

(No Model.)

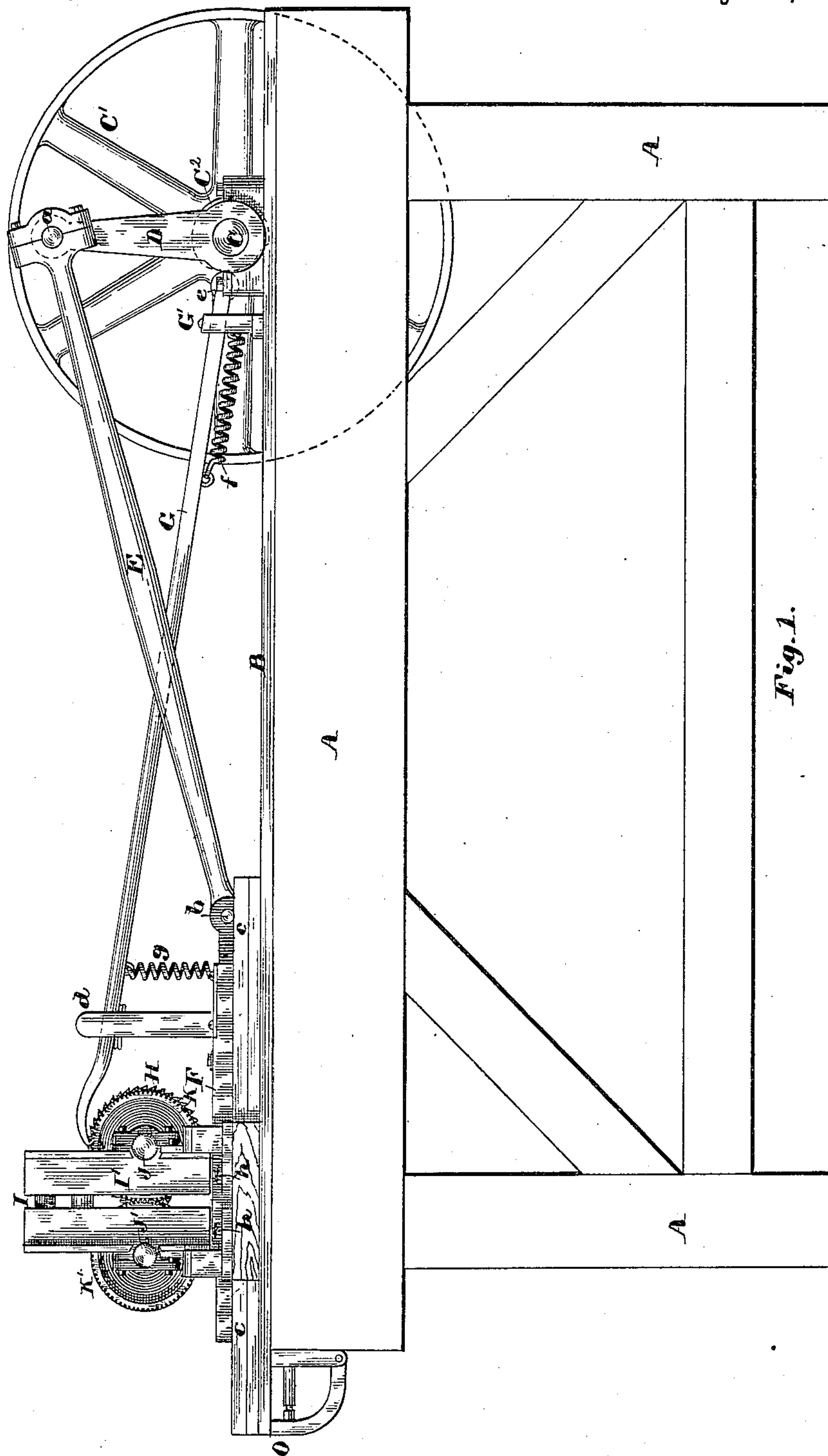
4 Sheets—Sheet 1.

