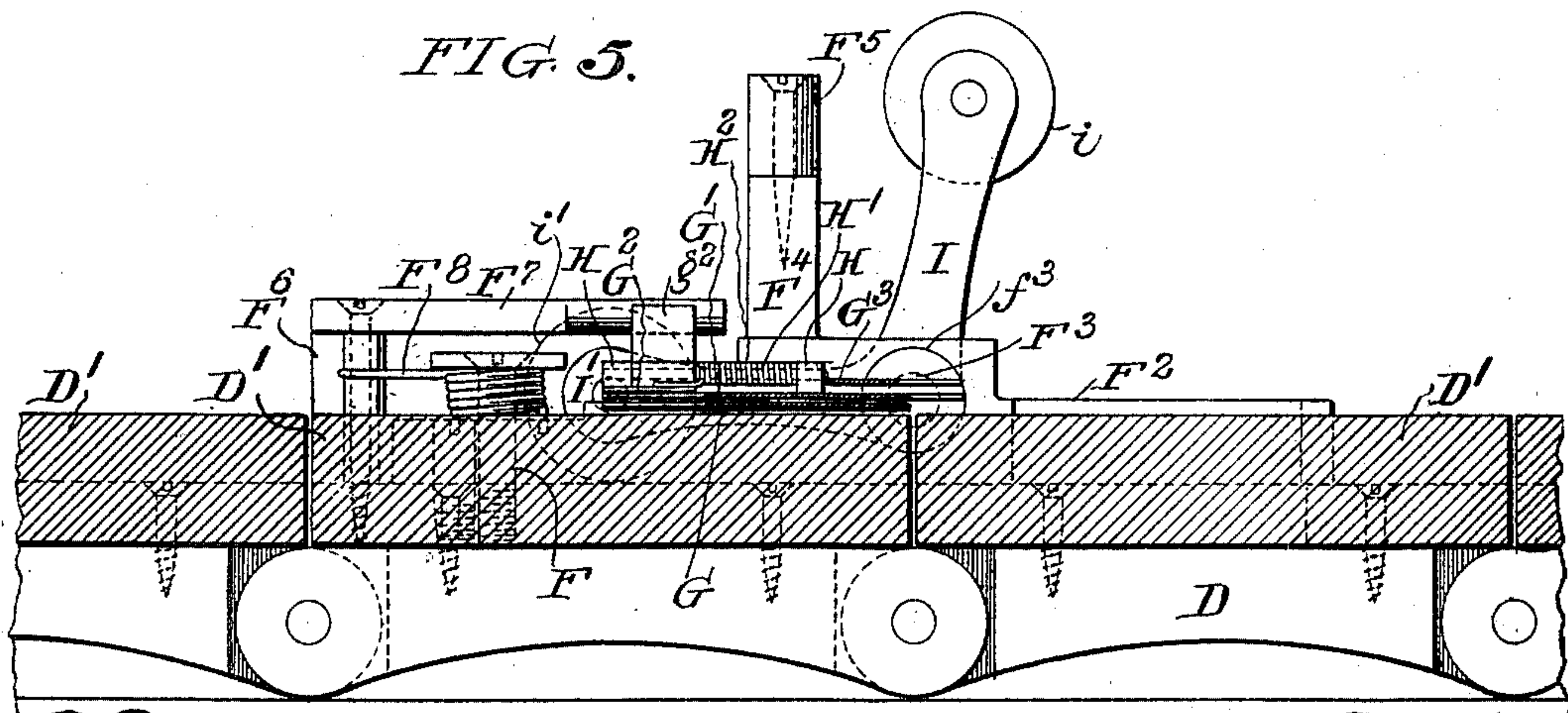
