July 14, 1936. W. G. ADAMS 2,047,608

SAFETY RAZOR

Filed Aug. 20, 1931 2 Sheets-Sheet 1

Fig. 1.

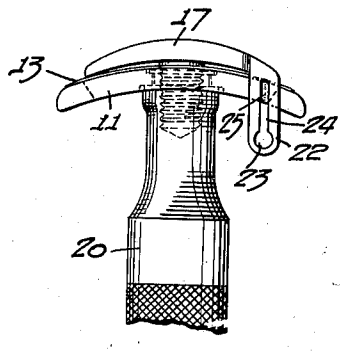


Fig. 2.

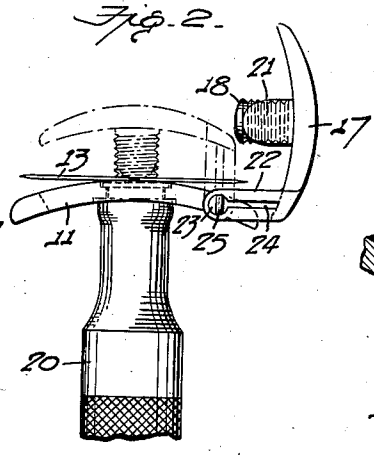


Fig. 5.

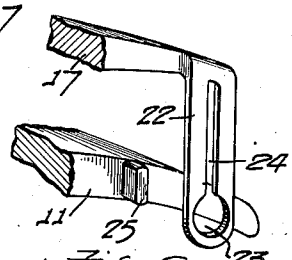


Fig. 6.

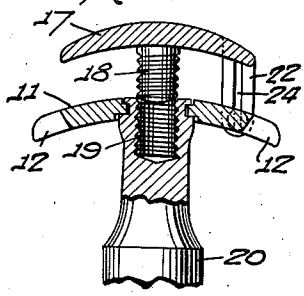


Fig. 3.

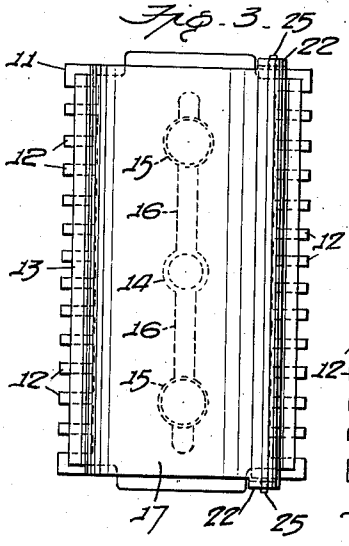


Fig. 4.

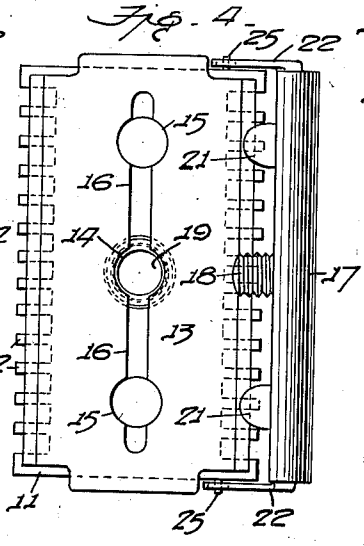


Fig. 7.

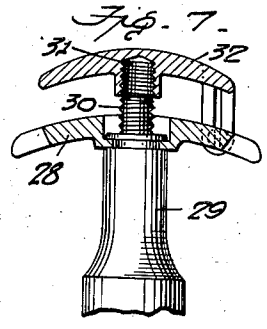


Fig. 8.

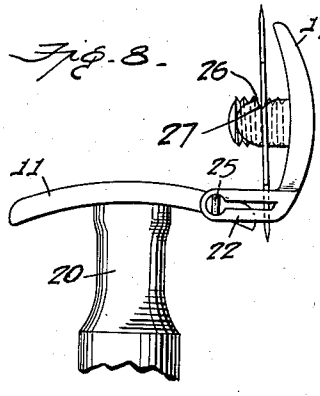


Fig. 9.

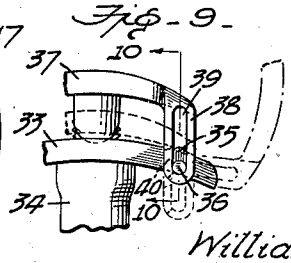
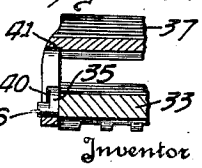


Fig. 10.



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Fig. 11.

