(Model.) 2 Sheets—Sheet 1.

R. KAMPFE.

MACHINERY FOR GRINDING CUTLERY.

No. 364,353. Patented June 7, 1887.

Fig. 1.

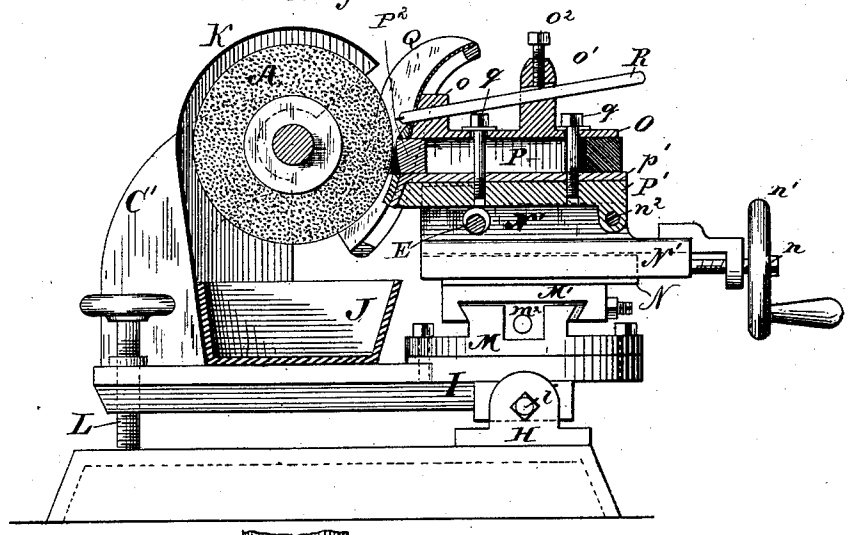
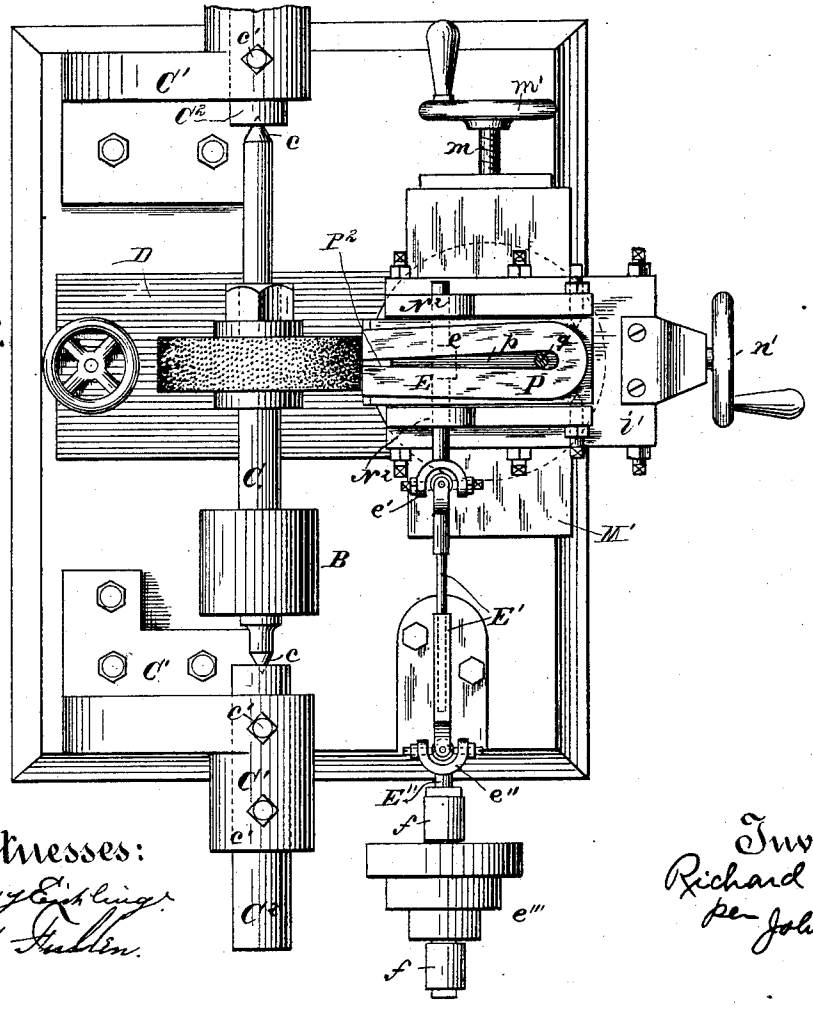


Fig. 2.