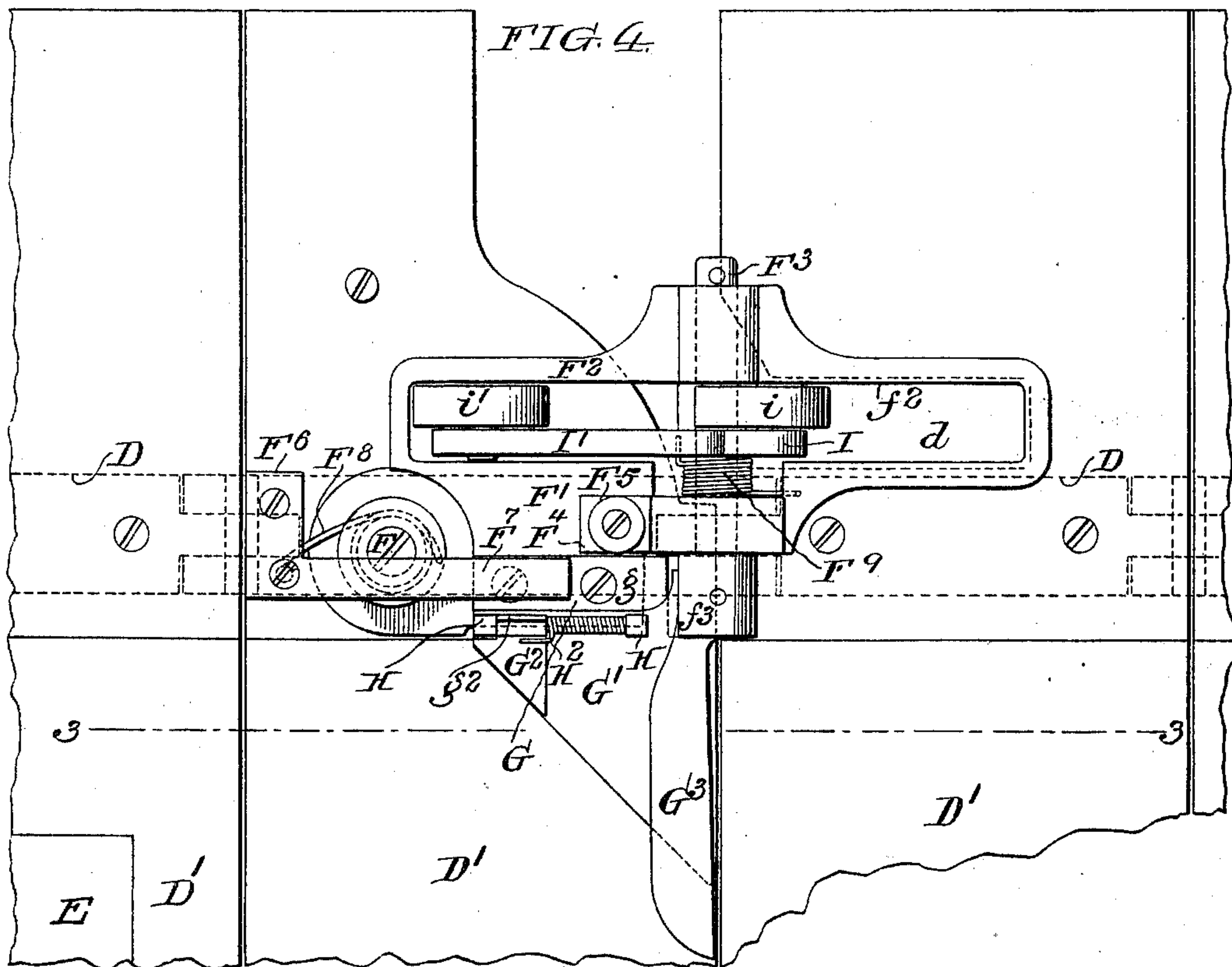
Patented June 6, 1899.

