No. 704,106. Patented July 8, 1902.

F. A. REICHARDT & H. WILCOX.

SHARPENING MACHINE.

(Application filed July 24, 1901.)

(No Model.) 2 Sheets—Sheet 1.

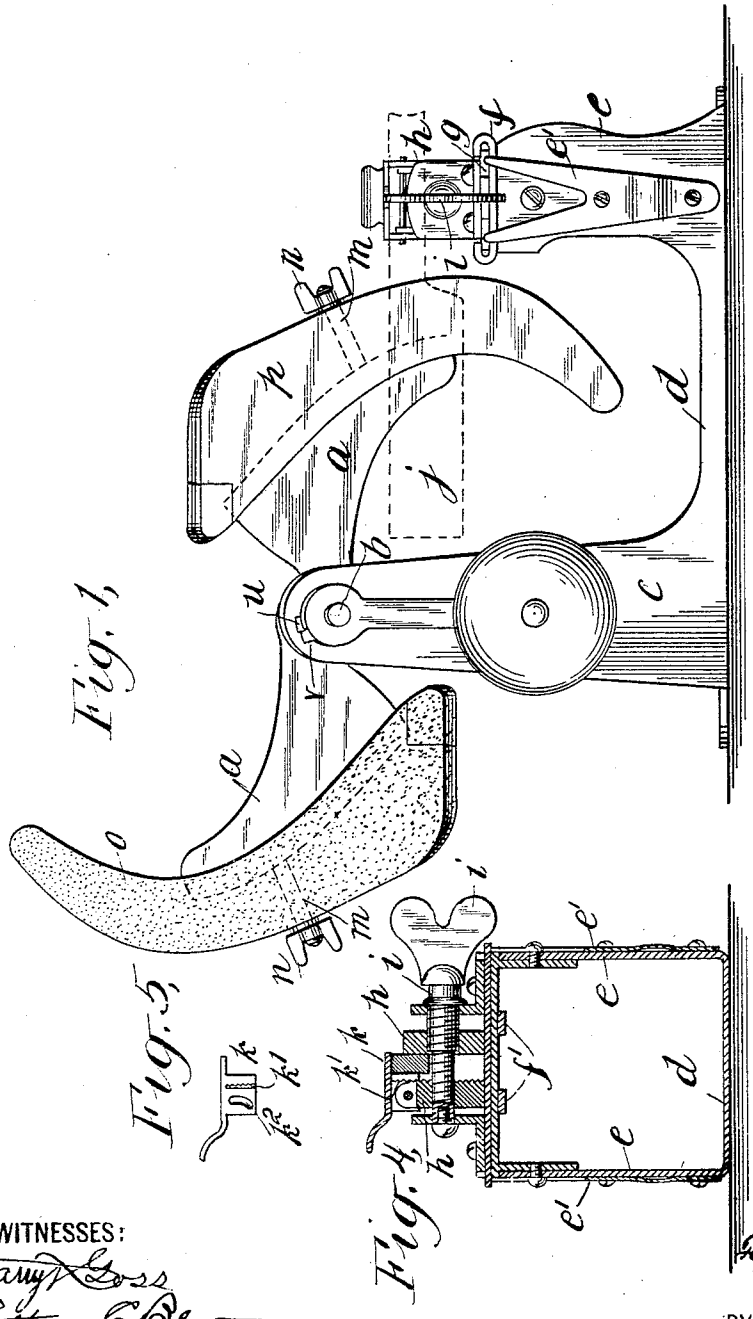


Fig. 1.

Fig. 2.

Fig. 4.

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Fig. 3.

