A. K. HANSON.

HONING AND STROPPING DEVICE.

APPLICATION FILED AUG. 30, 1911.

1,027,045. **Patented May 21, 1912.**

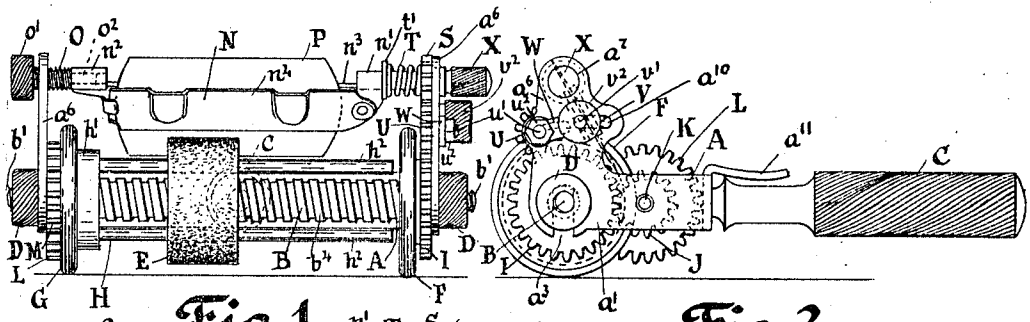


Fig. 1

Fig. 2

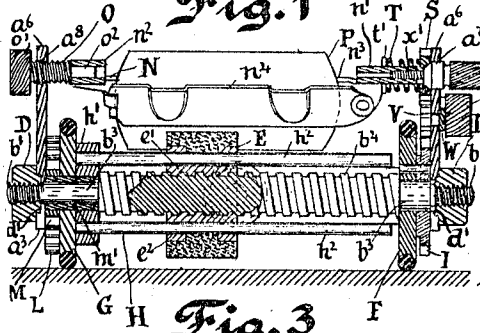


Fig. 3

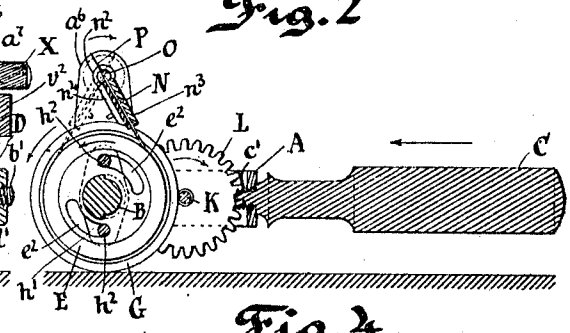


Fig. 4

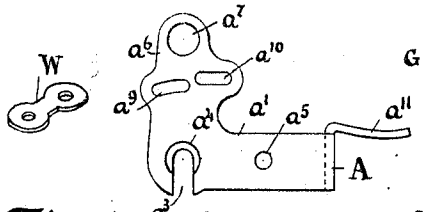


Fig. 6

Fig. 7

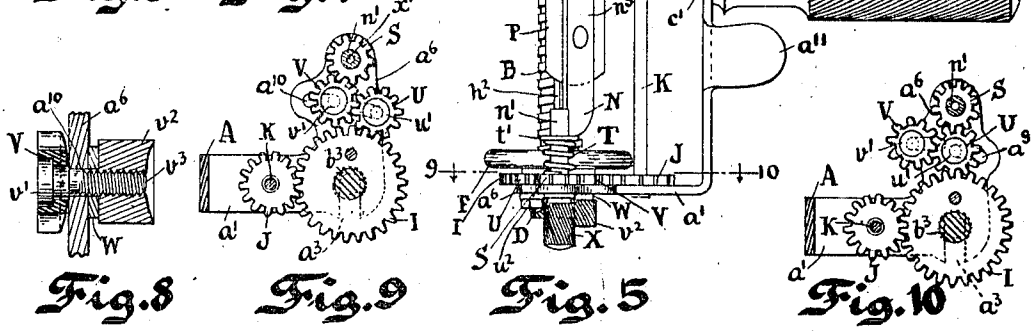


Fig. 8

Fig. 9

Fig. 5

Fig. 10

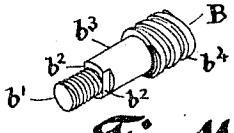


Fig. 11

Witnesses

Florence Mallon

M. J. Coogan

Adolf K. Hanson, Inventor

By George Wilmore Collins

Attorney

UNITED STATES PATENT OFFICE.

ADOLF K. HANSON, OF MILWAUKEE, WISCONSIN, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE MACHINERY & SPECIALTY COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

HONING AND STROPPING DEVICE.

