

(No Model.)

3 Sheets—Sheet 1.

R. A. COFFIN.  
SLATE SHAVING MACHINE.

No. 315,247.

Patented Apr. 7, 1885.

Fig. 1.

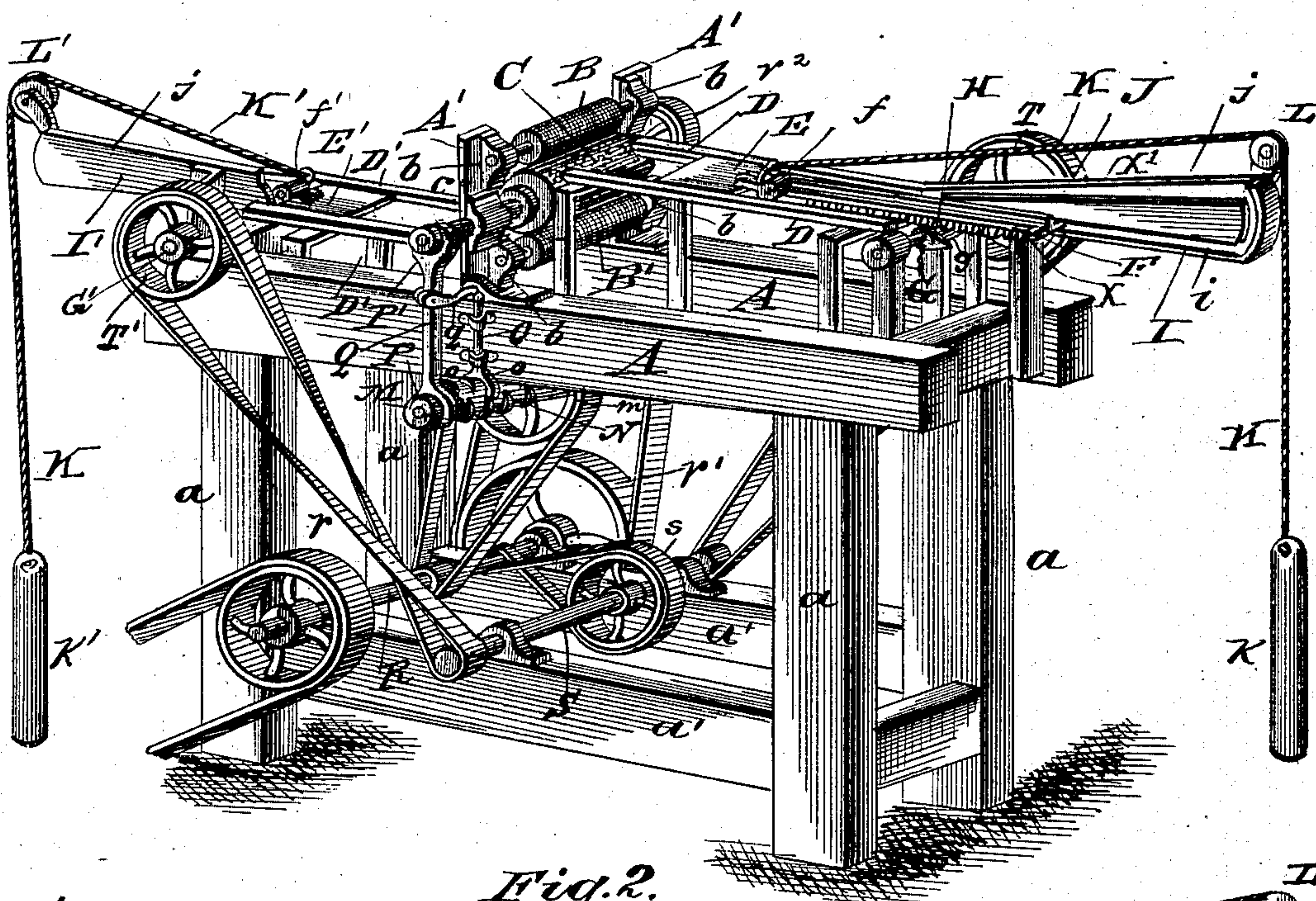
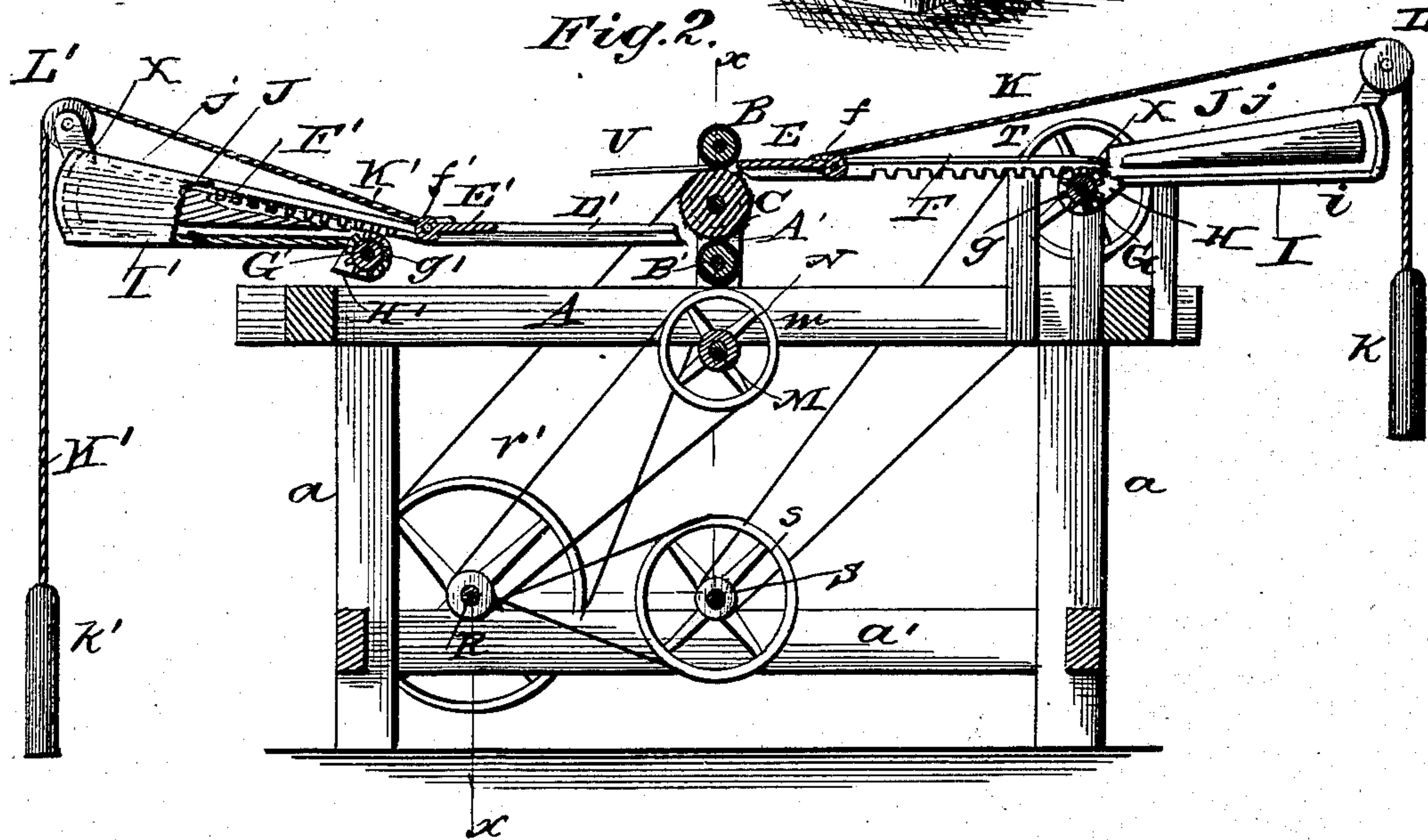


