Nov. 1, 1960 J. NARIZZANO 2,958,128

SAFETY RAZOR HAVING A LATERALLY ADJUSTABLE GUARD

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FIG. 1.

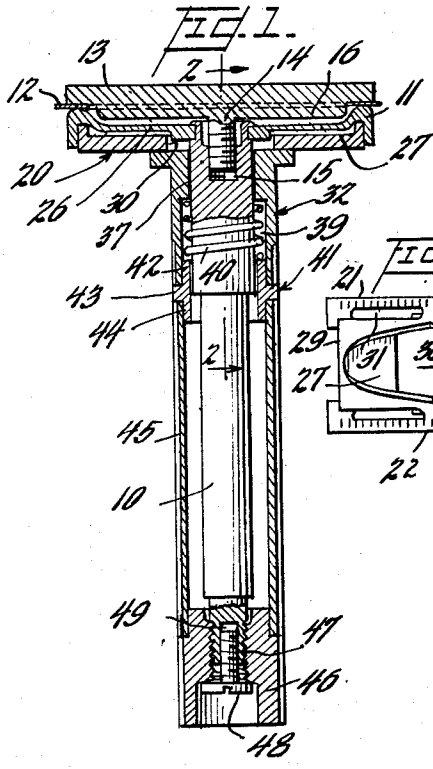


FIG. 2.

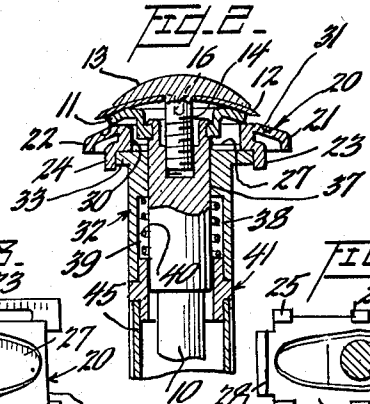


FIG. 8.

FIG. 9.

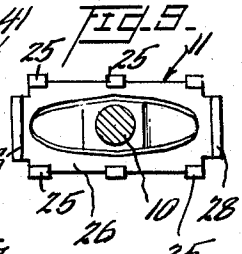


FIG. 3.

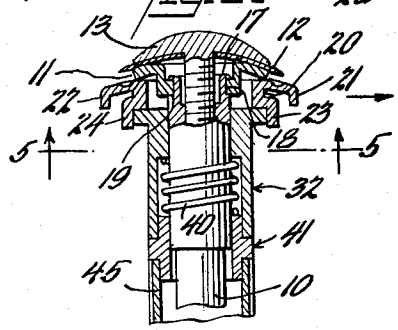


FIG. 4.

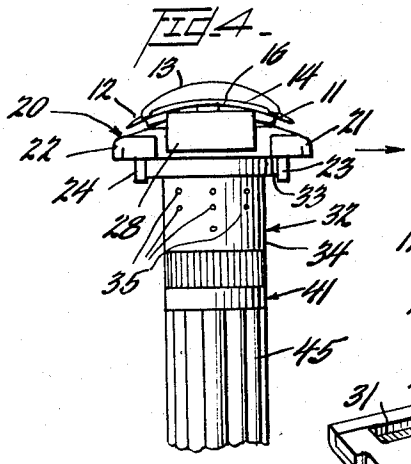


FIG. 5.

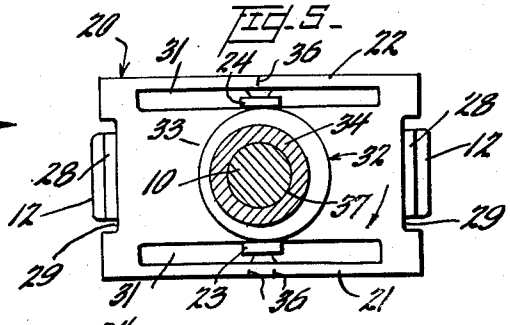


FIG. 7.

