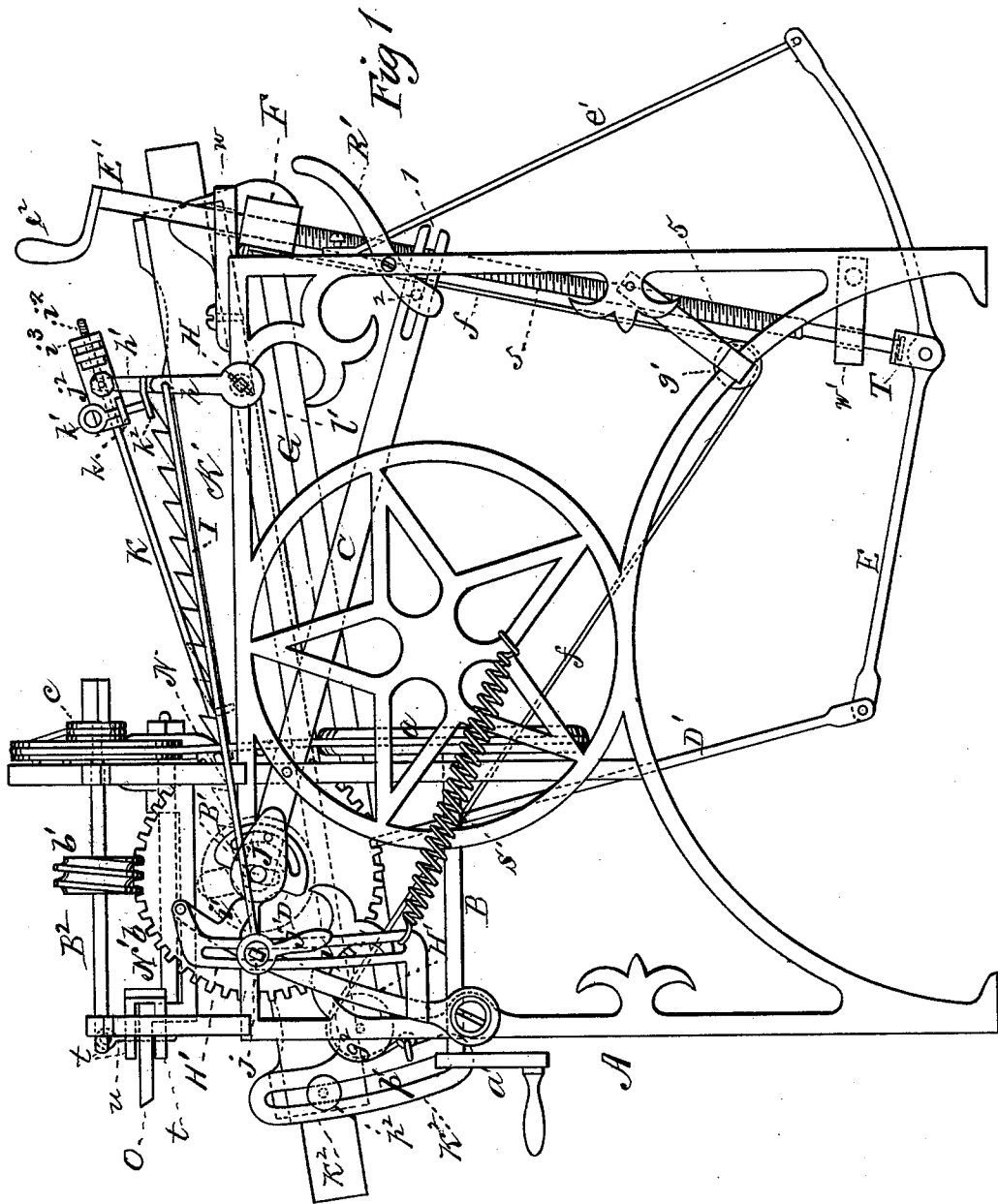


W. L. COVEL.
Machine for Sharpening Saws.

No. 222,386.

