

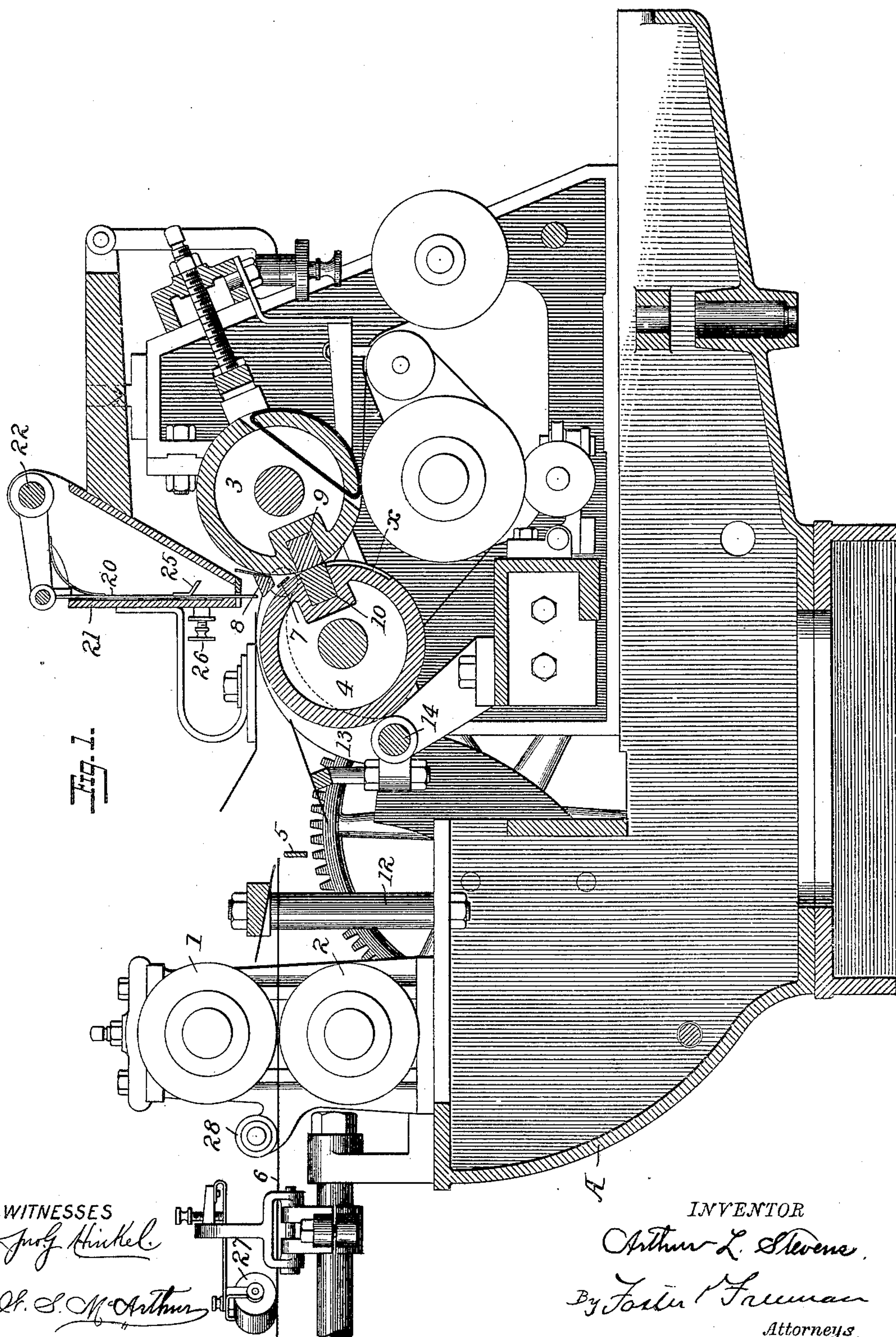
(No Model.)

3 Sheets—Sheet 1.

A. L. STEVENS.  
PAPER BAG MACHINE.

No. 467,776.

