

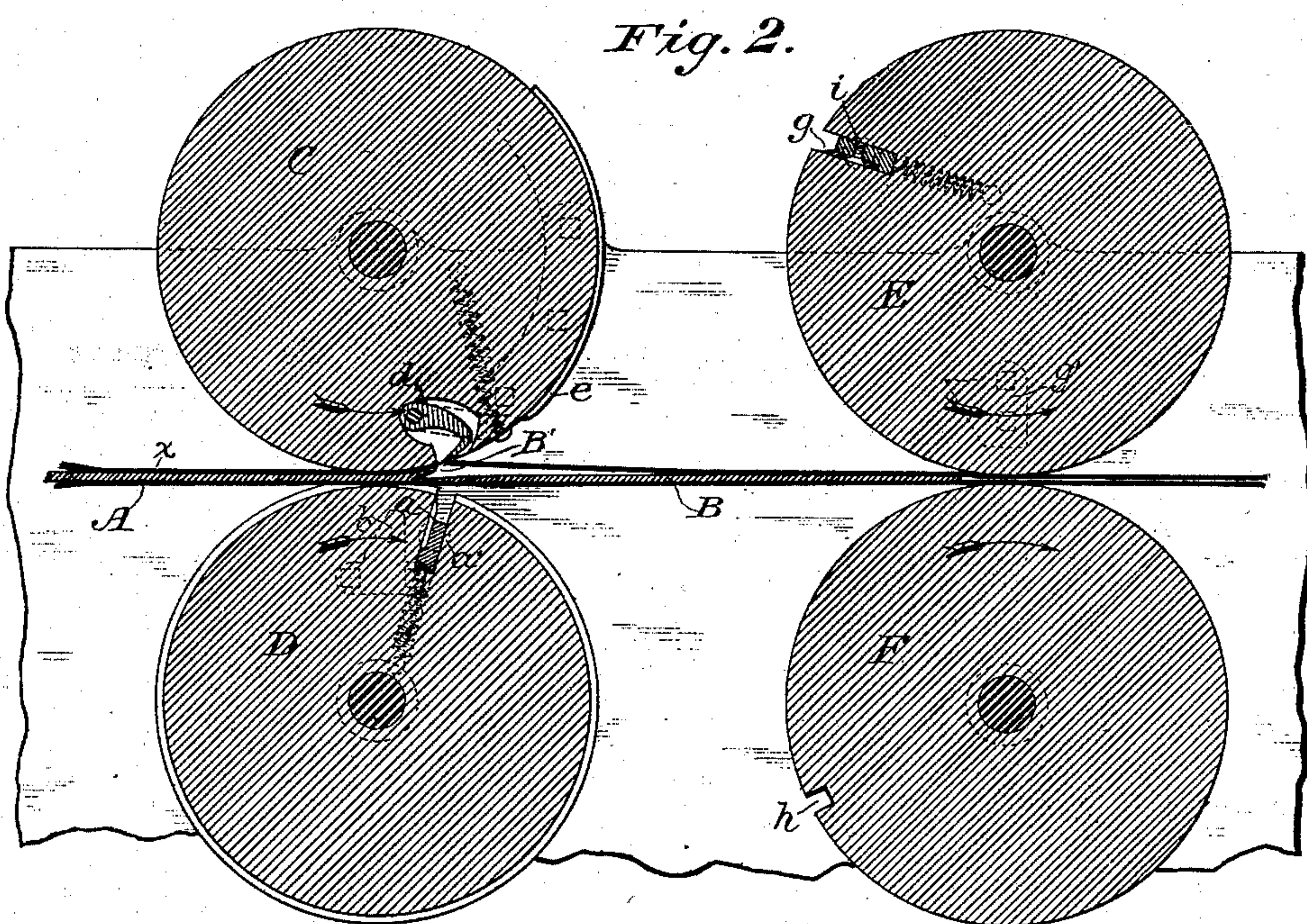
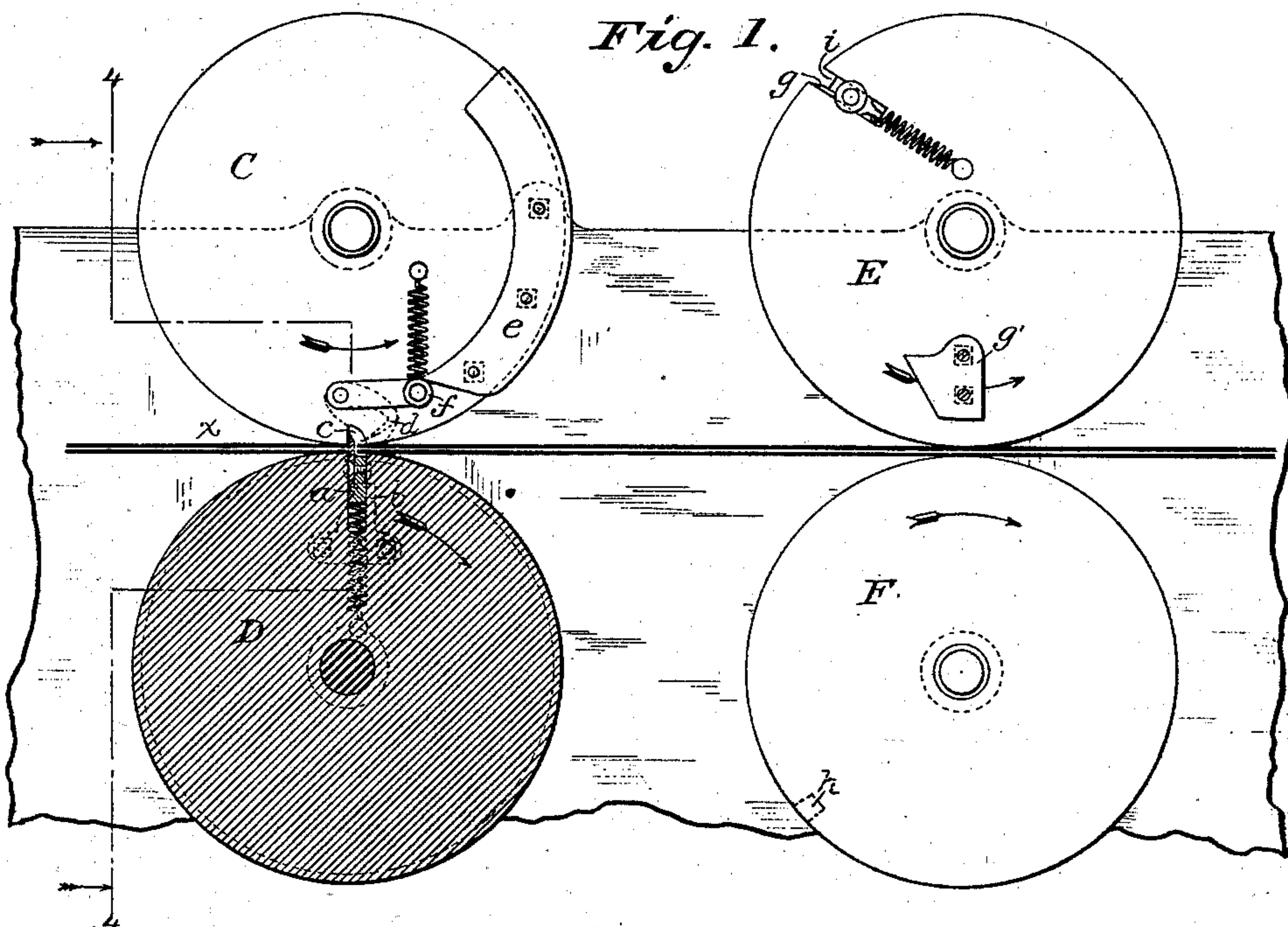
(No Model.)

