The present invention relates to safety razors providing manual blade changing, and more particularly to the type utilizing an expendable blade having a single cutting edge placed in a dull or buttered edge, with insertion of the blade taking place across the razor head components, said invention constituting an improvement on the safety razor disclosed in my U.S. pending application Serial No. 639,949, filed February 13, 1957.

In the magnetic-type of razor disclosed in my prior application above referred to, the permanent magnets are of substantially U-shaped configuration and mounted rigidly on the rearward marginal portion of the support member attached to one end of the handle with the blade platform slidably mounted on this support member for manual operation to open the razor head in opposition to spring action for closing said head. The razor to which the present invention relates comprises a blade platform provided with a forward guard edge mounted rigidly on one end of the handle, spaced blade stops on the extremities of the guard edge abutting by the corners of the cutting edge of the blade in shaving position, a blade clamping member pivotally mounted on the platform, a leaf spring secured to the underside of the platform and having aligned opposed flexible ends and a medially disposed flexible segment normal to the aligned ends, an overcenter-acting double arm pivotally mounted on the platform in superimposed alignment with the medial flexible segment of the leaf spring and actuating one end of the arm with the other end of the arm projecting through a rectangular aperture in the clamping member for controlling said arm responsive to pivotal movement of the clamping member urged toward clamping position by the aligned ends of the leaf spring acting on edge portions of depending side wall segments integral with said clamping member, said arm having relative movement with respect to the clamping member for releasing the blade into contact with the magnets and for breaking said contact to engage the corners of the cutting edge with said blade stops, a spring clip anchored between the leaf spring and platform for detachably retaining a pair of aligned cylindrical rod-type magnets in longitudinally spaced relation and for guiding the butt edge of an inserted blade into contact with the working surfaces of said magnets.

It is a general object of my invention to produce a new and novel safety razor provided with magnetic blade control accommodating instant and efficient cleansing of both sides and the cutting edge of the blade at will during a shaving operation and wiping the blade and razor head parts dry for subsequent use until a blade change is required, without removing the blade from the razor head, and wherein thorough cleansing of the blade by water flow from a faucet may be accomplished irrespective of the position or movements of the razor while open with subsequent closure of the razor head automatically establishing the blade in correct and safe shaving position.

A more particular object is the provision of a new and novel means manually operable on a rearwardly projecting mid-portion of the clamping member for opening the razor head and retracting the overcenter arm to release the butt edge of the blade into engagement with the working surfaces on the pair of magnets whereby relative pivotal movement of the blade with respect to the razor opening is accommodated for cleansing and drying of both sides of the blade including the cutting edge thereof for subsequent use. During closure of the razor head, the magnets automatically grasp and maintain the blade in correct position for engagement with the forward blade stops and the underside of the butt edge portion adjusted on upward extrusions from the platform for correct shaving angularity of the blade with respect to the guard edge, while the overcenter control arm is effective to engage the butt edge of the blade and break the magnetic hold thereon to advance the blade into engagement with the blade stops to condition the razor for shaving.

In accordance with the general object, I provide a cover or clamping member whose opening and closing is of an extremely simple nature, cooperating in an efficient manner with the blade controlling overcenter arm referred to. More particularly, it is a feature of my invention to provide a construction and arrangement whereby the manipulation of a single control element will serve simultaneously to retract the blade into contact with the pair of magnets, and at the same time to open the cover, the latter being biased into closed position by said leaf spring opposed ends acting through an overcenter pivotal connection and manually retracted to full open position to accommodate cleansing of the blade during a shaving operation or a blade change as required.

A further specific feature of my invention lies in providing a simple low-cost permanent magnet which is detachably held in operating position by said spring clip for easy removal and insertion in the case of replacement. The magnets are "snapped" into and out of the cylindrical portions of the spring clip which encircle more than half the diameter of the magnetic rods for effective hold thereon in the assembled status of the clip and magnets, said cylindrical portions each having preferably a pair of legs which extend angularly forwardly into continuous engagement with the underside surface portions of the cover to act as a ramp or guide for the butt edge of the blade to insure its entrance into the magnetic field, the tension in these legs being only sufficient to maintain the free ends in continuous engagement with the cover, and therefore not sufficiently strong tending to open the clamping member against the stronger force of the leaf spring biasing effect on the cover toward closed position, however, the biasing action of said legs cooperate with said leaf spring to lift the cover.