Patented Jan. 26, 1892.



WITNESSES

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Prof. Hinkel

L. S. McArthur

INVENTOR

Arthur L. Stevens

By Foster Freeman

*Attorneys.*

(No Model.)

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Fig. 2.

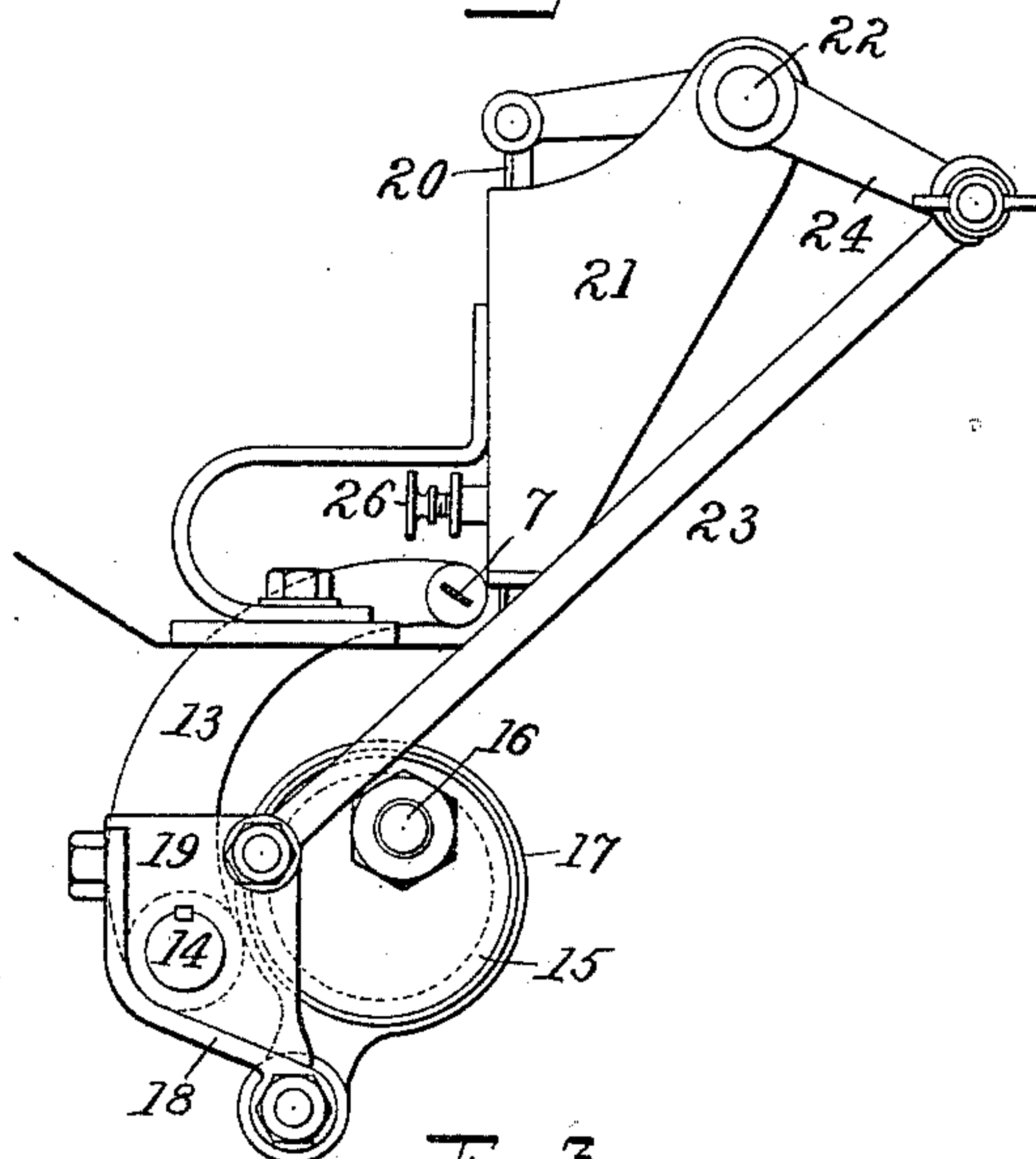
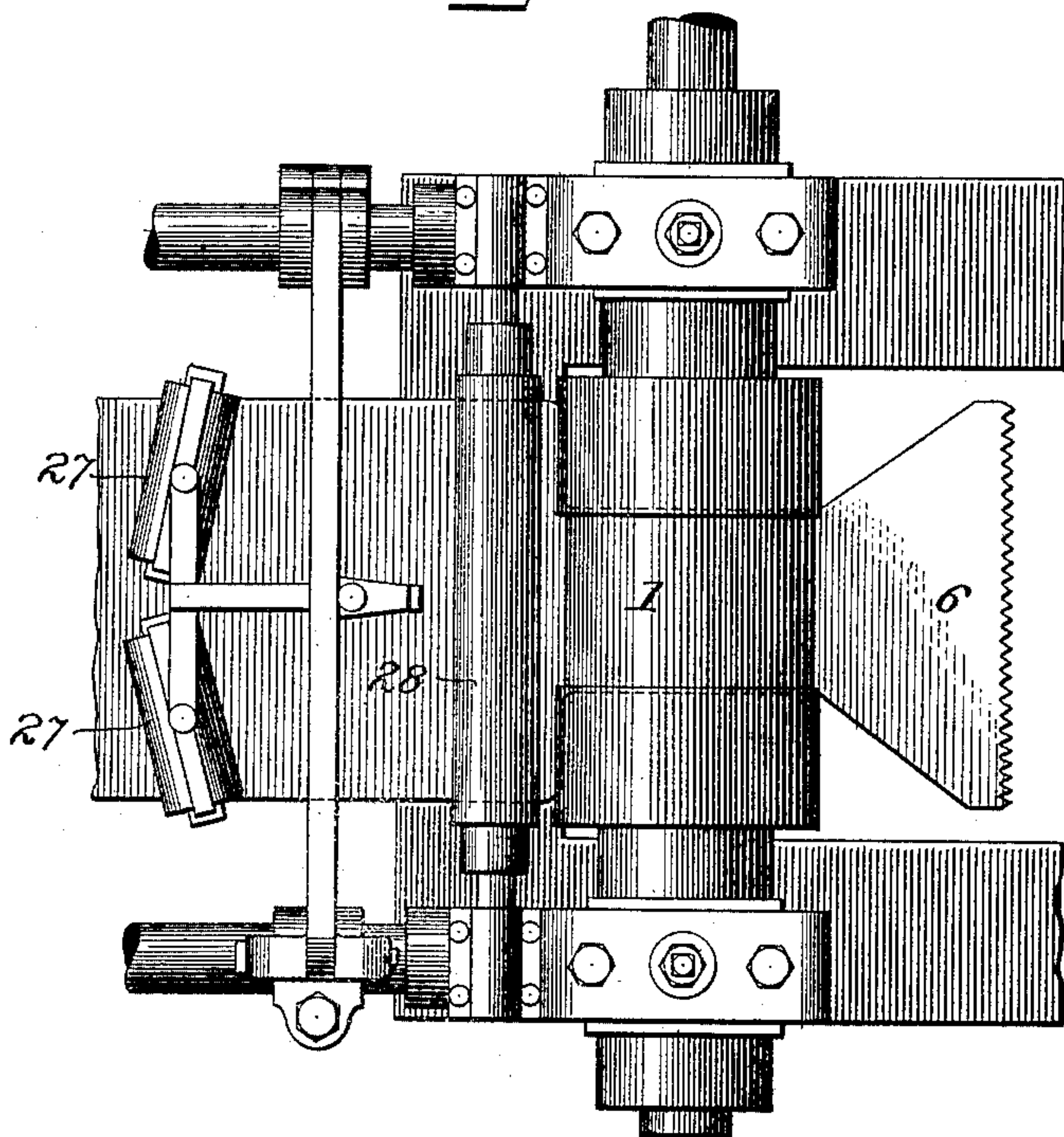


Fig. 3.



