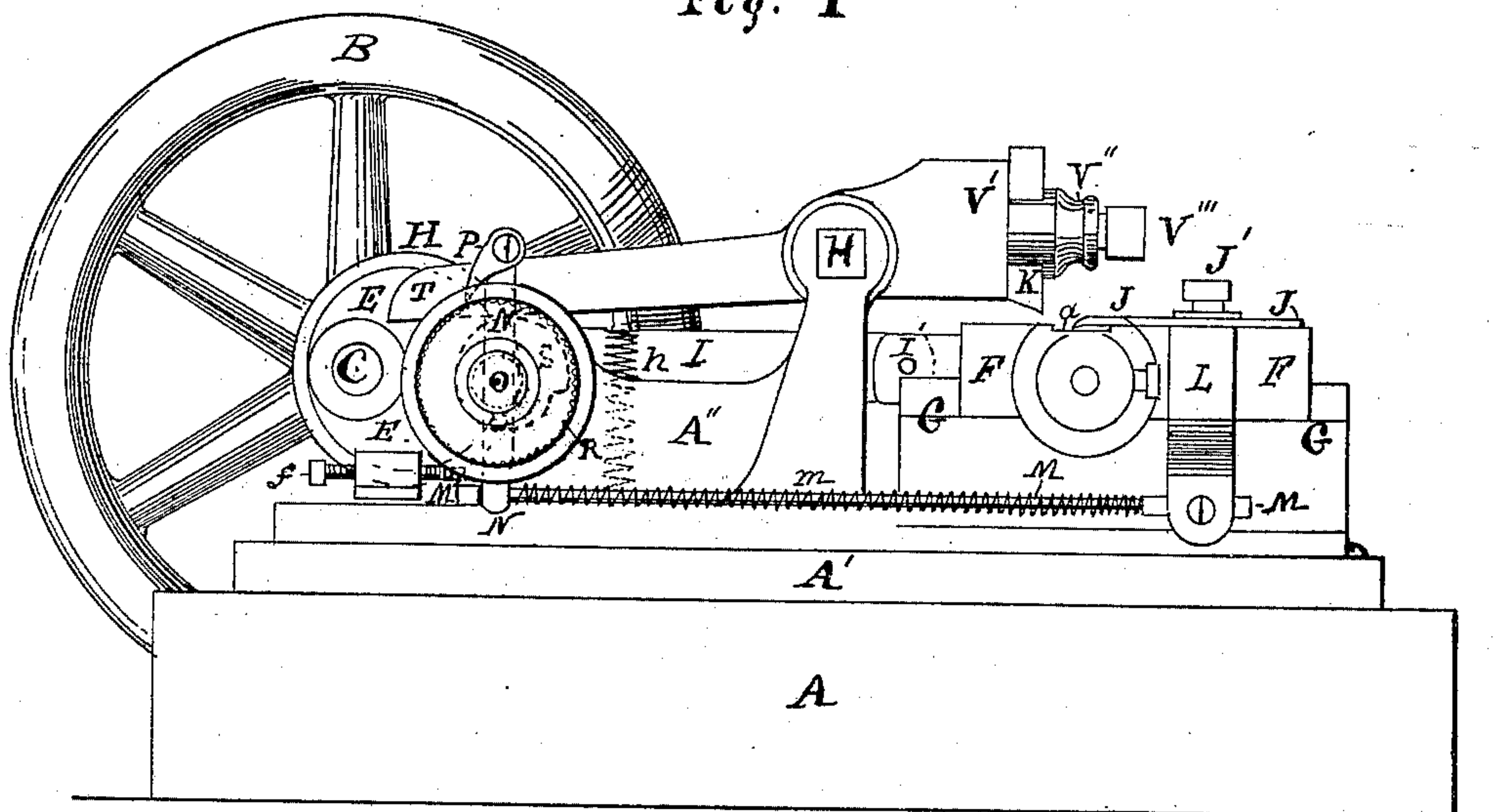


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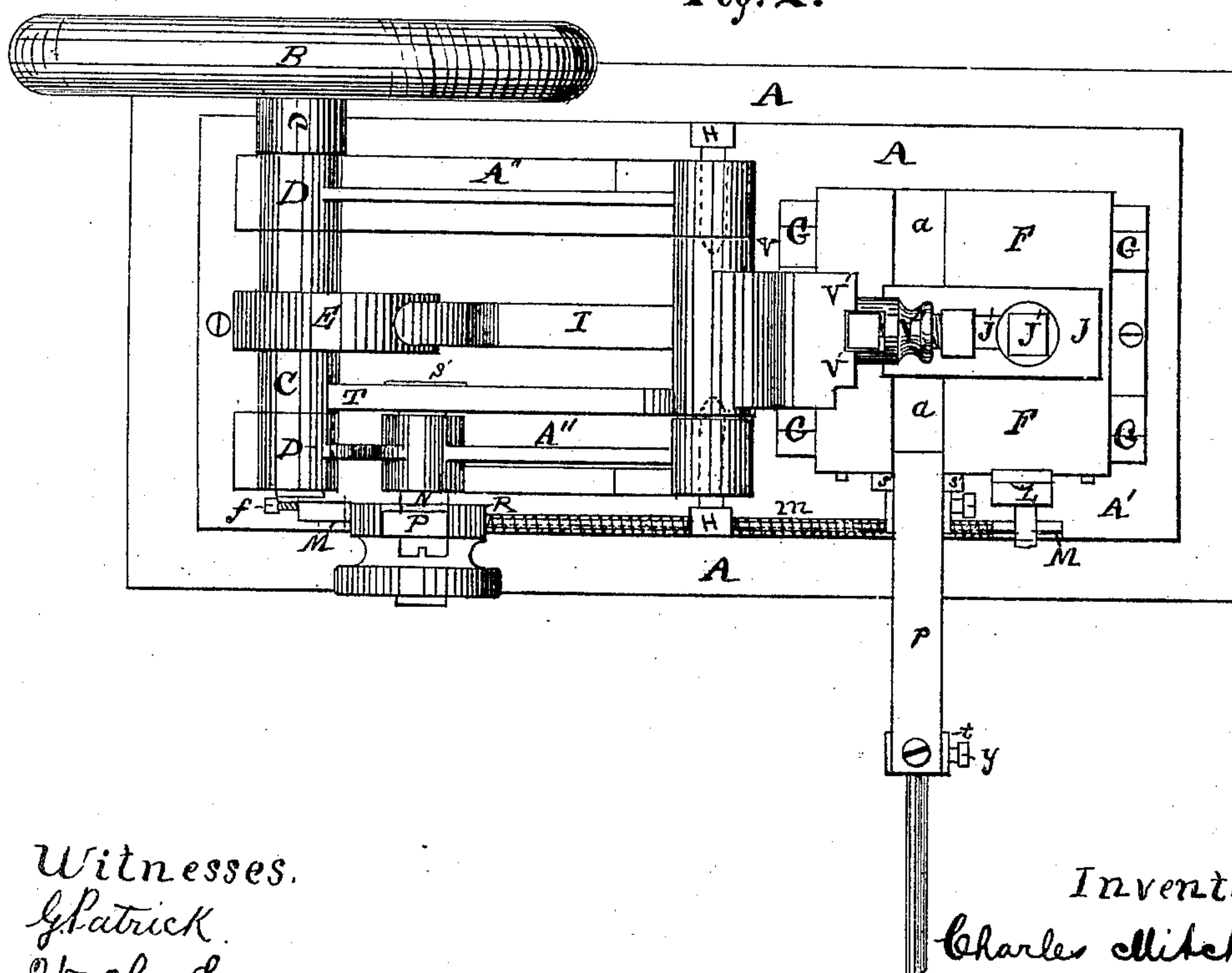
No. 271,349.

Patented Jan. 30, 1883.

Fig. 1



*Fig. 2.*



Witnesses.

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MACHINERY FOR CUTTING AND MITERING PRINTERS' RULES.

No. 271,349.

Patented Jan. 30. 1883.

Fig. 3.

