Oct. 9, 1945. D. BENSEL 2,386,536

SAFETY RAZOR

Filed April 3, 1944 2 Sheets-Sheet 1

Fig. 1.

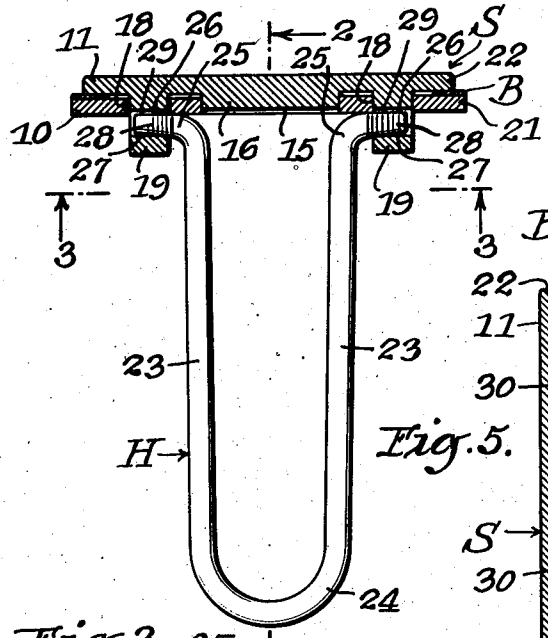


Fig. 2.

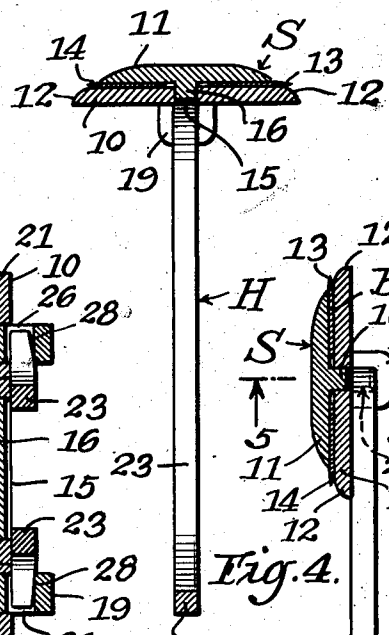


Fig. 5.

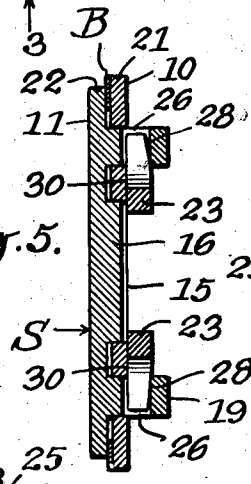


Fig. 4.

Fig. 3.

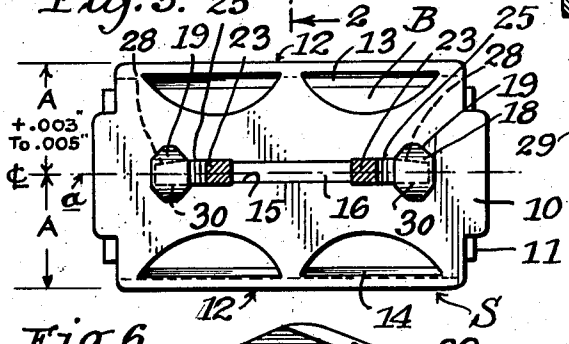


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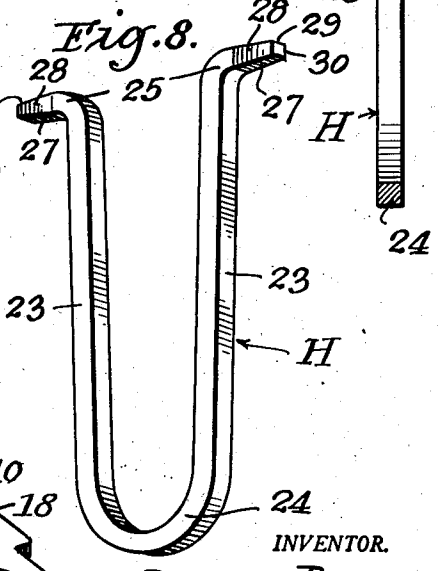


Fig. 6.

