Oct. 1, 1935. G. B. LAMBERT 2,015,901

SAFETY RAZOR

Filed April 15, 1933 2 Sheets-Sheet 1

Fig. 1.

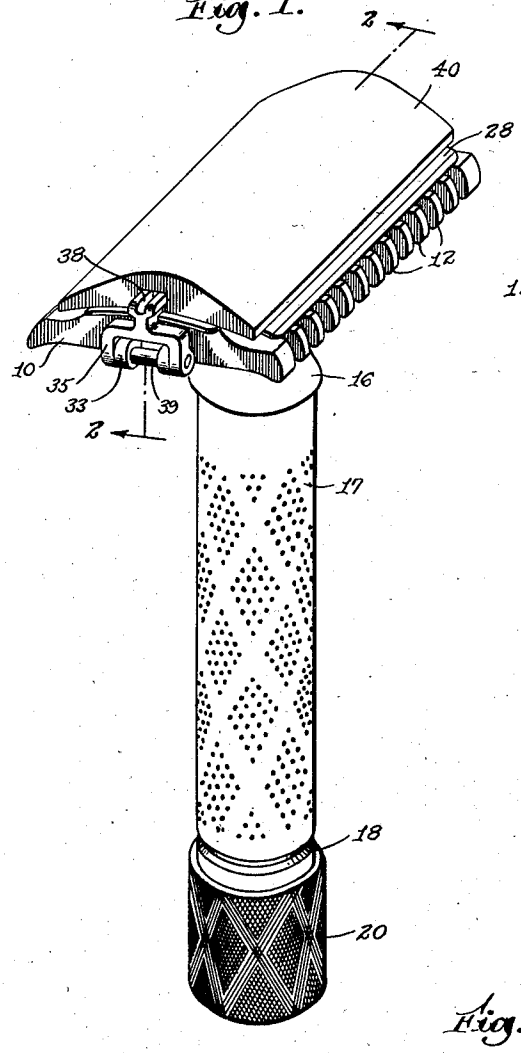


Fig. 3.

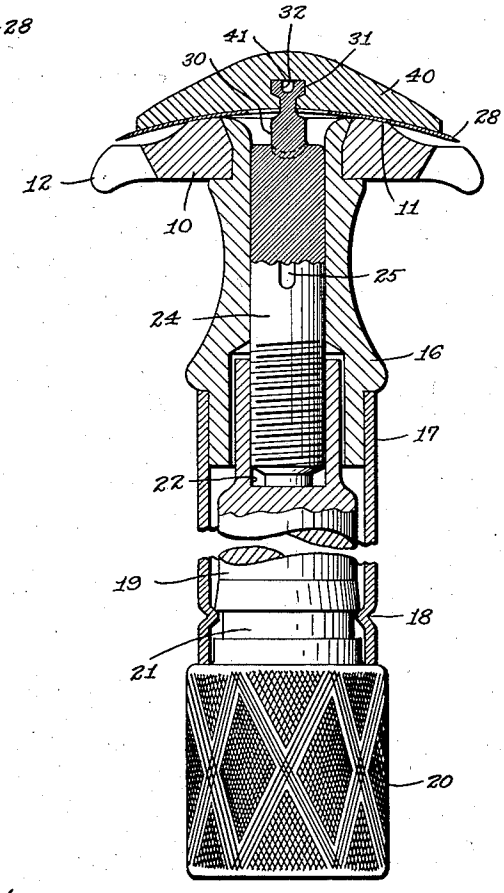


Fig. 2.

