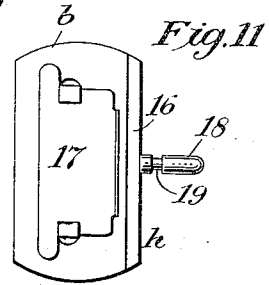
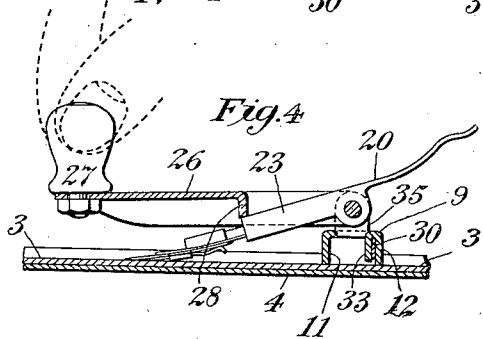
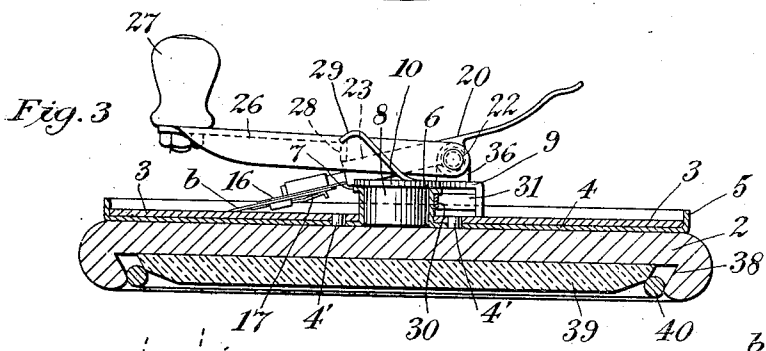
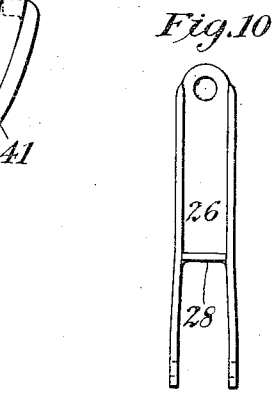
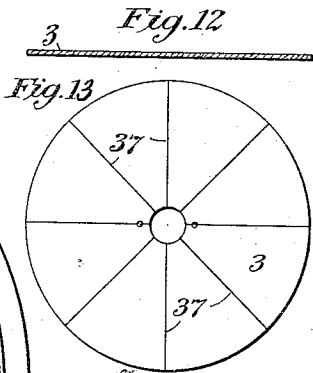
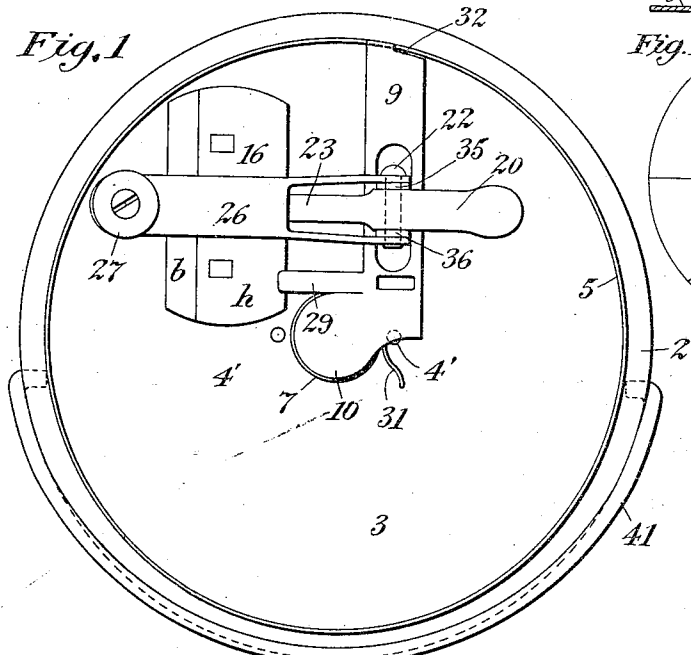


C. E. A. GRONBECH.  
 BLADE SHARPENING APPARATUS.  
 APPLICATION FILED OCT. 5, 1912.

1,069,329.

