

(No Model.)

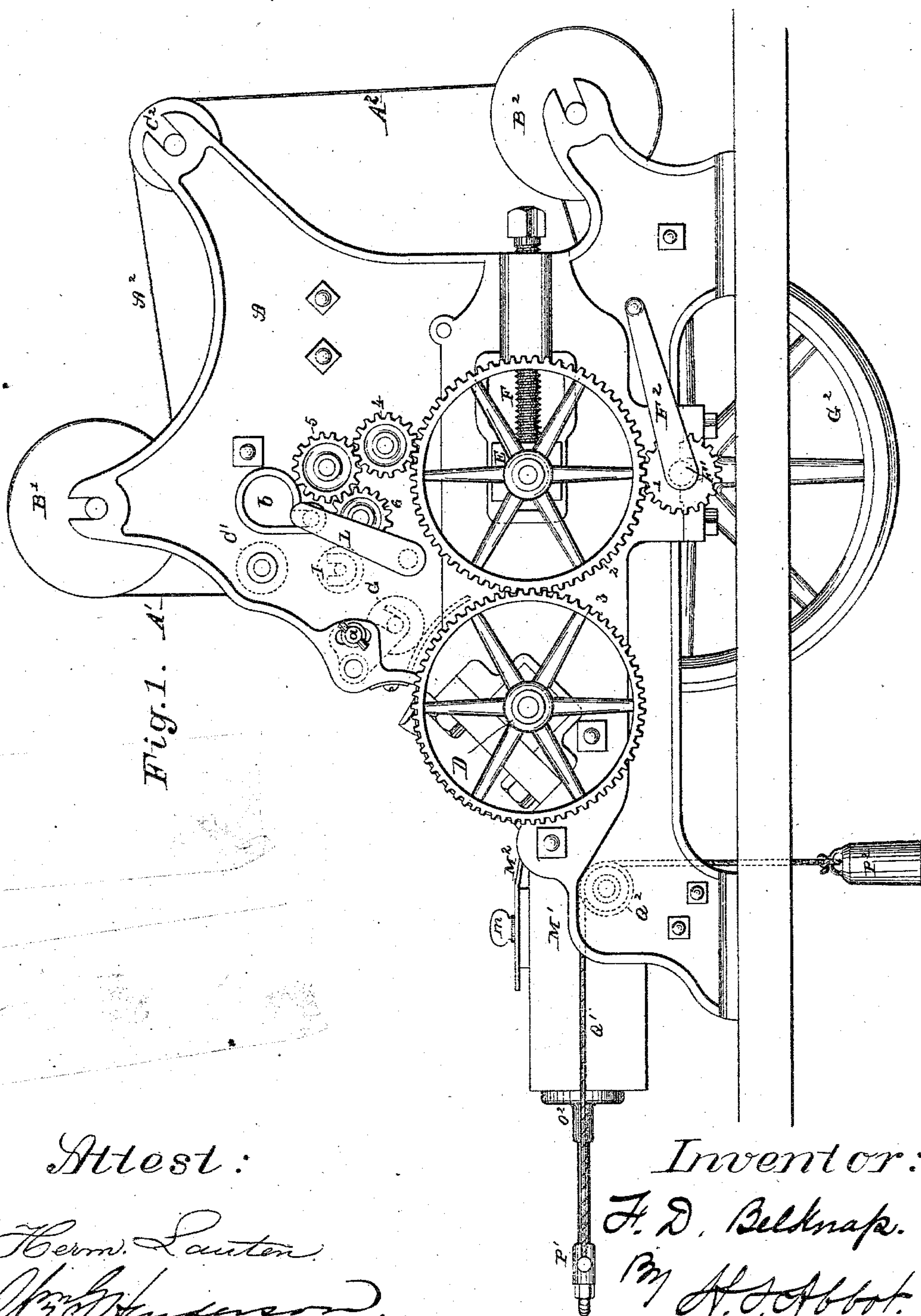
4 Sheets—Sheet 1.

F. D. BELKNAP.

COPYING AND PRINTING PRESS.

No. 286,677.

Patented Oct. 16, 1883.



Attest:

Herrn. Lauten.
 J. G. Henderson.

