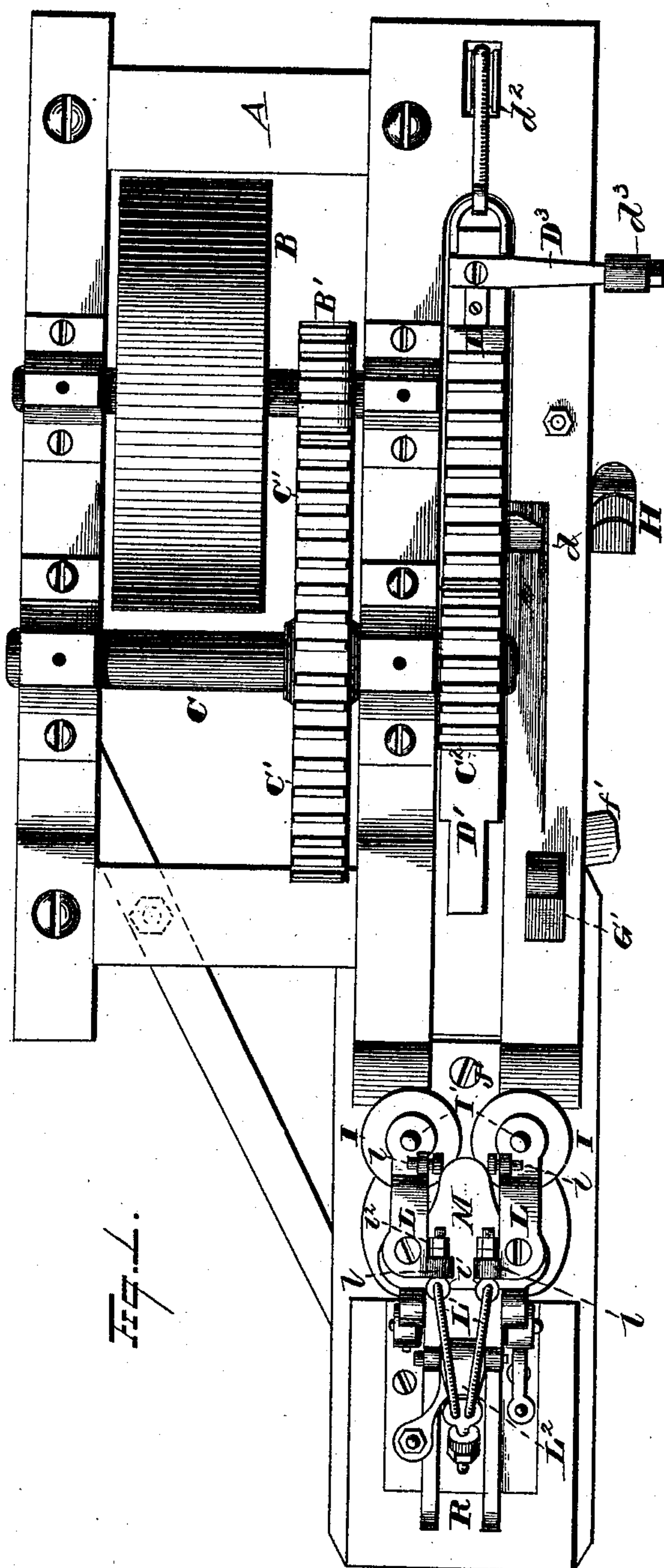


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Machine for Dressing Staves.  
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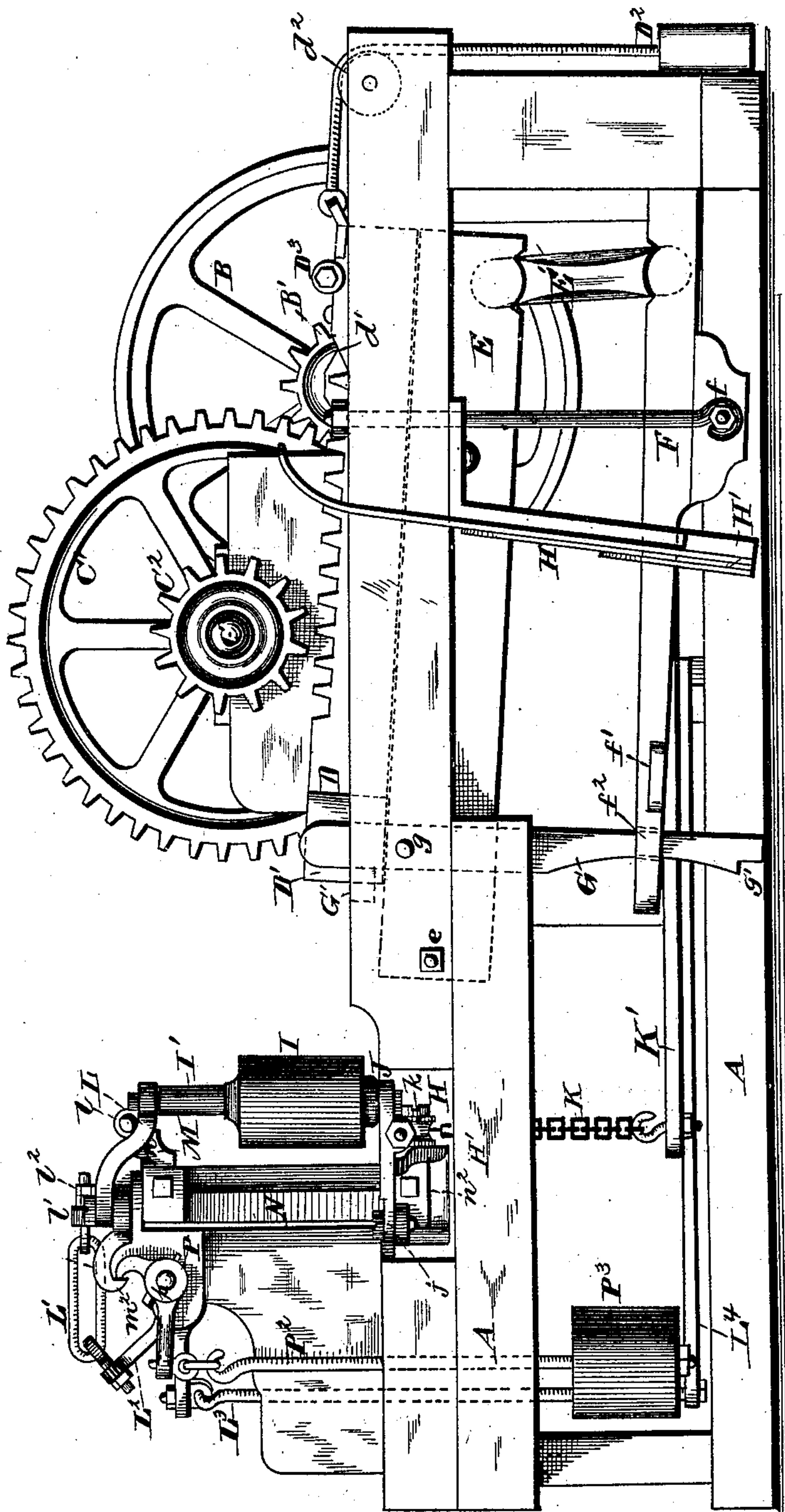


Fig. 2.

