No. 653,882. Patented July 17, 1900.

F. A. REICHARDT.

SHARPENING MACHINE.

(Application filed Jan. 12, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

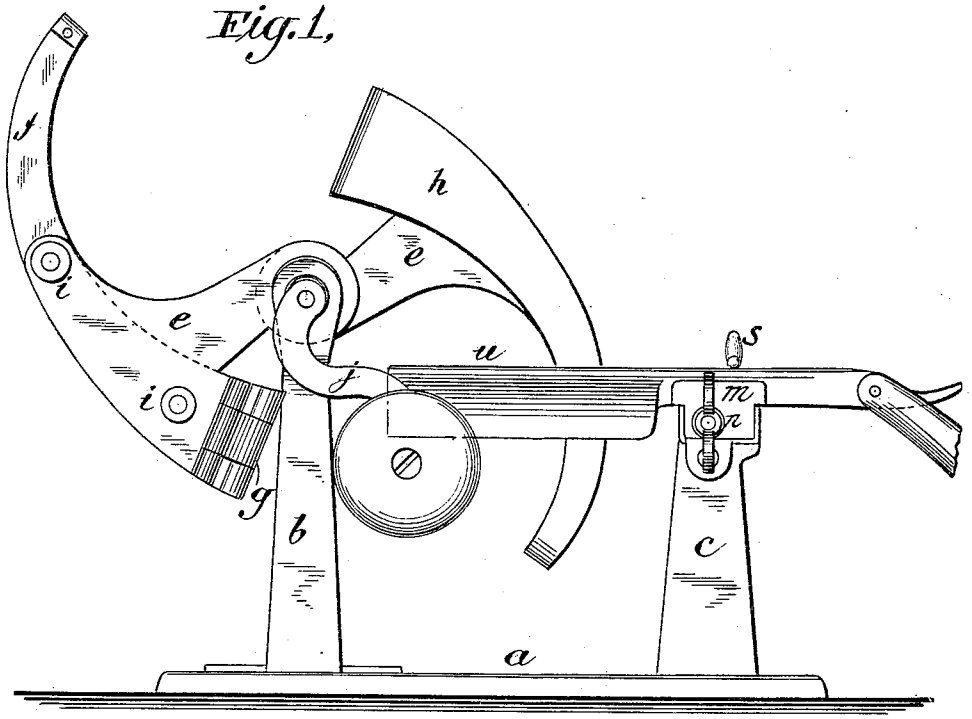
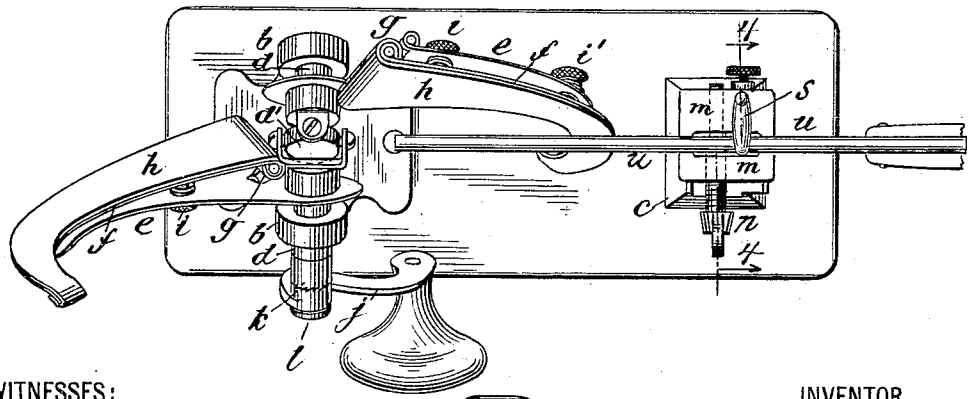


Fig. 2.

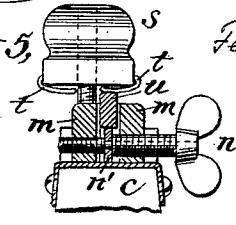


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Fig. 5.