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Fig. 5.

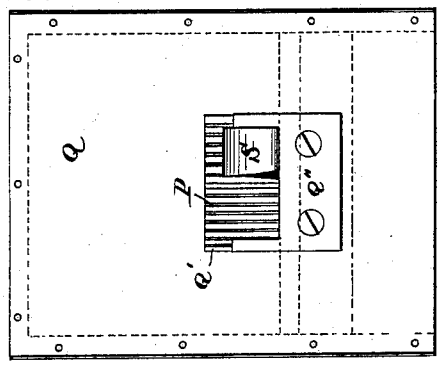


Fig. 6.

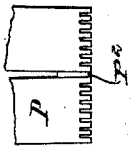


Fig. 4.

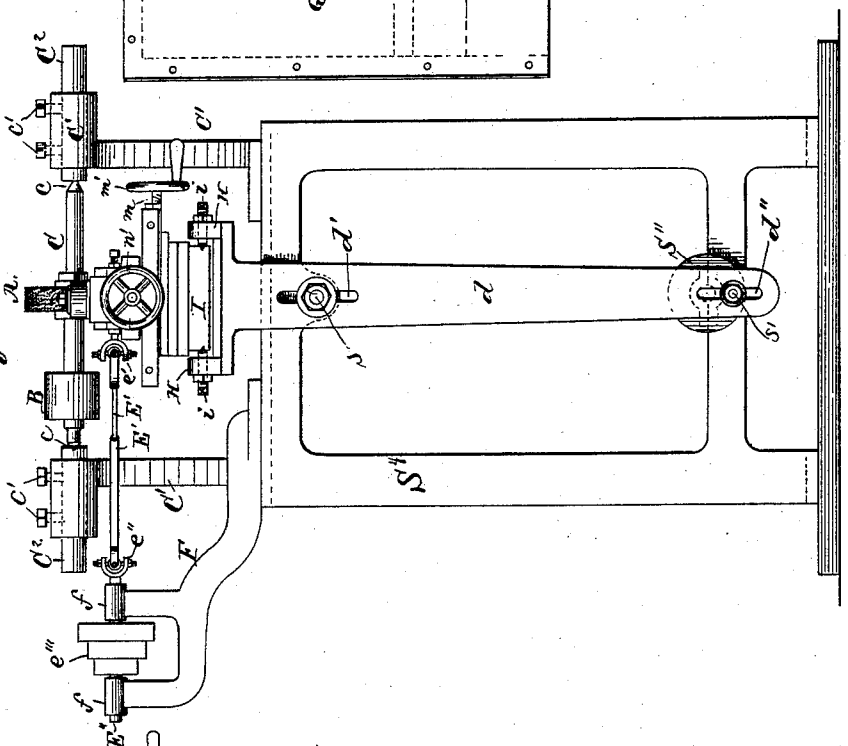
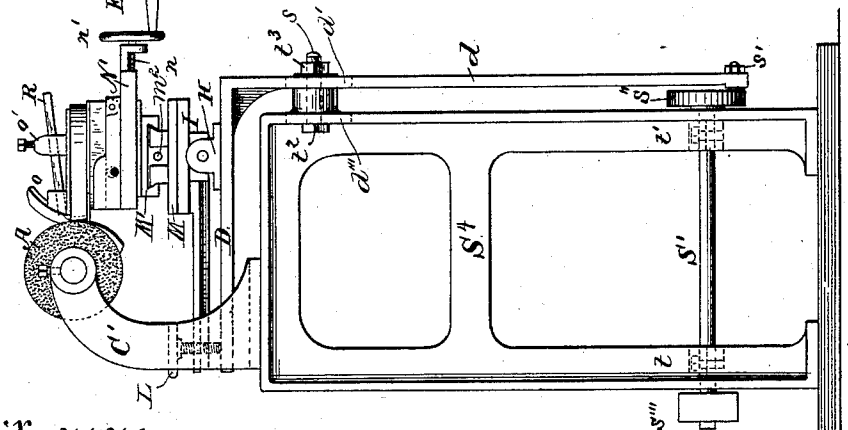


Fig. 3.