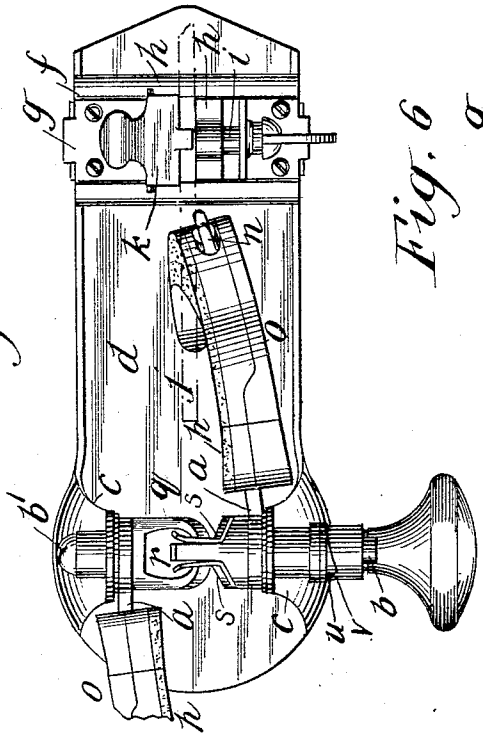


Fig. 6

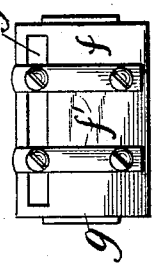
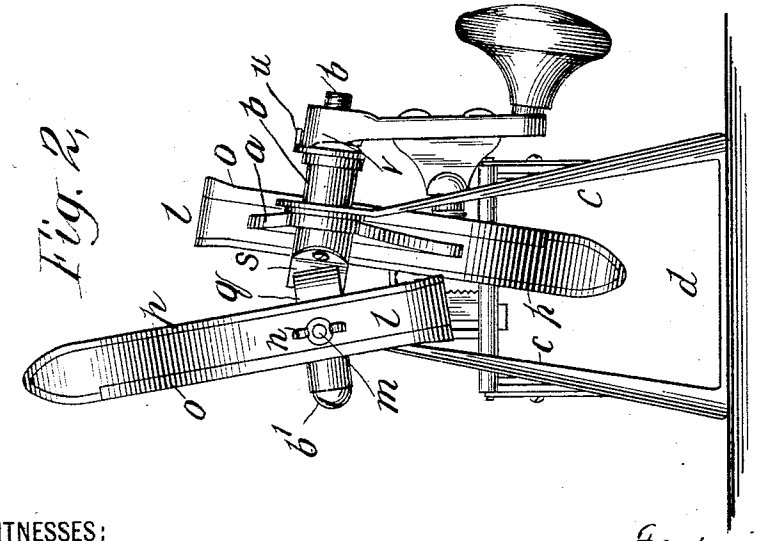


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SHARPENING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 704,106, dated July 8, 1902.

Application filed July 24, 1901. Serial No. 69,484. (No model.)

To all whom it may concern:

Be it known that we, FERDINAND A. REICHARDT, a resident of Elizabeth, county of Union, and HENRY WILCOX, a resident of Newark, county of Essex, State of New Jersey, citizens of the United States, have invented certain new and useful Improvements in Sharpening-Machines, of which the following is a specification.

This invention relates to that class of sharpening-machines in which the blade to be sharpened is held in the paths of abrading or polishing surfaces arranged to alternately act on the two sides of the blade.

One of the novel features of this invention consists in so making the devices which carry the active surfaces that they are readily detachable from the rotating arms and interchangeable, they being of a duplex nature, one of their sides being provided with an abrasive surface, as a stone or honing material, and their other sides provided with a polishing or finishing surface, as leather or strapping material, the arrangement being such that when these devices are fastened to the rotating arms, of which there are preferably two, their opposed surfaces will be of the same character, and when transposed on the rotating arms the opposed surfaces will also be similar in character, but different in kind or quality to the other opposed surfaces. The shaft carrying the arms to which the honing and strapping blocks are attached is compound, consisting of two parts fitted in angularly-arranged bearings and centrally connected by means of a universal joint, as described and claimed in United States Letters Patent to F. A. Reichardt, No. 653,882, dated July 17, 1900, the arrangement being such that the opposed active surfaces of the blocks rotate in two circular planes at an angle to each other intersecting at a line below their axes, the edge of the blade to be sharpened being located at or about this line of intersection.

Our present invention also includes an improved blade-holding device, the principal feature of which is an auxiliary jaw carried by one of the vise-jaws having angular grooves formed to coact with lateral grooves in the face of the vise-jaw and having an extension arranged to project over the mouth of the two vise-jaws and to bear on the upper edge of the shank of a blade held by the jaws and so press and firmly hold said shank down in the jaws, said auxiliary jaw or clamp being so connected that it may be vertically set to accommodate shanks of blades of varying height and to swing away from the vise-opening for the ready insertion and removal of the blade-shank. These with other minor features of improved construction will now be more fully described by reference had to the accompanying drawings, in which—

Figure 1 is a side elevation of a sharpening-machine embodying our improvements. Fig. 2 is an end elevation. Fig. 3 is a plan view of the same. Fig. 4 is a sectional view of the blade-holding vise or chuck. Fig. 5 is a side view of the auxiliary jaw detached; and Fig. 6 is an underneath view of the blade-holder, showing the slide-controlling means.