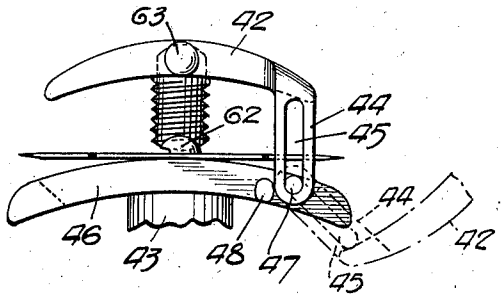


Fig. 12.

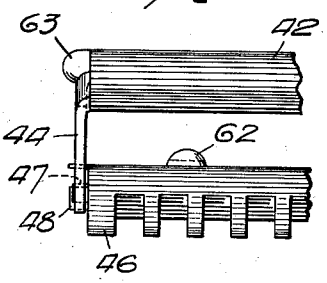


Fig. 13.

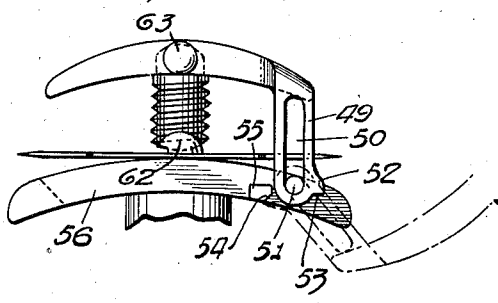


Fig. 14.

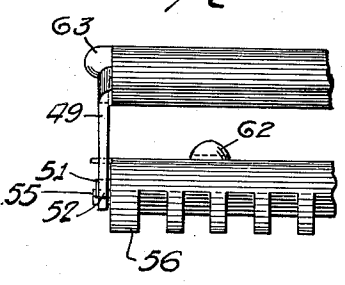


Fig. 15.

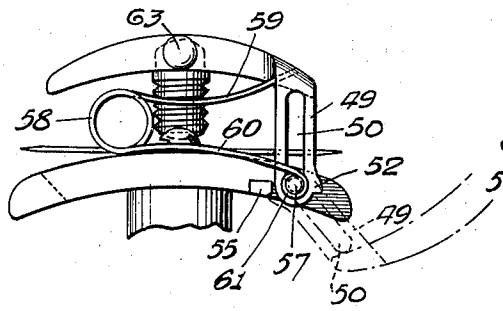
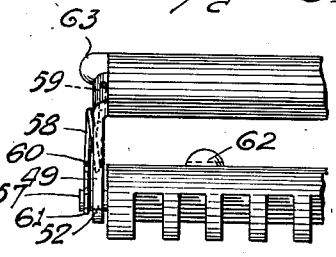


Fig. 16.



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UNITED STATES PATENT OFFICE

2,047,608

SAFETY RAZOR

William G. Adams, Greensboro, N. C.

Application August 20, 1931, Serial No. 558,386

16 Claims. (Cl. 30—61)

This application is a continuation in part of and substitute for my pending application for patent for Safety razors, filed April 18th, 1931 and given Serial No. 531,209.

The invention relates to safety razors, particularly that type including coacting cap and body members connected by screw means and between which an initially or normally flat double edged blade is clamped in flexed condition when in use.

It is well known that the conventional razor of this type comprises a body and a cap the latter being usually provided with a centrally located threaded post received within a threaded socket in the handle. A razor of this character consequently embodies three distinct and separate parts and is open to the objection that in use there is always more or less danger of dropping one of the parts, with probable detriment thereto, as there is nothing to hold them permanently associated. Furthermore the parts must be entirely disconnected to effect proper cleaning. I am aware that it has been proposed to provide a razor in which the handle, body and cap are permanently connected with the cap swingable with respect to the body into and out of clamping relation to the blade. However, in accomplishing this several difficulties are encountered and must be overcome as it is not sufficient to provide a mere loose connection between the body and the cap as it is necessary to provide for considerable rectilinear movement of the cap and body with respect to each other during clamping and releasing of the blade, the rectilinear movement being followed by pivotal movement when effecting release and being subsequent to the pivotal movement when effecting clamping of the blade. Unless adequate provision be made to prevent it there is a probability that the front edge of the cap may drop down and damage the cutting edge of the blade.

It is with the above facts in view that I have devised the present invention which has for one object the provision of a razor or holder in which the handle, body and cap are not only permanently connected though relatively movable but are of such construction and arrangement that the cap has its movement with respect to the body limited to a rectilinear character for a predetermined travel before any swinging movement is possible during release of the blade and, conversely, in which when clamping of the blade is desired pivotal movement is followed by rectilinear movement for the same travel, the character of movement in each instance being definite and limited so as to preclude entirely the possibility of the cap dropping down upon and dulling or otherwise damaging the cutting edge of the blade.

An important object of the invention is to provide a razor of the permanently connected cap type with a screw connection between the handle and cap and in which the cap is pivoted along an axis paralleling and close to the cutting edge of the blade, the arrangement being such that when the cap is swung into open position in non-obstructing relation to the blade there can be no movement of the edge of the cap toward the longitudinal center line of the body, thereby avoiding any possibility of contact between the cap and the edge of the blade with deleterious results to the latter.