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Fig. 3.

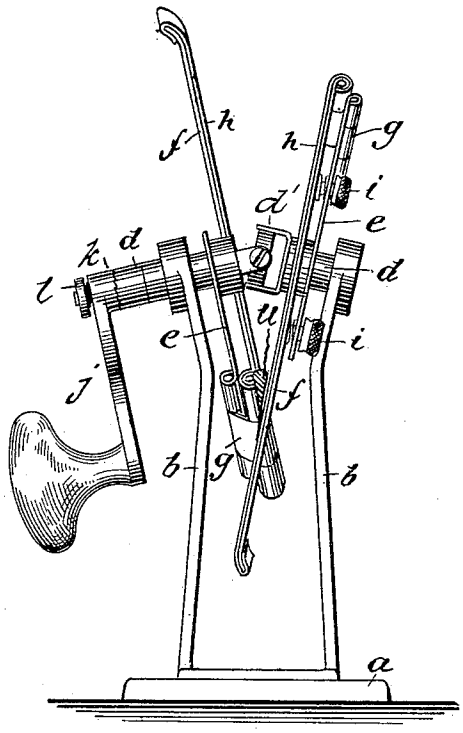
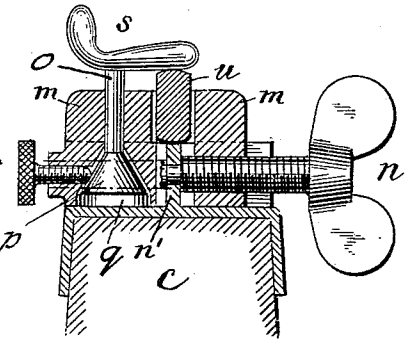


Fig. 4



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UNITED STATES PATENT OFFICE.

FERDINAND ALFRED REICHARDT, OF ELIZABETH, NEW JERSEY.

SHARPENING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 653,882, dated July 17, 1900.

Application filed January 12, 1900. Serial No. 1,176. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND ALFRED REICHARDT, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented a certain new and useful Sharpening-Machine, of which the following is a specification.

The sharpening-machine forming the subject of this invention is designed to sharpen or strop cutting-blades of angular cross-section, such as razor-blades; and it comprises arms carried by shafts mounted in suitable bearings, so as to rotate in two circular planes angularly arranged, the opposing faces of the arms being provided with abrading or polishing surfaces, a blade-clamping device for holding the blade in the paths of the rotating arms in such manner that the abrading or polishing surfaces will when rotated alternately act on the sides of the blade in lines of travel substantially in the planes of the angular sides of the blade, and means for rotating the angularly-arranged arms and their shaft. To insure a proper and uniform action of the abrading or polishing surfaces on the sides of the blade held in the paths of their rotation, said abrading or polishing surfaces are preferably connected to and carried by the arms in a yielding manner and are so shaped as to rub on the blade from its heel to its point and to leave the extreme cutting-point of the blade before passing away from the end of the back of the blade, thereby avoiding undue lateral pressures at the cutting-point as said surfaces are about to leave the same. These with the other features of construction will now be fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side view of a sharpening-machine embodying my improvements. Fig. 2 is a plan view of the same. Fig. 3 is a vertical elevation of the rubbing-surface-carrying arms, showing a blade in section held in their paths of rotation. Fig. 4 is a sectional view of the blade-holding device, taken on the line 4 4, Fig. 2; and Fig. 5 is a sectional view of a modified form of blade-clamping device.

The frame of the machine comprises a base-plate *a*, bearing-standards *b*, between which the rotating arms are mounted, and the post *c*, to the top of which is attached the blade or razor holding device.

In angularly-arranged bearings formed in the upper ends of the standards *b* are fitted to rotate the short shafts *d d*, their inner adjacent ends being higher than their outer ends and connected together by means of a universal joint, such as a gimbal-joint *d'*, as shown. Bevel-gear or other form of universal joint may be used having the function to cause the two shafts to rotate together.

