Dec. 1, 1936. C. A. SMITH 2,062,683

SAFETY RAZOR

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FIG. 1

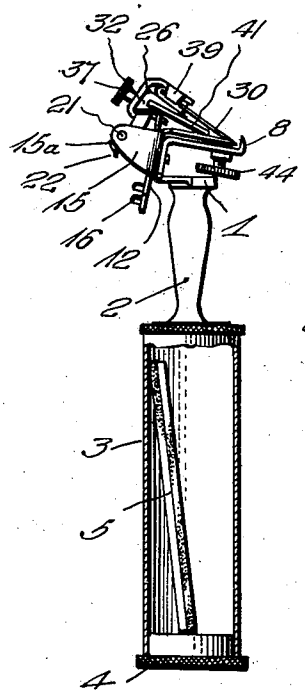


FIG. 2

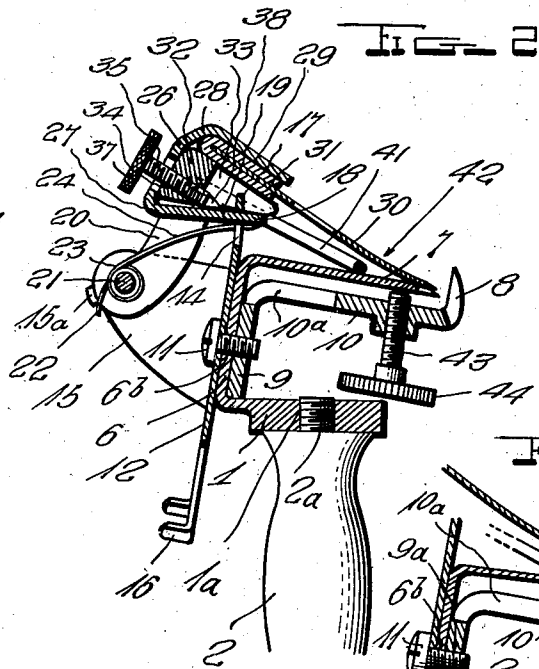


FIG. 7

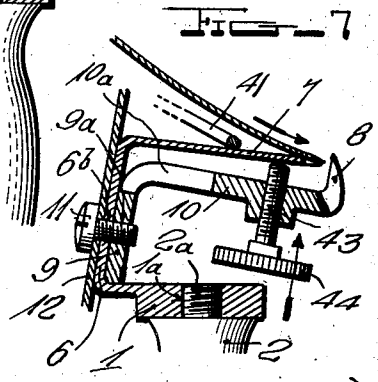


FIG. 6

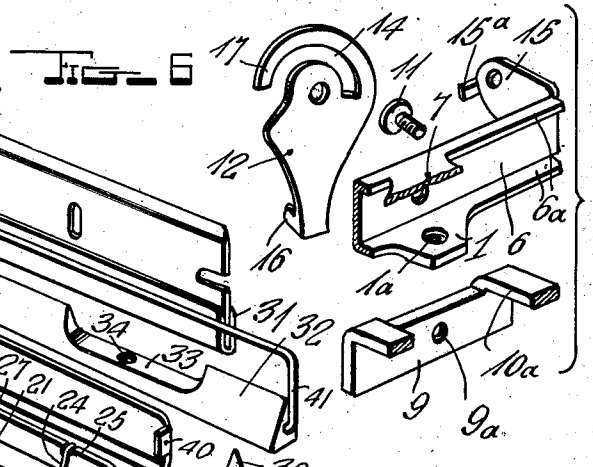
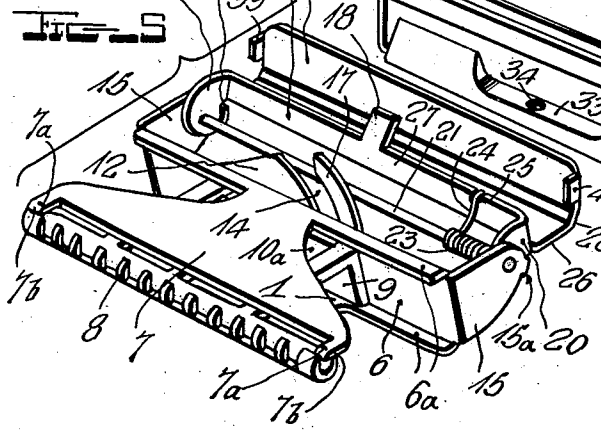


