

O. S. HARMON.

PLATE PRINTING MACHINE.

No. 334,225.

Patented Jan. 12, 1886.

Fig. 1.

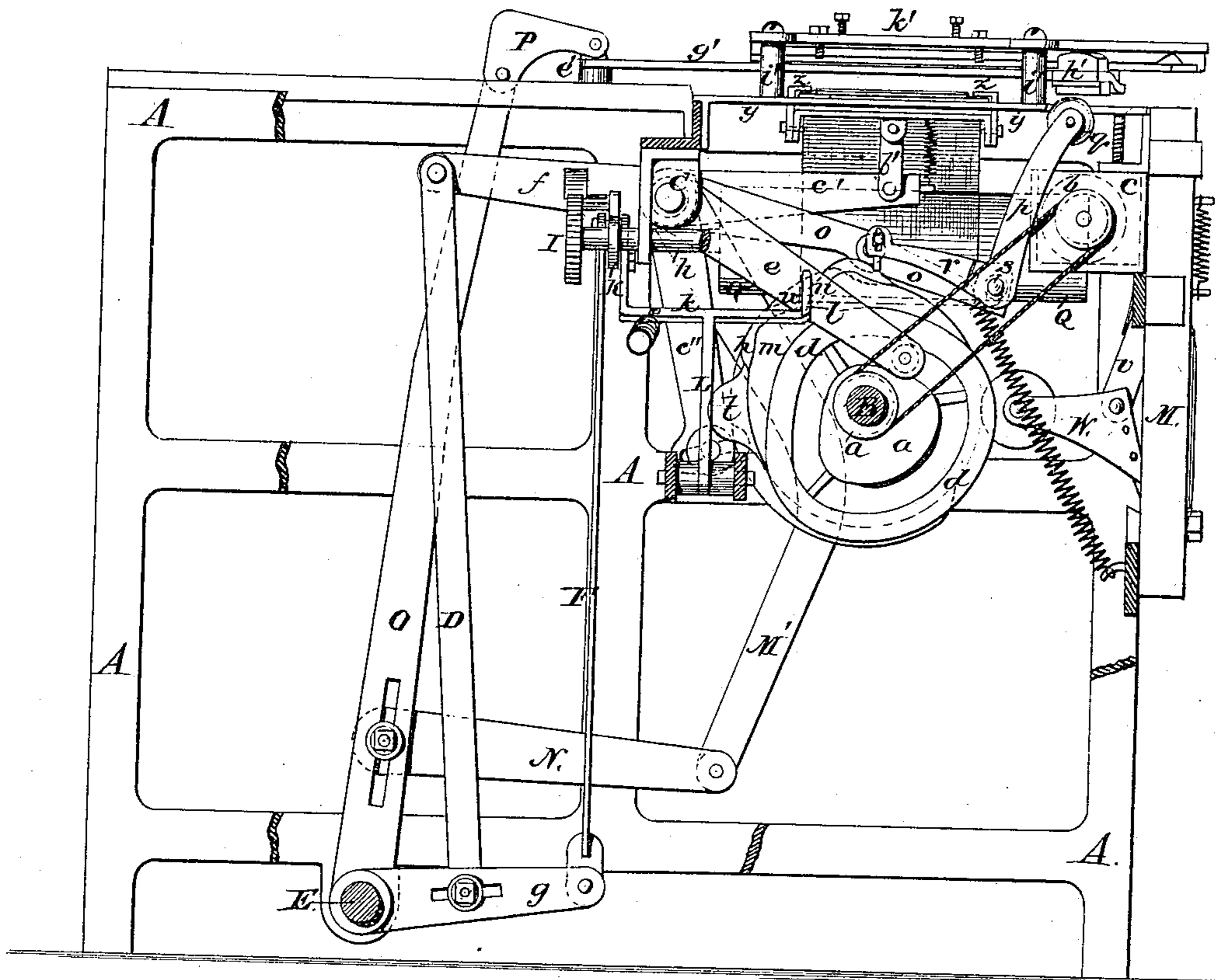
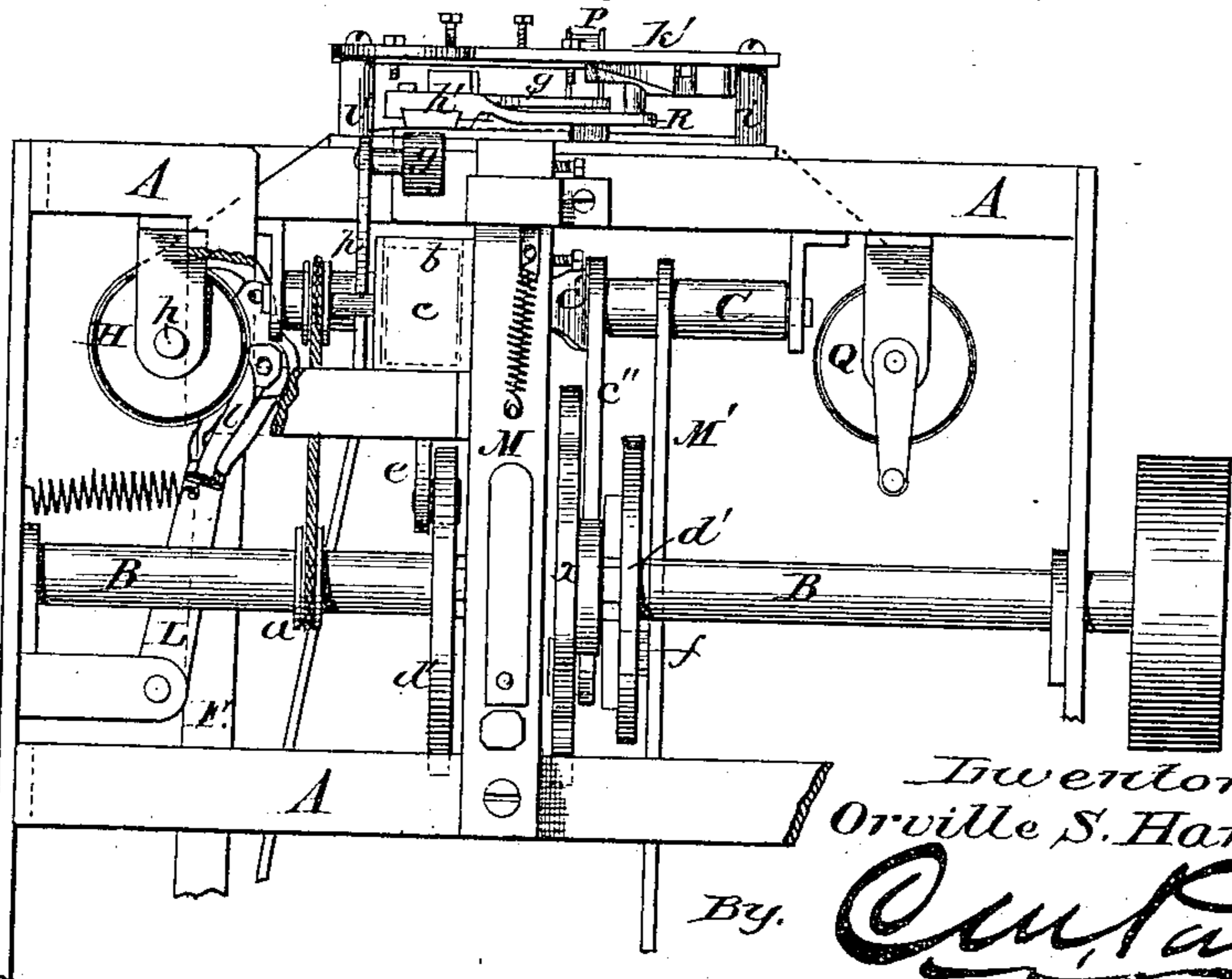


