June 25, 1929. H. DE HAVEN 1,718,219

RAZOR

Original Filed June 17, 1924 2 Sheets-Sheet 1

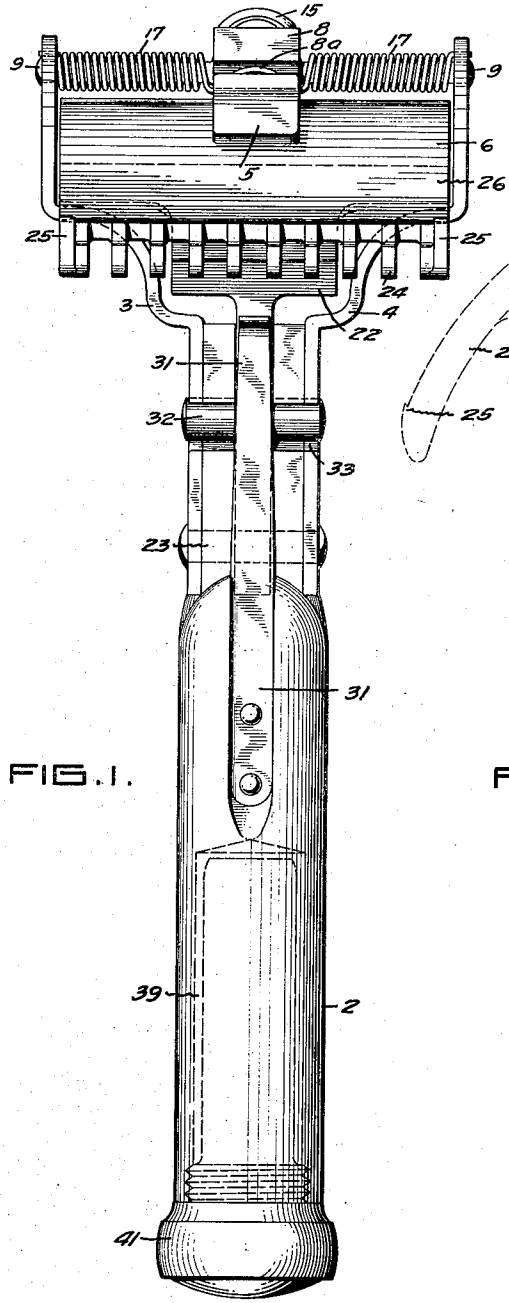


FIG. 1.

