

May 24, 1932.

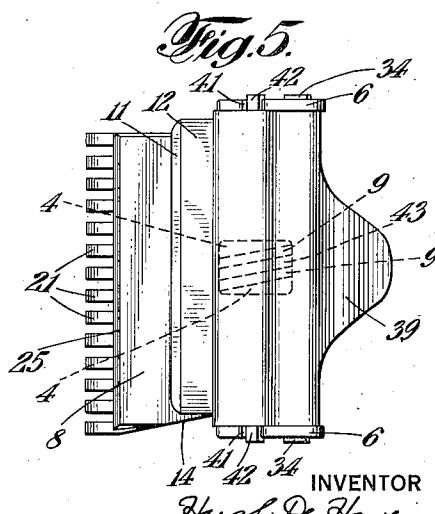
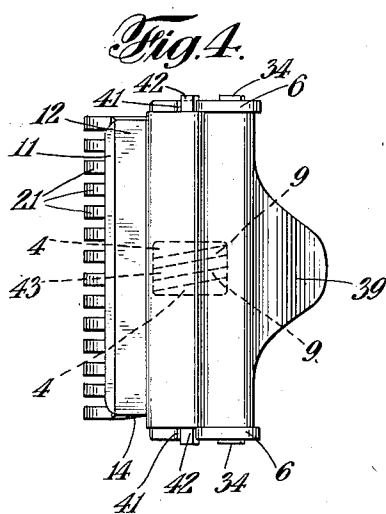
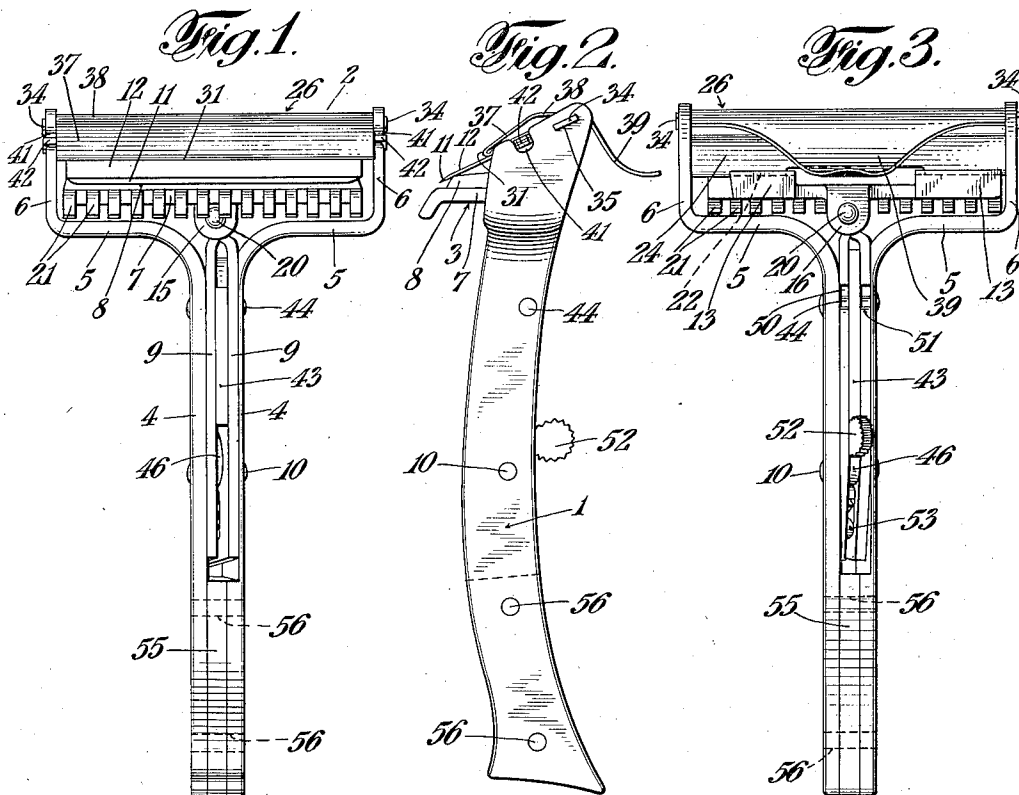
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RAZOR