Patented Aug. 5, 1913.

2 SHEETS-SHEET 1.



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2 SHEETS—SHEET 2.

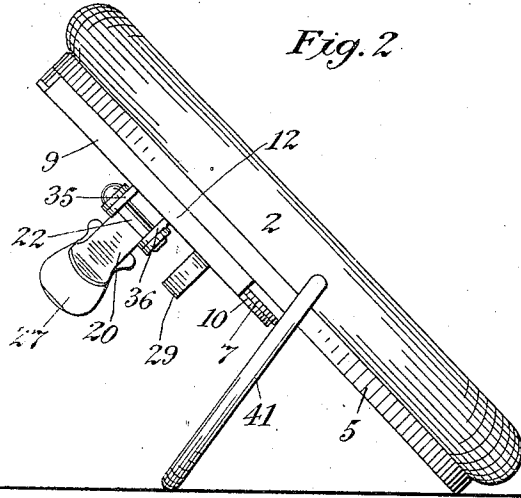


Fig. 2

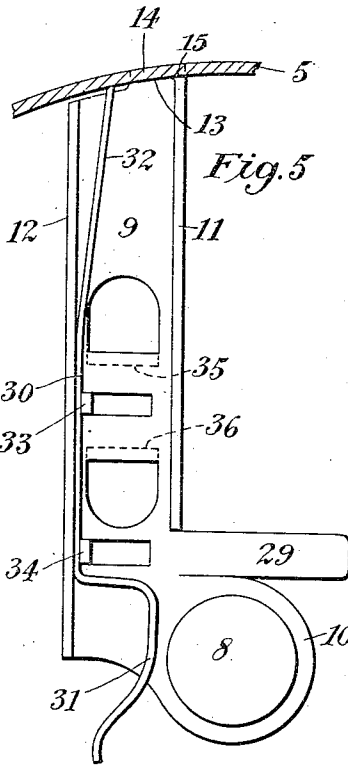


Fig. 5

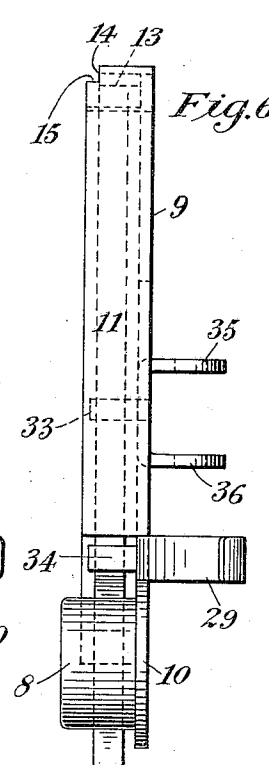


Fig. 6

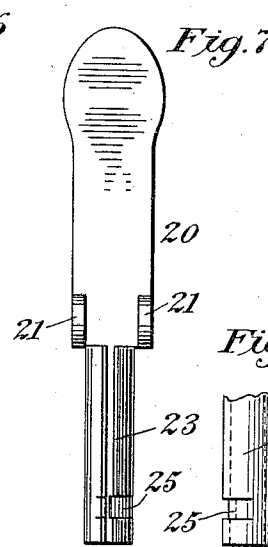


Fig. 7

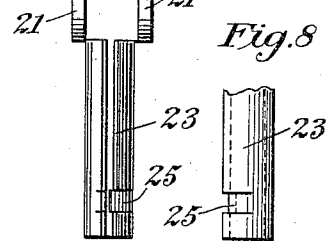


Fig. 8



Fig. 9

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 by *[Signature]*  
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# UNITED STATES PATENT OFFICE.

CHRISTIAN E. A. GRONBECH, OF JERSEY CITY, NEW JERSEY.

## BLADE-SHARPENING APPARATUS.

1,069,329.

Specification of Letters Patent.

Patented Aug. 5, 1913.

Application filed October 5, 1912. Serial No. 724,027.

*To all whom it may concern:*

Be it known that I, CHRISTIAN E. A. GRONBECH, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Blade-Sharpener Apparatus, of which the following is a specification.

This invention relates to a blade-sharpening apparatus, and especially to a rotary blade-sharpener for sharpening the blades of safety razors.