WITNESSES

*Geo. G. Hinkel*  
*Ch. S. McArthur*

INVENTOR

*Arthur L. Stevens*  
By *Foster Freeman*  
Attorneys



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Fig. 4.

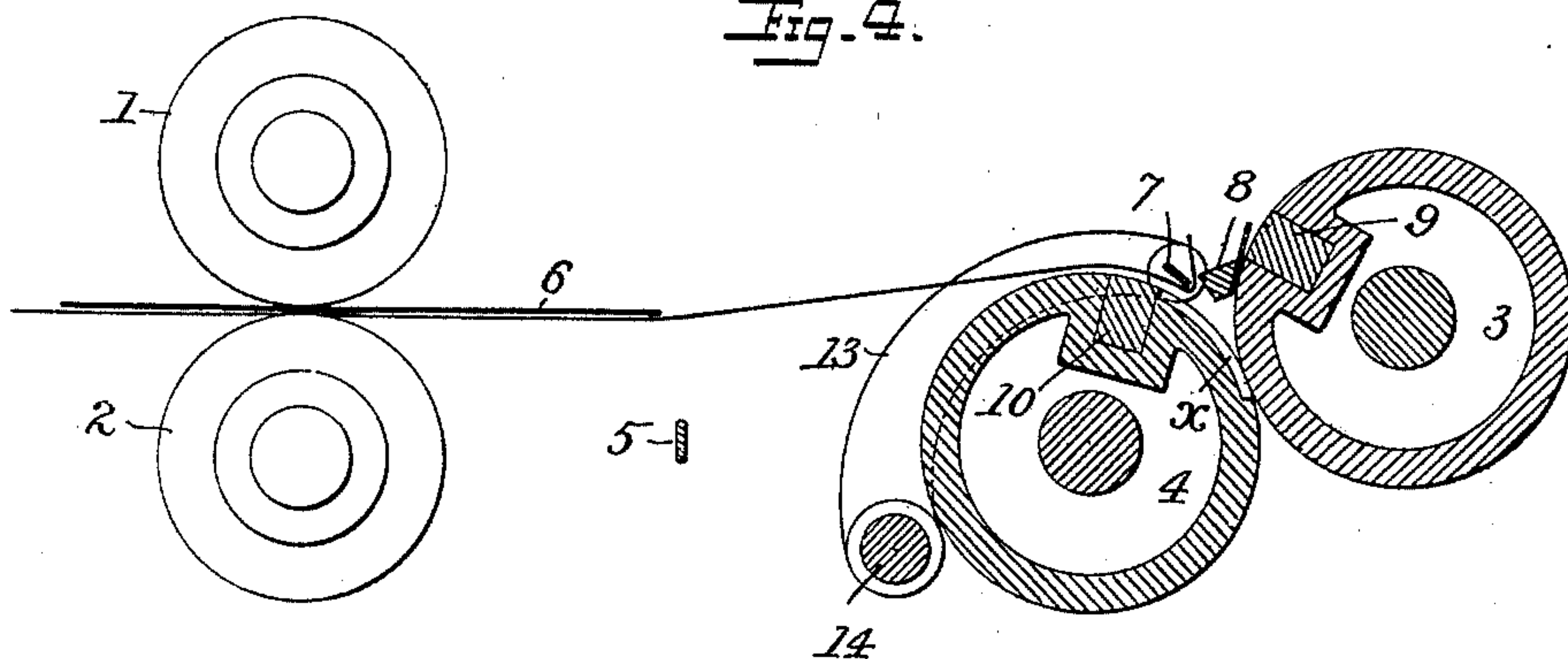


Fig. 5.