3 Sheets—Sheet 1.

W. C. CROSS.
PAPER BAG MACHINE.

No. 254,928.

Patented Mar. 14, 1882.



WITNESSES

Wm A. Shinkley.
Geo W. Beck.

INVENTOR

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By his Attorney

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(No Model.)

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Fig. 3.

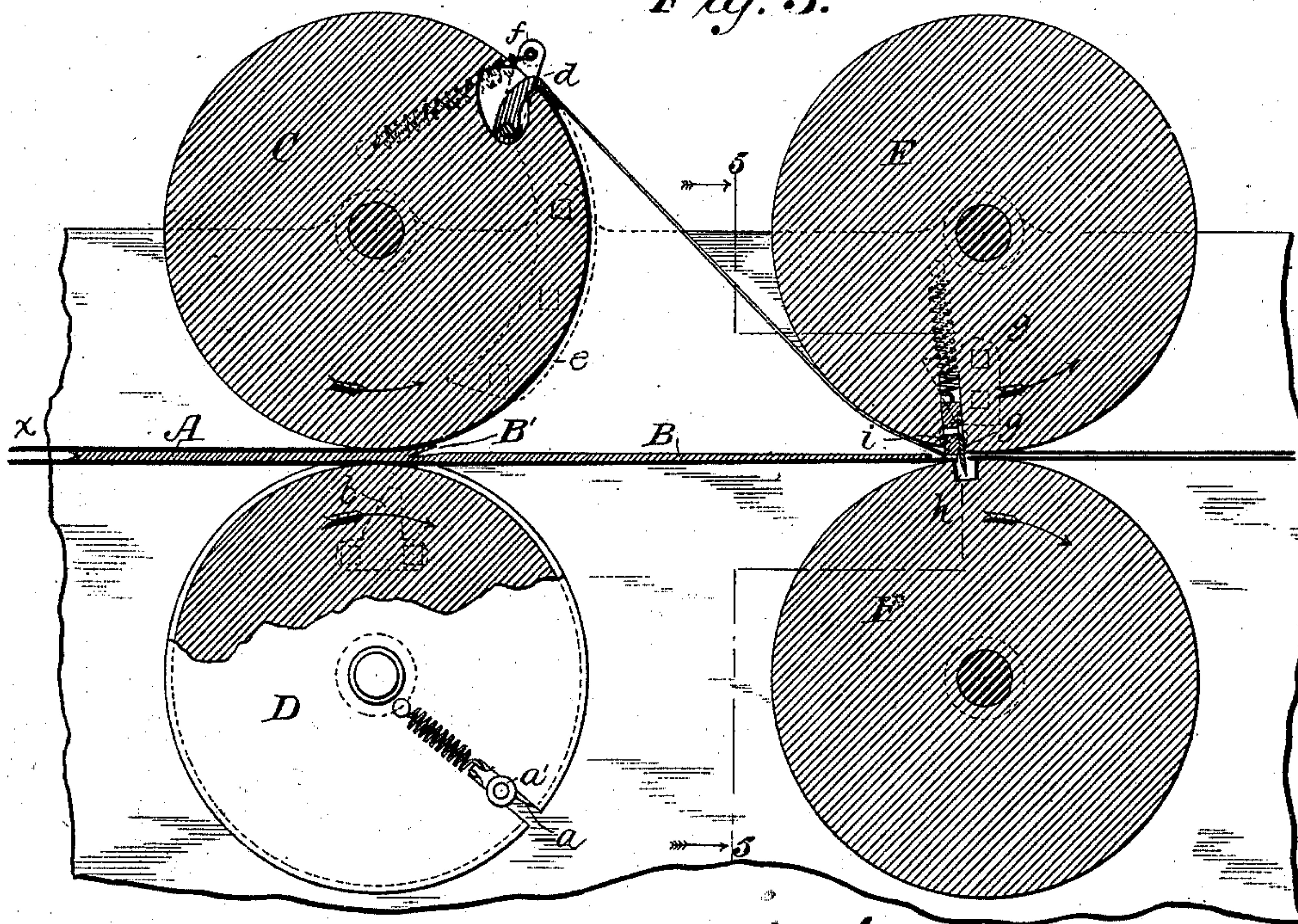
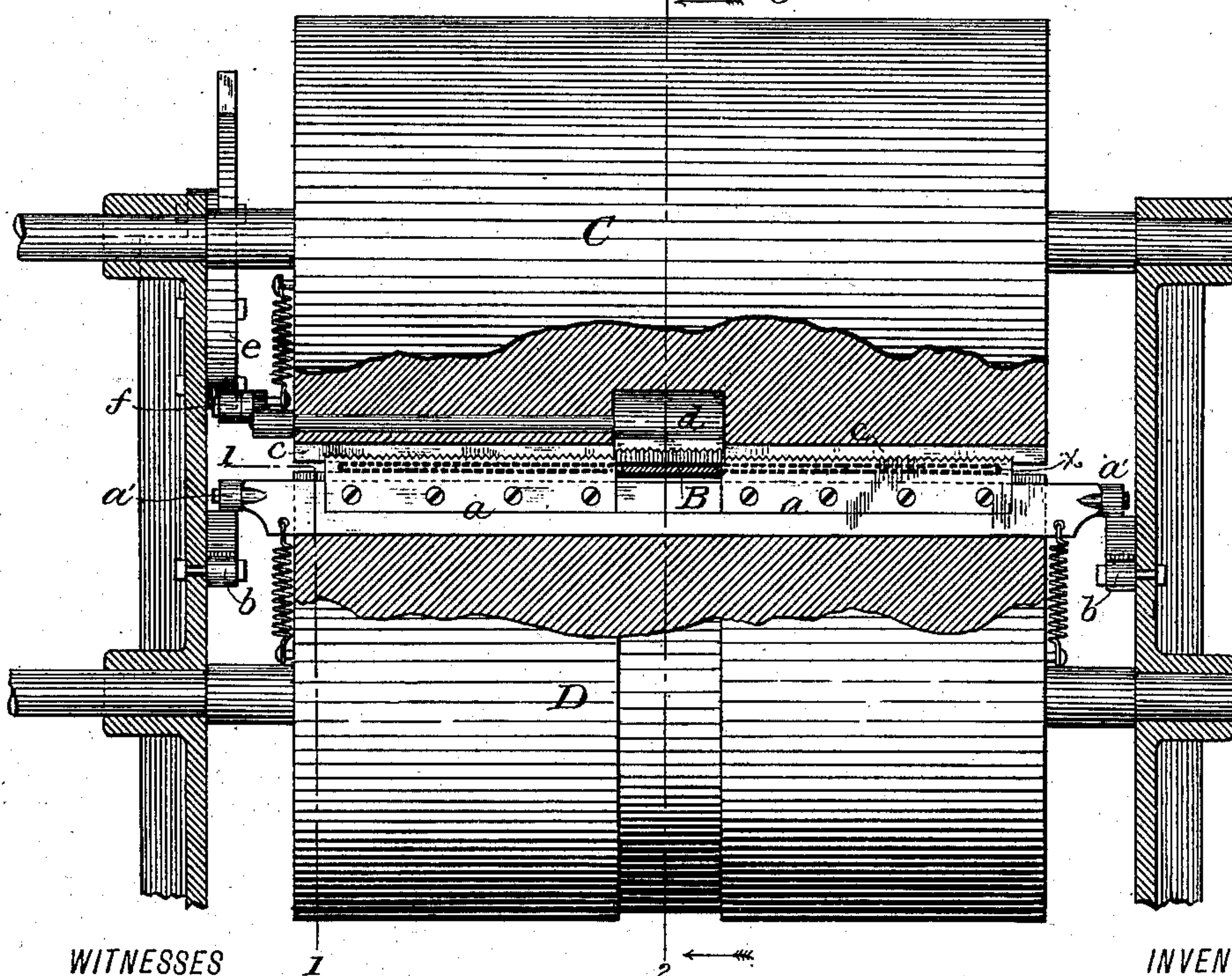


Fig. 4.



