May 24, 1932. H. DE HAVEN 1,859,554

COMBINED RAZOR AND BLADE SHARPENER

Filed July 24, 1925

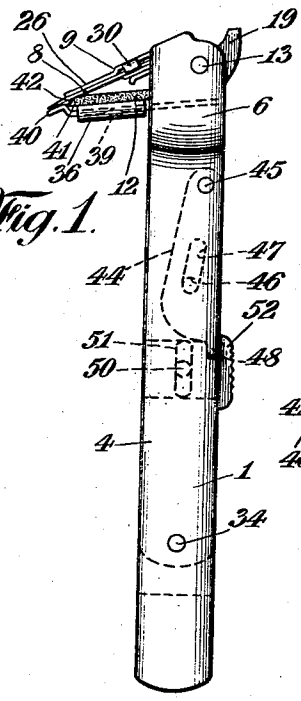


Fig. 1.

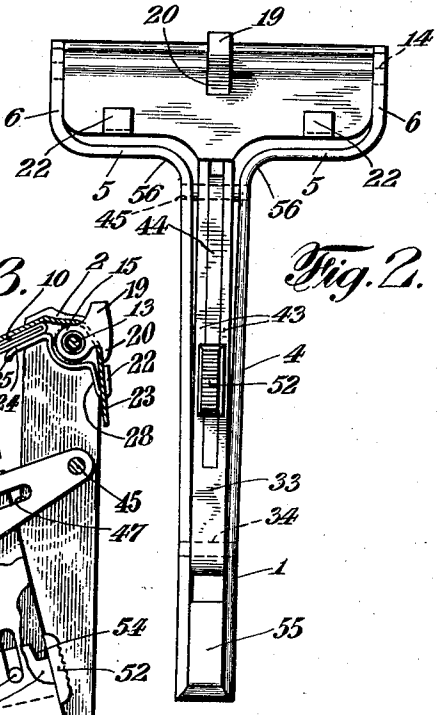


Fig. 2.

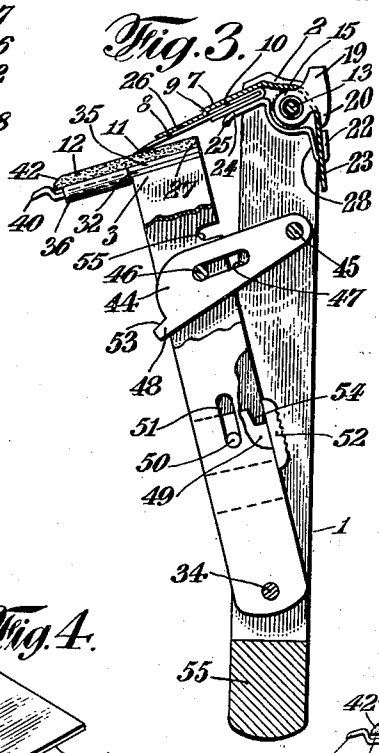


Fig. 3.

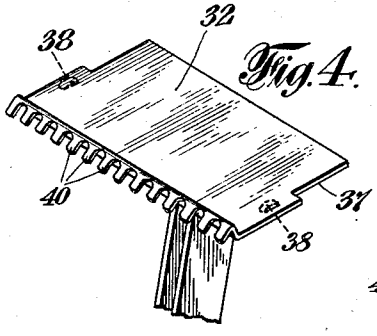


Fig. 4.

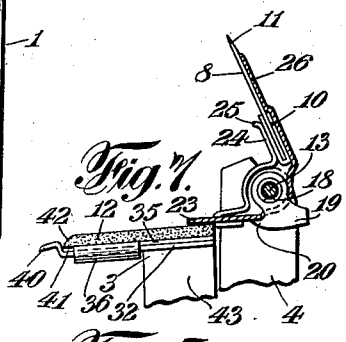


Fig. 7.

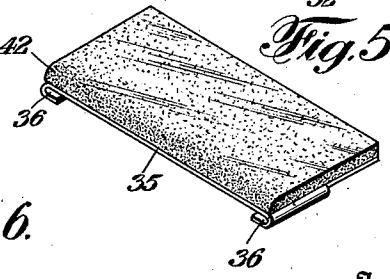


Fig. 5.