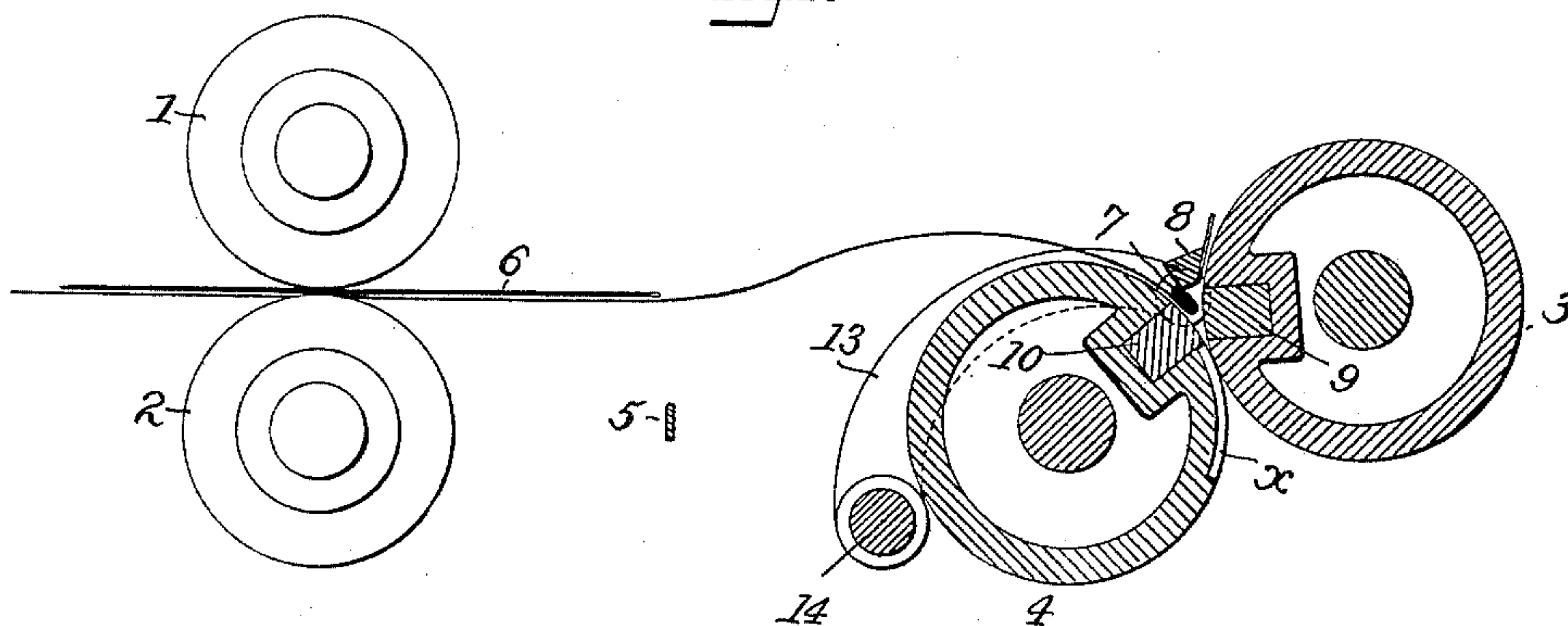