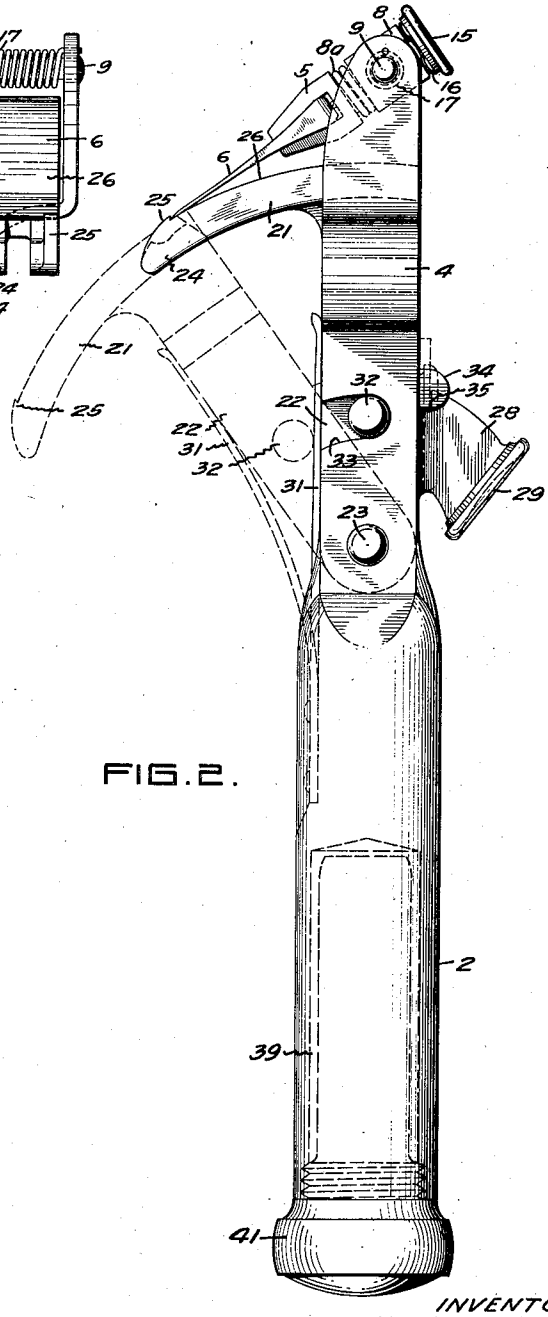


FIG. 2.

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RAZOR

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FIG. 3.

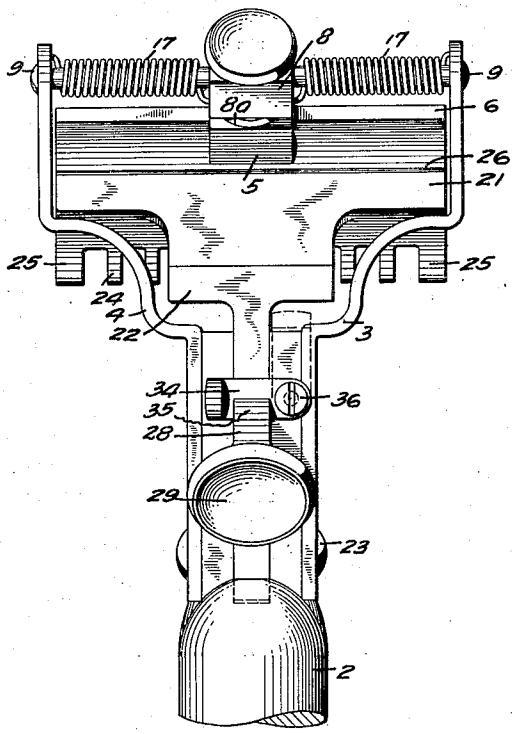


FIG. 4.

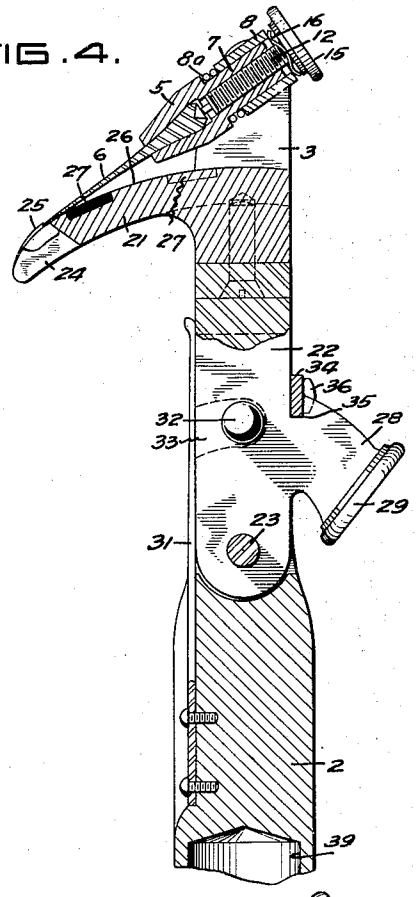


FIG. 5.