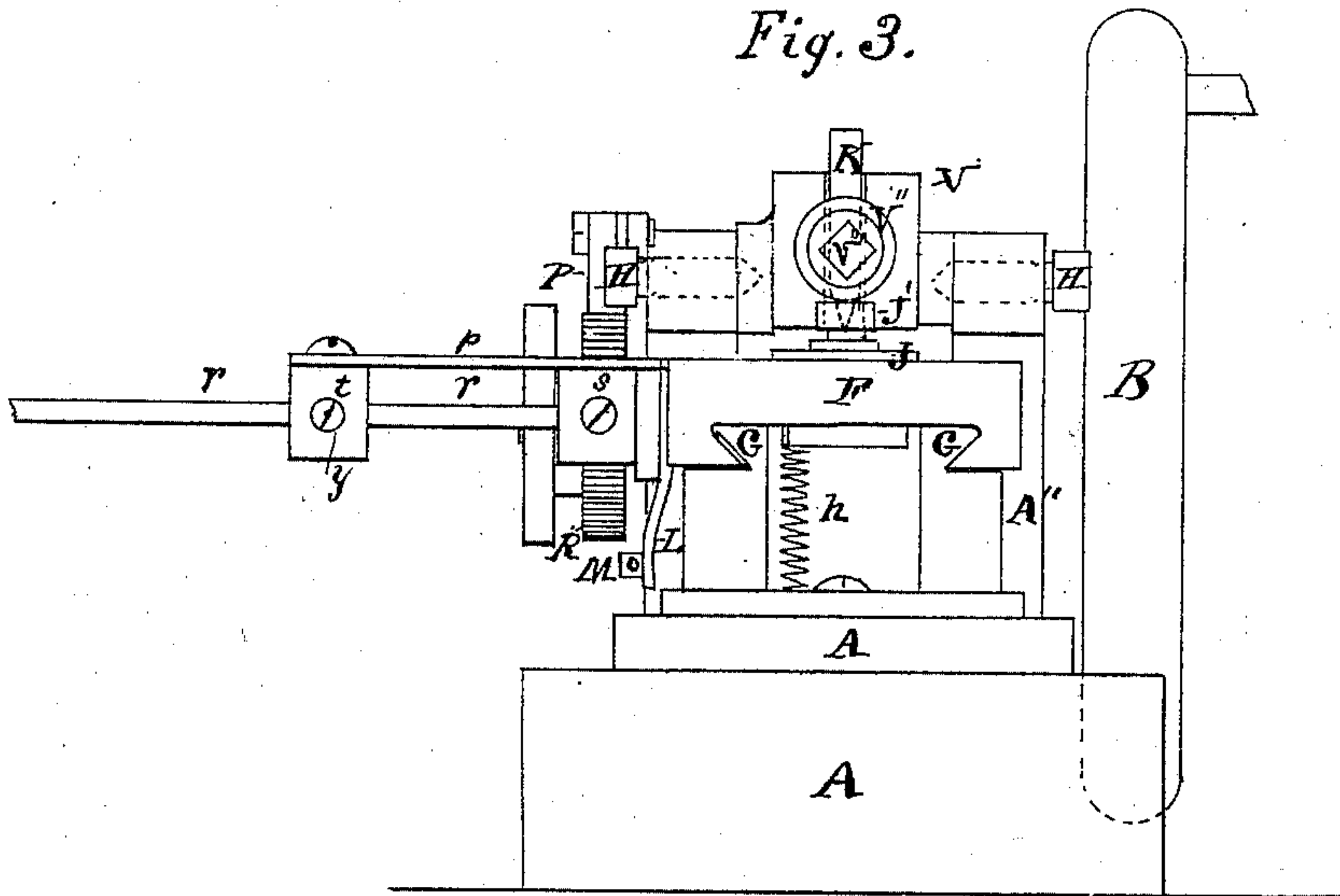


Fig. 4.

