(No Model.)

3 Sheets—Sheet 1.

A. BLACKMER.

SAW SHARPENING MACHINE.

No. 385,693. Patented July 10, 1888.

Fig. 1.

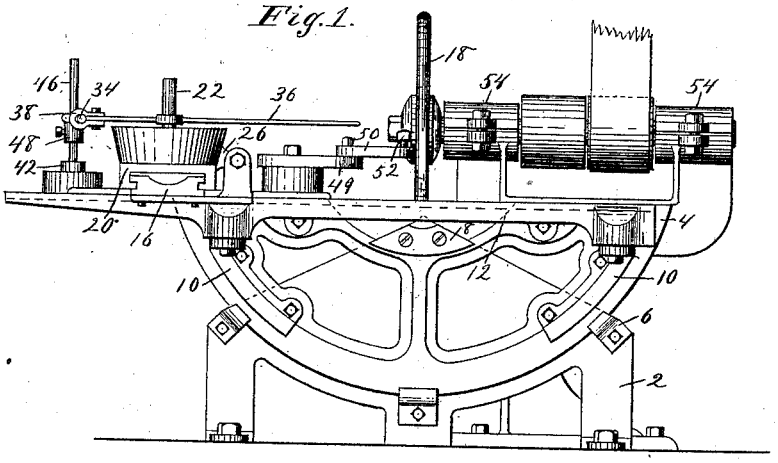
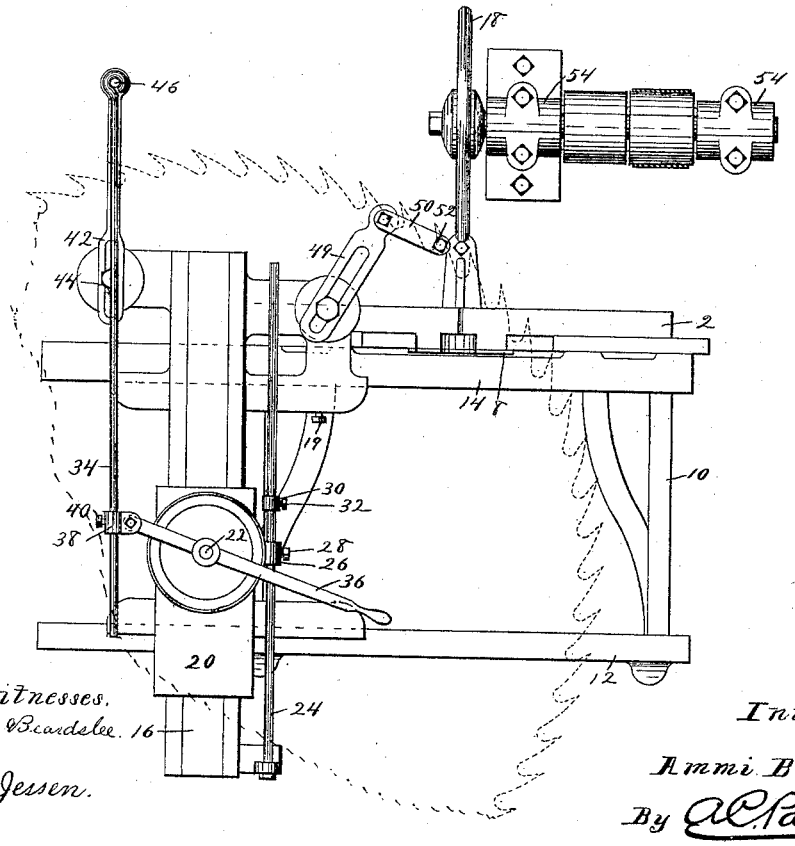


Fig. 2.



Witnesses.
S. J. Beardslee.
J. Jessen.