Patented Dec. 9, 1879.



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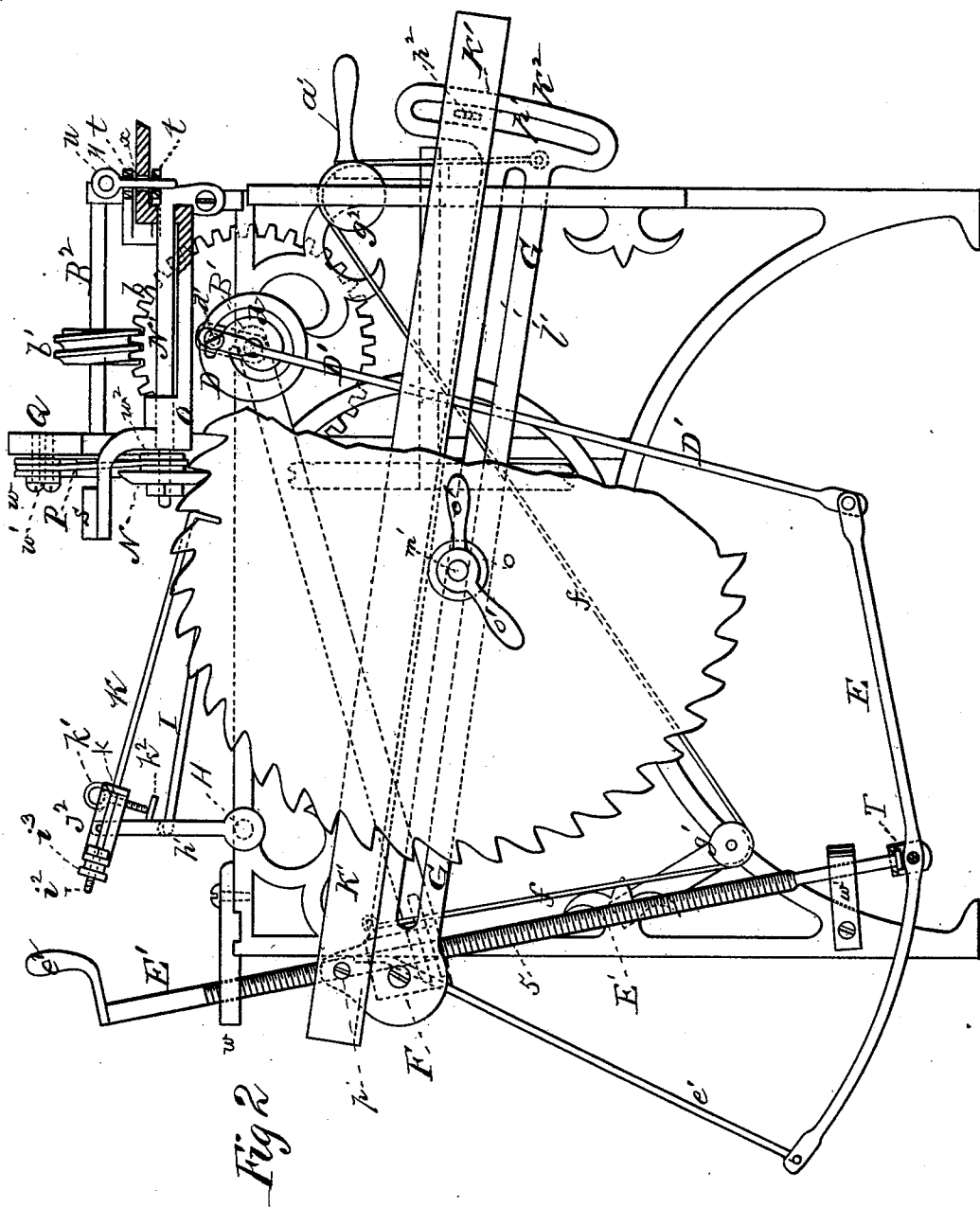