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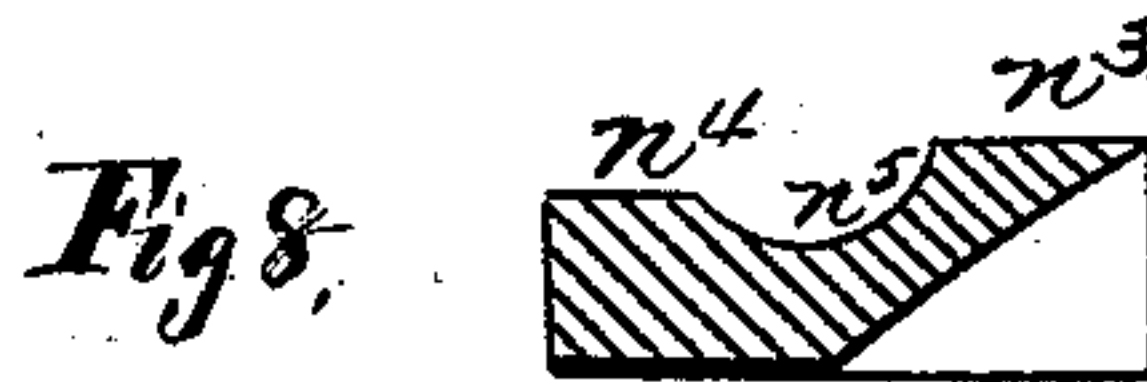