Inventor:

F. D. Belknap.

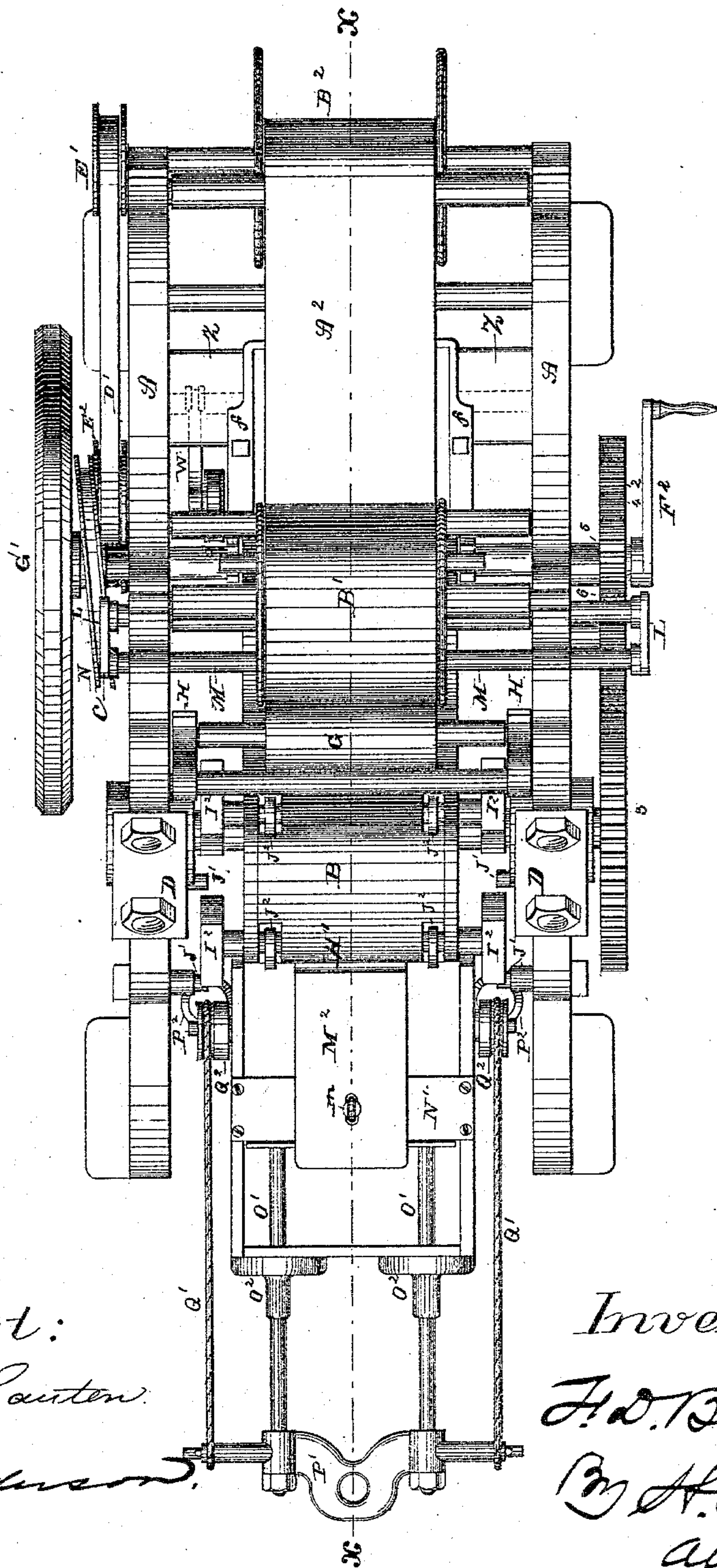
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Fig. 2.



