April 2, 1946. N. TESTI 2,397,890

SAFETY RAZOR

Filed Feb. 14, 1945 2 Sheets-Sheet 1

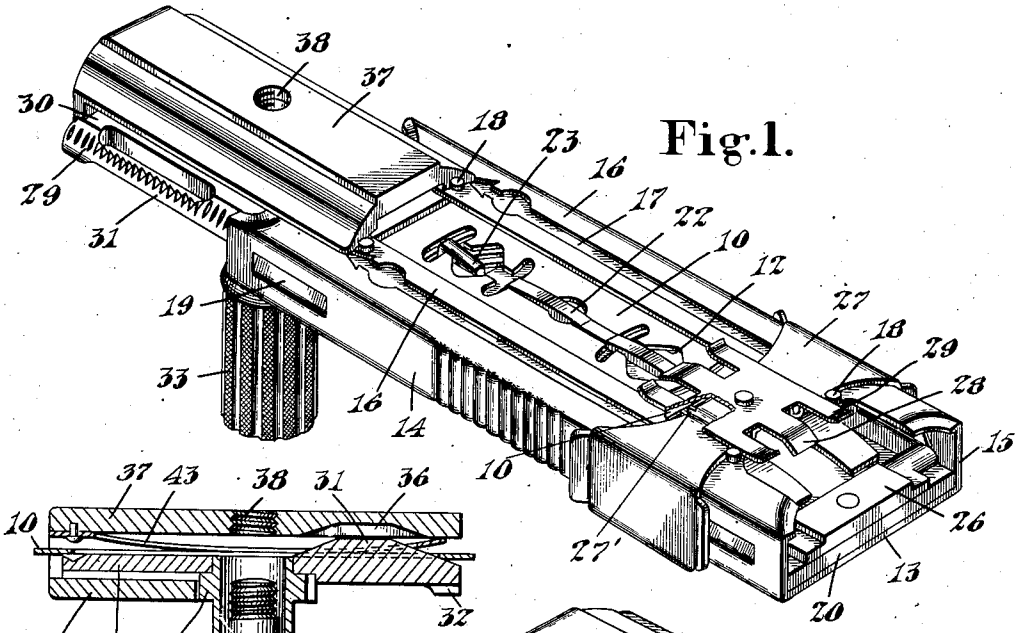


Fig.1.

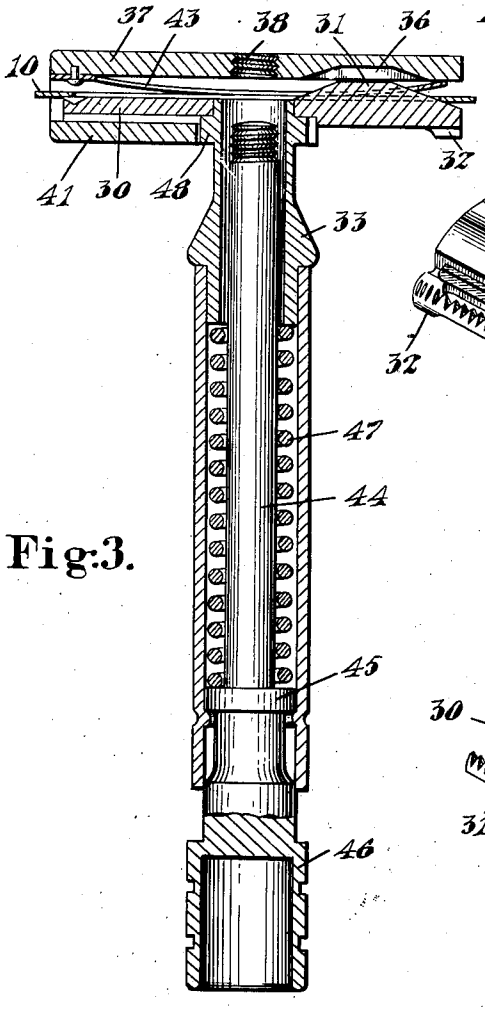


Fig.3.