Fig. 2.



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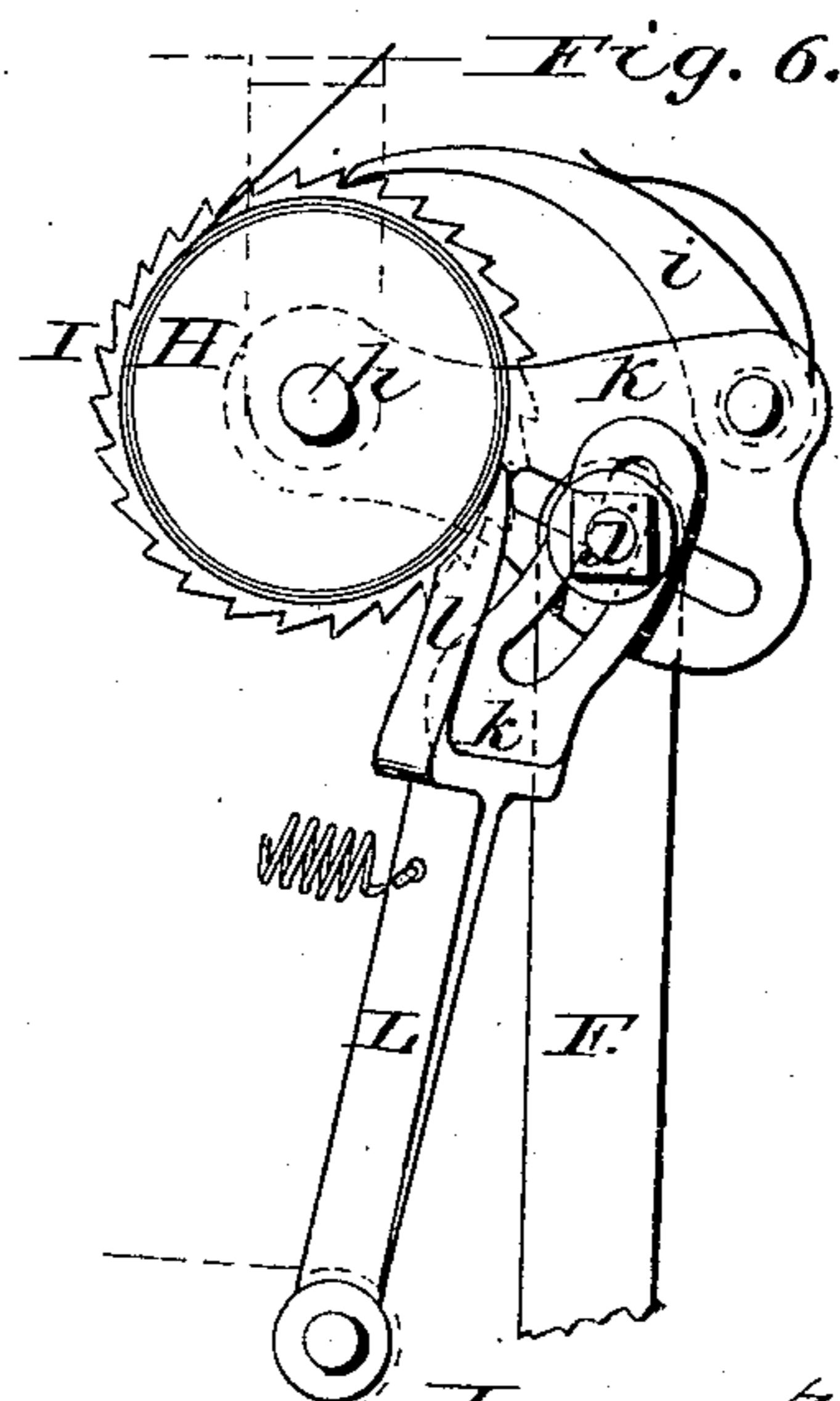
