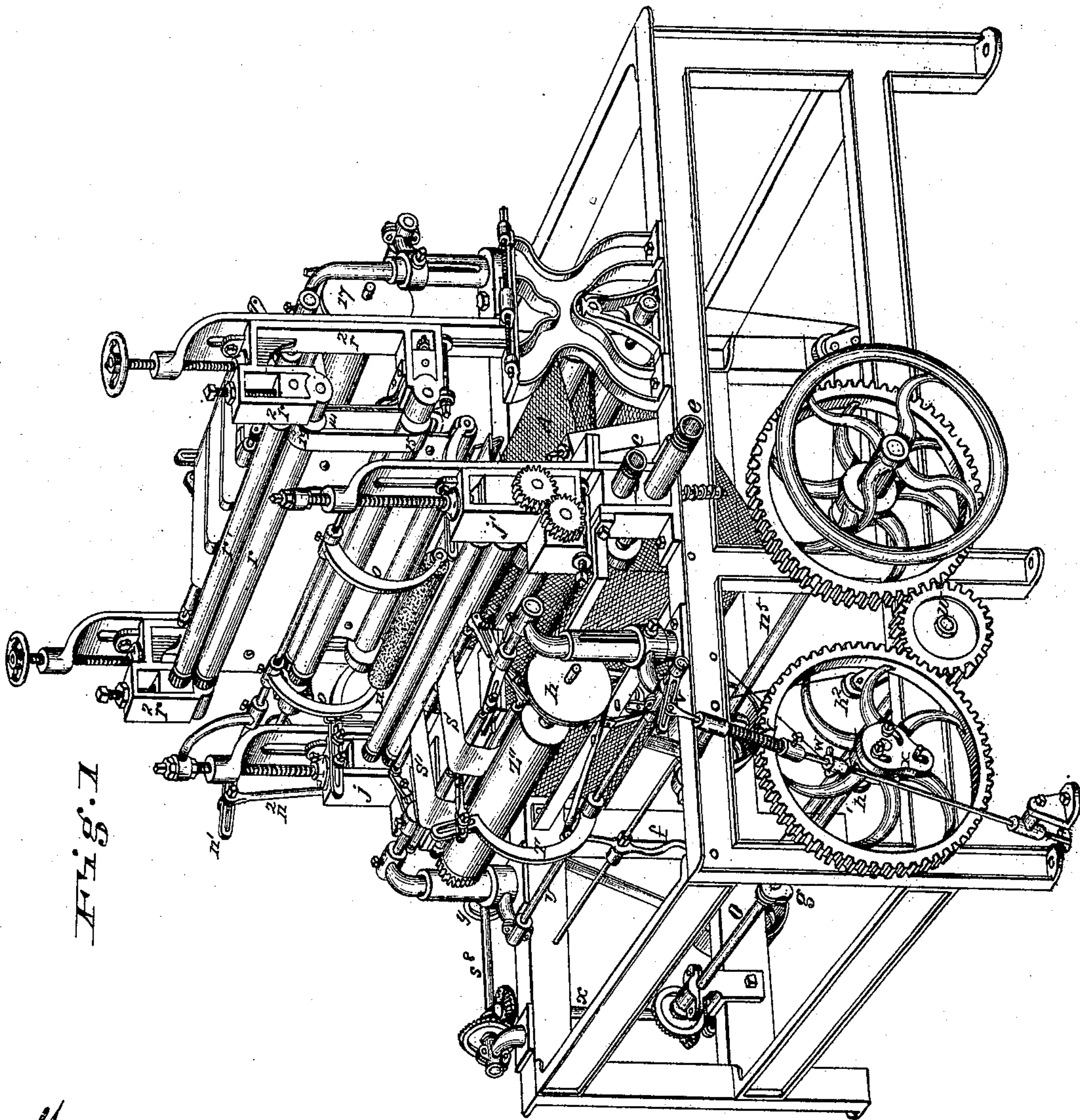


5 Sheets—Sheet 1.

J. S. OSTRANDER.
PAPER-BAG MACHINE.

No. 175,576.

Patented April 4, 1876.



Attest

John E. Jones

Edgar J. Cross

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By J. Millward

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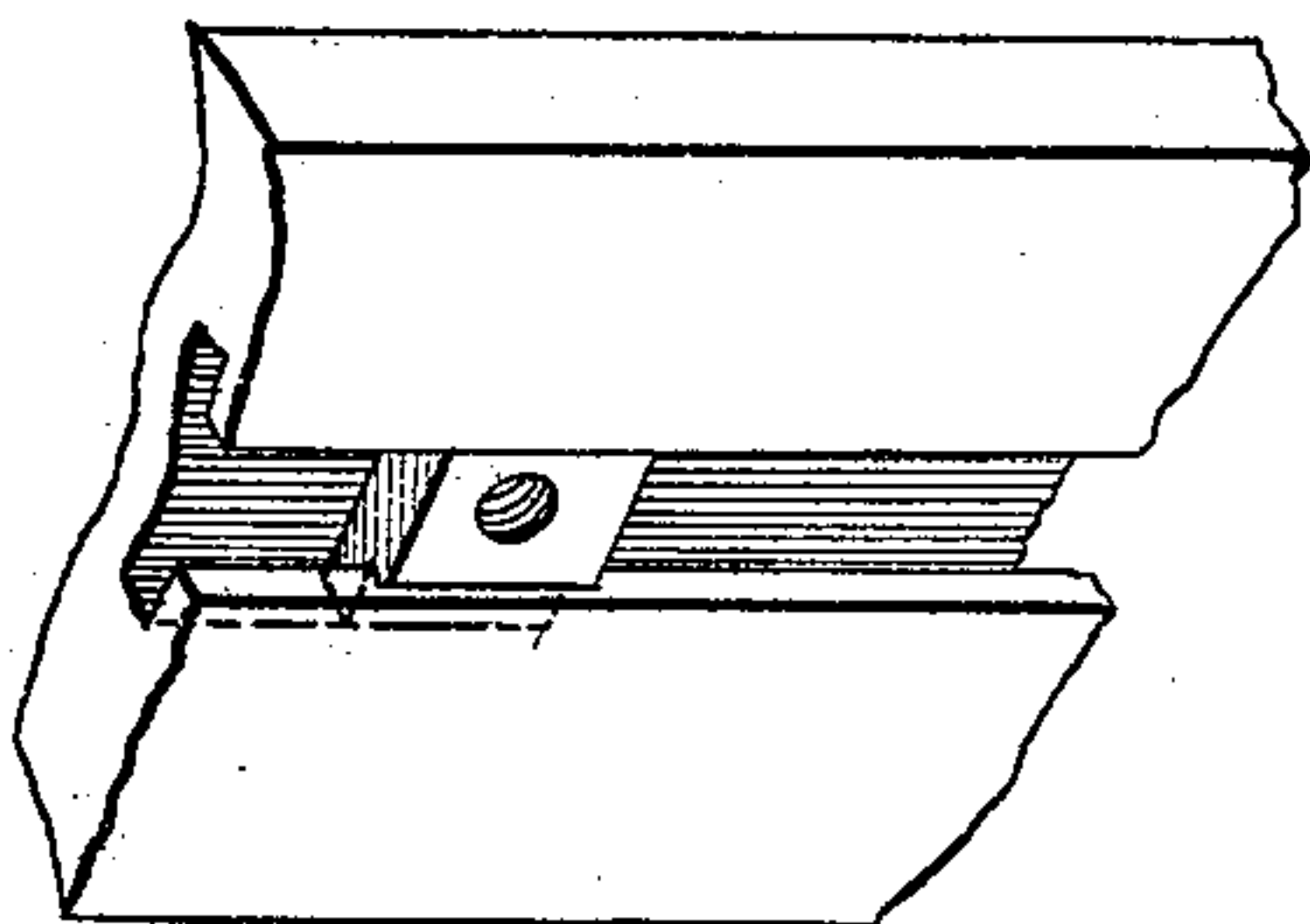