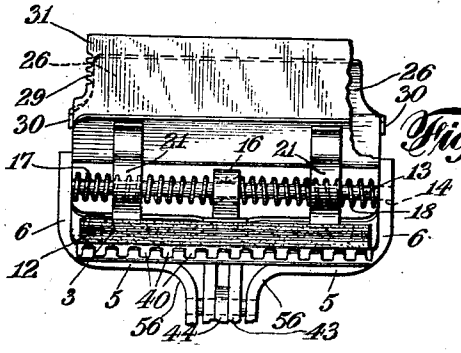


Fig. 6.

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UNITED STATES PATENT OFFICE

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COMBINED RAZOR AND BLADE SHARPENER

Application filed July 24, 1925. Serial No. 45,745.

This invention relates to self contained self sharpening safety razor which may be used, in addition to its use as a safety razor, to sharpen safety razor blades, and to a process which may be utilized in other devices to sharpen the cutting edges of various other cutting means.

One of the objects of the present invention is to disclose a sharpening instrument for razor blades and particularly one which operates upon shaking to sharpen a blade properly held within the instrument.

Another object of the invention is to disclose a razor and sharpening instrument in which the blade is rocked during sharpening to contact at different angles with a reciprocable sharpening element in order to give the edge of the blade a desirable contour.

A further object of the invention is to disclose a razor and razor blade sharpening instrument having a reciprocable blade edging element so arranged that upon reciprocation it sharpens the blade edge and the blade is rocked during sharpening.

A still further object of the invention is to disclose a process of sharpening a razor blade.

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

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

In the drawings:

Fig. 1 is a side elevation of a razor.

Fig. 2 is a rear elevation of the razor.

Fig. 3 is a longitudinal section through the razor.

Fig. 4 is a perspective of the guard plate forming a part of the razor.

Fig. 5 is a perspective of the blade edging element which fits on the guard plate and functions to sharpen the blade.

Fig. 6 is a front elevation looking into the head of the razor with the parts arranged as shown in Fig. 7 for removing the blade from its support.

Fig. 7 is a longitudinal section through Fig. 6.

The device illustrated is particularly designed to be used as a safety razor in which the blade can be sharpened without removing it from the razor and by the simple means of operating a catch, the parts of the razor can either be held in shaving position or be released for the purpose of sharpening the blade. Although the sharpening mechanism is intended primarily to keep a keen edge on the blade used for shaving, it will be seen that dull blades may be inserted in the device and sharpened.

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 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 support 2 comprises a blade holding plate 7 having its forward or blade engaging end so formed that it holds or assists in holding the razor blade 8. Although a blade of any rigidity may be used the blade shown is thin and flexible and to back it up the forward end of the blade holding member extends quite near the edge of the blade. As illustrated, the forward end of the blade holding member is formed with an angle 9 forming a recess behind it in which is seated the jacket 10 on the rear edge of the razor blade. It will of course be appreciated that the blade holding member may have any form desired to permit it to perform its function of holding any desired razor blade.

The blade holding member is so mounted in the head of the razor that the edge of the blade 11 may contact evenly with the surface of the blade edging element 12, and to that end the blade may have movement in every direction. It has been found convenient to mount the blade holding member