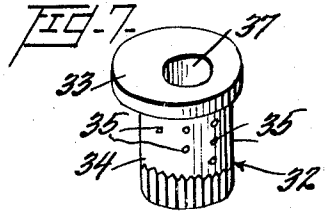
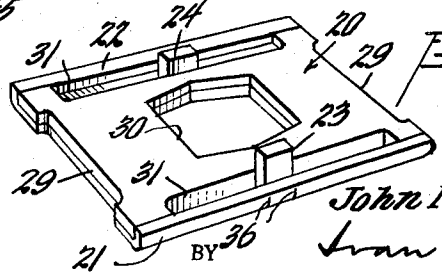


FIG. 6.



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SAFETY RAZOR HAVING A LATERALLY ADJUSTABLE GUARD

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FIG. 10.

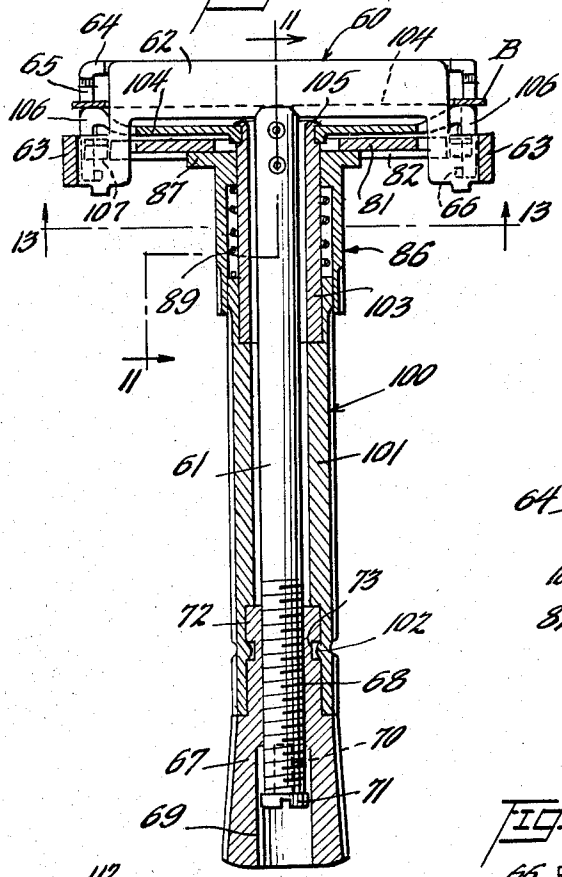


FIG. 11.

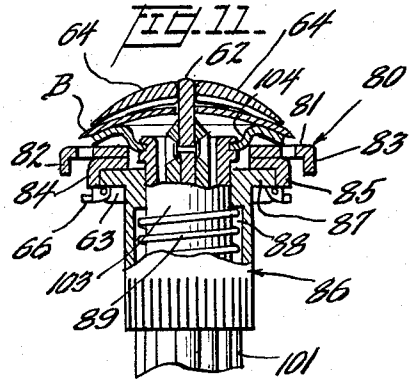


FIG. 12.

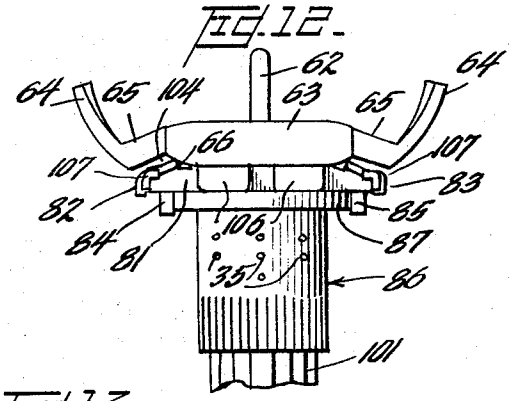


FIG. 13.

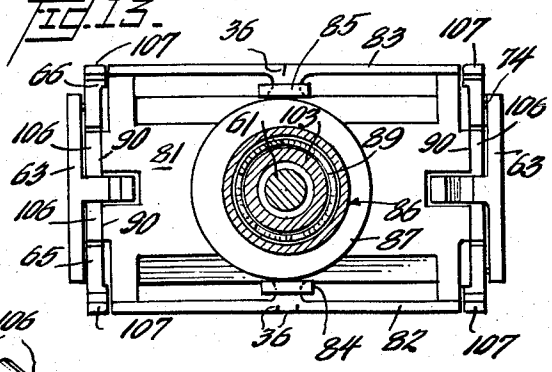


FIG. 14.