The present invention, therefore, facilitates blade insertion, removal, and cleansing while minimizing the risk of personal injury attendant thereto, without using mechanical means for releasably holding the blade within the razor head while open to any extent, said magnetic holding and positioning means having the dual function of drawing the blade from the hand into the razor head square with the platform and holding it in this position for subsequent clamping in shaving position automatically.

Other important objects and advantages of the present invention will be apparent to one skilled in the art from the following detailed description considered in conjunction with the accompanying drawings, in which:

Figure 1 is a side elevation on an enlarged scale, of a razor constructed in accordance with the principles of the present invention, the lower portion of the included handle being broken away;

Figure 2 is a top plan of the razor illustrated in Figure 1;

Figure 3 is a fragmentary transverse sectional view taken along the line 3-3 of Figure 2 looking in the
direction of the arrows and showing the two operating position of the overcenter blade control arm; and Figure 6 is a rear elevation taken from the line 4—4 of Figure 2 with fragmentary portions thereof shown in section for clarity of detail;

Figure 5 is an exploded perspective of the leaf-type clamping spring, magnet holding bracket, and overcenter blade control arm; and

Figure 4 is a side elevation partly in section showing the razor head open to accommodate a blade change or cleaning of the blade for re-use.

Referring to the drawing, the letter "R" designates generally a safety razor incorporating the principles of the present invention. The lower end of the razor handle 12 is broken away to conserve space with the upper end section being designated 14.

Surmounting said handle upper end section 14, is the razor head generally designated "RH," which includes two interfitting members functioning as a blade support platform or base segment 16 rigid with said handle end 14, and a pivoted top wall or clamping member 18 having end wall segments 20 integral therewith to form therebetween a variable blade receiving chamber generally designated "BC."

The blade used with the present razor is conventionally constructed and generally designated "B" and comprises a cutting edge 22 opposite a butt or blunt edge 23, the latter in commercial practice having a U-shaped metallic reinforcing strip to facilitate handling during a blade change.

The upper end portion 14 of the handle is encased in a metallic sleeve 26 preferably of rectangular cross section, said sleeve terminating in a pair of obliquely formed laterally disposed angular flanges 27 each having a hole 28 therethrough adjacent their respective ends.

The blade platform 16 of generally rectangular configuration comprises a forward guard edge 30 having a pair of longitudinally spaced stops 31 each provided with a rearward opening angular undercut or notch 32, openings 33, preferably three in number, rearwardly adjacent the guard edge, arcuate finger cutouts 34 in the side edges thereof, a pair of upstanding semi-spherical projections 36 longitudinally spaced from each other and disposed on the rear marginal surface, a pair of longitudinally spaced holes 37 through the platform registering with the holes 28 and forwardly disposed with respect to the projections 36, a pair of opposed pinlets 38 projecting from the side edges adjacent the rear corners of the platform, a medially disposed rectangular cutout 40 in the rear edge, and a pair of semicircular channels 41 in the undersurface of the platform leading from opposite side edges of the cutout 40.

The cover or clamping member 18 comprises a forward marginal blade-engaging edge 42, circular apertures 43 through the side walls 20 for reception of the pinlets 38 to provide pivotal movement of the clamping member with respect to the platform, a substantially rectangular aperture 44 medially disposed adjacent the rear marginal portion of the clamping member, a finger piece or tab 45 projecting rearwardly from the medial portion of the rear marginal edge, camming surfaces 47, 48 formed by merging at a vertex 49 of the lower horizontal and rearward angular edges of the side walls 20, said vertex normally lying slightly rearward of a vertical centerline through said pinlets 38 for an important purpose as will appear.

Spring clip bracket means designated as a whole "BR" is formed of springy sheet metal, preferably brass having a thickness of .008 to .010 inch, and comprises a pair of upstanding open side circular portions 50 in longitudinal spaced relation, said circular portions being normally greater than a half circle with their side openings 51 toward the razor cutting components, preferably a pair of forwardly projecting flexible angular fingers 52 integral with the upper marginal edge of each circular portion and continuously engaging portions of the undersurface of the clamping member 18, a horizontally forwardly extending flange 54 downwardly offset at 55 and integral with the lower marginal edge of each of the circular portions, and a bridging segment 56 interconnecting the flanges 54 to form the assembled bracket means BR, said segment having pinlets 58 spaced to register with the holes 37 in the platform.