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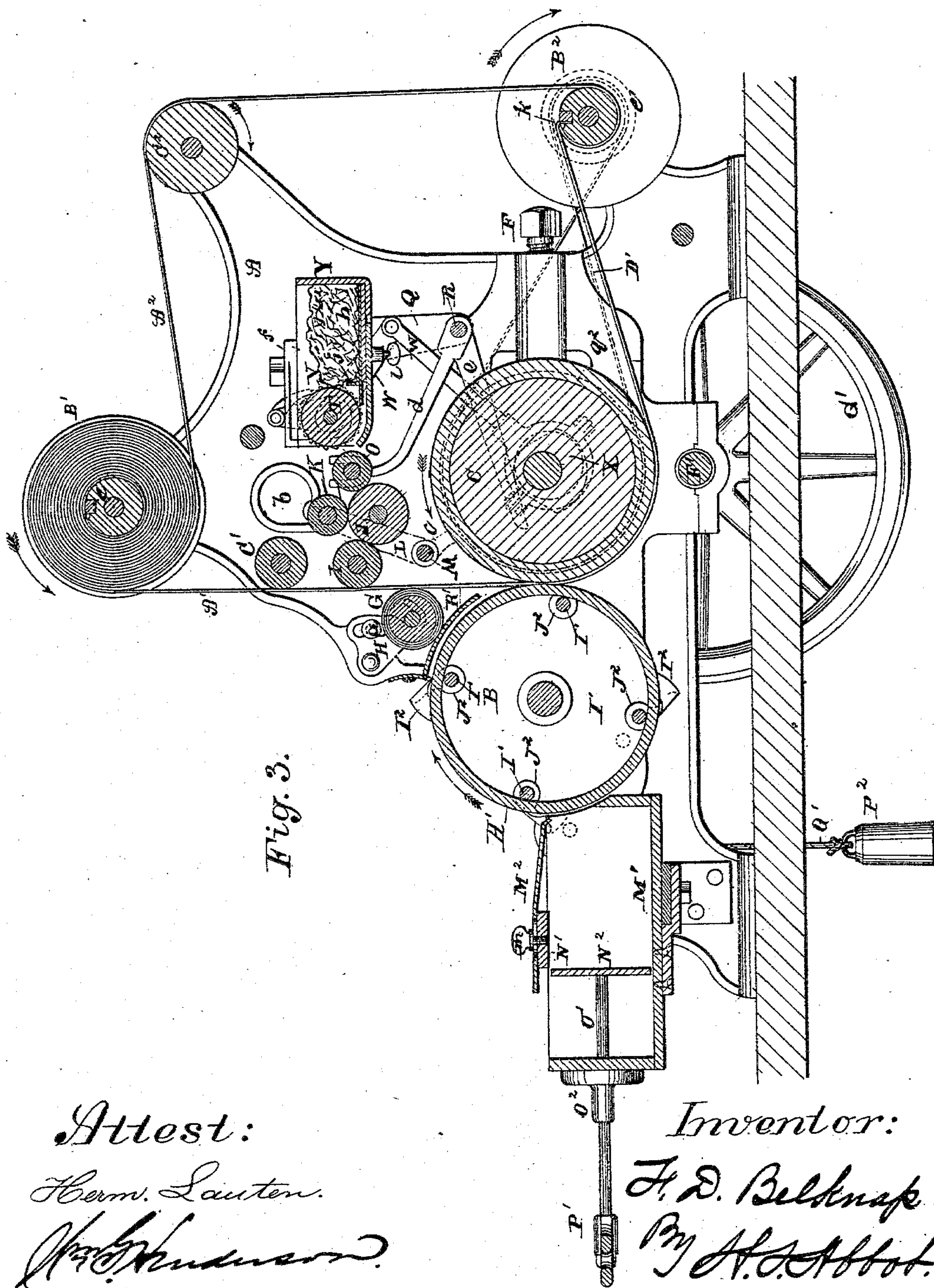


Fig. 3.

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Fig. 6.