Another object is to provide a razor in which the threaded stud may be carried either by the cap for coaction with a socket in the handle, or in which the threaded post may be formed as a part of the handle with the socket in the cap.

A more specific object of the invention is to provide a razor in which the blade may be initially engaged upon the body or carried by means projecting from the cap, the construction in the former instance being such that the blade cannot be picked up and moved with the cap when the cap is moved into open or released position, and in the latter instance being such that the blade will be positively prevented from dropping off when the cap is swung from its open position into superposed relation to the body preparatory to clamping the blade by the action of the threaded post and socket.

Still another object is to provide a razor in which the cap will be positively restrained against any rotary movement with respect to the body while the handle is turned in one direction or the other to effect clamping or releasing of the blade, the cap being guidably connected with the body and the arrangement being moreover such that when the previously opened cap is swung back preparatory to clamping the blade the threaded post will be disposed in coaxial relation to the socket, thereby avoiding any necessity for beveling or cutting away the edge of the post so as to clear the edge of the socket.

A further object of the invention is to provide a razor of this type in which any one of numerous expedients in the way of guides, stops and the like may be resorted to to insure the sequential rectilinear and pivotal movement on release of the blade and pivotal and rectilinear movement when clamping is being effected, this characteristic of the construction being of paramount importance.

Yet another object is to provide a safety razor in which a spring connection may be resorted to for maintaining the cap in parallel relation to the body until swinging movement is desired to permit free access to the blade.

An additional object is to provide a razor of this character which will be simple and inexpensive to make, easy to use, positive in action, efficient and durable in service, and a general improvement in the art.

To the attainment of the foregoing and other objects and advantages, the invention preferably consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of one form of a razor constructed in accordance with my invention, the parts being shown in clamping relation to an interposed blade,

Figure 2 is a similar view showing in dot and dash lines the cap in released position and in full lines the cap swung back into open position,

Figure 3 is a plan view of what is shown in Figure 1,

Figure 4 is a plan view of what is shown in Figure 2,

Figure 5 is a fragmentary detail perspective view with the cap detached from the body to illustrate the construction more clearly,

Figure 6 is a vertical cross sectional view taken through the center,

Figure 7 is a view similar to Figure 6 but showing a modification in which the threaded post is carried by the handle instead of the cap,

Figure 8 is a side elevation showing the cap provided with positive means for retaining the blade associated therewith,

Figure 9 is a fragmentary side elevation showing another modification,

Figure 10 is a detail section taken on the line 10—10 of Figure 9,

Figure 11 is a side elevation of a further modification and showing the cap in released position but in parallel relation to the body prior to swinging,

Figure 12 is an elevation taken at right angles to Figure 11,

Figure 13 is a side elevation of still another variation with the parts in the same position as in Figure 11 and embodying positive stop means for limiting the swinging movement of the cap,

Figure 14 is an elevation taken at right angles to Figure 13,

Figure 15 is a view similar to Figures 11 and 13 and showing a still different form of the invention,

Figure 16 is an elevation taken at right angles to Figure 15.

Referring more particularly to the drawings and especially Figures 1 to 6 inclusive, the numeral 11 designates the body of the razor which is formed in the ordinary manner as a substantially rectangular plate having guard teeth 12 at its opposite longitudinal edges. As is well known the outer face of the body is convex and is adapted to support the blade 13 which is ordinarily provided with a central hole 14 at opposite sides of which are other holes 15 registering with corresponding holes in the body and, in some makes, formed with a longitudinal slot 16 for rendering the intermediate portion of the blade more flexible.

Coacting with the body and adapted to have clamping engagement with the blade for flexing the latter is a cap 17 having a concave undersurface and provided centrally with a threaded post 18 adapted to be received within a socket 19 in a handle 20 which is swivelly mounted within the body 11. Any preferred detailed construction may be resorted to for providing this swivelled connection. However, the point is that the handle is permanently associated with the body and is never detached therefrom at any time. In common with most razors of this type I provide my razor with a pair of studs 21 projecting from the cap and adapted to pass through the holes 15 in the blade and through the registering holes in the body for the purpose of centering or positioning the blade properly between the body and cap.