On each of the shafts *d* is mounted an arm *e*, carrying a curvilinear plate *f*, the ends of the arms and plates nearest the axes of the shafts *d d* being connected together by the hinge-joints *g g*. The plates *f f* are provided on their adjacent faces with an abrading or polishing material, as razor-strops *h h*. The inner and outer ends of the plates and their active surfaces *h h* are curved, as shown, for the purpose hereinafter described. These plates *f f* and the arms *e e* have interposed springs which surround the studs *i i*, having thumb-nuts on their outer ends, by setting which the elastic pressure of the abrading or polishing surfaces may be varied and their positions relative to the sides of the blade being acted upon adjusted. As the shafts *d d* are rotated the strops *h h* move in two circular planes which intersect at a line below the axes of the shafts, and the blade being sharpened is held with its edge at or about on this line.

To impart rotation to the arms *e e*, one of the shafts *d* is provided with a crank-handle *j*, loosely mounted thereon, but caused to engage said shaft through the medium of the ratchet-teeth *k*, which are held in engagement by the spring *l*, interposed between the hub of the handle and a head on the end of the shaft. This provides a means by which the arms *e e* can be rotated in one direction only, said ratchet slipping when the handle is turned in a backward direction, which would otherwise move the strops *h h* against the edge of the blade *u* being sharpened, and so cause the blade to cut into said strop.

The device for holding the blade or razor in the paths of the abrading or polishing surfaces consists of two clamping-jaws *m m*, fitted to slide in guide-bearings on the top of the post *c* and moved uniformly toward and

from a central line which coincides with the vertical plane dividing the angular planes of rotation of the surfaces *h h* by means of the right and left handed screw *n*, fitted in the jaws and held against longitudinal movement by the central bridge-piece *n'*. This form of clamping-jaws insures razors and other blades being held in proper alinement for the uniform action of the two abrading or polishing surfaces thereon, however much their shanks, by which they are held, as shown at *u*, Fig. 4, may vary in thickness within the limit of the holding capacity of the jaws. To press the shanks down in the jaws *m m*, so that the blades will be firmly held against displacement by the action of the surfaces *h h* thereon, the device fully shown in the sectional view Fig. 4 may be used, the same consisting of a rod *o*, fitted to slide in a vertical hole in one of the jaws *m*, having a taper head *p* at its lower end, located in the recess *q*, and an arm *s* at its upper end, formed to extend over the opening of the jaws *m m* to bear on the shank held therein and when turned to freely expose said opening for the admission to and removal therefrom of the blade-shank with perfect ease and without obstruction, and a thumb-screw *r*, worked in a tapped hole through the side of the jaw *m*, with its end bearing against the inclined side of the taper head *p*, so that when this thumb-screw is set inwardly the rod *o* is drawn down and the arm *s* caused to press on and hold the shank *u* firmly down in and between the jaws *m m*. A slight slackening of the screw *r* permits the arm *s* to be quickly turned away from the shank *u* when the blade is to be removed from the holding-jaws.

In the modification of the blade-holding device shown at Fig. 5 the jaws *m m* and clamping-screw *n* are similar to those just described. The means for pressing the blade-shank *u* down into the jaws consists of the flat thumb-nut *s'*, working on a threaded post projecting upwardly from one of the jaws, said nut being provided at its under bearing side with spring-faces *t*, which act on the top of the shank to firmly hold it down and compensate for the pitch of the thread of the nut as it is turned from the position parallel to the jaws opening it occupied when a blade is being placed in or removed from the jaws to its position at right angles to the opening to bring one of the spring-faces over the shank held in the jaws.

In operation the surfaces *h h* alternately act on the sides of the blade, held as shown in the drawings, the outer ends of the surfaces first coming in contact with the heel of the blade, the curvature of which ends insures the surfaces passing down their respective sides of the blade. The surfaces as they rotate along the sides of the blade have a gradual uniform action thereon from the heel to the toe or point, and their inner ends are shaped as shown, so that as this part of them reaches the toe of the blade the said surfaces are acting on or bearing against the thick back of the blade at the time the surfaces are leaving the extreme cutting-point. This is quite an important feature in a device of this character, for if the cutting-point is the last portion of the blade acted upon by the abrading or polishing surfaces, which bear with considerable pressure on the blade, said point is liable to be broken when said surfaces are about leaving the same.