Fig. 2.



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By H. S. Attorney  
H. Alexander



(No Model.)

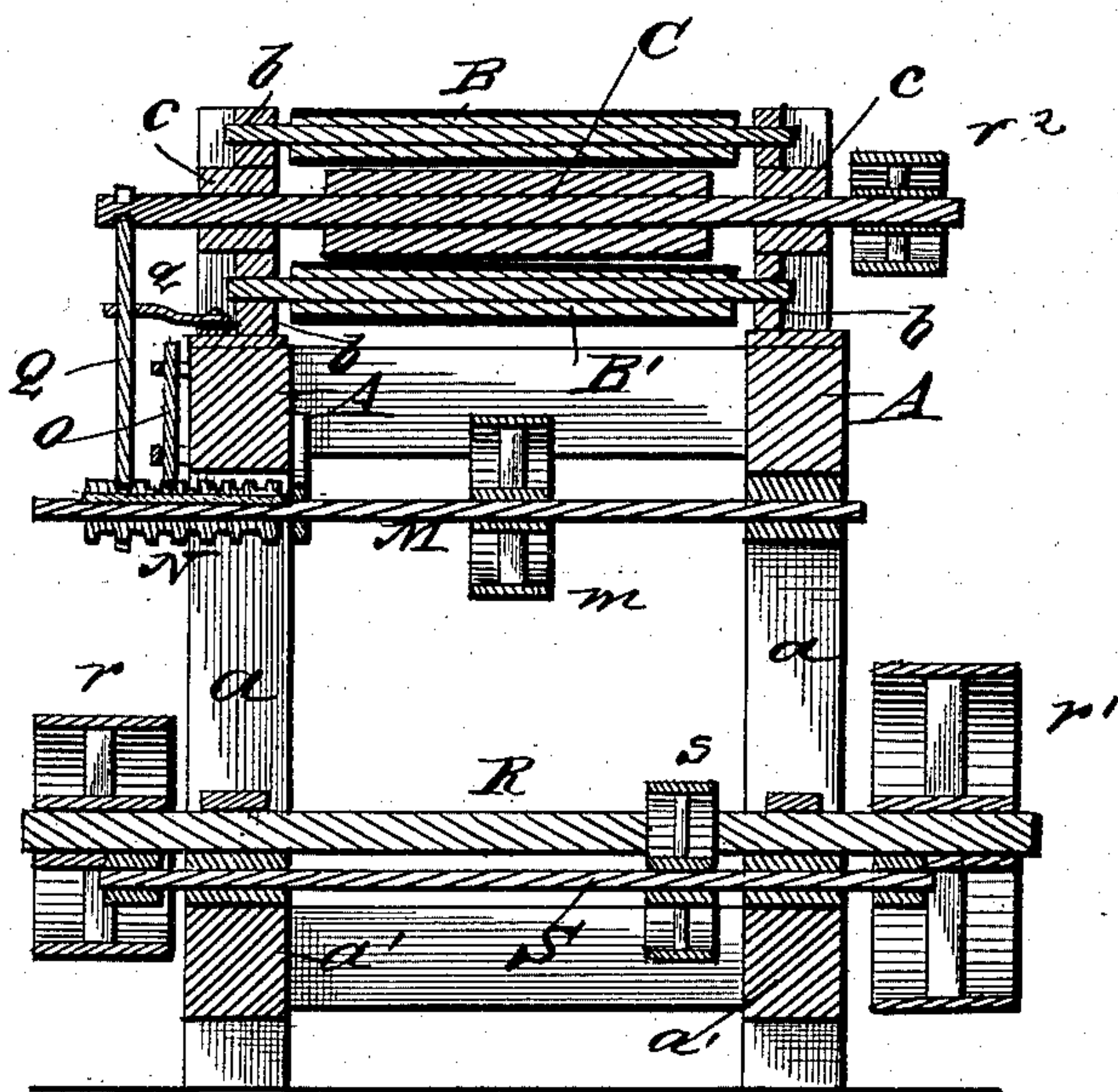
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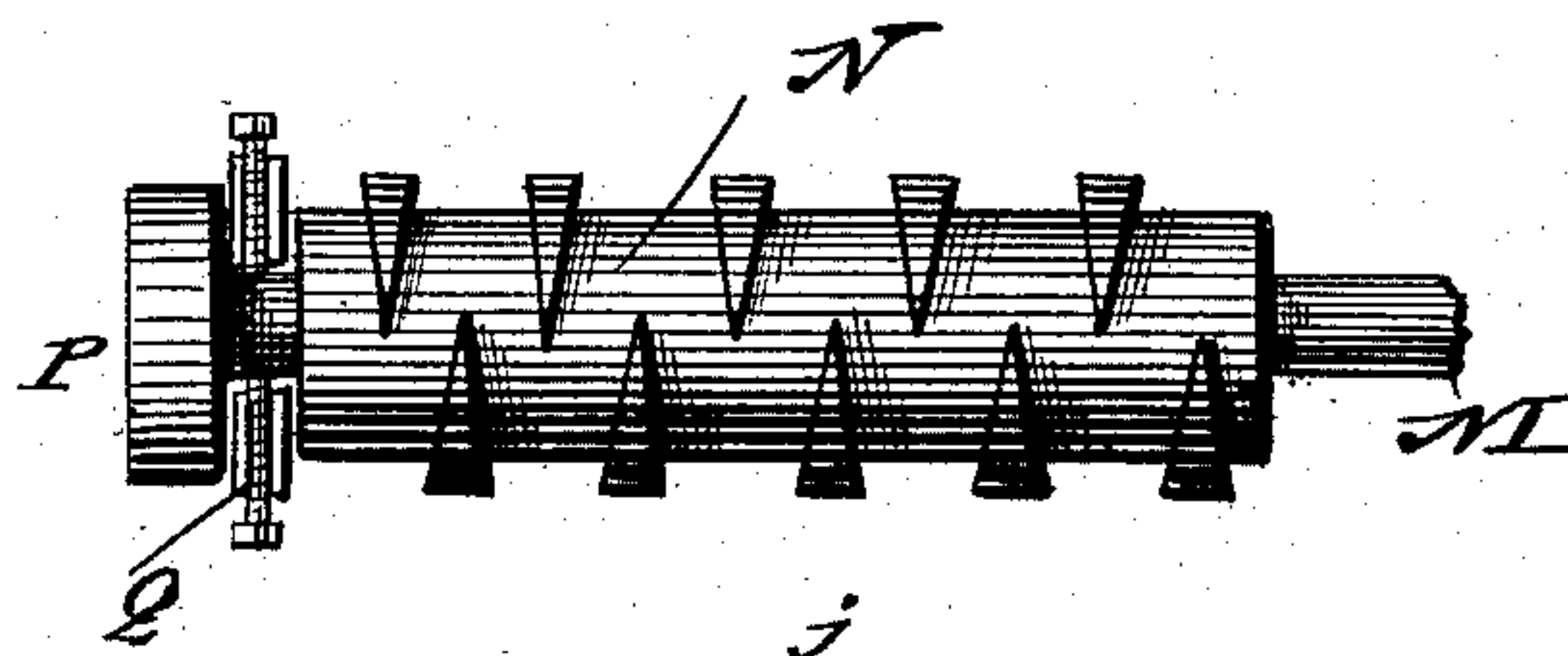