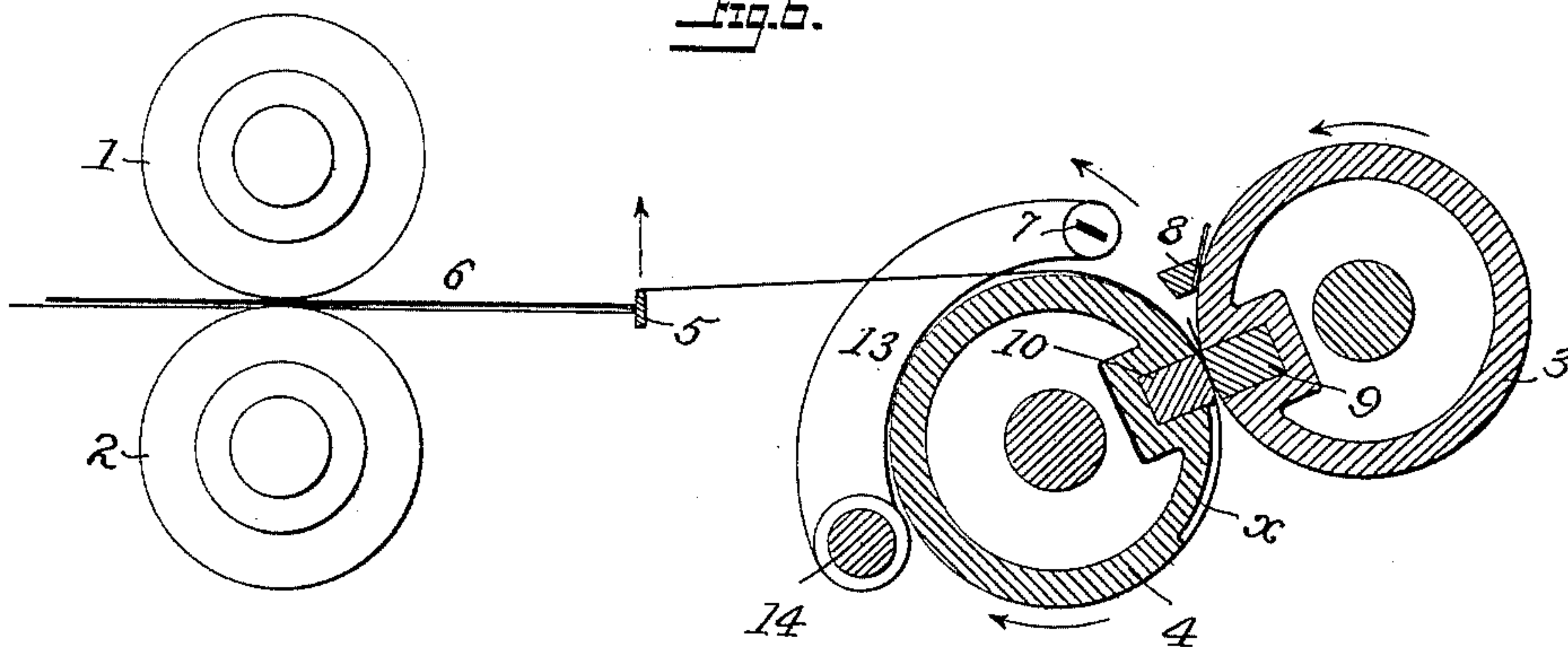


