Oct. 31, 1944. N. TESTI 2,361,512

MAGAZINE SAFETY RAZOR

Original Filed Oct. 12, 1942 3 Sheets-Sheet 1

Fig. 1

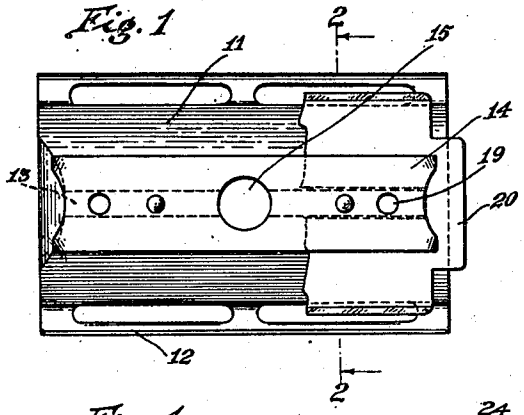


Fig. 2

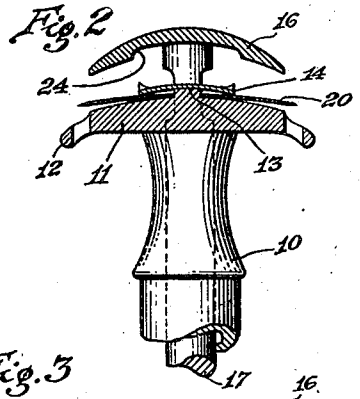


Fig. 3

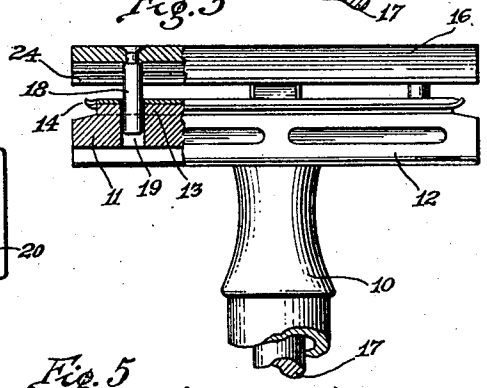


Fig. 4

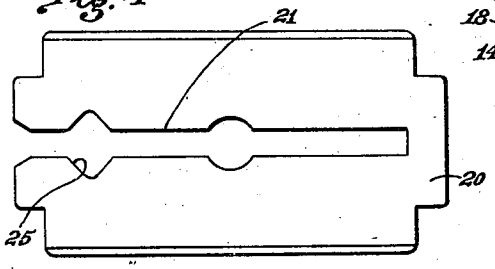


Fig. 5

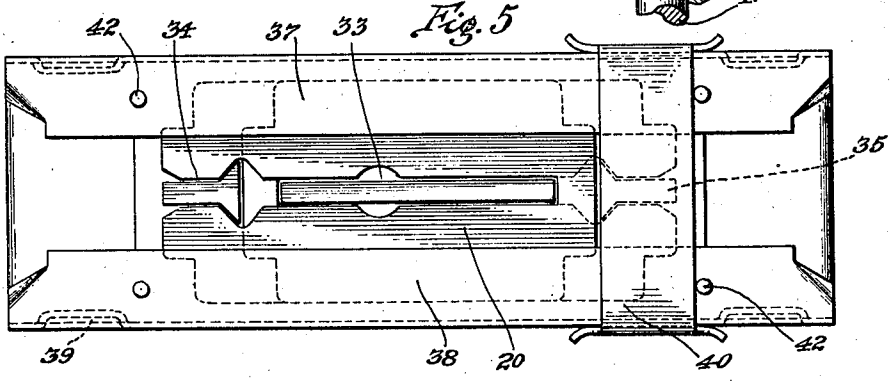


Fig. 6

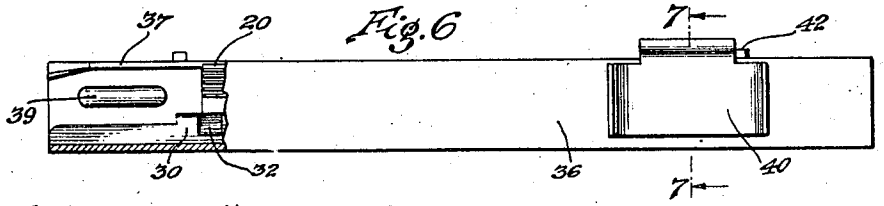
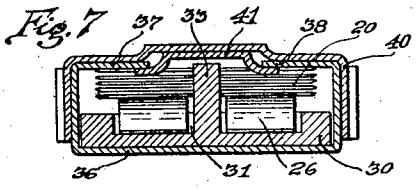


