P. D. BURGHER.

SAW-SHARPENING MACHINE.

No. 184,832. Patented Nov. 28, 1876.

FIG. I

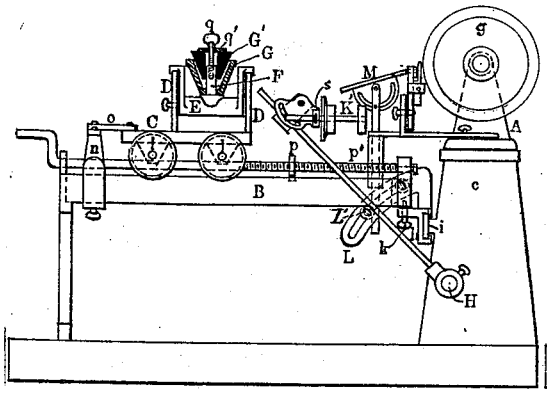


FIG. II

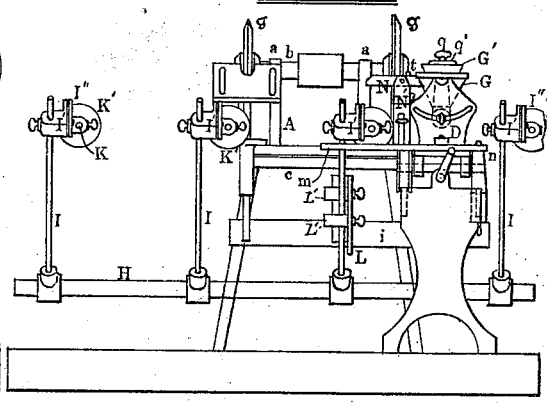


FIG. III

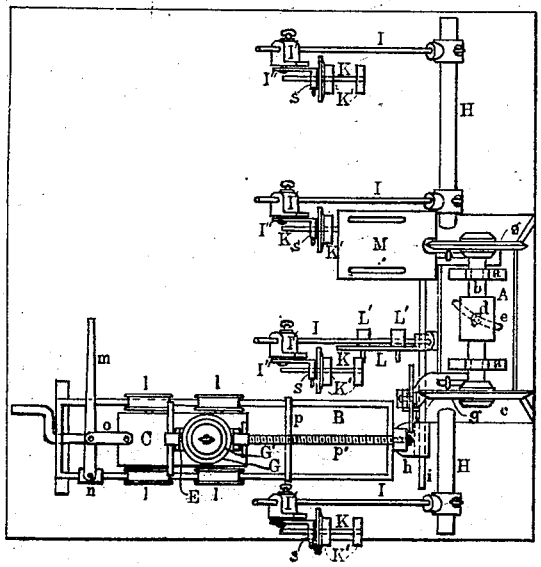
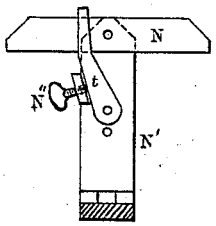


FIG. IV



WITNESSES.

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UNITED STATES PATENT OFFICE.

PETER D. BURGHER, OF DEEP CREEK, VIRGINIA.

IMPROVEMENT IN SAW-SHARPENING MACHINES.

Specification forming part of Letters Patent No. **184,832**, dated November 28, 1876; application filed April 27, 1876.

To all whom it may concern:

Be it known that I, PETER D. BURGHER, of Deep Creek, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Machines for Sharpening Circular and other Saws, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention relates, first, to the parts of a machine of the above class more especially adapted to the sharpening of circular saws, and to the means employed to center the saws, and hold the same in various angular positions during the sharpening operation, which consists, broadly, in bringing the saws in contact with a revolving grinding-disk, as hereinafter described.

My invention relates, secondly, to means whereby the said machine is adapted to the sharpening of straight or gang saws of various widths, and of various descriptions of teeth, the devices employed being adjustable to suit the angle of the teeth, as in the case of the mechanism used in the manipulation of circular saws, above referred to.

In the description of my invention which follows, due reference must be had to the accompanying drawing, forming a part of this specification, and in which—

Figure 1 is a side view of the machine, partly in section; Fig. 2, a front view of the same; Fig. 3, a plan of the invention, and Fig. 4 a partly sectional view of a portion of the same.

Similar letters of reference indicate similar parts in all the figures.

A is a stand, provided with the bearings *a*, in which the grinding-shaft *b* revolves. The stand A is secured to the top of the frame *c*, the means of connection being a bolt, *d*, fitted to pass loosely through a curved slot, *e*, in the stand into the frame *c*, to which it is fastened.

By this mode of attachment the stand A, with the shaft, grinding-disks *g*, and other attachments hereinafter referred to, may be moved independently of the frame, and made to assume various positions in the same plane with reference to the said frame and the holding and other devices, hereinafter described.

B is a track, the inner end of which is pivoted to a block, *h*, fitted to slide upon an arm, *i*, projecting from the frame *c*. This pivot is formed on the end of a thumb-screw, *k*, in order to admit of its vertical adjustment. C is a carriage, adapted to move longitudinally of the track B, upon grooved wheels *l*, by means of a lever, *m*, pivoted to an adjustable block, *n*, and the link *o*. The distance moved by the carriage toward the grinding-disks *g* is limited by a stop, *p*, the position of which is regulated through the medium of a screw, *p'*. D D are standards projecting from the upper side of the carriage C, and serving to support the saw-swing E, suspended from the upper ends thereof.

The saw-swing is held at any desired angle of inclination by means of a set-screw passing through a slot in one of the standards.

The means for centering and holding the circular saw to the saw-swing consist of a cylindrical stud, F, projecting from the saw-swing and two conical blocks, G G', which fit over the stud, and are held thereto by a bolt, *q*, and washer *q'*.