It is my aim to provide as a substitute for reciprocating blade-sharpener heretofore generally used a simple, cheap and thoroughly efficient rotary blade-sharpener with which, and without the exercise of special skill, blades may be readily sharpened, and in which the pressure applied to the edge to be sharpened may always be under full control.

In the drawings Figure 1 is a plan of a combined rotary blade-sharpener and a looking-glass or mirror embodying my invention; Fig. 2 is an edge elevation of the same showing the device mounted on a suitable supporting surface and used as a mirror; Fig. 3 is a substantially central, transverse section through the combined apparatus showing the construction and mode of mounting of both the blade-sharpening means at one side of the device and the mirror at the opposite side; Fig. 4 is a detail illustrating in transverse section substantially as in Fig. 3 the construction and organization of the principal parts of the rotary blade-sharpening means, showing the manner in which the blade-carrier is rotated and a graduated pressure applied by it to the blade-holder and blade in all rotary positions of the parts; Fig. 5 is an enlarged under-side view of the blade-carrier and of means carried thereby for detachably securing said carrier to its pivot and for preventing reverse rotation of said carrier, the parts being shown in operative relation with a section of the rim with which they cooperate; Fig. 6 is an edge view of the same; Fig. 7 is an under-side view of a blade-holder-lever and means for detachably engaging and rotatively supporting a blade-holder; Figs. 8 and 9 are details of a portion of the same illustrating the manner in which the blade-holder is detachably held in place thereby for rotation; Fig. 10 is an under-side view of the main portion of the

operating lever; Fig. 11 is a plan of a blade-holder with a blade in place therein, and Figs. 12 and 13 are respectively a central transverse section and a face view of a double-surface sharpening disk having at one side thereof a roughened sharpening and abrasive holding surface which will be hereinafter more fully described.

Similar characters designate like parts in all the figures of the drawings.

The main support for the several operative parts of my improved rotary blade-sharpener is usually a disk, such as 2, at one side of which I prefer to place the sharpening apparatus while the other side is preferably so constructed as to securely hold a mirror.

The sharpening apparatus will be first described.

The base of the blade-sharpener, whatever the material of which it is formed, embodies a blade-sharpening surface suitable for putting a keen edge on razor blades, etc. This blade-sharpening surface is usually formed on an element separate from the base 2, the element employed ordinarily being a disk, such as 3, of leather or other suitable material having one or both sides suitably prepared to form a sharpening surface. This element 3 will be more fully described hereinafter.

Those elements of the rotary blade-sharpener intended to cooperate directly with and to carry a blade to be sharpened are mounted at the same side of the base 2 as the sharpening surface or element 3. The detailed construction of these parts may also vary considerably. Here the leather disk 3 is supported directly on a flanged disk of metal, 4, securely fastened to the base 2, its flange being a peripheral one upturned at substantially a right angle, as indicated at 5, to form an upstanding circular rim which with the disk itself is in fixed relation with the wood base 2 and constitutes with said base part of the fixed frame of the apparatus, the disk and the base 2 being secured together by any suitable means. In the present construction all those parts of the blade-sharpening apparatus between which and the frame proper there is to be relative movement for sharpening purposes, etc., are mounted on the disk 4. The principal movement of these parts is a movement of rotation for the purpose of bringing about a relative cir-