H. L. HAPGOOD.

MACHINE FOR CUTTING MATCH SPLINTS.

No. 258,414.

Patented May 23, 1882.



**Witnesses:**

Walter E. Lombard  
E. A. Hemmenway

***Inventor:***

*Herbert L. Hapgood,*  
by *N. C. Lombard*  
*Attorney.*

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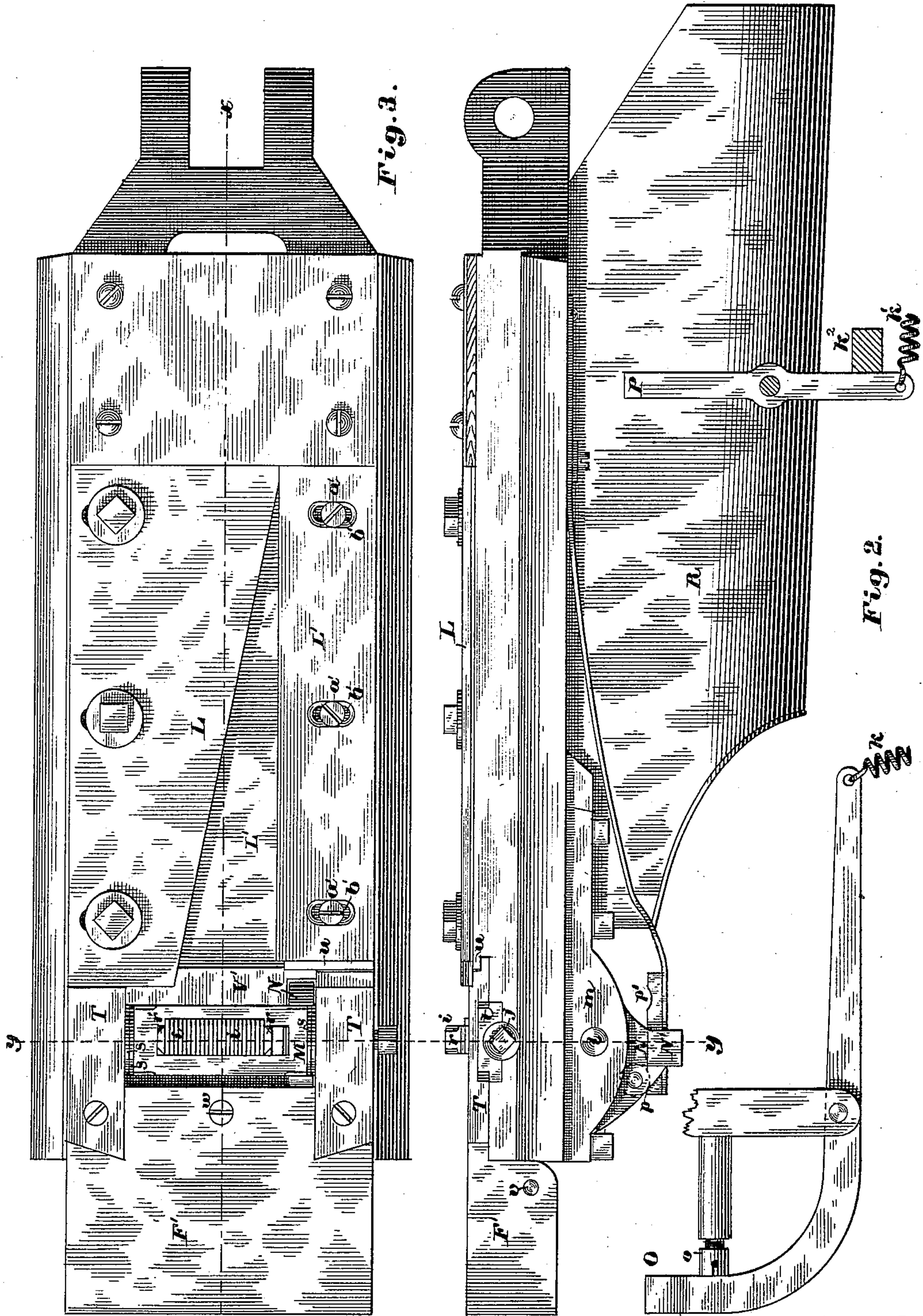
4 Sheets—Sheet 2.