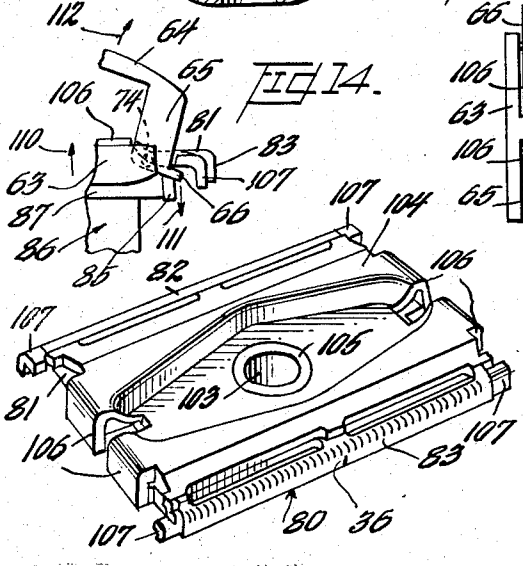


FIG. 15.

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SAFETY RAZOR HAVING A LATERALLY ADJUSTABLE GUARD

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Filed Sept. 5, 1956, Ser. No. 608,124

7 Claims. (Cl. 30—60.5)

The present application is an improvement on the subject matter of my prior application Serial No. 524,151 filed July 25, 1955, which has matured into Patent No. 2,840,901, granted July 1, 1958.

The present invention relates to improvements in safety razors. More particularly, the invention relates to a safety razor in which the conventional safety bar or guard is incorporated in a slidably mounted laterally shiftable unit and which is laterally positionable with respect to the cutting edge of a razor blade mounted in the safety razor by means of a cam which can be actuated by rotating a portion of the safety razor handle to thereby provide a variable safety razor of simple and efficient construction which permits the blade exposure and cutting angle to be regulated by the shaver either prior to or during the shaving operation.

The invention includes the provision of a one-piece safety razor having the basic operational features disclosed in the patent to Muros No. 2,009,272 dated July 23, 1935, while simultaneously enabling the blade exposure and angle of cutting to be varied at will depending upon the preference of the shaver and/or the stage of the shaving operation.

With the conventional safety razor, the blade exposure and cutting angle are established by the manufacturer and cannot be regulated by the shaver. As a result, if the blade exposure and angle are set to provide a proper initial shave, only a light shave can be obtained. An improved shave can be obtained by repeating the shaving operation. However, the blade exposure and angle are now improperly set so that a fully satisfactory close shave cannot be obtained. On the other hand, if the manufacturer provides an exposure and angle adapted to achieve a close shave, the initial shave is poor, the danger of nicks and cuts is increased and the razor pulls and is otherwise unsatisfactory. As will be understood, the barber uses his skilll to adjust the angle and pressure of the blade against the skin to provide an initial light shave using a shallow blade angle and light pressure and a second close shave using a steeper blade angle and an increased pressure.

The invention permits the proper shaving procedure as employed by professional barbers to be duplicated by the normal shaver using a safety razor of simplified construction and enhanced operating efficiency.

Moreover, every beard and skin requires a different blade exposure and angle. This has already been recognized in the market place where conventional safety razors are presently marketed in a variety of different predetermined and invariable blade exposures and angles. However, the purchaser cannot test the various types and must select one razor on the basis of his best guess. Guessing is eliminated by the invention since the shaver can determine by actual test the most appropriate exposure and angle and adjust his razor accordingly. However, as pointed out above, no matter what blade angle and exposure is pre-selected, the pre-selected angle and exposure must be regulated during the shave in order

to duplicate the shaving procedure employed by professional barbers to the end that a close shave may be attained in the safest and most efficient manner.

The invention will now be described in greater detail in conjunction with the accompanying drawings in which the invention is illustrated in connection with a "two-piece" safety razor and a "one-piece" safety razor.