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PAPER BAG MACHINE.

(Application filed Mar. 22, 1898.)

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4 Sheets—Sheet 3.



Witnesses.

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PAPER BAG MACHINE.

(Application filed Mar. 22, 1898.)

(No Model.)

4 Sheets—Sheet 4.

FIG. 6.

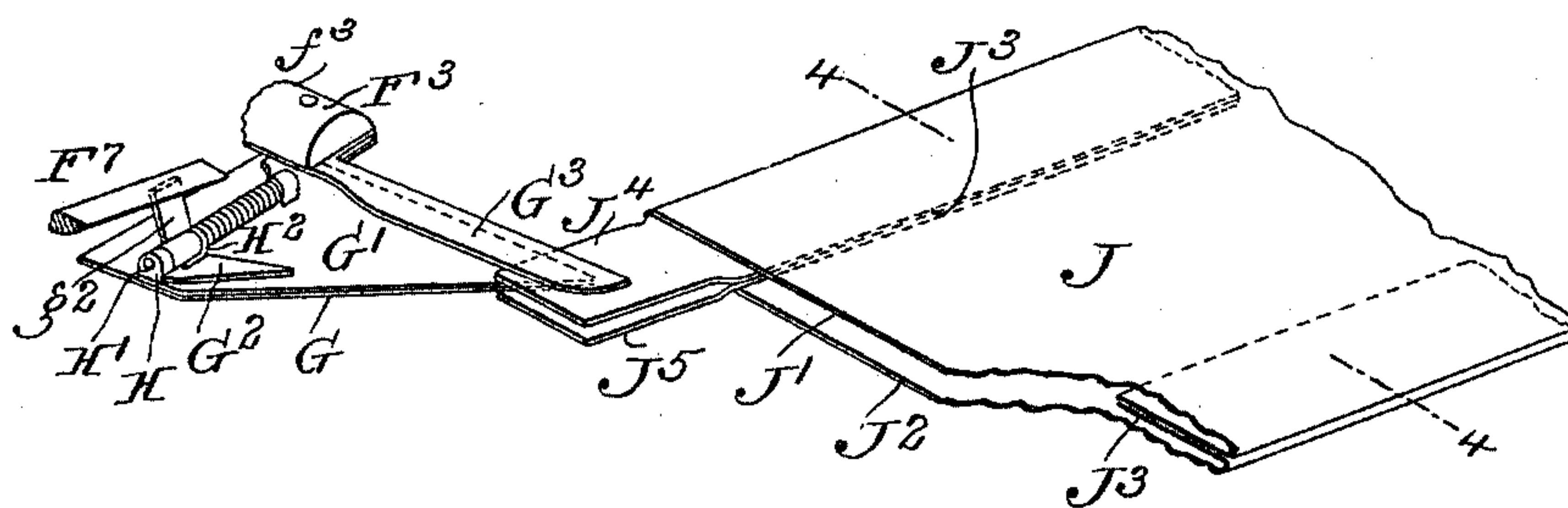


FIG. 7.

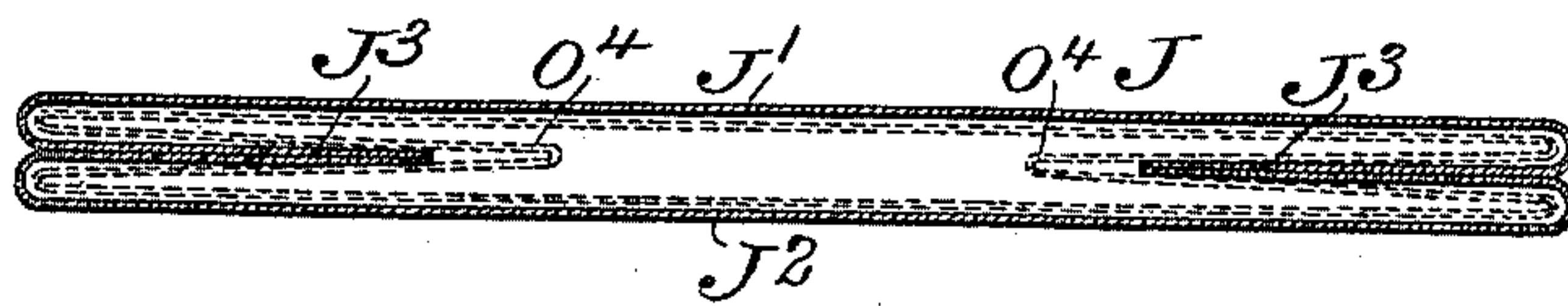


FIG. 8.