The manner of their application is as follows: The saw is laid upon the block G, and the block G' inserted through the central aperture in the saw, into the block G, and over the cylindrical stud F. The bolt *q* and washer *q'* are then applied and a slight tension placed thereupon.

It will be seen that by the use of these devices, saws with various-sized spindle-apertures can be centered without alteration in the existing mechanism.

The object in making the obliquity of the saw variable by means of the saw-swing, as described, is to give any desired angle of cutting-edge to the teeth in grinding, and thereby adapt them for any description of work.

The parts of my invention used in connection with the grinding-disks in the sharpening of straight or gang saws consist in the

following-described mechanism: A shaft, H, is adapted to partially revolve in bearings situated in the frame *c*, and is provided with the arms I, which may be placed at any angle with reference to each other, and secured thereat by set-screws. I′ I′ are heads constructed to be moved to and fastened at any part of the arms I, and are fitted with the vibratory plates I″. The plates I″ have projections *s*, which serve as bearings or holders for the extensible rods K. K′ K′ are rollers or pulleys, upon which the straight saw rests, and is moved longitudinally in the sharpening operation.

It will be seen that the rods K may be placed in such relative positions as to give to the saw laid upon the rollers K′ an angular or inclined position with reference to the shaft H, and thereby cause an oblique or angular edge to be ground on the saw-teeth when they are brought into contact with the grinding-disks *g*, and that by their adjustability in other respects, by reason of the movable arms to which they are connected, teeth of any desired shape may be ground.

L is a slotted curved bar, fitted for attachment to the arm *i* at any portion of its length, and provided with adjustable stops L′, which regulate the transverse movement of straight saws in the sharpening operation, hereinafter described.

Parts of the machine not yet alluded to will be described and their uses set forth in the description of the operations of sharpening circular and straight saws which follows: The circular saw having been secured to the saw-swing, as hereinbefore explained, the track B is moved to a position that will bring the cutting-edge of the saw-teeth parallel with the back or flat side of the emery-wheel, and the saw inclined laterally to give the necessary angle of cutting-edge. The inner end of the track is then elevated or depressed by means of the movable pivot on the thumb-screw *k*, in order that the saw may tend toward the center of the grinding-disk, or to a point above or below it, as may be desired. The stop *p* is now adjusted to regulate the forward motion of the saw or the length of the teeth.

The several movable parts of the machine having thus been adjusted and secured in their respective places, the emery-wheels are put in revolution and the saw moved toward the one to be used by means of the lever *m*. One tooth of the saw is thus brought into contact with the revolving disk and ground, the tooth during the operation resting upon a movable cross-piece, N, pivoted to an arm, N′, of variable length and position.

After the completion of the tooth the saw is withdrawn and partially revolved, and the next tooth moved into position, the stop *p* regulating the forward movement in each case.

The entire number of teeth having been ground, their points are, by another complete revolution of the saw, successively brought into contact with the beveled edge of the wheel to grind them to a common length, or their ends to a uniform distance from the center of the saw.

During this final operation the gage *t*, which is hinged or pivoted to the arm N′, and adjusted by means of a set-screw, N″, is brought into requisition, and secured in such manner as to give, when the teeth are successively brought against the gage, the common required angle to the point of the teeth.

The operation of sharpening straight or gang saws by means of my improved machine is as follows: The distance over the rollers or pulleys K′ being arranged to suit the width of the saw by means of the extensible rods K, the angle of the saw or its deviation from a horizontal line is then determined upon, and the arms I secured or set to suit the saw. The stops L′ are then placed in such positions in the slotted curved bar L as will give to the arms I, when one thereof is located between them, the necessary forward movement to grind the teeth to the required depth when brought into contact with the grinding-disk, and sufficient backward movement to admit of the saw being withdrawn entirely from the disk to allow of the feed-motion. The grinding-disks are now put in revolution, and each tooth of the saw brought successively into contact therewith and ground. The backs of the teeth are subjected to the same method of grinding, in connection with the cross-piece N and gage *t*, as those of the circular saw before mentioned.

M is a plate attached adjustably to an arm pivoted to the stand A, to be used with a round or flat edged grinding-disk, to cut out the spaces between the teeth, or in other manipulations of saws not forming a part of the regular sharpening operation.

Having thus described my invention, what I claim as new, and wish to secure by Letters Patent of the United States, is—

1. The carriage C and saw-swing E and its attachment, adapted to be moved by the lever *m*, in combination with the stop *p* and screw *p′*, substantially as and for the purpose specified.

2. In combination with the saw-swing E, the cylindrical stud F, conical blocks G G′, and bolt *q*, substantially as described.

3. The track B and arm *i*, adjustably connected by means of the block *h* and screw *k*, substantially as shown.

4. The arm N′, adjustable in height, as described, in combination with the pivoted cross-piece N and gage *t*, pivoted to the arm N′, and capable of adjustment by means of a set-screw, N″, substantially as set forth.

5. The revoluble shaft H and adjustable arm I, in combination with the heads I′, vi-

bratory plates I″, and extensible rods K, substantially as shown.

6. The extensible rods K, in combination with the pulleys or rollers K′, substantially as described.

7. In combination with the arm *i*, the curved bar L, provided with the adjustable stops L′, substantially as and for the purpose specified.

8. In combination with the stand A, the plate M, attached adjustably to an arm pivoted to the said stand, and adapted for use in connection with a grinding-disk, substantially as and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name this 10th day of April, in the year of our Lord 1876.

PETER D. BURGHER.

Witnesses:
J. L. RAPES,
R. D. PARROTT.