W. DOUGHERTY.

MACHINE FOR GRINDING SAWS, &c.

No. 30,130. Patented Sept. 25, 1860.

Fig. 5

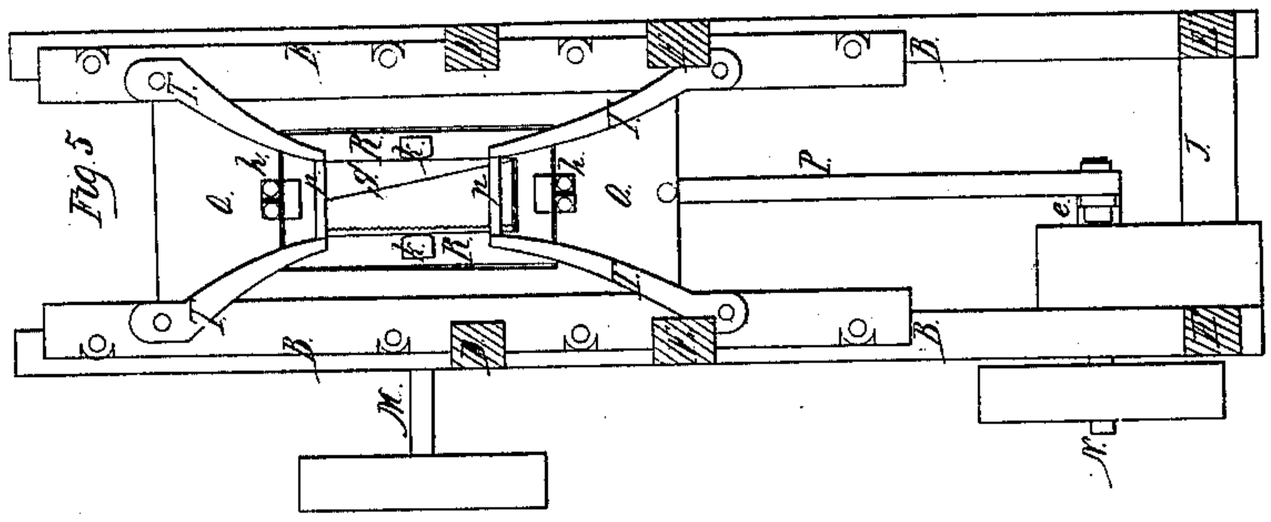


Fig. 3.

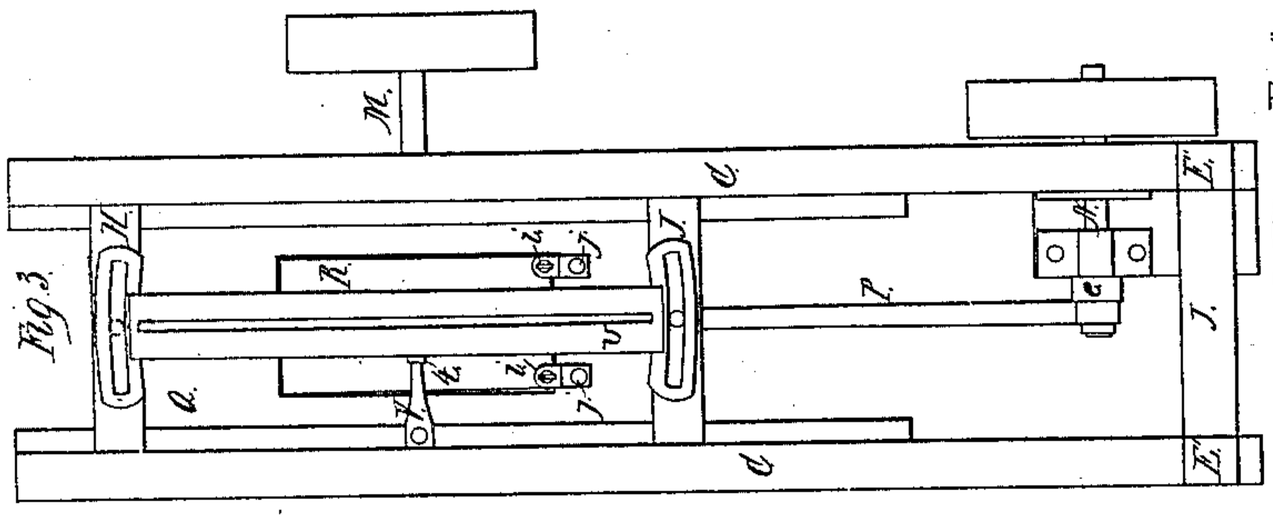


Fig. 4.