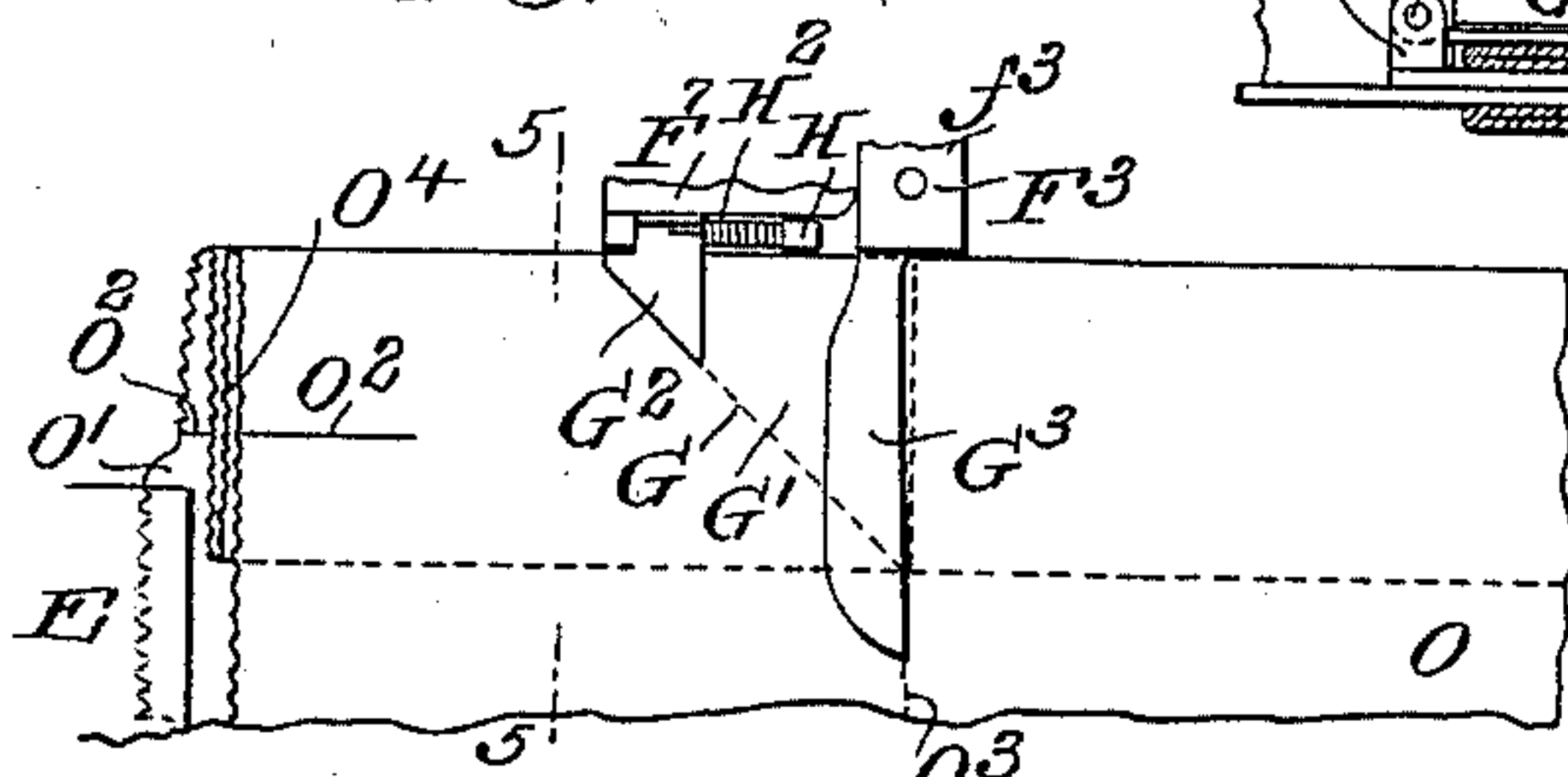
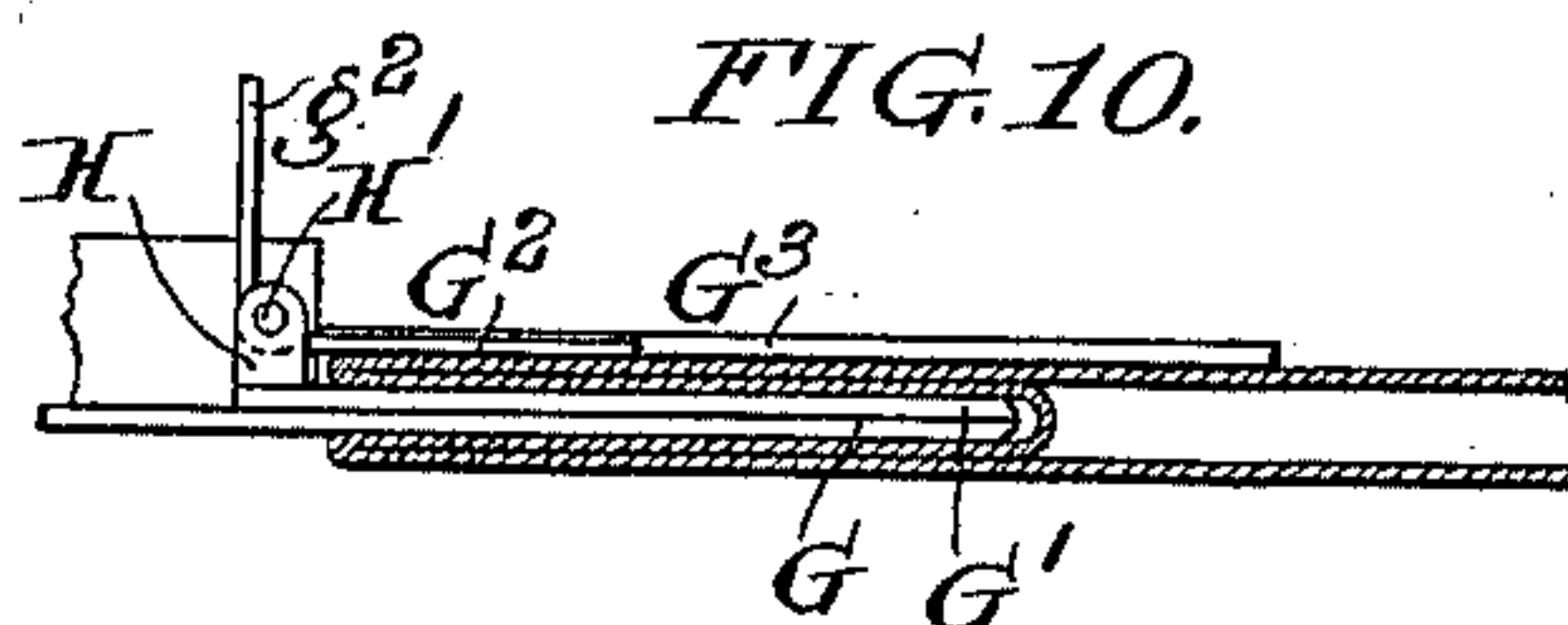