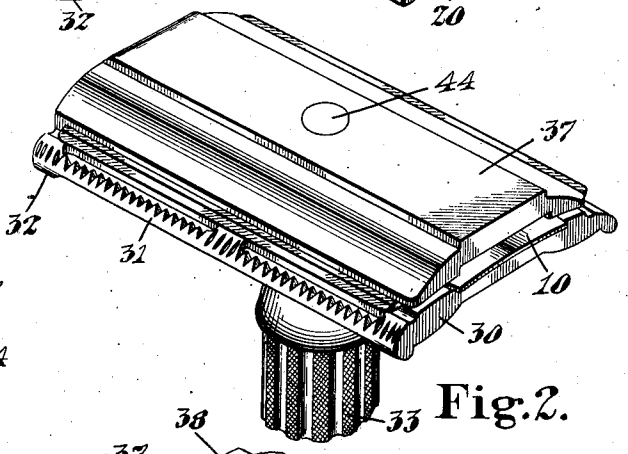


Fig.2.

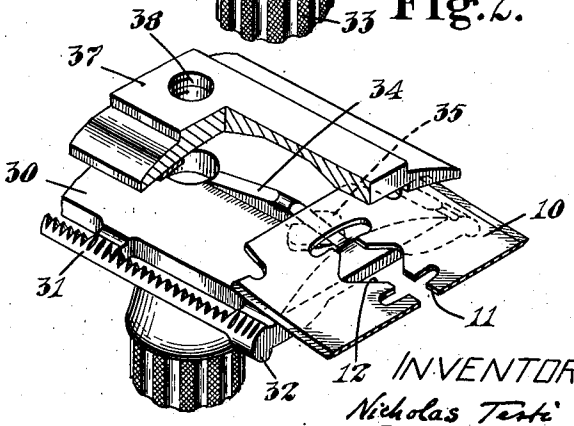


Fig. 4.

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SAFETY RAZOR

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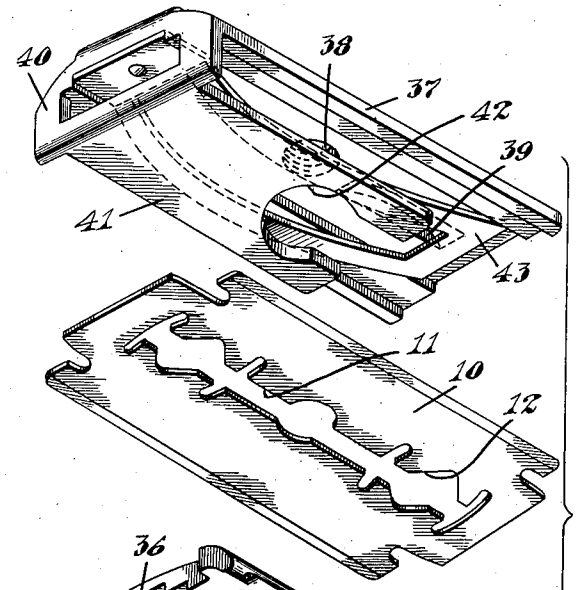


Fig. 5.

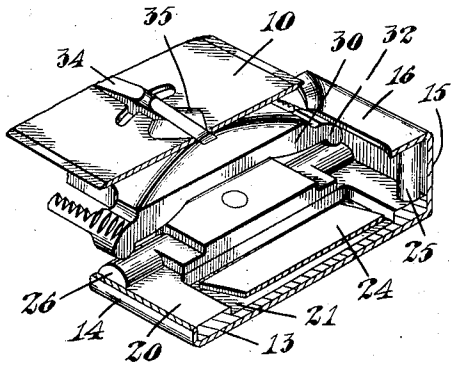


Fig. 6.

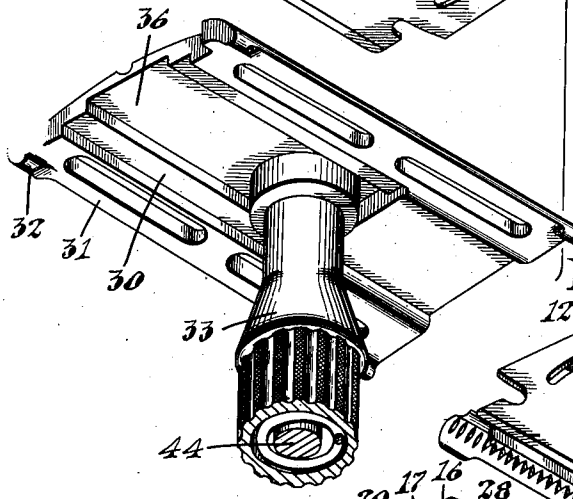
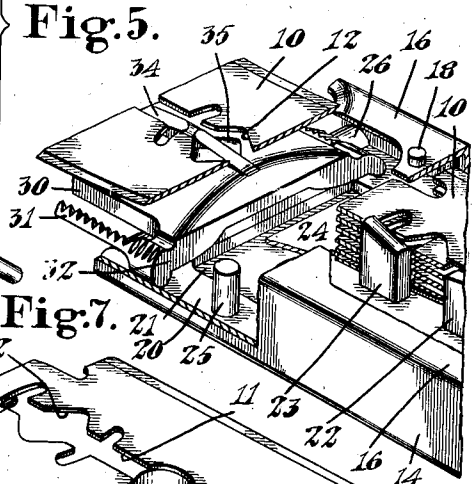