For effecting a permanent association of the cap with the body, I provide the former at two corners with spaced parallel arms 22 formed at their free ends with circular openings 23 and also formed with longitudinally extending slots 24 which lead from the openings 23 to the undersurface of the cap. These slotted arms cooperate with trunnion lugs 25 which project from the opposite ends of the body, these lugs having their opposite sides flattened as clearly shown, the width of the studs being substantially the same as the diameter of the openings 23 and their thickness being substantially the same as the width of the slots. When the cap is formed and the razor assembled, it is intended that the arms 22 be slightly divergent so that the slots therein may be engaged upon the lugs 25, subsequently to which a certain amount of pressure is applied to the arms for moving them inwardly or toward each other so that the lugs will be engaged within the slots. If it is so desired, the lugs 25 may project upwardly beyond the top or convex surface of the body 11, for instance if it is advisable to have the pivot point higher, though in such an instance it would be necessary to recess the underside of the cap 17 at the junctures of the arms 22 therewith, the recesses being required for the accommodation of the lugs. On account of this I have simply shown the lugs as having their upper edges flush with the top of the body. The exact location of the axis is, however, intended to be such that when the cap is raised as shown by the dot and dash lines in Figure 2 and swung over or laterally as shown by the full lines in the same figure the edge of the blade will be sure to clear the top or convex side of the body, it being a distinct feature of importance that clearance be provided in order to avoid dulling the edge. It is only for the sake of simplicity that the location is shown where it is, except, however, as will later appear, in order that the cap may be turned backward in proper sequence with rectilinear movement, it is important that the relative position of these trunnions and their engaging bearings in the ends of the apertures in the arms, with respect to the location of the engaging elements of the screw parts that clamp the blade, be such that when the latter are entirely unscrewed the cap will have moved the bearings which comprise the ends of the slotted apertures into engaging contact with the trunnions.

Assuming that the razor has been constructed and assembled as shown and described, to use it the blade may be, if preferred, simply laid upon the body 11 when the cap 17 is in its open and swung back position shown by the full lines in Figure 2. At such a time the lugs 25 are located within the openings 23. The cap is then swung

over into the position shown by dot and dash lines in Figure 2 so as to bring the post 18 and studs 21 into alinement with the socket in the handle and the holes in the blade and body. The handle is then rotated to engage the threaded post and draw the cap 17 down into clamping engagement with the blade. At such a time the slots 24 in the arms 22 will slide down along the lugs 25, any rotary movement of the blade with respect to the body being positively prevented. If preferred, instead of laying the blade upon the body the operator may engage it upon the post 18 and studs 21 when the cap is in open or swung back position. The edge of the central hole 14 in the blade will engage between two of the threads on the post and this will operate to hold the blade associated with the cap while the cap is being swung over preparatory to turning the handle for bringing about the clamping action. This engagement of the blade with the studs and post on the cap will maintain the blade in the exact proper relation to the body so that it will be accurately positioned between the cap and body.

In order to avoid any possibility of the blade becoming disassociated from the cap during swinging thereof preliminary to clamping and to insure lifting of the blade off from the body when the razor is opened up, I may form the threaded post and the studs with notches 26 and 27 as shown in Figure 8, the notches receiving the edges of the holes in the blade so that the blade cannot slip off. Of course these notches are the equivalent of hooks and the latter might be substituted if preferred, this alternative arrangement being within the purview of the invention. Naturally in the use of this form of the device it is always intended that the blade be engaged upon the post and studs instead of being initially laid upon the body. A reversal of this will be later disclosed.

In the above described form of the invention the threaded post is shown in each instance as carried by the cap. However, there is no particular limitation in this respect and in Figure 7 I have illustrated a modification wherein the body 28 has swivelly connected therewith the handle 29 which instead of being socketed terminates in a threaded post 30 projecting beyond the top or convex face of the body, this post being adapted to be received within a threaded socket 31 in the cap 32. The same arm and lug arrangement is provided in this form as in the form first described.

A feature of great importance in all of the above described forms is that as the sides of the lug 25 are flat and as the lug is of the same thickness as the width of the slot 24 the cap will be guided in its movement away from the body when the handle is turned in a counter-clockwise direction to effect disconnection of the post from the threaded socket. When the post is entirely unscrewed the cap will be in such position that the openings 23 in the arms thereof will receive the lugs 25 and as the openings 23 are of the same diameter as the width of the lugs rotary movement will be permissible so that the cap may be swung back. When swung back it cannot slide with respect to the body and will therefore be retained in the proper position to have the blade engaged upon the post and studs, whether they be notched or not. When the cap is then swung over to cover the blade the elongated or flattened lugs will be in line with the notches 24 so that the arms 22 may slide along them. The benefit of this arrangement is that the post and studs will be returned to closed position in axial alinement with the socket and holes, respectively, provided for their reception. Furthermore there will be no necessity for beveling off or cutting away the end of the post to avoid interference with the edge of the socket.