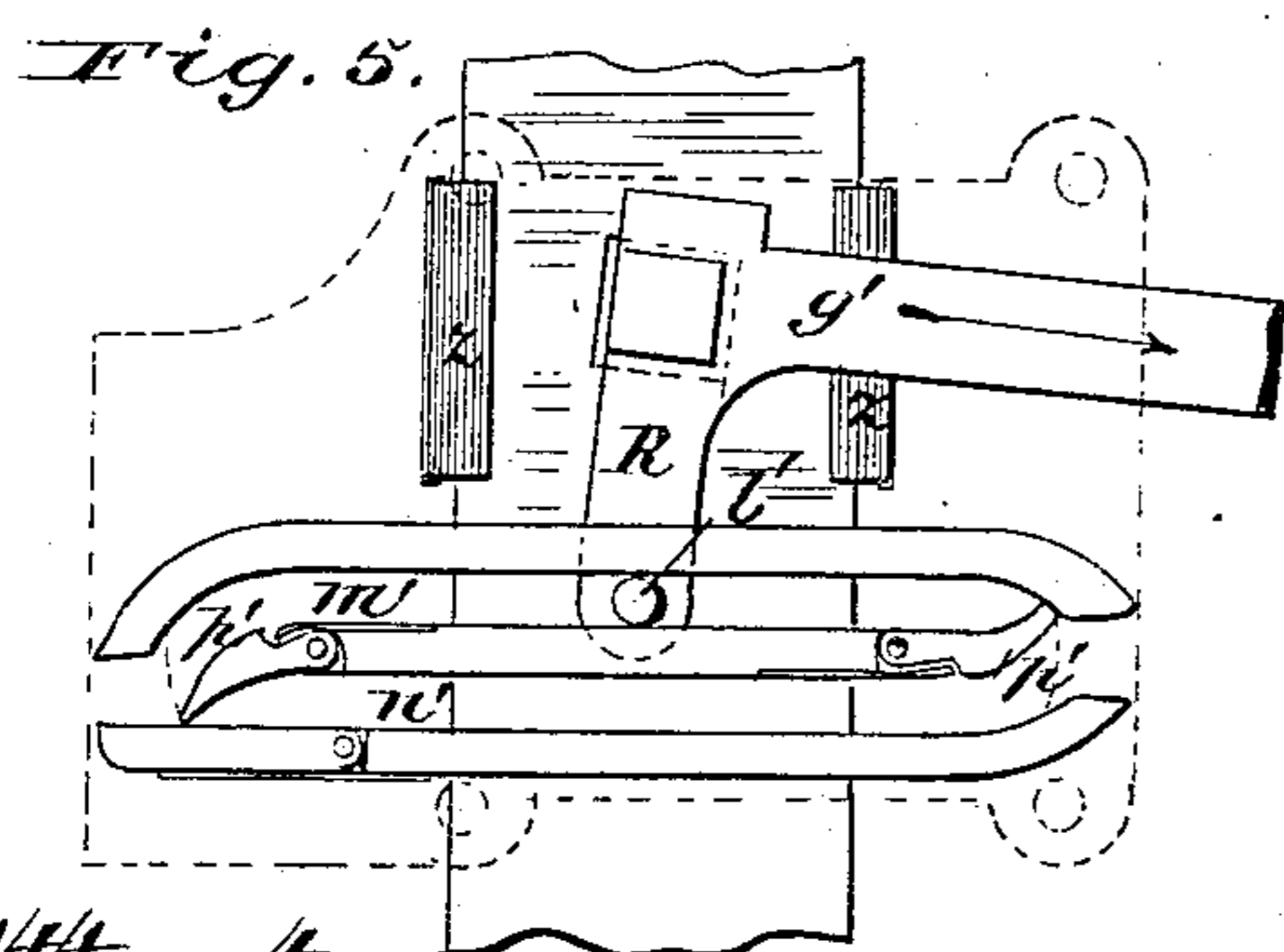
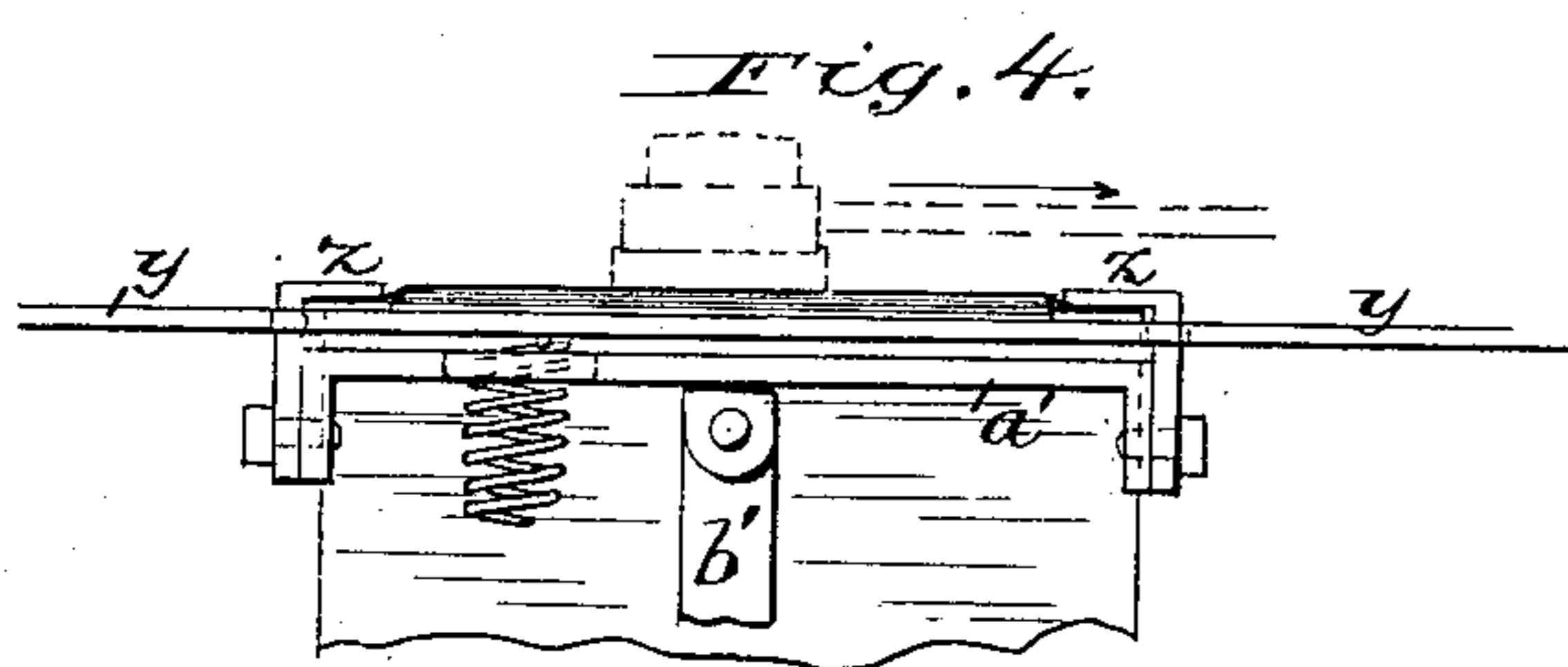
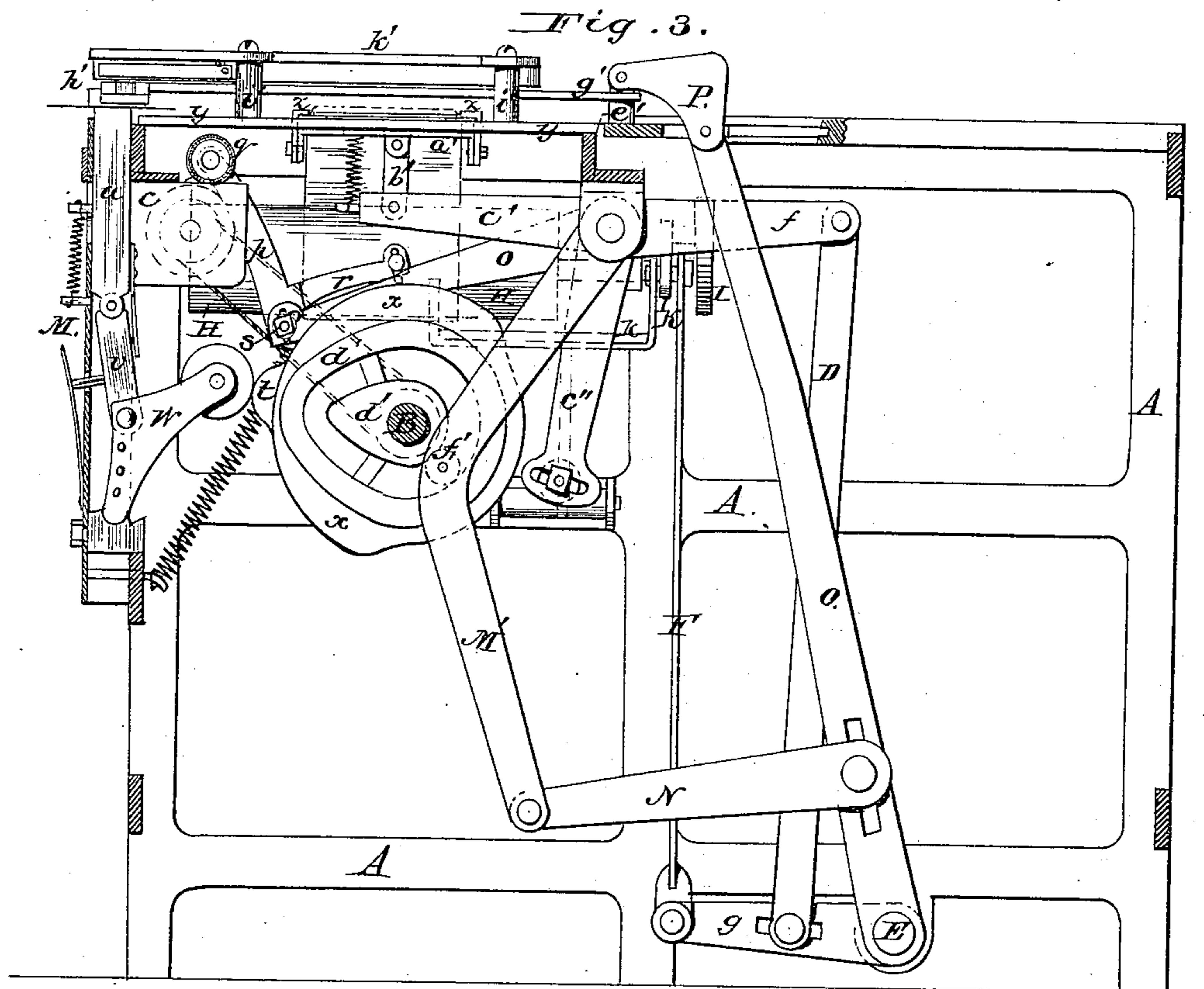
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# UNITED STATES PATENT OFFICE.