on a rod 13 which extends across the head of the razor between the arms 6. The rod may be loosely mounted in the openings 14 in the arms 6 or may be fastened therein so long as it does not fall away from the arms and let the blade holding member fall. The blade holding member may be mounted on the rod in any suitable manner, but preferably a collar 15 is fast to the blade holding member and serves to support the blade holding member on the rod 13. Preferably, although not necessarily, the opening through the collar is tapered, so that its smallest diameter is at 16 in the center of the collar. The collar, at its point of smallest diameter however, is preferably somewhat larger than the rod 13 to permit play between the rod and the blade holding member. It will thus be seen that with the parts constructed as just described the blade holding member is supported only at one point namely along the edge 16 of the opening through the collar and thus the member may have a rotary movement about the rod 13 as an axis and also the blade holding member may change its angular position with relation to the rod with the result that the blade may adjust itself to contact with equal pressure at all points along the line of contact with the blade edging element 12. Yielding tension means, illustrated as springs 17 and 18 cause the blade holding member to press the blade against the blade edging element 12. In the device as illustrated, the springs contact at their outer ends with the arms 6 and at their inner ends with the collar 15 and exert their force on the blade holding member through the collar. For convenience in lifting the blade and blade holding member from the blade edging element, there is a finger grip 19 which may be a part of the collar 15 and projects through the blade holding member into an exposed position. One edge 20 of the finger piece is preferably fastened to the outside of the blade holding member to assist in transmitting the pressure of the springs 17 and 18 from the collar 15 to the blade holding member. In the device as illustrated, springs 21 are fastened at one end to the rear extension 23 of the blade holding member and at the other end 24 contact with the jacket on the rear of the blade yieldingly to hold the blade against the blade holding member in the recess in back of the angle 9 of the blade holding member. The forward edge 25 of the end 24 of the springs is preferably turned down as illustrated, so that the blade may easily be slipped into and removed from its seat on the blade holding member.

The blade holding member is preferably made of resilient material and the rear end 23 of the member is formed at such an angle to the forward end 26 that when the parts of the device are in shaving position, as illustrated in Fig. 1, the rear edge 27 of the blade edging element exerts pressure against the rear end 23 of the blade holding member to assist the springs 17 and 18 in forcing the blade against the blade edging element. The parts 28 of the springs 21 are preferably so formed that they lie at an angle to the rear end 23 of the blade holding member and contact with the rear end 27 of the blade edging element when the parts of the device are in shaving position, thus causing the forward portions 24 of the springs to exert increased pressure against the rear of the blade in order securely to hold the blade in proper position on the blade holding member during shaving.

In order to facilitate the removal of the blade from the blade holding member, the sides of the blade are serrated as shown at 29 and the forward end 26 of the blade holding member is cut away opposite the serrations, so that the blade may firmly be grasped at its serrated sides and pulled from between the springs 21 and the blade holding member. To position the blade properly on the blade holding member, tabs 30 may be provided for abutting the sides of the blade and keeping it within the limits of the blade holding member. The corners of the cutting edge of the blade are rounded as is shown at 31 so that there is no sharp corner which might cut into the skin of the person using the razor.

The blade edging device, on the razor illustrated, includes a guard plate 32 and the blade edging element 12 which is removably supported on the guard plate. The blade edging element is reciprocable with relation to the blade and as a convenient means for obtaining the reciprocation the guard plate and thus the blade edging element, are carried by a stem 33 pivotally mounted by means of a pin 34 on the handle. The surface of the blade edging element which contacts with the edge of the blade is substantially flat and thus eccentric of the pivot pin 34 and therefore as it reciprocates about the pin as a pivot the blade contacts with the surface of the element at different angles whereby the blade is rocked as the blade edging element reciprocates. The effect of this rocking is to somewhat round the blade in back of the shaving edge thus giving the blade edge a convexly rounded cross-section instead of a concavely rounded section and tending to keep the blade edge smooth and free from wire.

The blade edging element may be fastened to the guard plate in any suitable manner, but it has been found convenient to removably support the blade edging element on the guard plate by cementing the element to a base plate 35 having resilient under turned lips 36 adapted to extend around the edges of the guard plate. In order to facilitate the removal of the blade edging element from the