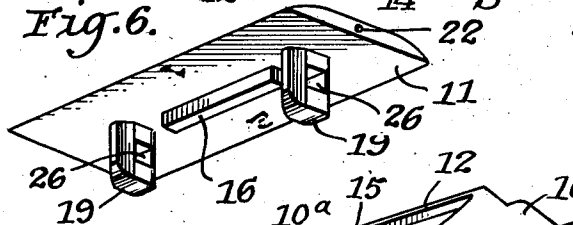
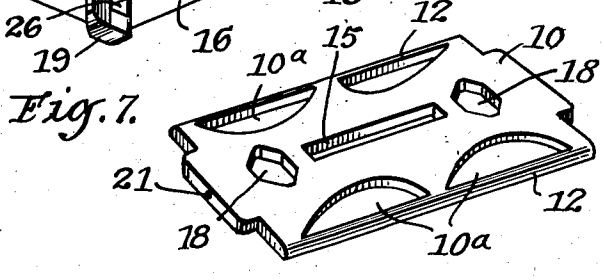


Fig. 7.



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Fig. 10.

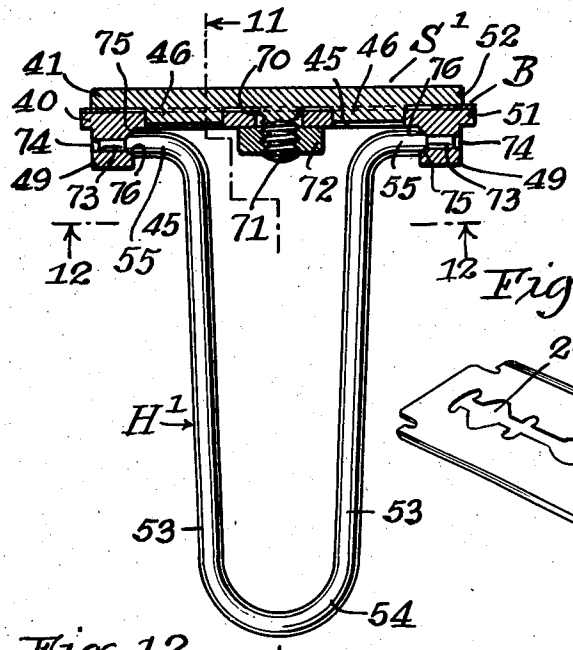


Fig. 11.

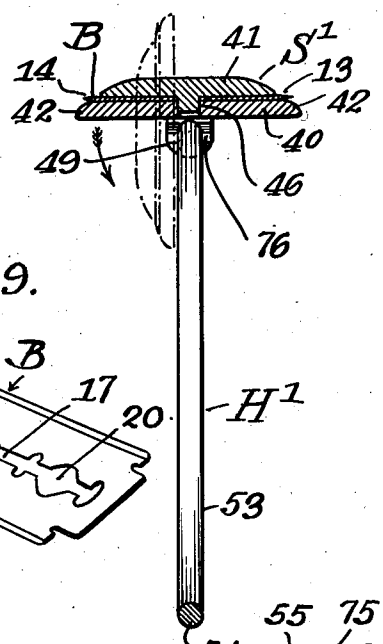


Fig. 9.

Fig. 12.

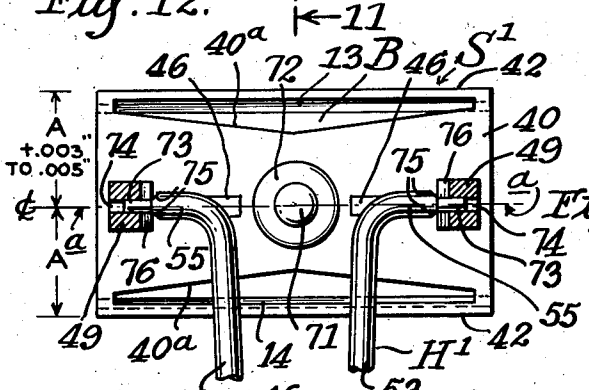


Fig. 15.

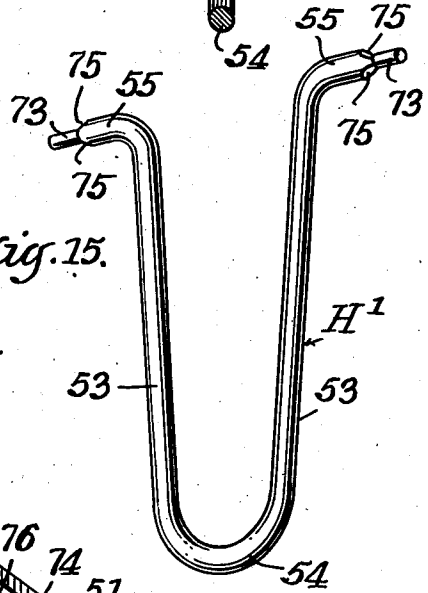


Fig. 13.