Fig. 5.



WITNESSES

*Geo. G. Hinkel*  
*W. S. McArthur*

INVENTOR

*Arthur L. Stevens*  
By *Foster Freeman*  
Attorneys.



# UNITED STATES PATENT OFFICE.

ARTHUR L. STEVENS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE  
DIAMOND PAPER BAG COMPANY, OF WILMINGTON, DELAWARE.

## PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,776, dated January 26, 1892.

Application filed December 4, 1890. Serial No. 373,569. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR L. STEVENS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

My invention relates to that class of paper-bag machines in which a strip of traveling paper is pasted into a tube, which is severed to form bag lengths or sections, the ends of which are folded and pasted to form bottoms; and my invention consists of means fully set forth hereinafter for preventing the improper tearing of the paper, for properly applying the paste, and for generally increasing the efficiency of the machine.

In the accompanying drawings, Figure 1 is a sectional elevation of sufficient of a paper-bag machine to illustrate my improvement. Fig. 2 is a detached view of the folder-blade-operating devices. Fig. 3 is a detached plan showing the arrangement of rollers for drawing and smoothing the tube. Figs. 4, 5, and 6 are diagrammatic views illustrating the operations in connection with the forming of the bottom and severing the tube.

In the manufacture of paper bags it is common to sever a continuously-traveling tubular strip by means of a rapidly-moving knife or breaker, which acts upon the strip at the time the opposite end thereof is being folded to form the bottom of the bag. It has been found necessary to tear or cut the strip while the same is slackened to a slight extent, inasmuch as the blow of the knife or breaker when the paper is taut almost invariably results in tearing the paper elsewhere than along the line on which it should be severed. For this reason various appliances have been devised for feeding the paper to afford the requisite amount of slack; but such appliances have generally proved objectionable from their perplexity or the necessity of driving the feeding-rolls at variable speed, and for other reasons. To avoid these objections, I drive the feeding-rolls and the bottoming-rolls without any variation of speed, so that there are no irregular movements either in the feed of the tube or in the rotation of any of the shafts;

but in order to afford the requisite slack I retard the movement of the free end of the tube prior to severing the tube, whereby the feed-rolls feed the tube faster than the folded end is traveling, so that at the time the end of the tube is gripped to form the bottom there is sufficient slack to permit the severing devices to work properly.

As different means may be employed for folding and holding the end of the tube to prevent its premature presentation to the bottoming-rolls, I have, therefore, in diagrams 4, 5, and 6, illustrated only the main parts, which co-operate to produce the desired results, having in view various forms of actuating devices for operating such parts, some of which will be hereinafter described.

Referring to said diagrams, 1 2 are the feeding-rolls operating at a uniform speed. 3 4 are the bottoming-rolls, the surfaces of which travel at the same speed as those of the feeding-rolls. 5 is the revolving or reciprocating breaker or knife; 6, the stationary tearing-blade, and 7 the reciprocating folding-blade for folding the bottoms of the bag against and beneath a transverse bar 8.

The bottoming-rolls 3 4 are provided with transverse nipper-bars 9 10, of steel or other hard material, which are arranged to coincide as the folded end of the tube is brought to the point where the peripheries of the rolls are in closest proximity. To prevent the premature gripping of the folded ends between the bottoming-rolls, and before the bars 9 and 10 are in desired proximity, the surface of one or both of the rolls forward of the nipper-bar is cut away to leave a recess  $x$  sufficiently deep to prevent the paper from being pinched between the opposite surfaces at this point.

The folding-blade 7 travels in the path between the roll 4 and the bar 8, and upon its downward movement strikes the tube and folds it between the bar and the roll, as shown in Fig. 4, and carries it downward until the folded end is pinched between the bars 9 10, as shown in Fig. 6, after which the rotation of the rolls 3 4 carries the bag forward.

If the blade 7 moved at the same speed as the surface of the roll 4, the tube would be



maintained taut, with the disadvantages before referred to. I therefore impart to the said blade a downward movement so much slower than that of the roll that the folded  
 5 end of the tube is practically retarded, so that the action of the feed-rolls 1 2 thrusts the rear portion of the tube faster than the folded end travels, whereby the intervening portion between the rolls 1 2 and blade 7  
 10 bends slightly or buckles until the folded end is gripped between the bars 8 10, at which instant, and while the tube is still slack, the bar 5 moves rapidly across the edge of the plate 6, severing the tube. Meanwhile the  
 15 blade 7 has risen and another section of the tube moves forward over the roller 4 and bar 8, and the blade 7 again descends, with the same result as before.

Having described the devices that operate  
 20 directly upon the strip or tube and the movements thereof, I will now refer in detail to the appliances employed for imparting these movements and to the coacting parts in a practical working machine.

25 The feeding and bottoming rollers are supported in bearings of a frame A suitably constructed. The blade 6 is supported upon standards 12, and the folder-blade 7 is carried by arms 13 of a rock-shaft 14, rocking in bearings on the frame. The rock-shaft 14 is moved  
 30 by an eccentric 15 upon the shaft 16 of the bottoming-roll 4, a strap 17 around said eccentric being connected with an arm 18 upon the shaft 14. As shown, said arm 18 is in the  
 35 form of a tempered-steel blade bolted at one end to a block 19 on the shaft 14 and having an eye at the opposite end for connecting with the arm of the strap 17. The spring-arm 18 is sufficiently rigid to insure the positive  
 40 movement of the blade 7 under ordinary circumstances, but will yield slightly independently of the shaft 14 in case the movement of the blade is in any way impeded.