1,027,045. Specification of Letters Patent. Patented May 21, 1912.

Application filed August 30, 1911. Serial No. 646,795.

To all whom it may concern:

Be it known that I, ADOLF K. HANSON, of Milwaukee, Wisconsin, have invented a Honing and Stropping Device, of which the following is a specification.

This invention relates to devices for honing and stropping razor-blades, more especially the blades of what are known as safety-razors.

My device is of that class wherein a revolving sharpening-member is brought in contact with the blade, and is revolved by rolling the device as a whole, which is provided with carrier-wheels, along a flat surface, and the object which I have in view is to improve the construction of this class of devices, first, by providing means whereby in a sharpening device of this class, the speed of movement of the sharpening-member is greater than that of the travel of the device as a whole; secondly, by providing means for changing or reversing the direction of the sharpening-member with respect to the edge, so that it may be used either for honing or stropping, as desired; and generally by providing a more simple, effective and versatile form of rotary sharpening-device than at present exists.

An important feature of my invention consists in the means which I provide for increasing the rate of rotation of the sharpening-member, or multiplying the speed thereof, which is important for the proper sharpening of the blade, for, as those skilled in the art are well aware, a fine edge can better be obtained by a high speed and light pressure, than by a low speed and strong pressure.

Another important feature of my invention consists in the means provided for reversing the direction of the sharpening-member with relation to the blade-edge, which permits of a hone as well as a strop being used; for as is well understood by those skilled in the art, a hone can only be properly used upon a razor-blade by moving the surface thereof toward the edge, whereas a stropping-surface must be moved from the edge.

The screw-device, by means of which the sharpening-wheel is conveyed to one end or the other of the blade, is not claimed herein, as it is not my invention.

Other features of my invention consist in the constructions and combinations which will be hereinafter explained and particularly pointed out in my claims.

The most improved form of my invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a front view of the complete apparatus; Fig. 2 is a side-view thereof; Fig. 3 is a vertical-section on the plane of the main axis of rotation; Fig. 4 is a longitudinal central section; Fig. 5 is a plan-view; Fig. 6 is a perspective view of the link for the reversing-gear; Fig. 7 is a side-view of one end of the frame separately; Fig. 8 is a longitudinal section on a large scale through the mounting of one of the reversing gear-wheels; Figs. 9 and 10 are longitudinal sections on the plane 9—10, looking from the inside, and showing the reversing-gear in its two positions as used for the honing and stropping devices respectively; and Fig. 11 is a perspective view of the end of the main axle on the driving-wheel side.

The reference letters refer each to the same part in each figure of the drawings.

The frame of the device consists of a strip of sheet-metal A, the two end-portions a' and a^2 of which are bent at right angles with the middle portion or bar, and form the supports for the main shaft or axle B and the other operative parts of the apparatus; at the center of the middle bar is mounted a handle-member C which may be provided with a screw-boss c' screwing into a threaded hole in the member A, or otherwise suitably attached thereto. The ends of the end-portions a' and a^2 are formed with slots a^3 opening on the bottom side and destined to receive the reduced stud-ends b' of the main axle B; one of which ends is provided with two flats b^2 on the opposite sides fitting between the sides of the slot a^3, to prevent it from rotating, the axle being thus held stationary. The studs b' are screw-threaded to receive nuts D, and these nuts are preferably formed with slight cylindrical bosses d' on their inner faces,

which enter correspondingly shaped recesses a^4 on the outer faces of the frame-ends a', a^2, whereby, the nuts being tightened, the axle is positively held in place.

On the ends of the axle inside the frame-ends are formed bearings b^3 whereon rotate the carrier-wheels, the hub of the driving-frame, and two of the drive-gears, as will be presently described; and between these bearings the surface of the axle is provided with a helical screw-thread b^4. On this threaded portion is rotatably mounted the sharpening-wheel E, the same being provided with an internal-thread e', which engages the thread b^4; so that the rotation of said wheel is accompanied by its longitudinal movement on the axle. This rotative movement is accomplished not directly by the rubber-tired carrier-wheels F, G, as in many of the heretofore invented sharpening-devices, but through a driving-frame H which is geared to one of these wheels. The driving-frame H comprises preferably a hub h' turning on the right-hand bearing b^3, and carrying a pair of longitudinal bars h^2, which pass through arcuate slots e^2 in the sharpening-wheel E; these slots providing for a certain amount of lost motion in the reversing of the direction of the sharpening-device. However, it is not necessary to provide more than one bar h^2, and I may successfully operate the device with a driving-frame having only one bar h^2, or I may provide more than two bars without interfering with the principle involved.