Fig. 3 clearly shows the angular relations of the planes of rotations of the abrading or polishing surfaces *h h* and the manner in which said surfaces act substantially flatwise on the inclined sides of the blade *u*, held in the paths of their rotation.

I claim as my invention—

1. In a sharpening-machine, the combination of arms arranged to rotate in two circular planes at an angle to each other and intersecting at a line below their axes, said arms having abrading or polishing surfaces on their opposed faces; means for rotating the arms; and means for holding a blade, at or about the intersection of the two circular planes and in the paths of the rotating arms.

2. In a sharpening-machine, the combination of arms arranged to rotate in two circular planes at an angle to each other; spring-acting abrading or polishing surfaces carried by the arms; means for rotating the arms; and means for holding a blade in the paths of the rotating arms.

3. In a sharpening-machine, the combination of arms arranged to rotate in circular planes; curvilinear abrading or polishing surfaces carried by the arms, formed to sweep along a straight line within their circular planes of rotation from the outer to the inner parts of said circular planes, and having their inner ends formed to pass away from the edge at the end of a blade located on said straight line before leaving the back of the blade at said end; means for holding the blade; and means for rotating the arms.

4. In a sharpening-machine, the combination of arms arranged to rotate in circular planes; curvilinear abrading or polishing surfaces carried by spring connections from the arms, formed to sweep along a straight line within their circular planes of rotation from the outer to the inner parts of said circular planes, and having their inner ends formed to pass away from the edge of a blade located on said straight line before leaving the back of the blade; and means for rotating the arms, comprising a crank-handle connected to the driving-shaft of the arms by means of a spring-clutch, whereby said arms cannot be rotated backwardly by the handle.

5. In a sharpening-machine, the combination of two shafts fitted to rotate in bearings with their axes inclined and rotatively connected together at their inner ends; an arm or arms carried by each of the shafts; abrading or polishing surfaces on the inner or opposing faces of the arms; and means for holding a blade in the paths of rotation of the

arms so that their abrading or polishing surfaces will alternately rub along the two sides of the blade.

6. In a sharpening-machine, the combination of arms arranged to rotate in circular planes; curvilinear abrading or polishing surfaces carried by the arms; two clamping-jaws and provisions for moving them simultaneously to and from a central line, whereby blades of different sizes are centrally held in the paths of rotation of the abrading or polishing surfaces; and an adjustable clamping device for pressing down and holding the blades in the clamping-jaws.

7. In a sharpening-machine, the combination of arms arranged to rotate in circular planes; curvilinear abrading or polishing surfaces carried by the arms; two clamping-jaws and provisions for moving them simultaneously to and from a central line, whereby blades of different sizes are centrally held in the paths of rotation of the abrading or polishing surfaces; a clamping-arm adapted to be placed over the opening of the jaws and away therefrom, and connected to a conical head; and a screw arranged to bear against and act on the conical head so as to draw the clamping-arm toward the opening of the jaws.

8. In a sharpening-machine, the combination of two shafts fitted to rotate in bearings with their axes inclined and rotatively connected together at their inner ends; an arm or arms carried by each of the shafts; abrading or polishing surfaces on the inner or opposing faces of the arms; and means for holding a blade in the paths of rotation of the arms, so that their abrading or polishing surfaces will alternately rub along the two sides of the blade, comprising parallel-moving clamping-jaws, and an arm fitted to move laterally toward and from the opening of the clamping-jaws and having a conical head; and a screw arranged to bear against and act on the conical head to draw the arm toward the opening of the clamping-jaws.

Signed at New York, in the county of New York and State of New York, this 10th day of January, A. D. 1900.

FERDINAND ALFRED REICHARDT.

Witnesses:
A. E. ELWIN,
JOSHUA M. SMITH.