(No Model.) 2 Sheets—Sheet 1.

J. F. BARBER.

MACHINE FOR GRINDING FLAT SURFACES.

No. 437,747. Patented Oct. 7, 1890.

Fig. 1.

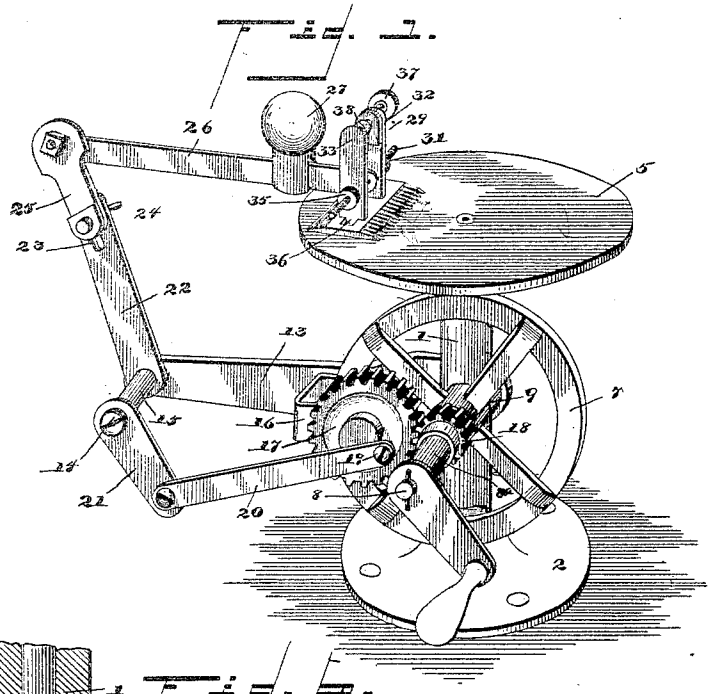


Fig. 3.

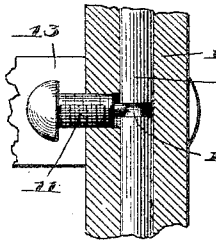
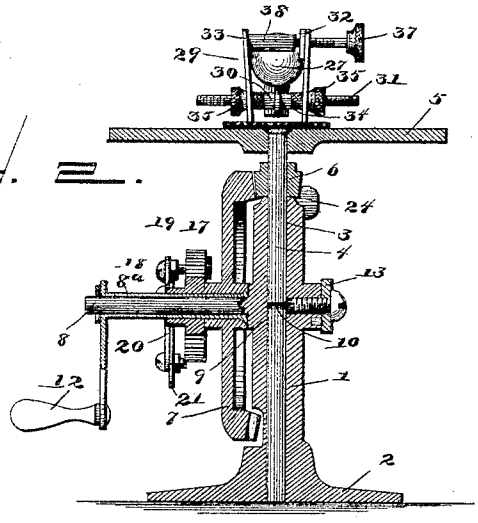


Fig. 2.



Witnesses

Samuel Kirk

J. K. Siggers

Inventor

John F. Barber.

By his Attorneys,

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

J. F. BARBER.

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Fig. 3.

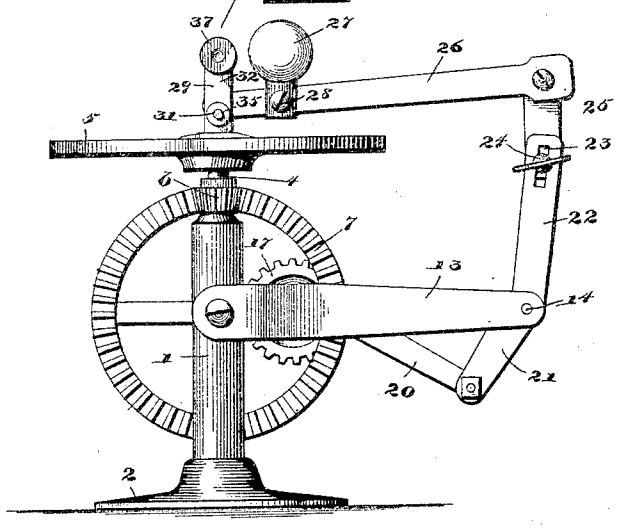


Fig. 4.