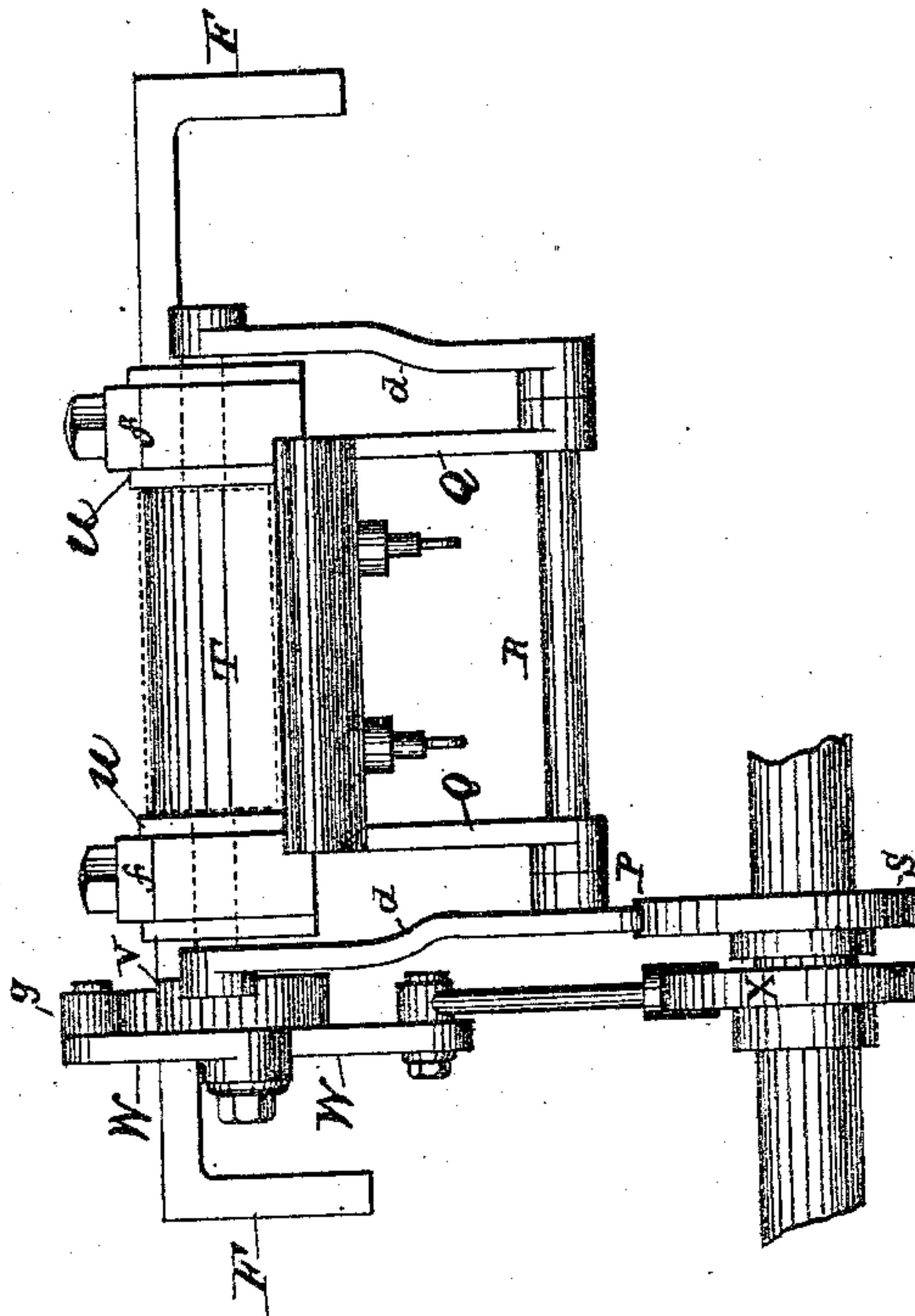


Fig. 4.