WITNESSES

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(No Model.)

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Fig 5

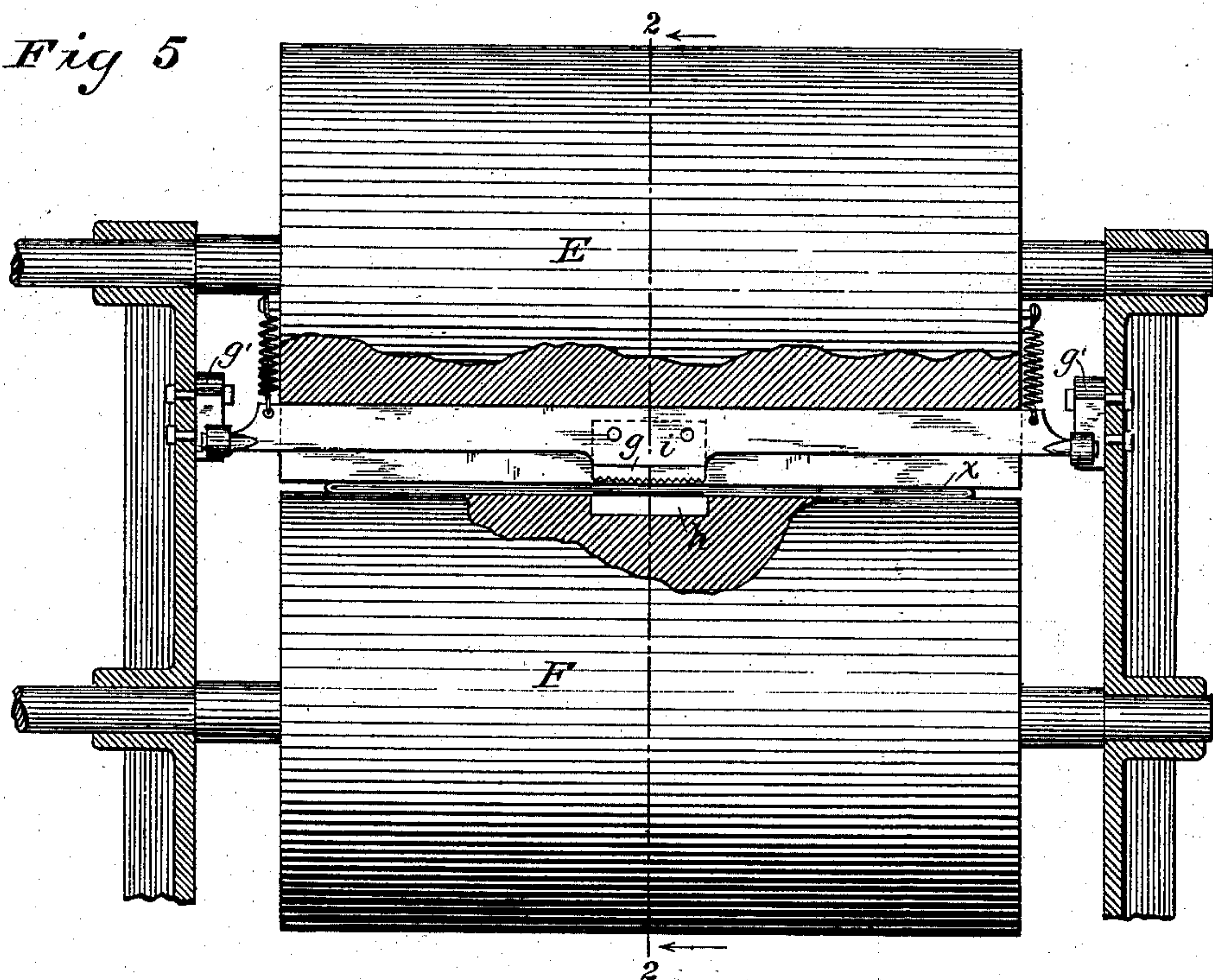


Fig. 6.