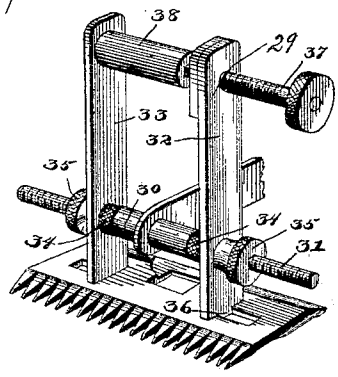
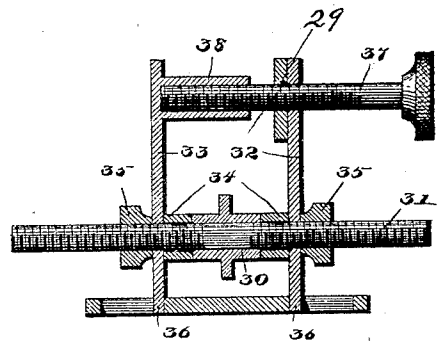


Fig. 5.



Witnesses

Samuel Kirk

J. F. Diggers

Inventor

John F. Barber.

By his Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOHN F. BARBER, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO SIMEON W. CANTRIL, OF SAME PLACE.

MACHINE FOR GRINDING FLAT SURFACES.

SPECIFICATION forming part of Letters Patent No. 437,747, dated October 7, 1890.

Application filed February 24, 1890. Serial No. 341,452. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BARBER, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented a new and useful Machine for Grinding Flat Surfaces, of which the following is a specification.

This invention relates to machines for grinding flat surfaces of that class in which a flat rotary grinding-disk is employed; and it has for its object to construct a machine of this class which shall be simple, inexpensive, and easily operated, and by means of which the article that is operated upon shall be reciprocated automatically across the entire face of the grinding-disk or any portion thereof, so as to expose the surface that is to be ground equally to the action of all portions of the grinding-disk, thereby insuring accuracy in the work performed, and also preventing the grinding-disk from being worn unevenly.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view of my improved grinding-machine. Fig. 2 is a vertical sectional view taken longitudinally through the main operating-shaft. Fig. 3 is a side elevation. Fig. 4 is a perspective detail view of the holding-clamp used in connection with my invention. Fig. 5 is a vertical sectional view of the said holding-clamp. Fig. 6 is a detail section showing the screw for holding the spindle of the grinding-disk.

Like numerals of reference indicate like parts in all the figures.

1 designates an upright or standard rising from a base 2, with which it may be formed integrally, as shown in the drawings hereto annexed. The upper end of said standard has the socket 3 to receive a vertical spindle 4, the upper end of which carries the grinding-disk 5. Said spindle is also provided below the grinding-disk with a pinion 6, meshing with a bevel-gear 7, which is journaled upon a spindle 8, formed integral with or rigidly secured in the standard 1. The spindle 4 is annularly grooved, as shown at 10, to receive the point of the set-screw 11 for the purpose of retaining the said spindle in its bearings. The outer end of the spindle 8 has a sleeve 8^a, which is provided with a crank or handle 12, by means of which it can be conveniently manipulated. The sleeve has the gear 7 rigidly mounted thereon.

The standard 1 is provided with a forwardly-extending arm or bracket 13, the outer end of which has a laterally-extending pin 14, upon which is journaled the sleeve 15. The arm 13 also has a laterally-extending bracket 16, forming a guard for the bevel-gear 7, and to which is journaled a spur-wheel 17, meshing with the pinion 18, rigidly mounted upon the sleeve 8^a. The spur-wheel 17 has a wrist-pin 19, which is connected by a pitman 20 with an arm or lever 21, extending from the outer end of the sleeve 15. It will thus be seen that when the sleeve 8^a is rotated the intermediate mechanism serves to communicate an oscillating motion to the sleeve 15.