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UNITED STATES PATENT OFFICE.

RICHARD KAMPFE, OF BROOKLYN, NEW YORK.

MACHINERY FOR GRINDING CUTLERY.

SPECIFICATION forming part of Letters Patent No. 364,353, dated June 7, 1887.

Application filed May 18, 1885. Serial No. 165,861. (Model.)

To all whom it may concern:

Be it known that I, RICHARD KAMPFE, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machinery for Grinding Cutlery, of which the following is a specification.

My invention relates to machinery for grinding cutlery, and more especially razor-blades; and it consists partly of an improved device for automatically holding the blade to the grindstone, and partly of a device adapted to impart to the blade while so held a desired motion and to automatically control said motion.

My invention is fully illustrated in the accompanying drawings, in the several figures of which like letters indicate like parts.

Figure 1 is a sectional view showing the various parts of my invention above the line of the supporting-frame, said parts being shown as removed therefrom and placed upon an independent base, constituting no part of my invention or apparatus. Fig. 2 is a top view of my invention, showing the same arrangement as above, with the magnet-covering and the shield removed. Fig. 3 is a side view of my invention, and Fig. 4 is a front view of my invention. Fig. 5 is a front view showing the shield I employ to catch the water and débris thrown from the grindstone when in motion. It shows also the plate which is screwed onto the face of the shield, whose office is to support the blade while the same is being held to the stone. This view shows also the grooved ends of the magnetic blade-holder. Fig. 6 is a top view of a short section of my magnetic blade-holder, showing the top edges of the grooves cut in the ends of the holder.

A is a grindstone.

B is a pulley mounted upon the shaft C, which is supported upon the standards C′ C′. The shaft C terminates in pointed bearings *c* *c*, which impinge against the blocks C^2. These latter are secured in horizontal position in the upper end of the standards C′ by set-screws *c′ c′*.

D is an oscillating frame carrying the two standards H H, which are provided with pointed set-screws *i i*, upon which the bed I, with its superincumbent slide-rest, is pivoted.

J is a drip-pan, whose office is to catch the waste from the stone; K, a screen, whose office is to prevent the water, débris, &c., from being thrown upon surrounding objects.

L is a screw, whose office is to throw the blade holding and feeding parts of the machinery back or forward by raising or lowering the far end of the bed I. This screw may engage an opening in the bed I and impinge against the top of the frame D, or it may engage an opening in the frame and impinge against the lower side of the bed.

M is the stationary portion, and M′ the movable portion, of the lateral slide, and their office is, by the aid of the screw *m*, which turns loosely in the movable portion M′, and screws into a threaded hole, m^2, in the stationary portion M, to feed the blade across the face of the stone. The screw is operated by the hand-wheel *m′*. Usually this lateral slide will not be employed, and the feeding of the blade to and fro across the face of the stone will be done automatically by the operation of the oscillating frame, hereinafter explained; but there are times when it is desirable to hold the blade in one place, or to present one portion longer than the rest, and for this purpose the hand-feed is particularly adapted.

N is the stationary and N′ the movable portion of the forward slide. The office of this slide is to feed the blade against the stone. The slide is operated by the hand-wheel *n′* and the screw *n*, which turns loosely in the movable portion N′ and screws into a threaded hole in the stationary portion N.

P is my improved blade-holder, which is essentially a horseshoe-magnet. The end of it is rounded to conform to the shape of a hollow-ground razor. It should be of a thickness equal to the width of the blade. If need be, several magnets may be placed upon each other to make up the desired thickness. In this case a non-conductor will be placed between them; but in the present instance I have shown but one magnet, which is of the required thickness. It is found desirable, also, to fill the center P^2 between the ends of the arms with a non-conductor. The magnet is secured by the

bolts q q onto a bed, P′, from which it is separated by a thickness of non-conducting material, p'. The bed P′ is hung upon an axle, n^2, which is journaled in any suitable manner in the slide N′.

O is a covering of non-conducting material, which is placed upon the magnet. The bolts q q pass through this and secure it in position. This covering is provided with the elevated portions o o', which are drilled to admit the passage of the facing-tool R. By a proper adjustment of the relative heights of the openings in o and o' the facing-tool is given the desired angle. The facing-tool consists of a diamond set in the end of a rod.