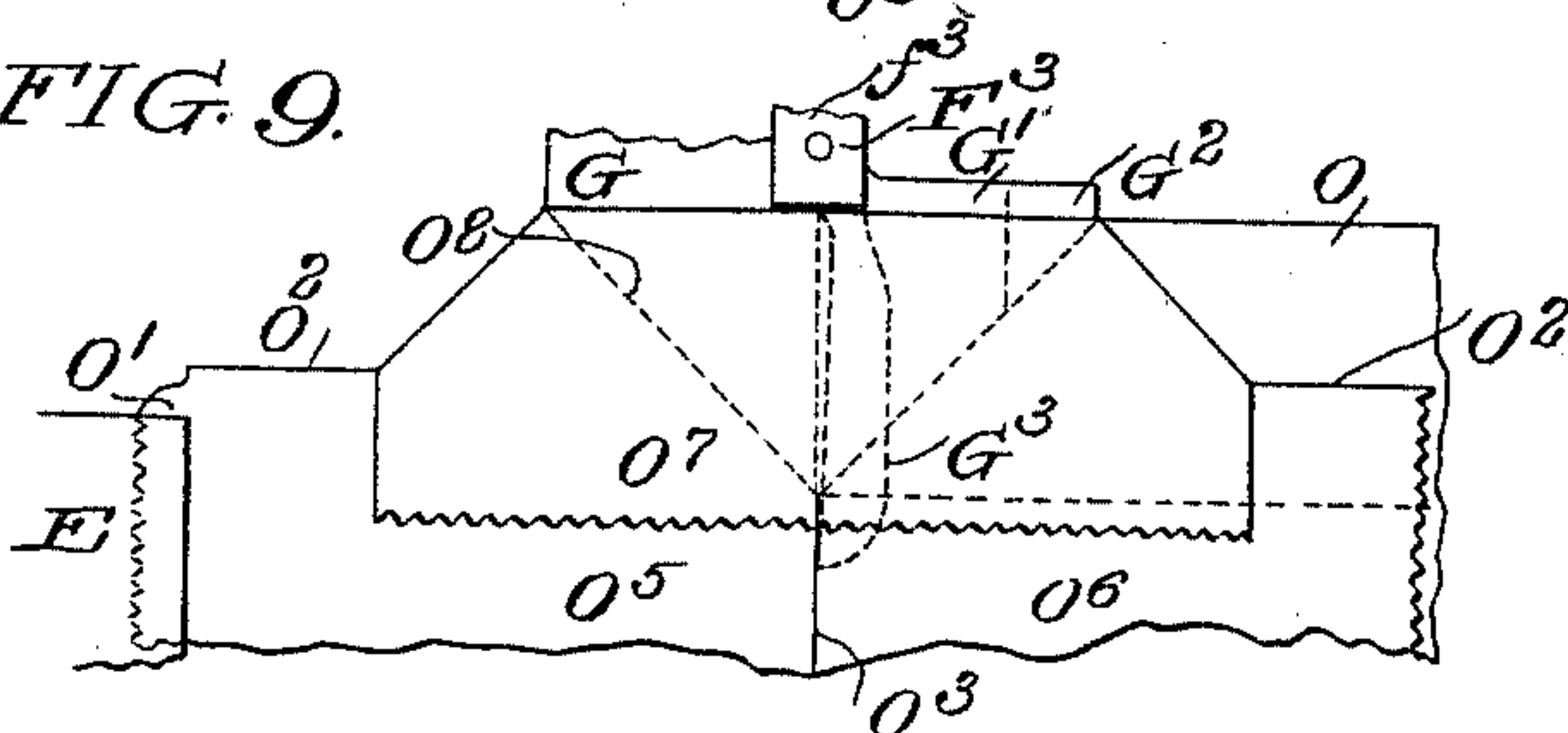