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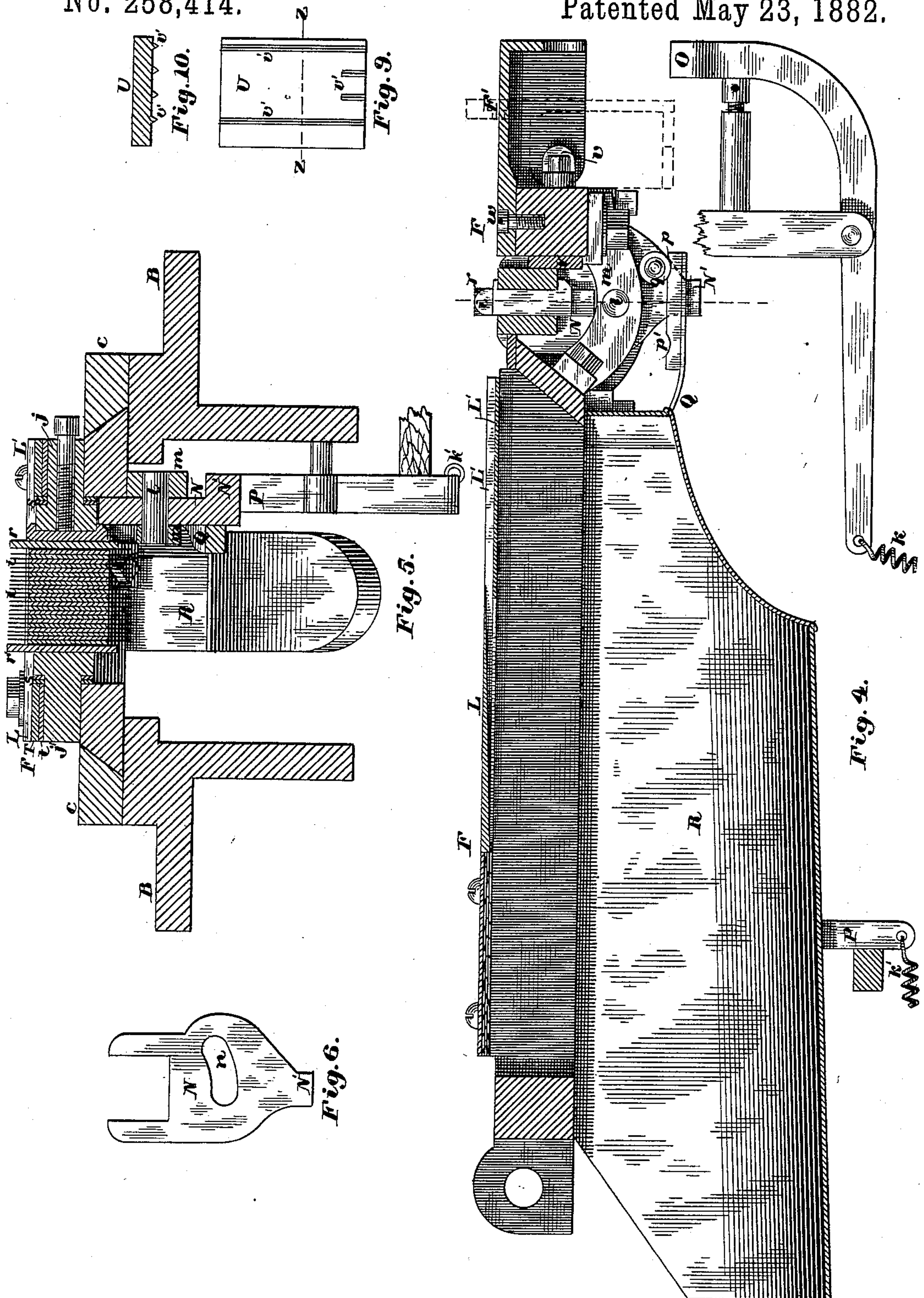