Fig. 4

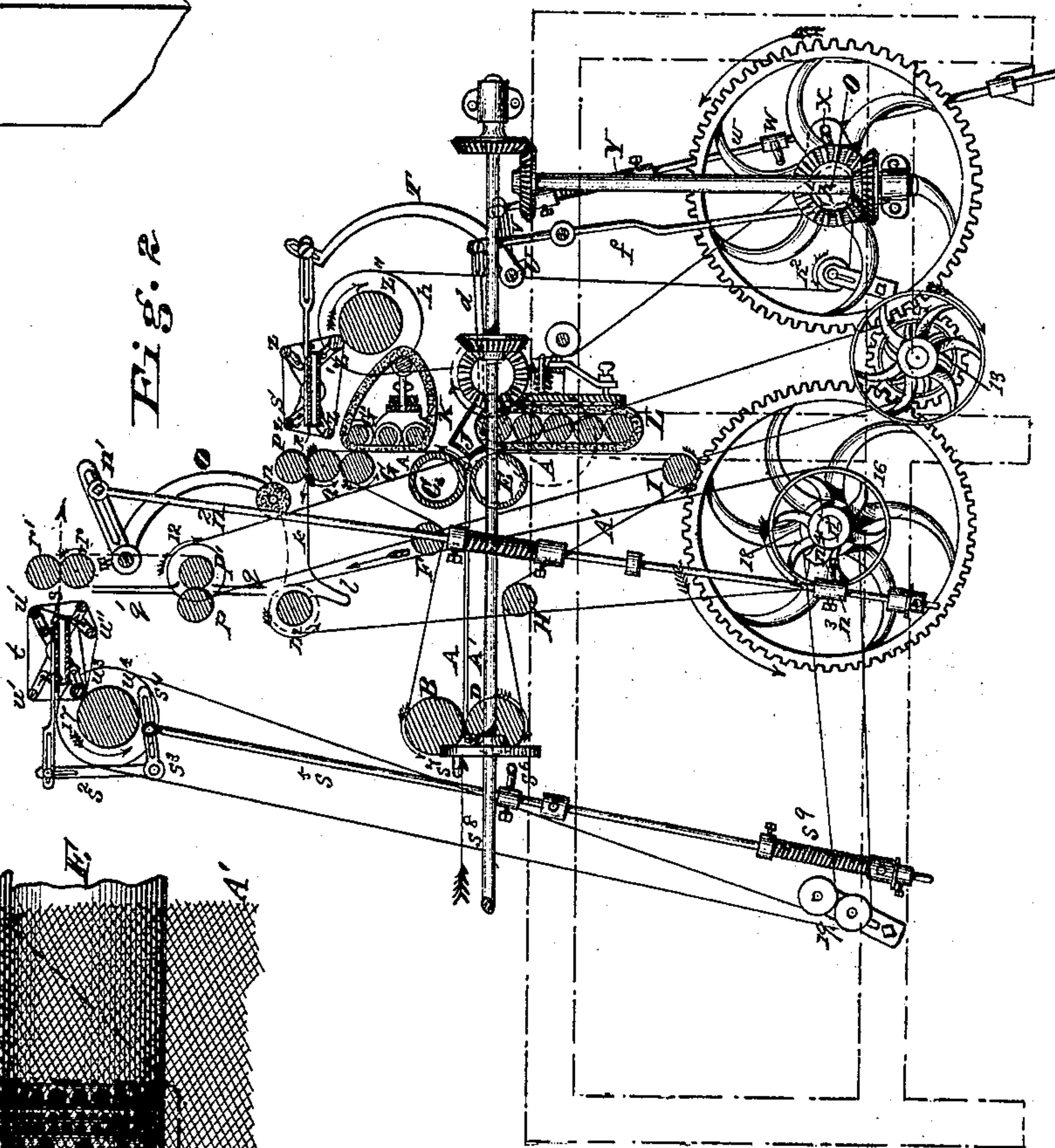
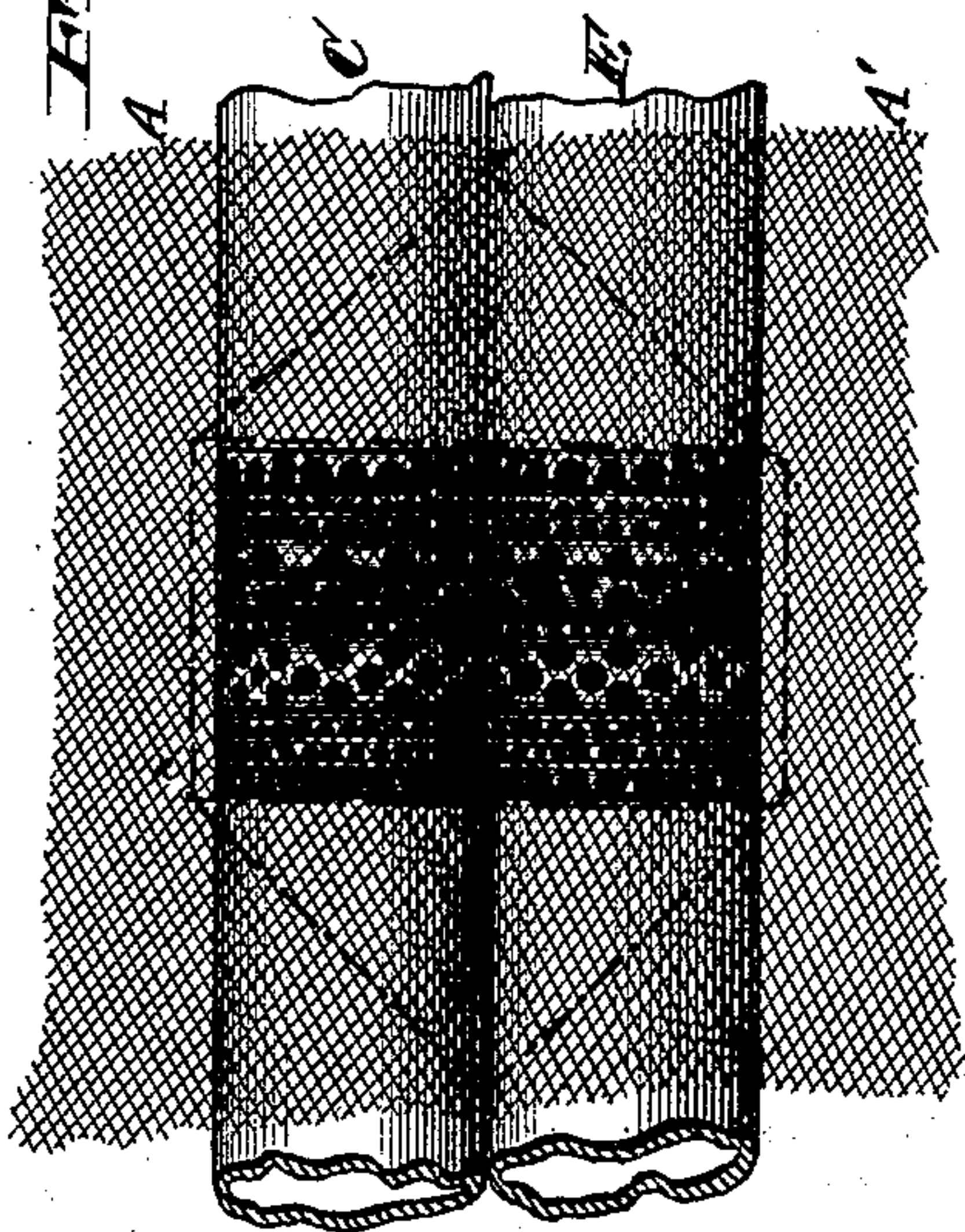