Fig. 7.



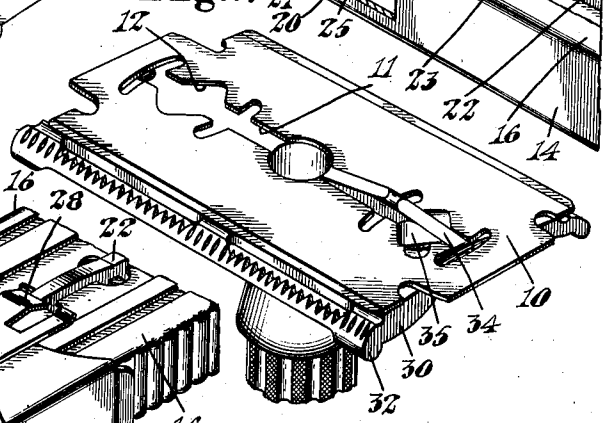


Fig. 8.

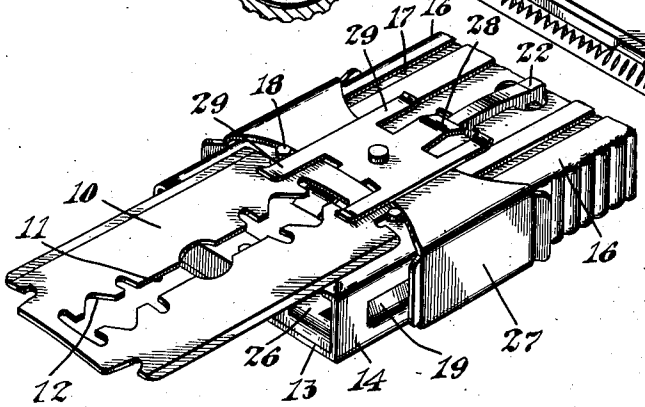


Fig. 9.

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Patented Apr. 2, 1946 2,397,890

UNITED STATES PATENT OFFICE

2,397,890

SAFETY RAZOR

Nicholas Testi, Boston, Mass., assignor to Gillette Safety Razor Company, Boston, Mass., a corporation of Delaware

Application February 14, 1945, Serial No. 577,759

4 Claims. (Cl. 30—65)

This invention relates to safety razors of the type in which a thin flexible replaceable blade is supported on both sides for shaving between co-operating blade-clamping members.

In handling safety razor blades under commercial conditions of transportation and distribution, and in the more-or-less casual treatment of such blades by the user, the extremely fine, keen edge of the blade is likely to become dulled by being brought into contact with its wrapping or with other objects before it can be actually clamped in shaving position in the razor. On this account, the best and most successful efforts of the manufacturer in sharpening blades is often rendered futile because of damage done to the very fragile and delicate structure of the blade edge after it has been brought to the keenest possible shaving condition and before the shaving operation is actually undertaken.

The present invention consists in an improved blade magazine and a novel combination of safety razor and magazine, whereby a fresh sharp blade may be introduced mechanically and accurately into final shaving position in the razor in such a manner that its edges are safeguarded from contact with any part of the razor head while the used blade is at the same time displaced to make room for the fresh blade, and finally the used blade is mechanically withdrawn from the safety razor. The magazine by which these steps are carried out serves as a container wherein an ample supply of blades may be safely maintained with their edges protected from contact and from which fresh blades may be delivered successively to the safety razor after a preliminary displacement of the used blade to provide passage for the fresh blade.