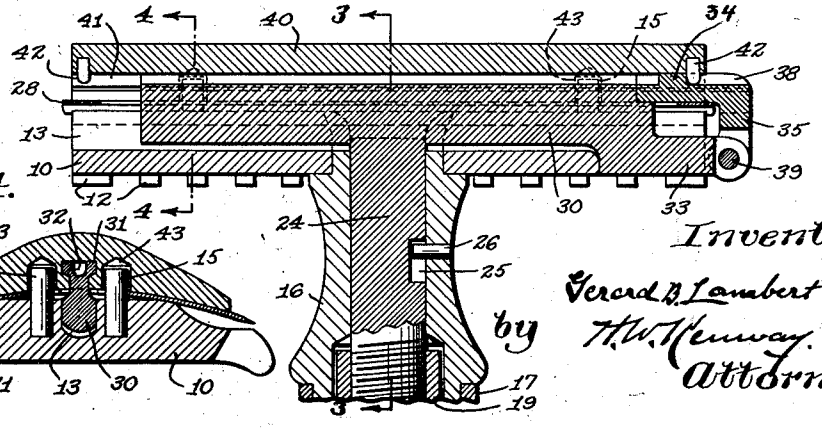


Fig. 4.

Inventor

Gerard B. Lambert

by H. W. Kenway.

Attorney

Oct. 1, 1935. G. B. LAMBERT 2,015,901

SAFETY RAZOR

Filed April 15, 1933 2 Sheets-Sheet 2

Fig. 5.

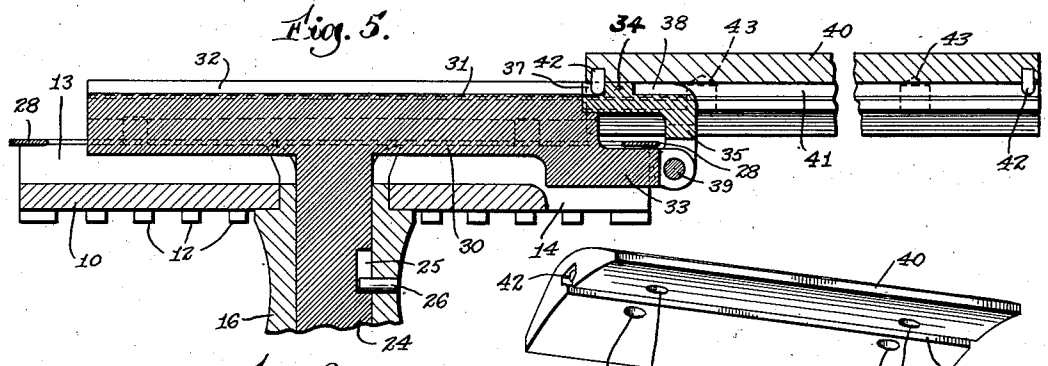


Fig. 6

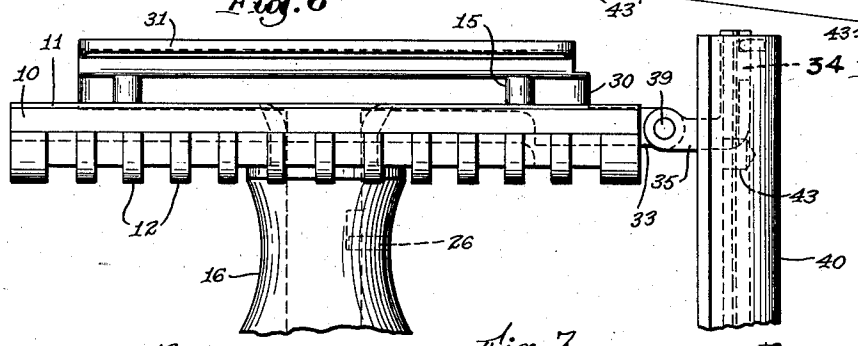
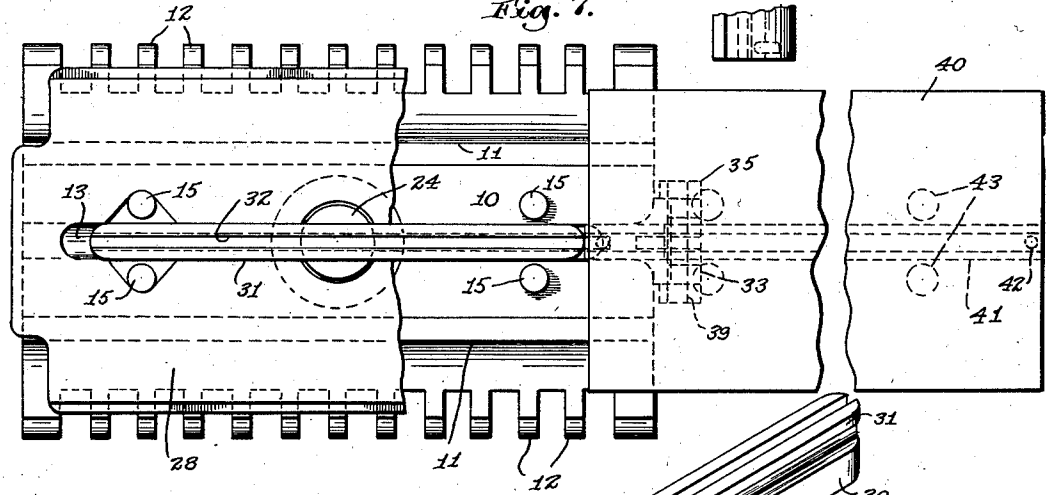