FIG. 5



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Fig. 3

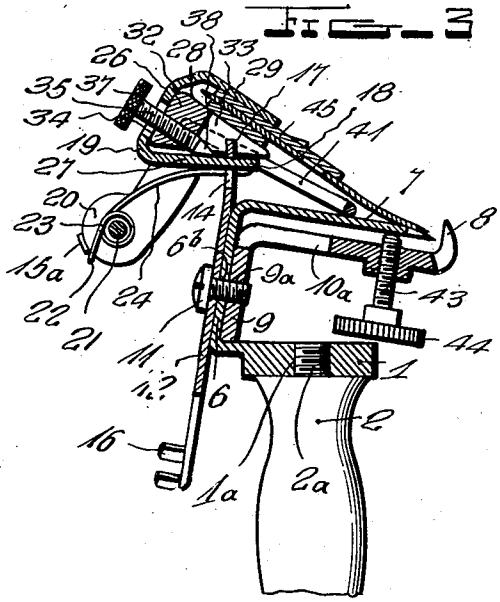



Fig. 4

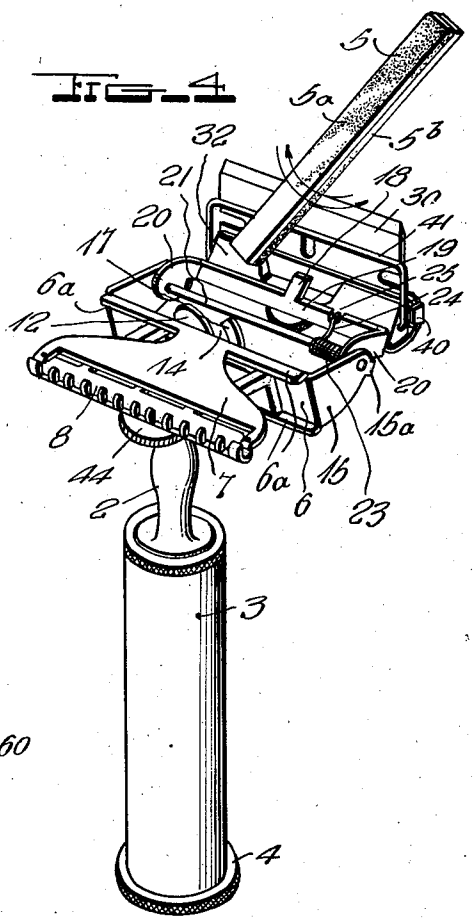



Fig. 8

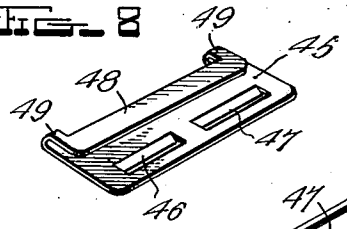
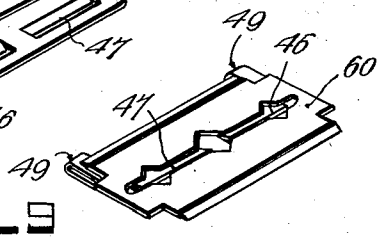