Fig 2

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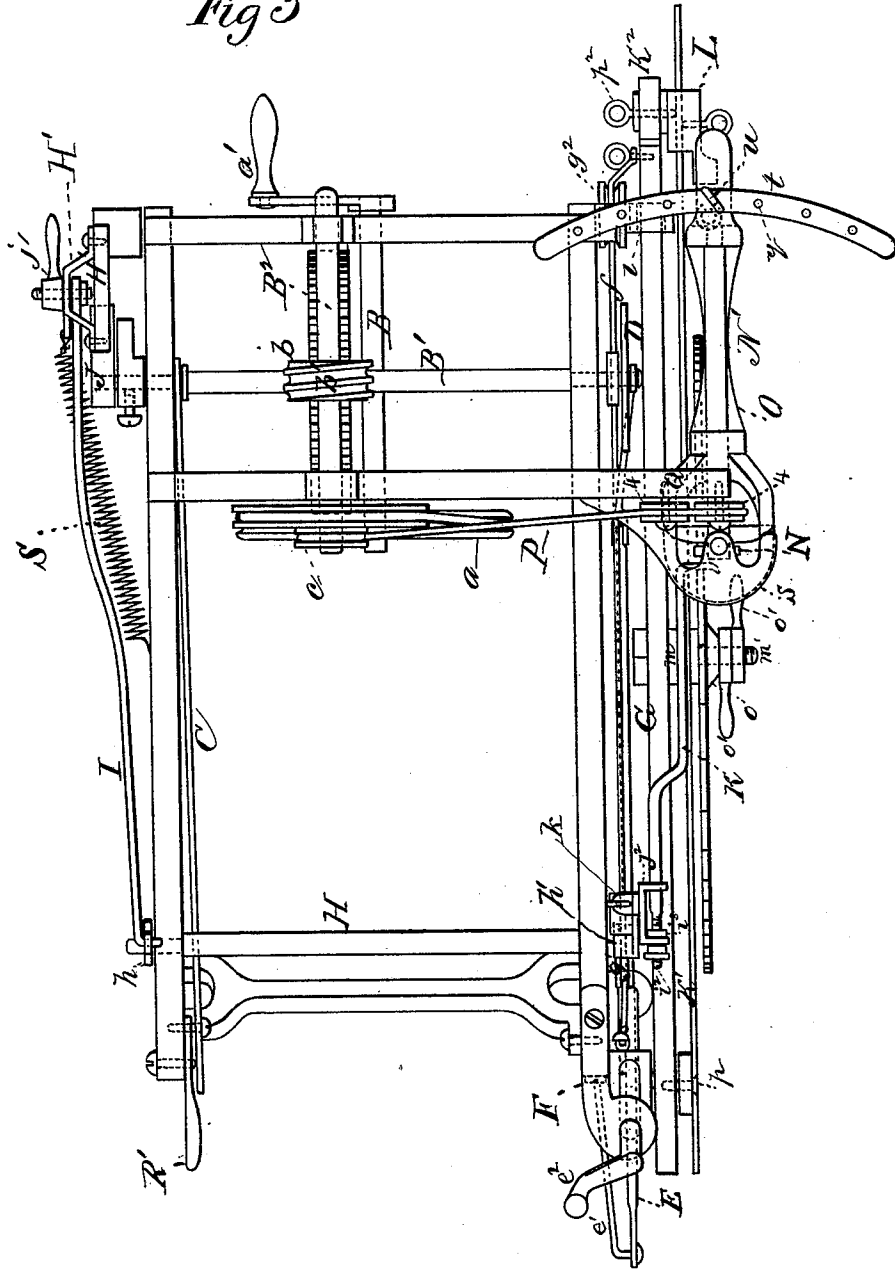
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Fig 3