Fig. 8.

Fig. 7.



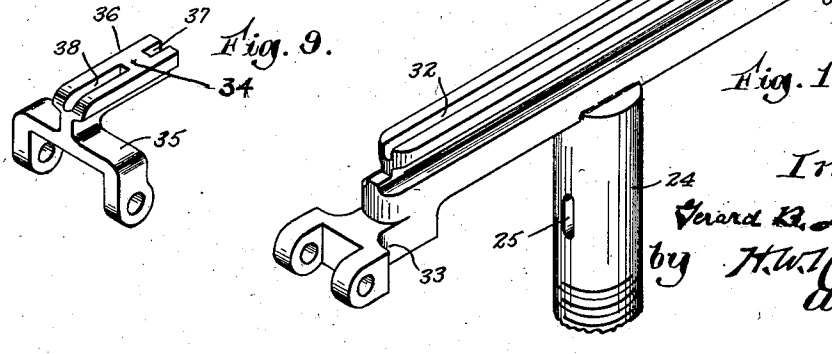


Fig. 9.

Fig. 10.

Inventor
Gerard B. Lambert
by H. W. Kenway
Attorney

Patented Oct. 1, 1935 2,015,901

UNITED STATES PATENT OFFICE

2,015,901

SAFETY RAZOR

Gerard B. Lambert, Princeton, N. J., assignor to Gillette Safety Razor Company, Boston, Mass., a corporation of Delaware

Application April 15, 1933, Serial No. 666,339

20 Claims. (Cl. 30—66)

This invention relates to safety razors of the type in which a thin, flexible blade is clamped and shaped in operative position for shaving between cooperating blade-clamping members. The present invention contemplates a novel construction of cap and guard connected in a relationship which permits the user conveniently to carry out the operations of replacing and clamping the blade and also of cleaning the razor.

In one aspect, the present invention consists in improvements upon the safety razor construction disclosed in my prior Letters Patent No. 1,906,631, granted May 2, 1933. In another aspect, is consists in improvements having general application to safety razors wherein the cap and guard members are separated to expose the blade by longitudinal movement with respect to each other.

In the safety razor herein shown as embodying my invention, one of the blade-clamping members is provided with a longitudinal groove in its face and the other with a connecting member which extends through its blade-supporting or flexing face. This construction is rendered possible by the wide commercial use of safety razor blades having a longitudinal slot of appreciable length, in that such slot may be used as a clearance opening for the connecting member, with the result that the construction of the razor may be simplified by the employment of a direct acting connection between the blade-clamping members, and the efficiency of the blade-clamping action is thereby improved, since the clamping pressure may be applied to the sliding blade-clamping member through substantially its whole length and in a direction normal to the blade-shaping face thereof.

As herein shown, the guard member is provided with a blade-supporting face and the guide member is arranged to project through this face and to have slidable connection with the cap. The guide member is also made or arranged for up and down adjusting movements, for releasing or clamping the blade and for varying its transverse curvature and blade exposure in accordance with the requirements or preference of the user.

A feature contributing to the accuracy of the safety razor of my invention consists in blade-locating projections, located independently of the movable connecting member and serving accurately to position the blade upon the guard without dependence in any way upon those elements which connect or position the cap and guard members with respect to each other.