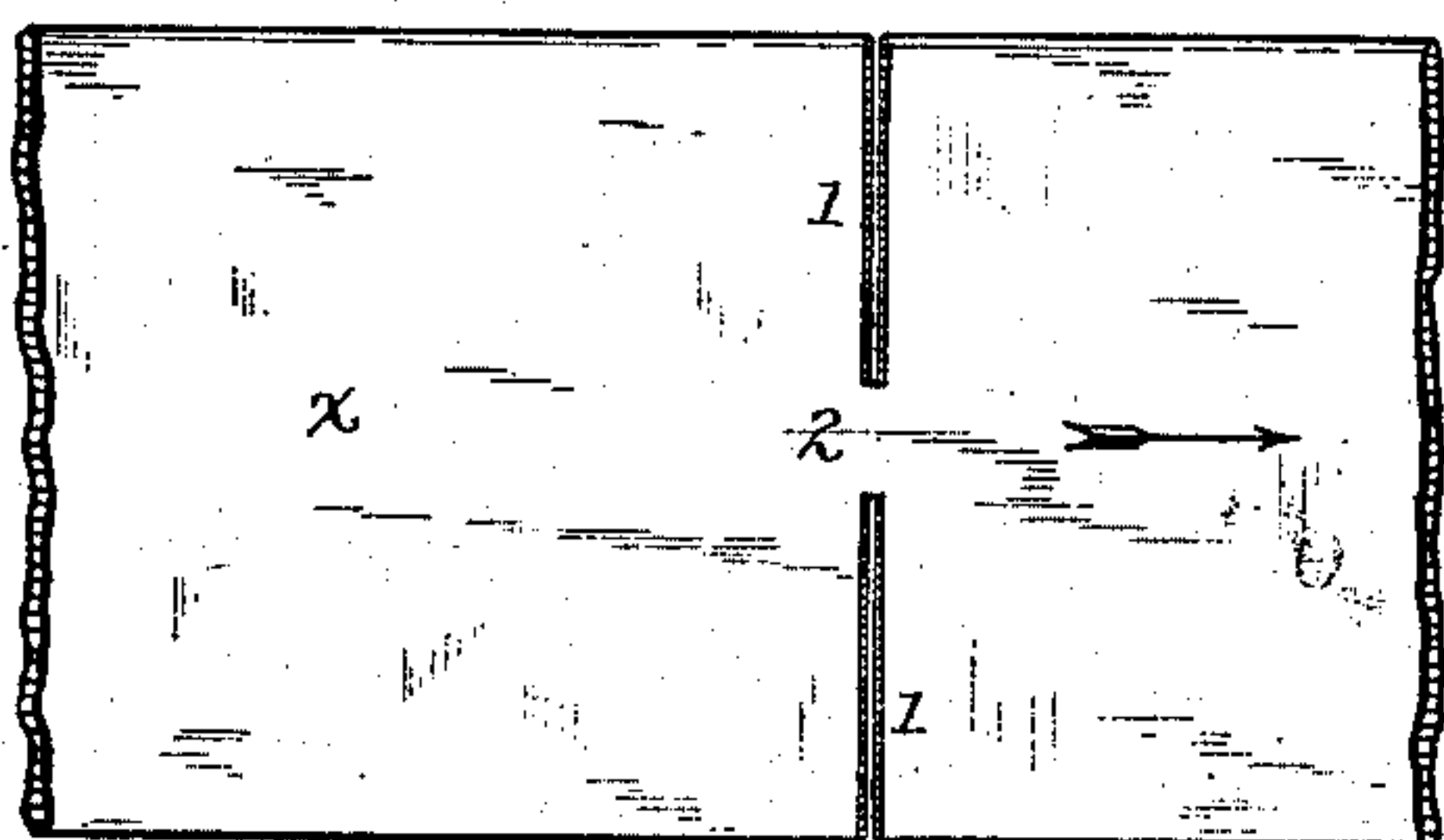


Fig. 7.