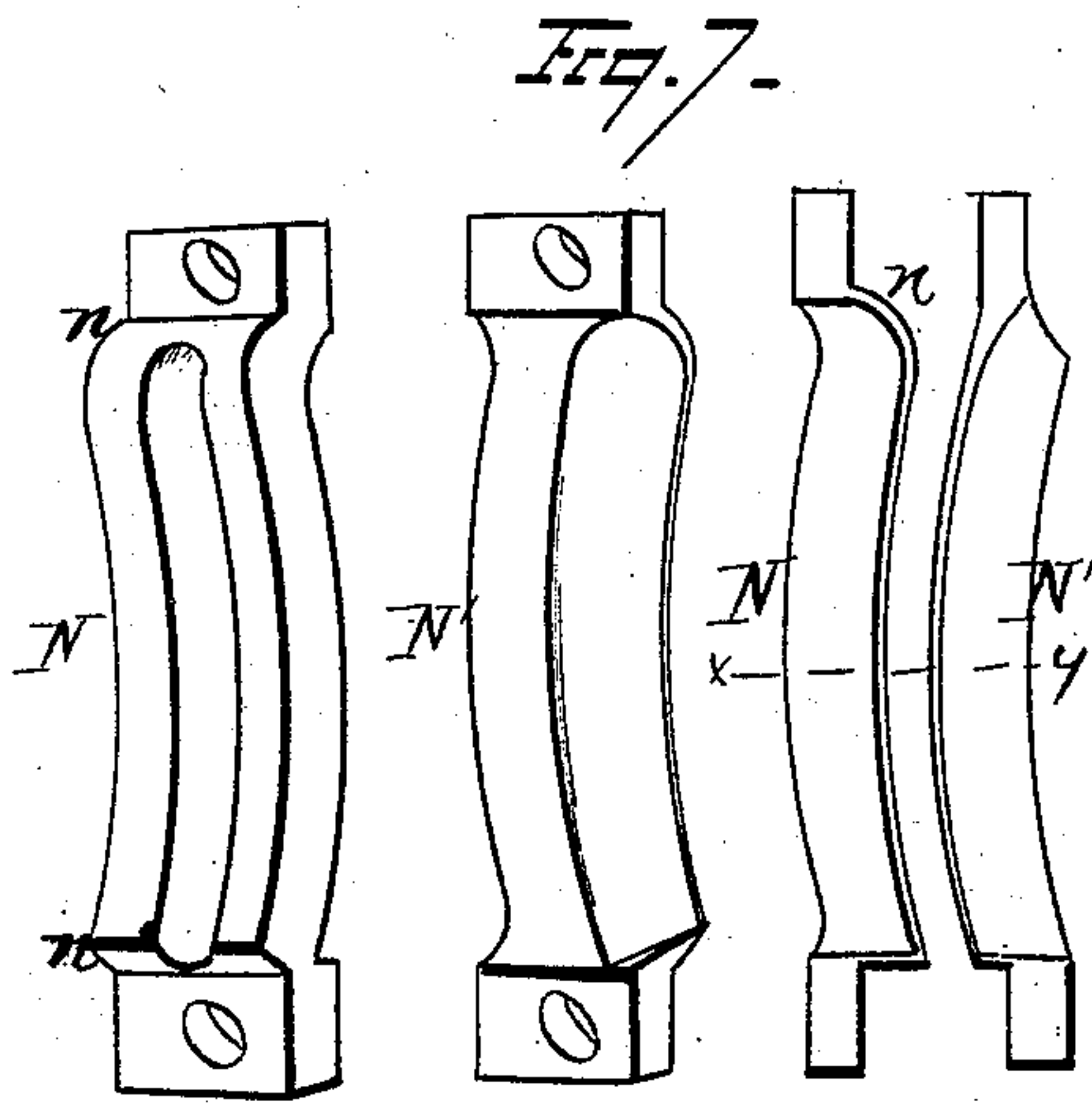
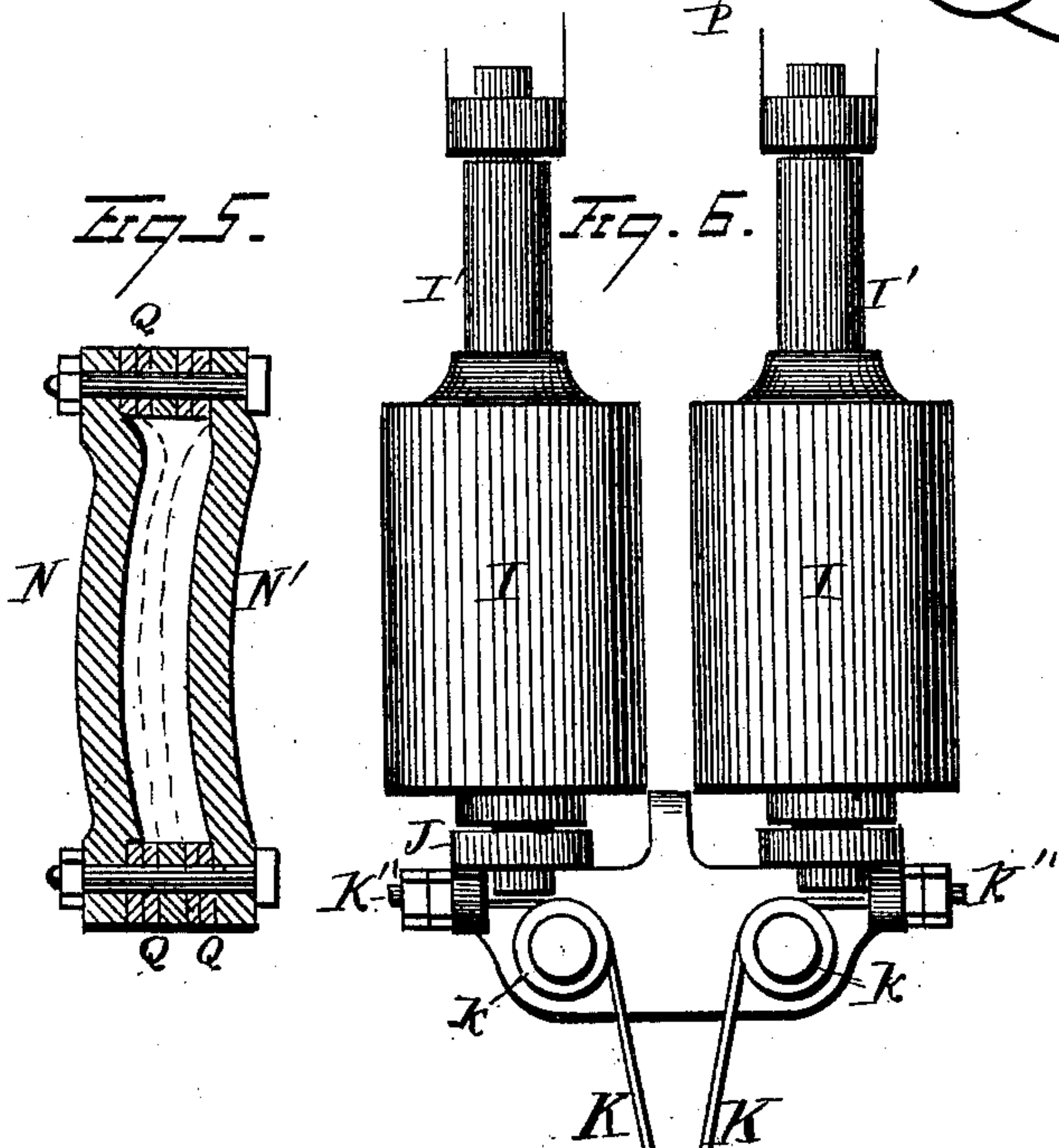