guard plate, said plate is cut away at 37 so that the blade edging element need only be pulled backward a portion of the width of the plate before it and its associated base plate may be removed from the guard plate. To hold the blade edging element securely yet removably in place on the guard plate, the guard plate and lips may be provided with corresponding and cooperating protuberances and recesses 38 and 39 which seat one in the other and thus hold blade edging element properly positioned on the guard plate. Teeth 40 serve to guard the edge of the razor blade when the parts are in the shaving position illustrated in Fig. 1. These teeth may be and preferably are formed integral with the guard plate. The teeth stand up somewhat above the plane of the guard plate and may be used as an abutment to engage the forward edge of the blade edging element properly to position said element on the plate. Preferably however, the teeth stand only high enough above the plane of the guard plate to guard, but not contact with, the edge of the blade, and the blade edging element together with its base plate are just high enough so that when in the proper position on the plate they engage with the plate back of its edge to support the blade in proper position above the guard teeth. It is evident that by using blade edging elements of different thicknesses the edge of the blade will be supported at different heights above the guard teeth and thus, by using a thick element the blade edge may be so positioned with relation to the guard that a close shave is obtained while if a thin element is used the blade will be so positioned that a light shave is obtained.

The blade edging element may be of any suitable material which is hard enough to permit the edge of the blade to move over it in opposite directions without cutting into the element. High polished steel, china, and glass are some of the materials which are deemed satisfactory for use as blade edging elements. Glass has proven to be satisfactory for the reason, among others, that it is very hard and capable of being used either when highly polished or when slightly roughened. It will be appreciated that the effect of a highly polished surface is to smooth off and polish the edge of the razor blade and the effect of a slightly roughened surface is to abrade the edge of the blade and eradicate small nicks which from time to time may appear in the edge. It is contemplated to provide several blade edging elements of varying degrees of roughness and polish for use with a razor in order that a blade, when dull, may be ground on the rough element and smoothed off on the polished element. A light lubricant on the polished glass assists in the movement of the blade on the surface and beneficially affects the edge of the blade. A suitable grinding compound such as a mixture of diamantine and rouge may be used on either the rough or polished blade edging elements to give a quick abrading action. The surface of a blade edging element may even be provided with fine lines or cuts 41 to assist in holding the polishing material or to roughen the surface so that the edge of the blade will be ground down more quickly. In order that the edge of the blade may smoothly pass over the forward edge 42 of the blade edging element, said edge is rounded.

The following described parts and arrangement thereof are provided to limit the stroke of reciprocation of the blade edging element and to hold the various parts of the razor in shaving position.

The upper part of the stem 33 is preferably made with two prongs 43 which provide space between them for the movement of a link 44 which serves to limit the stroke of reciprocation of the guard plate and blade edging element. As is clearly shown in Fig. 3 the link is pivoted on a pivot 45 passing through the upper parts of the upright portions 4 of the handle. The link is connected with the stem by means of the pin 46 which operates in the slot 47 in the link. As will clearly be understood, any length stroke may be obtained by properly positioning the pin 46 and lengthening or shortening the slot 47.

For securely holding and locking the parts of the razor in the shaving position illustrated in Fig. 1, the link 44 is provided with a projection 48 which cooperates with a latch 49 movably mounted on the stem and preferably positioned between the prongs 43. A pin 50 passing through the body of the latch and cooperating with slots 51 in the prongs 43 of the stem holds the latch on the stem and permits it to move longitudinally of the stem into and out of engagement with the projection 48 of the link. The thumb piece 52 facilitates the movement of the latch and also assists in holding the latch in proper position on the stem. To force the parts of the razor into the shaving position the projection 48 on the link is beveled on one face 53 and the recess in the body of the latch is beveled on the face 54 for cooperation with the beveled face 53 on the link. It will thus be seen that when the projection 48 is seated in the recess on the latch, a movement of the body of the latch toward the link causes a wedging action between the faces 53 and 54 causing a leverage action resulting in a great deal of pressure being exerted by the rear end 27 of the blade edging element against the parts 28 of the springs 21 and through the springs against the rear end 23 of the blade holding member with the result that the ends 24 of the springs 21 firmly press the jacket of the rear end of the blade into its seat on the blade holding member and

the forward portion of the blade holding member firmly presses the blade against the forward edge 42 of the blade edging element. The indentation 55 in the stem receives the pivot 45 and permits the stem to move rearwardly sufficiently for the full wedging action just described to take place.