The magnetic blade holding and positioning means "PM" comprise a pair of cylindrical rod-type permanent magnets 60 held in longitudinally aligned operating positions by the circular portions of the bracket means BR. Manufacture of the bracket means BR produces the circular portions with a slightly reduced diameter with respect to the diameter of the magnets clasped thereby so that installation of the magnets via the side openings 51 springs these openings sufficiently wide to accommodate entrance of the magnets into the circular portion which intimately engages the magnets with a clamping action induced by tension resulting from the expansion thereof on the larger diameter of the magnets.

Substantially flat spring means S are provided with opposed offset free flexible ends 62, a flexible leg 63 projecting from the forward edge 64 medially disposed in the rear edge thereof, a pair of semicircular channels 65 leading from side edges of said cutout on the upper side of said spring means, and a pair of apertures 68 spaced for registering with the holes 28, 37, and 55 whereby the handle flanges, spring means S, bracket means BR, and platform 16 are secured in a unitary assembly by fasteners such as rivets 69 inserted through said registering holes.

The semicircular channels 41 in the underside of the platform 16, and channels 67 in the upperside of the spring means S register when the razor head is assembled to form circular holes 70 for journaling pinlets 71 projecting from the opposite lower side edges of an "overcenter" blade holding and releasing double arm 72 which is rearwardly spaced from the blade stops 31 to define a variable blade channel with respect to said arm and magnets 60. The free end 73 of the lower shorter arm 74 overlies and engages the flexible portion 62 of the spring means S and due to the angularity of this lower arm with respect to the center of the pivotal connection 70, 71, the double arm is given an overcenter action in both directions of oscillation. This overcentering action is inaugurated by the longitudinal projecting through the aperture 44 in the clamping member, acted on by the front and rear edges 76, 77 respectively of said aperture to rotate the double arm 72 rearwardly to release the blade into engagement with the magnets 60, and to advance the blade into engagement with the stops 31 by interrupting the magnetic hold on the blade, responsive to opening and closing the clamping member, respectively.

Normally the overcentering blade-control arm 72 assumes an intermediate position relative to the front and rear marginal edges 76, 77 of the cover aperture 44 when the razor is open but this position is not necessarily essential for the arm 72 to carry out its forward overcentering movement to interrupt the magnetic hold on the blade and advance it into engagement with the front stops 31. This intermediate position may be termed the stationary position with respect to the pivotal connection 70, 71 of the blade platform.

Pivotal connection 70, 71 thereof with the blade platform. This stationary center is established by rotating the overcenter arm rearwardly to a point wherein the free end 73 of the lower arm 74 which is a flat surface normal to a straight line passing therethrough and its pivotal center, engages its cooperating upper flat surface of the spring segment 63 to effect a straight line of force from the spring segment through the lower arm and its pivotal center aforesaid to thus neutralize the overcentering tendency at substantially the medial point of full travel of the overcentering arm. Due to variations in manufactur-
ing tolerances and assembly, and rapidity of manually retracting the clamping member 18 when opening the razor head RH, the acceleration imparted thereby to the overcentering arm may be such as to cause the arm 72 to "skip" its stationary center with full rearward stroke thereof being effected causing the upper arm 75 to lie closer to the rear marginal aperture edge 77 when the head RH is fully open than would be the case in establishing the intermediate position responsive to a slower movement of the clamping member with the assembly and tolerances of the razor R in substantially optimum opening relationship.