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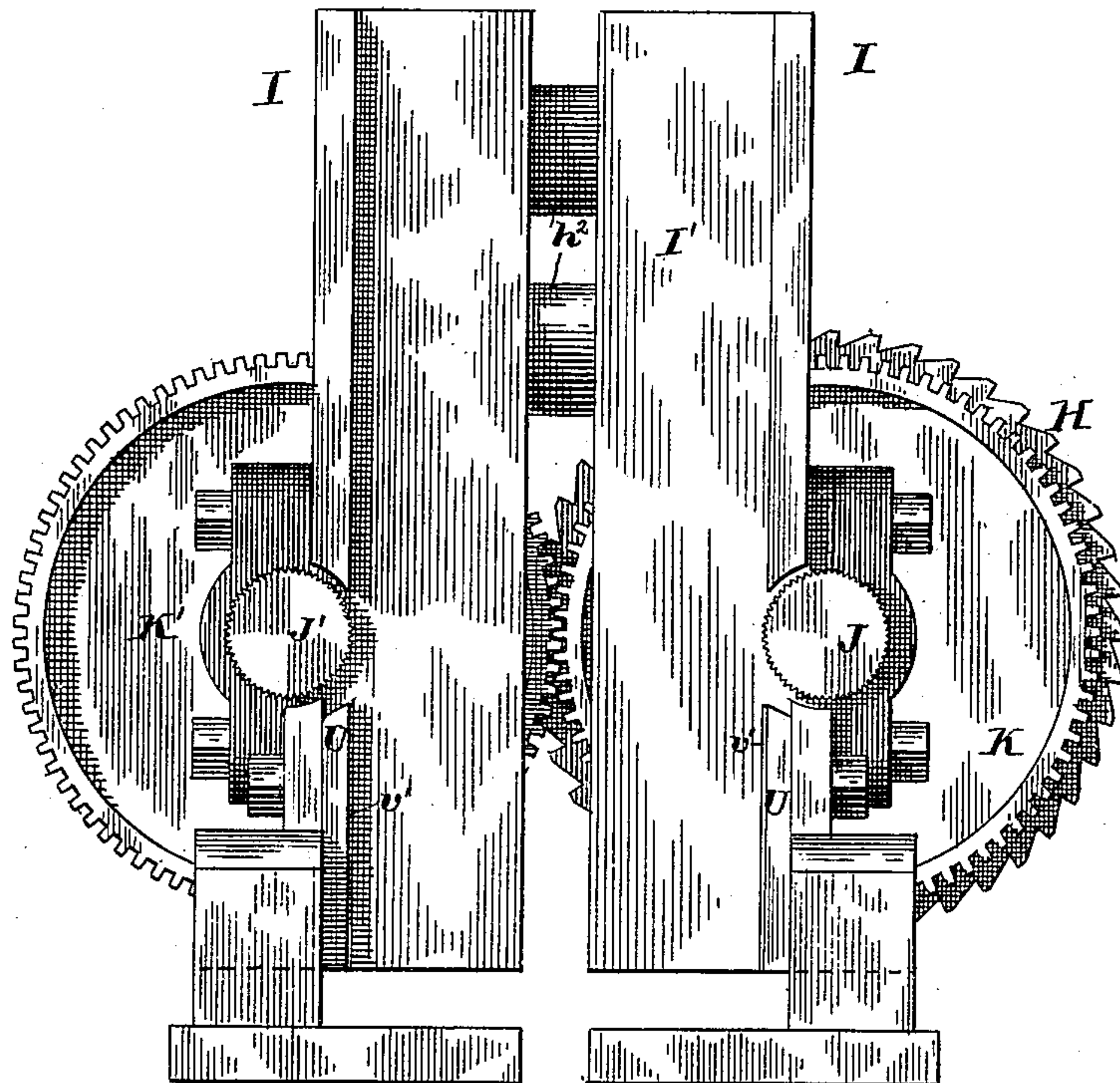