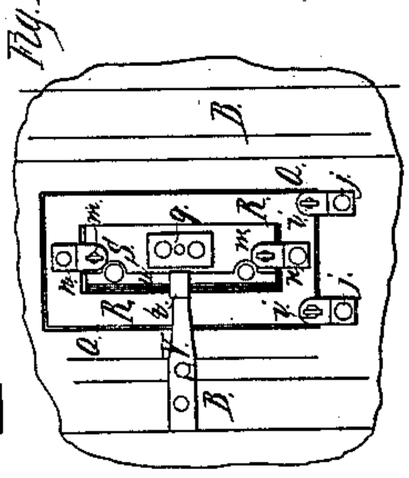


Fig. 1.

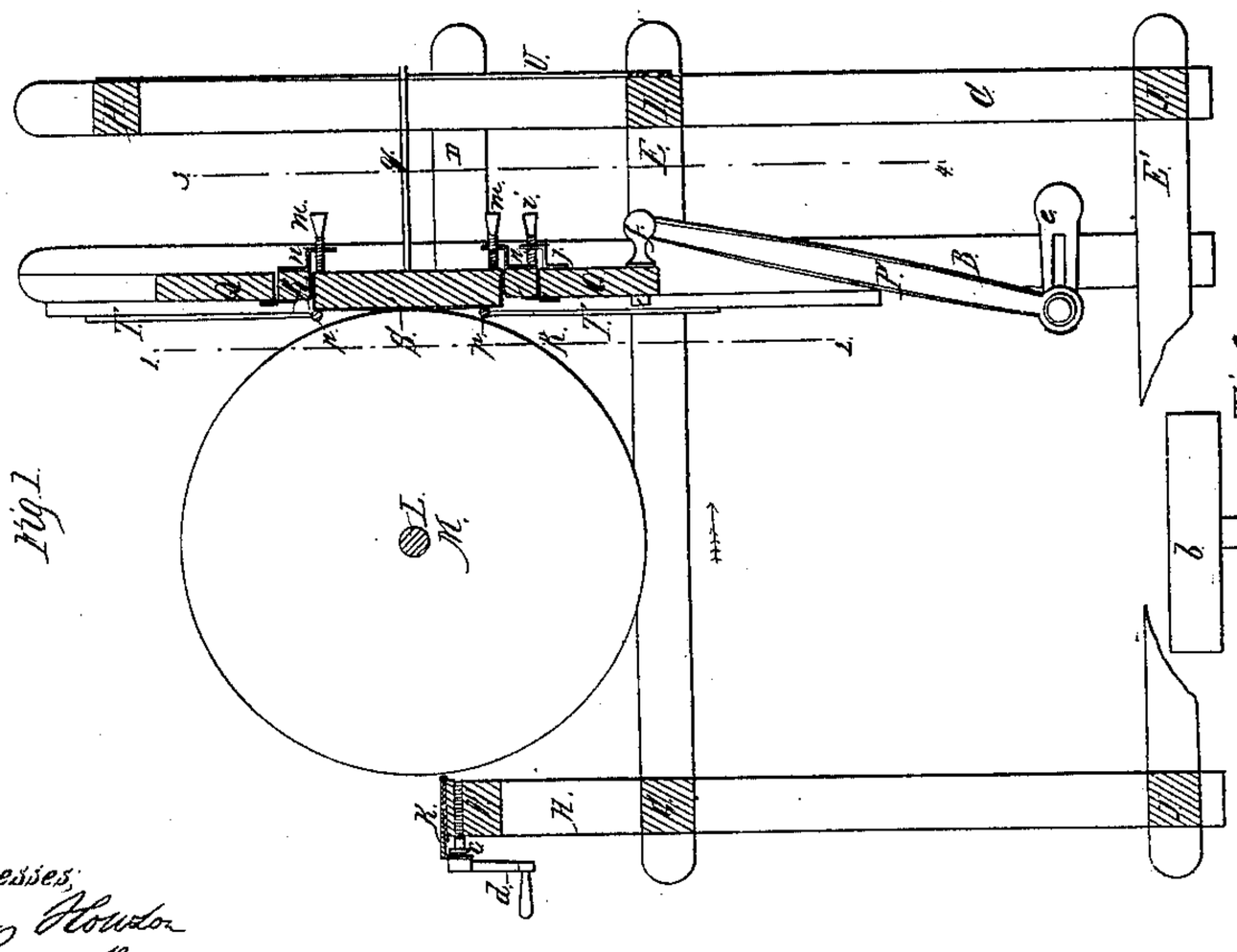
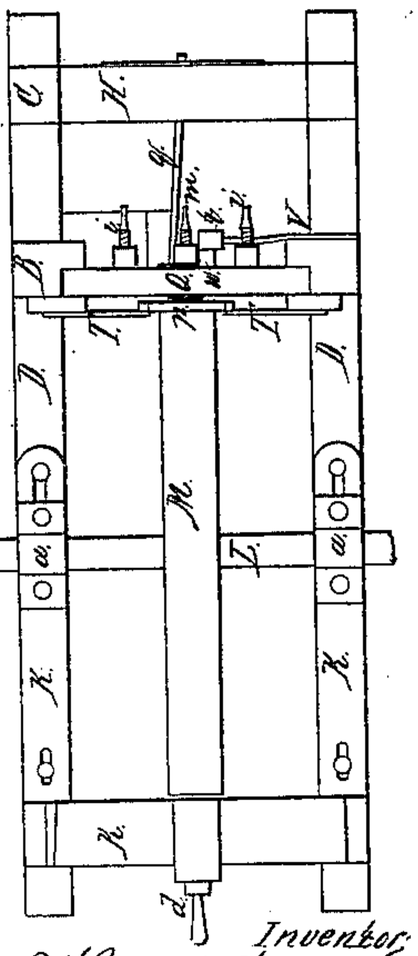