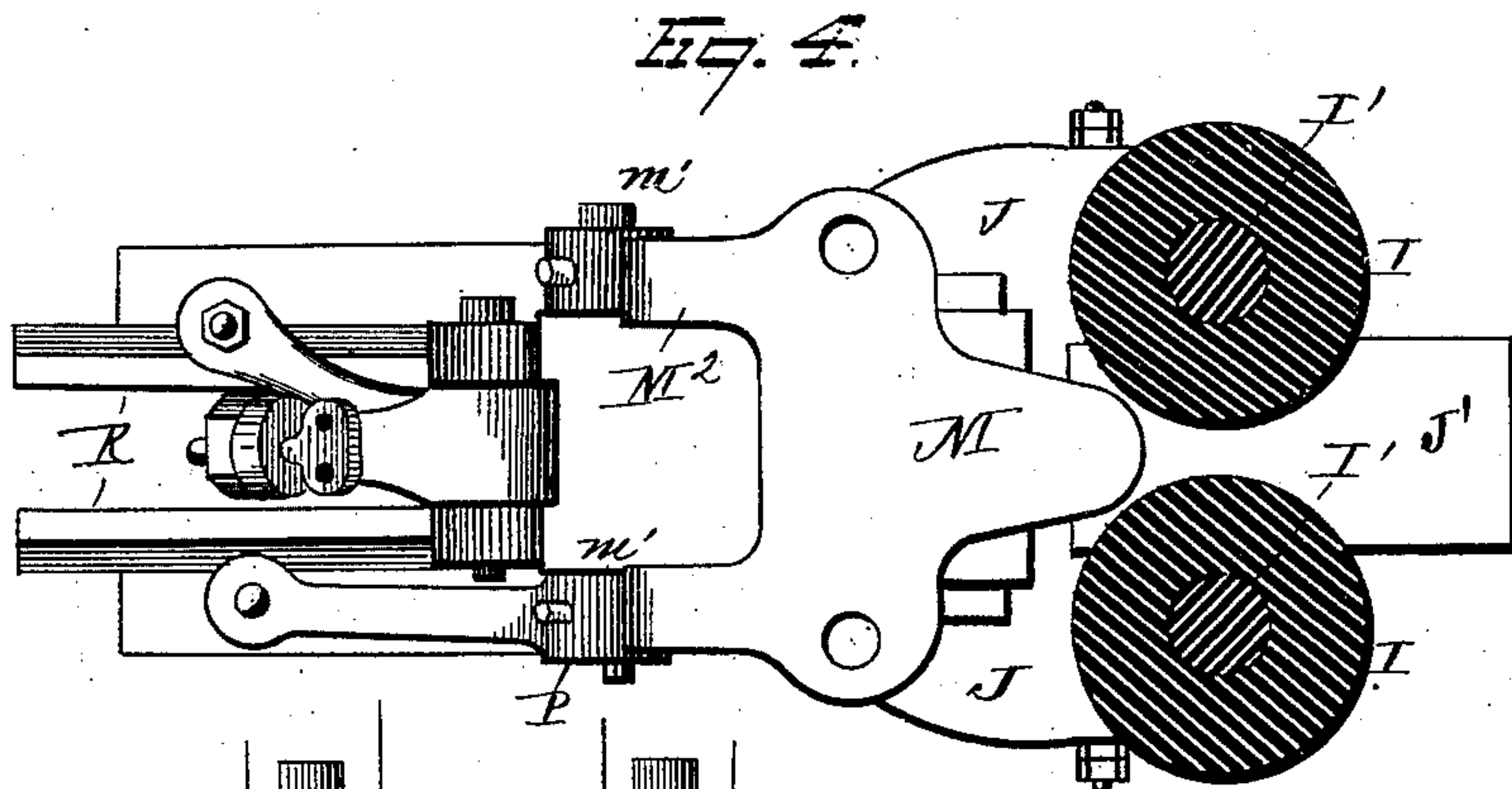
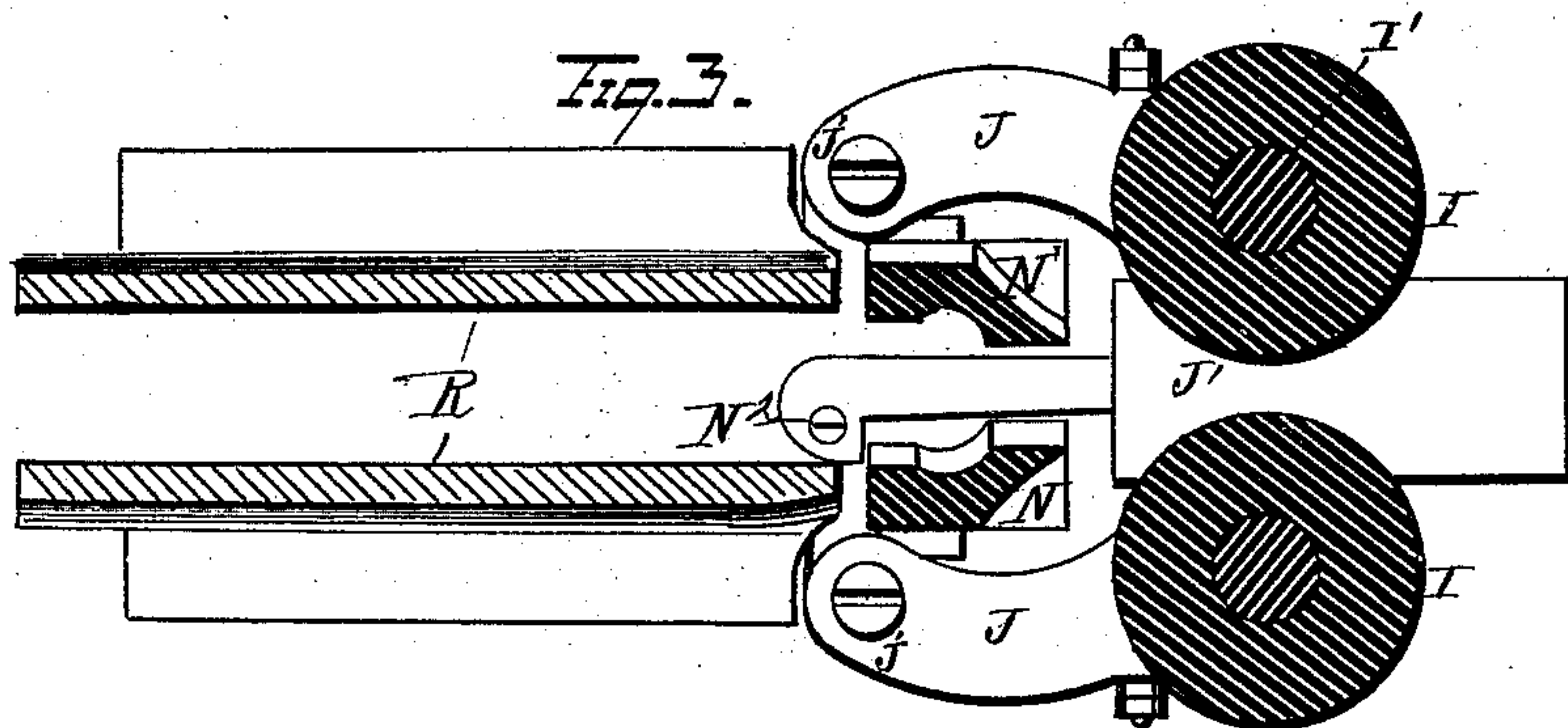
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ARZA M. BENSON, OF CLEVELAND, OHIO.