Fig. 9



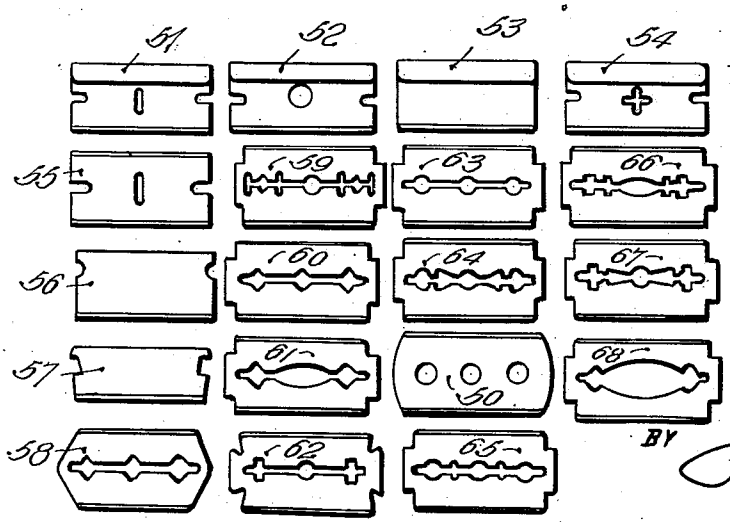




Fig. 10

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Patented Dec. 1, 1936

2,062,683

# UNITED STATES PATENT OFFICE

2,062,683

## SAFETY RAZOR

Charles A. Smith, Honesdale, Pa., assignor of one-half to Harry A. Frederick, Lake Ariel, Pa.

Application November 18, 1935, Serial No. 50,436

13 Claims. (Cl. 30—35)

My invention relates broadly to razors and more particularly to a construction of safety razor capable of improved operation in shaving.

One of the objects of my invention is to provide a construction of safety razor in which a long period of useful life may be obtained from a razor blade which may be cleaned and sharpened from time to time while retained in the razor frame.

Another object of my invention is to provide a construction of safety razor in which a micrometer adjustment of the cutting blade of the razor may be obtained for insuring a high degree of efficiency in shaving operations.

Still another object of my invention is to provide a construction of safety razor universally adaptable for mounting and employing safety razor blades of various known makes and insuring safety in shaving operations regardless of the kind of safety razor blade employed in the razor frame.

A further object of my invention is to provide a construction of razor frame for rigidly mounting a safety razor blade of various descriptions in a manner whereby the blade may be washed and cleaned and sharpened without removal from the razor frame.

A still further object of my invention is to provide a construction of razor blade support which may be interchangeably mounted in a razor frame as a carrier for safety razor blades of various descriptions for rendering the razor frame universally adaptable for safety razor blades of various makes and manufacture.

Still another object of my invention is to provide a construction of razor frame including a wedge-like mechanism for locking the razor blade in position free to be shifted to either a cleaning and sharpening position or a shaving position without removal of the razor blade from the razor frame.

A further object of my invention is to provide a construction of spring tensioned razor blade supporting means which may be manually released from a position adjacent the handle of the razor frame to quickly displace the razor blade from shaving position to a position for cleaning and sharpening.

Other and further objects of my invention reside in the construction of manual control mechanism for maintaining the razor blade in shaving position or angularly shifting the razor blade to a cleaning and sharpening position as set forth more fully in the specification hereinafter following by reference to the accompanying drawings, in which:

Figure 1 is a side elevation of the safety razor of my invention with a portion of the handle broken away and illustrated in cross section; Fig. 2 is an enlarged cross sectional view showing the razor blade in shaving position; Fig. 3 is a cross sectional view showing the razor frame of my invention serving as a mounting means for a safety razor blade of the double edge type; Fig. 4 shows the safety razor of my invention with the blade carrier released by movement of the manual control means for the displacement of the razor blade to cleaning and sharpening position; Fig. 5 is a perspective view showing the parts of the razor frame and the supporting means for a safety razor blade in disassembled position and illustrating the relative relation of the several elements constituting the razor frame and blade carrier; Fig. 6 is a perspective view showing the relative arrangement of parts of the razor frame, and more particularly the manually controllable means for maintaining the razor blade in shaving position; Fig. 7 is a fragmentary cross sectional view illustrating the micrometric adjustment mechanism for the razor blade; Fig. 8 is a perspective view of the carrier for a safety razor blade of the double edge type; Fig. 9 illustrates a safety razor blade of the double edge type mounted in position upon the carrier; and Fig. 10 illustrates various types of safety razor blades which may be universally employed in the safety razor of my invention.