Fig. 2

Fig. 3



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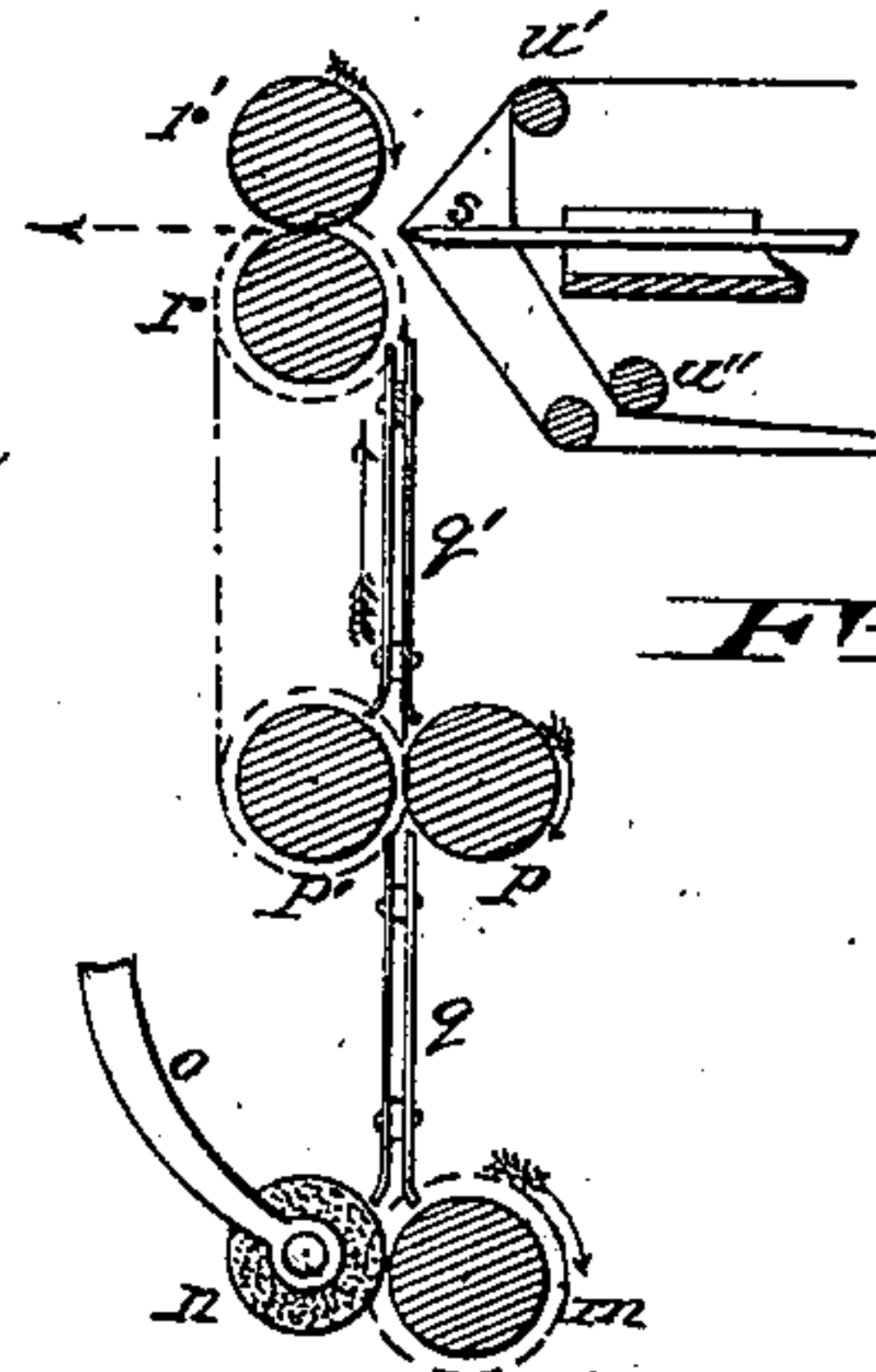
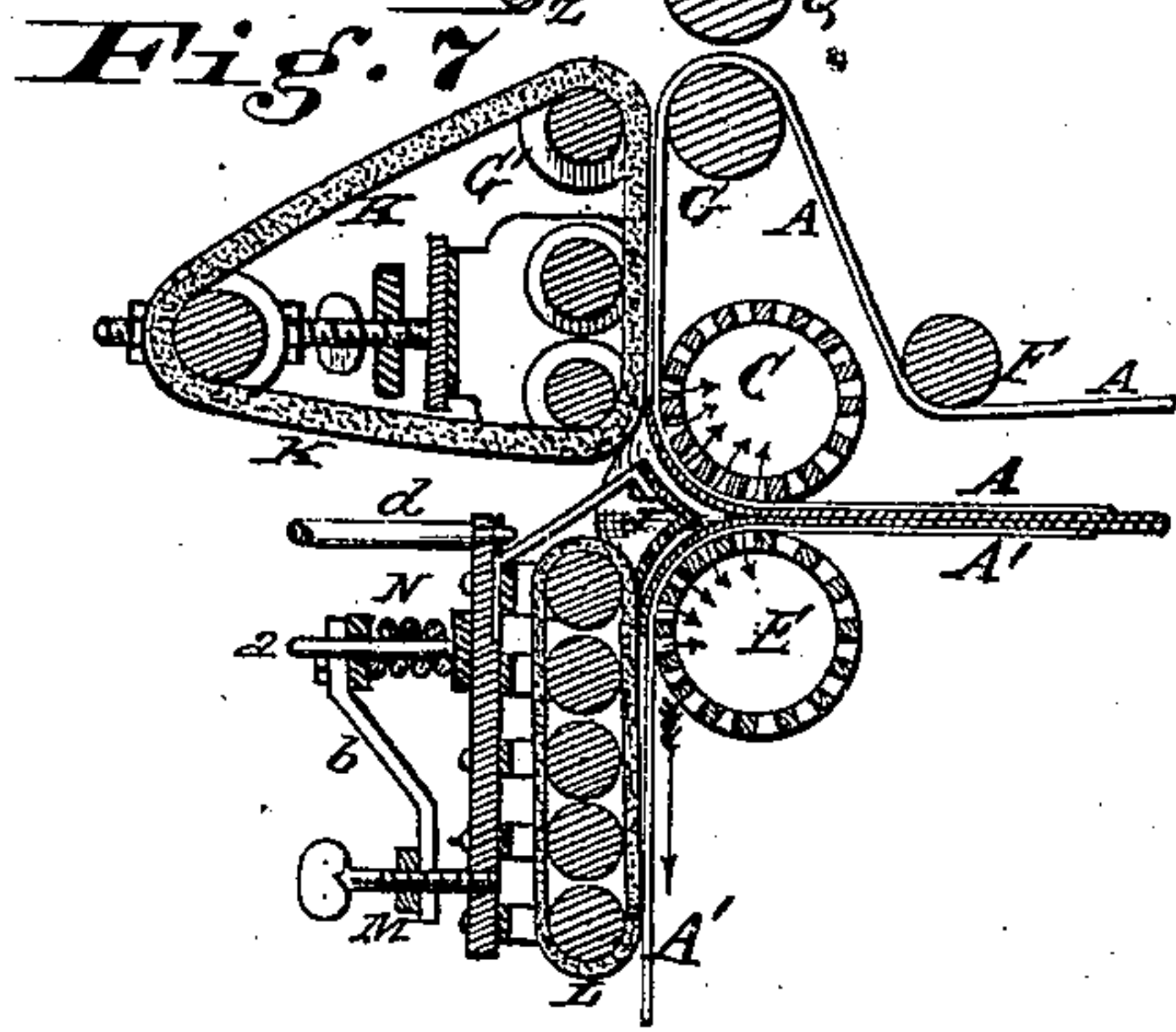