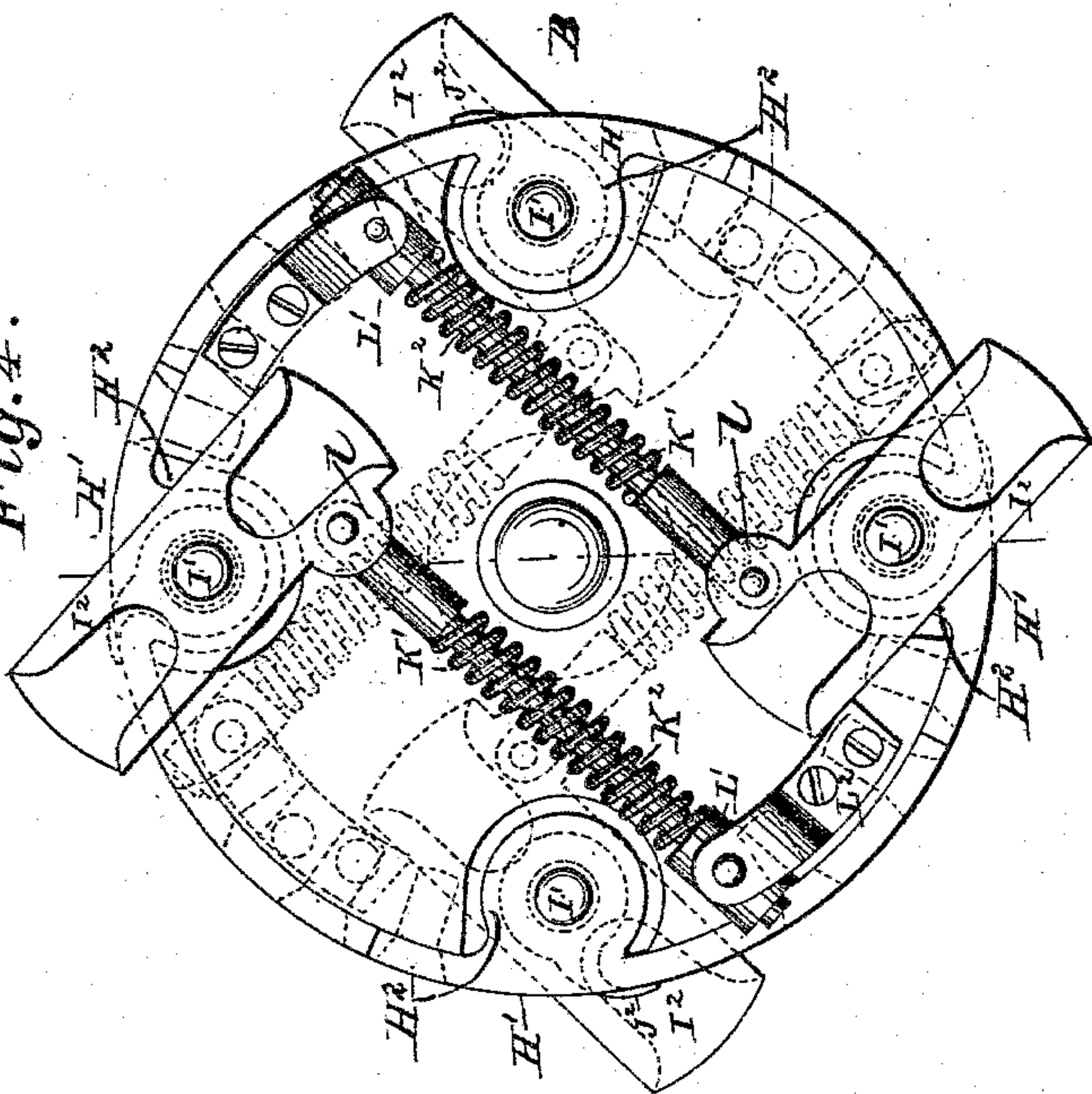
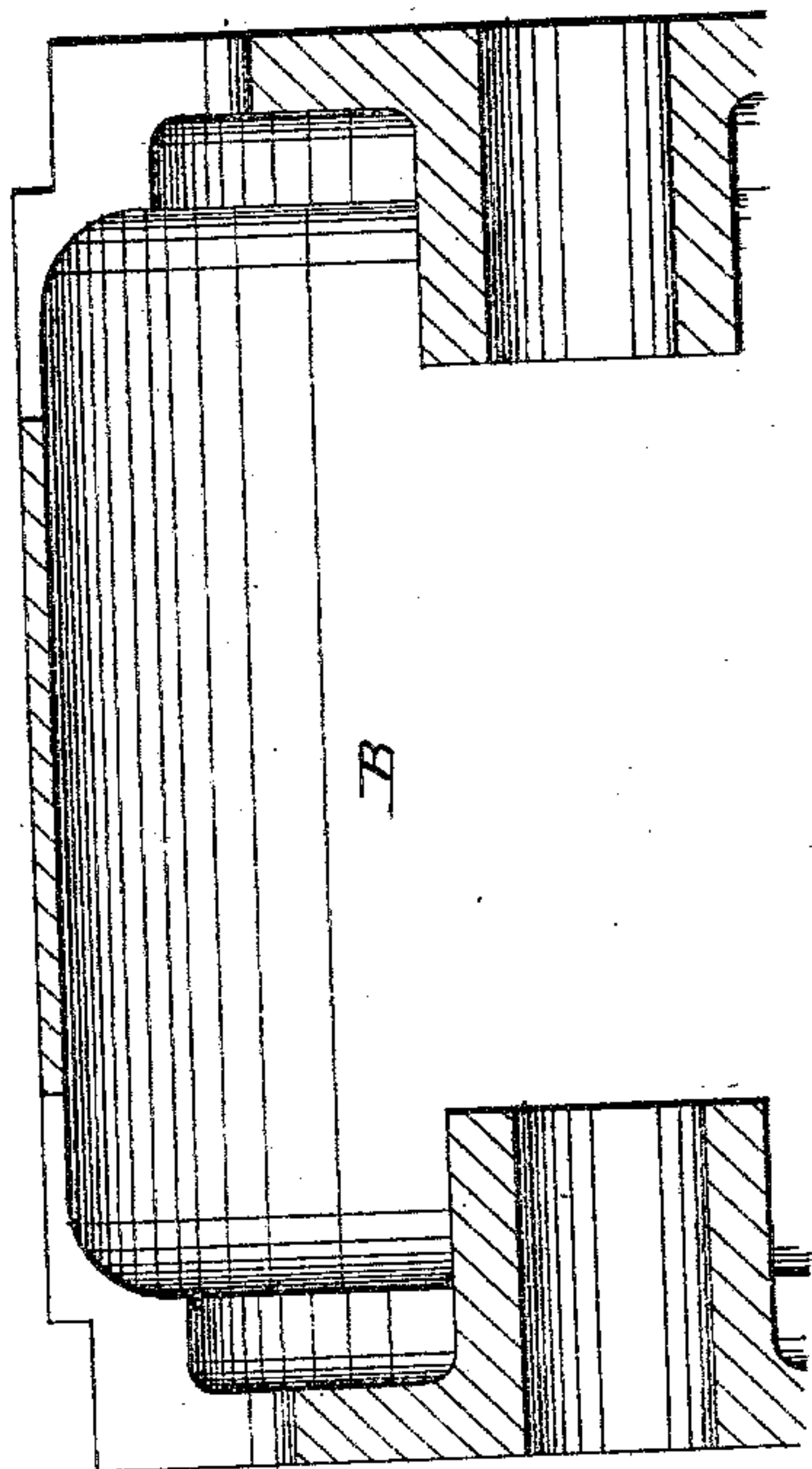


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK D. BELKNAP, OF WOOSTER, OHIO.