Referring now to the opposed flexible free ends 62 of the spring means S, which enable the clamping member 18 to be swung on its pivotal connection 38, 43 from the position shown in Figure 1 to the fully open position shown in Figure 3, the latter position effecting blade release into engagement with the magnets 60 or for removal from the razor head as by grasping the side edges accommodated by the finger cutouts 93. As will be observed from the drawing, the cover 18 is maintained in either of the above two operating positions by means of the free ends 62 of the spring means S reacting continuously on the working surfaces 47, 48 respectively adjacent the apaxes 49 normally to the rear of the pivots 38 when the cover 18 is closed. The action of the free ends of the spring means S is so related to the apaxes 49 that the spring means produce a double action, forcing the cover to closed position when the apaxes 47 are on the rearward side of the critical angle and forcing it to open when on the front side of the critical angle. This spring action of the cover is transmitted to the upper longer arm 75 of the double arm 72 by engagement of the opposed longitudinal edges of the aperture 44 to initiate the overcentering movement of the double arm for depletion as a consequence of the flexible leg 63 of the spring means S retracted on the shorter arm 74 as the critical angle of the double arm is past with respect to the pivotal center thereof on the platform 16. The upper arm 75 of the double arm 72 is formed with a medial rearward curved portion which engages the butt edge 23 of the blade B to advance into engagement with the forward stops 31 and simultaneously interrupt the magnetic hold thereon, as a result of the biasing effect of the flexible spring leg 63 on the end of the lower arm 74.

The engaging point of the front and rear edges 76, 77 of the aperture 44 in the cover 18, requires a degree of precision timing such that initial opening of the cover by application of manual pressure on the fingers 45 brings the front edge 76 of the aperture into engagement with the confronting side of the upper end of the longer arm 75 after taking up a slight lost-motion movement (see Figure 2) between said upper arm end and front edge, with full opening of the cover disposed on the upper end of the overcenter arm 72 spaced over-centered forwardly from the rear edge 77 of said aperture and the working edge surface 48 parallel with the confronting face portion on the free ends 62 of the spring means S to thereby hold the cover open until closure thereof is desired. Withdrawal of the overcenter arm 72 from the butt edge 23 of the blade B releases the blade for attraction by the magnets 60 and thereby maintains the blade within the open razor head RH while enabling relative oscillatory movement of the blade for cleansing and drying purposes without removing it from the head as a consequence of the pivoting action of the butt edge of the blade with the magnets. When the cover 18 is manually released to a point at which the apaxes 49 pass the vertical centerline through the pinlets 38, the overcentering action induced by the flexible ends 62 of the spring means S will close the blade with the forward marginal undersurface 42 of the cover engaging the upper confronting surface adjacent the cutting edge of the blade. During closure of the cover as aforesaid, the overcentering action of the double arm 72 into engagement with the butt edge of the blade to break the magnetic hold thereon and advance the blade into engagement with the forward stops 31, is initiated substantially simultaneously with the engagement of the forward margin 42 of the cover with the upper surface of the blade to insure that the corners of the cutting edge of the blade are positioned for reception into the notches 32 of the blade stops 31 thus preventing any possibility of the cover being closed and one or both corners of the blade cutting edge 22 disengaged from their respective notches. Accordingly, the operating relationship between the overcenter arm 72 and aperture edges 76, 77 must be precisely held in the manufacture and assembly of the present razor construction, and particular is this true of the rear edge 77 of the aperture with respect to its engagement of the forward overcentering action of the blade control arm 72. This latter overcentering action must be timed to be initiated under influence of the spring legs 62 at substantially precisely the moment the forward marginal portion 42 of the cover comes into light contact with the upper surface of the blade immediately adjacent the cutting edge thereof.

Operation

Although the manner in which my invention achieves its objectives should be manifest from the foregoing description augmented by an inspection of the drawing, a brief explanation is deemed apropos, and will be given as follows:

What will be considered a shaving cycle will now be described with reference to the razor of the present invention. Such a cycle comprises the steps of successively mounting a blade B in effective cutting position while the cover 18 is fully open; thereupon closing the razor head and shaving in normal fashion interrupted by intermittently opening the razor head to rinse the blade of beard-laden lather while the magnets 60 hold the blade from dislodging from the open head; and thereafter effecting removal of the blade in the event a blade change is needed by grasping the opposed ends of the blade between the thumb and forefinger and withdrawing it from the razor which blade removing operation is facilitated by the arcuate cutouts 34 in the marginal edges of the platform 16, or resuming the shaving operation upon closure of the cover 18 which automatically clamps the blade in correct shaving position behind the front stops 31 and breaks the magnetic hold on the butt edge 23 of the blade responsive to the overcentering forward movement of the double arm 72. Blades are insertable into and removable from the razor head RH via the forward longitudinal opening leading to the blade chamber BC between the platform 16 and cover 18 when fully open best demonstrated in Figure 3 while the blade cutting components comprising the guard segment 30 and blade cutting edge portion 48 are formed into opening into effective control and cutting positions respectively with the guard segment disposed forwardly subjacent to the cutting edge.