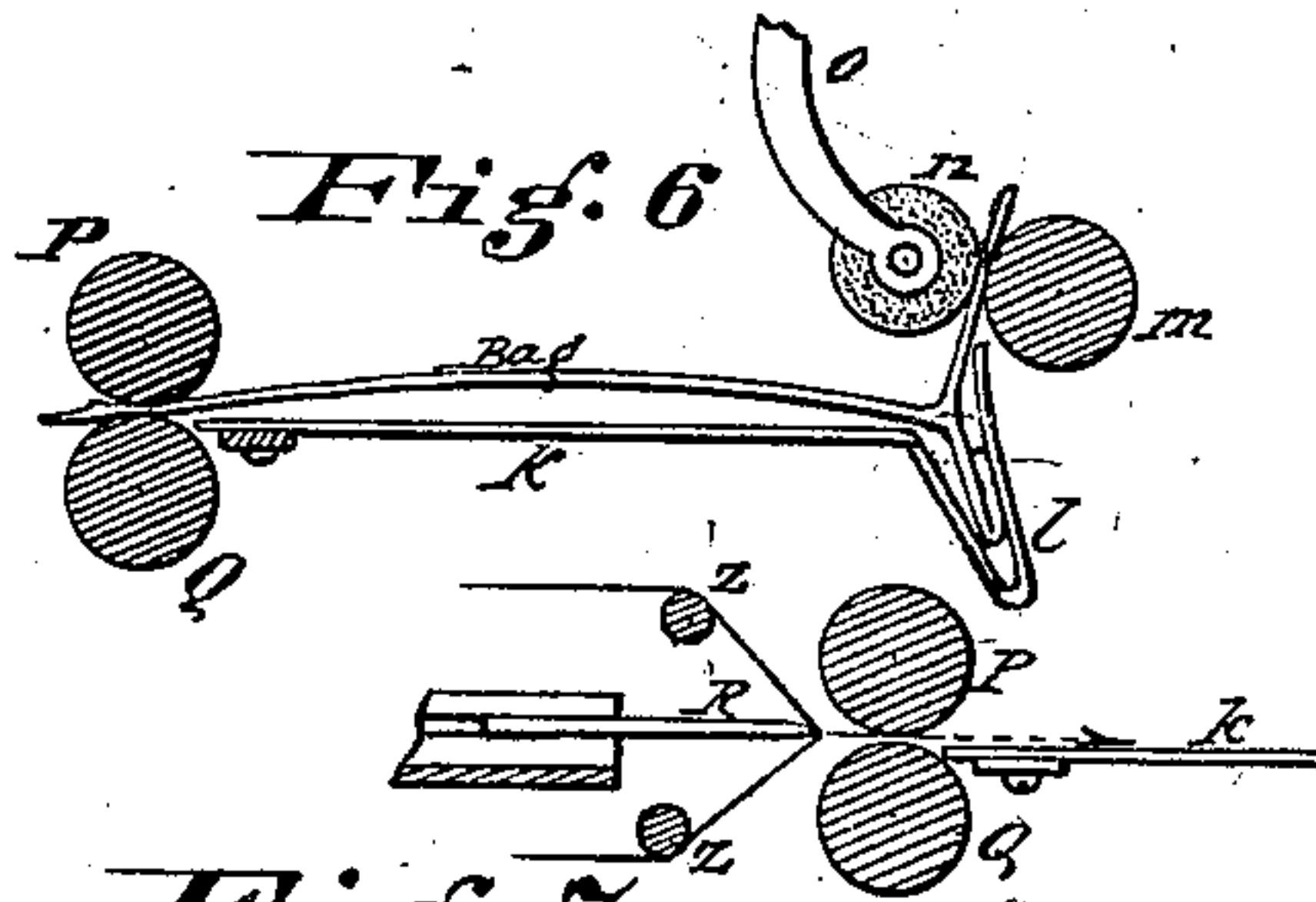
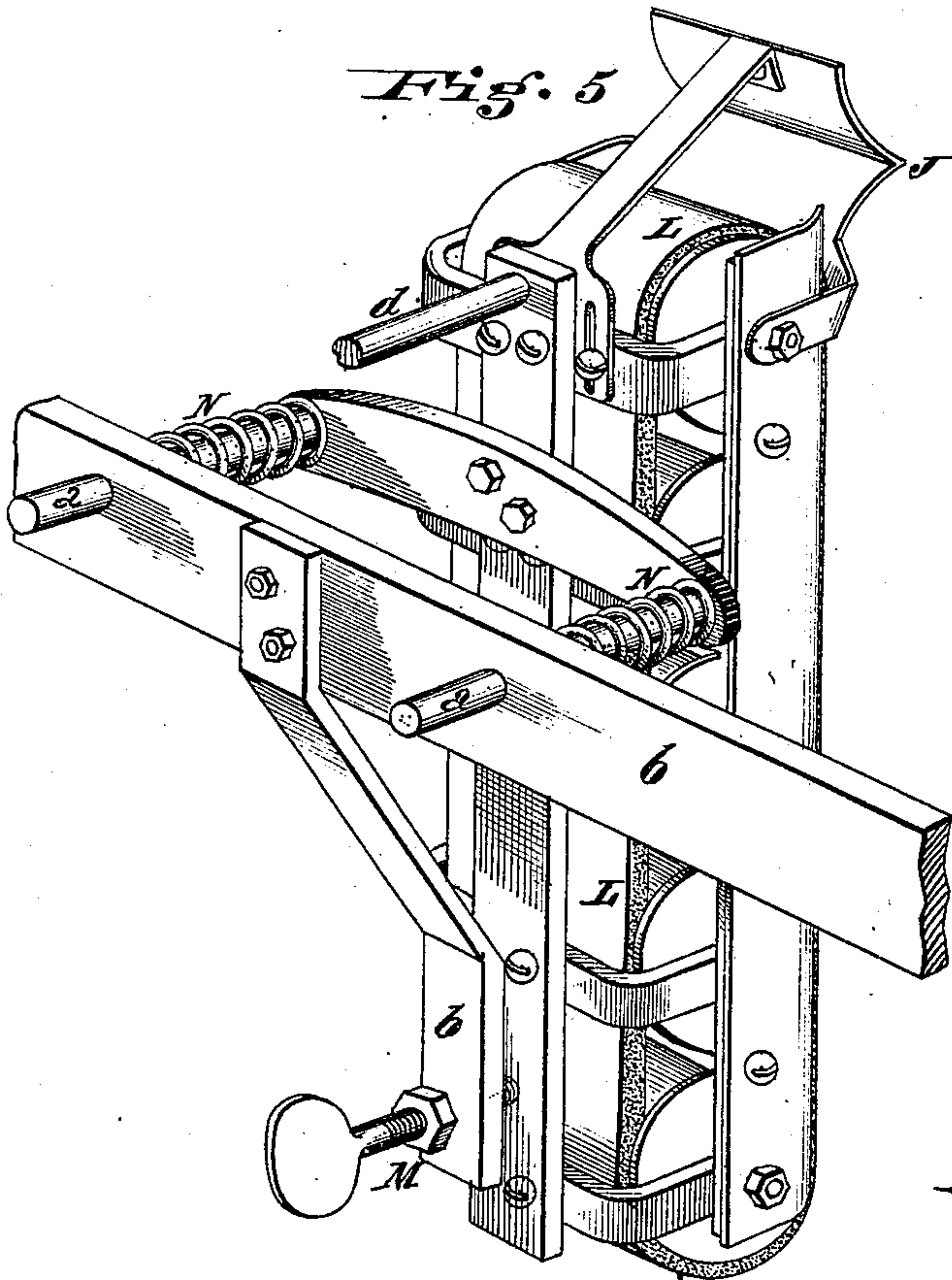
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Fig. 9