COPYING AND PRINTING PRESS.

SPECIFICATION forming part of Letters Patent No. 286,677, dated October 16, 1887.

Application filed June 24, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANK D. BELKNAP, a citizen of the United States, residing at Wooster, in the county of Wayne and State of Ohio, have invented certain new and useful Improvements in Copying and Printing Presses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a side elevation of the device; Fig. 2, a plan view; Fig. 3, a longitudinal section through *xx* of Fig. 2. Fig. 4 is an end view of the feed-cylinder, showing the attachment thereto of the fingers that hold the envelope or other paper to the cylinder, also of the shifting-blocks which operate the fingers. Fig. 5 is a section through the cylinder, showing the rabbet in both ends of the cylinder, into which are fitted the bearing-plates of the shifting-blocks; and Fig. 6 is a detached view of the inking apparatus, showing the doctor-roll removed.

My invention has for its object ~~the address~~ ing of envelopes, postal-cards, and the like, and the printing of manifold copies of a paper, which object is accomplished by puncturing or otherwise marking a continuous web of paper or like suitable material with the name or matter to be transferred, and passing the ink or marking-fluid through the said stenciling, and transferring the same from the web to the surface of the envelope or paper which is to receive the impression or imprint.

I will hereinafter point out means whereby the objects may be accomplished, and will then endeavor to clearly define by the claims what protection is sought for.

In the accompanying drawings, the letter A indicates the two side frames of the machine, in which are journaled the two cylinders B and C, the journals of cylinder B having their bearings in the boxes D, set into the front of the side frames, and the journals of cylinder C having their bearings in the boxes E, set into the side frames and adjustable to and from cylinder B, and held to their adjustment by set-screws F.

A roll, G, covered with blotting-paper and located above the cylinder B, has keyed to its shaft two hangers, H, which are hinged to the two side frames, A, one to each frame. These hangers are slotted, and a bolt or set-screw, *a*, passes through one or both of the slots into the side frame, so that by means thereof the roll may be held to its vertical adjustment, which it admits of by reason of its hinged connection to the side frames.

An inking-roll, I, is journaled in the side frames or boxes, secured thereto at a point above the blotting-roll G, and a little in advance thereof. The inking-roll (which may be of printers' composition) receives its supply of ink from a distributing-roll, J, journaled in the side frames, A, preferably a little in advance of and in a lower plane than the inking-roll but in contact therewith. The ink is spread over the surface of the distributing-roll by a vibratory roll, K, made of printers' composition. This roll travels back and forth longitudinally, its shaft passing loosely through bearings made in the side frames, and can be removed from the machine by disconnecting it from its operating-arms and then raising it and sliding it through the openings *b* in the side frames, A. The ends of the shaft which project through the sides of the frame are connected to the operating-arms L, the lower ends of which are connected to the ends of a shaft, M, which passes loosely through bearings in the side frames the same as the shaft of the vibrating roll itself. On this shaft M, or on one of the levers L, at the point where it joins the shaft, there is a projection, *c*, which fits into a groove formed in the periphery of a cam, N, keyed or otherwise secured to the shaft of cylinder C, so that as the cam is revolved by the turning of the cylinder-shaft, the shaft M and vibrator-roll connected thereto are caused to travel to and fro the roll across the surface of the distributing-roll, thereby spreading the ink over that roll.

Ink is carried from its fountain to the distributing-roll by means of a doctor-roll, O, made of printers' composition, and journaled in the forked arms *d* of a lever, P. This lever is journaled or fulcrumed in two lugs, Q, extending from the ink-fountain box by means of the shaft R, which connects to the arms *d* of the lever, and has its bearings in the lugs Q. The

other arm, *e*, of the lever rests upon a cam, *S*, on the shaft of cylinder *C*, which cam raises and lowers the lever, and thereby causes the doctor-roll to move from the ink-fountain roll to the distributing-roll and back again, whereby the distributing-roll is kept supplied with ink.