Another important feature of my invention, by which I am enabled to secure the complete uncovering and exposing of the blade-supporting face of the guard, consists in an auxiliary guide member, which in effect constitutes an extension of the connecting member, arranged to swing beyond the end of the blade into position in alignment with the guide member, or the main portion of the guide member, and to be simultaneously engaged therewith by the cap when the latter is in position superposed above the guard. In this position the auxiliary guide member constitutes a part of the connection with the cap through which the clamping pressure is transmitted thereto. When the cap is moved so as to disengage the connecting member and maintains its connection only with the auxiliary guide member, the latter may be swung angularly and the cap guided to a position underneath and at one side of the blade-supporting face of the guard, thus completely exposing the latter and leaving the user free to remove or replace the blade without obstruction.

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 of the razor in perspective and on an enlarged scale;

Fig. 2 is a view in cross-section of the razor head on a still larger scale taken on the line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a cross-sectional view through one end of the razor head on the line 4—4 of Fig. 2;

Fig. 5 is a cross-sectional view similar to Fig. 2 but showing the cap shifted to the outer limit of its longitudinal movement;

Fig. 6 is a view in elevation of the razor head, showing the cap in blade-exposing position;

Fig. 7 is a plan view of the razor head, the cap being shown in the position which it occupies in Fig. 5;

Fig. 8 is a view in perspective of the cap;

Fig. 9 is a view in perspective of the auxiliary hinge member; and

Fig. 10 is a view in perspective of the adjustable cross bar member of the razor.

The illustrated razor includes a guard 10 which comprises an elongated plate having a blade-supporting face bounded by spaced parallel fulcrum shoulders 11 over which the blade is adapt-

ed to be transversely flexed in the assembled razor. The guard is provided with the usual guard teeth 12 along its longitudinal edges and as herein shown it has a central longitudinal groove 13 in its upper face which merges at one end into a short slot 14 opening through the bottom of the guard. Projecting blade-locating studs or pins 15 are arranged in pairs in the blade-supporting face of the guard on opposite sides of groove 13 and spaced from its edges.

The handle of the razor is permanently secured to the guard 10 and comprises a head 16 riveted or spun at its upper end into a corresponding hole in the guard. The head 16 is shouldered and receives a barrel member 17 within which is rotatably mounted a stud 19 having a knurled head 20 at its lower end. The barrel 18 is provided with a circumferential corrugation forming an internal rib which is received in a groove 21 in the body of stud 19 and thereby the stud is maintained rotatably mounted within the handle. Above the groove 21 the stud 19 is provided with an outwardly tapering zone which is bounded at its lower edge by the groove 21. In assembling the handle this tapered portion is forced past the rib of the barrel which snaps into retaining position behind it. The upper end of the stud is provided with a threaded recess 22 in which is adjustably received the lower threaded end of a stem 24 having a short slot 25 in one side into which projects a pin 26 in the head 16 of the handle thereby positively limiting the longitudinal movement of the stem 24 in the handle, when the knurled head 20 is turned in either direction.

The stem 24 carries at its upper end a cross-bar 30 having parallel longitudinal side faces arranged to fit with clearance for movement in the groove 13 of the guard and thus permit up and down movement of the cross-bar therein. The cross-bar is provided with a reduced longitudinal zone which is surmounted by a transversely extending flange or tongue 31 terminating at its left end, as shown in Fig. 10, short of the end of the cross-bar so as to form a shoulder for a purpose to be presently described, and provided in its upper face with a longitudinal groove 32 extending from one end to the other. At its left end, the cross-bar 30 is also provided with a downwardly-projecting forked hinge element 33 by which a hinged connection is provided for the cap, as will presently appear.