While the razor head is open as shown in Figure 3, the magnets 60 maintain the butt edge 23 of the blade B in engagement therewith yet concurrently providing limited oscillatory movement of the blade with respect to the razor head RH so that the blade may be thoroughly rinsed free of beard-laden lather without likelihood of fortuitous displacement from the open razor head, and in case the same blade is to be reused for another shave, it may be thoroughly cleaned and wiped dry without removing from the razor head to preserve the cutting edge for additional shaves from the same blade.

Initially it will be assumed that the razor R is empty. At such time, the flexible ends 62 of the spring means S are exerting upward pressure on the apaxes 49 and horizontal edge portion 48 immediately adjacent thereto to thus bias the cover 18 into pivotal engagement with
the confronting forward surface portion on the upper side of the platform, and the overcenter arm 72 is biased by its locating spring into engagement with the front edge 76 of the cover aperture 44. The thumb piece 45 is now pressed downwardly while the handle is grasped in the palm of the same hand to retract the cover 18 from the Figure 1 position to the Figure 3 position. This opening operation is performed in opposition to the forward motion of the spring means S on the clamping member 18, and as stated above, by grasping the razor handle in one hand and operating the thumb piece with the thumb of that hand. The ends of the blade are now grasped between the thumb and fingers of the other hand and the blade inserted through the longitudinal forward opening with the butt edge in the lead is propelled rearwardly until the butt edge 23 enters the magnetic field established by the permanent magnets 60 whereupon the blade is instantly and automatically drawn fully into the open razor head chamber BC in contrast with the working surfaces on the magnets and so held even though the butt edge is movable relatively along the curved surfaces of the magnets during opening and closing of the razor.

The magnetic action effective on the blade B draws the blade square with the platform so that closure of the cover 18 by releasing the thumb piece 45, the blade is advanced into engagement with the front stops 31 substantially simultaneously as the forward portion 42 on the cover engages the upper side of the blade immediately adjacent the cutting edge 22. This advancing operation breaks the magnetic hold on the blade responsive to the overcentering action of the double arm 72 induced by the rear edge 77 of the aperture 44 engaging the upper arm 75 synchronized with the closure of the cover 18 as above described to prevent any possibility of the cutting edge corners being disengaged from their respective notches 32 in the front stops 31 when the cover 18 fully closed as shown in Figure 1. The razor is now closed and ready for a shaving operation.

As the shaving operation progresses the operator may open and close the razor at will without dislodging the blade from the head due to the magnetic hold thereof, to the bladed father from the cutting edge and head parts. Upon completion of the shave, the razor may again be opened to enable cleaning and drying of both sides and the cutting edge of the blade and interior of the razor head without removing the blade from the head so that the cutting edge may be preserved for another shave, or in the event the cutting edge has become dull, the blade may be removed from the head and a new blade inserted in the manner described in readiness for another shave, the blade while in the razor acting as a "keeper" between the magnets 60 and thus maintain the force of the magnets at the maximum.

Thus it should be manifest that blade-insertion into effective shaving position is a simple and automatic operation from the time the butt edge of the blade enters the magnetic field. The finger piece 45 obviously facilitates this operation, and the bumps 36 together with the magnetic action maneuver the blade into its most desirable and effective angular cutting position with respect to the guard segment 30. The upward biasing force of the spring means S maintains the cutting edge of the blade in intimate contact with the forward stops 31 via the overcenter blade control arm 72 engaging the edge of the blade to interrupt the magnetic hold on the blade and consequently, the butt edge is spaced slightly forwardly from the magnets 60 while the blade is in shaving position.