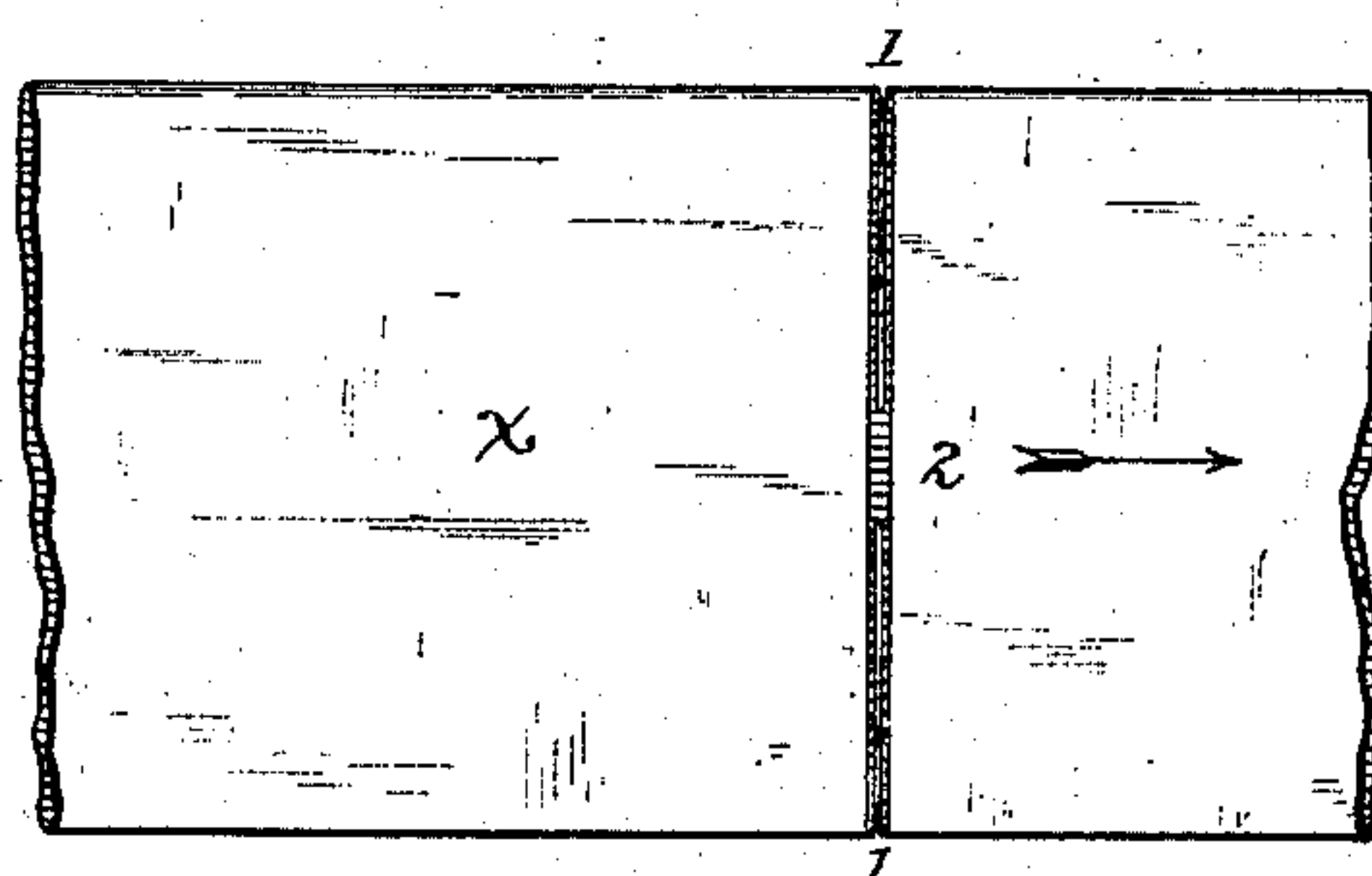
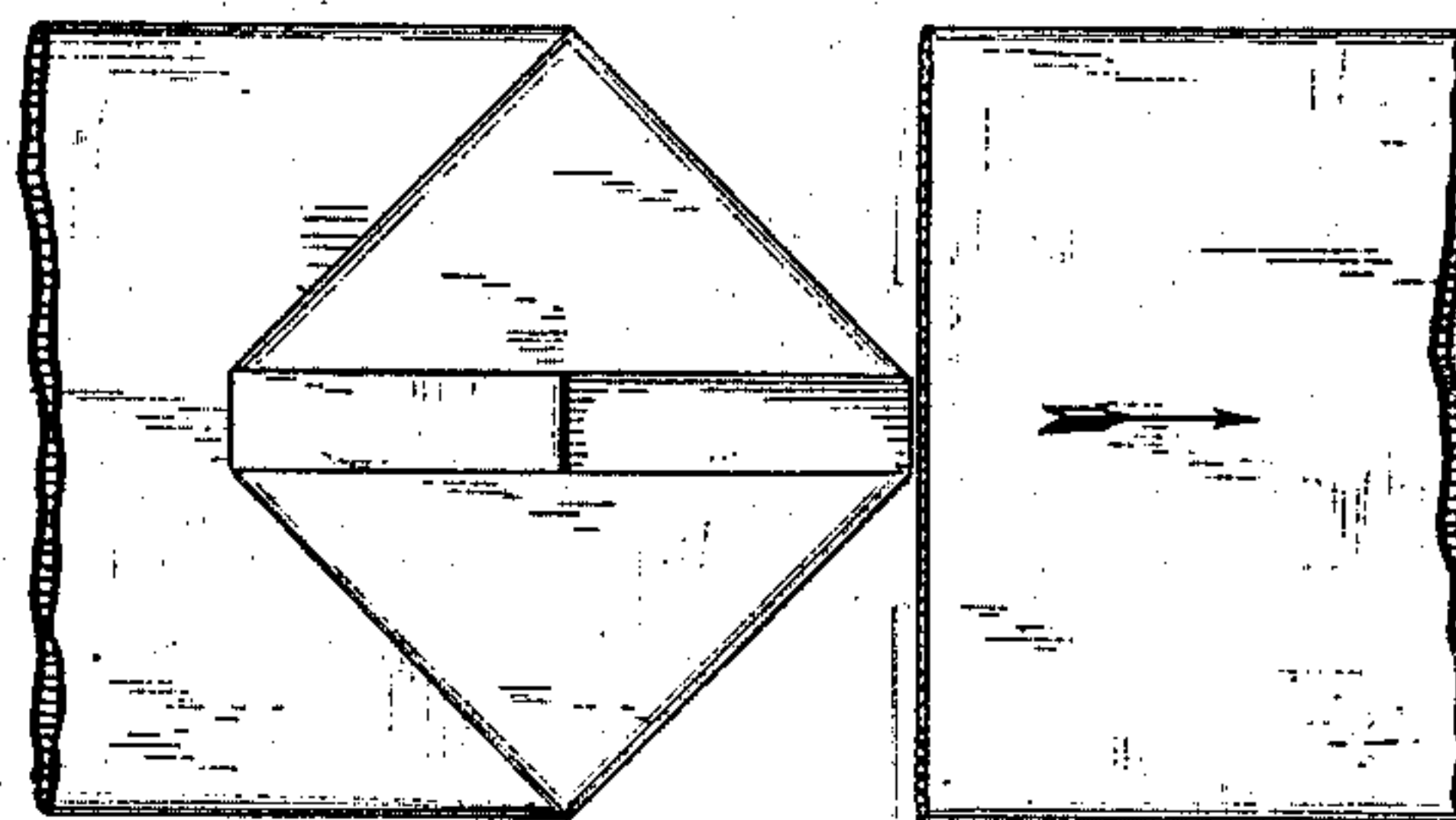


Fig. 8,



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM C. CROSS, OF BOSTON, MASSACHUSETTS.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 254,928, dated March 14, 1882.