ORVILLE S. HARMON, OF BROOKLYN, NEW YORK.

## PLATE-PRINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 334,225, dated January 12, 1886.

Application filed July 19, 1877.

*To all whom it may concern:*

Be it known that I, ORVILLE S. HARMON, of Brooklyn, in Kings county, and State of New York, have invented a certain new and useful Improvement in Plate-Printing Machines; and I do hereby declare the following to be a full and correct description of the same.

My invention relates to machines for automatically stamping envelopes, cards, and other like material from an engraved surface.

I will describe in detail a machine for stamping embodying my improvement, and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a view of one side of a machine embodying my improvement, the side piece of the frame that is in the foreground being partly broken away. Fig. 2 is a front view of the machine with certain parts broken away. Fig. 3 is a view of the reverse side of the machine to that shown in Fig. 1, certain portions of that side piece of the frame which is in the foreground being broken away. Fig. 4 is a detailed view of certain parts with which the wiping-apron operates; Fig. 5 a view of the under side of a pressure-plate under which the engraved die passes in wiping, and Fig. 6 a side view of the feeding apparatus for the wiping-apron.

A designates the frame of the machine.

B designates the main or driving shaft of the machine. It is journaled in the side pieces of the frame A. Motion may be imparted to it by a belt running on a pulley with which it is provided, or in any other suitable manner.

On the driving-shaft is a pulley, *a*, that receives a belt, which also passes around a pulley arranged on one journal of an ink-drum, *b*. This ink-drum is thus constantly rotated in an ink-tank, *c*, in which it is journaled.

The driving-shaft B has also mounted on it a cam, *d*, having a groove in its side. An arm, *e*, rigidly secured at one end to a rock-shaft, C, is at the other end provided with a bowl or roller that engages with the groove of the cam

*d*. The cam as it rotates acts on the arm *e*, so that a vibratory motion will be imparted to the rock-shaft C. The rock-shaft C has also affixed to it an arm, *f*, and this arm at the outer end is pivotally connected to the upper end of a rod, D, which at the lower end is pivotally connected to an arm, *g*, that is mounted on a shaft, E. A rod, F, is pivotally connected at the lower end to the arm *g*, and at the upper end it is connected

by a bolt, *j*, with an arm, K, that is loosely hung on one of the journals *h* of a roller, H, to which one end of the wiping-apron is attached. The other end of the wiping-apron is attached to a roller, Q. The bolt *j* also connects the rod F to a lever, L. On the journal *h* of the roller H on which the arm K is hung, a ratchet wheel, I, is mounted. The arm K, near the outer end, has pivoted to it a pawl, *i*, which is held in engagement with the ratchet-wheel by a spring impinging upon it. The lever L is fulcrumed at the lower end to an arm extending from one of the side pieces of the frame A, and at the upper end has two bifurcated arms, *l k*. One arm, *k*, has an arc-shaped slot, through which the bolt *j* can move up and down as the rod F vibrates the arm K to cause the pawl *i* and ratchet-wheel I to impart motion to the roller H. The arm *l* bears against the wiping-apron, and as coils of the latter collect on the roller H the contact thereof with the arm *l* causes the lever L to be swung outward. The pin *j* is thus moved outward in the slot of the arm K through which it passes. Consequently, as the wiping apron coiled on the roller increases in diameter, the rod F is progressively moved so as to act on the arm K farther from the center of the motion of the latter. The arm *l* of the lever L is caused to maintain contact with the wiping-apron coiled upon the roller H by means of a spiral spring. As the wiping-apron coiled upon the roller H increases in diameter, and the point of connection between the rod F and the arm K is moved outward by the lever L, the pawl *i* will move a less distance; but then, owing to the increase of the diameter of the wiping-apron coiled on the roller H, a lesser movement of the pawl will be compensated for and the feed of the paper made practically uniform.

To the driving-shaft B are affixed cams *m* and *n*.

The rod D is connected by a bolt to a slotted portion of the arm *g*; hence it can be connected to the arm *g* in different positions. By varying its position, the speed of the feed of the wiping-apron may be altered.

Upon the shaft C is loosely hung an arm, *o*, having fulcrumed to it by a bolt, *s*, near the outer end, a bell-crank lever, *p*. The end of the lower arm of this bell-crank lever impinges against the periphery of the cam *m*, and the end of the upper arm carries an ink-roller, *q*.