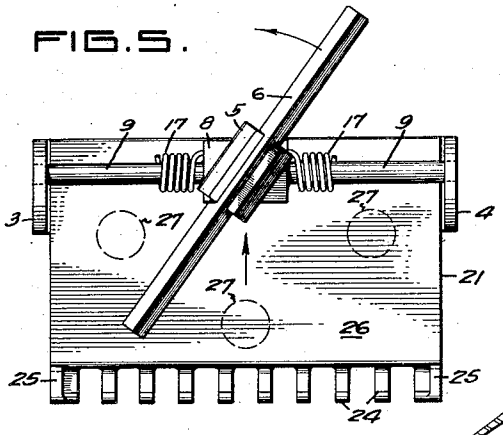
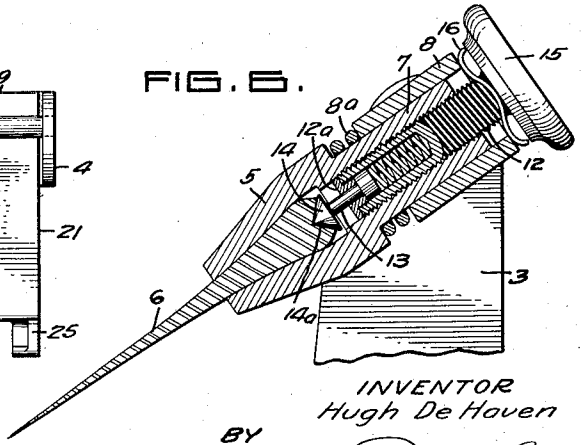


FIG. 6.



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UNITED STATES PATENT OFFICE.

HUGH DE HAVEN, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO DE HAVEN RAZOR CORPORATION, A CORPORATION OF DELAWARE.

RAZOR.

Application filed June 17, 1924, Serial No. 720,564. Renewed December 20, 1926.

The invention relates to razors and particularly to safety razors.

An object of the invention is to provide a self-sharpening safety razor.

Another object of the invention is to provide a safety razor containing means for honing or edging the razor blade.

Another object of the invention is to provide a safety razor with a blade-edging device of such character that it may be reciprocated in contact with the blade toward and away from the edge of the blade.

A further object of the invention is to provide a self-honing safety razor in which the razor blade may be readily reversed to grind both sides of the blade.

A further object of the invention is to provide a self-sharpening safety razor, which may be readily and substantially instantaneously changed from sharpening condition to shaving condition.

The invention possesses other advantageous features, some of which, with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of my invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings I have shown one form of razor embodying my invention, but it is to be understood that I do not limit myself to such form, since the invention, as set forth in the claims, may be embodied in a plurality of forms.

Referring to said drawings, which are on an enlarged scale, approximately twice the actual size of the razor:

Figure 1 is a front elevation of the razor with the parts in shaving position.

Figure 2 is a side elevation of the razor with the parts in shaving position, the position of the parts during the blade sharpening operation being shown in broken lines.

Figure 3 is a rear elevation of the upper portion of the razor.

Figure 4 is a vertical section through the upper portion of the razor.

Figure 5 is a view of the upper portion of the razor, showing the razor blade being turned over.

Figure 6 is a detail of the razor blade and its holder, showing the means for centering the blade in the holder.

Safety razors have heretofore been produced which were constructed so that the blade in the razor might be stropped without removing the blade from the razor. The stropping of a razor does not actually sharpen the edge of the razor but causes the minute jagged portions of the edge of the razor to become alined, so that the razor cuts better. After a period of use, however, the razor blade must be ground or honed to produce a new edge and this edge must be frequently stropped thereafter to maintain the jagged portions of the edge in alinement. The action of the honing is a grinding operation, but I have found that commercial hones are so coarse in texture that stropping is required after honing, in order to place the desired cutting edge on the razor. I have provided a razor in which the blade is ground or is subjected to abrasive action to sharpen the edge of the blade, but I use an abrasive material which is much finer in texture than the hones which I have been able to obtain, so that the edge produced by the grinding or edging surface of my invention is very sharp and smooth. Heretofore, as far as I am aware, no safety razor has been provided with a blade edging device over which the blade might be moved forward and backward for the purpose of improving the edge of the blade. In stropping devices, the blade is always moved backward over the strop, since a forward movement of the blade would cause cutting of the strop and injury to the edge of the blade. I provide an edging surface of such character that the blade may be reciprocated back and forth over the surface without injury to the blade or to the surface. This is accomplished without removing the blade from the razor, so that the blade may be sharpened at any time during its use without removing the blade from the razor. The razor of my invention comprises a handle 2 which is provided at its upper end with a fork consisting of the two arms 3 and 4, providing what may broadly be termed a blade supporting frame. Disposed between the arms 3 and 4, which form the upper portion of the handle, is a holder 5 for the razor blade 6. The holder 5 in the present instance, is formed with a slot of increasing width toward the base of the holder, to accommodate the beveled razor blade 6. The holder 5 is provided with a hollow stem 7 which extends through a bearing