FIG. 9.



Witnesses.

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UNITED STATES PATENT OFFICE.

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PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 626,369, dated June 6, 1899.

Application filed March 22, 1898. Serial No. 674,758. (No model.)

To all whom it may concern:

Be it known that I, JUSTUS DOERING, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, 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 particularly to that class of paper-bag machines which are adapted to make what is generally known as the "satchel - bottomed bellows - folded paper bag;" and the object of my invention is to provide a simple mechanism whereby such bags may be made with great rapidity and at the same time without unduly rapid movements of operative parts of the machine.

The nature of my improvements will be best understood as described in connection with the drawings, in which they are illustrated, and in which—

Figure 1 is a plan view of a machine embodying my invention; Fig. 2, a longitudinal section taken as on the line 1 1 of Fig. 1; Fig. 3, a cross-section taken as on the line 2 2 of Fig. 2. Fig. 4 is a plan view of a portion of the mechanism on an enlarged scale; Fig. 5, a similar enlarged view of the same portion of the mechanism shown in elevation. Fig. 6 is a perspective view illustrating another detail of construction; Fig. 7, a cross-sectional view taken as on the line 4 4 of Fig. 6; Figs. 8 and 9, plan views showing the operation of the folding-blades upon the bellows-folded paper tube; Fig. 10, a front view taken as on the section-line 5 5 of Fig. 8, showing the engagement of the folding-blades with the tube; and Fig. 11, a detail showing the nipper by which the paper tubes are grasped to the apron.

A indicates the frame of the machine, upon which, as shown, are mounted the shafts B and B', each carrying chain or sprocket wheels, as indicated at B² B², and one, the shaft B, as shown in the drawings, being provided with fast and loose pulleys, as indicated at B³ and B⁴.

C C indicate guides arranged between the sprocket-wheels and serving to support the

apron, to be hereinafter described, as it passes through the operative portion of its travel.