Fig. 8.

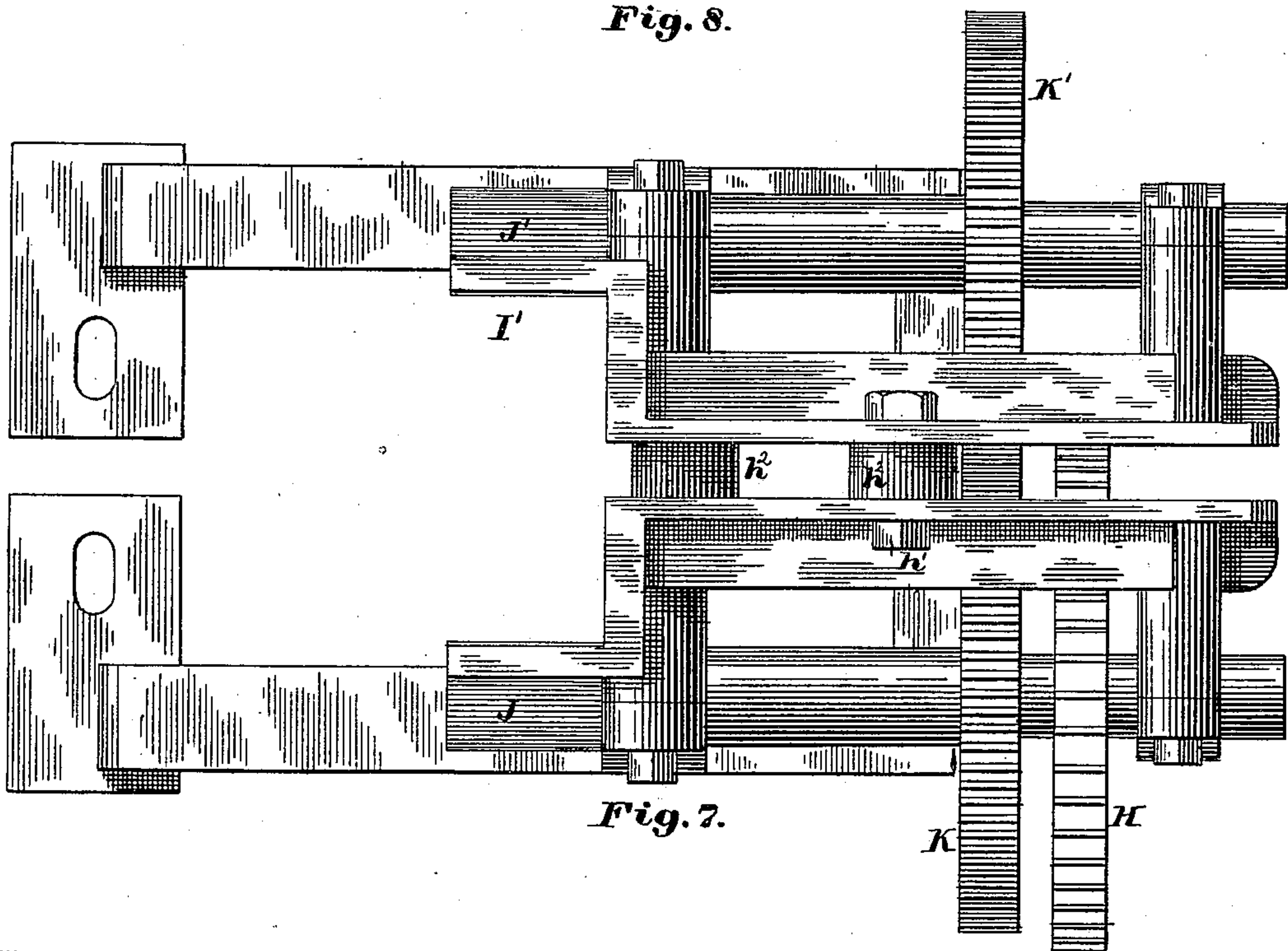


Fig. 7.