Inventor.
Ammi Blackmer.
By A. C. Paul. Atty

(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

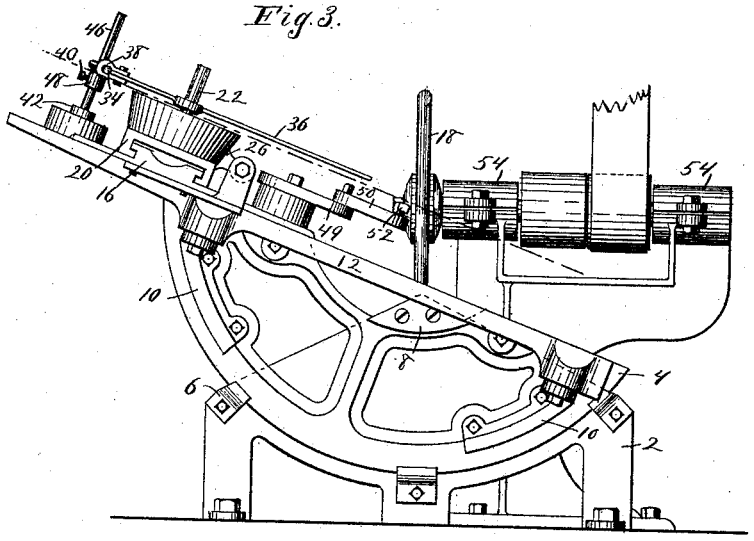

Fig. 4.

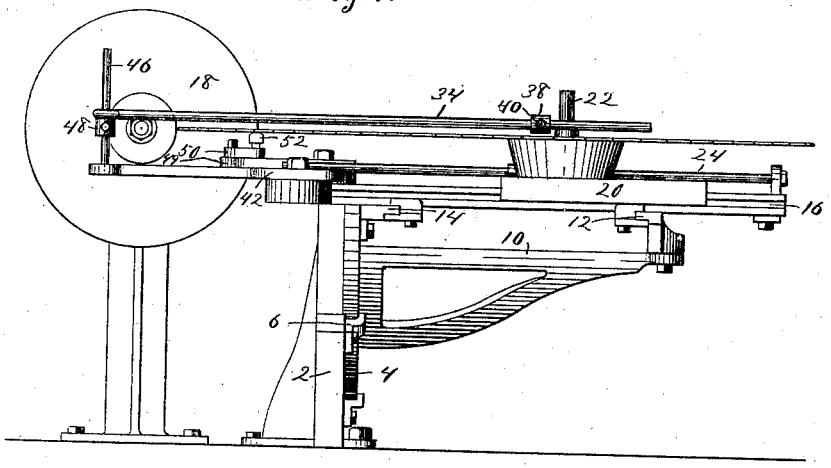

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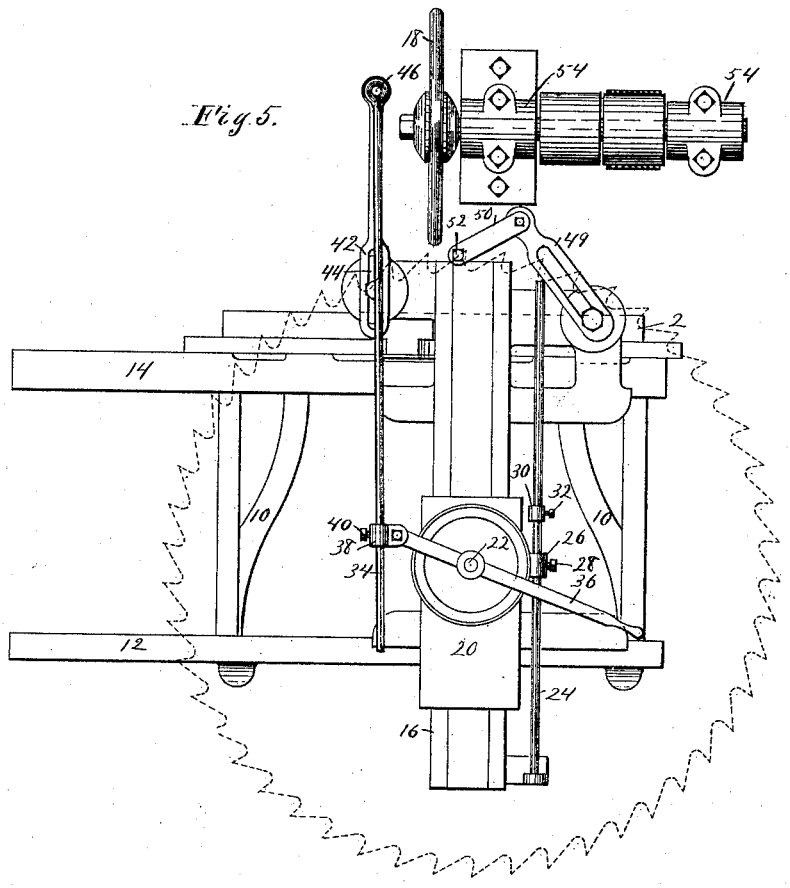
Fig. 5.