D D indicate chains formed of pivot-links arranged to pass over and engage with the sprocket-wheels B² B² and supporting the plates D' D', making up the apron of the machine, and upon which apron the blanks to be operated upon are delivered and to which apron the devices for operating upon the blanks are secured. At regular intervals, somewhat in excess of the length of a bag-blank, the plates D' are perforated, as indicated at D², and provided with nippers E, which, as shown, are secured on levers E', fastened to rock-shafts E², which rock-shafts are provided with springs E³, which normally hold the nippers closed down, as indicated in Fig. 11. The shafts E² are also provided with lever-arms E⁴, which as the belt travels come first in contact with a pin M, which opens the jaw and enables it to engage the front end of a bag-blank to be operated upon, the said levers E⁴ coming next in contact with a pin M', which again opens the nipper, releasing its hold upon the bag-blank. Secured to the apron and somewhat in the rear of each nipper E are the pivot-pins F F, one pair lying upon each side of the portion of the apron upon which the blank rests, and upon these pins are pivoted the folding-blade frames, (indicated at F' F²,) the portion F² being slotted, as indicated at f², and traversed by the pivot-pin F³, having its bearing in the frame, and, as shown, a head f³, to which the movable blades G' G³ are attached.

G is a fixed folding-blade, which is rigidly fastened to the portion F of the frame, as indicated at g g.

G' is movable folding-blade having in that part which comes in contact with the paper blank a substantially identical form with that of the blade G, and G³ is another movable folding-blade lying in normal position above the blade G' and intended to lie upon the top of the tube-blank and to define a line of fold about which the blank is opened. Both of the blades G' and G³ are fastened to the head f³ of the shaft F³, and a spring, such as that indicated at F⁷, normally holds the blades in the position indicated in Figs. 4 and 5.

G² is a supplemental or gripping blade piv-

oted on the rear edge of the blade G' by being fastened to a shaft which has its bearings in the standards H H, said standards projecting, as shown, from the face of blades G', and which shaft is acted upon by a spring H², so as to normally keep the gripper-blade G² pressed down upon the blade G'.

g² indicates a heel extension of the nipper G², extending up substantially at right angles to the blade.

F⁶ is a standard extending up from the plate D', to which the pivot-pin F is secured, and having extending from it the bar F⁷, which in the retracted position of the frame lies in front of the heel extension g² and in such position that as the frame is swung forward it opens the nipper by acting on this heel extension and releases its hold, permitting the nipper G² to close when the folders have come to operative position, as indicated at the ends in Fig. 1.

F⁴ is a post or standard extending up from the frame F' F², as shown, and carrying a roller F⁵ on its end in position to be acted on by cam K K².

I and I' are lever-arms secured to the shaft F³ and angling to each other preferably, as shown, slightly over ninety degrees. i and i' are rollers secured on these levers.

J is a former through which the bellows-folded tubes are fed to the apron. As shown, it is formed with the top plate J¹ and bottom plate J² and the inwardly-extending end walls, as indicated at J³ J³, these end walls continuing beyond the top and bottom plates and being expanded, as indicated at J⁴ and J⁵. (See Fig. 6.)

K K' K² indicate a stationary cam-surface, formed, preferably, as shown, on the front of a plate K⁴, secured to the frame of the machine and in such position that its cam edge will come in contact with the roller F⁵ at the top of the post F⁴. One of these cams is situated on each side of the apron, and its operation is, by acting through the post F⁴, to press the folding-plate frame in, hold it in, and allow it to be retracted at proper times. L, L', L², L³, and L⁴ indicate another stationary cam, of which there is one situated on each side of the apron and which is placed so as to engage and operate the rollers i and i', the form of the cam being regulated not only by the effect to be produced on the shaft F³, but also in accordance with the form of the cam which operates the frame, so as to keep in contact with the rollers.

N N are folder-plates of usual and well-understood form.

O, Figs. 8 and 9, indicates a bellows-folded paper tube having the front end of its lower ply (indicated at O') extending somewhat beyond its upper ply and preferably formed with slits O² O² in its upper and lower plies, O⁴ indicating the bellows fold.

O³ indicates the line on the upper ply of the paper about which the tube is opened or distended, the portion of the under ply ex-

tending beyond this line being indicated in Fig. 8 at O⁵ and the portion of the upper ply extending beyond this line and folded back being indicated at O⁶. In the act of opening the bellows fold the inward triangular fold (indicated at O⁸) is formed in a well-known way and a flap O⁷ folded in toward the center of the blank.