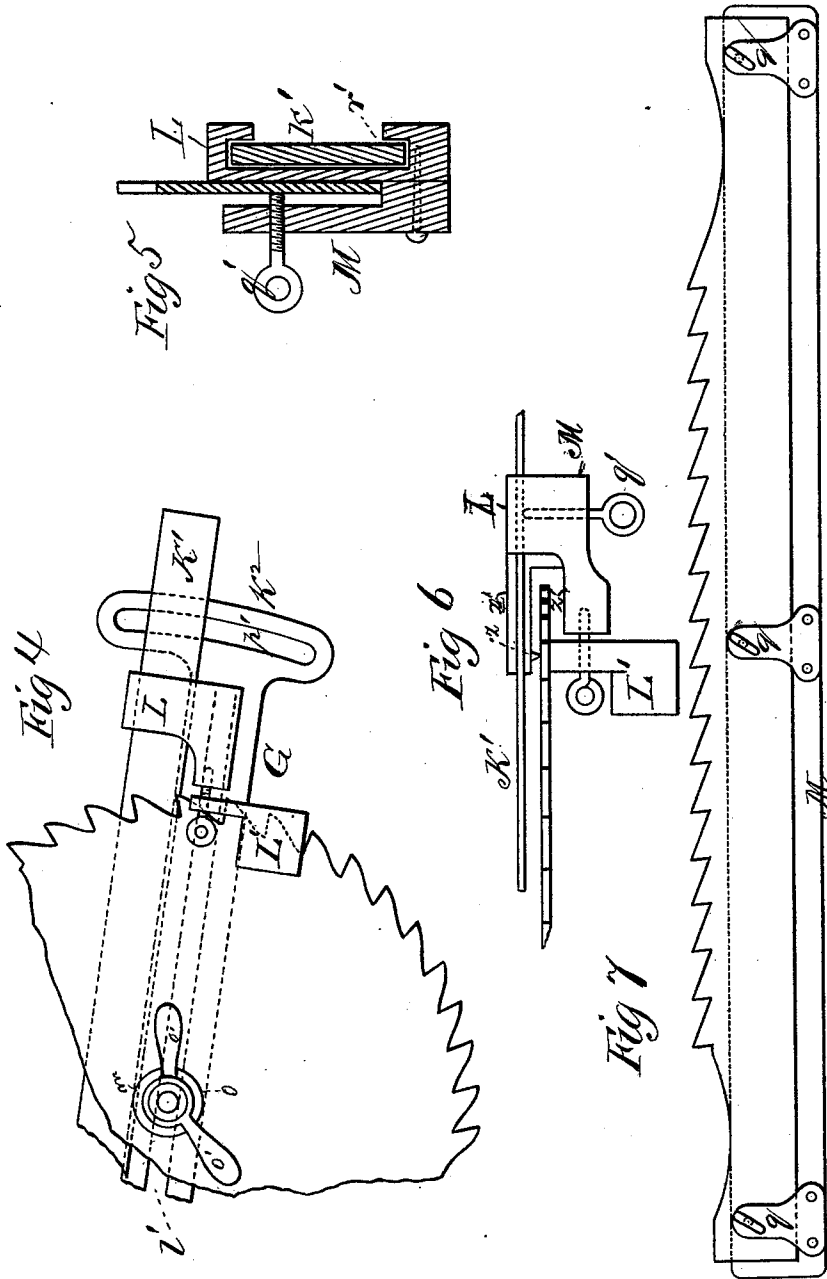
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WILLIAM L. COVEL, OF БЕЛОIT, WISCONSIN.

IMPROVEMENT IN MACHINES FOR SHARPENING SAWS.

Specification forming part of Letters Patent No. 222,386, dated December 9, 1879; application filed December 16, 1876.