I have developed the safety razor of my invention with a view of providing a razor frame which is universally adaptable for mounting safety razor blades of a large variety of different makes. The owner of the razor of my invention may use such type of safety razor blade as may be available and is not restricted to the use of a limited number of different makes of safety razor blades which may fit a given type of safety razor. That is to say, the owner of the safety razor of my invention is free to employ any of the numerous types of safety razor blades offered for sale, which under conditions of travel and in remote places becomes a condition of very great convenience. The safety razor of my invention is provided with a blade carrier which is resiliently mounted with respect to the razor frame and which may be normally locked in shaving position or which may be manually released for displacing the razor blade carrier to a position for cleaning or sharpening.

A safety razor blade of the reinforced back type may be mounted in the blade carrier and locked therein by means of a thumb screw operated wedge device. The blade carrier when maintained in shaving position supports the razor blade in a position in which micrometric adjustment may be made and the distance of the cutting edge of the blade with respect to a protective guard adjusted for thereby regulating the closeness of the shave. One such micrometric adjustment is fixed for any given blade. Such adjustment may be maintained continuously throughout the useful life of the blade. By reason of the ease with which the blade may be cleaned and sharpened while retained in the razor blade carrier, the life of the blade is extended over a very substantial period.

Where a safety razor blade of the double edge type is employed a blade support is provided for the purpose of mounting the blade in the carrier. The construction of the blade support is such that safety razor blades of various descriptions may be mounted irrespective of the contour of the apertures normally provided for mounting such razor blades in complementary forms of razor frames. A manually operative device is employed adjacent the handle of the razor frame for releasing the razor blade carrier and allowing displacement of the razor blade under spring tension to the cleaning and sharpening position thereof without removal of the razor blade from the razor blade carrier. The sharpening stone or stropping hone may be conveniently carried in the hollow handle of the razor frame of my invention.

Referring more particularly to the drawings, reference character 1 indicates the main frame of the razor which is apertured and screw threaded at 1*a* to receive the screw threaded portion 2*a* of the handle 2. The handle 2 is provided with a hollow portion 3 which provides a container for the sharpening or stropping hone. A removable cover 4 is provided for closing the end of the hollow handle 3. The sharpening or stropping hone is indicated at 5 having faces of differing material shown at 5*a* and 5*b*, one of which is used for first cutting and the other of which is used for securing a finished or finer edge. The main frame is provided with an upwardly directed projecting portion 6 which extends forwardly to provide a yieldably adjustable plate 7 and rearwardly at each end thereof to provide side portions 15 which serve to support the razor blade carrier as will be more fully explained hereinafter. For the purpose of strengthening the vertically extending portion 6 of main frame 1, I provide ribs 6*a* formed integrally with the material of the main frame and coextensive with the laterally extending portions of the main frame 1 and the yieldably adjustable plate 7.

The razor frame is provided with a razor blade protective guard which I have indicated at 8 and which is shaped to generally correspond with the contour of the razor blade frame between the main frame 1 and the yieldably adjustable plate 7. The protective guard 8 is provided with a supporting portion 9 extending substantially normal to the flat portion 10 of the protective guard 8. It will be observed that the flat portion 10 of the protective guard 8 is centrally apertured at 10*a* to allow free flow of water through the razor frame when the razor is washed. Guard support 9 is secured to the main frame 1 by means of screw device 11 which extends through the manually adjustable cam member 12 and through screw threaded aperture 6*b* in vertical extension 6 and screw threaded aperture 9*a* in guard support 9. The manually adjustable cam member 12 is provided with an arcuate shaped slot 14 and a finger grip portion 16 by which the manually adjustable cam member 12 may be shifted to engaged position or to release position as will be more fully pointed out hereinafter.