member 8 which is mounted on the cross rods 9, so that the holder may be moved about the axis of the rods 9 as a center. By virtue of the rotational mounting of the stem 7 in the bearing member 8, the holder 5 may also be rotated for the purpose of turning the blade over. The blade holder is mounted so that it may be adjusted back and forth, to adjust the angle of inclination of the blade with respect to the edging surface and to position the edge of the blade with respect to the edge of the guard. Surrounding the stem 7 of the holder and interposed between the holder and the bearing member 8 is a relatively stiff coiled spring 8^a which permits longitudinal adjustment of the stem in the holder. Extending into the hollow stem 7 is a screw 12 provided on its outer end with a head 15, between which and the bearing member 8 there is arranged a coiled spring or spring washer 16. Rotation of the head 15 will cause movement of the stem 7 with respect to the bearing member. The upper part of the razor may be termed the head.

Means are provided for centering and securing the blade 6 in the holder. The screw 12 is provided with a socket, partially closed at the forward end by a nipple 12^a and extending through the nipple is a plunger 13 provided on its end with a conical head 14 adapted to seat in a V-shaped groove 14^a formed in the back edge of the razor blade. By virtue of this mounting the razor blade may be moved about an axis parallel to the cutting edge of the blade, may be shifted back and forth and may also be moved about an axis perpendicular to the cutting edge of the blade, so that the blade may be raised and turned over without removing it from the holder. The blade is normally pressed downward at its outer edge by the spring 17 engaging the arms 3 and 4 and the bearing member 8, and the pressure of the blade against the edging surface may be varied by varying the tension of the spring 17.

Pivoted to the handle below the arms 3 and 4 is a combined guard device, shown as a guard plate and razor blade edging device. This device comprises a guard plate 21 having a downward extension or stem 22 which is connected to the handle by the pivot 23 and which forms a support for the edging device. As shown in the drawings the inner surface of the lower portions of the arms 3 and 4 are preferably flat and the sides of the support 22 are also flat in order that as the support moves in and out between the arms it is guided by the arms so that the edging device is steadied in its movement and is not permitted to wobble. It is of course evident that if the pivot 23 fits snugly in the holes provided for it in the arms and in the support, wobbling of the edging device is also prevented by the fit of the parts. The guard plate 21 is provided at its forward edge with a plurality of guard teeth 24 of any suitable construction and at the sides with abutments 25 which form stops for engagement with the cutting edge of the blade, to properly position the blade on the guard plate. The guard plate is provided with a curved upper surface 26 which is concentric with the pivot 23, and the blade 6 is preferably disposed substantially tangential with respect to the surface 26 so that the blade and surface contact at all times at the angle which will sharpen the blade when the edging device is moved. While the pivot 23 may be placed at any suitable point on the handle it is preferably placed as low as possible so that the curvature of the surface of the edging device is on a relatively large radius which, when the edging device is operated, gives the edge of the blade a fine taper resulting in a thin keen edge. Means are provided for oscillating the guard plate 21 to move the blade edging surface back and forth under the edge of the blade for the purpose of sharpenig the blade. The surface 26 of the guard plate is preferably formed of a blade edging material of such fineness that the razor blade will require no stropping after it has been sharpened by the edging surface 26. I prefer to make the guard plate 21 of aluminum which is preferably polished and to coat the surface 26 thereof with a very fine abrasive such as a mixture of jeweler's rouge and diamondtine, or other extremely finely divided abrasive, these materials being mixed together with a suitable binder, such as vaseline, and applied to the surface 26. For the purpose of maintaining a supply of this compound on the surface 26, the surface is preferably provided with several indentations 27, which become filled with the compound and from which the supply is drawn for maintaining a coating of the compound on the surface. The guard plate 21 is reciprocated back and forth under the blade, and the blade is given a perfect shaving edge by this operation. When desired the blade may be raised and turned over, so that both faces of the blade may be subjected to the abrasive or grinding or edging action.