Filed Jan. 24, 1927

2 Sheets-Sheet 1



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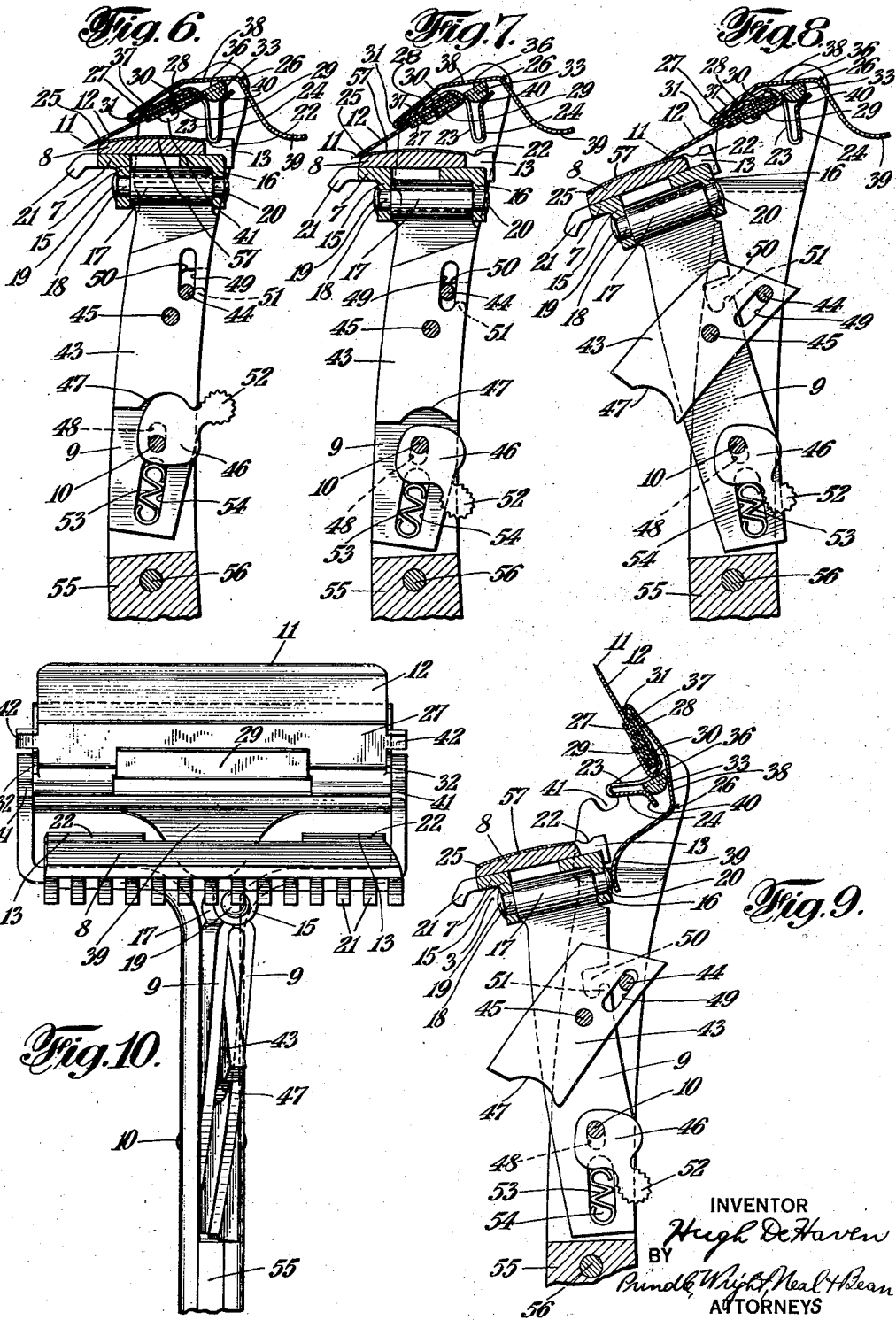
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RAZOR

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# UNITED STATES PATENT OFFICE

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## RAZOR

Application filed January 24, 1927. Serial No. 163,029.

This invention relates to a safety razor containing a blade and a blade edging element mounted on the razor to move in contact with the edge of the blade for sharpening it.

One of the objects of the invention is a razor of the type described in which the blade edging element is swingably mounted so that it may, at all times, contact evenly with the edge of the blade.

A further object of the invention is a razor of the type described in which there is relative movement between the blade and the blade edging element in a direction parallel to the cutting edge of the blade to sharpen the blade.

Another object of the invention is a razor of the type described in which the blade edging element is movable from a sharpening position in which it is free to move to sharpen the blade, to a shaving position in which the parts of the razor are securely locked against movement.

Still another object of the invention is a novel surface used for sharpening the edges of razor blades and other cutting tools.

Other and further objects and features of the invention will more fully appear from the following description and the accompanying drawings and will be particularly pointed out in the claims.

The drawings illustrate in section, elevation, and detail, a preferred form of construction adapted for use in a razor and blade sharpening instrument and embody the broad principles of the invention.

In the drawings:

Fig. 1 is a front elevation of the razor.

Fig. 2 is a side elevation of the razor.

Fig. 3 is a rear elevation of the razor.

Fig. 4 is a plan view of the head of the razor with the parts in shaving position.

Fig. 5 is a plan view of the head of the razor with the blade edging element in extended sharpening position.