The fountain-roll *T* is journaled in boxes *U*, formed on the sides of the fountain-box, and its caps *f* are detachable, so that the roll can be removed from its bearings. On the shaft of the roll, at one end, outside of the box, there is keyed a ratchet, *V*, with the teeth of which engages a pawl, *g*, pivoted to the crank-lever *W*, which is journaled on the shaft of roll *T* and connected with the eccentric *X*, which is on shaft of cylinder *C*, so that as cylinder *C* turns, the fountain-roll is revolved a part of a complete revolution, (more or less,) as may be required, whereby it is caused to take the ink from the fountain-box and transfer it to the doctor-roll.

The ink-fountain box *Y* is preferably of rectangular form, and is open at the end where the fountain-roll is located, and is supported between the side frames, *A*, on the extensions *Z*, which are secured to the side frames. In the bottom of the box there is placed a metallic plate, *h*, which projects partly under the fountain-roll, and is adjustable to and from the same by means of a thumb-screw, *i*. The sponge and felt which holds the supply of ink will rest upon this plate, and will be kept by the angle-piece *j*, which is brazed or riveted to the plate, from being drawn under the roll.

The webs of paper *A'* *A*² unwind from the reel *B'* and wind up on the reel *B*², the ends of the paper being clamped to the reels by keys *k*, fitting into grooves in the reels. The webs of paper pass over the tension-rolls *C'* *C*², which, as well as the reels, are journaled in the side frames, *A*.

The reel *B*² is turned by a belt, *D'*, which passes over a pulley, *E'*, on the end of its shaft, and over a pulley, *E*², on the shaft of cylinder *C*. This cylinder is revolved by a pinion, *1*, which meshes with the gear-wheel *2* on the shaft of the cylinder, and it in turn meshes with the gear-wheel *3* on the shaft of cylinder *B*, whereby that cylinder is turned; also, with gear *4*, which, through gears *5* and *6*, revolves the distributing-roll *J*. The gears *4* and *5* are journaled in one of the side frames, *A*, and gear *6* is keyed to the end of the distributing-roll shaft. The pinion *1* is on shaft *F'*, which has its bearings in the lower part of frames *A*, and is turned by crank *F*² or other suitable power, and has on its other end the fly-wheel *G'*.

The ends of cylinder *B* are rabbeted, as shown in Fig. 5, and in these rabbets, so as to be flush with the face of the cylinder, are set plates *H'*, which are provided with ears *H*², the plates being secured to the cylinder by countersunk head screws. Four shafts, *I'*, run through the cylinder, and are journaled in the ears of the plates *H'*, one end of each shaft extending beyond the end of the cylinder, so

that the projecting ends on each end of the cylinder will be of each alternate shaft. To the projecting end of each shaft there is keyed a shifting-block, *I*², which is grooved or recessed (preferably bell-shaped) on its outside face inwardly from both ends, and in the drawings is represented as positioned so that one end will project beyond the periphery of the cylinder. The recesses in the blocks are intended to receive the studs *J'*, which project inwardly from both side frames, so that they will bear against the walls of the recesses and shift the blocks as the cylinder continues to revolve, whereby the shaft to which they are keyed is caused to turn a part of a revolution and carry with it and close the gripper-fingers *J*², which are also keyed to it, and extend through slots made in the periphery of the cylinder. After the blocks have passed the studs the fingers are held to the position given them, as described, by means of a spring, *K'*, fitting about a rod, *K*², which is pivoted at one end to an ear, *l*, formed on the block near one end, and is free to play in the direction of its length in a collar, *L'*, which is swiveled in the end of the cylinder, and a plate, *L*², screwed or bolted to the cylinder, so that the rod may have a lateral swing. The spring bears against one end of the collar and against a shoulder formed on the upper end of the rod, and is compressed when the block *I*² comes in contact with the stud *J'*, and holds the fingers against the envelope till the block strikes in the same manner the delivery stud, when the fingers are released and the envelope dropped and the fingers held open till the blocks strike the first stud, when the parts operate as in the first instance.

The box or trough *M'*, for holding the envelopes or paper while being fed to the feed-cylinder *B*, is located immediately in front of that cylinder, and the upper portion of its end next to the cylinder is cut away, as shown in Fig. 3. The envelopes are laid in the box upon their sides with their long edges next to the cylinder, and a metallic plate, *M*², is placed over them, one end resting upon the cross-piece *N'*. It is adjustable to and from the cylinder by means of the thumb-nut *m*, and is inclined or bent downward next to the cylinder, allowing only one envelope at a time to present its top edge to the cylinder for the fingers to take it from the box. The envelopes are moved forward by a plunger, *N*², the rods *O'* of which pass through the guide-plates *O*², fastened to the end of the box, and are joined together at their outer ends by a cross-bar, *P'*. The plunger is moved forward by means of weights *P*², connected to the ends of cords or chains *Q'*, which pass over pulleys *Q*², and are fastened at their ends to the cross-bar *P'*. The weights *P*² should not be too heavy, for if they are they will cause the plunger to hold the envelopes too tightly for their easy feed.