In the embodiment of our invention as shown in the drawings, *a a* represent two curvilinear-shaped flat arms secured to and carried by the compound shaft *b b'*, which has its bearings in the standards *c c*, projecting upwardly from one end of the base *d* of the machine. The upper end of the standards *e e* at the other end of the base carries the blade-holding device. This blade-holder comprises a plate *f*, provided with guideways and secured to the upper ends of the standards *e e*, in which the slide *g* is located, so as to have a free lateral movement, said slide carrying jaws *h h*, controlled and actuated by the longitudinal stationary right and left hand screw *i* in such manner that the jaws *h h* are caused to move at equal speeds toward and from the central plane of the machine which is coincident with the planes of rotation of the active surfaces carried by the arms *a a*. These jaws hold the blade to be sharpened—as a razor-blade *j*, illustrated—by its shank, and to hold the blade secure against possible displacement while being sharpened an auxiliary jaw *k*, carried by one of the jaws, is caused to bear down on the upper edge of the part of the shank within the jaws, said jaw *k* having formed in the face of the part which is adjacent to the vise-jaw a series of inclined grooves and projections *k'*, which

coact with corresponding grooves and projections formed in the face of the jaw h, so as to cause the jaw k to be pressed firmly down on the shank when set in position to act thereon, the side pressures on the shank causing a downward movement of the jaw k by means of the inclination given to the lateral grooves and projections on the adjacent faces of the jaws k and h. The jaw k is connected to the jaw h through the medium of slots k^3 in side wings and a pin or rod on the jaw h entering said slots, the arrangement being such that the jaw k has considerable vertical adjustment relatively to the jaw h and is free to be swung away from the opening between the two vise-jaws, leaving a free passage for the entrance therein and removal therefrom of the shank of the blade and to be set over and on the shank to assist in holding it in place, as before described.

The slide g of the blade-holder is held normally in central position by the springs e' e', secured to the sides of the standards e e, with their ends bearing against the ends of the slide, said springs having the functions to hold the blade being sharpened against the rotating abrading or polishing surfaces with a yielding pressure, and to permit the slide to move laterally in relation to the rotating active surfaces with the least amount of resistance parallel links f' f' are employed, located under the plate f, one of their ends being pivoted to the plate and their other ends pivoted to the slide g, which slide connections pass through a slot in the plate f, as clearly shown at Fig. 6.

The compound reversible abrading and polishing devices comprise each a block l, similarly formed, substantially flat and having an irregular curvilinear contour, giving them such a shape as to cause their surfaces to act on a blade j, held in the vise-jaws h h, with a regular sweeping action from the heel or shank end to the head or point of the blade. These blocks l l are provided in their inner edges with grooves shaped to receive the peripheral flanges of the arms a a, as shown by the dotted lines a' a', Fig. 1, so as to be rigidly connected thereto by any suitable locking means, the locking means selected and here shown consisting of rods m m, extending from the periphery of each of the arms a a and passing through holes in the blocks l l, and thumb-nuts n n, fitted on the threaded ends of the rods m m. These blocks l l may be made of wood or other suitable material and have secured to one of their sides honing or abrading material o o and to their other sides straps or polishing material p p, these active surfaces being secured on the blocks in any suitable manner, as by means of a cement, and they are so attached to the blocks that similar surfaces will be opposed when the blocks are secured to the arms a a—as, for instance, the surfaces p p—as shown in the drawings, which are now the surfaces acting on the blade j when the shaft carrying the arms is rotated. The blocks l l being interchangeable, it will be readily seen that when they are transposed on the arms a a then their opposed active surfaces will be the surfaces o o. Any number of such pairs of blocks each having active surfaces of different kinds and qualities may, as will be readily understood, be used with this machine for grinding, honing, strapping, and polishing blades.

The universal connection between the two sections b b' of the shaft consists in forming at the inner end of one of the sections, as b', a forked head q, having a diametrical open slot in which projects a diametrical flange extension r on the other section b, said flange being provided with side springs s s, which take up the slack and insure a steady action between the two parts of the shaft when rotary motion is imparted to one of them.

To prevent any backward rotation of the handle t, causing a backward movement of the abrading or polishing surfaces, particularly when in contact with a blade, one end of the part of the shaft is provided with a quick or coarse screw-thread, and the hub of the operating crank-handle t is correspondingly tapped. A stop u, which projects from the shaft or from a collar screwed on the threaded end, is so located relatively to a lug v on the hub of the crank-arm that as said crank is screwed on the shaft the lug will just pass by the end of the stop and will bring up against it at the next revolution of the crank-arm, and so positively cause the shaft to be rotated with the crank in the desired direction, but will leave the shaft entirely free as soon as the crank is rotated backwardly.