Fig. 1 is a sectional side elevation taken along the length of an illustrative "two-piece" safety razor constructed in accordance with the invention;

Fig. 2 is a cross-section taken on the line 2—2 of Fig. 1 and showing the safety razor adjusted to provide a light shave with the cutting edge of the razor blade which protrudes to the right of the figure and a heavy or close shave with the cutting edge of the razor blade which protrudes to the left of the figure;

Fig. 3 is a cross-section, similar to Fig. 2, and showing the safety razor adjusted to an intermediate or central position in which the two cutting edges of the razor blade protrude equally and to an intermediate extent;

Fig. 4 is a partial end elevation of the assembled safety razor of Fig. 1;

Fig. 5 is a cross-section taken on the line 5—5 of Fig. 3, the view having been rotated 90° in a counterclockwise direction;

Fig. 6 is a perspective view of the laterally shiftable safety guard including unit, looking at the unit from beneath the same;

Fig. 7 is a perspective view of the cam adjusting member;

Fig. 8 is a top plan view of the laterally shiftable unit;

Fig. 9 is a bottom view of the blade supporting plate with the rotatable stem being shown in section;

Fig. 10 is a sectional side elevation taken along the length of an illustrative "one-piece" safety razor constructed in accordance with the invention, the blade guiding bar and supporting stem being shown in elevation;

Fig. 11 is a cross-section taken on the line 11—11 of Fig. 10.

Fig. 12 is a partial end elevation showing the "one-piece" safety razor of Fig. 10 in its open position;

Fig. 13 is a section taken on the line 13—13 of Fig. 10;

Fig. 14 is a detailed partial end elevation showing the manner in which the cap sections, which together constitute the upper clamping plate, are opened, and

Fig. 15 is a perspective view showing the blade supporting plate and the laterally shiftable unit in sliding interengagement with the under surface thereof.

Referring to the drawings and more particularly to Figs. 1–3 thereof, the safety razor illustrated comprises a stem 10 which is rotatably secured at its upper end to a blade supporting plate 11. A blade 12 is shown supported upon the blade supporting plate 11, the blade being clamped to the upper surface of the blade supporting plate 11 by an upper blade clamping plate 13.

As is usual in safety razors of this type, the upper blade clamping plate 13 is provided with a downwardly projecting threaded stud 14 and the upper extremity of the stem 10 is formed with an internally threaded axial cavity 15. As is customary, the blade clamping plate 13 is secured upon the blade supporting plate 11 by inserting the threaded stud 14 into the axial cavity 15 and then rotating the stem 10 to draw the clamping plate 13 downwardly to thereby clamp the razor blade 12 between the blade supporting plate 11 and the clamping plate 13. The blade clamping plate 13 is also provided with the usual downwardly depending positioning lugs 16 which project through suitable apertures in the blade 12 to properly align the same in the razor.

Rotatable securement between the stem **10** and the supporting plate **11** is achieved in conventional manner by turning down the upper extremity of the stem **10** as indicated at **17** where it projects through central opening **18** in the plate **11** to loosely position the plate **11** upon a shoulder **19** at the upper end of the stem **10** (note Fig. 3).

In accordance with the invention a laterally shiftable unit **20** underlies the blade supporting plate **11**. The laterally shiftable unit includes the customary safety guards or bars **21** and **22** and, in accordance with the invention, is provided with downwardly depending lugs **23** and **24**. The lugs **23** and **24** are laterally spaced across the width of the razor head and provide abutment means which permit the laterally shiftable unit to be laterally displaced to provide an adjustment in the spacing between the cutting edges of the razor blade **12** and the safety guards or bars **21** and **22** which are associated therewith to regulate the blade exposure and cutting angle, all as will be more fully hereinafter set forth.

In the embodiment shown, the under surface of the supporting plate **11** is provided with extensions **25** which are preferably ground flat and the upper surface of the unit **20** slidingly contacts the extensions **25**. The supporting plate **11** is formed with a downwardly depending portion **26** which receives the blade positioning lug **16** of the clamping plate **13**. The portion **26** of the supporting plate **11** is received within a central recess **27** in the upper surface of the shiftable unit **20**. The recess **27** is wider than the portion **26** to permit the unit **20** to be laterally shifted with respect to the plate **11**.