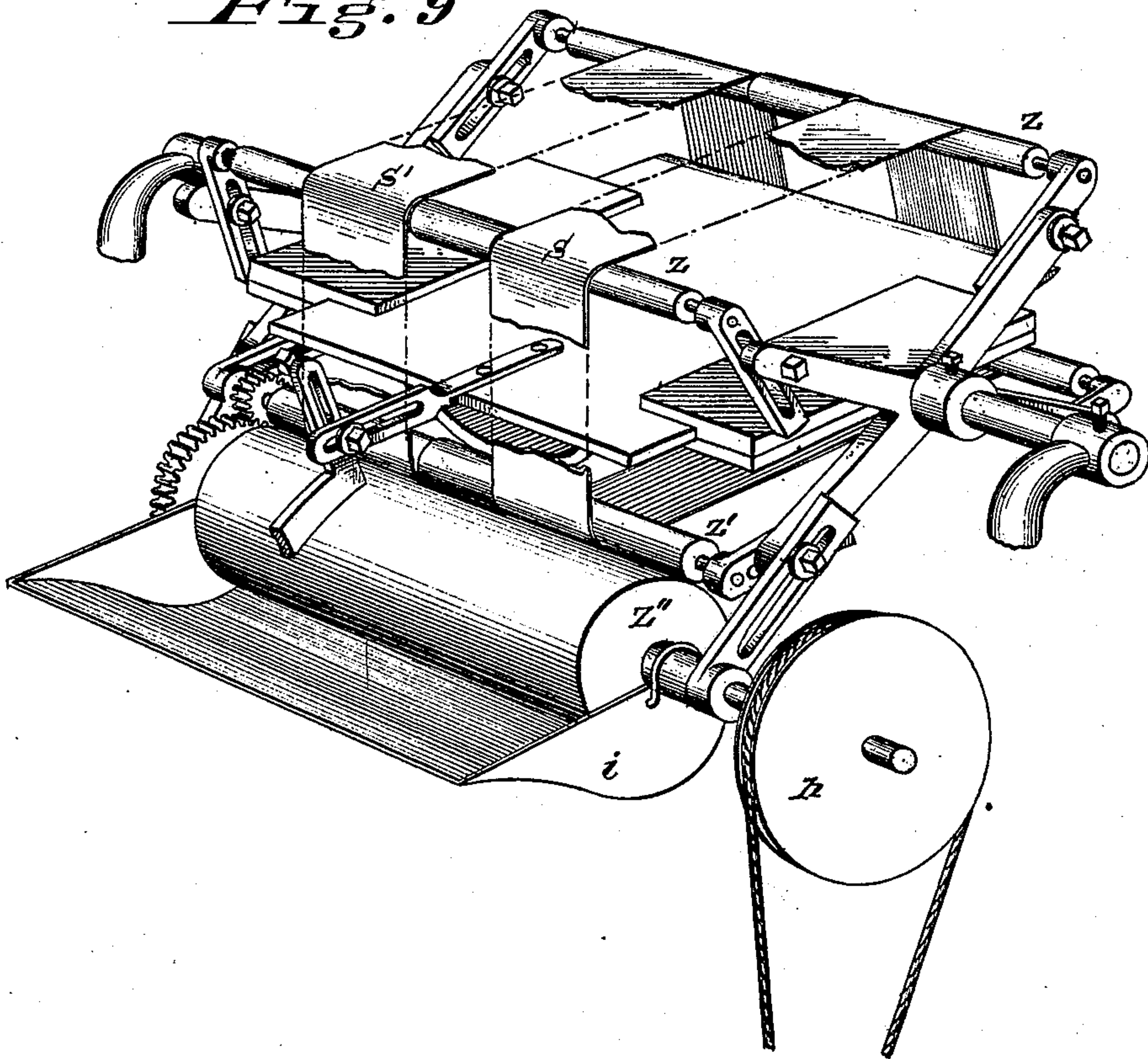
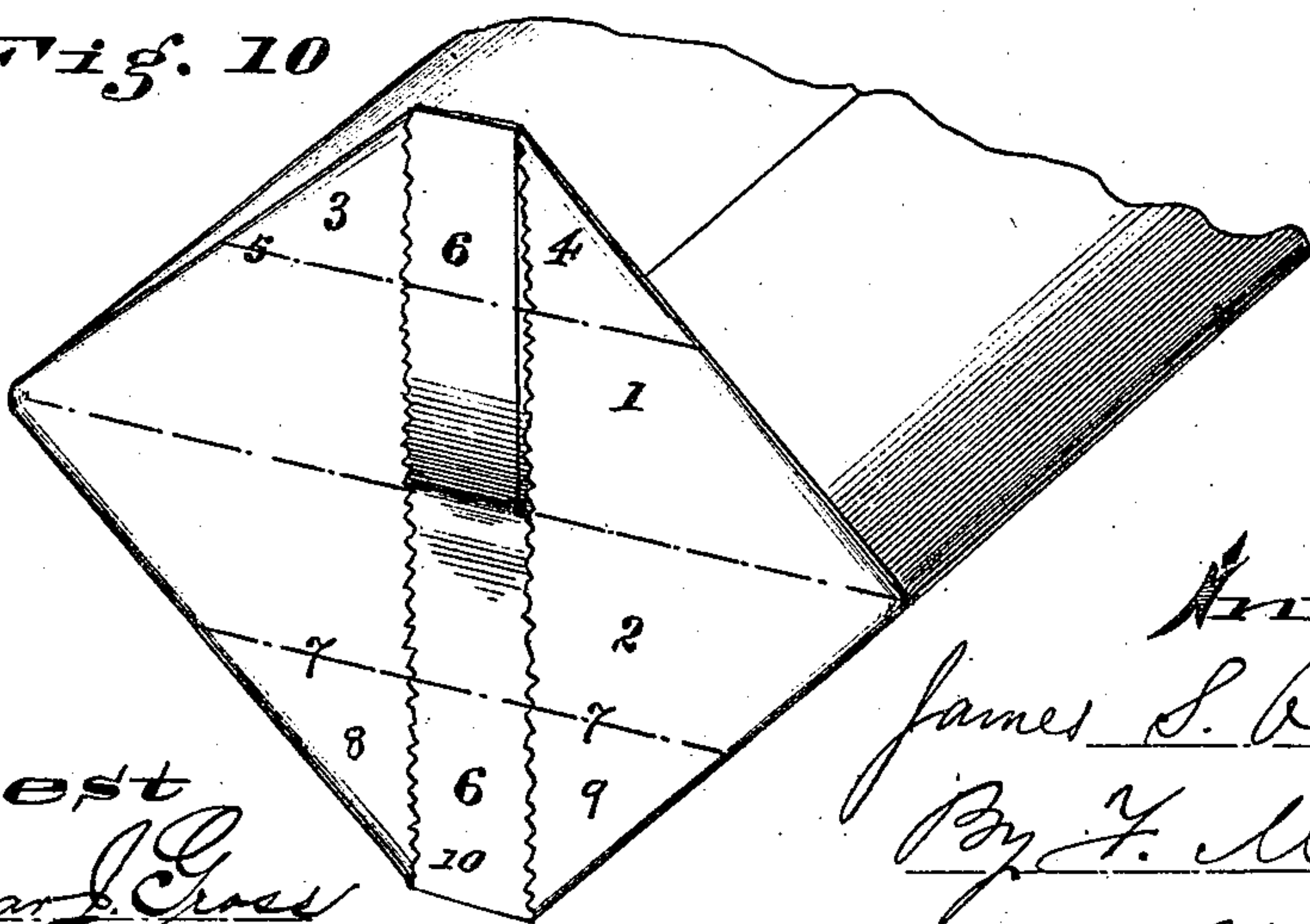