The extension 22, which forms part of the guard plate 21, is provided with a curved stem 28, projecting from the rear side of the handle, and this stem is provided on its end with a thumb piece 29, by which the guard plate 21 may be moved forward under the razor blade. The reciprocation of the guard plate 21 and the abrasive surface 26 may also easily be accomplished by shaking the razor because of the construction thereof, as the weight of the plate 21 and the fact that it is on the end of the stem 22 renders the combined plate and stem unbalanced whereby by grasping the lower end of the handle and shaking the instrument, the edging device may be reciprocated to sharpen the blade. The forward movement of the plate is limited

by the underside of the thumb piece coming into contact with the rear face of the handle. The guard plate 21 may be reciprocated in any desired manner and in the present drawings I have shown a flat spring 31 arranged to move the guard plate backward towards its normal position. This spring is attached at its lower end to the handle below the pivot 23 and bears against the extension 22 above the pivot, acting to return the guard plate to normal or shaving position in the head of the razor under the blade after it has been moved forward by pressure against the thumb piece 29. Backward movement of the guard plate is limited by the pin 32 seating in the slot 33 in the handle. Means are also provided for locking or securing the guard plate 21 in position with respect to the handle. One form of means for accomplishing this result may comprise a latch 34 pivoted to the rear side of the handle and adapted to fall into a notch 35 on the stem 28. The latch is pivoted on a screw 36, which is preferably adjustable so that it serves as an adjustable stop for the thumb piece 29, thus permitting adjustment of the stroke of the edging device.

The lower portion of the handle is preferably formed with a socket 39 therein to receive a tube or stick of the abrasive material which is applied to the surface 26. The socket is closed at its lower end by a suitable cap 41.

Normally the razor is in the position indicated in full lines in Figure 2 and, when it is desired to sharpen the blade, the latch 34 is raised and by applying pressure against the thumb piece 29, or by shaking the razor the guard plate 21 is reciprocated, reciprocating the curved, abrasive surface 26 under the edge of the blade and thereby putting a new edge on the blade. When it is desired, downward pressure may be exerted on the head 15 for the purpose of raising the blade from the surface 26 and the blade may then be turned over, as shown in Figure 5, so that the other side of the blade is brought in contact with the edging surface 26. After the edging surface has been reciprocated a sufficient number of times to put the proper edge on the blade, the latch 34 is replaced and the razor is in condition to be used for shaving. When the blade edging device moves from the extended position, shown in dotted lines in Fig. 2, to the retracted or shaving position shown in full lines it may be said to move against and beyond the edge of the blade. Since the blade is pressed down on the surface of the edging device, the edge of the blade and the edging device, or rather the surface thereof, are in contact during such movement. Due to this movement of the edging device against the edge of the blade, said edge is the first part of the blade to pass off of the edging device and thus said device is never withdrawn from under the edge of the blade in such a manner that the edge of the blade is curled or bent. The result of the operation of the blade edging device and the associated parts of the razor is that the edge of the blade always remains in the position given it by the edging device. When desired, the razor blade may be lifted from the abrasive surface, on the back stroke of the abrasive surface, by pressing downward on the head 15, so that the blade is given a stropping only. Due to the fact that the blade is pivotally supported at its center, it is free to adjust itself so that the entire edge of the blade bears evenly against the abrasive surface.

It is recognized that many changes may be made in the structure of the device disclosed herein without departing from the spirit of the invention and it is desired that the invention be construed as broadly as the claims, taken in conjunction with the prior art, may allow. Notice is hereby given that certain features allied to the invention claimed herein are claimed in my copending application, Serial No. 45,745.

I claim:

1. A razor comprising a blade having a shaving edge, a blade support, and means for contact with said edge and operable upon shaking the razor to sharpen the edge.

2. A razor comprising a blade having a shaving edge, a blade support, and an unbalanced blade edging device mounted on the razor for contact with said edge and operble upon shaking the razor to sharpen the edge.

3. A razor comprising a blade having a shaving edge, a blade edging device reciprocable upon shaking the razor, and a blade holder capable of movement to permit an even contact between the edge and said device whereby upon shaking the razor the edge of the blade is sharpened.