An auxiliary hinge piece or supplementary guide 35, best shown in Fig. 9, is provided with ears which straddle the hinge element 33 and which are adapted to be connected thereto by a hinge pin 39. The guide piece 35 includes a top flange or tongue 36, corresponding in cross-section to the flange 31 of the cross-bar 30 and adapted to be aligned therewith. The flange 36 includes a short groove 37 corresponding to the groove 32 of the flange 31 and an end groove 38 of similar cross-section separated from the groove 37 by a bridge 34. The hinge piece 35 is angular in shape so that when it occupies its upper position, in which the flanges or tongues 31 and 36 are aligned, there is a recess or clearance space formed between it and the hinge element 33 of the cross-bar 30 for the reception of the end of the blade.

The cap 40 is substantially of the same length as the guard and has a concave blade-engaging face bounded by longitudinal blade-flexing edges which cooperate with the fulcrum shoulders 11 of the guard in transversely flexing the blade when the razor is assembled for shaving. The cap 40 is provided with a central longitudinal groove 41, T-shaped in cross section and adapted to slide over the transverse flange 31 of the cross-bar 30, and over the flange 36 of the auxiliary guide piece 35, which it will be understood in one position is accurately aligned with the flange 31 of the cross-bar 30. Near each end of the groove 41 there is provided in the cap a stop pin 42 and these cooperate with the bridge 34 between the grooves 37 and 38 of the auxiliary guide piece to limit the free sliding movement of the cap upon the flange 31. In one position, as shown in Fig. 2, the right-hand pin 42 engages the right-hand end of the bridge 34 and locates the cap in registration with the guard. In its other extreme position the left-hand pin 42 engages the left-hand end of the bridge 34, as shown in Fig. 5, and registers the left-hand end of the cap substantially flush with the inner end of the auxiliary hinge piece 35. The cap 40 is also provided with four sockets 43 located in its blade-engaging face in alignment with the four blade-locating pins 15 of the guard when the cap and guard are registered in superposed position.

The safety razor herein described is adapted to take thin, flexible, slotted blades. One such blade 28 is shown in Fig. 7. This is provided with re-entrant corner recesses and a longitudinal blade-locating slot substantially as long as its cutting edges, and provided with spaced diamond-shaped enlargements designed to register with the blade-locating pins 15 of the guard, as is well shown in Fig. 7. It will be understood that the blade-locating aperture may be of any desired design so long as it fits or clears the cross-bar 30 and has edges which cooperate with the pins 15 for accurately locating the blade on the guard.

The parts of the razor above described are assembled so that when the knurled nut 20 and the stud 19 are turned to the inward limit of their movement, the threaded stem 24 is drawn down until its end abuts against the bottom of the recess 22 in the upper end of the stud. In this condition the pin 26 is at the upper end of the longitudinal slot 25 of the stem 24 and the lower concave face of the cap 40 is spaced from the upper or blade-supporting face of the guard by a distance of three or four thousandths of an inch, that is to say, a distance slightly less than the thickness of the blade to be used in the razor. It will be noted that the flange 31 constitutes a sliding connection between the cross-bar 30 and the cap 40. When the cap is in operative position above the guard 10 this connection extends for the full length of the cap and is effective to impart to the cap adequate clamping pressure for the blade. This pressure and the vertical position of the cap may be adjusted by retracting the knurled nut 20, relaxing the pressure upon the blade and thus increasing the amount of its edge exposure. When the cap 40 is drawn toward the guard to any degree the ends of the blade-locating pins 15 enter the sockets 43 of the cap and thus positively lock the cap against longitudinal movement. The razor is shown assembled in shaving condition in Fig. 2 and under these circumstances it will be noted that the hinge piece 33 of the cross bar 30 fills the slot 14 of the guard and extends substantially flush with the lower face of the guard.

When it is desired to expose the blade for cleaning or for replacement, the knurled nut 20 is turned reversely and the threaded stem 24 is lifted together with the cross-bar 30 and the cap 40 which is mounted thereon. As this movement

continues the stop pin **26** slides downwardly in the slot **25** in the side of the stem **24** and the ends of the pins **15** are withdrawn from the sockets **43** in the lower face of the cap, thus unlocking the cap. The releasing movement of the cap continues until the pin **26** is located in the lower end of the slot **25**. In this position of the cap the blade is entirely released and reassumes its flat position upon the blade-supporting face of the guard **10** and, as already stated, the cap **40** is freed from its locking engagement with the ends of the blade-locating pins **15**. The cap **40** is now free to be slipped toward the right from the position shown in Fig. 2 to that shown in Fig. 5. This may be done by pushing the cap longitudinally or merely tilting the razor and allowing the cap to run by its own weight until the stop pins **42** in its left end encounter the bridge **34** of the auxiliary hinge member **35**. This is the position illustrated in Fig. 5.