The arm *o* impinges against the periphery of the cam *n*. The cam *n* is so shaped that at a certain point in rotation the arm *o* will be raised, and the roller *q* will be brought into contact with the face of an engraved printing-die, *h'*, and dropped several times, and the cam *m* is so shaped that when the roller *q* is brought by the raising of the arm *o* into contact with the printing-die the bell-crank lever *p* will be oscillated in such manner that the said roller will be moved across the die and returned to its starting position when the arm *o* is dropped. During all that part of the rotation of the cams *m n*, except while they produce these motions of the roller *q*, this roller is dropped, so that it can rotate by frictional contact with the ink-drum *b* and receive ink therefrom. The arm *o* and bell-crank lever *p* are kept in contact with the cams *n m* by means of a spring acting on the lower arm of the bell-crank lever. By moving the roller *q* across the die in the manner described, the die will be very thoroughly inked. The number of times which the ink-roller is caused to move across the face of the printing-die may be varied by modifying the cam that produces such motion.

The bolt *s* passes through a slot in the arm *o*; hence it may be adjusted to fulcrum the bell-crank lever *p* in different positions to the arm for the purpose of varying the action of the roller *q* upon the printing-die.

The driving-shaft B has affixed to it a cam, *t*. In the front of the frame is a slideway, M, in which reciprocates vertically a plunger, *u*, constituting or carrying the counter-die in conjunction with which the printing-die operates. To the lower end of this plunger is pivotally connected one end of a toggle-lever, *v*. The toggle-lever *v* at the lower end is pivotally connected to a toggle-lever, W, that at the lower end bears in a shoe or rest. The toggle-lever W is provided with a roller that bears against the periphery of the cam *t*. A spring fastened to the side of the slideway and acting on the toggle-lever *v*, and another spring fastened to the slideway M and to the plunger *u*, serve to hold the roller of the toggle-lever W in contact with the cam *t*. When the cam *t* forces back the toggle-lever W, the plunger *u* will be raised so as to forcibly press the counter-die toward the printing-die. The shoe in which the lower end of the toggle-lever bears may be adjusted into different positions and secured by a screw to vary the force with which the toggle-lever will act.

At the top of the frame A is a plate, *y*. Clamping-jaws *z* extend over this plate, and have shanks that pass through slots or openings in the plates. The shanks of these jaws are pivotally connected to a yoke or cross-piece, *a'*, that is pivotally connected to the upper end of a link, *b'*. The link *b'* is pivotally connected at the upper end to the arm *c'* of a bell-crank lever, *c' c''*, hung loosely upon the rock-shaft C. The arm *c''* of the lever *c' c''* is provided with a roller or bowl, that bears

against the periphery of a cam, *x*, which is affixed to the driving-shaft B. The roller or bowl is secured to this arm of the lever by a bolt passing through a slot in the said arm; hence the position of the roller or bowl may be varied to cause the lever to operate differently upon the jaws *z*. The jaws *z* extend over the side edges of the wiping-apron, and at certain times are drawn down to clamp and hold the apron. They are pivotally connected to the yoke *a'*, in order that they may seat themselves properly on the wiping-apron.

Hung loosely upon the shaft C is a lever, M', provided with a roller or bowl, *f'*, working in the groove or slot of a cam, *d'*, that is affixed to the driving-shaft B. To the lower end of the lever M' is pivotally connected a link, N, which is also connected to a lever, O, pivoted upon the shaft E. The upper end of this lever *o* is connected by a link, P, to a cross-head, *e'*, traveling in ways across the top frame, A. To the cross-head *e'* is attached a rod, *g'*, carrying the printing-die *h'*. The link N is connected to the lever O by a bolt passing through a slot in said lever; hence the point of connection between the link and the lever may be varied to alter the movement of the printing-die.

Upon the top of the plate *y*, and underneath the jaws *z z*, is an elastic cushion. The wiping-apron is caused by the roller H to travel over this cushion. Above the plate *y*, cushion, and wiping-apron, a pressure-plate is supported from a plate, *k'*, which is mounted on pillars *i'*. This pressure-plate is adjustable relatively to the plate *k'* by means of set-screws. The rod *g'* at the free end, where the printing-die is secured to it, has a lateral extension, R, provided with a pin, *l'*. The under side of the plate *k'* is provided with ways *m'* and *n'*, the center bar of which has at its ends dogs *p' p'*, impelled by springs each against one of the outer bars. The pin *l'* can only move past the dogs in one direction; hence it will always move in one direction through the way *m'* and return through the other way, *n'*.