An important feature of the invention consists in a blade magazine constructed and arranged to be interlocked or otherwise associated with a razor head for blade delivery, and provided with means for lifting the used blade from the blade seat, or causing it to be lifted, so as to make way for the fresh blade which is to be subsequently presented. As herein shown, the magazine is provided at its delivery end with projections in the shape of spaced flanges adapted to be inserted between the end of the blade and the blade seat when the magazine is brought into operative relation with the safety razor head and before the blade-feeding device is operated. In this way the used blade is lifted by a prying or wedging action and the blade-receiving end of the blade seat is cleared for the reception of the oncoming fresh blade.

Another feature of the invention consists in a blade magazine equipped with a feeding device having blade-engaging or gripping means, constructed and arranged to seize the used blade in its displaced position in the safety razor and then to withdraw it from the razor either by retracting movement of the feeding device or simultaneously with the separating movement of the razor and the magazine.

The construction of the safety razor head itself is of secondary importance as long as its clamping members may be arranged to present between them a passage through which the fresh blade may reach shaving position in registration with the blade-locating projections of the razor. The particular safety razor herein shown for purposes of illustration, however, includes a novel blade hold-down device, preferably comprising an elongated spring movably retained between the co-operating blade-clamping members and shaped to engage and hold a blade inserted beneath it while leaving the blade free to be moved against yielding pressure to a released position preparatory to its withdrawal from the razor.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings in which:

Fig. 1 is a view in perspective on an enlarged scale showing the magazine and a safety razor head associated for blade delivery and withdrawal;

Fig. 2 is a similar view in perspective of the razor head;

Fig. 3 is a view of the razor in longitudinal section;

Fig. 4 is a fragmentary view in perspective of portions of the razor head and a blade;

Fig. 5 is an exploded view in perspective showing the several parts of a safety razor head and a blade;

Figs. 6 and 7 are fragmentary views in perspective showing the interlocking or telescoping parts of the magazine and razor;

Fig. 8 is a view in perspective of the guard member of the razor with a blade located thereon; and

Fig. 9 is a view in perspective of one end of the magazine illustrating the operation of withdrawing the used blade.

The magazine herein described is intended for handling double-edged slotted blades of the well-known "Gillette" type. It is, however, not limited to that blade or to blades of any specific shape

but, with appropriate modifications may be readily adapted for handling blades of other types, all within the scope of the invention.

The illustrated blade 10, as best shown in Figs. 5 and 8, is sharpened at both longitudinal edges and provided in its corners with reentrant notches which define elongated unsharpened end portions at each end of the blade. The blade is also provided with a longitudinal medial slot 11, having a central enlargement for the passage of the clamping spindle and intermediate diamond-shaped enlargements 12 arranged to fit the blade-locating projections of the different razors with which the blades are adapted for use. The slot 11 may be closed at both ends as herein shown or it may be opened at one end. The blades are usually of sheet steel .004 to .007 inch in thickness and therefore readily take a transverse curvature when clamped in position between the cap and guard members of the razor head.

For purposes of illustration, I have selected a blade magazine of the general type disclosed in my prior Patent No. 2,330,252, in which a stack of blades is maintained in longitudinally staggered relation.

In the illustrated embodiment, the magazine is shown as having an elongated tubular body of sheet metal, rectangular in cross-section and open at both ends. Its bottom 13 merges into side walls 14 and 15 and these, in turn, are folded inwardly to form top flanges 16.

The flanges 16 are separated at their inner edges by a wide channel or space that extends from end to end of the magazine and through this space the surface of the uppermost blade 10 in the magazine is exposed. Each of the top flanges 16 is provided with a double-headed arrow for indicating the direction in which the feed slide should be moved to deliver a blade, as will presently appear. Short stop pins 18 extend upwardly from the flanges 16 at both ends of the magazine and serve to limit the movement of the feed slide. Rectangular flanges 19 are formed in the side walls 14 and 15 at each end of the magazine and these flanges serve as guides for the end of the guard member of the safety razor when the latter is introduced into the magazine.

The magazine casing contains a blade-carrying unit which may be formed of plastic material and includes a base 20 in which is formed an elongated rectangular well 21. Projecting upwardly from the bottom of the well is a blade-locating rib 22 and a pair of blade-locating studs 23 placed in alignment with the rib 22 and spaced from either end thereof by a distance which corresponds substantially to the solid end portion of the blade. A bowed spring 24 is placed with its ends resting upon the bottom of the well 21. The spring is slotted or cut away to clear the blade-locating rib 22 and studs 23. It is bowed upwardly to engage the blade stack and hold the uppermost blade therein yieldingly in contact with the top flanges 16 of the magazine casing. Within the casing, the base 20 is provided with a pair of upstanding posts 25 near each of its ends and these posts serve as stops to limit the inward movement of the guard member of the safety razor as will be apparent from Figs. 6 and 7.