In accordance with the invention the laterally shiftable unit **20** is guided by a sliding engagement between the unit **20** and portions of the supporting plate **11**. Preferably, the supporting plate **11** is formed with downwardly depending flanges **28** which depend from the longitudinal extremities thereof.

The flanges **28** function to guide the end surfaces **29** of the shiftable unit **20** to maintain the guards **21** and **22** parallel with the cutting edges of the blade **12**. The manner in which the flanges **28** slidingly engage the end surfaces **29** of the shiftable unit **20** can be seen with particular clarity in Fig. 5.

The laterally shiftable unit **20** is preferably formed in two secured together pieces as can most clearly be seen in Fig. 6 of the drawings. Fig. 6 also shows the central opening **30** which is provided to enable the stem **10** to extend through the unit **20**. The unit **20** is also provided with the customary elongated openings **31** adjacent the safety bars or guards **21** and **22**.

Adjustment of the lateral position of the unit **20** is achieved in accordance with the invention by a cam member **32** which is mounted coaxially about the upper end of the stem **10** for rotation thereabout. More particularly, the cam member **32** is constituted by an upper eccentrically positioned cam element **33** which is preferably constituted by an eccentrically positioned disk, as shown, and a lower tubular handle portion **34**. Desirably, a portion of the handle portion **34** is knurled, as shown in Figs. 4 and 7 and another portion of the handle portion **34** is provided with indicia **35**. The indicia **35** cooperate with indicia **36** on the safety guards **21** and **22** so that the position of each of the guards **21** and **22** with respect to the associated cutting edge of the blade **12** can be easily ascertained. It will be understood that the action of cam element **33** upon the lugs **23** and **24** is the only factor involved in the lateral positioning of the guards **21** and **22**. Accordingly, the rotational position of the cam member **32** entirely determines the blade angle and blade exposure of each cutting edge of the razor blade **12**. In this respect, the marking system shown facilitates a rapid determination by the user of the blade exposure and cutting angle which is present and is simply illustrative. Many other marking systems will be apparent.

In the preferred form shown, the cam element **33** is circular in shape and is eccentrically positioned with respect to the handle portion **34**. The handle portion **34** is axially bored as indicated at **37** and the lower end of the bore **37** is enlarged as indicated at **38**. The stem **10** fits within the bore **37** and this forms an annular chamber **39** between the bore **38** and the stem **10**. An expansion spring **40** is compressed within annular chamber **39** to resiliently bias the cam member **32** against the under surface of the supporting plate **11**. In this way, the cam member **32** can be easily rotated to shift the unit **20** despite the fact that the blade **12** is clampingly secured between the plates **11** and **13**.

The spring **40** is maintained in compression within the annular chamber **39** by a bushing **41** having an upper end **42**, a lower end **44** of reduced diameter and an intermediate outwardly extending circumferential rib **43**, the upper end **42** being forced within the lower end of the annular chamber **39**. The bushing **41** is held in place by a tubular barrel **45** which is locked in position by a head **46** which is threadedly secured to the lower end of the stem **10**, as indicated at **47** and the head **46** is locked in position by nut **48** which is threaded (left-hand thread) in axial bore **49** in the lower end of the stem **10**.

It will be appreciated that rotation of head **46** will rotate the stem **10** and enable clamping and release of the blade **12** without disturbing cam **32** and hence the position of the safety guards **21** and **22**. In this respect, the head **46** is not threaded to such an extent as to jam the barrel **45** and hence the bushing **41** and the cam **32** against the under surface of the plate **11**. Instead, a small amount of play is permitted and this permits rotation of the cam **32** without rotating the barrel **45**, the head **46** or the stem **10**. This play also permits the stem **10** to be rotated by head **46** without rotating the cam **32**. In either event, one simply grasps the barrel **45** and rotates either the cam **32** or the head **46** depending upon whether the blade is to be changed or the guard position regulated.