Also note the special advantage derived from the action of the fingers 52 associated with the bracket means BR, which lightly engage the underside confronting portions of the cover 18 to form a ramp for guiding the butt edge of the blade into contact with the magnets 60. These flexible fingers are provided with only sufficient tension as to insure continuous contact with the underside of the cover and therefore, any tendency to raise the cover from its fully closed position effected by spring means S is obviated until the thumb tab 45 is deliberately actuated to open the razor head.

Thus, it should be manifest that my invention discloses a new and novel safety razor that is very simple in design, that is adapted to accommodate conventional single-edge blades, that is easy to manipulate, that is manipulable without risk of personal injury, and that the magnetic blade holding feature greatly enhances the safety of this type of razor by preventing erroneous placement of the blade while the razor is open and establishing the bladeline unfailingly behind the front stops for engagement therewith when the razor is closed in shaving condition. This latter malfunctioning characteristic of currently produced razors utilizing front stops enabling closure of the head with the corners of the cutting edge of the blade disengaged from their respective guard edge stops presents a serious hazard in the use of this general type of production razor.

The resilient characteristic of the open sized circular portions 50 of the bracket means BR provides for easy replacement of the magnets 60 when necessary to avoid loss of magnetism as by a sharp blow, and the contractible nature thereof for holding the magnets serves to maintain the magnets in their respective aligned operating positions. In the case of the magnets losing their magnetic force, the razor of the present invention is fully operative for shaving, but greater caution must be exercised when opening the razor to change the blade, and special care used in closing the razor to insure correct positioning of the blade so that the corners of the cutting edge will effectively engage the underscarts 32 in the stops 31, and, of course, the advantage of cleaning and drying the blade resulting from the close together with automatic placement thereof within the razor head for clamping in shaving position is not available where the magnetic force is not present. The magnets are effective as butt edge stops in the usual manner when the razor head RH is closed should the double arm 72 move rearwardly under the effects of shaving very heavy beard tending to overcome the biasing action of the spring leg 63. This movement, however, is limited by the space normally obtained between the magnets and butt edge when the blade is engaging the front stops, to prevent the corners of the cutting edge from becoming free of the stone contact. The magnets are shown engaging the magnets with water resistant lacquer to prevent rusting.

The precautionary statement relating to production safety razors having front stops emphasizes the novel advantages resulting from the magnetized stops 60 of the present invention to provide automatic compulsion of blade insertion and proper placement within the razor head when open with the added advantage of providing cleaning and drying of the blade pivotally held at its butt edge by said magnetic stops whereby manual manipulation of the razor induces limited inertial oscillatory movements of the blade as defined by the forward opening between the platform and cover to facilitate thorough cleansing of the blade and interior of the razor head.

Referring to the terminology used in the foregoing description and in the appended claims, the identifying expressions and/or terms employed are intended to cover the range of reasonable equivalents in the patent sense. For example, the expressions, "razor head," "interlocking member," "clamping members," "blade opening," "blade chamber," are intended to include any structure or chamber for the reception of a razor blade of the single-edge type, whether such assembly provides for sliding or pivotal movement of the members to accommodate insertion and removal of the blade, or a different type of movement serving the same purpose. The terms "depending," "upstanding," "subjacent," "superjacent," "top," "bottom," "front,"
In a razor wherein a single-edged blade is insertable into a razor head between a pair of pivotally movable clamping elements with the blade edge contacting a stop member, the improvements of blade-contacting means for displacing the blade in one direction toward and against said stop member when the pair of elements clamp the blade therebetween, relative movement of the clamping elements moving the blade-contacting means in an opposite direction from said stop member, thereby separating the blade>Contacting means and the stop member to return the blade to a position ready for engagement, and a permanent magnet carried by one of said elements and having a magnetic field of force encompassing a portion of said blade and effective to magnetically attract the blade to retract the blade in said opposite direction from said stop member and also to retain said blade in the razor head when said blade is free for movement upon separation of the blade-contacting means and said stop member.

2. In a razor for use with a blade having a cutting edge, a razor head having a blade platform and a first blade clamping member movably connected to the platform for movement to a closed position at which the blade is clamped in operative position between the platform and the first clamping member and to an open position at which the blade is released from its operative position, the platform having a stop engageable with the blade cutting edge to aid in positioning the blade in its said operative position; the improvements of magnetic means carried by the head and engageable with a portion of the blade spaced from the blade cutting edge to retain the blade in the head with the blade edge free of the stop when the first clamping member is in its open position, and a second blade clamping member contacting the blade in spaced relation to the cutting edge thereof only when said first clamping member is in its closed position to retain the blade in its operative position against said stop and spaced from said magnetic means.