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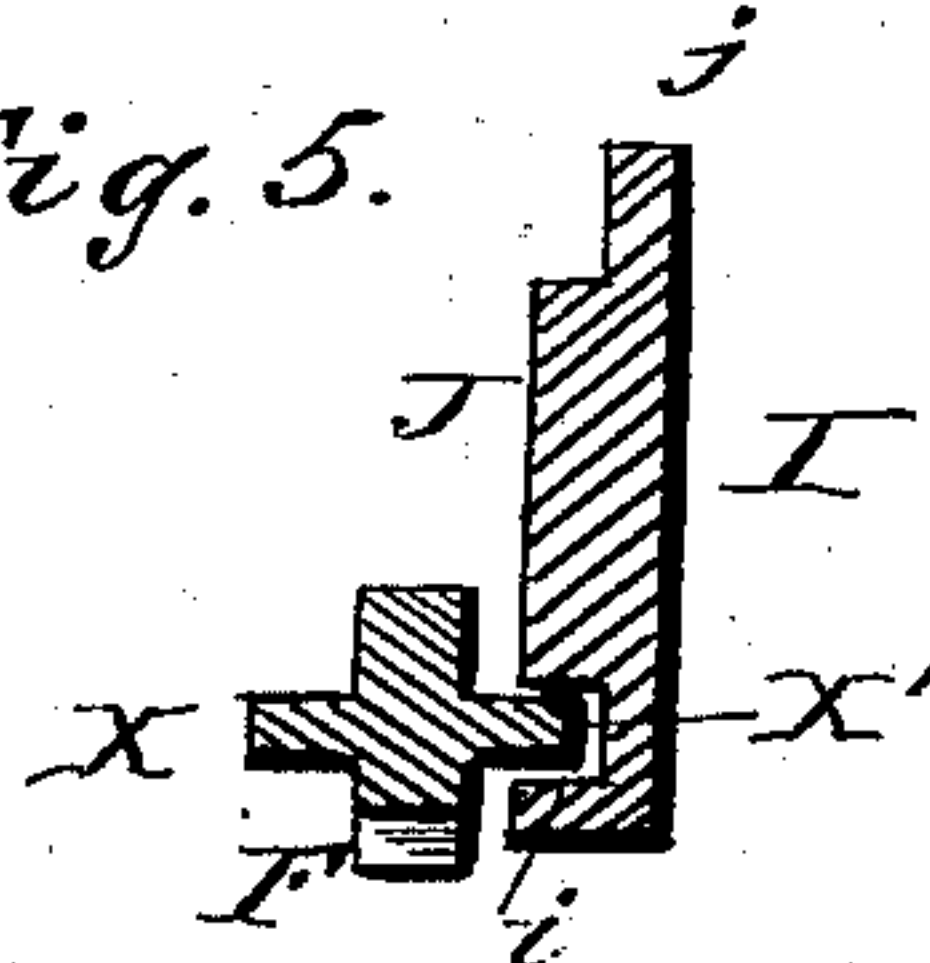
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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3 Sheets—Sheet 3.