The manner in which the cam member **32** functions to laterally shift the laterally shiftable unit **20** will be particularly apparent from a consideration of Figs. 2, 3, 4 and 5. In Figs. 3, 4 and 5, the outer extremities of the safety guards **21** and **22** are equally spaced from the associated cutting edges of the blade **12**. As can be seen in Fig. 5, this intermediate position of Fig. 3 corresponds with the position of cam **33** which is shown and in which the surfaces of the cam element **33** which contact the lugs **23** and **24** are equally distant from the center of the stem **10**. When the cam **32** is rotated in the direction indicated by the arrow in Fig. 5, the cam element **33** forces the lug **23** away from the stem **10** and this forces the safety guard **21** to the right as indicated by the arrows in Figs. 3 and 4.

The displaced position of the unit **20** in which the safety guard **21** is at a substantial distance from the cutting edge of the razor blade which is associated therewith and in which the safety guard **22** is closely adjacent its associated cutting edge is shown in Fig. 2. When shaving is then performed with the safety guard **21** adjacent the surface to be shaved, a light shave will be obtained and the angle between the cutting edge of the blade **12** and the surface to be shaved will be slight. On the other hand, if the safety guard **22** is placed adjacent the surface to be shaved, the cutting edge of the blade will bear heavily against this surface and be at a steep angle with respect thereto. It will be manifest that further rotation of the cam element **33** in the direction indicated by the arrow in Fig. 5 will cause the unit **20** to return to the position shown in Fig. 3 and that still further rotation of the cam element **33** will force the lug **24** away from the center of the stem **10** so that the safety razor will assume a position exactly opposite

to that shown in Fig. 2, e.g. the unit **20** will be projected to the left instead of to the right as is shown in Fig. 2.

The present invention is particularly adapted to the provision of a "one-piece" safety razor having the basic operation set forth in the patent to Muros No. 2,009,272, dated July 23, 1935. This form of the invention is illustrated in Figs. 10–15, inclusive.

Referring to Figs. 10, 11, 12 and 13, the "one-piece" safety razor illustrated is constituted by a vertically reciprocable unit **60**, a laterally shiftable unit **80** and a stationary frame **100**.

The vertically reciprocable unit **60** of the safety razor includes a stem **61**, a blade guiding bar **62** which is secured at the forward extremity of the stem **61**, said bar carrying transverse outwardly extending arms **63** to the outer ends of which are pivotally secured concavely formed cap sections **64** which together constitute an upper blade clamping plate. Each of the cap members **64** are formed at the outer ends of arms **65**, the ends of the arms **65** remote from the cap **64** being pivotally connected to the transverse arms **63**. As will later more fully appear, the arms **65** are provided with outwardly extending lugs **66** which cooperate with a portion of the stationary frame **100** so that elevation of the vertically reciprocable portion **60** will result in opening of the cap **64** into the position shown in Fig. 12. Moreover, the arms **65** cooperate with the stationary frame **100** so that lowering of the vertically reciprocable portion **60** will result in closing of the caps **64** into the blade clamping position shown in Fig. 11.

Raising and lowering of the vertically reciprocable portion **60** is effected by projection and retraction of the stem **61**. This is accomplished by rotation of the tubular head member **67** which is in threaded engagement with the lower extremity of the stem **61** as shown at **68**. The lower end of the head **67** is bored to an enlarged diameter, as indicated by numeral **69** and a nut **70** having an enlarged head **71** is secured to the lower end of the stem **61** to limit the upward movement thereof. It will now be apparent that upward projection of stem **61** is limited by engagement of the head **71** of the nut **70** with the upper extremity of the bore **69**.

The laterally shiftable unit **80** is best seen in Figs. 11, 13 and 15 and comprises a guard plate **81** carrying opposed safety guards **82** and **83**. The plate **81** is also formed with abutment means constituted by the laterally spaced downwardly depending lugs **84** and **85**. The unit **80** is laterally shifted, in the same manner as previously set forth in the embodiment shown in Figs. 1–9, by a cam member **86** which coaxially surrounds the stem **61**. The cam member **86** comprises an eccentrically mounted cam element **87** of circular cross-section which engages the lugs **84** and **85** and is provided with an interior annular chamber **88** within which an expansion spring **89** functions to force the cam member **86** upwardly and hence to bias the plate **81** against the under surface of the blade supporting plate which is part of the stationary frame. The cam member **86** is identical in construction with that shown in Fig. 7 and will not be further described.