Witnesses:

Walter E. Lombard.  
E. A. Hemmenway.

Inventor:

Herbert L. Hapgood.

by N. Lombard  
Attorney.



# UNITED STATES PATENT OFFICE.

HERBERT L. HAPGOOD, OF ATHOL, MASSACHUSETTS, ASSIGNOR TO  
HAPGOOD & SMITH, OF SAME PLACE.

## MACHINE FOR CUTTING MATCH-SPLINTS.

SPECIFICATION forming part of Letters Patent No. 258,414, dated May 23, 1882.

Application filed September 19, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT L. HAPGOOD, of Athol, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Cutting Match-Splints, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a machine for cutting match-splints of a rectangular cross-section; and it consists in certain improvements in the manner of hanging and operating the cutters, and in the means employed to hold the block of wood from which the splints are to be cut, which will be readily understood by reference to the description of the drawings, and to the claims to be hereinafter given.

Figure 1 of the drawings is a side elevation of a machine embodying my invention. Fig. 2 is a side elevation of the cutter-carrying slide detached from the machine and drawn to an enlarged scale. Fig. 3 is a plan of same. Fig. 4 is a longitudinal section of same on line *x x* on Fig. 3. Fig. 5 is a transverse section on line *y y* on Figs. 2 and 3, looking toward the driving-shaft. Fig. 6 is an inside elevation of the forked lever for oscillating the spur-cutter-carrying shaft or bar. Fig. 7 is a plan of the block holding and feeding devices. Fig. 8 is a front elevation of the same. Fig. 9 is an elevation of one of the block-guiding plates below the feed-rolls, and Fig. 10 is a horizontal section of the same on line *z z* on Fig. 9.

A is the main frame of the machine, in the case shown made of wood, and B is a cast-iron bed secured upon said wooden frame, and upon which are mounted the several working parts of the machine.

C is the driving-shaft, having mounted thereon the driving-pulley C' and the cam C<sup>2</sup>, and is itself mounted in bearings formed upon the bed B and a bracket secured to the back side of the frame A; or the second bearing may be upon an independent stand rising from the floor of the building in a well-known manner.

D is a crank secured to the inner or front end of the shaft C, and provided with the crank-pin *a*, to receive one end of the connect-

ing-rod E, the opposite end of which is pivoted at *b* to the cutter-carrying slide F, which is fitted to and reciprocates in a dovetailed slide formed upon the bed B by bolting thereon the guide-plates *c c*. (Shown in Fig. 5.)

G is a pawl-rod having a bearing near its rear end in the stand G', and resting near its other end upon a leather pad secured in the forked upper end of the standard *d*, as shown in Fig. 1. The rear end of said pawl-rod G is provided with an anti-friction roll, *e*, which bears against the cam C<sup>2</sup> by virtue of the tension of the spring *f*, while the opposite end of said pawl engages with the teeth of the ratchet-wheel H, being drawn downward by the coiled spring *g* in an obvious manner.

I is the block-holding hopper or frame, made in two parts and bolted together, so that the distance between the side walls of the channel I', down which the block is fed to the cutters, may be adjusted to different lengths of blocks, according to the length of splint to be cut. This is done by loosening the holding-down bolts *h h*, removing the bolts *h' h'* and thimbles *h<sup>2</sup> h<sup>2</sup>*, and substituting therefor thimbles of greater or less lengths, and then bolting the two parts together again and securing the whole in position.

J and J' are two feed-rolls so located as to engage with the ends of the block of wood placed between the side walls of the hopper and move it downward by their intermittent rotary motion. The shaft of the feed-roll J has mounted thereon the ratchet-wheel H and the spur-gear wheel K, which engages with and imparts motion to a corresponding gear-wheel, K', secured upon the shaft of the feed-roll J'.