Fig. 6 is an enlarged longitudinal partial section through the razor showing the parts in shaving position.

Fig. 7 is a view similar to Fig. 6 with the parts in retracted sharpening position.

Fig. 8 is a view similar to Figs. 6 and 7 with the parts in extended sharpening position.

Fig. 9 shows the head of the razor opened with the parts in position to remove the blade.

Fig. 10 is an enlarged view looking into the head of the razor with the parts in the positions shown in Fig. 9.

The invention is illustrated by showing a safety razor in which the blade may be sharpened while it remains in the razor, but although a razor is used for the purposes of illustrating the invention, it is to be understood that the features thereof may be applied to any device for using cutting tools or sharpening the edges.

The parts of the razor may be designated generally as a handle 1, a blade support 2, and a sharpening means 3. The handle may be formed of any suitable material but is preferably of a non-corrosive and non-rusting metal stamped to provide upright portions 4, the upper parts 5 of which extend outwardly at an angle to the portions 4 and then again extend upwardly at 6 to form separated arms and to provide, with the associated parts of the razor, the head. The term head is used to denote generally the upper part of the razor including the blade support 2.

The blade edging device, on the razor illustrated includes the plate 7 and the blade edging element 8. To obtain between the edge of the blade and the sharpening means a relatively diagonal movement and thereby to simulate the motion of the edge of the common straight razor over a sharpening surface when it is sharpened by hand, the blade edging element is so mounted that it reciprocates in contact with the edge of the blade and at an angle thereto, that is, the blade edging element has a component of motion transversely of the edge of the blade and also parallel to said edge. To permit reciprocation of the blade edging element and to give it this angular movement, in the illustrated form of the invention, the plate 7 is connected to a stem having arms 9, which are pivoted at 10 in a recess in the handle formed by the upright portions 4, the sides of said recess be-

ing at an angle to the cutting edge 11 of the blade 12 and the pivot 10 being at a right angle to the sides of the recess. The sides of the arms 9 of the stem are preferably flat and adapted to engage the sides of the recess and be guided thereby so that, when the stem and the plate 7, which form the support for the blade edging element, reciprocate, the blade edging element 8 moves at an angle to the cutting edge of the blade.

To assist in guiding the plate 7, particularly on the return stroke from its extended sharpening position shown in Fig. 8 to its retracted sharpening position shown in Fig. 7, the projections 13, which are formed on or fastened to the plate 7, and the one side of said plate are beveled as shown at 14 so that if those parts of the razor which guide the blade edging device in its diagonal movement should become excessively loose due to long wear the beveled side of the plate may contact with the adjacent arm 6 to guide the blade edging device in its diagonal path. These projections are preferably of such a length, as is clearly shown in Fig. 8, that the rear ends of the projection always overlap the front edges of the arms 6 when the blade edging device is in extended sharpening position so that the rear edge of the projection will never catch on the forward edge of one of the arms 6.

In order to obtain an even contact between the edge of the blade and the blade edging element, the blade edging element is so mounted that it may move to adjust itself on its support for contact with the edge of the blade throughout its entire length. For this purpose there is a pivotal connection, preferably at a right angle to the front edge 11 of the blade edging element, between the stem and said element. This pivotal connection may be made by providing tabs 15 and 16 fastened to the plate 7 and spaced to enclose between them a bearing 17 on the top of the stem. The bearing is of a size snugly to enclose the pivot pin 18 and the tabs have openings through them to receive the pivot pin, the ends of which are headed over at 19 and 20 to keep the pin in place and retain the pivotal connections in assembled relation. For convenience in manufacturing these parts, the tabs 15 and 16 may be stamped out of the plate 7 and the bearing 17 formed by bending the stem around a form at the time the stem is made. The tab 16 may be formed by stamping and bending down the middle of the rear of the plate 7 which leaves the sides of the rear of the plate to provide the projections 13.

The stem is preferably of such a length that when the plate 7 is connected to it by means of the pivotal connections just described, the bottom edges of the projections 13 are only slightly above the outwardly extending portions 5 of the arms (which are a

part of the head of the razor) so that the plate 7 and blade edging element 8 can have only limited movement on the pivotal connections. The movement is of course limited by the play between the bottom edges of the projections 13 and the outwardly extending portions 5 of the arms and the parts are so correlated that this movement is sufficient to permit the blade edging element to adjust itself for even contact with the edge of the blade in any position which the parts may assume in the shaving or sharpening positions but prevents the blade edging element and plate from tilting on the pivot pin 18 to an extreme angle with relation to the blade. In this way, no matter whether the blade is lowered gently or snapped from its position shown in Fig. 9 to the positions shown in either of Figs. 6, 7 or 8, the blade edging element is always in a position substantially parallel to the edge of the blade and there is no danger of injury to the edge of the blade.