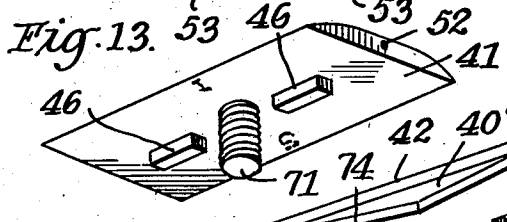
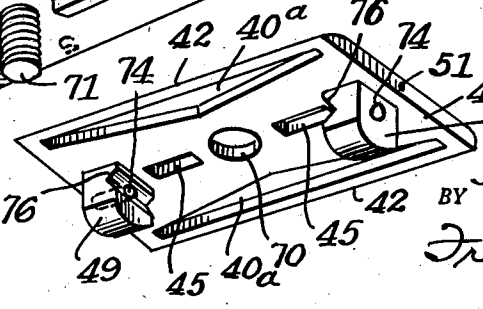


Fig. 14.



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2,386,536

SAFETY RAZOR

Duryea Bensel, Los Angeles, Calif.

Application April 3, 1944, Serial No. 529,245

10 Claims. (Cl. 30—68)

This invention relates generally to cutting instruments and more particularly to razors of the safety type.

An object of this invention is to provide a safety razor structurally characterized by being composed of a few simply and inexpensively constructed parts which are releasably retained assembled in a working position for rapid, smooth shaving with the utmost convenience, or readily arranged to form an extremely compact and flat parcel for carrying in the pocket, all while enabling the razor parts to be instantly disassembled for cleaning or sterilizing with ease and dispatch.

A further object of this invention is to provide a safety razor of the above described character whose blade-supporting head is adjustably mounted on a spring handle having means automatically co-acting under the resiliency of the handle, to rigidly hold the head with the cutting blade disposed at a convenient angle to the handle for shaving, or generally parallel to the length of the handle to form the compact parcel for carrying in the pocket, all with but a simple manipulation of the handle.

With these and other objects in view, the invention resides in the combination and arrangement of elements as set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings,

Figure 1 is a longitudinal sectional view of one form of safety razor embodying this invention, and illustrating the relation of the razor parts for shaving;

Figure 2 is a longitudinal sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a transverse sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a view similar to Figure 1, but with the razor parts related to provide a flat, compact parcel when not in use;

Figure 5 is a transverse sectional view taken on the line 5—5 of Figure 4;

Figure 6 is a perspective view of the top element for the cutting blade;

Figure 7 is a perspective view of the guard element for the cutting blade;

Figure 8 is a perspective view of the handle;

Figure 9 is a perspective view of one design of the conventional double edged flexible wafer type cutting blade adapted to be used in the razor;

Figure 10 is a longitudinal sectional view of another form of safety razor embodying this invention, and showing the relation of the shaving head and handle for shaving;

Figure 11 is a longitudinal sectional view taken on the line 11—11 of Figure 10;

Figure 12 is a transverse sectional view taken on the line 12—12 of Figure 10;

Figure 13 is a perspective view of the top or clamping element of the form of safety razor shown in Figures 10 to 12;

Figure 14 is a perspective view of the guard element; and

Figure 15 is a perspective view of the handle.

Referring specifically to the drawings, and particularly to Figures 1 to 8 inclusive, this form of safety razor comprises a shaving head S and a handle H, the shaving head being composed of the bottom or guard element 10 and the top or clamping element 11 adapted to receive the conventional double edged razor blade B (Figure 9) therebetween for co-action with the handle H in rigidly clamping the blade flatly in a shaving position.

The guard and clamping elements 10 and 11 are in the form of flat, rectangular metal or plastic plates which can be die-cast or molded. These parts are substantially co-extensive in length with the blade B, with the width of the guard element 10 exceeding that of the blade and having its continuous guarding edges 12 rounded towards its side confronting the blade. Suitable openings 10*a* are provided in the guard element 10 adjacent its edges 12 for the free passage of whisker cuttings and soap or shaving cream so as to prevent clogging of the blade. The width of the clamping element 11 is slightly less than that of the blade for co-action with the rounded edges 12 of the guard element 10 in exposing the two cutting edges 13 and 14 of the blade for shaving when the parts are assembled as shown particularly in Figure 2.