The arcuate shaped slot 14 in the manually adjustable cam member 12 provides a circular locking finger 17 which is adapted to engage lug 18 on the razor blade carrier when the razor blade carrier is maintained in shaving position and to release the lug 18 when the razor blade carrier is displaced to washing and sharpening position. The razor blade carrier is formed from a metallic housing, shown more clearly in Fig. 5 at 19, having a pair of side projecting portions 20 which fit inside the extensions 15 on the vertical extension 6 of main frame 1 and are pivoted with respect to the laterally extending rod member 21 which passes through apertures in the side projecting portions 20 and are secured in the extensions 15. The extensions 15 are each provided with lug members 15*a* extending laterally toward each other and which serve as limiting stops for abutment with the side projecting portions 20 when the razor blade carrier is displaced to a position for washing and sharpening the razor blade.

One of the lugs 15*a* also serves as a confining means for the end 22 of the coil spring 23. The opposite end 24 yieldably engages a notch 25 which is formed in one edge of the razor blade carrier 19. Coil spring 23 is properly tensioned to normally maintain the razor blade carrier 19 in displaced position, indicated more clearly in Fig. 4. In the displaced position of the razor blade carrier the razor blade may be readily washed, sharpened, or renewed.

It will be observed that the razor blade carrier 19 is shaped to provide a housing for the means which confine the razor blade carrier or the razor blade in position. That is to say, the razor blade carrier 19 includes a pair of laterally extending portions directed toward each other. The laterally extending portions are interconnected by a rear portion 26 extending substantially at an acute angle to one laterally extending side portion 27 of the razor blade carrier 19. The wall of the razor blade carrier 19 immediately adjacent the upper extremity of rear portion 26 as indicated at 28, projects in a plane substantially at an obtuse angle to the plane of the rear portion 26. The upper laterally extending wall of the razor blade carrier 19 is shown at 29 extending in a plane at an obtuse angle with respect to the plane of the intermediate wall 28. By virtue of the angular arrangement of the walls of the razor blade carrier I am enabled to readily mount a selected razor blade in the razor blade carrier. In Figs. 1, 2 and 5, I have shown the razor blade carrier arranged to support a razor blade of the reinforced rear edge type. The blade is shown at 30 having a rear edge reinforcement 31. The rear edge reinforcement 31 is confined directly against the upper laterally extending wall 29 of the razor blade carrier by means of the adjustable wedge block 32. The adjustable wedge block 32 is substantially triangular in cross section as illustrated more particularly in Fig. 5. The wedge block 32 has a central cut-away portion 33 which is screw threaded at 34 to receive the adjusting screw 35. The adjusting screw 35 extends through an aperture in the

rear wall portion 26 of the razor blade carrier and is provided with a knurled gripping edge 37 by which the screw 35 may be advanced or retracted through the wedge shaped block 32.

The end of screw 35 is ground to substantially frusto-conical form indicated at 38 adapted to bear against the lower wall 27 of the razor blade carrier for forcing wedge shaped block 32 into engagement with the reinforced edge 31 of the razor blade and rigidly securing the razor blade in position. The razor blade is confined lengthwise in the razor blade carrier by abutment with the limiting lugs 39 and 40 at opposite ends of the razor blade carrier. The wedge shaped block 32 is provided with pivotally mounted bail 41 engaged in opposite ends of the block 32. The bail 41 normally rests beneath the razor blade 30 and directly above the yieldably adjustable plate 7. When the razor blade carrier is released and sprung to position for washing or sharpening the razor blade, the bail 41 is used as a means for maintaining the razor blade 30 in rigid position to allow operation of the stropping or sharpening hone 5. The hone is drawn over one side of the edge of razor blade 30 which is maintained rigid by virtue of the abutment of the razor blade carrier against the lugs 15a in one direction. When the stropping or sharpening hone is drawn over the opposite edge of the razor blade 30 the razor blade is maintained rigid by resting the finger against the bail 41 which in turn rests against razor blade 30. In the former stropping operation the correct slant for the hone is had by bearing the hone lightly on the bail 41 as a guide; and in the latter operation, the hone is aligned with the edge of the portion 29 of the razor blade carrier.