The blade edging element 8 is preferably supported directly on and fastened to the base plate 7 which preferably has the guard teeth 21 formed on its forward edge. This base plate with the guard teeth on it may therefore be termed the guard plate. The projections 13 are grooved on their upper surface as shown at 22, so that when the plate 7 is in its retracted sharpening position the grooves lie under the arms 23 and 24 of the projecting rear portion of the blade holding member. Therefore, when the sharpening device (which includes the blade edging element and the plate) is moved from its lowered sharpening position, shown in Fig. 7, to its raised shaving position, shown in Fig. 6, the grooves 22 receive the projecting rear portion of the blade holding member and the forward edge 25 of the blade edging element engages the blade 12. Due to the fact that the cap 26 is made of a material which has some spring to it the parts of the razor will firmly be held in shaving position because the projecting rear portion of the blade holding member engages with the grooves 22 and the forward edge 25 of the blade edging element engages with the razor blade to force the cap farther open which, of course, is resisted by the springiness of the cap.

The grooves 22 which engage with the rear portion of the blade holding member also perform the function of assisting in positioning the edge of the blade in its position parallel to the line of edges of the guard teeth. As will be described hereinafter the blade is held on the blade holding member in a predetermined position, due to the form of the parts of the blade holding member which receive the blade, and the blade holding member is so made that its projecting rear portion has a definite and predetermined position with regard to the parts of the blade

holding member which receive the blade. Therefore when the blade is properly positioned in the blade holding member the edge of the blade has a definite predetermined position relative to the projecting rear portion of the blade holding member. The parts of the razor are so made that the depending portion of the blade holding member is preferably parallel to the cutting edge of the blade. The grooves 22 which receive the depending rear portion of the blade holding member are so placed with regard to the line of edges of the guard teeth that when the blade edging device is in its raised position, shown in Fig. 6 the seating of the depending rear portion of the blade holding member in the grooves 22 of the plate 7 positions the line of edges of the guard teeth parallel to the edge of the blade. If, as stated above, the depending rear portion of the blade holding member is parallel to the edge of the blade, the grooves 22 will be parallel to the line of edges of the guard teeth so that when the parts of the razor are in shaving position the edges of the guard teeth are parallel to the edge of the blade. Obviously there may be any angle between the projecting rear portion of the blade holding member and the edge of the blade in which case a corresponding angle is between the line of the groove 22 and the line of edges of the guard teeth.

The edge of the blade is preferably spaced above the guard teeth so that although the edge of the blade is guarded by the guard teeth to prevent the blade from cutting the skin of the shaver, the edge of the blade is always free and at no place contacts with the guard teeth so that the entire width of the edge of the blade may be used for shaving. For this purpose the blade 12 and the forward edge 25 of the blade edging element are in contact when the parts of the razor are in shaving position and said forward edge of the blade edging element is spaced the required distance above the base plate to position the edge of the blade the desired distance above the guard teeth. The forward edge of the blade edging element is preferably parallel to the line of edges of the guard teeth and therefore the contact of the forward edge of the blade edging element with the blade assists the action of the grooves 22 and projecting rear portion of the blade edging element in aligning the edge of the blade parallel to the line of edges of the guard teeth.

By arranging the parts of the razor so that the forward edge of the blade edging element contacts with the blade and the edge of the blade is spaced from the guard teeth, a space is formed under the blade in which the lather which is removed from the skin of the shaver may collect, but due to the fact that the forward edge 25 of the blade edging element contacts with the blade, this lather

cannot work up onto the surface of the blade edging element.

The cap 26 is of novel construction and its parts perform the separate and distinct functions of holding the blade, and acting as a spring to maintain the edge of the blade in yieldable contact with the blade edging element, and of retaining the cap in the position shown in Fig. 9 so that the blade may easily be removed from the blade holding member as well as of providing a means for raising the cap into such position. The cap is preferably composed of a single piece of non-rusting material having some spring to it and is preferably formed by stamping. For receiving and holding a blade of the type shown in the drawings, that is, a blade which has on its rear edge the strengthening sheath 27, the blade holding member which forms the forward portion of the cap is provided with parallel parts 28 and 29 which receive between them, with a snug fit, the sheath on the rear of the blade. As shown in Fig. 10 the under part 29 of the blade holding member does not extend entirely across the width of the cap, but is stamped out of the middle of the width of the cap thereby leaving sufficient material to provide the arms 23 of the before mentioned projecting rear portions. A tongue 30 is stamped out of the upper part 28 of the blade holding member and serves to hold the blade securely in position against the lower part 29 and, as illustrated, an enlarged bend of metal 31 is formed in front of the upper part 28 of the blade holding member in back of which the sheath 27 of the blade rests. This bend of metal in effect provides a recess in the upper part 28 of the blade holding member in which recess the sheath of the blade rests.