Application filed December 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. CROSS, of Boston, Massachusetts, have invented certain new and useful Improvements in Machines for Making Satchel-Bottom Paper Bags, of which the following is a specification.

My invention mainly has reference to the operation of severing the flattened paper tube into bag lengths, and in its preferred embodiment involves the employment of the rotary nipper mechanism for opening the mouth of the blank described in my Letters Patent No. 221,531, of November 11, 1879.

In making the diamond fold in accordance with said Letters Patent it is requisite that that ply of the blank which adjoins the nipper-roll should be at the mouth end, cross-cut or severed at the point where it is to be grasped by the nipper, so as to permit the latter to take hold of the ply and open the mouth of the blank. It is impracticable for this cut to be made by the side slitting or cutting devices carried by the nipper-roll and its fellow roll, inasmuch as the cutter-blade is there placed in such relation to the nipper that it must be notched or cut away at the point where it adjoins the nipper, so as to avoid contact with the guide-bar—a continuation of the trunk or former—over and around which the blank passes. It has therefore been deemed necessary heretofore, in order to slit the ply of the blank at this point, to employ a distinct and separate cutting apparatus placed in or on the trunk or former, and arranged to operate on the mouth end of the blank before the latter reaches the nipper-roll.

In paper-bag machines the various moving parts require to be adjusted relatively to one another with the greatest nicety and precision, in order to obtain a working machine, and the greater the number of parts the greater the difficulty of making and maintaining their proper adjustment. It is therefore particularly desirable in this class of machinery to reduce the number of working parts.

I have found that instead of employing a separate and distinct apparatus for making the transverse slit in the ply next to the nipper-roll, the nipper may be successfully employed to do this work at the time it closes on

the ply. I thus impart to the nipper an added function, and I dispense entirely with the preliminary slit-forming mechanism. It is in this feature that my improvement mainly resides, and I shall now proceed to more particularly describe the same by reference to the accompanying drawings, in which I have represented so much of a satchel-bottom paper-bag machine as is needed for the purpose of explanation.

In the drawings, Figure 1 is a diagrammatic elevation, partly in section, of the nipper-roll and its fellow roll, and the diamond-fold-pressing rolls. Fig. 2 is a vertical central section of said rolls on the line 22, Figs. 4 and 5. Fig. 3 is a like section, (with the lower one of the first pair of rolls partly in elevation,) representing the parts in the position they occupy when the diamond-fold-pressing rolls have made the final cut and the nipper is just quitting its hold on the upper ply. Fig. 4 is a face view, partly in section, on line 44, Fig. 1, of the nipper-roll and its fellow roll. Fig. 5 is a face view, partly in section, on line 55, Fig. 3, of the diamond-fold-pressing rolls. Fig. 6 represents the adjoining ends of two blanks after the side slits have been made. Fig. 7 represents the same after the nipper has severed the central part of the upper ply. Fig. 8 represents the same after the two blanks have been completely severed and the diamond fold of the rear blank subsequently laid.

A is the trunk of the former, and B the guide-rod extending out in front of the same, so as to pass between and beyond the meeting point of the nipper cylinder or roll C and its fellow roll D. In the latter roll is the reciprocatory sliding cutter-blade *a*, for making the side transverse slits, which is kept within the roll by a spring or springs in the usual way, and is forced out, so as to protrude from the roll, by a stationary cam or knocker, *b*, fixed to the machine-frame at each side, which, at the proper time during each revolution of the roll, acts on a stud or roller, *a'*, attached to the blade at each end and projecting from the ends of the roll. The cutter, when protruded from the roll, enters a recess, *c*, in the nipper-cylinder, and cuts through both plies of the flattened tubular paper blank *x*, except at the point where

the guide rod or bar B is situated, forming the side slits, 1, Fig. 6.

The vibratory nipper *d* is spring-controlled, and is actuated to close against the stress of its spring by a stationary cam, *e*, fixed to the frame of the machine, with which a roller-stud, *f*, on a crank-arm fixed to the rocking nipper-shaft is caused at a similar time during each revolution of the nipper-cylinder to come in contact.

In the parts thus far described there is no novelty. They are organized and timed in their movements relatively to one another in the same manner and for the same purpose as described in my aforesaid Letters Patent.

The guide-bar B extends up to within a suitable distance of the diamond-fold-pressing rolls E F, and has at a proper point on its face which adjoins the nipper-roll a projection or raised strip or blade-like protuberance, B', which acts to hold up the tubular paper blank that adjoins the nipper-cylinder away from the body of the guide-bar. This projecting part may, if desired, be made so as to be slightly springy at its free end.