It may be desirable to construct a razor of this type so that the blade edging element is capable of a side movement during its forward and backward reciprocation in order that the relative motion of the blade and blade edging element may be similar to the motion of a razor over a honing stone when a razor is honed by hand. For this purpose the stem is loosely mounted on the pivot pin 34 and the connecting bends 56 between the upright portions 4 and the upper parts 5 of the handle are appreciably spaced from the adjacent prongs 43 of the stem. The upright portions 4 of the handle taper from the bends toward each other as they approach the pivot pin 34. The blade edging element is preferably of such a width that it does not contact with the upwardly extending arms 6. The blade used in the razor is consequently preferably of such a dimension along its edge that all parts of the edge contact with the surface of the blade edging element even though the blade edging element moves to the limit of its permissible side movement. The combined forward and backward reciprocating and side movement will almost inevitably take place when the razor is shaken for sharpening the blade, because it is practically impossible for the human hand to shake the razor in such manner in two successive shakes that the blade edging element will take the same path and it is also practically impossible that the blade edging element will have a straight forward and backward reciprocation without some side movement.

A feature of that form of the razor herein described is that after the blade has been placed in the blade holding member and lowered into contact with the blade edging element, such contact is continuous except when the blade is purposely raised from the element as when a new blade is inserted or the blade is raised for the purpose of turning it over to sharpen the other side. It will be seen from an inspection of Figs. 1 and 3 of the drawings that when the parts are in the sharpening position shown in Fig. 3, the edge of the blade is in contact with the flat surface of the sharpening element and that when the parts are in shaving position as shown in Fig. 1, the rounded edge of the blade edging element contacts with the blade in back of the blade edge to support the blade in proper position relative to the guard teeth. When the parts are in shaving position the blade and rounded edge of the blade edging element are in engagement throughout their entire line of contact with the result that when the razor is used for shaving the lather passes from the edge of the blade through the guard teeth on to the lower side of the guard plate and therefore none of the lather collects upon the surface of the blade edging element to contaminate the mixture of rouge and diamantine which may be on the surface of said element for sharpening the edge of the blade. The lather may easily be removed by moving the blade edging element from the shaving position shown in Fig. 1 to the extended position shown in Fig. 3. Since the blade contacts with the forward edge 42 of the blade edging element, all of the lather will be scraped from the blade and, with the parts in the position shown in Fig. 3, the lather may easily be washed from the razor because the blade is out of the way and there is nothing to hold the lather and to prevent it from being washed away.

The normal positions of the parts of the razor are of course the shaving positions with the blade edging element normally lying under and in back of the edge of the razor blade. When the blade is being sharpened, however, the blade edging element moves on its pivot from its normal or retracted position within the head to an extended position in advance of the shaving edge thereby rocking the blade. When the blade edging element moves from its extended position to its normal or retracted position, the rounded edge 42 of the element is said to move against and beyond the edge of the blade while in contact therewith and it is obvious that upon such movement the blade edge is the first part thereof to pass off of the element over the smoothly rounded edge. This is important because it prevents the edge of the blade being bent as would happen if the edge of the blade were the last part to pass off of the edge of the element; thus the edge of the blade always retains the position which is given to it by the edging surface of the blade edging element.

The operation and use of the razor is quite simple and effective. In order to place a blade in the razor the parts are brought into the position shown in Fig. 7 with the rear end 23 of the blade holding member resting on a rear edge 27 of the blade edging element. To bring the parts into the position shown in Fig. 7, the latch 49 is lowered from the position shown in Fig. 1, whereupon the resiliency of the parts 28 of the springs 21 will throw the blade edging device slightly forward. The finger grip 19 is then pressed downwardly to raise the cap. The rear end 23 of the blade holding member will move forwardly and will engage the back of the prongs 43 of the stem to move the blade edging element farther to the front of the razor so that if the finger of the person who is opening the razor should slip off of the finger grip 19, the blade edging element will be in position to