Where the razor blade is of the single edge type as illustrated in Figs. 1, 2 and 5, I may protect the edge of the razor blade by means of a cardboard cover device slipped over the cutting edge of the blade.

When the razor is in use, adequate tension is applied to the blade 30 so that the blade is slightly buckled as represented at 42 for the purpose of elevating the cutting edge from the yieldably adjustable plate 7. or normal shaving operFation the edge of the blade 30 is brought into alignment with marks 7a provided on the side projections 7b on yieldably adjustable plate 7. To provide for micrometric adjustment of the cutting edge of the razor blade 30 with respect to the protective guard 8 and with respect to the yieldably adjustable plate 7 I provide the adjusting screw 43 which is screw threaded through the portion 10 of guard 8 and engages the undersurface of the yieldably adjustable plate 7. The adjusting screw 43 is provided with a knurled edge 44 allowing micrometric adjustments to be made with the thumb of the hand which grips the handle 2 of the razor.

Where a double edge razor blade is employed, I provide a razor blade mounting means or adaptor illustrated more particularly in Figs. 8 and 9. The razor blade mounting means comprises a metallic sheet-like member 45 having a supporting surface which is die-pressed to provide outstruck lug members 46 and 47 which provide ledges adapted to support the centrally apertured portion of the razor blade where the razor blade is of the double edge type. Fig. 9 illustrates the manner in which a double edge blade may be mounted on the razor blade mounting means. The razor blade mounting means constituted by plate 45 is bent upon itself as shown at 48 with strip portions 49 connecting the opposite ends of portion 48 with plate 45. The upturned portion 48 provides a pocket in which one edge of a double edge razor blade may be protected where the razor blade is not of a type which can be supported by lugs 46 and 47. Consider, for example, a double edge razor blade of the type illustrated at 50 in Fig. 10. Lugs 46 and 47 could not be conveniently employed for mounting the type of blade shown at 50, and yet the razor blade mounting means can be readily employed using the upturned portion 48 in the nature of a pocket for supporting one edge of the double edge razor blade of the type shown at 50.

I have illustrated in Fig. 10 various types of razor blades which the razor of my invention may readily employ. The reinforced back type razor blades have been shown at 51, 52, 53, and 54, all of which may be readily mounted in the razor frame in the manner illustrated in Figs. 1, 2 and 5. The types of razor blades shown at 55, 56, 57 and 58 are adapted to be mounted in the razor blade carrier illustrated in Figs. 8 and 9, with one edge of the blade protected within the pocket formed by upturned strip 48. The type of blade shown at 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, and 68 may be readily mounted in the razor blade mounting means by employing lugs 46, 47 projecting through the apertures in the razor blade. The type of razor blade shown at 55 may be supported in the razor blade mounting means by protecting one edge of the blade by the upturned portion of the razor blade mounting means illustrated at 48.

I have found the razor of my invention highly practical in its construction and convenient in its use. The resilient means 23 are ready at all times to spring the razor blade carrier to opposite position for washing and sharpening. A safety razor blade of any description may be readily mounted in the razor frame either by use of an adaptor as illustrated in Figs. 8 and 9, or directly in the razor blade carrier. The razor blade may be given a micrometric adjustment for controlling the shaving operation of the razor, and the razor blade may be washed and sharpened without removing the blade from the razor frame.

In operation, the razor blade is held in adjusted position behind the guard teeth 8 by the engagement of the cam finger 17 with the lug 18 on the razor blade carrier 19. If adjustment of the position of the cutting edge is required, this is accomplished by means of the screw 43. After use of the razor, the finger engaging lug 16 is manipulated to rotate the cam 12 and release the razor blade carrier which is then automatically moved to substantially vertical position under action of the spring 23. When thus in open position, the blade 30 may be easily cleaned or sharpened as hereinbefore explained, and eventually replaced as may be required.