## IMPROVEMENT IN MACHINES FOR DRESSING STAVES.

Specification forming part of Letters Patent No. **210,444**, dated December 3, 1878; application filed October 9, 1878.

*To all whom it may concern:*

Be it known that I, ARZA M. BENSON, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Stave-Machines; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to a new and useful improvement in machinery for dressing staves for barrels and similar packages; and it consists in the parts and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a plan view; Fig. 2, a side elevation, illustrating a machine embodying my invention. Fig. 3 is a section by a horizontal plane passed about centrally of the length of the rollers, and illustrating, in horizontal projection, the parts beneath the plane. Fig. 4 is a similar section, illustrating, in horizontal projection, the parts above the plane. Fig. 5 is a section by a vertical plane passed longitudinally of the knives and containing their fastening-bolts. Fig. 6 is a view, looking against the faces of the rolls, and illustrating how they are connected at the bottom with the spring beneath. Fig. 7 is a separate view of the knives. Fig. 8 is a transverse section on the line *x y* of Fig. 7.

A is a suitable frame. B is a drive-pulley, geared by any suitable means, B' and C<sup>1</sup>, so as to operate a shaft, C. The end of this shaft C has a pinion, C<sup>2</sup>. D is a rack-bar, finished at one end, D<sup>1</sup>, as a plunger for driving the stave forward. At its other end it is attached to a cord and weight, D<sup>2</sup>, passing over a pulley, d<sup>2</sup>.

The rack-bar D rests loosely upon the adjustable bed E, which is pivoted at *e*. Its other end engages with a connecting-bar, E', which, in turn, is connected with one arm of the lever F. The lever F is pivoted at *f*, and the end of its other arm is provided with a foot-tread, *f*<sup>1</sup>, and an opening, *f*<sup>2</sup>. A trigger, G, is pivoted at *g*. Its lower end extends through the opening or slot *f*<sup>2</sup>, and is provided with a notch, *g*<sup>1</sup>, in order that when the lever F is pressed down the notch *g*<sup>1</sup> will engage with the lever. The upper end of the trigger

G projects above the frame, and a spring of rubber or other suitable material, G', acting against the trigger, makes sure its engagement with the lever F below.

On the rack-bar D is a lug or projection, *d*, the office of which is to spring the trigger by striking its upper end as the plunger moves forward.

H is a spring, of any suitable form, though I prefer the form shown in the drawings, wherein the spring is supported by and attached to a depending bracket, H'. D<sup>3</sup> is an arm projecting from the rack-bar D, and preferably provided with an anti-friction roller, d<sup>3</sup>.

The operation of the plunger mechanism is substantially as follows: Power being applied to the band-wheel or drive-pulley B, motion is communicated to the shaft C and its pinion C<sup>2</sup>. Now, when it is desired to operate the plunger forward the stave is inserted in the channel in front of the plunger. The operator then puts his foot upon the tread *f*<sup>1</sup>, and presses down the lever F until it engages beneath the notch *g*<sup>2</sup> on the trigger G. By pressing down the lever F its rear end, in rising, lifts, by means of its connecting-bar E', the movable bed E. This raises the rack-bar until it engages with the pinion C<sup>2</sup>. This drives the plunger forward. Shortly before it reaches the end of its travel its arm D<sup>3</sup> comes in contact with and retracts the spring H. When the plunger is moved sufficiently forward the projection or lug *d*, coming in contact with the trigger G, springs the same and releases the lever F below. As soon as the lever F is released the movable bed E drops down, the rack-bar D disengages from the pinion C<sup>2</sup>, and the spring H instantly and quickly starts the rack-bar back to its original position.