Blade positioning ends 32 fastened between the parts 28 and 29 of the blade holding member may be used to prevent the blade from sliding from side to side in the blade holding member and from contacting with the arms 6. Said ends are preferably spaced apart only far enough to receive between them the rear edge and sheath 27 of the blade and are so placed that when the rear of the blade is in position between them and the parts of the razor are in shaving position the cutting edge 11 of the blade is entirely within the confines of the guard so that the corners of the cutting edge of the blade are guarded. It will therefore be evident that, due to the form of the parts of the blade holding member and said ends 32, the blade is held securely in a fixed and predetermined position on the cap.

In removing the blade from the blade holding member the parts are moved into the position shown in Fig. 9 and the sides of the blade are grasped and the blade pulled downwardly against the lower part 29 of the blade hold-

ing member so that the blade revolves on the rear of the sheath 27 as a pivot. This movement forces the lower part of the blade holding member outwardly against its own resistance, due to the fact that the cap is made of springy material, and also forces the spring into the opening from which it was stamped and brings the forward edge of the upper member of the sheath below the lower part of the bend 31 of metal so that the blade may easily be slipped out of position. In placing the blade into the blade holding member the reverse movements take place and the blade is received and firmly held on a predetermined fixed position in the blade holding member.

The projecting rear portions 23 and 24 of the blade holding member are formed as a continuation of the upper part 28 and perform the function above described of cooperating with the grooves 22 to position the line of edges of the guard teeth parallel to the edge of the blade. These projecting rear portions of the blade holding member also perform other important functions. One of these functions is providing a bearing on which the cap may revolve when said cap moves between the positions shown in Figs. 6, 7, 8 and 9. For this purpose the projecting rear portions cooperate with a rod 33 which extends across the head of the razor between the arms 5. The ends 34 of the rod are flattened and snugly fit in rectangular openings 35 formed in the arms 5 so that the rod cannot turn. The rod is flattened, as shown at 36, on one side and is preferably positioned as illustrated so that when the cap 26 is in any of the positions shown in Figs. 6, 7 and 8 the arms 23 and 24 of the projecting rear portion of the blade holding member bear on the round portion of the rod. With this construction the blade holding member rotates easily on the rod 33 in order that the edge of the blade will at all times contact with the blade edging element except when the cap is purposely raised into the position shown in Fig. 9. As is clearly shown in the sectional figures, Figs. 6, 7, 8 and 9, the lower part 29 of the blade holding member is formed out of the middle part of the arm 23 of the projecting rear portion of the blade holding member which leaves the arm 23 composed of two spaced parts which, however, have sufficient width to contact entirely across the projections 13 as is clearly shown in Fig. 3.

From the bend 31 the cap extends as shown at 37 and 38 to give the top of the razor a finished appearance. The under surface of the part 38 of the cap bears against the upper corner of the flat side of the rod and it will be obvious that, due to the springiness of the material from which the cap is made, this portion 38 of the cap always tends to press the blade holding member downwardly, that

is, the under surface of the blade holding member always tends to lie parallel to and against the flat part of the rod. This tendency gives the spring action which holds the blade in contact with the blade edging element in all of the positions illustrated in Figs. 6, 7 and 8.

The cap is farther extended at 39 to form a tail or thumb piece so that by pressing on the thumb piece the cap may easily be raised from the positions illustrated in Figs. 7 or 8 to the position illustrated in Fig. 9 for the purpose of removing the blade or cleaning the razor. If the parts of the cap are made as herein described and shown in the drawings it will be seen that when the parts are in the position shown in Fig. 9 the under surface of the part 38 of the cap and the arm 24 of the projecting rear portion of the blade holding member bear on the round part of the rod 33 and the arm 23 of the projecting rear portion of the blade holding member bears on the flat side 36 of the rod which firmly but yieldably hold the cap in the position shown in Fig. 9 so that the blade may easily be removed. The tail of the cap is preferably made as long as is shown in the drawings and is given the curvature shown, so that when the cap is swung into the position shown in Fig. 9 the tail drives the blade edging device forward so that the blade edging element is automatically thrown into extended position in which it is distantly removed from the edge of the blade for cleaning said surface or applying abrasive thereto and furthermore the cap and blade may be lowered by pressing the stem from the position shown in Fig. 9 toward the position shown in Fig. 7 which forces the tail of the cap outwardly until the spring action of the flat side 36 of the rod 33 and the associated parts of the cap cause cap and blade to move into the positions shown in Figs. 6, 7 and 8. The snapping of the blade against the blade edging element may be prevented by the shaver catching the tail of the cap against his thumb as the tail moves on outwardly from the position shown in Fig. 9.