The stationary frame includes a barrel **101** surrounding the stem **61**. The lower end of the barrel **101** rests upon the head member **67** and surrounds an upwardly projecting portion thereof to which it is secured in a manner permitting free rotation of the head **67**. More particularly, head **67** has an upwardly projecting portion **72** which is formed with a circumferential recess **73**. The lower portion of the barrel **101** surrounds the portion **72** and is turned or pressed into locking relationship with the circumferential recess as indicated at **102**.

The upper end of barrel **101** is forced into a bushing **103** and the upper end of the bushing **103** is secured to a blade supporting plate **104** as indicated at **105**. This can be seen with particular clarity in Fig. 10.

Referring to Figs. 12, 13 and 15, the blade supporting plate **104** is formed with downwardly depending guiding flanges **106** which engage the end surfaces **90** of the plate **81** to maintain the guards **82** and **83** parallel with the cutting edges of the blade. The blade is identified in Figs. 10 and 11 by the letter B.

Referring more particularly to the opening and closing of the cap sections **64**, and with particular reference to Fig. 14, the caps **64** are opened by projecting the vertically reciprocable unit **60** and such projection is indicated in Fig. 14 by arrow **110**. In this manner, arms **63** are raised and the lugs **66** on the cap supporting arms **65** engage with the undersurface of end guards **107** on the blade supporting plate **104**. This engagement forces the lugs **66** downwardly as shown by arrow **111** and causes cap **64** to pivot about the hinge connection **74** as indicated by arrow **112**.

When the caps **64** are fully opened, the lugs **66** have slipped by the end guards **107** as shown in Fig. 12.

The closing of the caps **64** takes place when stem **61** is retracted, the arms **65** engaging the upper surface of end guards **107** so that, as the arms **63** are lowered, the caps **64** are folded inwardly into a closed position.

In accordance with the invention, the "one-piece" opening and closing action is substantially undisturbed and there has been added a lateral adjustment of the safety guards so that the blade exposure and angle can be varied at will. As will be apparent, the barrel **101** can be grasped by one hand and rotation of the head **67** can be employed to open and close the caps **64** to enable the blade to be changed in rapid and efficient manner and without altering the blade exposure and cutting angle. On the other hand, the barrel **101** can be grasped by one hand and the cam member **86** rotated. In this manner, the laterally shiftable unit **80** can be moved to regulate the blade exposure and cutting angle and without disturbing the position of the caps **64**. In other words, when the caps **64** are closed to clamp the blade, the cutting angle and blade exposure can be adjusted without in any way disturbing the clamped condition of the blade. The same is true when the caps **64** are in open position for blade changing.

The invention has been illustrated in connection with a "two-piece" razor using a double-edged flexible blade and also with a "one-piece" razor using the same type of blade. It will be understood that the invention is not limited to the embodiments thereof which have been specifically illustrated but can be adapted to single-edged blades and also to non-flexible blades. Further, while the invention is particularly adapted to the regulation of a "two-piece" razor of the type illustrated in Figs. 1–9 and is especially adapted to the regulation of a "one-piece" razor, as shown in Figs. 10–15, as to which the invention is of outstanding utility, and value, the invention can also be adapted to other types of safety razors. The invention is, therefore, not to be limited to the specific forms thereof which are shown in the drawings, but is instead defined by the claims which follow.