The above embodiments of the invention do not exhaust the possibilities and I may use the modification illustrated in Figures 9 and 10, if such is desired. Referring to these two figures in detail, the body 33, equipped with the swivelled handle 34, is provided near each of two corners with a lug 35 having flattened sides as above described and terminating in a cylindrical trunnion 36. The cap 37 is provided with arms 38 having elongated slots 39 therein of a width substantially equal to the thickness of the lugs 35. Furthermore the inner faces of the arms are formed with notches 40 which communicate with the slots and which are of a width substantially equal to the width of the lugs 35. This form operates, essentially, in the same manner as the previously described ones, the only difference being in the specific construction of the lugs and arms. When the cap is moved away from the body to the maximum extent, by rotating the handle in a counter-clockwise direction, the lugs 35 will be at the lower or outermost ends of the slots 39 so that the cap 37 may be swung into the open position shown by dot and dash lines in Figure 9, the lugs 35, being in registration with the notches 40, passing through them and the pivoting action taking place upon the cylindrical trunnions 36. In this form it will be observed that the lugs 35 extend upwardly slightly beyond the convex face of the body, a circumstance necessitating recessing the underside of the cap at 41 at the juncture of the arms therewith in order to accommodate the projections. The possibility of having the lugs in the first described forms of the invention projected upwardly in the same manner has already been discussed.

While in Figures 1 to 10 inclusive I have shown a highly efficient construction for bringing about the desired purpose I have discovered that it is possible to provide additional refinements in some respects, some of which are a matter of added simplicity and others of which relate to the limiting of the swinging movement of the cap into non-obstructing relation to the blade. In Figures 11 and 12 I have shown a variation in which the cap 42, which may be connected with the handle 43 in the same manner as disclosed either in Figure 6 or Figure 7, is provided at two adjacent corners or at the ends of one longitudinal edge with arms 44 corresponding to the arms 22 in Figures 1 to 8 but formed with slots 45 of uniform width throughout instead of the key-hole shape illustrated in Figures 1 to 8. In this instance the ends of the body 46 are provided with outstanding plain cylindrical trunnions 47 fitting closely within the slots 45. Instead of flattening the sides of these trunnions as is done in Figures 1 to 8, I provide combined guide and stop projections 48 on the ends of the body spaced from the trunnions 47 and engaging against the edges of the arms 44.

In the operation of this form it will be seen that when the cap 42 is in clamping relation to the blade the trunnions 47 are at the upper ends of the slots 45. When release of the blade is desired the handle 43 is turned to release the connection between it and the cap. During this

time the cap retreats away from the body and blade. Of course the cap remains in parallel relation to the body and blade as long as the screw means on the cap and handle are in engagement but even after the screw means is disconnected the cap 42 can have no movement other than rectilinear until it has been retreated away from the body to such an extent that the trunnions 47 are within the extreme lower ends of the slots 45. This illustrates the paralleling influence of this arrangement, but desirability of having the bearing portion of slotted aperture engage the trunnions immediately the post is entirely unscrewed, applies in these forms also. When this position is reached the curved lower ends of the arms 44 may be rotated about the trunnions 47 and between the trunnions 47 and the projections 48 so that the cap may be caused to assume the dot and dash line position shown in Figure 11. After the cap is thus swung the arms 44 will engage against the lower portions of the projections 48 which, it will be noted, are elongated downwardly for this purpose, and the cap will thus be prevented from swinging beyond a predetermined limit.

Figures 13 and 14 disclose the same fundamental feature, the difference being a variation in the character of the stop means. In this construction the arms 49 carried by the cap and corresponding to the arms 44 are similarly formed with slots 50 of uniform width engaged upon trunnions 51 corresponding identically with the trunnions 47. However, in this instance the arms 49 are formed at their outer edges with projections 52 defining shoulders 53 designed to engage against inclined shoulders 54 on projections 55 extending from opposite ends of the body 56. This form of the device will function in the same manner as that disclosed in Figures 11 and 12, the two distinct movements of the cap being sequential. The only difference at all lies in the provision of the stops 52 engageable with the stops 55 so that the cap cannot swing downwardly to an inconvenient extent or slide upwardly.

As another departure from the specific features above described, I may resort to the structure disclosed in Figures 15 and 16 wherein the added feature resides in the provision of means for positively holding the cap spaced away from the body and immovable with respect thereto except upon the exertion of a definite force applied in a definite direction. The structure in these two figures is identically the same as that disclosed in Figures 13 and 14 in so far as the slotted arms, projections thereon and stop lugs are concerned, for which reason the same reference characters are applied to the corresponding parts. The trunnions 57, corresponding to the trunnions 51 are, however, different in a respect to be explained. In this embodiment of the invention I provide at the ends of the razor a spring having a coil 58 from which extend arms 59 and 60, the former being anchored within suitable holes at the junctures of the arms with the body and the latter having their ends curled, coiled or looped at 61 about the trunnions 57 which are headed to prevent disconnection of the coils or loops 61 therefrom. The operation of this form is exactly the same as that of the form disclosed in Figures 13 and 14, the only difference being that the springs operate always to urge the cap away from the body and to hold the cap away from the body in parallel relation thereto when the coacting screw means carried by the cap and the handle are disconnected. After the cap has moved in a rectilinear manner away from the body it may be swung over into the position shown by dot and dash lines exactly as described in connection with Figures 11 to 14, the coils 61 rotating about the trunnions 57.