Fig. 10



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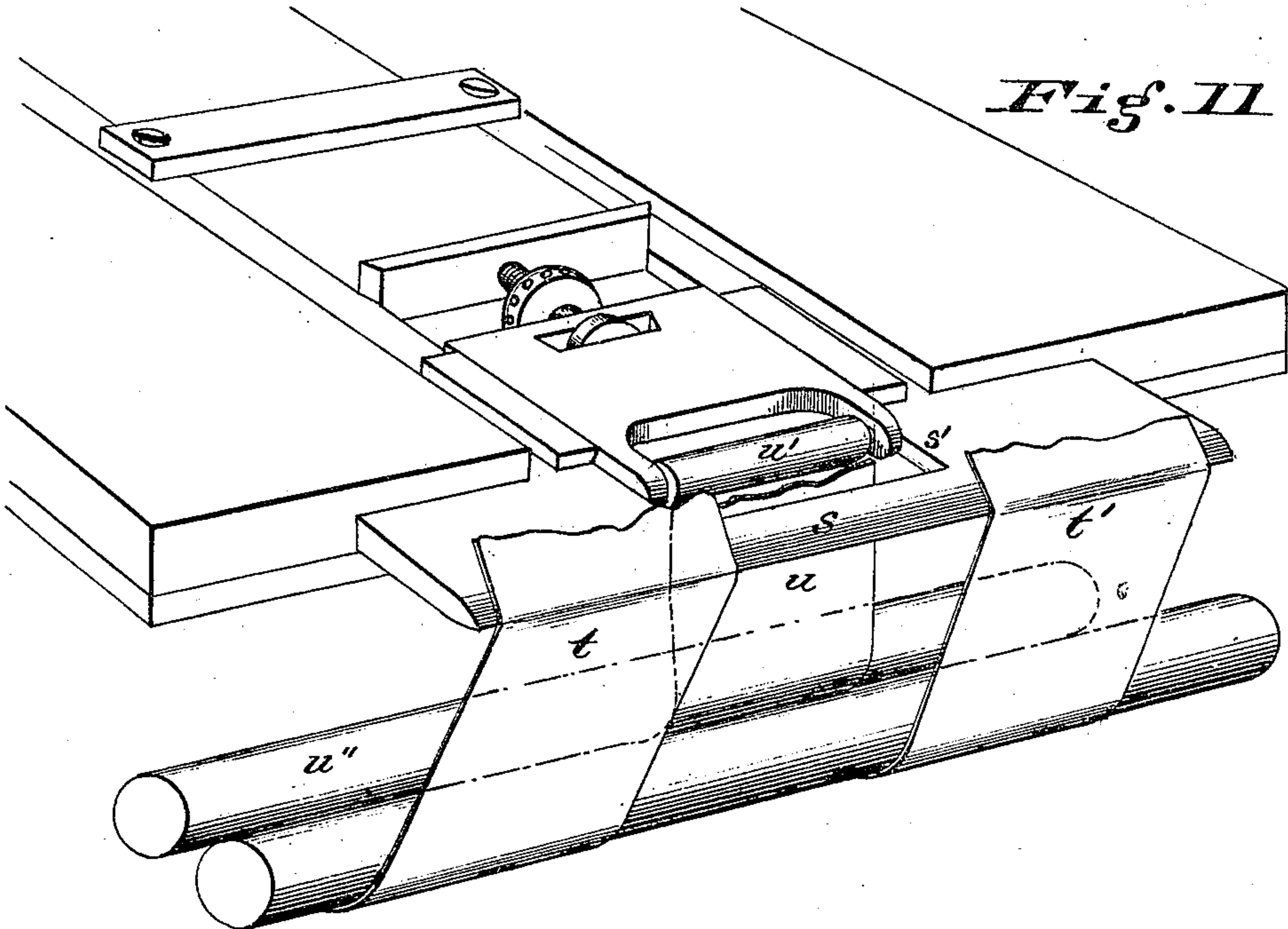