The paper is prepared by writing upon it with an electric pen the matter to be printed. The paper *A'*, thus stenciled, in connection with strip *A*², which is unstenciled, and pos-

sesses blotting qualities, being thin Manila or printing paper, is wound up on reel B', so as to form alternate layers of stenciled and un-stenciled paper. The stenciled sheet or web is then run down between cylinders B and C, and its end connected by key *k* to the shaft of reel B², one surface being in contact with tension-roll C', which causes it to move in a straight line, and also in contact with the inking-roll I, against which it is held by the blotting-roll G, which also takes from its surface all surplus ink received from the inking-roll I. The un-stenciled or blotting web A² is run over the tension-roll C² and connected to the shaft of reel B² by the same means that connects the web A' thereto. Motion is imparted to the several parts by the means hereinbefore described, and as the two webs of paper unwind from the reel B' they travel in the two lines already indicated, and wind up on reel B² in alternate layers of stenciled and un-stenciled or blotting paper in like manner as upon reel B'. The envelopes received from the feed-box one at a time, and grasped by the fingers on the feed-cylinder, as already described, are carried forward under the apron or hood R', which is fastened to the front of the side frames, and projects between the cylinder and blotting-roll, so as to keep the envelope from being soiled by coming in contact with the blotting-roll, and is then carried on between the two cylinders B and C, in contact with the stenciled web of paper from which the matter to be printed is transferred to the envelope by the pressure between the two cylinders, after which the envelope is dropped, as previously described, into a receptacle provided therefor under the machine. This operation is continuous until the supply of envelopes or web of stenciled paper is exhausted, when a new supply can be provided by substituting reel B², with the paper wound thereon, for roll B'.

Instead of using the electric pen for stenciling the paper, the paper may be prepared by the papyrograph system or other system that will admit of inking the surface of the system and the transfer of the print to the envelope or to the paper when letters or circulars are to be duplicated.

There may be a second stencil-sheet of paper passing from roll B' over tension-roll C² and winding up on roll B², the second stencil-sheet being under blotting-sheet A², and wound up on roll B², so that the surface intended to receive the ink will be next to the inked surface of sheet A'. The second stencil-web will be used alternately with web A'. The surface of cylinder C is made up of felt washers, so as thereby to prevent the ink from rendering the roller smooth or hard.

Having described my invention, what I claim is—

1. In an organized machine for the purposes set forth, the combination of a continuously-fed web of paper, from which the matter is transferred to the envelope, a cylinder for automatically feeding the envelopes to the web of paper, and after they have been printed dropping them beneath the cylinder, and a cylinder-support for the web opposite to the feeding cylinder, substantially as set forth.

2. In a machine for the purposes described, the combination of a box for holding the envelopes and permitting one at a time to be taken therefrom, a cylinder provided with fingers for automatically taking the envelope from the box and discharging it beneath the cylinder, a cylinder opposite the feeding-cylinder, and a web of paper between the two cylinders, marked with the characters to be transferred, substantially as set forth.

3. In a machine for the purposes set forth, the combination of a cylinder for automatically feeding and discharging the envelopes, a cylinder for compressing the envelopes between the feed-cylinder and a continuously-fed web marked with the characters to be transferred, a reel carrying the marked web and a plain web, and a second reel for drawing the marked web over an inking-roll and between the feed and compression cylinders, and the plain web in a different direction, and winding the two webs around the second reel, substantially as set forth.

4. In a machine for the purposes set forth, the combination of inking-roll I, perforated web A', and blotting-roll G, substantially as set forth.

5. In a machine for the purposes set forth, the combination of inking-roll I, perforated web A', and adjustable pressure and blotting roll G, substantially as set forth.

6. In a machine for the purposes set forth, the fountain-box Y, provided with the adjustable base-plate *h* and angle-piece *j*, substantially as set forth.

7. The feed box M', provided with a plunger for moving forward the envelopes, and a top plate for permitting only one envelope at a time to be taken from the box, in combination with the feed-cylinder B, provided with fingers for automatically taking the envelope from the box and discharging it from the cylinder, substantially as set forth.

8. The combination of feed-cylinder B, cylinder C, reels B' B², webs A' A², tension-rolls C' C², inking-roll I, and blotting-roll G, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

F. D. BELKNAP.

Witnesses:

LEMUEL JEFFRIES,
CARY W. KAUK.