In connection with all forms of the invention the blade positioning means may be on either the cap or the body, and in Figures 11 to 16 the body is represented as provided with lugs 62 preferably notched or of hook-like form to engage the blade and hold it positively on the body so that it cannot adhere to the cap and be carried with it when it is swung into open position.

Another feature which may be added to any or all forms is a pair of knobs or other projections 63 on the respective ends of the cap to facilitate manipulating it.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a very simply constructed razor adapted to use the conventional type of blade and embodying parts permanently though movably connected, making it easier to use as the individual parts cannot be dropped or become separated and misplaced. In every form or modification of the invention it will be observed that the cap has purely rectilinear movement with respect to the body and blade until it has traveled a predetermined distance, after which it has a pivotal movement to shift it into non-obstructing relation to the blade so that it may be removed for cleaning or drying or for replacement by a fresh one. In each case it is impossible for the edge of the cap to drop down onto or otherwise come into engagement with the edge of the blade and in this way the blade is fully protected against dulling or other damage. This is insured owing to the fact that under no circumstances does the edge of the cap nearest the pivot ever move in a direction toward the longitudinal center line of the body and blade, that is to say until the pivotal movement has progressed into the second quadrant at which time the cap is of course below the blade and therefore out of the way.

From the above it is believed that the construction, operation and advantages of all forms of the invention will be readily understood by one skilled in the art without further explanation.

While I have shown and described the preferred embodiments of the invention, it should be understood that the disclosure is merely an exemplification of the principles involved as the right is reserved to make all such changes in the details of construction as will widen the field of utility and increase the adaptability of the device provided such changes constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having thus described the invention, I claim:

1. A razor comprising a body and a cap adapted to have a blade interposed therebetween, a handle swivelly connected with the body, screw means on the cap and handle cooperating to move the cap rectilinearly toward or away from the body, lugs projecting from the ends of the body, arms projecting from the ends of the cap and having slots slidably accommodating said lugs during rectilinear movement of the cap toward or away from the body and enabling the cap to be swung laterally when the screw means is disengaged, and means for preventing sliding

of the lugs in said slotted arms during swinging of the cap.

2. A razor comprising a body and a cap adapted to have a blade interposed therebetween, a handle connected with the body, means on the cap and handle cooperating to move the cap rectilinearly toward or away from the body to clamp or release the blade, arms projecting from the ends of the cap and having slots therein, lugs projecting from the ends of the body and slidably and pivotally engaged within said slots and defining a pivotal axis for the cap closely adjacent a longitudinal edge of the body, said lugs being slidable along said slots during rectilinear movement of the cap and being rotatable therein when said first named means is disengaged and the cap spaced from the body, and means for preventing sliding of the lugs within the slots when they rotate during swinging of the cap, thereby insuring constant radius length for the arc of the circle defining the line of travel of the edge of the cap.

3. A razor comprising a body and a cap adapted to have a blade interposed therebetween, a handle connected with the body, means on the cap and handle cooperating to move the cap rectilinearly toward or away from the body to clamp or release the blade, arms projecting from the ends of the cap and having slots therein, lugs projecting from the ends of the body and slidably and pivotally engaged within said slots and defining a pivotal axis for the cap closely adjacent a longitudinal edge of the body, said lugs being slidable along said slots during rectilinear movement of the cap and being rotatable therein when said first named means is disengaged and the cap spaced from the body, and means for preventing sliding of the lugs within the slots when they rotate during swinging of the cap, thereby causing the pivoted edge of the cap to swing in an arc outwardly of the edge of the body.

4. A razor comprising a body and a cap adapted to have a blade interposed therebetween, a handle connected with the body, means on the cap and handle cooperating to move the cap rectilinearly toward or away from the body to clamp or release the blade, arms projecting from the ends of the cap and having slots therein, lugs projecting from the ends of the body and slidably and pivotally engaged within said slots and defining a pivotal axis for the cap closely adjacent a longitudinal edge of the body, said lugs being slidable along said slots during rectilinear movement of the cap and being rotatable therein when said first named means is disengaged and the cap spaced from the body, and means for preventing sliding of the lugs within the slots when they rotate during swinging of the cap, thereby causing the pivoted edge of the cap to move in a path outwardly of the edge of the blade to avoid contact therewith.