Q is a shield, whose office is to protect the slides, &c., and the person operating the machine from the water and débris which is thrown off from the grindstone when in motion. It is provided with the opening Q′, to permit the ends of the magnetic holder P to project through said opening. The blade S is held firmly in position by the magnet, and the operator's hands relieved from the duty of holding the blade. Increased attraction between the holder and blade may be secured by the employment of an electro-magnet of suitable shape.

Q″ is a small plate which is screwed onto the face of the shield Q, and serves to inclose and support the blade when placed against the ends of the magnetic blade-holder. When in this position, the back of the blade rests upon the bottom of the cut-away portion in the plate Q″ and its ends against the upright arms thereof, as seen in Fig. 5, wherein a blade, S, is shown supported by the plate Q″, the blade being partly broken away. It will be understood that the recess in the plate Q″ may be made of any size desired.

E is a shaft having bearings in either side of the slide N′, and carries an eccentric, e, and terminates in the double joint e', by which it is connected to the telescopic shaft E′ E′, which in turn terminates in the double joint e'', by which it is connected with the shaft E″, upon which is mounted the pulley e'''.

F is a standard terminating in the bearings f f, which serve as a support for the shaft E″.

The oscillating frame D is provided with a downwardly-extending arm, d, having two longitudinal slots, d' d''. S⁴ is a table or bench, by which the frame D is supported in the following manner: The top cross-bar of the bench in front is provided with a vertical slot, d''', normally opposite said slot d', and a stud, s, extending through said slots, forms the pivot about which the arm d turns. Nuts t^2 t^3 on either end of the stud s hold it in position, and the adjustment of the pivotal point may be regulated thereby. A shaft, S′, is journaled in bearings t t' of said bench S⁴, and on the opposite ends of said shaft are keyed the crank-wheel S″ and pulley S‴.

Upon the face of the eccentric is secured the stud s', which plays within the slot d''. The arm is firmly held from slipping off this stud by means of a nut screwed thereonto.

My improved grinding machinery is operated as follows: The respective pulleys, B, e''', and S‴, are set in motion by connecting them with corresponding pulleys upon suitable driving-shafts. The shaft C and its corresponding driving-shaft are so arranged that the stone A is made to revolve toward the blade to be ground. The object and advantage of this are, that the force of the stone is exerted to press the blade downward and against its holder, whereas if the motion were in the contrary direction the tendency would be to drag the blade upward and away from its holder. The shaft E, carrying the eccentric e, may revolve in either direction. The office of the eccentric is to alternately raise and lower the bed P′, and with it the blade-holder P. The objects and advantages of giving this up and down motion to the blade are, that the débris from the stone is allowed to be washed out of the way more freely than would be the case if the blade were held steady; secondly, this motion frees the stone from many particles of sand, which, when detached, fall between the blade and stone and serve to increase the cutting quality of the stone, and at the same time the tendency of the blade to burn and the stone to become polished at the point of contact is avoided. Again, if the blade is held still, the stone will grind it hollow, making it thin in the center and thick at the front and back edges. Even in hollow-ground blades it is desirable to have the blade flat toward the front edge, and this is accomplished by a careful adjustment of the blade and stone with reference to their median lines—that is to say, the higher the blade is raised with reference to the median line of the stone the more the back of the blade is ground off, and vice versa. The adjustment is effected by raising or lowering the screw L, as may be desired. Lastly, by this motion all the advantages are secured which trained grinders have found in keeping the blade in motion when presented to the stone. The double joints e' e'' and telescopic shafting E′ E′ adjust themselves automatically to the changed positions of the slide N, within which the shaft E has its bearing, which result from the operation of the hand-screws m and n and the oscillating frame D and set-screw L. The respective male and female portions of the telescopic shaft E′ E′ are respectively provided with a feather and groove or equivalent device, to keep one from rotating upon the other. When the shaft S′ is set in motion, the crank-wheel S″ carries the lower end of the arm d with it from side to side alternately. It will readily be seen that as the lower end of the arm d is carried by the crank-wheel to either side the head of the frame, with its superincumbent bed, slides, blade-holder, blade, &c., is swung to the opposite side and then back, and the line of motion described by the blade while