The nipper *d* has a sharp serrated edge, as represented, and is so positioned that when it is closed by means of the cam *e* it will strike the central uncut part of the upper ply forcibly at a point just in advance of the part B', which latter will co-operate with it to sever the said part of that ply. The nipper thus acts first, as indicated in Fig. 2, to sever the ply at the point 2, Figs. 6 and 7, and then to enter the mouth of the blank at this point, and clamp the ply upon the cylinder C and pull back the ply, as indicated in Fig. 3, and as described in my aforesaid Letters Patent. Inasmuch as the cylinder C is in continuous rotation and the blank is continuously moving forward, the nipper, after it strikes the ply, will be carried around far enough by the moving cylinder to be out of the way of the end of the guide-bar before it clamps the upper ply on the cylinder, so that the nipper and guide-bar will not interfere. The central part of the under ply is still uncut, and the blank in front is in the bite of the rolls E F, which, after the upper ply of the blank is pulled back and released, press down and form the diamond fold, the upper ply being for that purpose released at the proper time from the hold of the nipper.

The rolls E F, which form and press the diamond fold of the blank, acted on by the nipper-cylinder and its fellow roll, also carry the cutting mechanism which severs the uncut central part of the under ply that connects the blank with the one in front. This cutting mechanism is a sliding reciprocatory spring-controlled blade, *g*, carried by one roll and a recess, *h*, in the other roll, the blade being operated at the proper time by knockers *g'*, which act against the stress of the spring or springs to protrude the blade.

It will be noticed that the knockers *g'* are so placed that the blade makes and completes the

cut which severs the connection between the two blanks before the point of the blank in rear is in the bite of the rolls E F. The diamond fold is not made before the blank passes between the rolls E F. In fact, if the blank be taken from the machine after the final dividing-cut by the blade *g*, but before entering the bite of the rolls, it will be found to be a mere flattened tube, without creases indicative of the diamond fold. Thus the blank is completely severed from the one in front before the diamond fold commences to be laid and before it is in the bite of the rolls. Practically, however, no difficulty is experienced on this account. When the machine is running at normal rate the speed at which the blanks travel is such that the point of the blank in rear, although disconnected from the blank in front, will be carried unerringly into the bite of the rolls E F. If desired, however, provision may be made for carrying by positive means the point of the under ply into the bite of the diamond-fold-forming rolls. Such a provision is illustrated in the drawings, consisting of a presser foot or block, *i*, carried by the blade *g* upon its rear face. When the blade makes the cut the presser *i* clamps the end of the ply upon the roll F, as indicated in Fig. 3, and the knockers or cams *g'* are so shaped as to hold the presser down until the blank enters the bite of the rolls. The presser may, if desired, be made elastic or yielding, so as to conform to inequalities in the material operated on. The rolls E F, as before said, lay and complete the diamond fold, as indicated in Fig. 8, and the diamond-folded blank from these rolls passes to mechanism by which lines of paste are laid on the diamond fold and the end flaps of the latter are folded over to make the usual satchel bottom.

The rolls C D E F move in unison or at the same peripheral speed, and are driven positively by suitable gearing. I have, however, omitted to represent their driving-gear, in order not to obscure those parts in which my improvement is comprised; nor have I deemed it necessary to represent the means for forming and pasting the continuously-moving flattened paper tube from which the blanks are successively cut by the mechanism herein described. These means are well known to those acquainted with the art to which my invention pertains, and require no description here.

I remark, in conclusion, that it is not indispensable to extend the guide-bar up to a point near the rolls E F. The bar may stop short a little beyond the bite of rolls C D—as, for instance, at the point where the projecting front edge of B' is situated. The end of the bar, in this case, may be curved or shaped to raise the upper ply from the lower one sufficiently to enable the nipper to make the cut, and this portion of the bar may also, if desired, be made slightly yielding or elastic.

What I claim as of my own invention is—

1. In combination with the guide-bar, the rotating nipper-cylinder, and the intermittently-

moving vibratory nipper carried by the same, adapted and arranged, substantially as hereinbefore set forth, to sever or cross-cut the adjoining ply of the blank at the point where said nipper subsequently takes hold of that ply in the operation of opening the mouth of the blank for the formation of the diamond fold.

2. The combination of the guide-bar, the vibratory nipper arranged and adapted, substantially as described, both to cross-cut at the mouth end of the blank that portion of the adjoining ply opposite to it and to take hold of the part of the ply thus cut, the rotating nipper-carrying cylinder or roll, its rotating fellow roll, and the cutting mechanism carried by the same, the combination being and acting substantially as hereinbefore set forth.

3. The rotating diamond-fold forming or laying and pressing rolls and cutting mechanism carried by the same, arranged and operated, substantially as hereinbefore set forth, to make the final cut which separates the blanks from one another before the blank in rear enters the bite of said rolls, in combination with mechanism, substantially as described, for opening the mouth of the blank and presenting it to said rolls, the combination being and acting substantially as set forth.

4. The rotating diamond-fold forming or laying and pressing rolls, the cutting mechanism carried by the same, arranged and operated to make the final cut which severs the blanks from one another at the times specified, and the presser, in combination with mechanism, substantially as described, for opening the mouth of the blank and presenting it to said rolls, the combination being and acting substantially as set forth.

5. The guide-bar, the rotating nipper-cylinder and its fellow roll, the blank-cutting mechanism, and the vibratory nipper arranged and operating both to cross-cut and to grasp the central part of the adjoining ply at the times and in the manner substantially as specified, in combination with the rotating diamond-fold pressing rolls and the final-cutting mechanism carried by the same, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 9th day of November, 1881.

WILLIAM C. CROSS.

Witnesses:

ELIHU G. LOOMIS,
GEO. W. MORSE.