The arm 24 of the projecting rear portion of the blade holding member is extended at an angle as shown at 40 and the arm 23 of said projecting rear portion of the blade holding member joins the upper part 28 thereof in a smooth curve so that the round portion of the rod 33 is in effect seated in a V shaped groove, the sides of which may be sprung apart. Thus when the blade edging device is raised from the position shown in Fig. 7 to the position shown in Fig. 6, the bends in arms 23 and 24 of the projecting rear portions of the blade holding member seat in the grooves 22 in the plate 7 and then as the upward movement of the blade edging device is continued, the arms 23 and 24 of the projecting rear portions of the blade holding

member are spread apart against their tendency to remain in closed position and this tends to hold the bends of the projecting rear portions of the blade holding member firmly seated in the bottom of the grooves 22 which of course, tends to hold the parts of the razor firmly in position for shaving.

The edge 11 of the blade is also held in a predetermined position with relation to the line of edges of the guard teeth by means of slots 41 formed in the arms 5 into which wings 42 provided on the blade are adapted to seat when the cap and blade holding member are in their lowered positions illustrated in Figs. 6, 7 and 8. The cooperating slots 41 and wings 42 may be used to position the blade edge should a careless user of the razor bend the parts of the blade holding member out of shape.

The stem which supports the plate 7 and blade edging element 8 is preferably provided with two arms 9 and rotates about the pivot 10. The forward stroke of the blade edging device is limited by the link 43 which operates between the arms 9 of the stem and which is pivoted to the arms of the handle at 44 and to the arms of the stem at 45.

The blade edging device and its associated parts are moved from the lowered sharpening position shown in Fig. 7 to the raised shaving position shown in Fig. 6 by means of the cam 46 which rotates about the pivot 10 and bears against the cam surface 47 on the link 43. With the parts in the position shown in Fig. 7 it is obvious that if the cam is moved into the position shown in Fig. 6 the cam will contact with the cam surface 47 on the link and raise the link which will exert pressure, through the pivot pin 45, on the stem and thereby raise the stem which in turn will raise the plate 7 and blade edging element 8. Slots 48 in the arms of the stem and slot 49 in the link permit both the stem and link to be raised. The cam surface 47 and the corresponding portion of the cam have such a shape that not only is the link 43 raised, but the link is forced toward the rear of the handle so that all parts are within the confines of the portions 4 of the handle. To more securely hold the stem and link in the desired position and to stop the rearward movement of the stem and blade edging device, the slots 50 are formed in the arms of the stem to receive the pivot pin 44. The rear sides 51 of these slots are at an angle to the direction of motion taken by the stem in its movement from its lowered position shown in Fig. 7 to its raised position shown in Fig. 6 so that as the stem moves upwardly the cam edges 51 of the slots ride over the pivot pin 44 and draw the upper part of the stem within the confines of the portions 4 of the handle. The front of the slot contacts with the pin 44 to stop the rearward movement of the stem

and blade edging device when the razor is being shaken to reciprocate the blade edging device to sharpen the blade and the bottom of the slot snugly fits the pin to hold the stem and blade edging device rigid when the parts of the razor are in shaving position. The knob 52 on the cam permits the cam to be moved from the outside of the handle and such knob may be knurled as indicated to facilitate the movement thereof.

The spring 53 operates in slots 54 in the arms 9 of the stem with one end of the spring bearing against the cam 43 and the other end bearing against the lower edge of the slots to force the stem downwardly when the cam 43 is moved from its position shown in Fig. 6 to the position shown in Fig. 7, and to hold the stem and blade edging device in their lowered position when the blade edging device is reciprocated for sharpening the razor so that the upper surface of the blade edging element always revolves about a pivotal point which is determined by the seating of the pivot pin 10 in the upper end of the slot 48, that is, the arc in which the surface of the blade edging element moves always has a radius equal to the distance from the surface of the blade edging element to the center of the pin 10 when seated in the upper end of the slot 48 and not the radius from the surface of the blade edging element to the lower end of the slot. This is done because it is usually desirable to sharpen the edge of the blade on the same arc.

The handle filling piece 55 is used to fill in the space between the parts 4 of the handle below the lower end of the stem. This filling piece is of such a width that it properly spaces the parts 4 of the handle to prevent the moving parts, such as the stem and the link which are within the handle, from binding and it also provides a solid lower part of the handle which may be grasped for shaking the razor to sharpen the blade. In this connection it may be mentioned that the moving parts of the razor are quite loosely fitted together so that they do not bind but move very freely to permit easy reciprocation of the blade edging device by merely shaking the razor. The filling piece may be of any suitable material such as metal, ivory, bone, imitation amber, or rubber which does not rust or corrode and it may ornament the handle. Rivets 56 hold the filling piece 55 in place and assist the pins 10 and 44 in holding the arms of the handle in assembled position.