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Fig. 6

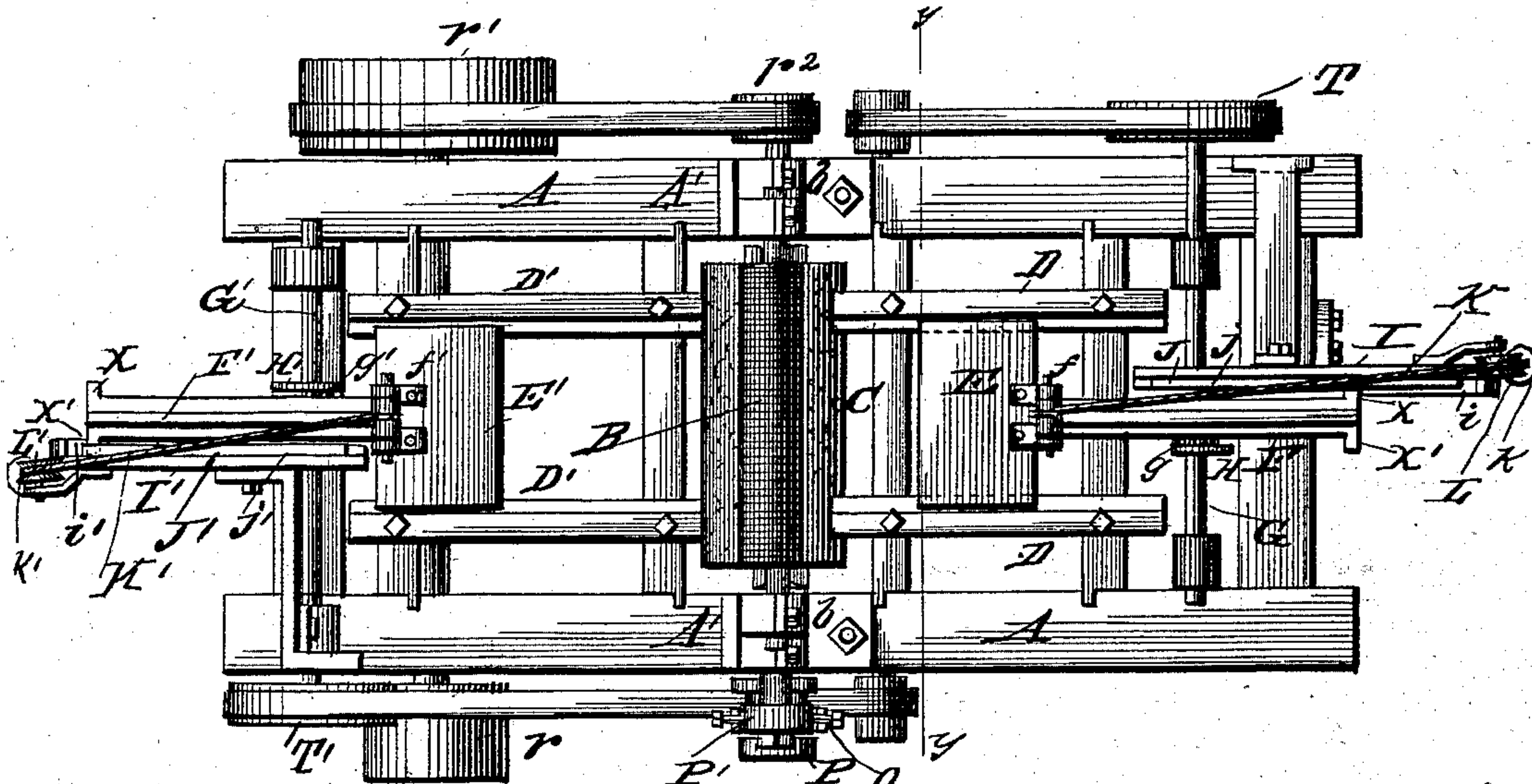
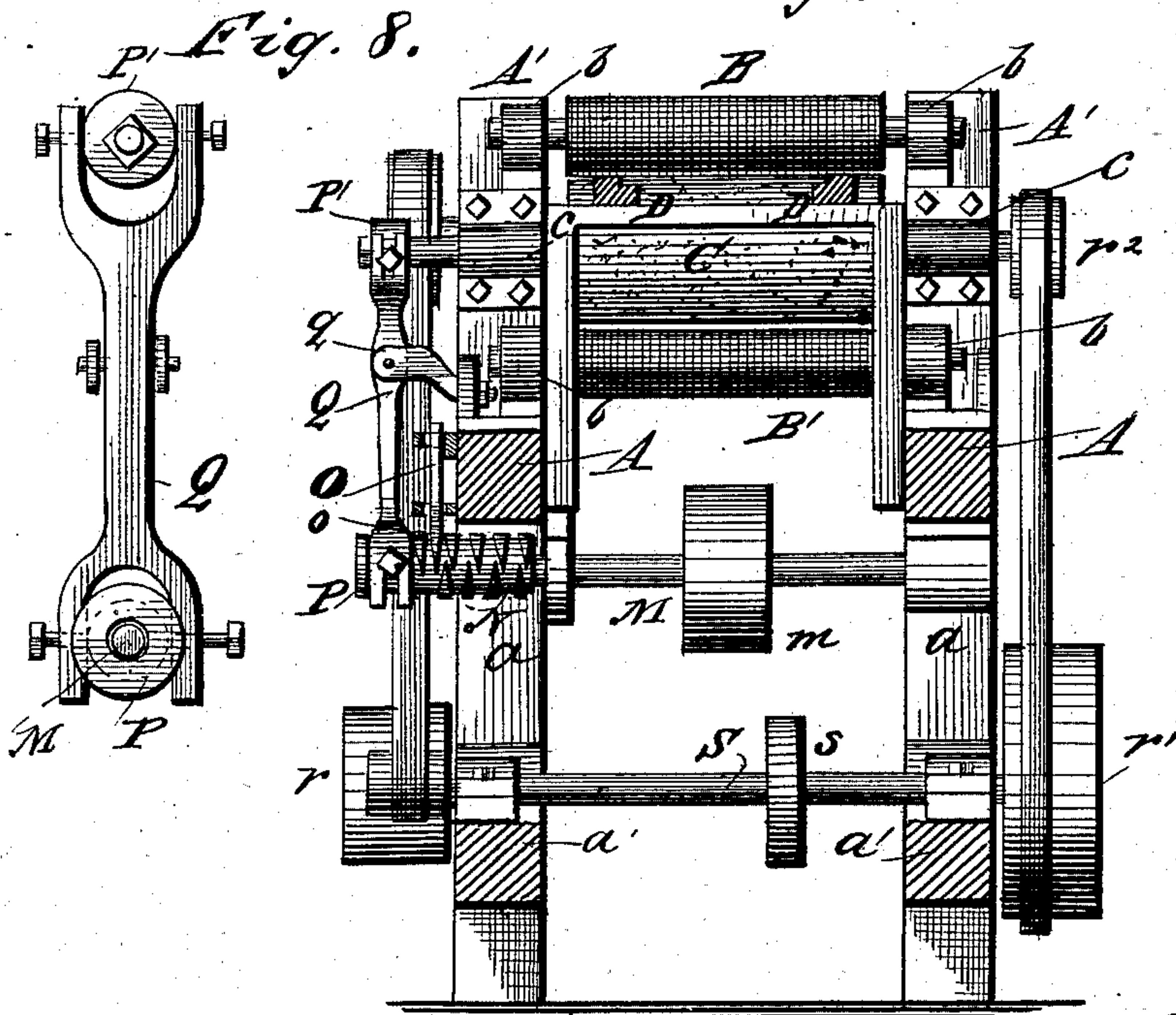


Fig. 7.