5. In a razor embracing cap and body members adapted to clamp a blade therebetween and having relative rotary movement, as well as rectilinear movement from and toward each other, the former motion being manually operated and the latter operated by handle actuated screw means, and in which the members are permanently associated by connecting means embracing a journal carried by one member and an outstanding arm carried by the other member, the arm having an elongated opening wherein the journal is pivotally and slidably engaged; control means fixing the journal in a predetermined position within the said opening whereby the said rotary movement can be only about an axis in predetermined temporary stable position relative to both members, the connecting means and the screw means acting cooperatively to establish the axis of rotation in said predetermined position and the said control means becoming effective substantially simultaneously with commencement of rotary movement.

6. In a razor embracing cap and body members adapted to clamp a blade therebetween and having relative rotary movement as well as rectilinear movement from and toward each other, the former motion being manually operated and the latter operated by handle actuated screw means having engageable and disengageable screw elements, the body having oppositely disposed guards on longitudinal edges, there being means slidably and pivotally permanently associating the cap along a longitudinal edge with one of said guard edges of the body, comprising journals carried by one member and outstanding arms carried by the other member, the arms having elongated openings wherein the journals are pivotally and slidably engaged, control means fixing the journals in a predetermined position within the said openings whereby said rotary movement can be only about an axis in predetermined temporary stable position relative to both members, the connecting means and the screw means acting cooperatively to establish the axis of rotation in said predetermined position and the said control means becoming effective substantially simultaneously with commencement of rotary movement.

7. A razor comprising cap and body members adapted to clamp a flexible blade into curved position therebetween, handle actuated screw means producing rectilinear movement between said members from and toward each other, the body having oppositely disposed guards on longitudinal edges, and means slidably and pivotally permanently associating the cap along a longitudinal edge thereof, with one of said guard edges of body, one member having journals, the other member having outstanding arms with elongated openings therein, an end of each opening being provided with a bearing and the said journals being engaged within the said openings; in which concurrently with attainment of maximum separation of said members as produced by said handle actuated means, the journals become engaged within the bearings, thereby establishing a pivotal relation whereby the said members are free to have relative rotary movement about an axis in temporarily spaced relation with one of said members and in fixed relation with the other, means operative, when elements of said screw means are out of operative alinement, to maintain engagement of said journal within the bearing, whereby the said temporary spaced relation is assured during all relative rotary movement.

8. In a razor comprising cap and body members, a handle and handle actuated means to produce relative movement of said members rectilinearly from and toward each other to clamp a flexible blade into curved position therebetween, the handle actuated means having engageable and disengageable elements and the body having oppositely disposed longitudinal guards; means affixed to and connecting the said members, comprising journals and outstanding arms, the latter having elongated openings slidably and pivotally engaging the said journals,

the said handle actuated means and connecting means cooperating to establish immediately upon disengagement of said elements of the former a temporary pivotal mounting enabling the cap to have manually operated rotary movement wherein a longitudinal edge thereof describes a circular path lying outward of and partly embracing one of said guards, the axis of said mounting when so established lying in a temporary position in spaced relation to the adjacent longitudinal edge of the cap and adjacent and parallel to the said embraced guard; and means stabilizing the pivotal axis in such temporary position during rotary movement of the cap, the said combination of means and members providing a mechanism whereby the movable parts are permanently associated and there is accomplished, together with requisite blade clamping rectilinear movement of the members, an outward exposure of the blade clamping surfaces in position closely adjoining each other for cleaning, assured axial alinement of the elements of the handle actuated means when the cap is rotated to closed position on the body, and protection of the cutting edge of the blade against damaging contact with moving parts when the cap rotates.

9. A razor comprising a body and a cap adapted to have a blade interposed therebetween, a handle for the body, screw means on the cap and handle cooperating to produce rectilinear movement of the former toward or from the blade, and means permanently slidably connecting the body and cap and providing a pivot for the latter to enable the same to be swung away from the body when the screw means is disengaged and acting to prevent the cap from movement other than swinging until the screw means is realined preparatory to reengagement, the rectilinear movement produced by the screw means being limited to a predetermined maximum distance, and means embodied in said connecting means preventing any rectilinear movement of the cap beyond the said predetermined maximum.

10. In a razor comprising cap and body members adapted to engage therebetween a flexible blade, a handle and handle actuated screw means embracing screw elements carried respectively by the cap and handle and adapted to produce relative rectilinear movement between the said members; pivotal lug and slotted arm connecting means permanently associating the cap and body and comprising journal and bearing elements, each in fixed relation to one of the said members, the journal and the bearing remaining separated during operative engagement of elements of said screw means and until brought into engaged relation by the said handle actuated means and then becoming operative to establish a pivotal mounting for the cap to the body about which the said members are free to have relative rotary movement, and means preventing the separation of said elements of connecting means at all times when the elements of said screw means remain substantially out of axial alinement.