5 circular movement between the base and its sharpening surface on the one hand and the blade to be sharpened on the other. This rotary mechanism is preferably pivoted at the center of the base, it being shown here-  
 10 in as mounted directly on a bearing portion of the disk 4. This bearing is here formed as a central sleeve, 6, struck up from the center of the disk 4 and formed  
 15 with a flange, 7, at its upper end, substantially parallel with the body of the disk. This flange constitutes a stop against which the main rotary member of the mechanism may be detachably locked to prevent up-  
 20 ward movement thereof during rotation. As shown, this central bearing with its flange constitutes both a vertical bearing for a journal member of the rotary mechanism of the sharpener and a horizontal  
 25 support for such mechanism during rotation. In order that it may perform these functions the rotary mechanism has as its main element a blade-carrier embodying a journal member or stud, 8, depending from  
 30 the under side of a rotary blade-carrier, 9, so shaped as to form adjacent to the journal or stud 8 a flange or rim, 10, of larger diameter than said journal, adapted to rest on top of the peripheral flange 7 at the center  
 35 of the disk 4. Thus the journal member 8 is located at the center of the base against radial movement in any direction and also against downward movement by the flange 7. It is also intended to be held  
 40 against upward movement at its pivot by a suitable latching or locking device which is intended to engage against the under side of the flange 7 and will be described in detail later.  
 45 The means just described serve to locate the pivot of the rotary blade-carrier positively against movement in any direction except its direction of rotation. Suitable means are also employed in the preferred  
 50 construction for supporting and locating the free end of the carrier positively and maintaining a positive relation between it and the circular rim 5 of the disk 4. In order that the cost of construction may be reduced as much as possible the blade-carrier is preferably formed up from a single  
 55 piece of metal (with the exception of the journal or stud 8 just described) all the parts necessary for supporting the blade-holder and other elements separate from the blade-carrier 9 being suitably struck up from the metal of the carrier 9 itself. In  
 60 transverse section this carrier is shown as being a substantially U-shaped member (see Figs. 4 and 5) having two parallel side walls or stiffening ribs, 11 and 12, bent down along parallel lines from the upper portion or body portion of the blade-carrier proper. At the extreme outer end  
 65 thereof the rib 11 is shown as having a

transverse rib, the inner and outer walls of which are preferably defined by arcs of circles struck from the center of the journal or stud 8. This transverse rib is indicated at 13. As shown, it is of slightly  
 70 less depth than the rib 11 in order that it may rest at its under side, 14, on top of the rim 5 and that the extreme end 15 of the rib 11 may form a stop wall for maintaining a predetermined relation radially between the carrier 9 and the rim 5 at all  
 75 points in the rotation of the carrier. Thus both at its pivot and at the circumference of the apparatus the rotary blade-carrier is located positively for movement in a predetermined path and in a predetermined relation to two fixed members, to wit, the  
 80 central bearing 6 and the circumferential rim 5; and when the blade-carrier 9 is in place and is turned it will, by reason of this positive location of the parts just described, rotate in an exact horizontal plane, it being understood that the top of the rim 5 is in such plane. Because of this relation  
 85 of the rotating and fixed parts of my rotary blade-sharpener it is possible to move the blade with great accuracy in a predetermined path in contact with the sharpening surface, and as the sharpening surface itself is also in exact parallelism with the  
 90 top of the rim 5 a very smooth and even sharpening of the edge of a blade results when it is properly held in place on the blade-carrier and properly pressed against the sharpening surface, as by the means now  
 95 to be described.

The article or blade to be sharpened may be mounted in any suitable type of holder supported on the rotary blade-carrier 9 provided the construction is such as to permit  
 105 a relative up and down movement between the blade to be sharpened and the sharpening surface. Here the blade, which is designated by *b*, is secured in a holder, designated generally by *h*, and comprising essentially  
 110 a main plate, 16, a clamping plate, 17, for engaging the blade *b* between it and the main plate 16 and a pivot pin, 18, projecting from the center of the rear edge of the main plate 16 and having a circumferential locking  
 115 groove, 19. In this apparatus the blade-holder *h* is intended to be carried by a blade-holder-lever, 20, mounted directly on the blade-carrier 9 and pivoted thereto in such a manner as to permit the blade and its  
 120 holder to be raised away from the sharpening surface and the blade reversed to bring the opposite side of the edge to be sharpened into contact, at will, with the sharpening surface. The lever 20 may be of any suitable  
 125 type and construction, but is here shown as pivoted near its center on the blade-carrier 9 and as formed from a single piece of metal having ears, 21, struck up therefrom with openings through them to receive a pivot  
 130