It will be noted that the cap has moved entirely out of engagement with the flange **31** of the cross-bar **30** and is now connected only with the corresponding short flange **36** of the auxiliary hinge piece **35**. When the cap has reached this position there is nothing to prevent the cap and hinge piece **35** from swinging through an angle of 90° into the position shown in Fig. 6 in which the cap occupies a substantially vertical position and the blade-supporting face of the guard **10** is entirely exposed and unobstructed so that the blade resting thereon may be conveniently removed or replaced. It will be noted that when the cap occupies its blade-exposing position, as shown in Fig. 5, its weight is effective in over-balancing the hinge member **35** and causing it to swing into the position shown in Fig. **6** in which the cap is now suspended by the engagement of the pin **42** with the upper side of the bridge member of the auxiliary hinge member **35**.

After the blade has been cleaned or replaced, the cap **40** and the auxiliary hinge piece **35** may be swung in a counter-clockwise position to carry the short flange **36** of the auxiliary hinge piece into registration with the flange **31** of the cross-bar **30** and as soon as this position has been reached the cap may be slipped toward the left into a position above the blade, being maintained in this movement out of contact with the blade by the elevated flange **31** of the cross-bar **30**. The cap, therefore, has no tendency to displace the blade nor is the longitudinal movement of the cap in any way interfered with by dragging upon the blade. The razor may then be placed in shaving condition by turning the knurled nut **20** and again lowering the threaded stem **24** together with its cross-bar **30**, the auxiliary hinge member **35** and the cap thereof. It will be noted that as soon as the cap **40** is moved toward the left beyond the end of the auxiliary hinge member **35** it acts to lock the latter member in registered position with the flange **31** and positively prevents relative angular movement of the hinge member and cross-bar.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is;—

1. A safety razor comprising cooperating blade-clamping members having blade-shaping faces for engaging and flexing a blade between them, one of said members having a longitudinal groove in its face and the other having a cooperating elongated tongue of uniform cross-section located above its blade-shaping face and adapted to be slidably received throughout substantially its entire length in said groove, said tongue being movable to draw said members into blade-flexing relation.

2. A safety razor comprising a substantially rectangular guard having a blade-shaping face, a guide member movable up and down through the face of the guard to positions of different height above it, and a blade-shaping cap slidably mounted for longitudinal movement on said guide member with respect to the guard.

3. A safety razor comprising cooperating cap and guard members relatively movable and shaped to flex between them a slotted flexible blade, means for drawing said members together to effect the clamping of the blade, and a longitudinal guideway projecting from one member through the slot of the blade and arranged to guide the other member for longitudinal movement to and from blade-covering position while holding said member substantially out of blade-engaging position.

4. A safety razor including a guard having a blade-supporting face and blade-locating means projecting from said face, a guideway mounted in the guard above said blade-locating means, a blade-flexing cap slidable thereon in spaced relation to the blade positioned upon the guard, and means for drawing the cap down upon the guard to clamp the blade.

5. A safety razor comprising a guard having a blade-supporting face with a slot therein, a narrow bar mounted in the slot and projecting therefrom above the blade-supporting face of the guard and being shaped to project through a slotted blade upon said face, a guideway in said bar disposed above the blade, a cap slidable thereon, and means for moving said bar to cause the cap to engage or release a blade positioned upon the guard.

6. A safety razor comprising a guard having a blade-supporting face with a longitudinal groove opening therethrough, a flexible blade internally apertured to register with said groove, a bar mounted for up and down movement in said groove, and a cap arranged to slide longitudinally upon the bar above the blade and to be positioned vertically thereby.