The guard element 10 is provided with a longitudinal slot 15 receiving a positioning projection or rib 16 projecting from the top element 11 and adapted to also pass through a central longitudinal slot 17 in the blade B to relate and confine the elements and blade in parallelism. The guard element 10 is also provided with openings 18 beyond the ends of the slot 15, receiving handle-attaching lugs 19 projecting from the top element 11 and passing through enlarged portions 20 (Figure 9) of the blade slot 17.

It will be noted from Figure 3 that the dimension A which represents the distance from the longitudinal center line *a* of the guard element 10 is indicated at one side of the center line as

being increased from .003" to .005". Thus, as the slot 15 and openings 18 in the guard element are symmetrically arranged about the center line *a*, whereas the slot 17 and its enlarged portions 20 of the standard type of double edged blade B are exactly centered between its two cutting edges 13 and 14, it will be clear that when the guard and top elements are assembled with the blade therebetween, one cutting edge will project from the respective rounded guarding edge 12 of the guard element 10 a greater distance by .003" to .005" than will the other cutting edge from its respective guarding edge 12. By this relationship of guard element and blade, the cutting edge of the latter which is exposed the greater amount from the guarding edge 12 will provide a heavy or close shave, whereas the other cutting edge will provide a light shave.

The top element 11 is provided along its two longitudinal edges with the indicia "1" and "2" respectively, as indicated in broken lines in Figure 6, to designate light and close shaves. In order to properly relate the top element 11 end for end with the guard element 10 so that the correct indicia "1" or "2" will be at that guarding edge 12 of the guard element for the corresponding type of shave, the elements are provided on one end with suitable identifying marks or indentations 21 and 22, which, when arranged at the same end of the shaving head as shown in Figures 4 and 5, correctly relate the guard and top elements end for end.

The handle H is composed of a length of spring tempered wire of non-circular and preferably square cross section as shown. The handle is formed into generally U shape to provide a pair of spaced spring arms 23 terminating at one end in a connecting bight 24 and at the other end in lateral attaching portions 25. These attaching portions or trunnions project substantially at a right angle outwardly from the respective arms 23, and are adapted to be freely, yet non-rotatably received in openings 26 in the attaching lugs 19, when the shaving head S occupies the right angular and parallel positions relative to the handle H as shown in Figures 2 and 4 respectively.

The attaching portions 25 of the handle have two of their right angularly related sides inclined to provide wedge or cam surfaces 27 and 28 respectively, whereas the other two sides are non-inclined to provide bearing surfaces 29 and 30 co-actable with the respective oppositely related cam surfaces in a manner to be described in the operation of the invention which is as follows:

Assuming that the parts are disassembled, the blade B is placed over the rib 16 and lugs 19 of the inverted clamping element 11, following which the guard element 10 is placed over the blade to receive the rib and lugs in the slot 15 and openings 18, respectively. With these two parts and the blade held assembled in one hand, the arms 23 of the handle H are grasped and forced towards each other sufficiently for the attaching portions 25 to be inserted into the openings 26, with the handle in its right angularly related or parallel position of Figure 2 or Figure 4 according as the razor is to be used or placed in a suitable case (not shown) for carrying.

Upon releasing the arms 23 in the shaving position of the razor shown in Figure 1, 2 and 3, the arms urge the attaching portions thereof into the respective openings 26 of the top element 11, so that the cam surfaces 27 and oppositely related bearing surfaces 29 of such portions co-act with a wall of the openings 26 and with the bottom confronting surface of the guard element 10 to draw the latter and top element 11 towards each other with sufficient force to tightly clamp the blade B between the elements, and to rigidly connect the latter as well as to rigidly support the head S in shaving position on the handle.

With the arms 23 released in the parallel position of the handle shown in Figures 4 and 5, so that the arms urge their attaching portions 25 into the respective openings 26 of the top element 11, the other cam surfaces 28 and the oppositely related bearing surfaces 30 of the portions 25 co-act with a wall of the openings 26 and with the bottom confronting surface of the guard element 10 to draw the latter and top element towards each other with sufficient force to rigidly lock the elements together with the blade clamped therebetween, and to rigidly support the handle in its parallel or non-use position so as to make a flat, compact parcel of the razor. It will be clear from the foregoing description that in both positions of the handle, it serves to rigidly support and automatically lock the guard and top elements together with the blade clamped tightly therebetween, so as to dispense with all extraneous fastening means.