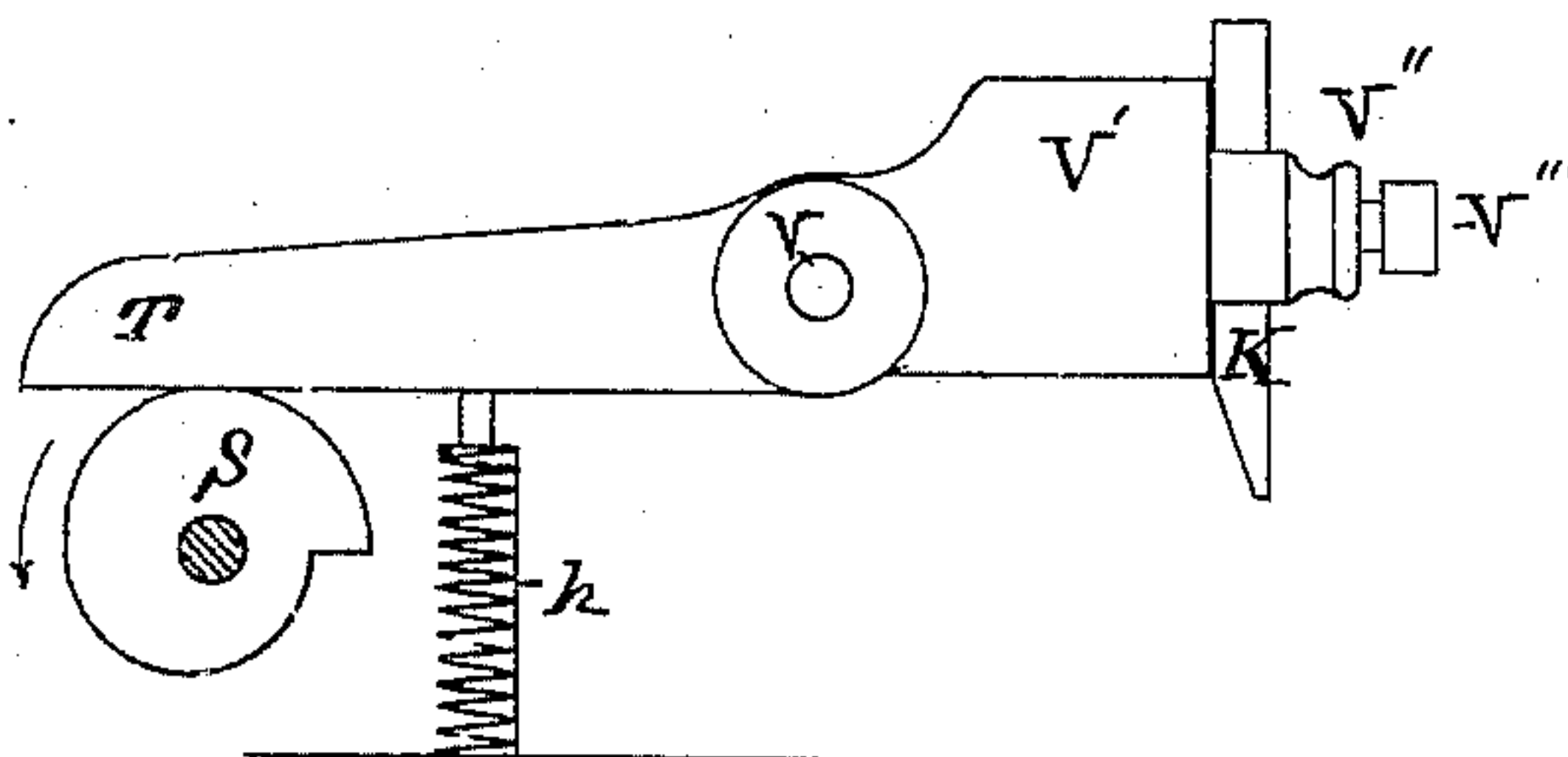


Fig. 9.

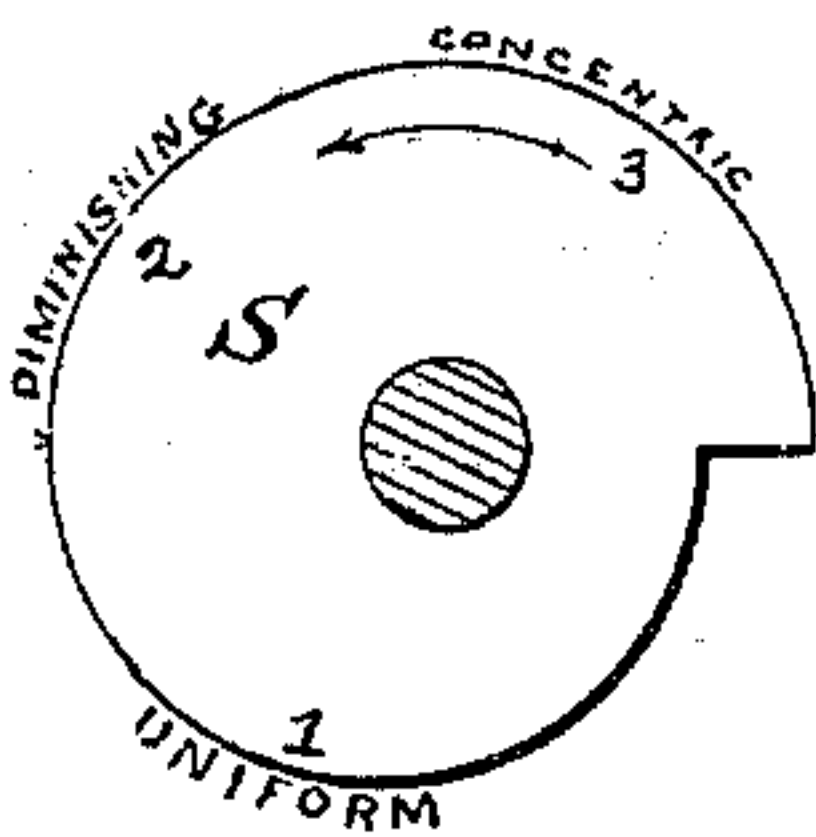


Fig. 6.