To all whom it may concern:

Be it known that I, WILLIAM L. COVEL, of Beloit, in the county of Rock and State of Wisconsin, have invented a new and valuable Improvement in Machines for Sharpening Saws; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figures 1 and 2 of the drawings are representations of side views of my saw-sharpening machine. Fig. 3 is a top view thereof and Figs. 4, 5, 6, and 7 are details.

My invention relates to improvements in machines for sharpening mill-saws automatically.

The object of the invention is, principally, to devise an apparatus which, when once adjusted, will automatically sharpen all the teeth without further attention, making them identically the same in shape, pitch, or hook, and which will be capable of easy adjustment to sharpen teeth of any of the usual sizes or shapes.

The nature of my invention will be fully understood from the following description.

The main frame of my machine is indicated in the drawings by the letter A, and at or near the middle of its height affords bearings for a longitudinal driving-shaft, B. This shaft will have on its inner end a large grooved pulley-wheel, *a*, and on its outer end a driving-crank, *a'*.

B' represents a transverse shaft having its bearings at one end in the side of the frame, and at the other in a vertically-vibrating lever, C, of the first degree. When the power end of this lever is depressed a gear-wheel, *b*, upon shaft B' will engage with a worm, *b'*, upon a second longitudinal shaft, B², at the upper edge of the frame; and if an endless belt be passed around the pulley-wheel *a*, and a small pulley, *c*, upon the inner end of the worm-shaft, motion will be communicated to the latter from shaft B, whence it will be transmitted to the shaft B'. Shaft B' will have upon its end next the emery-wheel a metallic disk, D, provided with a convolute slot, *d*, by means of which

and a clamp-pin, *d'*, a metallic rod, D', in the nature of a pitman, is adjustably secured thereto.

E represents a metallic lever secured by means of a link-rod, *e'*, to the frame, and pivoted at the other to the lower end of the pitman-rod D'. At or near the middle of the length of rod E an endwise-movable and rotating rod, E', is pivoted, which is sustained and guided in its movements by spaced brackets *w w'*, through which it passes, and is provided at its upper end with a crank-arm, *e''*.

The middle portion of rod E' is screw-threaded at 5, and extends through a female-threaded block, F, rigidly secured to one end of a carriage, G, which sustains the saw. By rotating shaft B', one end of the carriage will be alternately raised and lowered through the medium of the crank-disk D, pitman D', the rod E, the endwise-movable adjuster-rod E', and the screw-threaded block F on the carriage G, the other end being raised by means of a rope or chain, *f*, secured at one end to the said block, passing thence downward around a pulley, *g'*, thence upward diagonally across the frame-side, over a pulley, *g''*, whence it descends to and is attached to the remaining end of the carriage. As the block F accompanies the movements of the adjuster-rod it will, through the medium of the rope and pulleys *f g'*, raise or lower one end of the carriage at the same time and to the same extent as the said adjuster-rod raises or lowers the other; consequently the saw will move vertically up to and down from the emery-wheel, and its teeth will be evenly and equally sharpened. The successive teeth are automatically subjected to the emery-wheel by the following mechanism: A rock-shaft, H, having at one end a crank-arm, *h*, and at the other a crank-arm, *h'*, will be mounted transversely on frame A, near the adjuster E'. Arm *h* will be joined to a vertically-vibrating arm, H', pivoted at its lower end to the side of the frame by means of a connecting-rod, I, which latter will have a wrist-pin connection with arm *h*, and will be pivotally and adjustably connected to arm H'. This arm will have a curved slot, *i*, in its length and a rounded spur, *i'*, which is held into engagement with a cam, J, on the adjacent end of shaft B' by means of a spring, S.

The arm h' of the rock-shaft H will be provided with a vertically-vibrating and adjustable feed-finger, K, the free end of which is transversely hooked and overlies the edge of the saw in the throat of the teeth. The rotation of shaft B' will, by means of the cam, the connecting-rod, and slotted arm H', impart a rocking movement to the shaft H, and, through the medium of the arm h' , actuate the feed-finger K and impart an intermittent rotation to the saw. This rotation may be regulated so as to bring a fresh tooth up against the emery-wheel by lengthening or shortening the throw of the feed-finger.