catch the blade when the blade holding member snaps downwardly under the influence of the springs 17 and 18. In other words, whenever the blade holder is open, the blade edging element and not the guard teeth 40 is in a position to catch the edge of the blade if the blade holder should accidentally snap downwardly. As the finger grip 19 is pressed downwardly, the rear end 23 of the blade holding member gradually rises upwardly until it can slip over the top of the blade edging element, as is shown in Fig. 7. The blade holding member will remain fixed in the open position shown in Fig. 7, so that the blade may easily be cleaned without removing the blade from the blade holding member. To insert the blade the operator then forces the rear edge of a blade between the blade holding member and the ends 24 of the springs 21. The blade edging element is then moved into the position shown in Fig. 3 by lowering the blade holding member until the edge of the blade contacts with the surface of the blade edging element. If it is then desired to polish the edge of the blade the handle may be grasped at the lowest or solid portion 55 and the razor shaken in such manner that the blade edging element reciprocates in contact with the edge of the blade. The fact that the blade edging element is unbalanced due to the weight of the guard plate and the blade edging element and freely moving renders it easily reciprocable on shaking. If the razor is made to permit side movement of the blade edging element the razor may purposely be shaken so that there is a sidewise as well as forward and backward movement, but as previously stated the sidewise movement occurs almost inevitably with the usual shaking. If desired, after sharpening one side of the blade edge, the blade may be removed and turned over and again inserted in the blade holding member after which the razor may be shaken to polish the other side of the edge. For shaving, the blade edging element is pressed back into the head of the razor until the rear edge of the blade edging element contacts with the parts 28 of the springs 21 at which time the projection 48 of the link 44 will be above and ready to seat in the recess in the latch 49. The latch 49 is then removed from the position shown in Fig. 3 to the position shown in Fig. 1, thereby causing the wedging action of the surfaces 53 and 54 to hold securely the parts of the razor in shaving position as outlined above.

Although a particular and preferred form of the invention, namely, a razor of particular construction, has been described it is to be understood that the description is only one form of the invention and is set forth to enable the invention better to be comprehended. It is therefore desired that the invention be construed as broadly as the statements in the several claims taken in conjunction with the prior art may allow.

I claim:

1. A razor comprising a razor blade, a blade edging element having a flat surface portion upon which the blade may move in opposite directions, said element being mounted upon the razor for reciprocation relatively to the blade.

2. A razor comprising a razor blade, a blade edging element having a hard flat surface portion upon which the blade may move in opposite directions, said element being reciprocably mounted upon the razor.

3. A razor comprising a handle, a razor blade mounted on said handle, a guard plate arranged below said blade and movable with respect to said blade, and a blade edging element removably mounted on the guard plate.

4. A razor comprising a handle, a razor blade mounted on said handle, a blade edging element having a flat surface portion in contact with the edge of the blade and a pivot out of the plane of said surface upon which said element is mounted.

5. A razor comprising a handle, a razor blade mounted on said handle, a blade edging element having a flat surface portion in contact with the edge of the blade, a pivot out of the plane of said surface upon which said element is mounted and means for pressing the edge of the blade against said surface.

6. A razor comprising a blade and a blade edging element operatively associated, said element having a flat surface portion of blade edging material for contact with said blade.

7. In a safety razor, a blade edging device including a guard plate and a blade edging element removably mounted on the guard plate.

8. In a safety razor, a combined guard and flat razor blade sharpening element.

9. A razor comprising a blade, a blade holding member, a movable guard, and a blade edging element positioned to support the edge of the blade above the guard during shaving.

10. A razor comprising a blade, a blade holding member, a movable guard, and a blade edging element movable with the guard and positioned to support the edge of the blade above the edge of the guard during shaving.

11. A razor comprising a blade, a blade holding member, a movable guard and a blade edging element positioned to support the edge of the blade adjacent but spaced from the guard during shaving.

12. A razor comprising a blade having a shaving edge, means to hold said blade, a flat blade edging element mounted to contact with said blade and normally to lie under the blade and back of the edge thereof, said device being capable of movement from

its normal position to a position in advance of the shaving edge.