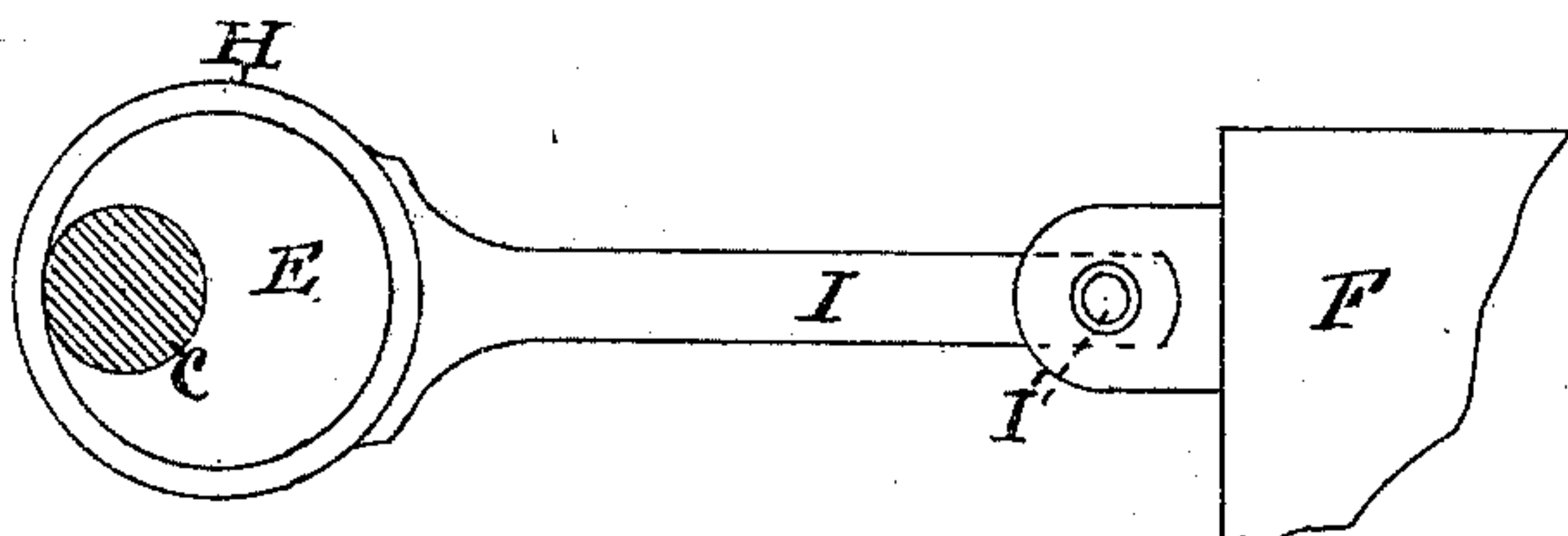


Fig. 5.