Fig. 7



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Fig. 8

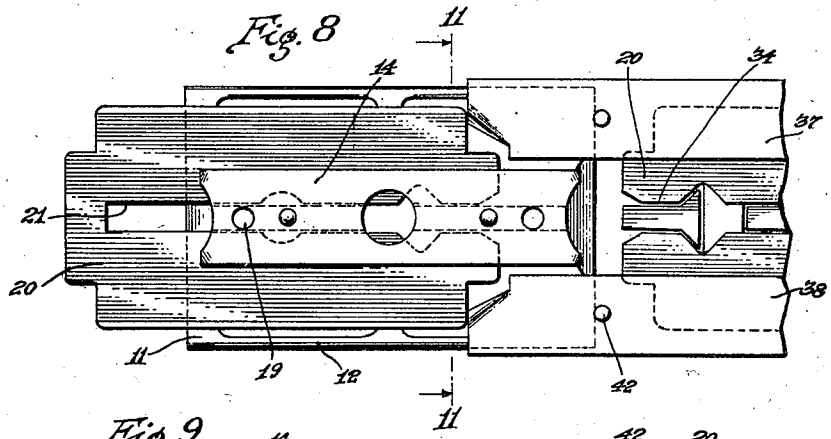


Fig. 9

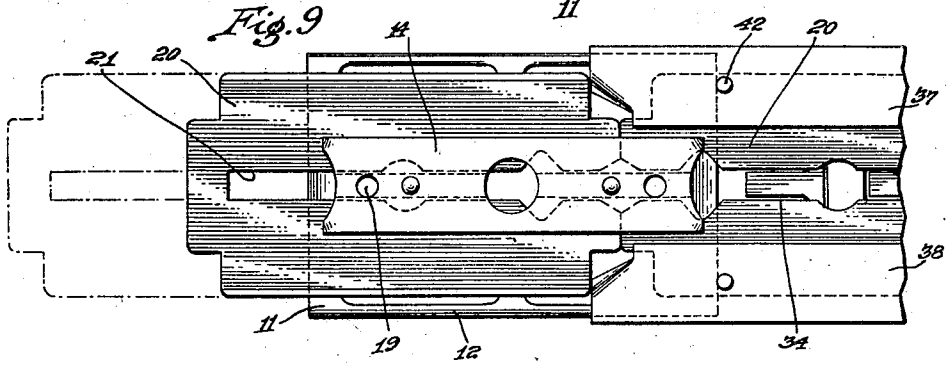


Fig. 10

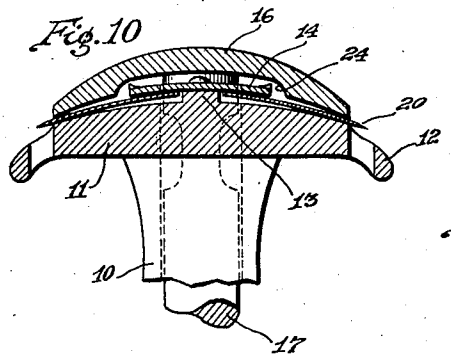


Fig. 11

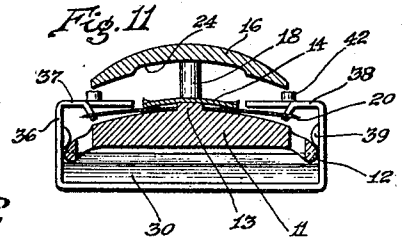
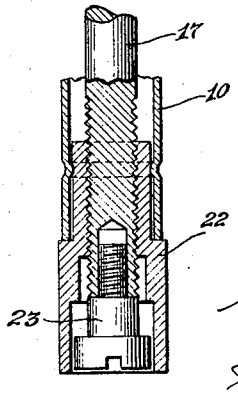