At each end of the magazine is provided a cross-bar 26 forming the bottom of the magazine opening and having curved guiding surfaces which control the entering movement of the guard member of the razor as will be presently described. The two top flanges 16 are curved and beveled at their outer ends and each thus provides a projection in the magazine for engaging a used blade in the razor and lifting or prying it off the blade seat preparatory to the presentation of a fresh blade.

The magazine includes in its organization a feed slide 27 which slides upon the top flanges 16 of the magazine casing and has walls which embrace the side walls 14 and 15 of the casing. A portion 27' of the feed slide 27 extends appreciably below the inner faces of the flanges 16, being shaped to clear the blade-locating rib 22 and to engage and advance the uppermost blade in the stack and to feed it in one direction or the other, depending upon the longitudinal position of the blade in the stack.

Projecting forwardly and rearwardly from the bridge of the feed slide 27 are resilient spring grippers, each comprising an intermediate downturned arm 28 spaced between a pair of upturned arms 29. The purpose of these spring arms is to engage the end of a used blade in the razor when the feed slide is moved to the end of its blade delivering stroke and to withdraw the used blade from the razor when the magazine is separated from it. In making engagement with the blade, the grippers bow it transversally upwardly and so tend to free it from the blade seat of the razor.

A safety razor constructed and arranged to co-operate with the magazine above described is shown in Figs. 3 and 5 of the drawings. The illustrated razor includes in its structure a blade-supporting or guard member 30, which is rectangular in outline and provided with a blade seat convex in transverse contour. This member is provided along each edge with guard elements, specifically with a guard bar 31 set off from the body of the member by elongated slots. Each guard bar terminates in a corner projection 32 extending substantially below the line of the guard bar 31. The guard member is provided centrally with a hole into which is inserted and fastened the razor handle 33. Between this hole and the blade-receiving end of the guard is provided a blade-locating rib 34 having an upper edge surface which slopes downwardly in both directions from a central point in order to facilitate the passage over the rib of the solid end of the blade. Adjacent to the forward end of the rib 14 is a shallow stud 35 shaped to fit one of the enlargements 12 of the blade slot and to retain a blade accurately in the proper longitudinal position when it has once been presented to the blade seat. In the under side of the guard member is also provided a wide rectangular channel 36

Co-operating with the guard member 30 is a cap member 37, similar in outline but of somewhat less width and having a transversely concave blade-engaging face. It is provided centrally with a threaded hole 38 for connection with the clamping spindle of the razor and with a longitudinal slot or groove 39, affording clearance for the rib 34 of the guard member when the cap is brought into blade-clamping position. At its rear end the cap is provided with spaced downwardly extending arms 40, formed integral with an inwardly extending connecting bar or flange 41 which is spaced from the body of the cap and provided at its inner end with a circular clearance aperture 42, disposed concentrically with respect to the threaded hole 38. A bowed and slotted spring 43 is riveted to the under-side of the cap 37 and this normally bears on the blade seat of the guard member 30 or upon a blade presented thereon.

The tubular handle 33 of the razor is provided

with a spindle 44, threaded at its upper end to fit the threaded hole 38 of the cap and provided with an intermediate shoulder 45 and with a knurled nut 46 at its lower end. A compression spring 47 bearing against the shoulder 45 of the spindle and an internal shoulder provided in the handle 33 tends to move the spindle always downwardly into an inoperative position in which it clears the blade passage between the cap and the guard as shown in Fig. 3.

The spring 43 tends at all times to lift the cap 34, maintaining it in the position shown in Fig. 3 when the cap is disengaged from the spindle 44. A passageway for the blade is thus provided between the convex face or blade-seat of the guard member 30 and the concave face of the cap 37. The razor handle 33 is provided at its upper end with a collar 48 which fits against the under side of the guard 30 and is of such diameter as to fill the clearance aperture 42 in the connecting bar 41 of the cap. So long as the cap is maintained in its lifted position, as shown in Fig. 3, its connecting bar 41 is therefore interlocked with the collar 48 of the razor handle. If it is desired to detach the cap from the razor for cleaning or inspection, the user has only to depress the cap against the pressure of the spring 43 so that the connecting bar 41 with its aperture 42 is carried below the collar 48 of the handle. When this is done, the cap may be disengaged by merely sliding it toward the left as seen in Fig. 3.