Extending upwardly from the inner end of the sleeve 15 is an arm 22, the upper end of which is provided with a slot 23 to receive a set-screw or clamping device 24, by means of which an extension-piece 25 is secured adjustably to the said arm 22. Pivoted to the upper end of the extension-arm 25 is the supporting-arm 26, which is provided with a weight 27, which also serves as a handle, and is adjustably secured thereon by means of a set-screw 28. The outer end of the arm 26 also carries the holding-clamp 29, the construction of which I shall now proceed to describe. The outer end of the arm 26 is provided with a transverse tubular sleeve 30, through which extends a screw-threaded rod 31, upon the ends of which a pair of vertical clamping-arms 32 and 33 are loosely mounted. Washers 34 may be interposed between the said clamping-arms and the ends of the sleeve 30, in order to space the said clamping-arms to fit the article which is to be operated upon. Nuts 35 are mounted upon the ends of the screw-threaded rod 31, for the purpose of clamping the arms 32 and 33 tightly against the sleeve and washers. The lower ends of the arms 32 and 33 are provided with points or claws 36, and the upper end of one of the clamping-arms 32 has a set-screw 37, adapted

to enter and to pass against the bottom of a sleeve 38, which is secured horizontally to the upper end of the clamping-arm 33.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains.

The machine is especially adapted for the purpose of sharpening barbers' and horse clippers, the blade of one of which has in the drawings hereto annexed been shown in position for being operated upon. The claws or points at the lower end of the clamping-arms are inserted into the slots in the said blades, and the nuts 35 are then tightened, so as to cause the lower ends of the clamping-arms to bear lightly in the said slots. The set-screw 37 is then tightened until the blade to be operated upon is held with a sufficient degree of security. The sleeve 8^a is now operated by means of a handle or crank 12, and a rapid rotary motion is thus imparted through the bevel-gear 7 and pinion 6 to the grinding-disk 5, which may be a flat smooth surface of cast-iron or other suitable material, and which may be used with oil and pumice-stone, emery, diamond-dust, or other suitable abrasive material. The surface which is being operated upon may be held against the grinding-surface by pressure of its own weight alone or by means of an adjustable weight 26^a upon the handle 27, by means of which the work may also at any time be raised for inspection. The holding-clamp carrying the work is reciprocated transversely across the face of the grinding-disk by means of the oscillating sleeve 15, which is operated from the sleeve 8^a by the intermediate mechanism herein described. The extent of the movement of the holding-clamp may be regulated by means of the adjustable arm 25, which may be lengthened or shortened at will, and by adjusting the said extension-arm at an angle to the arm 22 the holding-clamp may be caused to operate more or less on either side of the center of the rotary grinding-disk. When the machine is properly adjusted, the surface that is being operated upon will be subjected equally to the action of all parts of the grinding-disk, and on opposite sides of the center of the latter the said surface will be ground in opposite directions, thereby avoiding the formation of a wire-edge. The absolute regularity of the motion insures absolute accuracy in the work, and a perfectly true and level surface may always be attained, which is difficult, sometimes even impossible, by ordinary methods of holding the work to the grinding-surface by hand.

The base of the machine is in practice to be secured firmly to some suitable support, and it is for this purpose provided with perforations to receive fastening screws or bolts.

The machine, as may be seen from the foregoing, is exceedingly simple in construction, and its operation does not require the exercise of any particular skill.

Having thus described my invention, I claim—

1. In a machine for grinding flat surfaces, the combination, with a rotary grinding-disk, of a work-holding clamp and mechanism for imparting to the latter a reciprocating motion across the face of the grinding-disk at right angles to the axis of the latter, substantially as set forth.

2. The combination, with the rotary grinding-disk, of a vibrating arm or lever, a supporting-arm pivoted to the outer end of the same, and a work-holding clamp mounted loosely at the outer end of said supporting-arm above the face of the grinding-disk and reciprocating across the face of the latter at right angles to its axis, substantially as set forth.