The operation of the machine is as follows: Bellows-folded bag-blanks are fed through the former J, as indicated in dotted lines in Fig. 7, and with the result that as they emerge from between the top and bottom plates J¹ and J² their bellows folds are expanded by the diverging plates J⁴ and J⁵. Just as the bag-blank emerges from between the top and bottom plates its front lower ply is engaged by one of the nippers E and grasped tightly to the face of one of the plates D' of the apron, with which it accordingly moves until the hold of the gripper is released. As the apron moves forward after engaging a blank the roller F⁵ rides up on the surface K of the cam and pushes the frame F' F² in, so that the blades G and G' pass between the plates J⁴ and J⁵ and between the plies of the bellows folds of the blank, while at the same time the plate G³ passes above the plate J⁴ and over the top ply of the bag. The operation is indicated in Fig. 6 and the final position of the parts in Fig. 8. As the frame moves inward the heel extension g² of the gripper G² comes in contact with the bar F⁷ and is pushed backward, opening the gripper-blade, so that it, like the plate G³, passes above the upper ply of the bag, and after the heel extension has cleared the bar F⁷ it snaps down and grips the upper ply tightly against the blade G'. After the folding-blades have been brought to proper position—that indicated in Fig. 8—the roller i comes in contact with the cam-surface L and is pushed backward, moving with it, of course, the shaft F³ and the blades G' and G³ and also throwing up the lever I', with its roller i', which as the roller i reaches the lowest part of the surface L moves into the cam-surface L' and is then engaged by the cam-surface L² and pushed backward by said surface, so as to rotate the shaft F³ and the blades attached to it in the same backward direction and until they have accomplished a movement of approximately one hundred and eighty degrees, after which the roller i' runs along the flat surface L³ of the cam, holding the blades in that position, while the bag-blank distended, as indicated in Fig. 9, is drawn between the folding-plates N N, which plates compact and make permanent the folds indicated in Fig. 9. After the blank has passed between these folders the receding cam-face K² permits the post F⁴ and the blade-frame attached to it to move outwardly until the blades are disengaged from the blank, and then the roller i' is permitted to move forward by the conformation of the cam-surface L⁴, and after leaving this surface the folding-blades are moved forward to their normal po-

sition ready to be engaged with another blank, when they again come in registry with the mechanism through which the blank is fed to the machine.

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

10 1. In a paper-bag machine, an endless apron in combination with drums over which said apron travels, a series of separate mechanisms for opening bellows-folded tubes each secured to and moving with the apron, cams for operating said opening device fixed in position and acting on the opening devices as they come by turn into registry therewith and means for delivering tubes to the opening devices arranged at one point on the path traveled by the apron.

20 2. In a paper-bag machine, an endless apron in combination with drums over which said apron travels, a series of separate mechanisms for opening bellows-folded tubes each secured to and moving with the apron, cams for operating said opening devices as they come by turn into registry therewith, stationary folders as N N arranged to flatten the opened ends of the tubes as they pass, and means for delivering tubes to the opening devices arranged at one point on the path traveled by the apron.

30 3. In a paper-bag machine, a revolving supporting-surface moving constantly in one direction in combination with a series of sets of folding-blades pivotally secured to said

surface so as to be oscillatable on its face, one 35 or more levers as I I' arranged to operate the movable folding-blades of each set, fixed cams arranged to operate each set of folding-blades in turn to move them to and from a position to engage a blank, other fixed cams arranged 40 to engage and operate the levers as I I' also in turn and after the set of blades to which they belong has been brought to operative position by the first cams, and means for delivering tubes to the supporting-surface afore- 45 said so as to bring each tube under the action of a separate set of folding-blades.

4. In a paper-bag machine, an endless apron as D D' having a series of nippers, as E, at intervals to engage tubes in combination with 50 a corresponding series of folding-plate frames F' F² pivoted as at F F, &c., on the face of the apron, means, as springs F⁸, for holding said frames in a normally-retracted position, cam-standards as F⁴ for moving the frames, the 55 fixed blade G secured to the frame, the movable blades G' G³ secured to a shaft F³ pivoted in said frame, the lever cam-arms I I' secured to said shaft, means, as spring F⁹, for holding blades G' G³ normally closed 60 down over blade G, fixed cams as K, K' K² for operating on the standards F⁴ and fixed cams as L, L', L², L³ L⁴ for acting on the levers I I' substantially as specified.

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Witnesses:

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