Fig. 11

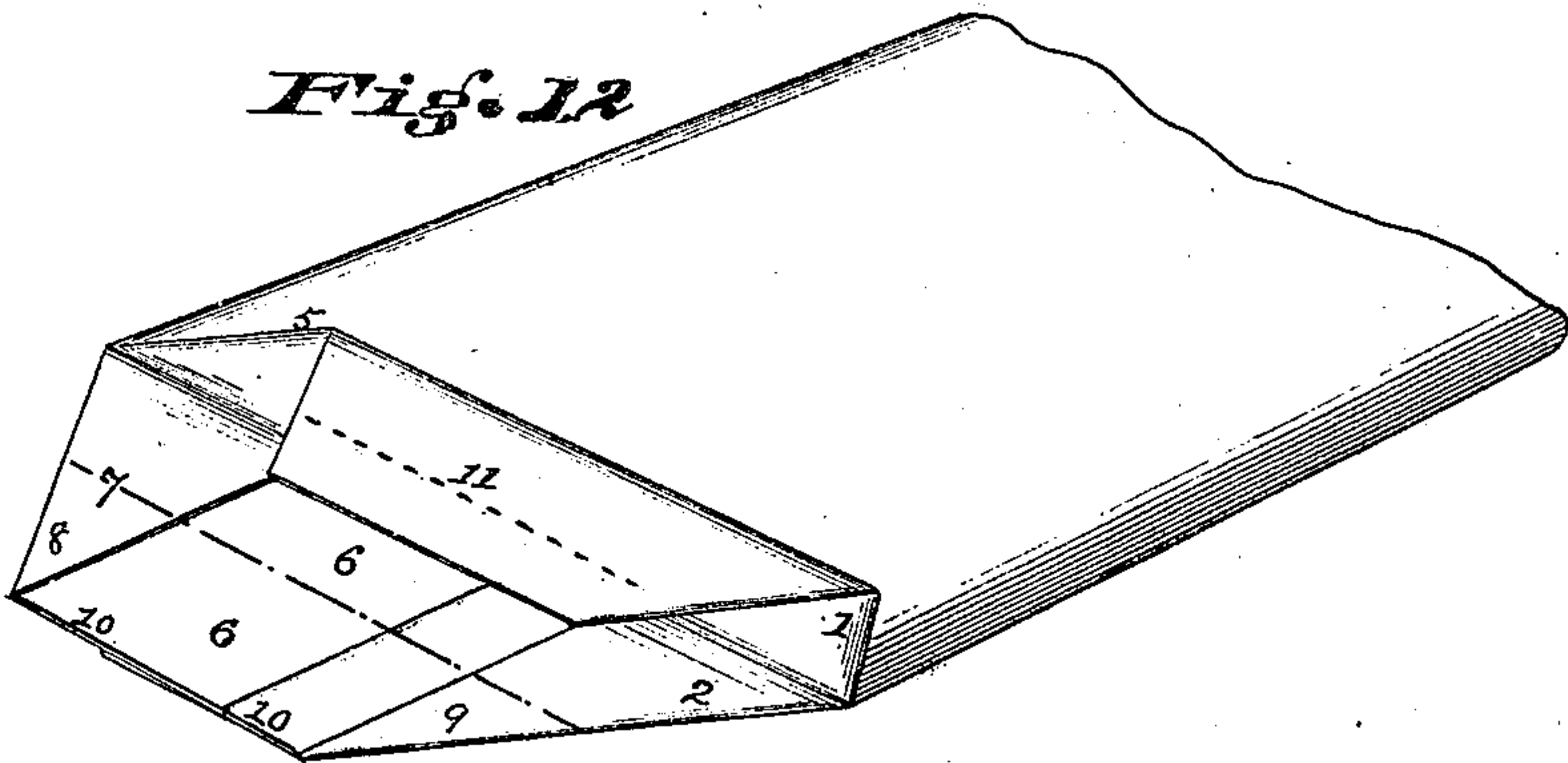


Fig. 12

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UNITED STATES PATENT OFFICE.

JAMES S. OSTRANDER, OF DAYTON, OHIO.

IMPROVEMENT IN PAPER-BAG MACHINES.

Specification forming part of Letters Patent No. **175,576**, dated April 4, 1876; application filed July 6, 1875.

To all whom it may concern:

Be it known that I, JAMES S. OSTRANDER, of Dayton, Montgomery county, State of Ohio, have invented an Improvement in Paper-Bag Machines, of which the following is a specification:

My invention consists of peculiar devices for opening the end of a tube of paper and folding it into the necessary diamond shape preparatory to the folding over of the bottom seams, and in new devices for applying the paste to the bottom, and folding over the bottom seams to complete the satchel-bottom of the bag.

Figure 1 is a perspective view of a machine embracing my improvements. Fig. 2 is a longitudinal section thereof. Fig. 3 is an elevation of the rolls which form the diamond bottom of the bag and the bands which feed the tube. Fig. 4 is a perspective view of one of the uprights upon which the folding-rollers of the machine are supported and adjusted for different widths of bags. Fig. 5 is a perspective view of the device, which, in connection with one of the suction-rollers of the machine, assists in opening out one side of the tube to form one side of the diamond. Fig. 6 is a sectional view of the feeding-rollers and pocket-guide which reverses the feeding side of the bottom. Fig. 7 is a sectional view, showing the suction-rolls and accompanying devices for forming the diamond shape for the bottom, and the device for pasting and folding one side of the bottom. Fig. 8 is a vertical section of the rolls for feeding the bag after its bottom is partially formed, and the pasting device and rolls by which the last fold is pasted and the bag completed. Fig. 9 is a perspective view of the mechanism for folding and pasting the first flap of the bottom. Fig. 10 is a view of the tube of paper with the diamond for the bottom formed, and dotted lines showing the two locations for the two folds of the flaps necessary to complete the bottom of the bag. Fig. 11 is a perspective view of the device for folding and pasting the last flap of the bottom of the bag. Fig. 12 is a view of the partly-finished bag before it is operated upon by the mechanism shown in Fig. 11.

The tube of paper, after being formed and

pasted, is fed between the endless wire-cloth bands A A', which are stretched, respectively, over the rolls B C and D E. The tube may be supported and cut to lengths for bags before it reaches the rollers B D by any suitable appliances. The wire-cloth A is carried in a circuitous path by the intervention of rollers F G, so that a short length of the feeding-cloth (that portion between the rollers G C) may travel in a vertical path and in an upward direction, and in order that a short portion of the cloth A' may travel in a vertical path and in a downward direction it is carried over the rollers H I. The rollers C E are hollow, the interiors communicating through the hollow shafts *c e* with a "suction-blower" or exhaust-fan attached and operated so that it shall exhaust the air from the rollers constantly. The rollers C E are perforated, as shown, through the wire-cloth in Fig. 3, and as shown in section in Fig. 7, so that a current of air will be constantly passing into the interior of the rolls, except where the paper is in contact. The exterior pressure of air upon the paper operates to compel the sides of the tube, as it emerges from between the rolls C E, to hug them close and follow them round in opposite directions, so that the end of the tube is drawn into the diamond shape shown in Fig. 10, the guide J assisting in the separating of the tube and the proper formation of the diamond.