3. The combination of a rotary grinding-disk, a vibrating arm or lever, a supporting-arm pivoted to the outer end of the latter, a work-holding clamp mounted loosely at the outer end of said supporting-arm and reciprocating across the face of the grinding-disk in a horizontal plane and at right angles to the axis of the disk, and a weight secured adjustably to the latter, substantially as set forth.

4. The combination of a horizontal rotary grinding-disk, a vibrating arm or lever swinging in a vertical plane, an extension-arm connected adjustably with the same, a supporting-arm pivoted at the outer end of said extension-arm, and a holding-clamp mounted loosely at the outer end of said supporting-arm and reciprocating diametrically across the face of the disk at right angles to the axis of the latter, substantially as set forth.

5. The combination of a horizontal rotary grinding-disk, a vibrating arm or lever having a slot at its outer end, an extension-arm connected with said vibrating arm by means of a set-screw, adjustable in said slot and enabling said extension-arm to be adjusted at different angles by the said vibrating arm, a supporting-arm pivoted at the outer end of the extension-arm, and the holding-clamp mounted loosely at the outer end of the supporting-arm and reciprocating across the face of the grinding-disk at right angles to the axis of the latter, substantially as set forth.

6. The combination of a rotary grinding-disk, a vibrating arm, the supporting-arm pivoted to the outer end of the latter and having a transverse sleeve at its outer end, a screw-threaded rod extending through said sleeve, clamping-arms mounted upon said rod, nuts to secure the said clamping-arms, a set-screw at the upper end of one of said clamping-arms, and a sleeve at the upper end of the other clamping-arm to receive the point of the set-screw, substantially as set forth.

7. The combination of the upright or standard, the spindle journaled vertically in the latter and carrying the grinding-disk, a spindle extending horizontally from the standard and having a bevel-gear journaled thereon and

meshing with a bevel-pinion upon the spindle of the grinding-disk, a bracket extending from the standard and having a laterally-extending pin or shaft, a sleeve journaled upon said shaft and having a downwardly-extending arm connected by a pitman with the wrist-pin extending laterally from the spur-wheel meshing with a pinion upon the operating-sleeve, an arm or lever extending upwardly from the oscillating sleeve, an extension-arm secured adjustably to said lever, a supporting-arm pivoted to the outer end of said extension-arm, and a holding-clamp at the outer end of said supporting-arm, substantially as herein set forth.

8. In a grinding-machine of the class herein described, the combination, with a rotary grinding-disk and a reciprocating supporting-arm, of a holding-clamp at the outer end of the latter reciprocating at right angles to the axis of the grinding-disk and comprising a pair of vertical clamping-arms, means for forcing the lower ends of said arms in the direction of each other and for connecting them together, and a set-screw for spreading or forcing apart the upper ends of said clamping-arms, substantially as herein set forth.

9. The combination of a rotary grinding-disk, a vibrating arm or lever moving at right angles to the axis of the disk, the supporting-arm pivoted to the outer end of the latter and having a transverse sleeve at its outer end, a screw-threaded rod extending through said sleeve, clamping-arms mounted upon said rod, nuts to secure the said clamping-arms, and a set-screw at the upper end of said clamping-arms, substantially as set forth.

10. In a grinding-machine, the holding-clamp comprising the supporting-arm, a screw-threaded rod mounted therein, clamping-arms mounted upon said rod and provided with points or claws at their lower ends, and the nuts, as set forth.

11. In a grinding-machine, the supporting-arm combined with the rotary grinding-disk and a work-holding clamp pivotally mounted upon the supporting-arm, and mechanism for imparting to said clamp a reciprocating motion across the face of the disk at right angles to the axis of the latter, as set forth.

12. In a grinding-machine, the rotary grinding-disk combined with the pivoted supporting-arm carrying the work-holding clamp, the vibrating arm or lever to which the supporting-arm is pivoted, and gearing, substantially as described, to operate the vibrating arm and reciprocate the supporting-arm across the face of the grinding-disk at right angles to the axis of the latter, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN F. BARBER.

Witnesses:
SIMEON W. CANTRIL,
JAMES CONNELL.