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# UNITED STATES PATENT OFFICE.

ROBERT A. COFFIN, OF SLATINGTON, PENNSYLVANIA.

## SLATE-SHAVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 315,247, dated April 7, 1885.

Application filed June 16, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT A. COFFIN, of Slatington, in the county of Lehigh and State of Pennsylvania, have invented new and useful Improvements in Machines for Shaving Slates or other Material; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 represents a perspective view of the machine. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a vertical section on the line *x x* of Fig. 2. Fig. 4 is a detail view of the double-threaded sleeve. Fig. 5 is a cross-section of the slide-frame and of the rack bar and pins thereon. Fig. 6 is a plan view of the complete machine. Fig. 7 is a central vertical section of the same, on the line *y y*, Fig. 6; and Fig. 8 is a front view of the rod *Q* and its attachments.

This invention relates to improvements in machines for shaving or reducing the thickness of slabs or plates of slate or other material; and it consists in the construction and novel arrangement of parts hereinafter fully described, and pointed out in the appended claims.

In the accompanying drawings, *A* represents the horizontal bed-frame of the machine, supported on the legs *a a*, which are connected near their lower ends by the longitudinal beams *a' a'*, upon which two of the actuating-shafts of the machine have their bearings, as shown.

*A' A'* are opposite standards rising from the center of the side beams of the bed-frame.

*B B'* are transverse rollers, of rubber or other suitable yielding material, the shafts of which turn in bearings *b b*, secured to the standards *A'*, as shown.

*C* is a transverse shaving or grinding roller, made of iron, corundum, emery, or other suitable material, and situated between the rollers *B B'*. The shaft of said roller has bearings *c*, secured to the standards *A'*, and is given a lateral reciprocating motion by means of mechanism, hereinafter described, which connects with one of its ends extended outward from its bearing.

*D D* are horizontal ways supported on up-rights rising from the bed-frame *A*, and run-

ning from one end of the said frame inward to within a short distance of the meeting line of the shaving-roller *C* and the upper roller, *B*, so that the slide *E* may drive before it on said ways a slab or plate of slate, and make the same pass between the said rollers.

*D' D'* are ways similar to the ways *D*, but running from the opposite end of the bed-frame inward to within a short distance of the meeting line of the shaving-roller and the lower roller. *B'* and *E'* is a slide moving and acting thereon similarly to the slide *E* on the ways *D*.

*F* is a rack-bar pivoted at its inner end to a bracket, *f*, fixed to the outer edge of the slide *E*, and having on its outer end the inwardly-extending pin *X* and the outwardly-extending pin *X'*. The rack is on the under edge of the bar *F*, and is moved inwardly by a pinion, *g*, on a transverse shaft, *G*, which has bearings fixed to up-rights rising from the bed-frame *A*.

*F'* is a rack-bar similar to the bar *F*, and connected in a like manner to the slide *E'*; and *g'* is a pinion actuating the same and fixed to a transverse shaft, *G'*, having bearings on the bed-frame.

*H* is a cam-arm fixed in such a position on the shaft *G* that when the pin *X* comes above it, as the rack-bar moves inwardly, it is turned up under said pin, disengaging the pinion *g* from the rack-bar *E*, and stopping the inward motion of the said bar. A similar cam-arm, *H'*, is fixed on the shaft *G'*.

*I* is a slide-frame fixed to the side of the bed-frame in such position that when the rack-bar *F* is moved inward the pin *X'* rests upon the inwardly-extending guide-flange *i* on its lower edge, and when the rack-bar is lifted by means of the cam-arm the said pin is raised on the inclined guide-way *j*, which is formed by the upper edge of the inward extension *J* of the slide-frame. The lower guideway for the pin *X'* lies between the flange *i* and the lower edge of the projection or extension *J*.

*I'* is a slide-frame fixed to the other end of the bed-frame, constructed like the frame *I*, and similarly engaging a pin, *X'*, on the rack-bar *F'*.

*K* is a cord or rope fixed by its inner end to the slide *E*, and having secured to its depending end a weight, *k*, as shown.



L is a pulley with bearings in a standard rising from the outer end of the slide-frame I, and having the cord K passing over it.

K' is a similar cord connected with the slide E', passing over the pulley L', connected with the slide-frame I'.

M is a transverse shaft having bearings fixed to the lower edges of the side beams of the bed-frame vertically below the standards A'.