Fig. 2.



Witnesses,
Henry Howson
Charles Howson

Inventor,
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UNITED STATES PATENT OFFICE.

WILLIAM DOUGHERTY, OF PHILADELPHIA, PENNSYLVANIA.

SAW-GRINDING MACHINE.

Specification of Letters Patent No. 30,130, dated September 25, 1860.

To all whom it may concern:

Be it known that I, WILLIAM DOUGHERTY, of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machinery for Grinding and Polishing Saw-Blades and other Objects; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention relates to automatic mechanism for guiding saw blades, files and other objects, and consists of certain devices described hereafter, whereby the object operated on may be ground to a uniform thickness, may be reduced to a gradual uniform taper, or may be made tapering on one side only or have a rounded surface imparted to it.

In order to enable others skilled in the art to make and use my invention I will now proceed to describe its construction and operation.

On reference to the accompanying drawing which forms a part of this specification, Figure 1 is a vertical section of my improved machine for grinding saw blades and other objects; Fig. 2 a ground plan; Fig. 3 a view of the rear end of the machine; Fig. 4 the same with part of the framework removed, and Fig. 5 a vertical section on the lines 1, 2 Fig. 1 looking in the direction of the arrow.

Similar letters refer to similar parts throughout the several views.

The machine has two side frames, each being composed of the three uprights A, B, and C, and the longitudinal beams D, E, and E′, the opposite frames being connected together by the transverse bars F, G, H, I, and J.

At the front end of the frame and on the opposite beams D D of the side frames, as well as on the transverse beam F, rests the plate K which is so secured to the frame that it can slide freely thereon in a longitudinal direction only. On this plate K are two boxes in which turns the shaft L carrying a grindstone M one end of the shaft being furnished with a suitable driving pulley *b*.

To a lip projecting from the plate K is connected a spindle *c* furnished with a handle *d* and screwing into the transverse bar F, so that by turning the handle the plate K can be moved backward and forward on the frame at pleasure.

N is a driving shaft turning in boxes attached to the uprights B of the opposite frames, one end of the shaft being furnished with a suitable driving pulley, and the opposite end with the slotted crank *e* to which is jointed the lower end of the rod P, the upper end of the latter being connected to a bolt *f* secured to the lower end of the sliding frame Q, which moves in vertical guides formed in the uprights B B of the opposite frames. Within the sliding frame Q is another frame R, and within the latter a third frame S, the frames being connected together as follows:

From the upper as well as the lower end of the frame R, at a point midway between its opposite sides, projects a pin or journal, the two pins turning in plates *h h* secured to the frame Q, one plate being secured to the upper edge and the other to the lower edge of the opening in the said frame (see Fig. 5) so that the frame R can be vibrated laterally when not secured by set screws *i i* which screw into the plates *j j* and bear with their points, one against one lower corner, and the other against the opposite lower corner of the frame R.

The frame S has at the opposite sides and midway or thereabouts between its opposite ends pins or journals adapted to turn in the plates *k k* secured one to one side and the other to the opposite side of the opening in the frame R so that the said frame S can be vibrated when not prevented by set screws *m m*, screwing into plates *n n*, and bearing with their points, one screw against the upper end, and the other against the lower end of the frame S.