The driving of the frame H is effected by one of the carrier-wheels only, to wit: the wheel F, coaxial with which is mounted a spur-gear I, said gear meshing with and driving a pinion J on a countershaft K, which is journaled in bearing apertures a^5 in the portions a', a^2 of the frame. The pinion J drives the shaft K, which in turn drives a spur-gear L mounted on its opposite end and meshing with and driving a pinion M turning on the journal b^3. The pinion M is directly connected with and drives the hub h' through a sleeve m' on which both are mounted, leaving room between them for the carrier-wheel G, which turns loosely thereon.

Above the sockets of the axle B the frame-ends are extended to form standards a^6, in the upper ends of which are apertures a^7, a^8. The aperture a^7 forms a pivot-bearing for the member X supporting pintle n' on one end of the blade-holder N, and the other aperture a^8 is threaded to receive a screw-stem O carrying a milled head o' on its outer end and a pivot o^2 on its inner end for the other end of the holder N, which is provided with a cylindrical socket n^2, into which said pivot extends. The specific form of holder here illustrated, as aforesaid, is not necessary to the invention as here claimed, the same consisting of a fixed-leaf n^3 and a pivoted-leaf n^4 holding between them a razor-blade P. On the left-hand end of the holder, and in the plane of the gear I is a pinion S turning freely on said end, a frictional drive between it and the holder being established by a coiled spring T under compression between the pinion and the washer t', and adjustable by a stem X the thread x' of which engages in the pivot t'. The piston S is operatively connected with the gear I through the medium of a reversing-gearing, which consists of two pinions U and V mounted on stub-shafts u' and v', which are adapted to slide in slots a^9 and a^{10} respectively in the standard a^6. These shafts are connected together by a link W, Fig. 6 in such manner that they are permanently in mesh with each other, and a pair of nuts u^2 and v^2 are screwed onto the threaded-ends v^3 of the stub-shafts, said shafts being shouldered and headed as shown in Fig. 8. The slot a^9 is described on an arc concentric with the axis of the gear I, and so placed that the pinion U is permanently in mesh therewith; while the slot a^{10} is so placed that when at one end of the slot the pinion V is in mesh with the pinion S, and when at the other end of the slot is out of mesh therewith, while the pinion U has been advanced to a position in which it meshes with said pinion S, as shown in Fig. 10. It will be seen that the effect of this gearing is that when it is in the position of Fig. 9 the pinion S will be driven in the reverse direction from the pinion I and consequently the surface of the sharpening-wheel will move toward the edge of the blade; and when the reversing-gear is in the position of Fig. 10, the pinion S will move in the same direction as the gear I, causing the edge to be sharpened to lie upon that side of the sharpening-wheel which is moving away from said edge. When therefore it is desired to merely strop the blade, a suitable stropping-wheel having been placed upon the axle B, the reversing-gear is placed in the position of Fig. 10, and clamped therein by the nuts u^2, v^2, or one of them, and when it is desired to hone the blade, the stropping-wheel is removed and replaced by a wheel with a honing surface, and the reversing-gear is set in the opposite position. The position shown in the principal figures of the drawing and the directional arrows correspond to the honing movement.

As all the driving is done from the left-hand carrier-wheel F, it is desired in operating the device to bring the pressure principally upon that wheel, and, therefore, a tab a^{11} is formed upon the frame A at the the left-hand side of the handle C, and bent at right-angles to form a thumb-rest. The effect of this is that in which ever hand the instrument is held, the thumb is invariably

brought upon this rest, which causes the principal pressure upon the wheel F.

From the above description it will be readily seen that my invention is not limited to special forms and mechanical constructions such as I have hereinabove shown by way of illustration, but that the principles thereof are expressible in a variety of ways as will be well understood by those skilled in the art; therefore the scope of my claims is to be interpreted in view of such alternative construction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a sharpening-device for razor-blades, the combination of carrier-wheels adapted to support the device and roll upon a plane surface, a sharpening-wheel and means for holding a blade in proper sharpening relation thereto, and a multiplying-gearing connecting said sharpening-wheel with one of said carrier-wheels and adapted to drive said sharpening-wheel at a higher relative speed of rotation.

2. In a sharpening-device for razor-blades, the combination of carrier-wheels adapted to support the device and roll upon a plane surface, a sharpening-wheel mounted coaxially with one of said carrier-wheels, and a multiplying-gearing operatively connecting said last-named carrier-wheel with said sharpening-wheel and producing a relatively higher rate of rotation in the latter.