While I have illustrated the razor of my invention in one of its preferred embodiments I am aware that modifications may be made and I intend that limitations upon my invention are not to be imposed except as may be required by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. A safety razor comprising a razor frame, a razor blade carrier pivotally mounted with respect to said razor frame, a yieldable bearing plate, a protective guard extending adjacent the

edge of said yieldable bearing plate, a razor blade mounted in said razor blade carrier and having the cutting edge thereof supported on said yieldable bearing plate adjacent said protective guard, and means for adjusting the position of said yieldable bearing plate with respect to said protective guard for correspondingly adjusting the position of the cutting edge of the razor blade with respect to said protective guard.

2. A safety razor comprising a razor frame, a razor blade carrier pivotally mounted with respect to said razor frame, a razor blade removably supported in said razor blade carriage, a yieldably adjustable plate carried by said razor frame and arranged to support the cutting edge of the razor blade, a separate plate carried by said frame and extending beneath said yieldably adjustable plate and terminating in a protective guard extending adjacent the cutting edge of the razor blade, and a screw device extending normal to the plane of said last mentioned plate for engaging a central position of said yieldably adjustable plate for controlling the relative position of the protective guard with respect to the cutting edge of the razor blade.

3. A razor comprising a frame, a razor blade carrier pivotally mounted with respect to said frame, a razor blade mounted in said carrier, a yieldably adjustable plate supported by said frame and extending beneath the cutting edge of said razor blade, a separate plate supported by said frame and extending beneath said yieldably adjustable plate, said separate plate terminating in a protective guard extending adjacent the cutting edge of the razor blade, means extending through said last mentioned plate and engageable with said first mentioned plate for adjusting the position of the cutting edge of the razor blade with respect to said protective guard, spring means for normally displacing said razor blade carrier to a position remote from the cutting position, and locking means for restraining said spring means and maintaining said razor blade in cutting position.

4. A razor comprising a frame, a razor blade carrier pivotally mounted on said frame, a razor blade supported on said razor blade carrier, a yieldably adjustable plate extending from said frame in a position for supporting the cutting edge of said razor blade, a protective guard, means for adjusting the position of said protective guard with respect to said yieldably adjustable plate, spring means interposed between said frame and said razor blade carrier for continuously urging said razor blade carrier to a position displacing said razor blade from cutting position to cleaning and sharpening position, and manually controllable means for restraining said spring means and maintaining said razor blade carrier in a position in which said razor blade is maintained in cutting position.

5. A razor comprising a frame, a razor blade carrier pivotally mounted on said frame, a razor blade supported on said razor blade carrier, a yieldably adjustable plate extending from said frame in a position for supporting the cutting edge of said razor blade, a protective guard, means for adjusting the position of said protective guard with respect to said yieldably adjustable plate, spring means interposed between said frame and said razor blade carrier for continuously urging said razor blade carrier to a position displacing said razor blade from cutting position to cleaning and sharpening position, and a latch device pivotally mounted on said frame and angularly shiftable from a position restraining the action of said spring means and maintaining said razor blade in cutting position to a position releasing said spring means and permitting displacement of the razor blade to a washing and sharpening position.

6. A razor comprising a frame, a razor blade carrier pivotally mounted on said frame, a razor blade supported on said razor blade carrier, a yieldably adjustable plate extending from said frame in a position for supporting the cutting edge of said razor blade, a protective guard, means for adjusting the position of said protective guard with respect to said yieldably adjustable plate, spring means interposed between said frame and said razor blade carrier for continuously urging said razor blade carrier to a position displacing said razor blade from cutting position to cleaning and sharpening position, a projecting lug projecting from said razor blade carrier, and a latch device having means engageable with said projecting lug for restraining the action of said spring means, said latch device being angularly shiftable to release said projecting lug for allowing said spring means to displace said razor blade to washing and sharpening position.