Fig. 12



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Fig. 13

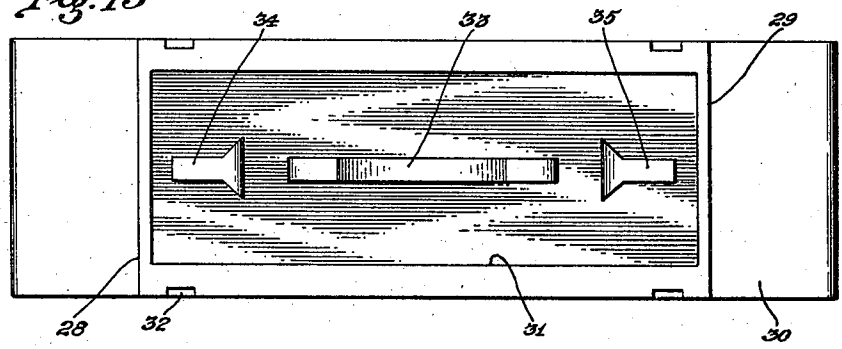


Fig. 14

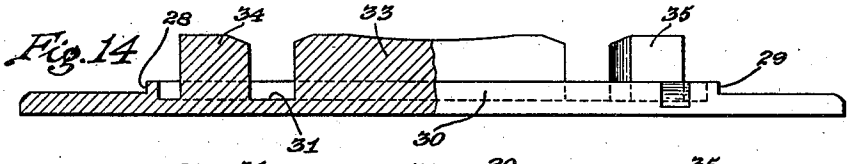


Fig. 15

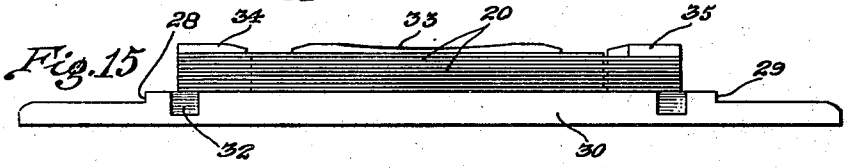


Fig. 16

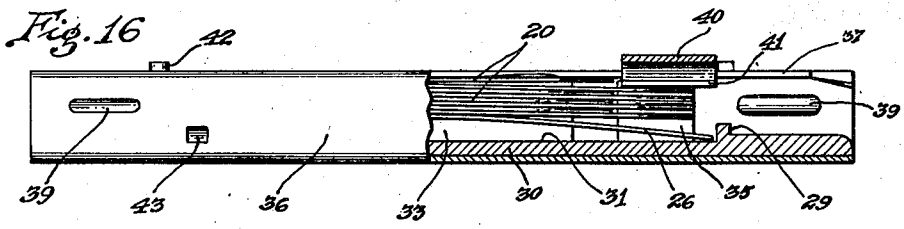
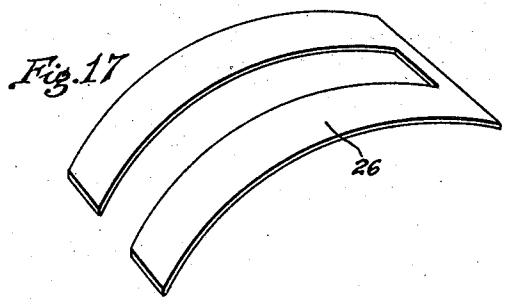