The hopper I I' is placed directly over the reciprocating slide F and firmly secured to the bed B in such a position that a block of wood fed downward in said hopper will be brought into the path of the cutting-edge of the oblique knife L, secured upon the upper side of the slide F, which, as the slide F is moved toward the front end of the machine, cuts from the lower edge of said block a chip of a thickness equal to the width of a side of the square splint to be cut.



So far the devices described are old and are not of my invention, and the slide F has been fitted with a gang of cutters for slitting the under surface vertically; but I have made certain improvements in the hanging and operating of the gang of cutters, which I will now proceed to describe.

Heretofore said cutters have been set rigidly in a vertical position, and as a consequence they acted upon the wood in the backward stroke as well as during the forward stroke, which was liable to injure the splints. To obviate this difficulty I set the gang of spur-cutters *i i* in a holder, M, provided with trunnions or journals *j* and *j'*, which rest in bearings on the slide F, so that said holder may be oscillated about its axis in order to drop the points of the cutters *i* below the surface of the block of wood during the rearward stroke of the slide F. This oscillation is obtained by means of the lever N, the upper end of which is forked and embraces the holder M near one end of its rectangular body, and the yielding stops O and P, pivoted to the bed B in proper positions to be struck alternately by the lug N' of the lever N just before the completion of the strokes of the slide F, the stop O serving to tilt the cutters *i i* into an inclined position at or near the completion of the forward stroke of the slide F and after said cutters have passed from under the block of wood held in the hopper, and the stop P serving to move said cutters *i i* into a vertical position again at or near the completion of the rearward stroke of the slide F and after the cutters have passed from under the block of wood. The stops O and P are rendered somewhat elastic to the blow of the lug N' of the lever N by means of the springs *k* and *k'*, respectively. The lever N moves around the axis of the tool-holder M, being supported upon the pin *l*, set in the ears *m m*, and passing through the curved slot *n* formed in said lever, as shown in Fig. 6. The position of the stop O may be adjusted by means of the stop-screw *o*, which limits the backward movement of the acting end of the stop-lever O, as shown in Fig. 2. The stop-lever P is maintained in its normal or upright position by the combined action of the spring *k'* and the lug or projection *k*<sup>2</sup>.

The lever N and holder M are maintained in a perpendicular or inclined position by means of the spring Q, the upper surface of the free or movable end of which is provided with two curved detent-notches, *p p'*, with which the roll *q*, mounted upon a pin set in the inner side of said lever, engages at the proper time, as shown in Fig. 4.

A sheet-metal chute, R, having an inclined bottom, is secured to the under side of the slide F in position to receive the splints as they drop from the cutters, and from the lower end of which they are discharged upon a horizontally-moving belt or apron. (Not shown.)

The two vertical sides of the block of wood are dressed or planed by the cutters *r* and *r'*,

which are set nearer to or farther from each other, according to the thickness of the block to be acted upon.

It has been found in practice that at times it is desirable to adjust the whole gang of spur-cutters *i i* and the facing-cutters *r* and *r'* toward or from the front side of the machine, or in the direction of the length of the axis of the holder M, a distance equal to one-half the diameter of a splint. To accomplish this I make the length of the holder M between its shoulders shorter than the distance between its bearings by twice the diameter of a splint, and place upon its trunnions or journals four washers, *s s*, which may be changed from one end to the other, according to the adjustment required. As the gang-cutters *i i* have to be sharpened quite often, it becomes very important to have the holder M quickly and easily removable and as easily replaced. To this end I have devised the box and cap for the bearings of said holder, (shown in the drawings,) in which *t* is the upper half of the box, and T is a cap, secured at one end by a vertical pivot to the slide F, so that its free or movable end, which fits under the lip *u* of said slide, may be moved outward to uncover the cap *t* and allow its removal and the removal of the holder M. The pivotal ends of the caps T are made angular, as shown, and fit nicely to shoulders formed for the purpose in the forward portion, F', of the slide F, which is pivoted at *v* to the main slide F, so that it can be turned at right angles thereto, as shown in dotted lines in Fig. 4. The section F' is secured in line with the main body of the slide F by the single screw *w*, in which position it effectually locks the caps T T, so that they cannot be moved around their pivots; but when the section F' is turned into the position shown in dotted lines the caps T T can be moved about their pivots to uncover the caps *t t* and permit their removal with the holder M. To accomplish this only one screw or bolt has to be removed, in place of four where the caps are secured in the usual way, and hence a great saving in time is made.