pin, 22, and as shaped at one end to form a bearing sleeve, 23, with a journal opening therein of sufficient diameter to receive the pivot pin 18 and permit rotation thereof and of the blade-holder *h* with its blade *b* relative to said blade-holder-lever. An important feature of this lever is that at a point near the sleeve end thereof the metal of the sleeve is struck up to form a spring detent, 25, adapted to lie in the peripheral groove 19 of the pin 18 and detachably connect the blade-holder to the blade-holder-lever in such a manner as to prevent relative longitudinal movement of these parts while permitting free relative rotary movement. This spring detent 25 is shown as formed by cutting two parallel lines in one edge of the split sleeve 23 and turning the transverse tongue so formed inwardly to the position shown in Fig. 9. The metal will of course be sufficiently resilient to spring in and out of position for engaging and releasing the walls of the locking groove 19 as the pin 18 is inserted into or withdrawn from the sleeve 23. This blade-holder-lever and the holder *h* constitute the means for mounting the blade to be sharpened, and the lever, of course, also constitutes the means for raising the blade and its holder away from the sharpening surface. These parts, however, do not in this case constitute the means for turning the blade in contact with the sharpening surface or for applying pressure to the blade during such turning movement. These functions are intended to be performed by separate means on the blade-carrier for applying downward pressure to the blade-holder at the same time that the blade is rotated. This pressure will preferably be applied to the blade-holder through the blade-holder-lever and at a point between the pivot 22 and the edge to be sharpened. The preferred means for applying such pressure is an operating lever pivoted on the blade-carrier 9 in such a manner as to engage said blade-holder-lever at the point just indicated. The axis of this lever may be coincident with that of the blade-holder-lever, and in the construction shown this operating lever, which may be such as shown at 26, is pivoted to the blade-carrier 9 on the same pin 22 as the blade-holder-lever 20. The operating lever 26 shown is also, as to its main element, a one-piece member and as illustrated is somewhat similar in form to the carrier 9, it being substantially U-shaped in cross-section, having a flat top or body portion with depending, substantially parallel stiffening ribs. It is also shown as having a separate handle, 27, secured to the free end of it. At a suitable point between its ends a transverse rib, 28, is illustrated which is intended to rest on the sleeve of the blade-holder-lever 20 and by downward pressure thereon applied in a line substantially midway between

the ends of the blade-holder *h* and blade *b*, force the blade to be sharpened into firm contact, at every point in the length of the contacting edge, with the sharpening surface.

The devices just described are sufficient for the purpose of effecting sharpening at one side of the edge of a blade and also serve in part to control the reversal of the blade to bring the other side of the blade edge into contact with the sharpening surface. The operating lever 26 is so constructed that the cross-bar or rib 28 cooperates with the blade-holder-lever not only at the point previously described, but also at a point near the free end or handle portion of the blade-holder-lever 20. This cooperation may be brought about by swinging the operating lever 26 over to the right in Fig. 3, until the upper side of the cross-bar or rib 28 comes into contact with the handle of said lever 20, the movement being continued to strike said handle a sharp blow and cause the blade-holding end thereof to be suddenly elevated. When so elevated one end of the blade-holder *h* will come in contact with a reversing or tripping device on the blade-carrier for the purpose of reversing the blade and blade-holder by turning them about the pivot pin 18 in the bearing sleeve 23. This reversing or tripping device is preferably a fixed member, such as 29, struck up from the body of the blade-carrier 9 at a point adjacent to the circular member 10. This reversing or tripping device 29 constitutes a fixed or resistance actuator bent up substantially as shown in Fig. 3, in a position to be struck by one end of the blade-holder *h* (see Fig. 1) when the forward end of the blade-holder-lever is thrown up sharply either by reversing the operating lever 26 in the manner just described or by direct action on the free end of the lever 20 after the operating lever 26 has been properly elevated. The blow struck by the end of the reversing arm 29 is such as to turn the blade-holder about its axis transverse to the blade-carrier 9, whenever the lever 20 is properly actuated, to bring the opposite side of the blade edge into contact with the sharpening surface.

Any suitable means may, of course, be employed for detachably securing the carrier to its bearing and for preventing reverse rotation, but in the construction illustrated a single device is shown for performing both functions. This device, as illustrated, is a spring extending from end to end of the blade-carrier 9 and designated generally by 30. At one end it is bent, substantially as shown at 31, to form a combined detent and releasing handle, the detent portion being so located that the upper side thereof works in the plane of the under side of the horizontal flange 7 of the bearing 6.