T T are two spring plates each carrying at its outer end a roller *p* the plates being secured to the framework of the machine in such a position that both rollers shall bear against the frame S, one roller near the upper, and the other near the lower end of the frame, when the driving crank *e* is at half stroke, or when the sliding frame Q is midway between the limits of its upward and downward movement.

From the middle of the frame S projects a rod *q* the end of which passes through a slot in the bar U, the opposite ends of the latter having curved openings through the upper one of which a pin passes and screws into the transverse beam H of the perma-

nent frame, a similar pin passing through the lower curved opening of the bar and screwing into the transverse beam I of the frame so that the slotted bar may be readily arranged to assume an inclined or vertical position.

From one of the uprights B of the frame projects an arm V furnished at the end with a roller *t* which bears against a rib *w* secured to the frame S, the surface of the rib being more or less concave so that on the reciprcating movement of the sliding frame Q a vibrating movement will be imparted to the frame S.

When the machine is required to grind a plate of uniform thickness the plate is attached to the frame S, the bar *v* is adjusted to the vertical position seen in Fig. 3, the set screws *i i* are adjusted to bear against the frame R, the set screws *m m* to bear against the frame S, which is set parallel to the face of the stone, and the arm V is moved out of the way so that its roller A shall be free from contact with the rib *w*. The frames R and S being now a permanent part of the sliding frame Q and the latter reciprocating in a vertical plane parallel with the face of the stone the action of the latter on the plate will tend to reduce the same alike in all parts.

It will be evident that by a proper adjustment of the set screws *i i* the frame R may be partially turned on its journals, so that the surface of the plate to be ground will be at an angle to the plane in which the frame Q reciprocates and consequently the face of the plate will be so ground that one edge is thicker than the other from end to end. In like manner by means of the set screws *m m* the frame S may be so adjusted that one end of the plate may be reduced by the stone more than the other. The blades of the better class of hand saws however have to be so ground that the back edge shall have a gradual taper from the butt to the outer end of the blade while the cutting edge is of the same thickness throughout, in this case it becomes necessary to turn the frame R on its journals as the sliding frame reciprocates. This is accomplished by the slotted bar U which is adjusted to a proper inclination, the points of the screws *i i* being removed from the frame so that its lateral position is entirely under the control of the arm *q* and the latter under that of the slotted bar U.

It will be evident without more minute explanation that the frame R will vary in its lateral position as the frame Q reciprocates and that the saw blade will be reduced at the desired points, the extent of the taper imparted to the back edge of the saw depending upon the inclination of the slotted bar.

In grinding ordinary flat files they must be reduced so as to present a slightly rounded surface and gradual taper from one end to the other. In this case the arm V, and the rib *w* on the frame S are brought into play, the points of the screws *m* being removed from the said frame and the frame R being secured to the frame Q by the set screws *i i*.

As the frame Q reciprocates the concave edge of the rib *w* bearing against the roller T will tend to tilt or vibrate the frame S which will cause the grindstone to reduce the file attached to the frame to the desired rounded surface, the amount and form of taper imparted to the file depending upon the shape of the rib *w*.

The plates to be ground, as for instance the saw blade shown in the drawing, is confined to its proper vertical position on the frame S by suitable strips or pins projecting from the frame to such a distance that they cannot interfere with the action of the saw on all parts of the blade, the ends of the latter however would be apt to leave these projections but for the rollers *p* on the yielding plates T T the said plates being so arranged on the frame of the machine that whatever position the sliding frame may occupy one or other of the said rollers bears against the blade and tends to press it against the frame S.

I wish it to be understood that I do not claim broadly the employment for grinding saws of a plate or frame capable of being so moved that the blade may be reduced to a gradual taper at the back edge and have an uniform thickness at the cutting edge, but

I claim as my invention and desire to secure by Letters Patent—

1. The reciprocating frame Q and the frames R and S connected together and arranged substantially as set forth in combination with the revolving grindstone.

2. The frame R hung to the reciprocating frame Q substantially in the manner described, in combination with the arm *q* and the adjustable slotted bar *v* the whole being arranged and operating substantially as and for the purpose herein set forth.

3. The frame S its rib *w* and the stationary arm V or its equivalent, in combination with the reciprocating frame for the purpose specified.

4. The yielding plates T T with their rollers *p p* when arranged in respect to the frame substantially as and for the purpose herein set forth.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIAM DOUGHERTY.

Witnesses:
HENRY HOWSON,
JOHN WHITE.