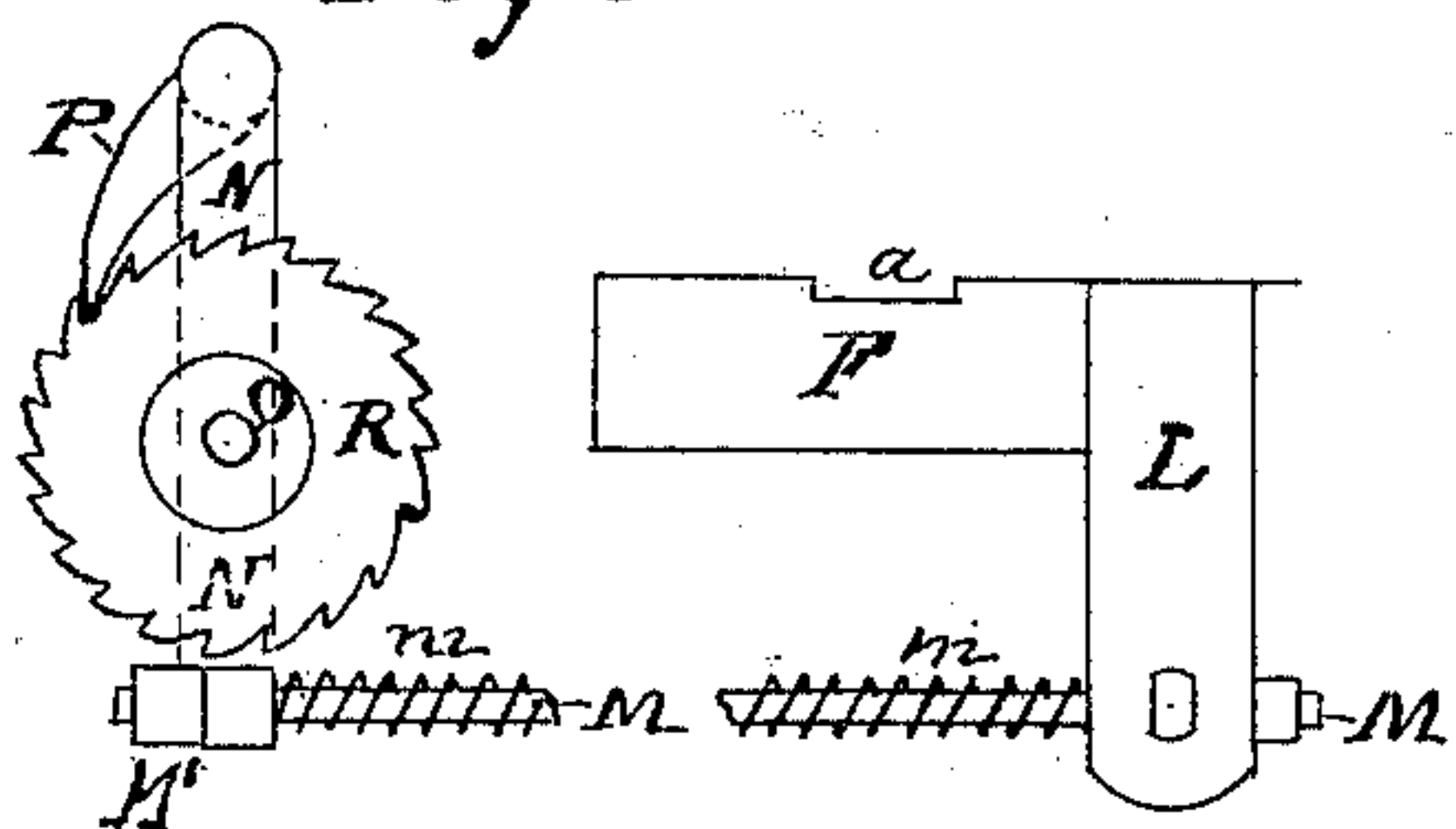
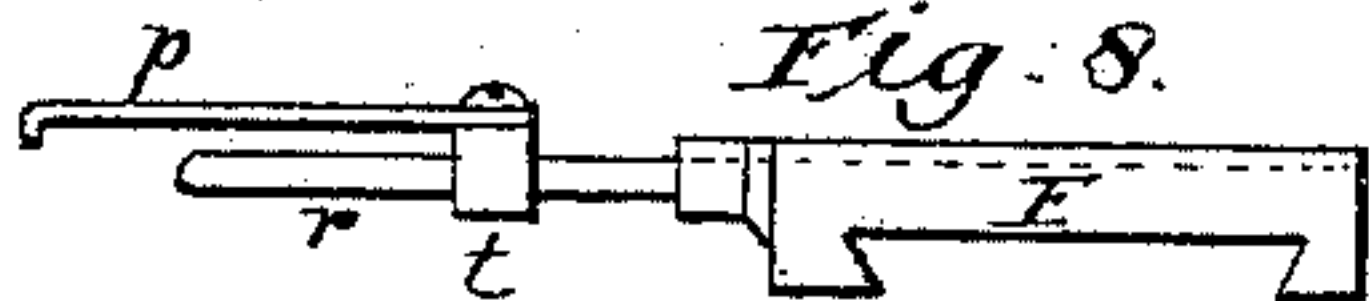


Fig. 7.



Fig. 8.



Witnesses.

J. Patrick.  
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By his att'y  
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# UNITED STATES PATENT OFFICE.

CHARLES MITCHELL, OF POUGHKEEPSIE, NEW YORK.