The paste is applied transversely to the end  
 45 of the tube by a reciprocating blade 20, sliding through an opening in the bottom of a paste-trough 21 and deriving its movement from a rock-shaft 22, from arms on which the blade 20 is suspended, the said shaft being  
 50 rocked from the rock-shaft 14, through the medium of a rod 23, pivoted to one corner of the block 19 and socketed at the upper end to engage a wrist-pin upon an arm 24, projecting from the shaft 22.

55 The paste in the trough of paper-bag and other machines is apt to thicken if left undisturbed or when the body of the same is not agitated by the action of the pasting-blade. I therefore connect to the blade 20, or  
 60 other movable part of the machine, an agitator 25, in the form of a blade, which moves in and disturbs the body of the paste and thereby maintains it in its fluid condition.

To regulate the amount of paste deposited  
 65 I make the opening in the bottom of the trough sufficiently wide to permit the blade 20 to be moved to and from the inner edge

of said opening and employ devices for setting the blade nearer to or farther from said edge, thereby regulating the width of the  
 70 feed-opening and the amount of paste carried down by the blade. Different adjusting devices may be employed for this purpose—as, for instance, one or more set-screws 26, passing through the face of the trough and bearing  
 75 on the blade.

In machines of this class inclined rolls 27 are arranged to draw in the overlapping side of the strip, forming the tube just before they are pasted together. The action of these  
 80 rolls tends to wrinkle the paper to a slight extent, and I therefore arrange a pressure-roller 28 between the rolls 27 and the feed-rolls 1 2, so as to bear upon the upper portion of the tube as it is fed forward, smooth the  
 85 same, and press out the wrinkles. This roller 28, or the former below the same, is cut away at the center, so that the roller will not bear upon the pasted portion of the sheet and press out the paste.  
 90

It will be seen that the surface of the bottoming-roll 4 is above the plane of the severing-blade 6, so that the tube rises from the blade toward the roll. As a result of this construction when the tube is severed, its cut end  
 95 will be raised to about the plane of the opposite end.

It will be seen that by the use of an eccentric and connections for rocking the shaft of the folding-blade the required variable speed  
 100 may be imparted to the latter, inasmuch as when the eccentric approaches the position shown in Fig. 2 the speed of the blade is gradually reduced to produce the effect required.  
 105

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination, with the feed-roll and severing devices of a paper-bag machine, of  
 110 bottoming-rolls traveling at a uniform rate of speed and means for retarding the presentation of the forward end of the bag-tube to the bottoming-rolls, substantially as set forth.

2. The combination, with the feed-rolls and  
 115 bottoming-rolls and severing devices, of a folding-blade for presenting the end of the bag to the bottoming-rolls and means for moving the said blade at a speed less than that of the bottoming-rolls, substantially as set forth.  
 120

3. The combination, in a paper-bag machine, of feed-rolls and bottoming-rolls and means for driving them continuously at the same speed, severing devices, and a folder-blade, and means for moving it at a speed less  
 125 than that of the feed-roll, substantially as set forth.

4. The combination, with the bottoming devices, paste-trough, and reciprocating paster-blade, of an agitator carried by said blade,  
 130 substantially as described.

5. The combination of the bottoming-rolls, blade 7, and rock-shaft carrying said blade, paster-trough, paster-blade 20, and rock-shaft



carrying the same, and rod 23, connecting arms on the two rock-shafts, substantially as set forth.

5 6. The combination of the paster-trough, reciprocating blade moving through a slot in said trough, and adjusting devices for varying the position of the blade in the slot, substantially as described.

10 7. In combination with the paste-trough, a reciprocating blade extending through a slot in the bottom thereof, and a set screw or screws acting on said blade to vary the position thereof in the trough, substantially as described.

8. The combination of the rock-shaft carrying the folding-blade, a block secured to the shaft, a spring-arm secured to the block at one end and having an eye at the other end, an eccentric, and a strap thereon connected to said eye, substantially as described. 15 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR L. STEVENS.

Witnesses:

MINOR HARVEY,

FRANK R. STEVENSON.