4. A razor comprising a blade having a shaving edge, a blade support, and a blade edging device reciprocable upon shaking the razor and operative to operate upon said blade when the latter is substantially in shaving position.

5. A razor comprising a blade, a blade support, a blade edging device mounted for continuous contact with said blade and operable upon shaking the razor to sharpen the blade.

6. A razor comprising a blade, a blade edging device reciprocable transversely of the blade edge and mounted for continuous contact with the blade and means to hold said blade in contact with said device.

7. A razor comprising a handle, a razor blade edging device having a hard surface upon which a razor blade may move in opposite directions while in contact therewith, said device being reciprocably mounted upon the handle and means for reciprocating said device.

8. A razor comprising a razor blade, a blade edging device having a hard curved surface arranged below and in contact with the edge of the blade, said blade being substantially tangential to said surface and in continuous contact therewith and means for reciprocating the surface with respect to the blade while maintaining the blade in tangential position with respect to the curved surface.

9. A razor comprising a handle, a razor blade mounted on said handle, a guard plate arranged below and in contact with said blade and movable with respect to said blade and a blade edging surface on the guard plate.

10. A razor comprising a handle, a razor blade mounted on said handle, a guard plate having a curved upper surface arranged below the blade and in contact with the edge of said blade, said blade being substantially tangential with respect to said surface, said surface being formed of blade edging material and means for reciprocating the guard plate with respect to the razor.

11. A razor comprising a handle, a razor blade mounted on said handle, a guard plate having an curved upper surface arranged below the blade and in contact with the edge of the blade, a pivot concentric with said surface on which said guard plate is mounted, said surface being formed of blade edging material and means for reciprocating the guard plate with respect to the razor.

12. A razor comprising a handle, a razor blade mounted on said handle, a guard plate having a curved upper surface arranged below the blade and in contact with the edge of the blade, said surface being formed of blade edging material, means for pressing the edge of the blade against said surface and means for reciprocating the guard plate with respect to the blade while maintaining the edge of the blade in continual contact with said surface.

13. A razor comprising a handle, a razor blade mounted on said handle, a guard plate having a curved upper surface of blade edging material pivoted to said handle and disposed below the blade and in contact with the edge thereof, said surface being concentric with said pivot, means for pressing the edge of the blade against said surface and means for reciprocating the guard plate to sharpen the edge both on the forward and backward stroke of the guard plate.

14. A razor comprising a handle, a razor blade mounted on said handle, a guard plate having a surface of blade edging material arranged in contact with the edge of the blade, said guard plate being reciprocable while in contact with the blade edge and means for preventing relative movement of the blade and guard plate.

15. A razor comprising a handle, a razor blade mounted on said handle, a guard plate having a surface of blade edging material pivoted to the handle with the surface in contact with the edge, said guard plate being reciprocable to sharpen the blade on its forward and backward strokes and means for preventing movement of the guard plate with respect to the handle.

16. A razor comprising a handle, a guard plate pivoted to said handle, a surface of razor blade edging material on said guard plate, means for reciprocating the guard plate and means for securing the guard plate to the handle.

17. A razor comprising a handle, a razor blade holder mounted on the handle, a blade in the holder, a blade edging device mounted on the handle and reciprocable with respect to the holder and means for pressing the holder toward said device to maintain the razor blade edge in constant contact with the device during reciprocations thereof.

18. A razor comprising a handle, a guard plate on the handle and a surface of razor blade edging material on the guard plate.

19. In a safety razor, a guard plate having a surface of razor blade edging material.

20. In a safety razor, a combined guard plate and razor blade sharpener.

21. In a safety razor, a guard plate having its upper surface covered with a razor blade edging material.

22. In a safety razor, a guard plate having an indented upper surface and razor blade edging material filling the indentations and covering the upper surface.

23. In a safety razor, a guard plate having a honing surface.

24. A razor comprising a blade, a holder therefor, a blade edging device, a guard movable with said device and means for holding said blade in shaving position with respect to said guard.