I claim:

1. A safety razor comprising a stem, a lower blade supporting plate, means defining an upper blade clamping plate, means to releasibly secure said upper blade clamping plate to said lower blade supporting plate in blade clamping engagement therewith for clamping a razor blade between said clamping plates, a laterally shiftable unit comprising a guard plate underlying and separate from said blade supporting plate in sliding engagement therewith, said unit being laterally shiftable while the blade is clamped between said clamping plates, at least one safety guard secured to said guard plate for lateral movement therethwith, cam means rotatably mounted coaxially with said stem, said cam means including a cam element eccentrically positioned with respect to said stem, said cam element interengaging with said guard plate whereby rotation of said cam means with respect to said stem will laterally shift said guard

plate to regulate the distance between said safety guard and the cutting edge of a blade clamped between said blade supporting plate and said blade clamping plate to vary the blade exposure and cutting angle of said blade.

2. A safety razor as recited in claim 1 in which spring means resiliently biases said guard plate into sliding engagement with the under surface of said blade supporting plate.

3. A safety razor as recited in claim 1 wherein said lower blade supporting plate is rotatably secured to the upper end of said stem, said means to releasably secure said upper blade clamping plate to said lower blade supporting plate includes a downwardly depending stud on said upper clamping plate and means to releasably secure said stud to the upper extremity of said stem whereby said upper blade clamping plate may be drawn downwardly upon said lower blade supporting plate in blade clamping engagement therewith, said guard plate includes a pair of laterally spaced apart opposed safety guards, said guard plate having a central opening through which said stem extends, said blade supporting plate includes longitudinally spaced downwardly depending guiding flanges, said guard plate including end surfaces in sliding engagement with said flanges, spring means are provided resiliently biasing said cam means toward said blade supporting plate, said cam element comprising a cam disk, said blade supporting plate has a pair of laterally spaced apart downwardly depending lugs secured thereto, said cam disk fitting between said lugs for engagement therewith whereby rotation of said cam means with respect to said stem will cause said cam disk to move said lugs and thereby laterally shift said guard plate to regulate the distance between said safety guards and the cutting edges of a double-edged blade clamped between said blade-supporting plate and said blade clamping plate to vary the blade exposure.

4. A one-piece safety razor comprising a vertically reciprocable unit, a laterally shiftable unit and a stationary frame, said vertically reciprocable unit including a stem, a blade guiding bar secured at the forward extremity of said stem, said bar carrying transverse arms positioned at the longitudinal extremities thereof, a pair of cap sections pivotally secured to said arms by means of transverse cap carrying arms, and means to vertically reciprocate said stem along the length thereof with respect to said stationary frame, said laterally shiftable unit comprising a guard plate carrying opposed laterally spaced apart safety guards and cam means coaxial with said stem and interengaging with said guard plate for laterally shifting said guard plate with respect to said stationary frame, said stationary frame including a barrel surrounding said stem and a blade supporting plate fixed with respect to said barrel, said blade supporting plate overlying said guard plate, said guard plate slidably disposed with respect to the under surface of said blade supporting plate, said blade supporting plate including guide means for maintaining said safety guards parallel to the cutting edges of a blade clamped between said cap sections and said blade supporting plate and means carried by said blade supporting plate and engageable with said cap carrying arms for opening and closing said caps upon protraction and retraction of said stem, said blade supporting plate and said cap sections clamping therebetween a razor blade, said laterally shiftable unit being shiftable without affecting the clamped condition of the blade between said blade supporting plate and said cap sections.

5. A one-piece safety razor as recited in claim 4 in which said cam means surrounds said barrel and said guard plate includes a pair of downwardly depending laterally spaced apart lugs and said cam means includes a cam disk eccentrically positioned with respect to said stem, said cam disk fitting between said lugs for engagement therewith.

6. A one-piece safety razor as recited in claim 4 in which said cam means is resiliently biased upwardly against said guard plate to maintain said cam means in engagement with said guard plate and to urge said guard plate against the under surface of said blade supporting plate.

7. A one-piece safety razor as recited in claim 4 in which said cam means is provided with a bore extending therethrough, the lower end of said bore enlarged, a tubular barrel surrounding said stem and projecting into the lower end of said enlarged bore, a bushing fitted within the bore of said cam means, said bushing secured to said blade supporting plate at its upper end and to said barrel at its lower end, said bushing and said enlarged bore defining an annular chamber therebetween and an expansion spring compressed within said annular chamber.

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