11. In a safety razor, the sub-structure comprising a cap member, said cap member having depending guide arms extending in parallel relation in the same direction from the ends of the cap member, each of said arms provided with a slot terminating in enlarged portions remote from the cap and locking lugs projecting from the face of said cap intermediate said arms.

12. A safety razor having a guard member, a cap, means for mounting a blade between said guard and cap, the said guard and cap being operatively joined to each other at their longitudinal ends by arms, and pins fixed to the guard extending through slots located in the arms of the cap, said slots each terminating at one end in circular apertures, the pins being substantially oblong in cross-section, so as to permit a perpendicular shifting of the cap relative to the guard while in the slots, and a swinging of the cap when the pins are in the apertures.

13. In a safety razor adapted to clamp a flat flexible blade into flexed curved position with an edge tilted for shaving, the combination of a plate having guard portions projecting from a longitudinal edge and a blade supporting surface, means for clamping an elongated blade of a predetermined width over said supporting surface, the said means embodying a leaf hinged longitudinally of the blade, arms depending from the leaf at opposite ends thereof and adjacent a longitudinal outer edge thereof, interengaging means on said arms and said plate for causing linear movement of the leaf in respect to the plate when the leaf is being lowered or raised into and out of clamping position respectively, said arms extending below the plate with their longitudinal axes substantially perpendicular to the said supporting surface when the leaf and plate are in clamping relation, and swivel means at the lower ends of said arms, the latter means defining therethrough the hinge axis for the leaf at a fixed distance from said outer edge, said distance being sufficient to permit the leaf when substantially raised from clamping position, to swing clear of the blade edge.

14. In a safety razor adapted to clamp a flat flexible blade into flexed curved position with an edge tilted for shaving, the combination of a plate having guard portions projecting from a longitudinal edge and a blade supporting surface, means for clamping an elongated blade of a predetermined width over said supporting surface, the said means embodying a leaf hinged longitudinally of the blade, arms depending from the leaf at opposite ends thereof and adjacent a longitudinal outer edge thereof, said arms extending below the plate with their longitudinal axes substantially perpendicular to the said supporting surace when the leaf and plate are in clamping relation, swivel means at the lower ends of said arms, the latter means defining therethrough a hinge axis for the leaf at a fixed distance from said outer edge, said distance being sufficient to permit the leaf when substantially raised from clamping position, to swing clear of the blade edge, said swivel means including means for permanently associating the leaf with the razor and enabling linear movement between the said leaf and plate from and toward each other and a swinging movement of the leaf about the hinge axis, and screw means for moving the leaf up and down, out of and into clamping relation with a blade and for establishing the hinge axis for the leaf under the blade and adjacent the said longitudinal edge of the plate during the said upward movement.

15. In a razor the combination of a plate member having guard portions projecting from a longitudinal edge, a flat flexible blade, means for clamping the blade over the plate, the said means embodying a longitudinally hinged leaf member, arms depending from the leaf at opposite ends thereof and adjacent an outer longitudinal edge

thereof, connecting means operatively engaging the arms for permanently associating the leaf with the razor and enabling swinging movement of the latter member as well as linear movement thereof downward toward the plate to clamp the blade into curved flexed operative position and upward from the plate to release the blade for opening the razor, said arms extending below the plate with their longitudinal axes substantially normal to the flat blade when the clamping action commences thereon, said connecting means embodying a potential pivot axis extending through the outer ends of the arms but ineffective as a pivot for the leaf when the members are in clamping relation and becoming effective after the blade is released to enable the leaf to swing about an axis located at a fixed distance from said outer edge, screw means for moving the leaf up and down, out of and into clamping relation with the plate and for establishing the pivot axis under the blade and adjacent the said longitudinal edge of the plate during the upward linear movement, and means cooperating with the connecting means to so govern the relative position of the members during swinging of the leaf that the outer edge thereof will pass outward of and clear the cutting edge of the blade, the last named means comprising outstanding surfaces on the ends of the plate which surfaces remain in constant operative slidable engagement with edge surfaces of said arms.

16. In a safety razor the combination of a guard plate and a clamping cap adapted to clamp a blade on the plate, screw means for moving the cap up and down linearly into and out of clamping engagement with the blade and to lift the cap to a spaced position above the plate, the cap having portions depending substantially vertically therefrom at the opposite ends thereof adjacent an outer longitudinal edge thereof and extending substantially below the upper surface of the plate when the cap is in clamping position, the lower ends of said depending portions having swivel means to permit the cap to be swung upwardly when the cap has been raised to a spaced position above the blade, the axis of the swivel being below the blade, said depending portions being in such slotted engagement with the plate as to permit linear movement of the cap and prevent the cap being swung until in raised position at a predetermined height above the plate, to avoid engagement of the cap with the edge of the blade when the cap is swung.

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