We claim as our invention—

1. In a sharpening-machine, in combination, rotating arms; removable blocks provided with abrading or polishing surfaces on their sides and detachably secured to the arms; a blade-holder adapted to hold a blade in the paths of rotation of the abrading or polishing surfaces of the blocks; and means for rotating the arms.

2. In a sharpening-machine, in combination, arms adapted to be rotated in two circular planes at an angle to each other; removable blocks provided with abrading or polishing surfaces on their sides and detachably secured to the arms, so arranged as to cause the opposed active surfaces of the blocks to be rotated in the two circular planes; a blade-holder adapted to hold a blade in the paths of rotation of the active surfaces of the blocks; and means for rotating the arms.

3. In a sharpening-machine, two blocks each having on one side a stone or honing material and on their other sides leather or strapping material; two rotating arms and means for the interchangeable attachment of the blocks to the arms, so that their opposed side surfaces will be of the same character; means for holding a blade in the paths of rotation of the active surfaces of the block; and means for rotating the arms.

4. In a sharpening-machine of the character herein described; a blade-holder; a block provided on each of its sides with an abrading or polishing material differing in quality or character from that on the other side; and means for holding and moving the block so that either of its sides having the active material thereon will be caused to rub over one of the sides of the blade.

5. In a sharpening-machine, two arms carried by a rotating shaft having flat flanges at their peripheries, two blocks each having a groove in its inner edges corresponding to and adapted to fit over either of the flat flanges of the arms, the opposite sides of the two blocks being provided with an abrading or polishing surface of similar character; and means, as threaded rods and nuts for holding the blocks on the arms.

6. In a sharpening-machine, a compound shaft comprising two parts fitted to rotate in angularly-arranged bearings one of said parts having a groove formed in its inner end and the other part having at its inner end a projecting flange and side springs extending into said groove, whereby rotary motion of one part will be imparted to the other part with substantial uniformity; arms carried by the two parts of the shaft; abrading or polishing surfaces attached to the arms; means for holding a blade in the paths of the abrading or polishing surfaces; and means for rotating the shaft.

7. In a sharpening-machine, a rotatable shaft; arms carried thereby provided with abrading or polishing surfaces; a blade-holder constructed to hold a blade in the path of the active surfaces of the arms; and an operating crank-handle attached to the shaft by means of quick or coarse pitch screw-thread, and a stop-arm projecting from the shaft against which the crank-arm contacts only when said crank is moved in one direction so as to be locked thereon and is released therefrom when the crank-handle is moved in the other direction.

8. In a sharpening-machine; a blade-holder comprising a pair of vise-jaws, means for moving them, one of said jaws having formed in face lateral angular grooves, and a third jaw or holding-down device formed to extend over the opening between the jaws and down the side of laterally-grooved jaw, said part having counterpart grooves, which are so shaped that when pressure is applied between these parts the upper part of this third jaw is moved downwardly, thereby constituting, with the vise-jaw, a three-side grip on the device placed between the jaws.

9. In a sharpening-machine, a rotatable shaft; arms carried thereby provided with abrading or polishing surfaces, a blade-holder constructed to hold a blade in the path of the active surfaces of the arms; said holder consisting of a pair of clamping-jaws adapted to be moved toward and from one another, and a holding-clamp attached to one of the jaws arranged to extend over the opening between the jaws and having angular grooves formed in its side adjacent to said jaw, formed to engage with counter-grooves laterally formed in the front of said jaw.

10. In a sharpening-machine, a blade-holder comprising clamping-jaws; a slide carrying the jaws; a guideway in which the slide works; parallel links horizontally arranged, connected at one end to the slide and at the other to the guideway-frame; and springs acting on the slide to hold it in central position.

11. In a sharpening-machine, a rotatable shaft; arms carried thereby provided with abrading or polishing surfaces, a blade-holder constructed to hold a blade in the path of the active surfaces of the arms; said holder consisting of a pair of clamping-jaws adapted to be moved toward and from one another, and a holding-clamp attached to one of the jaws arranged to extend over the opening between the jaws and having angular grooves formed in its side adjacent to said jaw, formed to engage with counter-grooves laterally formed in the front of said jaw; a slide carrying the jaws; a guideway in which the slide works; parallel links horizontally arranged, connected at one end to the slide and at the other to the guideway-frame; and springs acting on the slide to hold it in central position.

In testimony whereof we have hereunto subscribed our names this 10th day of July, 1901.

FERDINAND A. REICHARDT.
HENRY WILCOX.

Witnesses.
ARTHUR C. BLATZ,
ALFRED SHEDLOCK.