The block of wood from which the splints are cut is fed downward intermittently during the last part of the backward stroke of the slide F and after the spur-cutters have passed from under the block. The block is kept in position in the hopper, after it passes the feed-rolls, by means of the sharp-edged ribs *v'*, formed on the inner faces of the steel plates U, as shown in Figs. 9 and 10.

The holder M is held rigidly in position during the action of the spur-cutters *i i* upon the block of wood by the abutments V and V', so arranged that the lower part of the forward face of the holder bears against the abutment V and the upper part of its rear face bears against the abutment V' when the holder is in the position shown in the drawings, with the spur-cutters vertical.

Another improvement which I have made



is the use, in combination with the oblique-  
 edged cutter L, of the plate L', secured to the  
 slide F upon the side thereof opposite to the  
 cutter L by means of the screws *a' a'* and the  
 5 slots *b' b'*, in such a manner that it may be ad-  
 justed toward the cutter L as said cutter is  
 worn away, so that the inner edge of the plate  
 L', which is oblique and parallel with the ob-  
 10 lique edge of the cutter L, may be kept di-  
 rectly beneath the edge of said cutter, the in-  
 ner portion of said plate, which is directly  
 under the block of wood contained in the hop-  
 per, being sunk below the cutting-edge of the  
 15 cutter L a distance equal to the thickness of  
 the splint to be cut. This plate serves to guide  
 the splints as they are cut from the block and  
 compel them to drop into the chute R.

The operation of my invention will be readily  
 understood from the foregoing description  
 20 without further explanation.

What I claim as new, and desire to secure  
 by Letters Patent of the United States, is—

1. The holder M, provided with the trunnions  
*j j'* and means of holding a gang of spur-cut-  
 25 ters, *i i*, and the planing-cutters *r* and *r'*, in  
 combination with one or more removable wash-  
 ers, *s s*, fitted to each trunnion, substantially  
 as and for the purposes described.

2. The combination of the slide F, provided  
 30 with the abutments V and V', the holder M,  
 mounted by its trunnions *j* and *j'* in bearings  
 on said slide, and provided with means of  
 holding a gang of spur-cutters, *i i*, and mech-

anism for imparting to said holder an inter-  
 mittent oscillating motion.

3. The combination of the reciprocating slide  
 F, the holder M, the forked and slotted lever  
 N, the stops O and P, and means of locking  
 the lever N in a vertical and an inclined posi-  
 35 tion.

4. The combination of the slide F, the holder  
 M, the forked lever N, provided with the  
 curved slot *n*, the pin *l*, the stops O and P, the  
 spring Q, provided with the detent-notches *p*  
 and *p'*, and the roll *q*, all arranged and adapted  
 40 to operate substantially as and for the pur-  
 poses described.

5. The combination of the slide F, cutter-  
 holder M, mounted by its trunnions in half-  
 boxes formed on said slide, the removable half-  
 45 boxes *t t*, the pivoted caps T T, the lips *u u*,  
 the section F' of slide F, pivoted as set forth,  
 and the screw *w*, all arranged and adapted to  
 operate substantially as and for the purposes  
 described.

6. The combination of the slide F, the holder  
 M, the lever N, the stop-levers O and P, springs  
*k* and *k'*, and the stops or abutments *o* and *k*<sup>2</sup>,  
 all arranged and adapted to operate substan-  
 50 tially as described.

Executed at Boston, Massachusetts, this 2d  
 day of September, A. D. 1881.

HERBERT L. HAPGOOD.

Witnesses:

E. A. HEMMENWAY,  
 WALTER E. LOMBARD.