The blade edging element must have a hard surface against which the edge of the blade may reciprocate without materially scratching or damaging the surface of the blade edging element or the blade and this surface is level between opposite points on its sides so that the edge of the blade contacts with the surface entirely across the length of the

edge. Metals which are quite hard and capable of taking a high polish so that they are very smooth may be used with good results. I have found that a hard non-corrosive smooth metallic surface such as can be produced on stainless steel or like metal, is satisfactory. I preferably prepare the blade edging element so that the surface which contacts with the edge of the blade is of one of the group of hard and wear resistant materials including chromium, and vanadium, or compounds containing them, which have a hardness above 6.9 in the scale of hardness given in volume 63 of the Smithsonian Tables published 1914. The blade edging element may be composed solely of one of these metals or a hard alloy thereof, but I preferably make the blade edging element by forming a suitable core, either by casting or stamping or by hydraulic pressing, of a relatively soft metal such as copper, nickel silver, or brass which has a hardness below 6.9 and which is cheap and which may be coated or plated with one of the above mentioned hard metals, to give the desired surface. The coating or plating which is indicated at 57 (in exaggerated proportion relative to the blank) is as thick as necessary to withstand the usage to which it is put. After plating the blank the surface may be and preferably is lapped and polished until it is absolutely smooth.

The razor is extremely simple to make and assemble. The arms of the handle, the cam, the guard plate, the cap, the stem, and the blank for the blade edging element may also be stampings which, after blanking out, may be formed into shape on suitable shaping machines, and the rod 33 may be produced at a very low cost as such rods usually are. After stamping out and shaping the parts and plating or otherwise coating the blade edging element, the arms of the handle and the filling in piece 55 are riveted together with the rivets 56; the blade edging element is then fastened on the plate 7 which in turn is fastened on the stem by placing the pin 18 through the bearing 17 and tabs 15 and 16 and heading over the ends of the pin; the rod 33 is then forced through the cap and the flattened ends of the rod inserted in the slots 35 after which the assembled blade edging device and stem are inserted in the recess in the handle together with the link and cam and spring 53; the pins 10 and 44 are then put into position and headed over which completes the assembling of the razor.

In using the razor the shaver merely lowers the knob 52 of the cam and presses down on the tail 39 of the cap to raise the cap into the position shown in Fig. 9. He then inserts a blade into the blade holding member and rubs a small amount of abrasive on the upper surface of the blade edging element. The cap and blade are then lowered preferably

by grasping the handle around the stem and pressing the stem into the handle while pressing forwardly and downwardly with the tip of the thumb on the part 37 of the cap and holding the base of the thumb ready to catch the tail 39 of the cap and prevent the cap and blade from snapping downwardly, until the blade contacts with the surface of the blade edging element and the handle is grasped at its lower part and the razor shaken back and forth to reciprocate the blade edging element. As has been stated the action of the parts is such that when the blade edging device is reciprocated the blade edging element moves at an angle to the cutting edge of the blade in order to simulate the honing motion which is given to the usual straight razor when it is sharpened. After the edge of the blade has been sharpened on one side the cap may again be lifted and the blade removed and turned over so that the other side may be sharpened. It has been found from experiments that usually the blade is maintained in good shaving condition by sharpening on one side just prior to shaving with the razor and then when the shaving operation is finished and the blade removed for drying, reinserting the blade in reversed position so that the reverse side of the blade will be sharpened prior to the next shave. After the razor has been shaken to reciprocate the blade edging device the cam is lifted to raise the blade edging element and lock the parts in position. The razor is then ready for shaving.

I claim:

1. The combination of a razor blade with a blade sharpening instrument including a reciprocable blade edging element, a handle having therein a recess with the sides of the recess at an angle to the cutting edge of the blade, a reciprocable support supporting said blade edging element and operative within the recess and guided by the sides of the recess whereby said blade edging element has movement at a suitable angle to the edge of the blade.

2. The combination of a razor blade with a blade sharpening instrument including a reciprocable blade edging element, a handle having therein a recess with the sides of the recess at an angle to the cutting edge of the blade, a reciprocable support connected at one end to said sharpening element and at the other end pivoted in said recess with its sides engageable with the sides of the recess whereby when the support is reciprocated it moves at a suitable angle to the edge of the blade and carries with it said sharpening element.

3. A razor blade sharpening instrument including a blade holding member, a blade edging element reciprocable relatively to the edge of the blade while in contact therewith and adjustably mounted at a suitable angle to the edge of the blade to permit said element



to adjust itself for even contact with the edge of the blade.

4. A razor blade sharpening instrument including a blade holding member, a blade edging element reciprocable relatively to the edge of the blade while in contact therewith, and a support for said element to which said element is movably connected to permit said element to adjust itself for even contact with the edge of the blade throughout its entire length.