## MACHINERY FOR CUTTING AND MITERING PRINTERS' RULES.

SPECIFICATION forming part of Letters Patent No. 271,349, dated January 30, 1882.

Application filed December 8, 1882. (Model.)

*To all whom it may concern:*

Be it known that I, CHARLES MITCHELL, a citizen of the United States, residing at Poughkeepsie, county of Dutchess, and State of New York, have invented a new and useful Improvement in Machines for Cutting and Mitering Printers' Rules, of which the following is a specification.

My invention relates to improvements in machines for cutting and mitering printers' rules of the class cutting by a reciprocating motion, as distinguished from those working on the principle of a pair of shears.

The objects of my invention are to obtain greater accuracy in cutting, a smoother cut, and facility in working, combined with economy. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is vertical side view of the entire machine; Fig. 2, a horizontal projection or plan view. Fig. 3, an end view of the machine. Figs. 4 and 5 detailed side views of the feed mechanism for cutting-tool, and Fig. 6 a detailed view of mechanism for producing the reciprocating motion of the table for carrying the rule to be cut. Figs. 7 and 8 are side views of the reversible feeding-gage, showing the same in its two positions. Fig. 9 is a side elevation of the cam by which the movement of the tool is effected.

Similar letters refer to similar parts throughout the several views.

A is the base of the machine, of either wood or metal; A', the upper base, of metal; B, the balance-wheel, secured to the shaft C C and turning with it in bearings D, attached to the frame A'' A''.

The balance-wheel may be turned by hand, or, by adding a suitable driving-pulley, may be driven by power.

The shaft C C passes through and gives motion to the eccentric E, which communicates a reciprocating motion, like that of a planing-machine, to the table F, sliding on the ways G G, by means of the eccentric-strap H, connecting-rod I, and the wrist-pin I'. The rule to be cut is placed in the groove *a a* in the reciprocating table F and held firmly by the clamp J, which is secured in any desired position by the adjusting-screw J'. The alternate to-and-fro motion of the table F brings the rule against the cutting-tool K, and at each successive forward

movement the cut is deepened until the rule is entirely cut through or the bevel formed.

At each forward movement of the table F the cutting knife or tool must be fed down a distance depending on the nature of the metal to be cut. This is effected by the following mechanism:

Attached to the reciprocating table F is the piece of metal L, to which is attached one end of the rod M, passing through a spiral spring, *m*, and having its other end passing loosely through the lower extremity of a lever, N, and terminating in a nut or head, M', which rocks on a journal, O, and carries at its upper end the pawl P, moving loosely on the pivot and working in the teeth of the ratchet-wheel R, to which it gives a step-by-step movement of rotation. During the motion of the table F toward the tool K the rod M is pushed loosely through the hole in the stud attached to the lower end of the lever N, and produces no effect; but the spring *m*, with which rod M is surrounded, pushes, owing to its compression, with sufficient force against the stud, and causes the lever N to rock upon its pivot, and drags the pawl P loosely over the teeth of the ratchet-wheel until the lever N is stopped by the set-screw *f*. During the reverse movement of the table F from the tool K the rod M pulls, by means of the nut M', the lower end of the lever N by a positive motion with it. The pawl P thus pushes the ratchet-wheel around a distance equal to the width of one or more teeth, and carries the cam-wheel S, which is fast on the same shaft, with it. Upon this cam S rests the lever T, held against the cam by the spiral spring *h*, and fixed to the shaft V, which latter turns upon its conical bearings, which form part of the screws H H. The forward end of the lever T has a head, V', to which is attached the slotted tool-holder V''. The tool K may be adjusted and firmly held in place by the set-screw V'''. The cam S thus gives a slow downward movement to the cutting-tool, which takes a deeper and deeper cut at each movement of the reciprocating table F toward it.

The cam S is constructed with a gradually-diminishing pitch as it recedes from the center for the greater part of its circumference. Then a small portion is of constant diameter, ending with a vertical drop to release the tool at the end of the operation.



In Fig. 9, 1, 2, and 3 indicate respectively those portions of the circumference which have the rapid or extreme pitch, the diminishing pitch, and the concentric surface.