The spring H assists the weight D<sup>2</sup> in quickly overcoming the inertia of the rack-bar, so that no time is lost in forcing it back; but as soon as the arm D<sup>3</sup> leaves the spring, then the weight alone serves to carry the rack-bar from that point back. Now, in order that the rack-bar may not strike harshly against the frame A at the end of its backward travel, the cord to which the weight D<sup>2</sup> is attached is made sufficiently long that the weight may strike the ground or floor and cease its action just before the bar completes its travel.

I will now proceed to describe the dressing



mechanism: I I are rollers, made preferably to turn loosely upon upright shafts I'. These rollers are for the purpose of grasping the stave and holding it in the proper position and proper inclination for the knives. At their lower ends the shafts I' have a loose bearing in frames J. The frames J are each pivoted at points *j*, and at their free ends are attached to chains or cords K. These cords, passing over stationary pulleys *k*, extend beneath, and are both attached to, a stiff spring, K', so that the spring acts equally upon both chains K; and when the stave is not between the rollers, the free ends of the frames J rest squarely on plate J', over and in contact with which the stave passes, so that the lower ends of the rollers will guide the lower edge of the stave centrally on its passage. By loosening or tightening either of the eyebolts K'' the lower ends of the rollers will bring the stave into any desired position at the bottom of the rollers. The upper ends of the shafts I' are loosely journaled in frames, the rear ends of which are pivoted to the sides of the frame M, to which the knives are attached.

A rib or projection, *m*, extends out between the free ends of the frames L, and set-screws, or their equivalent, act as stops to prevent the upper ends of the rollers from coming together, and they may serve to adjust the upper ends of the shafts I' with relation to this projecting rib, so as to give the stave any desired tilt or inclination as it is fed to the knives; but this latter adjustment is intended to be effected by loosening or tightening either of the eyebolts, after which the set-screws *l* are adjusted to correspond.

The rear ends, *l*<sup>1</sup>, of the frames L are connected by suitable links L<sup>1</sup> with the lever L<sup>2</sup>, rod or chain L<sup>3</sup>, and spring or weight L<sup>4</sup> beneath, and thereby the upper ends of the shafts I' are acted upon equally and simultaneously by the same spring or weight L<sup>4</sup>. If, therefore, a stave is forced between the rolls I, and if one edge should chance to be thicker than the other, the rolls will yield at either end, and will yield equally, so that the median line will have the proper inclination desired to be given to the stave as it approaches the knives; and if there are any irregularities on the surface of the stave the said rollers will yield at either end without disturbing the other end, and will cause the stave to enter straight, or nearly straight.

N N<sup>1</sup> are the knives, the peculiarities of which will be hereinafter set forth. They are secured at the top to the frame M, which frame is pivoted at *m*. *m*<sup>2</sup> are arms, which project back and engage with the levers P, which are fastened rigidly at opposite ends of the shaft *p*. These levers have a common lever-arm, P<sup>2</sup>, to which is suspended the weight P<sup>3</sup>. At their lower ends the knives N N<sup>1</sup> are attached to a frame, N<sup>2</sup>, which is pivoted at *n*<sup>2</sup>.

The object of thus pivoting the knives and bringing their supporting-frame under the influence of the weight P<sup>3</sup> is as follows: If there

be bends or crooks in the stave, or if the rear end of the stave should rest at either side of the channel, the plunger striking against it would drive it forward between the rollers I. The forward end would then be centered by the rollers, and the rear end would be immovable against the end of the plunger. The tendency would be therefore to drive the stave against the knives in an improper direction. But this construction, it is apparent, is such that if the stave comes forward between the rolls in such improper direction its action on the rolls will cause the knife-frame to rotate slightly about its vertical axis, so as to present it properly for receiving the stave just the same as though the stave itself had entered properly. It is apparent that if the knives should not so turn one knife would gouge into and improperly dress the stave.

The knife N is shouldered well in at *n*, while the top of the knife N<sup>1</sup> is not so shouldered. The object of this construction is that the bearings or attachment to the frame M may be at equal distances on each side of the pivotal point *m*, so that when the strain is brought upon the knives as the stave enters or is passing through between them this strain will at the top be thrown as much upon one side of the pivot *m*<sup>1</sup> as upon its other side, causing the direction of the resultant strain to be through the center of the pivot, thereby obviating any tendency of the knives to turn about the said pivot, which, it is apparent, would cause one or the other of said knives to gouge into or improperly dress the stave.

It will be noticed that the lower ends of the knife-edges are at equal distances on each side of the center of the stave-channel; but the curved space between the knives, as it ascends from the base, projects somewhat to the left of a median vertical plane, and then projects across and to the right of said median plane at the top.