13. A razor comprising a blade having a shaving edge, means to hold said blade, a flat blade edging element pivotally mounted to contact with said blade, and normally to lie under the blade and back of the edge thereof, said device being capable of movement on the pivot from its normal position to a position in advance of the shaving edge, while in contact with the blade whereby rocking of the blade on the element is effected by the movement of the element.

14. In a razor having a blade, a flat reciprocable blade edging element associated therewith and means for pressing the edge of the razor blade against the element.

15. A razor mount having a flat blade edging element mounted thereon.

16. A razor mount having a flat hard surfaced blade edging element mounted thereon.

17. A razor comprising a blade, means for supporting the blade during shaving and a flat reciprocable hard surfaced blade sharpening element mounted on the razor.

18. A razor comprising a blade having a shaving edge, a blade edging element associated with the razor to sharpen said edge, and a blade supporting means including a blade holding member, and a rod on which said member is loosely pivoted whereby the blade and blade holder may automatically adjust themselves to the edging element while the blade edge is in contact with said element.

19. A razor having a blade, and having a blade edging element presenting a smoothly rounded edge mounted for movement against and beyond the edge of the blade in contact therewith whereby upon movement of the element against the blade edge said blade edge passes off of the element over said smoothly rounded edge.

20. A razor comprising a handle, a blade holding member, a blade edging element associated therewith, a pivoted stem to support said element, and a link connecting the stem to the handle.

21. A razor comprising a handle including a head, a blade support in the head, a blade edging element movable from an extended position to a retracted position, a pivoted stem to support said element, a link connecting the stem to the handle and having a projection and a latch on the stem for engagement with said projection to hold the blade edging element in retracted position.

22. A razor comprising a handle including a head, a blade support including a resilient blade holding member, a blade edging device movable from an extended position to a retracted position within the head, said device when in a retracted position exerting pressure against a part of said member to force another part of said member toward said device.

23. A razor comprising a handle including a head, a blade support including a resilient blade holding member, a blade edging device movable from an extended position to a retracted position within the head, said device when in fully retracted position exerting pressure against a part of said member to force another part of said member toward said device and means for wedging said device into fully retracted position.

24. A razor comprising a blade holding member, resilient means for holding a blade in position on said member, a blade edging device movable from an extended to a retracted position, said device when in a retracted position exerting pressure against said means more tightly to hold the blade in position on the member.

25. A razor including a blade, and means to clean the edge of the blade normally lying in back of the blade edge and contacting with the blade along a line in back of the blade edge, said means being movable relatively to the blade from its normal position to a position in advance of the blade edge while in contact therewith, to clean said edge.

26. A razor including a blade, a guard for the edge of the blade, and means to support the edge of the blade spaced from the guard during shaving, said means being movable relatively to and in contact with the edge of the blade, to clean the edge of the blade.

27. A razor including a blade, a guard for the edge of the blade, and means, to clean the edge of the blade, normally lying in back of the blade edge, said guard and said means being connected to move together, said means being movable relatively to the blade from its normal position to a position in advance of the blade while in contact therewith, whereby the lather is scraped from the edge of the blade and may be washed from the guard without interference from the blade.

28. In a safety razor, a blade edging device including a guard plate and a blade edging element removably mounted on the guard plate and positioned to support the edge of the blade adjacent to and a predetermined distance from the guard during shaving.

29. A safety razor including a blade, a guard for the blade and a blade edging element removably mounted on the razor and positioned to support the edge of the blade adjacent to the guard during shaving.

30. In combination, a razor blade, a blade sharpening element reciprocable relatively to and in contact with the blade, means for holding the blade and sharpening element in contact, and means whereby relative reciprocation of the blade and element may be caused to take place, such means including means for causing the angle of contact of the blade and element to change during such reciprocation.

31. In combination, a razor blade, a blade sharpening element reciprocable relatively to

and in contact with the blade, means for holding the blade and sharpening element in yielding contact, and means whereby relative reciprocation of the blade and element may be caused to take place, such means including means for causing the angle of contact of the blade and element to change during such reciprocation.

In testimony that I claim the foregoing, I have hereunto set my hand this 17th day of July, 1925.

HUGH DE HAVEN.