Rod I, before mentioned, is adjustably secured to arm H' by means of a bolt, j , passing through slot i in the said arm and an eye in the said rod, and a hand-nut, j' , clamping them together. Should the throw of the feed-finger prove too great I loosen nut j' and lower rod I in slot i until the said finger takes its place against the face of the tooth next to be sharpened. Shaft B' being then turned over, the feed-finger should push the tooth a short distance beyond the emery-wheel; but should it fall short of this I lengthen the feed-finger as follows: Its end farthest from the saw will be screw-threaded, as shown at i^2 , and will pass through a nut, i^3 , rotating in bearings in one end of a plate, j^2 . The body of the feed-finger will be prismatic and will pass through a perforation in the remaining arm of plate j^2 , of corresponding form.

By operating the nut i^3 the feed-finger may be extended or retracted, as the case may be, thus securing a very exact regulation of the same. Plate j^2 will vibrate vertically on the upper end of arm h' , and will have a horizontal screw-threaded lug, k , provided with an adjusting thumb-screw, k' , the lower end of which bears upon a shelf, k^2 , upon the arm h' . By means of this screw the feed-finger may be held in proper position for engaging with the teeth of the saw accurately.

Cam J will be readily detachable from the end of the shaft B', and a cam of different shape substituted therefor, which will cause a differently-shaped tooth to be given to the saw, as these cams serve not only to actuate the feed-finger, but, by limiting or increasing its throw, act as formers. Three or more of the former-cams will be allotted to each machine, so that every variety of saw-tooth may be sharpened.

The carriage G, before described, will have the end sustained by rope f , extended through a slot, i , formed at the frame-side, so as to be guided in its vertical movements, and will be provided with a longitudinal slot, l' , in which the tang of the centering-cone seat m will be adjustably secured by means of a clamp-nut. The seat m will be concave, and has a screw-threaded central bolt, m' , upon which the centering-cone o and two hand-nuts, o' , will be applied for the purpose of securing the saw to the carriage. On this carriage a dovetailed guide-strip, K', is arranged, the same being

pivoted at one end to the carriage, as shown at p , and connected adjustably at the other to an arm, K², of the carriage, having a curved slot, p' , by means of a set-screw, p^2 . This guide-strip carries an adjustable slide, L, having on its end a gravitating cam-lever, L', which bears upon the face of the circular saw, and prevents it from vibrating during the act of sharpening.

The cone-seat and slide are both removable, and the guide-strip K' is then serviceable as a way or track for a pit-saw carrier, M, having spaced clamps q for securing the saw to it. This carrier will have a dovetail groove, r , upon its rear face, of such a size as to receive the way or track and allow the carrier to have free endwise movement thereon, so that the feed-finger will, as above described, be allowed to give the saw-carrier endwise movement and bring the teeth of the saw successively against the emery-wheel N.

By loosening set-screw p^2 and raising or lowering the free end of the guide-strip until the desired adjustment is obtained, and reapplying the said set-screw, the pitch of the saw-teeth may be increased at pleasure.

In order that the cutting-edge of the saw-teeth may be transversely beveled I have devised the following:

The shaft N' of the emery-wheel N will have its bearings in a horizontally-vibrating plate, O, pivoted at its end next the emery-wheel to a horizontal offset, s , of the frame, and having its free end extended through two spaced perforated horizontally-arranged guides, t , projecting from the frame. The free end of plate O will have a perforation, x , which will register with spaced perforations y in the guides t ; and by passing a lock-pin, u , through the guide and plate O, the latter, and consequently the emery-wheel, will be adjusted so as to give the same bevel to the cutting-edge of the saw-teeth, and this bevel may be increased or diminished, as may be required, by swinging arm or plate O more or less, as may be requisite.