being so carried is a segment of a circle, and the stone being in motion and the operation of grinding going on, the blade is ground to an edge on the arc of a circle struck from the stud *s;* and this does not at all interfere with the operation of grinding the blade concave, which is going on at the same time. The distance from the stud *s* to the middle line of the blade is the measure of the radius of the circle described by the blade during the oscillation of the frame *d*, and this may be regulated by setting the stud *s* up or down. The frame *d* is not raised or lowered by setting the stud. As the distance between the stud and blade is increased or diminished so will the cutting-edge approach or recede from a straight line, since the greater the radius of the circle the less the curvature of the arc described by the blade. If it is desired to give the blade a straight edge, the pulley S‴ is disconnected from the driving-shaft and the blade is fed across the face of the stone by the operation of the slide M′. The ends of the blade-holder are provided with a series of perpendicular grooves. The object of these is to afford an avenue of escape for the water and sand, which might otherwise lodge between the blade and holder and interfere with the magnetic attraction between the same. Another advantage is, that the circulation of water back of the blade tends to keep it cool.

Having fully described my invention, what I claim is—

1. In a machine for grinding razors, the combination of the shield Q, provided with an aperture, Q′, the magnet P, the poles whereof are presented to said aperture, the face-plate Q″, secured to said shield for supporting said magnet, and the grindstone A, substantially as described.

2. In a machine for sharpening razors, the combination, with the grindstone A, of the magnetic blade-holder P, said holder being provided with vertical grooves on the ends of its poles, as and for the purpose set forth.

3. In a machine for sharpening razors, the combination, with the grindstone A, of the magnetic blade-holder P, the bed P′ below and the covering O above said magnet, respectively, and the bolts *q*, passing through said covering, bed, and magnet, for holding the latter in place, substantially as described.

4. In a machine for grinding razors, the combination of the shield Q, provided with an aperture, Q′, the magnet P, the poles whereof are presented to said aperture, the face-plate Q″, provided with vertical arms at each end, secured to said shield and extending around three sides of said aperture, for the purpose set forth, and the grindstone A, substantially as described.

5. In a machine for grinding razors, the grindstone A, laterally and longitudinally adjustable bed N′, and a blade-holder pivotally attached thereto at its rear end, in combination with the eccentric *e*, located between said bed and holder, the shaft E″, the telescopic shafts E′ E′, having the double joints *e″ e″*, connecting said eccentric and shaft, and means for rotating said shaft, substantially as described.

6. In a machine for grinding razors, the bench S⁴, frame D, pivoted thereto near the top of said bench on a stationary pivot, and means for oscillating the frame at its lower end, in combination with the bed I, pivoted to the frame D near its rear end, the screw L in the front end of said bed, adapted to bear upon said frame, whereby these parts can be adjusted relatively, a razor-holder supported on said bed, and a grindstone supported on said bench, substantially as described.

7. In a machine for grinding razors, the bench S⁴, the grindstone A, laterally and longitudinally adjustable bed N′ N M′ M I, frame D, to which said bed is pivoted near its rear end, screw L in the front end of the bed-piece I, adapted to bear upon said frame, whereby these parts can be adjusted relatively, said frame D being pivoted to said bench near its top, means for oscillating the frame at its lower end, and a blade-holder pivotally attached to said bed at its rear end, in combination with the eccentric *e*, located between said bed and holder, the shaft E″, the telescopic shafts E′ E′, having the double joint *e″*, connecting said eccentric and shaft, and means for rotating said shaft, substantially as described.

8. In a machine for grinding razors, the bench S⁴, frame D, pivoted thereto near the top of said bench on a stationary pivot, and means for oscillating the frame at its lower end, in combination with the bed I, pivoted to the frame D near its rear end, the screw L in the front end of said bed, adapted to bear upon said frame, whereby these parts can be adjusted relatively, a razor-holder pivoted to said bed near its rear end, the eccentric *e*, located between said bed and holder, the shaft E″, the telescopic shafts E′ E′, having the double joint *e″*, connecting said eccentric and shaft, and means for rotating said shaft, substantially as described.

9. In a machine for grinding razor-blades, the combination, with a grindstone, of a longitudinally-adjustable and laterally-reciprocating bed adjacent to said stone, a blade-holder pivoted on said bed at that end of the blade-holder farthest from the rim of the stone, and an eccentric or cam for oscillating said holder, substantially as shown and described.

Signed at New York, in the county of New York and State of New York, this 16th day of May, A. D. 1885.

RICHARD KAMPFE.

Witnesses:
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D. KNABE.