Endless elastic bands K L are stretched over rollers journaled in suitable frames, as shown, the bands being arranged to run in close proximity to and in unison with the vertically-moving portions of the belts A A', as shown in Fig. 7, so that in operation the outstretched portions of the diamond are pinched between the bands K A and the bands L A', and the bottom of the bag thus tightly stretched. This stretching action being accomplished by devices moving continuously in opposite directions, it is necessary that a release of one or the other be effected as soon as the diamond is properly formed. I fit the frame of the belt L to slide on guides *a*, through the part *b* of the frame of the machine, and attach it at the bottom to the part *b* by an adjustable loose connection, M, springs N being

interposed, which act to press the band L to its work when necessary. At proper times in the operation of the machine the band is drawn back, so as to release the bottom pinch on the diamond, by means of the rod *d*, lever *f*, and cam *g* on the shaft O of the machine. Upon the release of the band L the bands K A are enabled to feed the bag upward, and in passing between these bands the diamond is brought into line or parallel with the line of the tube, the half 1 of the diamond being pulled into line with the tube, and the half 2 laid back against the side of the tube. In this position the half-formed bag is fed through between the bands K A, and by them presented in front of the feeding and folding rolls P Q. Immediately in front of these rolls a pasting and folding blade, R, reciprocates in the interior of two elastic pasting-bands, S S'. These bands are designed and operated so as to apply paste to the parts 3 4 of the diamond, and, to some extent, upon the opposite side of the line 5 of the fold, avoiding the open strip 6 in the diamond. The blade R is reciprocated so as to present its forward or creasing edge between the rollers at the proper time, and to advance the pasting ribbons or bands at the same time by means of the lever T, shaft U, lever V, tappet W on rod *w*, projection X from the shaft O, and retractile spring Y. All these parts have means of adjustment, as shown, so that the time of striking of the blade may be adjusted to any desired size and length of bag. At the point in the feeding of the bands K A when the line 5 of diamond has reached a point opposite the line between the rolls P Q, the blade R strikes and pushes the bag at this point into the rolls, at the same time applying the paste, as before indicated. The bands or ribbons S S' are elastic and are stretched over the rolls Z Z Z Z', the latter, Z', being driven by gear-connection with the pasting-roller Z'', which, in turn, is driven by belt on pulleys *h* *h'*, stretched by idler-frame *h''*. The roller Z'' runs in a suspended paste-vat, *i*, from which it receives paste for supplying the pasting-ribbons S S'. The rollers Z Z Z Z' Z'' are supported by adjustable arms, as shown, so that the bands may be stretched thereby or the entire number elevated or depressed to follow the rollers P Q G G', which are all journaled in the sliding boxes *j j'*, so as to be vertically adjustable to suit different lengths or sizes of bags. The bag, while passing in the manner described through the rolls P Q and moving over the supporting-plate *k*, lies with its diamond upward and its first flap folded down and pasted, and as it moves forward it is received by the angular pocket-guide *l*, by which the diamond bottom is tipped up into the position shown in Fig. 6, so that the unfolded flap strikes against the feed-roller *m* at a time when the roller *n*, attached to swinging frame *o*, is away from contact with the roller *m*.

At the proper time, by means of lever *n*¹, rod *n*², tappet *n*³, and cam *n*⁴ on shaft *n*⁵, the

swinging frame is moved inward, so as to cause a bite of the paper between the roller *n* and feed-roller *m*, and the bag is by them fed up, as shown in Fig. 8, between feed-rollers *p p'* and guides *q q'*, to a position opposite the folding-rollers *r r'*.

When the line 7 of the bag, Fig. 10, is opposite the middle of the rollers *r r'*, the pasting and folding blade *s* strikes the bag at the line 7, pushes it through the rolls, and thus completes the last fold of the bottom. The blade *s* is inclosed in pasting-ribbons *t t'*, supported, operated, and fed with paste in the same manner as the ribbons S S', and these ribbons *t t'* apply the paste to the parts 8 9.

In addition to this a central ribbon, *u*, is provided, supported upon the rollers *u' u' u'' u'''*, and running through a hole, *s*¹, in the blade *s*, so as not to pass outside of the knife-edge. When the knife is pressed into the space between the rollers, the part 10 of the bag is rapidly swept across the ribbon *u* at the point where it runs over roller *u'*, and is caused thereby to receive paste at that point sufficient to enable it to secure the final flap, which laps over the first flap up to the line 11 of Fig. 12. As the bag is delivered from the rollers *r r'* it is completed, and may be carried therefrom to the drying apparatus.

The blade *s* is operated by lever *s*², shaft *s*³, lever *s*⁴, rod *s*⁵, tappet *s*⁶, projection *s*⁷ on shaft *s*⁸, and retractile spring *s*⁹, all the parts being adjustable to regulate the time of striking, and to adjust the position of the blade *s* with relation to the rollers *r r' o o'*, which are vertically adjustable by means of sliding boxes *r*² for different sizes or lengths of bags.

The main driving-shaft *w*, by gearing, as shown, operates the shafts *o n*⁵, and by bevel-gearing and upright shaft *x*, as shown, the shaft *s*⁸ is operated. The wheel *y* on shaft *s*⁸, through changeable and expansible gearing, (not shown,) operates to give the necessary motion and speed to the suction-rollers C E for the different lengths of bags, the rollers C E being geared together. The rollers P Q G G' are geared together, the roller G being driven by the band A. The rollers *p p'* are geared together and driven by belt on pulleys 12 13, and the rollers *r r'* are geared together and driven by belt over pulleys 14 and 15. The roller *m* is driven by belt from pulley 16 on shaft *n*⁵, and the pasting-roller *u*⁴ by belt over pulleys 17 18, through stretching-idlers 19. All the necessary parts of the machine are adjustable to permit the manufacture of different size and length of bags upon it, as shown.

I claim—

1. The perforated suction-rollers C E, operating to separate the sides of the tube, and stretch the bottom into the diamond form, substantially in the manner and for the purpose specified.

2. In combination with the suction-rollers C E, the perforated or wire-cloth feeding-bands

A A', arranged and operating substantially as and for the purpose specified.

3. In combination with the bands A A', the feeding-bands K L, operating substantially in the manner and for the purpose specified.

4. In combination with the feeding-bands A K, the folding-rollers P Q, pasting-bands S S', and knife R, operating substantially as and for the purpose specified.

5. The pocket l, arranged and operating to reverse the feeding side of the diamond, substantially as and for the purpose specified.

6. In combination with the pocket-guide, the feeding-roller m and pinching-roller n, operating substantially as and for the purpose specified.

7. In combination with the feeding-rollers p p', the folding-rollers r r', pasting-ribbons

t t', pasting-ribbon u, and knife s, operating substantially as and for the purpose specified.

8. In combination with the blade R and paste-wheel Z'', the pasting-ribbons S S', operating substantially as and for the purpose specified.

9. In combination with the blade s and paste-wheel u', the pasting-ribbon u, passing through an aperture in said blade, and the pasting-ribbons t t', all operating substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

JAMES S. OSTRANDER.

Witnesses:

JOHN E. JONES,
EDGAR J. GROSS.