The blade-carrier 9 and the base of the apparatus are assembled by drawing back the free end or handle portion 31 of the detent spring and pressing the stud 8 down in the sleeve 7 to the position shown in Fig. 3 whereupon the detent is released and snaps under the flange 7, thus locking the blade-carrier down in place until the detent 31 is withdrawn again. Said detent obviously serves to lock the carrier 9 against upward movement in all rotary positions of said carrier. At its opposite end the spring 30 serves in this case as a braking device cooperative with the rim 5 for preventing reverse turning movement of the blade-carrier and assembled parts. The brake portion of the spring 30 is designated by 32 and coacts in this instance with the inner vertical wall of the flange 5. When the blade-carrier is turned in the proper direction the free end of the spring 32 slides against this vertical wall of the rim 5 but on any attempt to turn the blade-carrier in the opposite direction it grips said wall and prevents such improper movement. The spring 30 is shown as held in place on the blade-carrier between the vertical rib 12 and a pair of struck-up lugs or rivets, 33 and 34, formed from the metal of the carrier in a manner which will be obvious. Other ears, 35 and 36 are also shown as struck up from the flat top of the carrier 9 and turned into vertical parallelism to form bearings for the pivot pin 22 on which the two levers 20 and 26 are mounted.

When the parts are assembled as shown in Figs. 1 and 3 and the knob 27 is turned in the proper direction, that is, to the right as seen in Fig. 1, and suitable pressure applied the blade-carrier 9 will rotate on the flange 7 and the rim 5 in exact parallelism with the sharpening surface, every point in the edge to be sharpened will be held in contact with said sharpening surface evenly and with substantially the same pressure applied on each point, the edge of the blade will travel diagonally through its circular orbit and every point in its edge will always be presented in the same manner to the sharpening surface and sharpened obliquely or with a drawing action, and at every point in the edge the pressure applied can be regulated exactly as desired by the user of the device.

The sharpening surface, as before stated, may be any suitable for the purpose. It is preferably embodied in a disk of leather or other suitable material, such as 3, which will usually have two different surfaces, one for putting a rough edge on a blade and the other for obtaining a fine edge, as is usual. An important feature of my improved rotary blade-sharpener is a sharpening disk, one surface of which has transverse lines or channels, 37, impressed or cut therein and

extending substantially from side to side of the zone of travel of the edge of a blade. These lines may be radial, as shown, and are intended to facilitate the holding on the surface of the sharpening medium of a suitable abrasive powder or compound which may be any ordinarily employed for dressing the surface of a razor strop. The disk 3 is preferably held against turning movement in the rim 5 which it fills by lugs, 4, projecting through corresponding perforations near the center of the disk.

The parts just described are all located at one side of the base 2. In order that the user may have a substantially complete shaving outfit a mirror is provided at the opposite side of the base 2, and the whole device illustrated herein will usually be mounted in a case with a set of blades and the handle, etc., of an ordinary safety razor set. Here the side of the base 2 opposite the sharpening medium is illustrated as having a circular undercut or dove-tailed cut-out portion, 38, against the back wall of which is placed a suitable round mirror, 39, which is held in place by suitable means, such as a locking ring, 40, between the beveled outer wall of the opening 38 and a correspondingly beveled periphery of the mirror 39.

A suitable bail, 41, is also shown for holding the combination article either in sharpening blades or when it is desired to use it (as in traveling) as a hand mirror. For use as a stationary mirror the bail is simply swung back to the position shown in Fig. 2 and the article placed in the position shown on any suitable support.

What I claim is:

1. A rotary blade-sharpener, comprising a base having a sharpening surface, a blade-carrier pivotally supported on said base for rotation about the center thereof, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, and means on said blade-carrier for applying downward pressure to the blade-holder substantially in the center line of a blade to be sharpened and in any rotary position of the blade-carrier.

2. A rotary blade-sharpener, comprising a base having a sharpening surface, a blade-carrier pivotally supported on said base for rotation about the center thereof, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, and an operating lever pivotally supported on said blade-carrier and cooperative with the blade-holder for applying downward pressure thereto substantially in the center line of a blade to be sharpened.

3. A rotary blade-sharpener, comprising a base having a sharpening surface, a blade-carrier pivotally supported on said base for rotation about the center thereof, a blade-holder pivoted on said blade-carrier to

swing up and down relatively to the sharpening surface, and an operating lever pivotally supported on said blade-carrier at the axis of said blade-holder and cooperative therewith for applying downward pressure thereto between the pivot and the free end of said blade-holder.

4. A rotary blade-sharpener, comprising a base having a sharpening surface, a blade-carrier pivotally supported on said base for rotation about the center thereof, a blade-holder-lever pivoted between its ends on said blade-carrier for movement up and down relative to the sharpening surface, a blade-holder carried by said blade-holder-lever, and means separate from said blade-holder-lever for turning it with the blade-carrier and for pressing its blade-holding end downward toward the sharpening surface.