7. A razor comprising a frame, a razor blade carrier pivotally mounted on said frame, a razor blade supported on said razor blade carrier, a yieldably adjustable plate extending from said frame in a position for supporting the cutting edge of said razor blade, a protective guard, means for adjusting the position of said protective guard with respect to said yieldably adjustable plate, spring means interposed between said frame and said razor blade carrier for continuously urging said razor blade carrier to a position displacing said razor blade from cutting position to cleaning and sharpening position, a centrally arranged lug projecting from said razor blade carrier, and a plate member pivotally mounted on said frame and having an arcuate shaped slot therein forming a substantially curved finger engageable with said projecting lug for restraining the action of said spring means and maintaining said razor blade in cutting position, said plate member being shiftable to a position where said curved finger releases said lug for rendering said spring means operative for displacing said razor blade carrier to a position for washing and sharpening said razor blade.

8. In a safety razor, means for universally mounting safety razor blades of widely differing constructions comprising a housing having a pair of converging walls, razor blade mounting means supportable adjacent the inner face of one of the said walls, a wedge shaped block disposed in said housing, means for adjusting the position of said wedge shaped block between the interior face of the other wall of said housing and said razor blade mounting means for securing said razor blade in cutting position, and a bail pivotally mounted in said wedge shaped block and shiftable to a position bearing against said razor blade for rigidly maintaining the razor blade in washing and sharpening position.

9. An adapter plate for supporting a variety of forms of safety razor blades, said plate comprising a sheet metal member folded over with the inner faces thereof in spaced relation, lugs formed at the folded corners of said plate, and outstruck lugs formed in one of the outer faces

of said member, said plate adapted to support a razor blade in either of two positions depending upon the structure of the blade, one of said positions being between the spaced inner faces of said folded-over member, and the other of said positions being on the said outer face of said member with the said outstruck lugs adapted to maintain the blade in position thereon.

10. An adapter plate for supporting a variety of forms of safety razor blades, said plate comprising a sheet metal member folded over with the inner faces thereof in spaced relation, means for supporting a two-edged blade between said faces with the cutting edges thereof out of contact with said member, and means for supporting a blade on one of the outer faces of said member, either of said means being separately operable to support a razor blade in a universal blade mounting device.

11. In a safety razor, a frame projecting forwardly and rearwardly, a handle depending from said frame, a support for a razor blade adjacent the forwardly projecting portion of said frame, a razor blade carrier pivoted adjacent the rearwardly projecting portion of said frame, a razor blade supported in said razor blade carrier, spring means for normally shifting said razor blade carrier to a position in which the razor blade is maintained in a plane substantially parallel with the axis of the handle and in a position for washing and sharpening, said razor blade carrier being shiftable to a position for moving said razor blade to a position in which the razor blade is supported on said razor blade support, and a latch operative from a position adjacent the handle of said razor for restraining said spring means and maintaining said razor blade carrier in a position for pressing the razor blade in cutting position.

12. A safety razor comprising a substantially perforate skeleton frame, a handle support for said frame, a razor blade supporting member adjacent one side of said frame, a razor blade carrier pivotally mounted on the opposite side of said frame, a razor blade mounted in said razor blade carrier, spring means for normally urging said razor blade carrier to a position displaced from said razor blade support, and latch means carried by said frame and operative to engage said razor blade carrier for maintaining said razor blade carrier in a position in which the razor blade is mounted adjacent said razor blade support while restraining the action of said spring means, said latch being removable to a position to release said razor blade carrier to a position displaced from the aforesaid position so that the razor blade may be washed by passing fluid through said perforate frame.

13. A safety razor comprising a substantially perforate skeleton frame, a handle support for said frame, a razor blade supporting member adjacent one side of said frame, a razor blade carrier pivotally mounted on the opposite side of said frame, a razor blade mounted in said razor blade carrier, spring means for normally urging said razor blade carrier to a position displaced from said razor blade support, latch means carried by said frame and operative to engage said razor blade carrier for maintaining said razor blade carrier in a position in which the razor blade is mounted adjacent said razor blade support while restraining the action of said spring means, said latch being removable to a position to release said razor blade carrier to a position displaced from the aforesaid position so that the razor blade may be washed by passing fluid through said perforate frame, and an angularly shiftable member connected with said razor blade carrier and adapted to bear against said razor blade for rigidly maintaining the razor blade in a position in which a sharpening hone may be drawn adjacent the cutting edge of the razor blade.

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