Witnesses.
S. J. Beardslee.
J. Jessen.

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By A. C. Paul atty

UNITED STATES PATENT OFFICE.

AMMI BLACKMER, OF MINNEAPOLIS, MINNESOTA.

SAW-SHARPENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 385,693, dated July 10, 1888.

Application filed October 28, 1887. Serial No. 253,585. (No model.)

To all whom it may concern:

Be it known that I, AMMI BLACKMER, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Saw-Sharpening Machines, of which the following is a specification.

My invention relates to improvements in machines for sharpening saws by grinding.

The objects I have in view are to provide a compact and easily-operated machine in which the grinding-wheel is secured upon a shaft or arbor mounted in stationary bearings, and the saw to be ground is carried upon a sliding support adapted to be moved toward and from the grinding-wheel.

Another object is to provide a machine of this class in which the saw is supported by means of a frame secured upon a segmental bed-plate whose axis is coincident with the center of the grinding-wheel.

Other objects of the invention will appear from the following detailed description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of my improved machine. Fig. 2 is a plan view of the same. Fig. 3 is a front elevation of the machine with the parts in position for grinding a bevel on the teeth. Fig. 4 is a side elevation. Fig. 5 is a plan view showing the saw-holder in a different position.

In the drawings, 2 represents the frame or standard of the machine, which may be secured to a bench or other suitable platform, and which supports the radially-sliding bed-plate 4. This bed-plate is made in the form of a segment of a circle and rests against the face of the standard 2, being held in curved ways, preferably formed of bearing-plates 6, placed at the bottom of the bed-plate, and in which the said bed-plate is free to slide. One of these plates 6 is arranged to clamp the bed-plate and hold it in position. The center or axis of the circle of which this bed-plate forms a part is located at the center line of the grinding-wheel, so that no matter at what position or angle the bed-plate may be placed this center of motion will not be changed. A top clamp, 8, may be located above the bed-plate and secured to the frame 2. This clamp projects over the face of the said bed-plate and acts as a support at the top. The top of the standard is inclined downward from the center toward both sides, thus permitting the bed-plate to be turned in either direction about its axis. The upper edge of the bed-plate which fits under the clamp 8 is preferably formed on a curve concentric with its outer edge.

Brackets 10 are secured to the bed-plate 4, the top edge of said brackets extending at right angles to the bed-plate and at or near their outer extremities, and resting upon the top of these brackets I prefer to place the guide 12. Another guide, 14, preferably similar to the guide 12, is secured to the bed-plate above the brackets 10. The brackets 10 and the guides 12 and 14, together with the bed-plate, form a frame that supports the devices by which the saw is handled.

The two guides 12 and 14 form ways for the support of the sliding cross-head 16, which is arranged to travel from side to side of the machine horizontally in front of the grinding-wheel, and is preferably provided with a set-screw or clamping-bolt, 19, which bears against the guide 14 in order to hold the cross-head in a fixed position.

A suitable saw-support, 20, is arranged to slide in suitable ways upon the cross-head 16 at right angles to the guides 12 and 14, and to this the saw to be operated upon is attached, preferably by means of the center pin, 22, which may be supplied with a suitable cone-washer to fit in the central opening of the saw to properly center and hold the saw in position.