I explained how the strain would be equalized at the top and directed centrally through the pivot *m*<sup>1</sup> by reason of the deep recesses *n*. Now, in order to prevent a similar tendency at the bottom to turn to the left when under action, the lower ends are attached to the plate *h*<sup>2</sup>, and its pivot *n*<sup>2</sup> is placed a little to the left of the median plane, sufficient to neutralize that tendency.

Washers Q serve to adjust the knives to suit any thickness of stave.

The knives, as will be seen by their cross-section, have their edges *n*<sup>3</sup> projecting well out beyond their heels *n*<sup>4</sup>, and there is a channel preferably formed between them. The object of this construction is that the knives wear rapidly on their inner surfaces adjacent to the stave, and they may be ground off along the portions *n*<sup>3</sup>, and a single set may thereby be made to serve for a long period. Moreover, the surface to be ground is rendered very small by reason of the channel *n*<sup>5</sup> and the fact that the heel *n*<sup>4</sup> is set so far back.

As the knives are ground away washers Q



may be reduced in number, so as to properly adjust the knives.

R represents check-plates, which guide the stave as it is passing out of the machine. Heretofore they have generally been made narrow; but when so formed a difficulty frequently arises, as follows: The stave may be passing through, as before explained, in a slightly-false direction, and, after its rear end passes through rollers, the knives will have a tendency to gouge the stave. If the said plates R be narrow, the end of the stave may project out at one side, and thereby cause the stave to be dressed too thin at its other end, whereas if the plates Q be made broad, as I construct them, the stave will maintain a bearing against the face-plate at the extreme end of the same, thereby accurately centering it as it passes out of the machine.

The plunger back of the rack-bar is inclined upward, as shown at  $d^1$ , so that when the pinion has driven the rack-bar forward its whole length the pinion will strike the incline  $d^1$  and knock the plunger down, so as to disengage from the pinion.

What I claim is—

1. The combination, with the rack-bar plunger and swinging bed formed to extend longitudinally beneath the same, of the foot-treadle, pivoted below said bed, and having link-connection therewith, substantially as set forth.

2. The combination, with the rack-bar plunger, swinging bed extending longitudinally beneath the same, and foot-treadle having link-connection with said bed, of the upright pivoted lever, which has trip-engagement with the free end of the treadle, and is adapted to be operated by engagement with a stud formed on the plunger, substantially as set forth.

3. The combination, with the rack-bar plunger and right-angular arm projecting therefrom, of the upright spring-bar, having its lower extremity secured to the frame, while its upper extremity is adapted to have lateral engagement with said arm as the plunger is driven forward, substantially as set forth.

4. The combination, with drive-pinion  $C^2$  and rack-bar plunger  $D^1$ , whose upper surface engages therewith, of swinging bed E, extending longitudinally beneath said plunger, together with link  $E'$  and treadle F, adapted to act as

a lever of the first order, substantially as set forth.

5. The combination, with rollers I, the upper extremities of whose shafts are seated in hinged frames L, formed with lever-arms  $l$ , of spring or weight  $L^4$  and intermediate connecting mechanism, said hinged frames operating as levers of the first order, substantially as set forth.

6. The combination, with rollers I, the upper extremities of whose shafts are seated in pivoted frames L, having their rear portions formed with lever-arms  $l$ , of link  $L^1$ , bell-crank  $L^2$ , upright link  $L^3$ , and spring or weight  $L^4$ , substantially as set forth.

7. In a stave-dresser, the combination of knives fastened rigidly to hinged plates  $M N^2$ , the said structure provided with lever-arms  $M^2$ , lever P, link  $P^2$ , and weight or spring  $P^3$ , substantially as and for the purposes described.

8. The combination, in a stave-dresser, of knives rigidly attached to pivoted frames, and provided also with weight or spring connection, and, in connection therewith, rollers I, with their shafts seated in pivoted frames and held together at both ends by spring or weight mechanism, said shaft-frames being pivoted to the knife-frame, substantially as and for the purposes described.

9. The combination, with the frames L, of the adjusting devices  $l^1 l^2$ , whereby, in connection with the frame M, the rollers are given any desired inclination, substantially as and for the purposes described.

10. In a stave-dressing machine, a knife having the edge  $n^3$  set well out in advance of the heel  $n^4$ , and an intermediate channel,  $n^5$ , substantially as and for the purposes described.

11. In a stave-dresser, the plunger  $D^1$ , provided with rack-bar and inclined surface  $d^1$ , substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARZA M. BENSON.

Witnesses:

JNO. CROWELL, Jr.,  
WILLARD FRACKER.