5 The cam operates to give a downward feed at a gradually-diminishing speed to the tool K until the rule is nearly cut through; then for several strokes the tool is not fed down at all; and, finally, at the completion of the cut, 10 the end T falls down the vertical part of the cam S, and thus allows the cutter-head and tool to return to their position at the beginning of the work. By imparting to the pointed tool a decreasing rate of feed the depth of its 15 cut is lessened as the surface increases, and thus a uniform and easy action is secured. By arresting the descent of the tool and holding the same stationary during the last few movements of the bed, the tool is caused to impart 20 to the surface of the metal a smoothness and accuracy of finish not otherwise attainable.

The rate of feed may be regulated by the set-screw *f*, so as to feed one or more teeth of the ratchet-wheel at pleasure.

25 The gage for determining the length of the rule cut consists of a rod, *r*, extending horizontally from the side of the bed, and sustaining a sliding collar, *t*, to which there is attached by a vertical screw one end of a gage-plate, *p*, the opposite end of which slides 30 usually in the groove *a* in the face of the bed. The end of the rule bears against the end of the slide *p*, and the distance between the end of the slide and the cutter consequently determines the length of the rule. 35

The collar and slide may be moved forward and backward, and held in position either by friction or by turning the connecting-screw down until it bears on the rod.

40 When rules of excessive length are to be cut the slide *p* may be reversed or turned end for end upon the screw, as shown in Fig. 8, thus permitting the rule to extend outward against the collar.

45 If desired, this gage is made so as to be easily removed.

The clamp *J'* is a simple piece of metal slotted to receive the screw *J*, and bent over slightly at the end toward the rule, so as to 50 bear on the center of the rule only.

I am aware of the patent granted to J. Stever, dated December 12, 1854, and numbered 12,076, and do not claim anything therein set forth or claimed.

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

1. In combination with the reciprocating bed, the vertically-rocking tool-carrier, and automatic means, substantially as described, for 60 gradually depressing the tool-carrier.

2. In a machine for mitering printers' rules, the combination of the reciprocating bed or carrier, the rocking head provided with the tool or cutter, the eccentric to depress the head, 65 and means, substantially as described, acting to rotate the eccentric automatically.

3. In combination with the reciprocating

bed or carrier, the rocking head provided with a cutter, and a cam to depress said head, constructed with a diminishing pitch, whereby the 70 tool is depressed with decreasing speed as the depth of the cut increases.

4. The reciprocating bed, its actuating-rod and eccentric, in combination with the vertically-rocking tool-carrier, the cam to depress 75 the same, the pawl and ratchet to turn said cam, and operating devices, substantially as shown, connecting the pawl with the reciprocating bed.

5. In combination with the reciprocating 80 bed or carrier, the vertically-movable tool-carrier, the cam to depress said carrier, the pawl-and-ratchet feed to turn said cam, and the rod and spring connecting the pawl-carrier with the reciprocating bed. 85

6. In combination with the cutter-supporting head, its depressing-cam, the ratchet-wheel, and the pawl and lever to turn said wheel, the reciprocating rod and spring to actuate the lever, and the adjustable stop to limit 90 the backward motion of the lever, whereby the rod may be caused to move the cam and depress the tool a greater or less distance at each stroke.

7. In a machine for mitering rules, the combination of a reciprocating bed or carrier, a pivoted tool-carrying head, a spring tending to 95 raise said head, and an automatically-actuated cam for depressing the head.

8. In combination with the movable bed or 100 carrier, the tool-carrier pivoted in fixed bearings, the spring tending to elevate the carrier, and the depressing-cam provided with a shoulder or depression, whereby the automatic elevation of the tool is effected when it has cut 105 to the predetermined depth.

9. In a machine for mitering printers' rules, the combination of a bed or support for the rule, a cutter having a pointed cutting end, and automatic mechanism, substantially as de- 110 scribed, adapted to depress said tool at a diminishing speed as its cut increases in depth, whereby the depth of the cut is lessened as its surface is increased, thus equalizing the strain and insuring a smooth action. 115

10. In a machine for mitering printers' rules, the combination, with the tool-carrying head, of the depressing-cam having its surface continued from the point of highest elevation a limited distance in a concentric line, whereby 120 the tool is permitted to remain in an unchanged position during its finishing cuts to impart a smooth surface to the metal.

11. In combination with the cutting-tool and the reciprocating bed or support, the rod *r*, the sliding collar *t* thereon, and the plate *p*, pivoted to the collar and adapted to be turned 125 thereon end for end.

In witness of my said invention I hereunto set my hand this 25th day of May, A. D. 1882. 130

CHAS. MITCHELL.

Witnesses:

W. G. BUTTON,

W. H. SONNEBORN.