The operation of the machine is as follows: Power having been applied to the driving-shaft B, the pulley *a* will, through its belt, cause the ink-drum to rotate in the ink-tank *c*. The ink-roll *q* will be rotated by contact with said drum, and supplied with ink ready for use. The cams *m* and *n* cause the ink-roller to distribute the ink upon the surface of the printing-die. After the printing-die is inked, it is moved over the wiping-apron above the cushion, but below the pressure-plate *k*. The pressure-plate is kept adjusted by the adjusting-screws, so as to give a proper pressure upon the printing-die, in order that all the ink, except such as is in the intaglio portions, may be wiped off the face of the printing-die. The pin *l*, by which the printing-die is guided, travels along the way *m'* when the said die leaves the inking apparatus, but in returning moves along the way *n'*, so that the die will be

rubbed over a fresh portion of the wiping-apron. After being wiped, the printing-die is brought into a position over the counter-die, the material to be printed is interposed between the dies, and the plunger *u* is operated to cause the dies to perform their work. While the printing is being performed, the wiping-apron is moved along to present a fresh clean surface for use next time the printing-die needs to be wiped. During the passage of the printing-die over the wiping-apron, the clamping-jaws *z* hold the wiping-apron firmly.

Different colored ink may of course be used, and when a succession of colors is desired one ink-tank may be exchanged for another containing a different color until the succession is complete, or a fountain of colors may be attached in any well-known manner.

The wiping-apron is made of smooth-surfaced calendered paper, and the pad over which it is fed is made of yielding material. I find that by the use of such devices the wiping of the printing-die will be performed very effectively.

I am aware that an ink-tank having a revolving ink-drum, with an ink-roll revolving in contact therewith, said roll being adapted to be raised to the surface of the die by means of a cam, in combination with a wiping and stamping mechanism, is old, and the same does not broadly constitute a part of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a printing-die, an inking-roller, a lever for causing it to traverse the face of the die and capable of adjustment to vary its action with relation to the die, a cam for actuating the lever, a traveling wiping-apron, and a stamping mechanism, substantially as specified.

2. The combination of a printing-die, an inking-roller, a bell-crank lever on which the inking-roller is mounted, an arm to which such bell-crank lever is fulcrumed, a cam for raising the said arm, and a cam for vibrating the bell-crank lever to cause the roller to traverse the face of the die, substantially as specified.

3. The combination of a printing-die, an inking-roller, a bell-crank lever on which the inking-roller is mounted, an arm to which the bell-crank lever is fulcrumed adjustably so that the action of the roller may be varied, a cam for raising the arm, and a cam for vibrating the bell-crank lever to cause the roller to traverse the face of the die, substantially as specified.

4. The combination of a printing-die, a wiping-apron having an intermittent feed, an elastic pad over which the wiping-apron is fed, a presser-plate, and screws, substantially as described, acting on the presser-plate for varying the pressure with which the die is wiped, substantially as specified.

5. The combination of a printing-die, a wiping-apron, an elastic pad over which the wiping-apron is fed, a presser-plate, and screws acting on the presser-plate for varying the pressure with which the die will be wiped, said die being moved in a direction transversely to the direction of movement of the apron, substantially as specified.

6. The combination of a printing-die, a wiping-apron having an intermittent feed, and jaws for clamping and holding the wiping-apron while the wiping of the die is being performed, substantially as specified.

7. The combination of a printing-die, a wiping-apron, a roller onto which the wiping-apron is wound, an arm from which motion is transmitted to the roller, a lever bearing against the wiping-apron wound upon the roller, and a connection between the lever and arm admitting of the action of the lever at different points in the length of the arm, substantially as specified.

8. The combination of a printing-die, a wiping-apron having an intermittent feed, the jaws *z*, the yoke *a'*, to which the jaws are pivotally connected, the link *b'*, and a lever and cam for actuating such link, substantially as specified.

9. The combination of a printing-die, a wiping-apron, a roller onto which the wiping-apron is wound, a pawl or dog connected to an arm whereby motion may be imparted to said roller, a rod for imparting motion to the said arm, and a lever impinging against the wiping-apron as it is coiled on the roller and serving to vary the point of connection between the said arm and rod as the coiled wiping-apron increases in diameter, substantially as specified.

10. The combination, with a printing-die, a wiping mechanism, and a stamping mechanism, of a lever for moving the die into its various positions, and means, substantially as described, whereby the throw of the lever may be varied, substantially as specified.

11. The combination, with a printing-die, a wiping mechanism, substantially as described, and a stamping mechanism, of the lever *M'*, the lever *O*, and the link *N*, adjustably connected to the lever *O*, substantially as specified.

12. The combination, with a printing-die, a wiping-apron moving in one direction therefor, means for moving the die transversely to that of the direction of the apron, and ways, substantially as described, whereby the die is caused to make reverse motions in different planes, substantially as specified.

The above specification of my said invention signed and witnessed at Brooklyn this 14th day of July, A. D. 1877.

ORVILLE S. HARMON.

Witnesses:

ALLAN STEVENSON,  
JOSEPH WILEY, Jr.