24 represents a rod secured at the outer end to an arm on the cross head 16.

26 represents a lug on the saw-support, which is bored to fit the rod 24, and is preferably provided with a set-screw, 28, by which the said lug may be clamped to the rod if it should be desired to hold the saw in a fixed position.

30 represents a collar bored to fit the rod 24, and provided with a set-screw, 32, by which it may be secured to the rod at any point upon its length. This collar is for the purpose of limiting the movement of the saw-support toward the grinding-wheel, and may be clamped upon the rod in a position to suit any diameter of saw and any depth of tooth required.

34 represents a rod or bar, of any convenient length, secured by suitable fastenings to the cross-head 16 and extending parallel thereto.

36 represents a lever, one end of which is pivoted to an adjustable fulcrum, 38, on the rod 34. This lever is also attached to the saw-support 20 by means of the center pin, 22. The free end of the said lever is preferably provided with a suitable handle, for convenience of operation. By means of this lever the saw-support is moved back and forth upon the cross-head and the teeth of the saw are brought in contact with the grinding-wheel. The fulcrum 38 may be placed at any required point upon the rod to suit the diameter of the saw, and is held in position by means of the set-screw 40. The rod 34 is preferably attached to the cross-head by means of an adjustable arm, 42, having a slot, 44, at the point where it is secured to the said cross-head, and is held in the desired position by a suitable bolt, which passes through the slot and through a suitable projection on the cross-head 16. By the use of the slotted arm I am enabled to obtain a greater variation for diameter of saws with the use of a shorter rod. I also prefer to allow the rod 34 to vibrate, in order to give the lever 36 a free movement about the center pin. For this purpose I provide the standard 46 at right angles to the arm 42 and secured to the said arm at or near its outer extremity. This standard is preferably cylindrical in form, and the end of the rod 34 is provided with an eye which fits over the said standard. A collar is preferably secured to the standard and supports the end of the rod. This collar may be adjusted upon the standard and the height varied to suit the position of the lever 36 on the center pin.

I prefer to provide the machine with a saw-rest attached to and traveling with the cross-head 16. For this purpose I provide the slotted arm 49, secured to the said cross-head by a suitable bolt passing through said slot and arranged to clamp the arm in any desired position. It is desirable to support the saw at a point as near as practicable to the grinding-wheel, and for this purpose I provide the arm 49 with a swinging arm, 50, pivoted to its outer end, and so arranged that the two arms can be clamped together by the bolt which forms the pivot and firmly held in any desired position.

52 represents an adjustable pin or bolt, preferably screw-threaded in the arm 50, and the upper end of this pin is brought in contact with the under side of the saw. This pin may be raised or lowered by turning it in the screw-threaded aperture in the arm 50 to make the desired contact with the saw. The grinding-wheel 18 is preferably mounted on a suitable arbor revolving in fixed bearings 54, which may be supported on a frame independent of the other portion of the machine. Fast and loose pulleys are mounted upon the arbor of the grinding-wheel, and power is applied, by means of a belt, in the ordinary manner.

The saw-support 20 is preferably made of such height as to bring the saw when horizontal on a line with the center of the grinding-wheel, and its plane will then cut the axis of the segmental bed-plate 4. The axis of the bed-plate is in the plane of the saw, and passes through the center of the grinding-wheel; whatever may be the position of the slides carrying the saw, and at whatever angle the saw may be presented to the grinding-wheel, hence the bed-plate may be turned in either direction, and the part of the saw that coincides with the axis of the bed-plate will remain in line with the center of the wheel. In other words, the point of contact between the wheel and the saw is always in a line that passes through the center of the wheel and the axis of the bed-plate, and this line will not be altered by turning the bed-plate in either direction or changing the position of the saw on the frame carried by the bed-plate; hence the necessity of readjusting the slides carrying the saw each time the bed-plate is turned is avoided, and a grinding-wheel of any diameter can be used with the same effect.