The blade may be supplied by hand to the razor while its cap 37 is lifted as shown in Fig. 3, by advancing the blade from right to left, flexing its advancing solid end over the rib 34 and continuing its movement until the rearmost of its two diamond-shaped enlargements 12 registers with the stud 35. In this position the blade is accurately located for shaving, as shown in Fig. 8.

When it is desired to supply the razor with blades from the magazine herein described, the spindle 44 is disengaged from the cap as shown in Fig. 3 and the right-hand end of the guard member 30 is inserted telescopically within the end of the magazine indicated by the arrows 17. This entering movement is illustrated in Figs. 6 and 7, from which it will be noted that the projections 32 of the guard member 30 are engaged and guided by the curved surfaces of the cross-bar 26 at the end of the magazine. As shown in Fig. 6, the co-action of these members registers the projecting ends of the flanges 16 upon the blade seat of the guard member beneath one end of the blade 10 which has been used in the razor and is now resting freely and in flat position upon the blade seat. As the telescopic movement of the magazine and guard member progresses, the projections 32 of the razor pass completely over the cross-bar 26 so that the magazine moves upwardly with respect to the guard member 30, lifting or prying the blade 10 upwardly from the blade seat and freeing it from the stud 35. After this occurs, the telescopic movement continues until the end of the guard member 30 encounters the posts 25 within the magazine. When this occurs, the magazine and razor are properly located for the delivery of a fresh blade to the razor.

Accordingly the feed slide 27 is moved toward the left, as seen in Fig. 1. The uppermost blade 10 of the stack is advanced endwise by the slide, passing inwardly upon the blade seat beneath the used blade which has been lifted, as already explained, by the projecting ends of the flanges 16. The fresh blade is advanced fully into position, moving beneath the used blade and as the feed slide approaches the end of its feeding movement the arms 28 and 29 of the gripper engage the outer end of the used blade, which up to that time has remained in position directly above the fresh blade. Now, as the magazine is separated from the razor, the gripper retains its hold upon the used blade and the latter is withdrawn from the razor as suggested in Fig. 9. In its delivering movement, the feed slide is passed from one end of the arrows 17 to the other. In Fig. 9, it is represented as covering the arrowheads, which are exposed in Fig. 1. The arrowheads, which have been exposed in this feeding movement, now indicate that the next blade is to be delivered from the other end of the magazine. Therefore, preparatory to the next delivery operation, the magagine must be reversed, end for end.

When the solid end portion of the fresh blade reaches the rib 34 it rides up its inclined edge, passing beneath the used blade which has previously been lifted from the blade seat by the flanges 16 of the magazine. This lifting action of the rib prevents the forward enlargement of the blade from registering with the stud 35. The end of the fresh blade then progresses down the rear or inner inclined edge of the rib 34 and the body of the rib enters the slot 11 of the blade so that the blade is permitted to rest upon the blade seat and its rear enlargement 12 to settle into place upon the stud 35.

Having thus disclosed my invention and described in detail an illustrative embodiment thereof, I claim as new and desire to secure by U. S. Letters Patent:

1. A safety razor comprising co-operating elongated members having opposed blade-clamping faces, and a longitudinal blade-locating rib projecting from one of said faces and merging at one end into a wide stud shaped to fit into an enlargement of corresponding contour in the slot of a blade located upon said rib.

2. A safety razor comprising co-operating elongated members having opposed blade-clamping faces and being connected at one end, a longitudinal rib projecting from one of said faces adjacent to the free end of the clamping members, and a wide shallow stud including a part of said rib within its contour.

3. A safety razor comprising co-operating elongated members having opposed blade-clamping faces, a longitudinal rib projecting from one of said faces and tapering both ways from its mid-section, and a stud wider than the rib disposed on both sides of said rib adjacent one end thereof.

4. A safety razor comprising elongated cap and guard members having opposed blade-clamping faces, and being connected at one end while leaving a blade passage at the other, a single longitudinal blade-locating rib projecting from the faces of the guard member adjacent to the unconnected end of said member, and a wide shallow stud of substantially square contour disposed on both sides of said rib near its forward end.

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