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[illegible]

Fig. 2.

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# United States Patent Office.

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## IMPROVEMENT IN MACHINES FOR GRINDING SAW-BLADES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, CHARLES J. GARDNER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and improved Machine for Grinding Saw-Blades; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a side elevation, partly in section, of my improved saw-grinding machine.

Figure 2 is a plan or top view of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to a new machine for grinding the blades of hand or circular saws, of all kinds and sizes, and for grinding the hand saws thin on the back, to give them the requisite degree of elasticity.

The invention consists, chiefly, in hanging the rotary grinding-stones in swiveled shafts, which allow the setting of the grinding-faces at any desired angle to each other.

The invention consists, also, in the combination therewith of reciprocating holders for the saw-blades, and in the use of an adjustable shoe, by which the taper of the blade toward the back is regulated.

A in the drawing represents the frame of my improved saw-blade grinding-machine. This frame is made of wood, or other material of suitable size and form to contain the machinery connected with the grinding apparatus.

In the lower part of the frame A is hung the horizontal longitudinal driving-shaft B, which receives rotary motion by suitable mechanism.

Above the shaft B are hung, in adjustable bearings, *a b*, the grindstone shafts C C, which carry, on their inner ends, the circular grindstones D, of suitable material. The grinding-faces of the stones D are opposite each other and near together, as shown.

The inner bearing *a* of each shaft C is pivoted or swiveled to the frame A. The outer bearing, however, has a tenon fitting through a circular slot or groove, *c*, and is, by a rod, *d*, connected with a crank, *f*, on a rock-shaft, E, which has a projecting handle, *e*, whereby it can be turned. By means of the handle *e* the bearing *b* can be set so as to put the shafts C into any desired oblique position, setting, thereby, the grinding-faces of the stones D also obliquely, as shown in fig. 2. The edges, which are thus brought near together, will thereby regulate the thickness to which the blade is to be ground. The stones can, in this manner, be set oblique, to be close together at either side of the machine.

Belts, *g g*, or other mechanism, serve to impart rotary motion to the shafts C.

The machine has a guide on each side, for holding a saw, one side being adapted to the grinding of hand-saws, while the other side is for circular saws.

The hand-saw F is pivoted to a slide, G, which moves in a grooved guide, *h*, and is, by means of a rod, *i*, connected with the crank of a rock-shaft, H.

The rock-shaft H receives oscillating motion from the driving-shaft B, either by the connections *j k l*, shown in fig. 1, or by other suitable means.

The lower edge of the hand-saw rests on a shoe, I, which can be adjusted up and down by means of screws, *m*, to regulate the inclination of the blade. The blade, by hanging in an inclined position, is ground more at the top than at the lower edge, and receives, thereby, the desired taper in thickness.

While the stones revolve in the same direction, the saw is moved back and forth between them by means of the slide G, which receives reciprocating motion from the rock-shaft H.

The circular saw is secured in a slotted crank, *n*, of a rock-shaft, J, which receives oscillating motion from the shaft B by means of the connections *j k l*, or other mechanism.

When the circular saw is to be ground the grinding-stones are drawn together at the side on which said saw is held.

It is evident that the machine can also be used for grinding other flat implements besides saws.

Having thus described my invention,

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

1. The arrangement of the stones D D, substantially as shown and described, so that the saw-blades may be ground between their flat surfaces, as specified.

2. The grindstones D, hung on shafts C, which hang in swiveled and adjustable bearings *a b*, substantially as herein shown and described, so that the grinding-surfaces can be adjusted at any desired angle, as specified.

3. The combination of the outer bearings *b* with the rock-shaft E, by means of which the shafts C are adjusted, as specified.

4. The slide G, arranged for holding the hand-saws, and connected with the rock-shaft H, substantially as herein shown and described, to operate as set forth.

5. The vertically-adjustable shoe I, combined with the reciprocating saw-blade and with the oblique grinders, substantially as herein shown and described.

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