5. A rotary blade-sharpener, comprising a base having a sharpening surface, a blade-carrier pivotally supported on said base for rotation about the center thereof, a blade-holder-lever pivoted between its ends on said blade-carrier for movement up and down relative to the sharpening surface, a blade-holder carried by said blade-holder-lever, and means on said blade-carrier for applying downward pressure to said blade-holder-lever at a point between the pivot and the blade-holding end thereof in any rotary position of the blade-carrier.

6. A rotary blade-sharpener, comprising a base having a sharpening surface, a blade-carrier pivotally supported on said base for rotation about the center thereof, a blade-holder-lever pivoted between its ends on said blade-carrier for movement up and down relative to the sharpening surface, a blade-holder rotatably mounted on said blade-holder-lever, a reversing device on said blade-carrier for turning said blade-holder about its axis on said blade-holder lever, and a reversible operating lever movable into and out of engagement with points at opposite sides of the blade-holder-lever for pressing down the blade-holder or reversing the same.

7. A rotary blade-sharpener, comprising a base having a sharpening surface and also having a central bearing and an annular guide-rim concentric with said bearing, a blade-carrier mounted at its opposite ends on said bearing and guide-rim respectively for rotation about said bearing, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, and means for turning the blade-carrier and pressing the blade-holder downward toward the sharpening surface.

8. A rotary blade-sharpener, comprising a base having a sharpening surface and also having a central bearing, a blade-carrier, means for detachably locking said carrier

to said bearing for rotation about said bearing, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, and means for turning the blade-carrier and pressing the blade-holder downward toward said sharpening surface.

9. A rotary blade-sharpener, comprising a base having a sharpening surface and also having a central bearing and an annular rim concentric with said bearing, a blade-carrier supported at its inner end by said bearing for rotation about the same, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, means for rotating the blade-carrier in one direction and pressing the blade-holder downward toward the sharpening surface, and means for engaging said rim and preventing turning of the blade-carrier in the opposite direction.

10. A rotary blade-sharpener, comprising a base having a sharpening surface and also having a central bearing and an annular rim concentric with said bearing, a blade-carrier supported at its inner end by said bearing for rotation about the same, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, means for rotating the blade-carrier in one direction and pressing the blade-holder downward toward the sharpening surface, and a brake at the outer end of said blade-carrier and cooperative with said annular rim for preventing turning of the blade-carrier in the opposite direction.

11. A rotary blade-sharpener, comprising a base having a sharpening surface and also having a central bearing and an annular rim concentric with said bearing, a blade-carrier supported at its inner end by said bearing for rotation about the same, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, means for rotating the blade-carrier in one direction and pressing the blade-holder downward toward the sharpening surface, and a combined locking and braking spring for detachably securing the blade-carrier to its central bearing for rotation and for engaging the annular rim and preventing turning of said blade-carrier in the opposite direction.

12. A rotary blade-sharpener, comprising a base having a sharpening surface and also having a central bearing and an annular guide concentric with said bearing, a blade-carrier mounted at its opposite ends on said bearing and guide respectively for rotation about said bearing, a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface, and means for turning the blade-carrier and pressing the blade-holder downward toward the sharpening surface.

13. A rotary blade-sharpening device, comprising a base having a central bearing and an annular guide concentric therewith and also having a sharpening surface disposed about said bearing in a single plane, a blade-carrier rotatable about said bearing, means for positively maintaining said blade-carrier throughout its rotation in contact with said annular guide and in a plane parallel with the plane of said sharpening surface, and a blade-holder mounted on said blade-carrier for up and down movement relative to the sharpening surface.

14. A rotary blade-sharpening device, comprising a base having a central bearing and also having a sharpening surface disposed about said bearing in a single plane,

a blade-carrying mechanism mounted on said base for relative rotary movement about said bearing and embodying a blade-holder mounted for relative up and down movement with respect to the sharpening surface, and means on said base and blade-carrying mechanism for positively maintaining the blade-carrying mechanism throughout such rotation in a plane parallel with that of said sharpening surface.

Signed at New York, in the county of New York and State of New York, this 27 day of June, A. D. 1912.

CHRISTIAN E. A. GRONBECH.

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