Reference will now be had to Figures 10 to 15 inclusive which illustrate a second form of safety razor comprising a shaving head S' and a handle H'. The shaving head is composed of a guard element 40 and a top or clamping element 41 which are flat rectangular metal or plastic plates die cast or molded. The elements 40 and 41 are substantially co-extensive in length with the blade B, and the guard element exceeds the blade in width to provide rounded longitudinal guarding edges 42, adjacent to which are suitable openings 40*a* for whisker cuttings and soap. The two cutting edges 13 and 14 of the blade are exposed from the longitudinal edges of the top element 11 for the shaving operation when the razor parts are assembled for use as in Figures 10 and 11.

The guard element 10 is provided with longitudinally spaced and extending slots 45 receiving correspondingly spaced positioning projections or ribs 46 projecting from the top element 41, and adapted to also pass through the longitudinal slot 17 in the blade B to relate and confine the elements 40 and 41 in parallelism. The guard element 40 is also provided with a central opening 70 intermediate the slots 45, through which opening projects a threaded stud 71 from the top element 41. A flat, knurled nut 72 is adapted to be tightly screwed upon the stud 71 to firmly clamp the blade B in a flat position between the elements 40 and 41.

It will be noted from Figure 12 that the relation of the center line *a* to the longitudinal guarding edges 42 of the guard element 40, is the same as that described in connection with the first form of the invention to so relate the cutting edges 13 and 14 of the blade to the guarding edges 42 as to provide light and heavy shaves from the respective edges of a double edge blade without any adjustment of the razor. Therefore, further detail description of this feature of the invention will be dispensed with.

The indicia "1" and "2" are provided along the longitudinal edges of the top element 41, and the identifying marks or indentations 51 and

52 (Figures 10, 13 and 14) are provided on the guard and top elements to correctly relate the elements end for end and dispose the proper indicia at the correct edges of the blade B for the light or close shave, as has been previously described.

The guard element 40 is provided adjacent its end and along the center line *a* with attaching lugs 49 for co-action with the handle H' which is composed of a length of spring tempered wire preferably round in cross section. This handle is formed into generally U shape to provide a pair of spaced spring arms 53 terminating at one end in a connecting bight 54 and at the other end in lateral attaching portions or trunnions 55. These attaching portions project outwardly from the respective arms 53 and have their ends reduced in diameter to provide pivot pins 73 rotatably mounted in alined bores 74 in the lugs 49.

At the junction between the pins 73 and the full diameter of the attaching portions 55, the latter are oppositely beveled at diametrically opposed locations to provide wedge surfaces 75 forming a symmetrical double wedge and adapted to seat in a V-shaped groove 76 formed in the confronting sides of the attaching lugs 49 to intersect the bores 74 as shown.

The arms 53 are normally urged outwardly relatively to each other with sufficient force to maintain the wedge surfaces 75 firmly seated in the grooves 76 for co-action therewith in releasably retaining the shaving head S' in right angular relationship to the handle with sufficient security for shaving. However, additional manual force applied to the handle H' in a direction to rotate same about the axis of the attaching portions 55 will cause the wedge surfaces 75 to act as cams against the walls of the grooves 76 in opposition to the normal outwardly urging tendency of the arms 53, so as to shift the attaching portions 55 axially towards each other until the wedge surfaces are entirely clear of the grooves upon 90 degree rotational movement between the head and handle to their parallel relationship shown in Figures 11 and 12. It will be clear that in this position, the razor forms a flat, compact parcel so as to enable it to be conveniently carried about in a suitable flat case (not shown).

Although only two forms of the invention have been shown and described, it will be understood that various modifications may be made therein without departing from the spirit of the invention and the spirit and scope of the appended claims.

I claim:

1. A safety razor comprising: a shaving head including a guard element and a top element co-acting to confine a cutting blade therebetween for shaving therewith; a handle having spring arms; lateral attaching portions on said arms co-acting with the shaving head to mount same on the handle for adjustment to occupy shaving and non-use positions; and cam means on said attaching portions co-acting with one of said elements in response to the spring urging action of said arms, to rigidly retain the shaving head in its shaving position relative to the handle.

2. A safety razor comprising: a shaving head including a guard element and a top element co-acting to confine a cutting blade therebetween for shaving therewith; one of said elements having attaching lugs provided with openings; a handle including spring arms provided with lateral attaching portions urged into said openings by the spring action of said arms; and means on said attaching portions co-acting with said lugs to rigidly retain the shaving head in a shaving position relative to the handle.