25. A razor comprising a blade having a shaving edge, means to hold said blade, and a blade edging device 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.

26. In a razor having a blade, a blade edging device mounted for movement to sharpen the blade while in contact therewith and for supporting the blade while in shaving position.

27. In a razor having a blade, a movable blade edging device mounted to contact with the edge of the blade during sharpening and to contact with the blade in back of the edge to support the blade during shaving.

28. In a safety razor, a slightly curved blade sharpening surface, means for pressing the edge of the razor blade against said sur-

face and means for moving the surface with respect to the blade while it is in pressure contact with the blade.

29. A razor comprising a blade having a shaving edge, a blade edging device to sharpen said edge, and a blade holder capable of universal movement to permit an even contact between the edge and said device.

30. A razor comprising a blade having a shaving edge, a blade edging device to sharpen said edge, a blade holder capable of universal movement to permit an even contact between the edge and said device during sharpening, and means to hold the blade rigid during shaving.

31. A razor comprising a blade having a shaving edge, a guard therefor, a blade edging device to sharpen said edge, a blade holder capable of universal movement to permit an even contact between the edge and said device during sharpening, and means to position the blade parallel to the guard during shaving.

32. In a safety razor, a razor blade, a reciprocable blade edging device in contact with said blade, and means for adjusting the stroke of reciprocation.

33. In a safety razor, a guard plate having a guard edge, a blade edging surface on said plate and means for adjusting the position of the edge of the blade with respect to said guard edge.

34. In a safety razor, a guard plate having a guard edge, a blade edging surface on said plate, a razor blade in contact with said plate, means for reciprocating the plate with respect to said blade and means for adjusting the position of the blade edge with respect to the guard edge.

35. A razor comprising a blade, a support for the blade, a blade edging device adapted for use with an abrasive material and means associated with said support for carrying a supply of the abrasive.

36. A razor comprising a blade having a shaving edge, a holder for said blade, a reciprocable blade edging device of a size to contact with the edge of the blade substantially throughout its entire length, and means to center the blade with respect to said device.

37. A razor comprising a blade, means to hold said blade, a blade edging device movable from a retracted position to an extended position, and means for holding the device in retracted position.

38. In a safety razor, a plate having a guard edge, a blade edging surface on the plate behind the guard edge, a razor blade and means for pressing the edge of the blade against the plate.

39. A razor comprising a blade, a blade edging device movable from a retracted to an extended position and means forming a part of the razor structure to hold the blade in yielding contact with said device.

40. A razor having a blade, and having a blade edging device mounted for movement against and beyond the edge of the blade in contact therewith whereby the edge of the blade is the first part thereof to pass off of the sharpening device.

41. A razor having a blade, and having a reciprocating blade sharpening device mounted for movement against and away from the edge of the blade while in contact therewith, said device having such a stroke that the edge of the blade does not pass off of the sharpening device except upon movement of the device against the edge of the blade.

42. A razor comprising a handle having at one end an arm presenting a guiding surface, a razor blade mounted on said handle, a movable blade edging device, a support for said device pivoted adjacent said arm adapted to be guided by said guiding surface whereby wobbling of the edging device during its movement is prevented.

43. A razor comprising a handle having a head, a razor blade mounted on the handle, a movable blade edging device, a stem for supporting said device in the head and pivoted to the handle at a point relatively remote from said device whereby the device may move through an arc having a relatively large radius.

44. A self sharpening razor comprising a blade, means to hold said blade, and a blade edging device, mounted for contact with said blade, said device being reciprocable transversely of the blade edge while maintained in such contact.

45. In a razor having a blade, a blade edging device which may remain upon the razor during shaving and reciprocable transversely of the edge of said blade while maintained in contact therewith.

46. A razor comprising a handle, a razor blade mounted on said handle, a blade edging device mounted to remain on the handle during shaving and with which the edge of the blade contacts, said device being reciprocable while maintained in contact with the blade to sharpen the blade.

47. A razor comprising a handle, a razor blade mounted on said handle, and a blade edging device mounted on the handle, said device being reciprocable while maintained in contact with the edge of the blade.