The collar w^2 , against which the emery-wheel N is clamped, is peripherally grooved and serves as a pulley, whereby motion is communicated from the cone-pulley a on shaft B² directly through an endless belt, P, or indirectly through two spaced pulleys, 4 4, having their bearings in a laterally-projecting arm, Q, of the frame.

Slide L, before alluded to, will be provided with a forked end, z' , adapted to receive the edge of the circular saw, and the action of the cam-lever L' will jam it against a metallic spur, z , projecting from the inner arm of the said fork z' , thus not only holding the saw against lateral vibration; but also preventing the saw from rotating while subjected to the action of the emery-wheel. Lever C will have in its free end a longitudinal slot, 1, in which a spur, 2, in the nature of a wrist-pin, on a vertically-vibrating operating-lever, R', having its fulcrum on frame A, will engage. By elevating

the power-arm of lever R', whose fulcrum is below the level of lever C, the gear-wheel *b* on shaft B' will become engaged with the worm *b'* on shaft B², a reverse movement of lever R' having the opposite effect.

The endwise-movable rod E' will have its lower bearing in a saddle, T, to which the lever E is pivoted, by means of which the said rod is allowed to rotate freely, and the lever to vibrate vertically, a universal or knuckle joint being thus made.

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

1. The combination, with a mechanism for rotating an emery-wheel, of the shaft B', disk D, having convolute slot *d*, the adjustable pitman D', lever E, the endwise-movable and rotating screw-rod E', the carrier G, having threaded block F, the chain or rope *f*, and the pulleys *g'* *g*², substantially as specified.

2. The carriage G and a dovetailed guide-strip, K', pivoted to the carriage at one end and adjustably secured to it at the other, combined substantially as specified.

3. The carriage G, having a longitudinal slot, *u*, a slotted end piece, K², the vibrating and adjustable guide-strip K', and a set-screw, *p*², adapted for use substantially as specified.

4. The combination, with the screw-threaded rod E' and the carriage having the threaded block F, receiving the said rod, of the rope or chain *f*, the pulleys *g'* *g*², the lever E, pitman D', crank-disk D, and shaft B', substantially as specified.

5. The combination, with the shaft B', having the cam-former J, of the vertically-vibrating arm H', having spur *v'* and curved slot *i*, the connecting-rod I, the rock-shaft H, and the vibrating and adjustable feed finger K, substantially as specified.

6. The combination, with the arm *h'* of the rock-shaft, having a ledge, *h*², of the vibrating

feed-finger K and an adjusting-screw, *k'*, for increasing or lessening the inclination of said finger, substantially as specified.

7. In combination with the rock-shaft H, having arms *h* *h'*, and the feed-finger K, the connecting-rod I, the slotted arm H', having spur *v'*, the cam-former J, rotary shaft B', and its actuating devices, substantially as specified.

8. The combination, with the rock-shaft H, arm *h*, and the vertically-vibrating slotted lever H', of the connecting-rod I, pivoted to the arm *h* and adjustably secured to the said lever, substantially as specified.

9. In combination with the emery-wheel N and its shaft N', the plate O, affording bearings for the said shaft, pivoted at its front end to the frame and extended between guides *t t*, having spaced perforations *y*, substantially as and for the purpose specified.

10. The slide L, having a forked end, *z'*, adapted to receive the edge of a circular saw, and provided with a spur, *z*, and a gravitating cam-lever, L', combined and arranged substantially as specified.

11. The combination, with the carriage G, having a dovetailed guideway-strip, K', of the pit-saw clamp M, having a dovetail groove, *r*, on one of its faces adapted to receive the saw-strip, substantially as specified.

12. In combination with the carriage G, having longitudinal slot *u'* and guide-strip K', the concave centering-cone seat *m* and the clamp-slide L, respectively-secured removably in the said groove and on the said strip, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM L. COVEL.

Witnesses:

CHAS. F. VAN HORN,
ALLEN H. GANGEWER.