3. In a razor for use with a blade having a planar body bounded at one side by a cutting edge and at the opposite side by a butt edge, the razor having a head including a pair of pivotally interconnected clamping members one of which is movable arcuately about a pivot axis adjacent the blade butt edge into and out of line engagement with the planar body of the blade adjacent the cutting edge, a blade control arm pivoted to the razor head, and a spring biasing said control arm toward the blade cutting edge for contacting the blade butt edge to urge the blade cutting edge against a stop projection carried by the other of said clamping members, movement of said one clamping member out of engagement with the blade body retracting said control arm against the bias of its spring to free the blade, the improvements of a permanent magnet carried by the razor head and spaced from said stop projection a distance greater than the distance between the cutting edge and the butt edge of said blade, said magnet having a magnetic field encompassing the butt edge of said blade and effective to attract and retain the blade butt edge when said blade is free and the control arm is retracted, and the control arm spring being of sufficient strength to urge the blade toward said stop projection upon movement of said one clamping member into engagement with said blade.

4. In a safety razor for use with a blade having a cutting edge at one side, and an opposite edge at the other side; a razor head having blade-supporting platform means provided with guard means at its forward edge, a stop carried by said platform means at said forward edge for engagement with the blade to define the forward operating position of the blade cutting edge with respect to the guard and to enable the blade to be withdrawn backwardly from the stop; the improvements of a permanent magnet on the razor head positioned in spaced relation to the opposite edge of the blade when the blade is against the limiting means and having sufficient magnetic field to be effective thereon; a clamping member movably attached to the platform means and manually operable from a closed position to clamp the blade in operating position to an open position to release the blade for cleaning; blade control means movably carried by the razor head and movable with the clamping member, the blade control means being engageable with the blade when the clamping member is in closed position to force the blade away from the magnet and into operating position, and the blade control means being withdrawn from the blade when the clamping member is in open position to free the blade for movement from operating position; and the magnetic field of said magnet drawing the blade back from the limiting means to be free thereof and holding the blade for cleaning in the razor despite movement of the blade control means and the clamping member from contact with the blade.

5. The razor of claim 4, with resilient means yieldably urging the clamping member toward its closed position, the resilient means having strength to overcome the resistance to closing caused by the force of the magnetic field on the blade.

6. In a razor for use with a single-edged blade having a cutting edge and opposite butt edge, a razor head having blade platform means with blade limiting means to position the cutting edge of the blade in operating position and blade clamping means movable from an open position at which the blade is free to a closed position at which the blade is held in an operating position; the improvements of a magnet carried by said platform means and spaced from said limiting means through a distance greater than the blade butt edge distance, said magnet having a magnetic field effective to attract the butt edge of the blade, and blade control means engaging the blade butt edge when the clamping means is in its said closed position to engage the blade and to force it away from the magnet and against the limiting means, thus retaining the blade in fixed cutting position free of the influence of said magnet.

7. In a safety razor including blade-engaging elements defining an expandable blade chamber for the reception of a blade having a cutting edge and a butt edge, the cutting edge projecting at one side of said chamber and a cutting edge guard member having a pair of longitudinally spaced stops engaging said cutting edge, the improvements of magnetic blade grasping and holding means defining a side of said chamber opposite to said one side thereof for magnetically attracting the butt edge of the blade to disengage the latter by magnetic force from said pair of stops when the chamber is expanded, and spring-operated means for contracting said chamber to interrupt the magnetic hold on the blade and to engage the blade cutting edge with said pair of stops.

8. The razor of claim 5 in which said platform means also include: a magnet subsequently engageable with an opposite edge of the blade for feasibly holding said permanent magnet in its spaced relation with respect to the opposite edge of the blade when the latter is in operating position; and an opening in said flexible portion to expose a portion of
said magnet to said opposite edge of the blade to draw
the latter back from said limiting means to free the blade
for movement from operating position.

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