48. In a razor having a blade, a sharpening device capable of a movement both against and away from the edge of the blade while said blade is substantially in shaving position.

49. A self sharpening razor comprising a blade and a blade edging device, said blade and device being reciprocable with relation to each other while in contact, and means for adjusting the angle of contact between the blade and the blade edging device.

50. A self sharpening razor comprising a

blade and a curved blade edging device, said blade and device being reciprocable with relation to each other while in contact, and means for adjusting the angle of contact between the blade and blade edging device.

51. A razor including a handle, a plate like sharpening device and a blade holder both mounted on the handle and reciprocable relative to each other, the mountings being such that the angle of contact between a blade in the holder and the surface of said device may be changed.

52. A self sharpening razor comprising a blade and a blade edging device, said blade and device being reciprocable with relation to each other while in contact, a holder for the blade and means for adjusting said holder to change the angle of contact between the blade and the blade edging device.

53. In a razor a blade presenting a shaving edge, a blade edging device adapted to reciprocate in contact with said edge to sharpen said edge, and means to produce an even contact between said edge and said device.

54. In a razor having a blade, a blade edging device having an indented surface for contact with said blade and mounted for movement to sharpen the blade while in contact therewith and for supporting the blade while in shaving position.

55. A razor comprising a blade, a blade edging device having an indented surface for contact with said blade and movable from a retracted to an extended position, and means forming a part of the razor structure to hold the blade in yielding contact with said device.

56. A self sharpening razor comprising a blade, means to hold said blade and a blade edging device having an indented surface and mounted so that said surface contacts with said blade, said device being reciprocable transversely of the blade edge while maintained in such contact.

57. A razor comprising a blade having a shaving edge, a blade support and means for contact with said edge and having indentations therein and operable upon shaking the razor to sharpen the edge.

58. A razor comprising a blade, a blade edging device having indentations therein and reciprocable transversely of the blade edge and mounted for continuous contact with the blade, and means to hold said blade in contact with said device.

59. A razor comprising a blade having a shaving edge, a blade support, and means reciprocably mounted on the razor for contact with said edge and having indentations therein whereby upon reciprocation of said means said edge may be sharpened.

60. A razor blade sharpening instrument comprising a blade holder and sharpening means said sharpening means being mounted on said instrument, for reciprocation in contact with the edge of a blade and operable upon shaking the instrument to sharpen said edge.

61. A razor blade sharpening instrument comprising a blade holder and a pivoted unbalanced blade edging device mounted for contact with the edge of the blade and operable upon shaking the instrument to sharpen said edge.

62. A razor blade sharpening instrument comprising a blade edging device reciprocable upon shaking the instrument and a movable blade holder movably mounted on the instrument and capable of movement to permit even contact between the edge of the blade and said device whereby upon shaking the instrument the edge of the blade is sharpened.

63. A razor blade sharpening instrument comprising a blade holder and a blade edging device mounted upon the instrument for continuous contact with the blade when said blade is in the instrument and operable upon shaking the instrument to sharpen the blade.

64. A razor blade sharpening instrument comprising a blade holder and a razor blade edging device having a hard surface upon which the razor blade may move in opposite directions while in contact therewith, said device being mounted on said instrument for reciprocation in contact with said blade.

65. A razor blade sharpening instrument comprising a blade holder, and a blade edging device mounted upon the instrument for movement against and beyond the edge of the blade in contact therewith whereby the edge of the blade is the first part thereof to pass off of said device.

66. A razor comprising a blade, a handle, a blade holder, a blade edging device, and a movable stem to support said device on the razor.

67. A razor comprising a handle including a head, a blade support in the head, a blade edging device movable from an extended position to a retracted position within the head, and means for locking said device in retracted position.

68. A razor comprising a blade having a shaving edge, a blade support, and sharpening means on the razor for contact with said edge and operable upon shaking the razor to move in contact with said edge to sharpen it.

69. A razor comprising a blade having a shaving edge, a blade support, and sharpening means on the razor for contact with said edge, said blade and sharpening means being movable with respect to each other while in contact, by shaking the razor.

In testimony whereof, I have hereunto set my hand.

HUGH DE HAVEN.