3. A safety razor comprising: a shaving head including a guard element and a top element co-acting to confine a cutting blade therebetween for shaving therewith; one of said elements having attaching lugs provided with openings; a handle including spring arms provided with lateral attaching portions urged into said openings under the spring action of said arms; and means defining cam surfaces on said attaching portions co-acting with said lugs under the spring action of said arms, to releasably retain the shaving head rigidly in a shaving position relative to the handle.

4. A safety razor comprising: a shaving head including a guard element and a top element co-acting to confine a cutting blade therebetween for shaving therewith; one of said elements having attaching lugs provided with openings; a generally U-shaped handle defining spaced spring arms having lateral attaching portions at their free ends, urged into said openings under the spring action of said arms; and cams on said attaching portions co-acting with said lugs to releasably retain the shaving head rigidly in a shaving position relative to the handle.

5. A safety razor comprising: a shaving head including a guard element and a top element; said elements having means co-actable with a cutting blade to dispose same between the elements with the cutting edge of the blade exposed for shaving; a handle; means on the handle and one of said elements co-acting to force the elements towards each other and clamp the blade between the elements with the shaving head rigidly supported on the handle in one position for shaving; and means on the handle co-acting with said one of the elements to secure the elements together and support same on the handle in a second position wherein the razor forms a flat parcel.

6. A safety razor comprising: a shaving head including a guard element and a top element adapted to receive a cutting blade therebetween; the top element having attaching lugs provided with openings of non-circular cross section; a handle including spring arms having lateral attaching portions of non-circular cross section non-rotatably received in said openings and urged thereinto under the spring action of said arms; and cams on said portions operable in response to the spring urging action of said arms to draw the elements towards each other into clamping engagement with a blade and to rigidly connect the elements to the handle in a position for shaving with the blade.

7. A safety razor comprising: a shaving head including a guard element and a top element adapted to receive a cutting blade therebetween; the top element having attaching lugs provided with openings of non-circular cross section; a handle including spring arms having lateral attaching portions of non-circular cross section non-rotatably received in said openings and urged thereinto under the spring action of said arms; cams on said portions operable in response to the spring action of said arms to draw the elements towards each other into clamping engagement with a blade and to rigidly connect the elements to the handle in a position for shaving with the blade; and other cams on said portions by which the elements and handle are caused to be rig-

idly maintained connected with the elements rotatably adjusted relative to the handle to a second position wherein the razor forms a flat parcel.

8. A safety razor comprising: a shaving head including a guard element and a top element adapted to receive a cutting blade therebetween; the top element having a positioning rib and attaching lugs at opposite ends thereof provided with openings of square cross section; the guard element having a positioning slot and openings at opposite ends thereof respectively receiving said ribs and lugs; and a generally U-shaped handle including spring arms having lateral attaching portions of square cross section non-rotatably received in said lug openings; said attaching portions having relatively inclined sides providing cams operable under the urging action of said arms, to draw the elements towards each other into clamping engagement with the blade and with the elements and handle rigidly locked in either of two rotatably adjusted positions of the shaving head relative to the handle.

9. A safety razor comprising: a shaving head including a guard element and a top element adapted to receive a cutting blade therebetween; the top element having a threaded stud and a positioning rib; the guard element having openings receiving said stud and rib, and provided with attaching lugs having registering bores and beveled cam grooves intersecting said bores; a nut threaded on said stud to clamp the elements against the cutting blade; and a generally U-shaped handle including spring arms having attaching portions terminating in pins rotatably mounted in said bores, and beveled surfaces co-acting with said cam grooves to releasably retain the shaving head in a shaving position relative to the handle, yet yielding to rotational force applied to the handle, to enable same to be rotated relative to the head to a non-use position in which the razor forms a flat parcel.

10. A safety razor comprising: a shaving head including a guard element and a top element adapted to receive a cutting blade therebetween; one of said elements having a threaded stud passing through the other element; a nut on said stud for clamping the elements together; a spring handle; means on the handle and one of said elements rotatably mounting the shaving head on the handle to occupy shaving and non-use positions; and means on the handle and said one of the elements co-acting to releasably retain the saving head rigidly in shaving position under spring action of the handle, yet yielding to rotational force applied to the handle, to permit the head and handle to be relatively rotated to non-use position.

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