3. In a sharpening-device for razor-blades, the combination of a pair of coaxially mounted carrier-wheels one of which is a driving-wheel, a gear-wheel mounted coaxially therewith and driven thereby, a countershaft carrying a pinion meshing with said first-named gear-wheel and carrying also another gear-wheel, a second pinion mounted coaxially with said carrier-wheels and meshing with said last-named gear-wheel, and a sharpening-wheel mounted coaxially with said carrier-wheels and operatively connected with said last-named pinion.

4. In a sharpening-device for razor-blades, the combination of a fixed axle provided with a helical thread and with journals at its ends, a pair of carrier-wheels mounted and turning on said journals, one of said wheels acting as a driving-wheel, a sharpening-wheel turning on said axle and having an internal-thread engaging the thread thereof, a driving-hub turning on one of said journals and adapted to rotate said sharpening-wheel while permitting its axial movement, and a gearing operatively connecting said driving-wheel with said hub and adapted to rotate it at a higher relative rate of rotation.

5. In a sharpening-device for razor-blades, the combination of a three-sided frame having a central handle, a pair of carrier-wheels mounted on said frame and only one of which acts as a driving-wheel, a rotary sharpening-device operatively connected with said driving-wheel, and a thumb-rest on said frame at the same side of said handle as said driving-wheel.

6. In a sharpening-device for razor-blades, the combination of a rotary sharpening-member, means for rotating the same, a blade-holder, means connecting said blade-holder with said driving-means and causing it to rest upon one side or the other of the sharpening-member in accordance with its direction of rotation, said connecting-means being reversible whereby the side on which said blade rests for any given direction of rotation is reversed.

7. In a sharpening-device for razor-blades, the combination of a rotary sharpening-member, a blade-holder adapted to hold a blade in proper sharpening relation with said member, whereby the edge of said blade comes on one side or the other of said member and in juxta-position thereto, and a reversible gearing operatively connecting said member and holder whereby the side of the member upon which said blade is pressed for a given direction of rotation is reversed.

8. In a sharpening-device for razor-blades, the combination of a rotary sharpening-member, a blade-holder adapted to hold a blade with its edge in juxta-position to the sharpening surface on either side of said member, a gear-wheel frictionally connected with said holder so as by its rotation to cause a pressure of said holder against said member in the corresponding direction, a second gear-wheel operatively connected and rotating with said member, and a pair of intermediate gear-wheels adapted to two positions, in one of which one of said intermediate wheels directly meshes with both said first-named wheels and in the other one of said intermediate gear-wheels meshes with one of said gear-wheels and the other with the other, whereby the relative direction of rotation of said first-named two gear-wheels may be reversed.

9. In a sharpening-device for razor-blades, the combination of a pair of carrier-wheels, one of which acts as a driving-wheel and carries a gear-wheel, a rotary sharpening-member mounted coaxially with said driving-wheel, gearing connecting said sharpening-member with said gear-wheel and acting to raise the speed of rotation of the same, a reversible blade-holder adapted to press the edge of the blade against either side of said sharpening-member, a second gear-wheel frictionally mounted on said holder in such manner as by its rotation to cause a pressure of said holder against one side or the other of said sharpening-mem-

ber, and a reversing-gearing adapted to connect said gear-wheels and to cause one to rotate in the same direction as or in the opposite direction from the other as desired.

10. In a sharpening-device for razor-blades, the combination of a pair of carrier-wheels one of which acts as a driving-wheel and carries a gear-wheel, a rotary sharpening-member mounted coaxially with said driving-wheel, gearing connecting said sharpening-member with said gear-wheel and acting to raise the speed of rotation of the same, a reversible blade-holder adapted to press the edge of the blade against either side of said sharpening-member, a second gear-wheel frictionally mounted on said holder in such manner as by its rotation to cause a pressure of said holder against one side or the other of said sharpening-member, and a reversing-gear comprising two intermediate gear-wheels permanently meshing with each other and one of which permanently meshes with one of said first-named gear-wheels, said intermediate gear-wheels being laterally shiftable and having two positions, in one of which said first-named intermediate gear-wheel engages the gear-wheel with which it is not permanently engaged and the second intermediate gear-wheel runs idle, and in the other of which positions said last-named intermediate gear-wheel meshes with the gear-wheel with which said first-named intermediate gear-wheel is not permanently engaged.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ADOLF K. HANSON.

Witnesses:

GEORGE W. COLLES,

CHARLES M. SCANLAN.