7. A safety razor comprising a guard having a blade-supporting face with a longitudinal groove opening therethrough, a flexible blade internally apertured to receive positioning and clamping means, a bar and blade-positioning means projecting from the blade-supporting face of the guard, a cap arranged to slide longitudinally upon the bar, and means for drawing said bar down into the groove to clamp the cap upon the blade.

8. A safety razor comprising a guard having a blade-supporting face with a groove therein, a bar movable in the groove, a cap arranged to slide upon the bar, blade-locating studs projecting above the blade-supporting face of the guard adjacent to the bar, and a blade internally apertured to clear the movable bar and to engage with said blade-locating studs.

9. A safety razor comprising a guard having a blade-supporting face, a bar mounted for vertical movement through said face, stationary blade-locating projections spaced from the sides of the bar, a blade internally apertured to clear the bar and engage said projections, and a cap carried by the bar and arranged to slide longitudinally thereof.

10. A safety razor comprising a guard having a blade-supporting face with a central longitudinal groove therein and blade-locating studs spaced from the sides of the groove, a cap-carry-

ing bar movable in said groove and extending between said studs, and a blade-clamping cap arranged to slide upon the bar to or from position above said studs and having recesses to receive the studs when it is moved into blade-clamping position.

11. A safety razor comprising a guard having a blade-supporting face with centrally-disposed bar mounted for movement therethrough, a cap arranged to slide longitudinally upon the upper part of the bar, and means for limiting the movement thereof in both directions.

12. A safety razor comprising a guard having a blade-supporting face, a bar mounted for movement therethrough and having a grooved guide in its upper edge, and a cap arranged to engage the guide and having a pin traveling in the groove thereof.

13. A safety razor comprising a guard having a projecting guide member, a blade internally apertured to receive said guide member, an auxiliary guide member hinged to the guard and arranged to swing beyond the end of the blade into a position in alignment with the guide member first mentioned, and a cap arranged to fit upon both guide members when so aligned.

14. A safety razor having a guard equipped with a centrally-disposed bar provided at one end with a projecting hinge and formed at its upper edge as a guide, a blade apertured to receive said bar with clearance, an auxiliary guide pivotally connected to the projecting hinge of the guard for movement to and from alignment with the bar, and a cap arranged to slide upon both guides when so aligned.

15. A safety razor having cooperating cap and guard members relatively movable to clamp between them a flexible blade, an elongated connecting device movably mounted in one of said members and having a guiding portion separated into two relatively movable sections, and a cap permanently connected to one section for sliding movement and arranged to be moved into engagement with the other when the two sections are brought into registration.

16. A safety razor having a guard with a blade-supporting face and blade-positioning projections thereon, a connecting member movable through said face, and a cap slidable thereon and having recesses cooperating with said blade-locating projections for locking the cap in registration with the guard when the cap is moved by said connecting member toward the guard.

17. A safety razor having cooperating blade-flexing members, a slotted flexible blade, a connecting guide passing through the blade slot and upon which one of said members is longitudinally movable, cooperating locking projections and recesses on said flexing members, and means for moving said connecting guide simultaneously to separate the flexing members and disengage said locking projections and recesses, thereby freeing said members for relative displacement.

18. A safety razor including a guard having a curved blade-supporting face with a centrally disposed groove opening therethrough, a blade having an internal slot adapted to register with said groove, a tongued bar movable up and down in said slot, and a cap having a groove extending centrally from end to end to receive said tongued bar whereby said cap may be moved longitudinally while out of contact with the blade.

19. A safety razor comprising a guard having a supporting face for a slotted blade, a guide member arranged to project through the slot of a blade located upon said face, a supplementary guide member movable from a position in alignment therewith to an inoperative position, and a cap movable upon said guide members and arranged to pass from one to another when the members are aligned.

20. A safety razor comprising a guard having a supporting face for a slotted blade, a guide member arranged to project through the slot of a blade located upon said face, a supplementary guide member pivotally connected to the guard and shaped to extend about one end of the blade into alignment with the guide member first mentioned, and a cap slidably connected to said guide members and arranged to pass from one to the other.

GERARD B. LAMBERT.