5. A razor blade sharpening instrument including a blade holding member, a blade edging element, reciprocable relatively to the edge of the blade while in contact therewith, a support for said element to which said element is movably connected to permit said element to adjust itself for even contact with the edge of the blade throughout its entire length, and means to limit the movement of the said element on said support.

6. A razor blade sharpening instrument including a blade holding member, a reciprocable blade edging element, a stem for supporting said element, and pivotal connections between said element and said stem whereby said element may adjust itself for even contact with the edge of the blade.

7. A razor blade sharpening instrument including a head, a blade holding member, a reciprocable blade edging element normally lying within said head, a stem for supporting said element, pivotal connections between said element and said stem whereby said element may move to adjust itself for even contact with the edge of the blade, and means associated with said element for engagement with the head to limit the movement of the element on the stem.

8. A razor blade sharpening instrument including a blade holding member, a reciprocable blade edging element having an edge normally parallel to the edge of the blade, a stem to support said element and pivotal connections between said stem and said element and at a right angle to the edge of said element whereby said element may adjust itself with relation to the stem and to the edge of the blade for even contact with the edge of the blade.

9. In a device for sharpening the edge of a cutting tool, a sharpening surface portion having a hardness above 8.5 in the Smithsonian scale of hardness and against which the edge of the tool is adapted to bear.

10. In a device for sharpening the edge of a cutting tool, an edging element including a core having a hardness below 8.5 in the Smithsonian scale of hardness and a coating against which the edge of the tool is adapted to bear having a hardness above 8.5 in said scale.

11. In a device for sharpening the edge of a cutting tool, a chromium sharpening sur-

face portion against which the edge of said tool is adapted to bear.

12. In a device for sharpening the edge of a cutting tool, a chromium containing sharpening surface portion against which the edge of said tool is adapted to bear.

13. A razor comprising a handle including a head, a blade edging element within the head movable from a shaving position to a sharpening position, and a cam pivoted on the handle to move said element between the shaving position and the sharpening position and to lock said element in the shaving position.

14. A razor comprising a handle including a head, a blade holding member in the head, a blade edging element movable from a shaving position to a sharpening position, a pivoted stem to support said element, a link connecting the stem to the handle and having a cam surface, and a cam pivoted to the handle to engage said cam surface to move said element from the sharpening position to the shaving position.

15. A razor comprising a blade, a blade holding member including a rear portion, and a blade edging device movable from a lowered sharpening position to a raised shaving position and including a rear portion and a blade edging element, said rear portion of said device being adapted to engage said rear portion of said blade holding member, and said element adapted to engage said blade when in shaving position, whereby when the parts are in shaving position the blade is firmly held.

16. A razor comprising a blade, a blade holding member including a projecting rear portion, and a blade edging device movable from a lowered sharpening position to a raised shaving position and including a blade edging element adapted to engage said blade when in shaving position, and a rear portion grooved to receive the projecting rear portion of the blade holding member when in shaving position, whereby when the parts are in shaving position the blade is firmly held.

17. A razor comprising a blade, a handle, a resilient blade holding member mounted on the handle, and a blade edging device mounted on the handle and movable from a lowered sharpening position to a raised shaving position in which latter position parts of said blade edging device are adapted to press against parts of said blade holding member to firmly hold said blade holding member and said device and said blade in shaving position.

18. A razor comprising a blade, a handle, a resilient blade holding member mounted on the handle, and a blade edging device mounted on the handle and movable from a lowered sharpening position to a raised shaving position in which latter position

parts of said blade edging device are adapted to press against parts of said blade holding member, and means to force said blade edging device into the shaving position whereby said device and said blade holding member and said blade are firmly held in shaving position.

19. A razor blade sharpening instrument including a blade edging element relatively reciprocable with relation to and in contact with the edge of the blade, means for connecting the said element and instrument, and means for directing the reciprocating movement at a suitable angle oblique to the edge of the blade.

20. A razor blade sharpening instrument including a blade edging element relatively reciprocable with relation to the blade edge and in contact therewith, a handle, a support supporting said element and pivoted to the handle and so guided that the relative reciprocating movement is at a suitable angle oblique to the edge of the blade.

21. A razor blade sharpening instrument including a blade holding member and a blade edging element relatively reciprocable with relation to and in contact with the edge of the blade upon shaking the instrument, said element being articulately connected to the instrument and capable of movement to permit even contact between the edge of the blade and said element.

22. A razor blade sharpening instrument including a blade holding member, a blade edging element relatively reciprocable with relation to and in contact with the edge of the blade upon shaking the instrument and articulately connected to the instrument and capable of movement to permit even contact between the edge of the blade and said element, and means to limit the amount of said movement.

In testimony that I claim the foregoing, I have hereunto set my hand this 20th day of January, 1927.

HUGH DE HAVEN.