N is a sleeve feathered or splined on the extended end of said shaft, and having its exterior surface doubly threaded, the two threads being in reverse direction and running into each other at their ends.

O is a vertical bar sliding in brackets fixed to the side of the bed-frame, and having laterally-extending arms o on its lower end, between which is a concaved edge which rests between the threads of the sleeve N, and makes the sleeve slip to and fro on the shaft M as it passes from one thread to the other in the reverse direction.

P is a loose collar on the sleeve N, and P' is a similar collar on the shaft of the roller C. The said collars may turn in annular grooves made on said sleeve and shaft near their ends, or may fit over the reduced ends of the same, and be kept thereon by headed bolts.

Q is a rod having its ends made into semi-circular forks the arms of which are longitudinally slotted for the insertion of pins on the collars P P', as shown.

q is a rod having its inner end secured to the foot of the standard A', and the rod Q pivoted to its outer end.

R is a transverse shaft having bearings on the beams a', and carrying the driving-pulley r and a pulley, r', which, by means of a proper belt, drives the pulley r" on the end of the roller C, opposite that to which the rod Q is connected. m is a pulley on the shaft M, which is rotated by a belt from the shaft R, (or a pulley thereon,) and, by means of its rotation and the bar O, makes the sleeve N reciprocate on the shaft M.

S is a transverse shaft having bearings on the beams a', and rotated from the shaft R by means of the pulley s and a proper belt.

T T' are pulleys, respectively on the opposite ends of the shafts G and G', which pulleys are rotated by means of belts from opposite ends of the shaft S or from pulleys thereon. The pulleys T T' are arranged to turn in opposite directions, so that the rack-bars F and F' will simultaneously approach and recede from the rollers; but this point is not essential, and one rack-bar may be arranged to approach the rollers as the other recedes therefrom.

U is a slate passing between the upper roller, B, and the shaving-roller C.

The general manner of operating the machine is as follows: The slate to be operated on is placed in the ways D, in front of the slide E, and the rack-bar F, actuated by the pinion g, moves inward till the pin X' is over the cam-arm H, which has then turned sufficiently upward to lift the rack-bar out of engagement

with the pinion and leave the pin X' in position to slip on the upper guideway, j. The rack-bar is then drawn outward on said ways by the cord K and attached weight till the pin X' passes beyond the outer curved edge of the projection J, when the rack-bar falls upon the flange i and again engages the pinion g, to carry another slate to the rollers.

The action of the mechanism at the other end of the frame is the same as the above. The double-threaded sleeve, by means of the mechanism connecting it with the shaft of the grinding or shaving roller C, causes the latter to reciprocate laterally across the slate which is being operated upon when the latter is passing between the rollers. The under side of the slate is shaved or reduced by the roller C and the upper roller, B, and after it has been passed between the same it is passed between the rollers C and B', whereby its upper surface is shaved. The rollers B and B', being of rubber or similar material, give to different thicknesses of slate.

Having described my invention, I claim—

1. In a slate-shaving machine, the combination, with a grinding or shaving roller having a lateral reciprocating motion in addition to its rotation, of two rollers similar in size, situated, respectively, above and below the shaving-roller and turning in opposite directions, so that the slate may pass in one direction between the shaving-roller and roller above it and in the reverse direction between the shaving-roller and roller below it, for the purpose of operating alternately on the lower and upper surfaces of the slate, substantially as specified.

2. In a slate-shaving machine, the combination, with the roller C, collars P P', rods Q q, threaded sleeve N, guide-bar O, and shaft M, of the rollers B and B', rotating in opposite directions, for the purpose of allowing the slate to pass between the rollers C and B in one direction and between the rollers C and B' in the opposite directions, substantially as described.

3. In a slate-shaving machine, the combination, with the rotating and longitudinally-reciprocating roller C, and the rollers B B', rotating in opposite directions to each other, of the ways D D', slides E E', and rack-bars F F', reciprocating, respectively, upon the ways D D', substantially as specified.

4. In a slate-shaving machine, the combination of the roller B and the rotating and longitudinally-reciprocating roller C, with the ways D, slide E, rack-bar F, provided with the pin x, pinion g, and cam-arm H, substantially as specified.

5. In a slate-shaving machine, the combination, with the ways D, slide E, rack-bar F, provided with the pins x and x', of the pinion g, cam-arm H, slide-frame I, provided with the ways i and j, cord K, and weight k, substantially as specified.

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