The cross-head 16 may be in the position shown in Fig. 2. In this case the saw will take the position horizontally, as denoted by dotted lines, and the teeth will be what is known as "undercut." As the saw is carried forward by the operation of the saw-support, each tooth in succession may be brought in contact with the grinding-wheel, and every tooth will have the same angle or under-cut. The amount of under-cut may be varied by the position at which the cross-head is placed upon the guides 12, and any variation desired may be obtained from a radial line to the greatest under-cut necessary.

With the cross-head in the position as before described, if it is desired to grind a cross-cut-saw, the bed-plate 4 is turned upon the standard 2 until the saw is brought into position to give the required bevel to the teeth, as shown in Fig. 3, which will bring the plane of the saw on the angle denoted by the dotted line. The point of contact between the saw and the grinding-wheel will still be on a line with the axis of the bed-plate, which is on the center line of the grinding-wheel, and each tooth will be brought against the wheel at precisely the same angle for the full revolution of the saw, or as long as the bed-plate is clamped in this position.

If desired, the cross-head may be placed at the opposite side of the grinding-wheel, as shown in Fig. 5, in which case the saw-teeth will be reversed, as denoted by dotted lines in this figure. The operation is the same in this case, and the bed-plate may be set horizontally or at any desired angle. The particular advantage of using the machine in this way is that the wear upon the grinding-wheel may be more equally distributed and both sides of the wheel be used.

I claim as my invention—

1. The combination, in a saw-sharpening ma-

chine, with a grinding-wheel whose arbor is mounted in stationary bearings, of a segmental bed-plate arranged to turn about an axis that is substantially coincident with the center of the grinding-wheel, and a movable saw-support carried by said bed-plate, substantially as described.

2. The combination, in a saw-sharpening machine, with a grinding-wheel whose arbor is mounted in stationary bearings, of a segmental bed-plate arranged to turn about an axis that is substantially coincident with the center of the grinding-wheel, a cross-head sliding at right angles to the axis of said bed-plate upon guides supported on said bed-plate, and a saw support sliding upon said cross head parallel with the axis of said bed-plate, substantially as described.

3. The combination, in a saw sharpening machine, with a suitable grinding-wheel, of the bed-plate 4, arranged to turn about an axis that is substantially coincident with the center of the grinding-wheel, and a movable saw-support carried by said bed-plate and arranged to support a saw in a plane that intersects substantially the center of the grinding-wheel, substantially as and for the purpose set forth.

4. The combination, in a saw-sharpening machine, with the grinding-wheel 18, of the bed-plate 4, mounted in ways and turning upon an axis that is substantially coincident with the center of the grinding-wheel, the brackets 10, secured to said bed-plate and projecting at right angles therefrom, the guides 12 and 14, secured above said brackets at right angles to the axis of the bed-plate, the cross-head 16, mounted upon said guides and adapted to move thereon, and the saw-support 20, mounted upon said cross-head and adapted to slide thereon in a line parallel with the axis of said bed-plate.

5. The combination, in a saw-sharpening machine, with the grinding-wheel, of the transversely-movable cross-head 16, provided with the rod 24, the saw-support 20, mounted and adapted to slide longitudinally on said cross-head and provided with the collar 26, engaging said rod 24, a set-screw, 28, and the collar 30, provided with the set-screw 32, substantially as described.

6. The combination, in a saw-sharpening machine, with the grinding-wheel, of the transversely-movable cross-head 16, the adjustable arm 42, secured upon said cross-head, the rod 46, secured to said arm 42, the rod 34, pivotally supported upon the rod 46, the sliding saw-support 20, and the adjusting-lever 36, adjustably pivoted upon said rod 34, substantially as described.

7. The combination, in a saw-sharpening machine, with a grinding-wheel, 18, of the transversely-movable cross-head 16, the longitudinally-sliding saw-support mounted upon said cross-head, the slotted arm 49, pivoted on said cross-head, and the arm 50, pivotally supported upon said arm 49 and provided with an adjustable rest, 52, substantially as described.

AMMI BLACKMER.

In presence of—
R. H. SANFORD,
A. M. GASKELL.