Fig. 17



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UNITED STATES PATENT OFFICE

2,361,512

MAGAZINE SAFETY RAZOR

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Original application October 12, 1942, Serial No. 461,702. Divided and this application March 26, 1943, Serial No. 480,639

10 Claims. (Cl. 30—40)

This invention relates to safety razors and magazines for safety razor blades. In one aspect it consists in a new and improved safety razor having means for positioning and retaining a slotted open-end blade therein in condition of transverse curvature independently of the usual blade-clamping cap. In another aspect it comprises a novel safety razor and magazine combination. In still another aspect the invention consists in a new and improved blade magazine wherein the blades are maintained stacked in longitudinally staggered relation and the blade located consecutively uppermost in the stack is fed out of the magazine by a feeding device which engages a portion of the blade already separated from the next adjacent blade by the staggered arrangement of the blades in the stack.

An important feature of the invention consists in a safety razor having a blade-supporting member or guard equipped with a blade-locating rib and a blade-retaining plate by which a slotted open-end blade may be retained upon the guard in a transversely curved position. This construction not only adapts the razor to receive blades of different thicknesses but by flexing the blade develops friction sufficient to retain it against accidental displacement on the guard. It also provides means for positively controlling contacting ends of blades being ejected and being presented and thus obviates the possibility of one blade riding over the other and jamming in the razor, a difficulty which has been troublesome in the past in dealing with magazine-supplied razors.

The feature of the razor construction above discussed is also important as one factor of a new combination of razor and magazine. It has been found impractical to engage the unsupported end of the blade in use by the unsupported end of a fresh blade and accordingly the present invention contemplates equipping the magazine with means for initially displacing the used blade in the razor so as to carry its end into a position where it is sandwiched between, or positively located by, the retaining plate and the guard surface. The magazine is provided with a feeding device which thereupon advances a new blade without any obstruction whatever until its advancing end encounters the used blade in its displaced position. Accordingly, the meeting ends of the two blades are positively controlled during the entire time that one is being ejected by the other.

Another feature of the invention consists in a double-ended magazine arranged to contain a stack of blades in longitudinal staggered relation and having means for feeding the blades alternately first from one and then from the other end of the magazine.

My invention includes also a novel combination of reversible magazine and reversible razor so constructed and arranged that blades are delivered from one end of the magazine to one end of the razor and from the other end of the magazine to the other end of the razor, reversing both razor and magazine between each withdrawal of a blade from the stack.

In this connection my invention includes as another important aspect the novel process of separating and feeding slotted open-end blades which consists in stacking the blades with the slots of alternate blades opening in opposite directions and with alternate blades displaced longitudinally in the stack, and then withdrawing one by one the blades successively located uppermost in the stack and reversing the stack end for end between each withdrawal.

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, all shown on an enlarged scale and in which:

Fig. 1 is a plan view of the guard member showing a portion of a blade thereon;

Fig. 2 is a view of the razor head in cross-section, showing the cap in elevated position;

Fig. 3 is a view in side elevation corresponding to Fig. 2 but with the end portions in section;

Fig. 4 is a plan view of a slotted open-end blade adapted for use with the razor of Figs. 1–3;

Fig. 5 is a plan view of the magazine;

Fig. 6 is a corresponding view in side elevation showing portions of the casing broken away;

Fig. 7 is a view of the magazine in cross-section on the line 7—7;

Figs. 8 and 9 are views of the guard and one end of the magazine showing the blade being ejected in two different positions;

Fig. 10 is a sectional view of the razor head on a still further enlarged scale showing the blade clamped for shaving;

Fig. 11 is a view in cross-section on the line 11—11 of Fig. 8, with the addition of the cap member;

Fig. 12 is a detailed view in longitudinal section of the end of the razor handle;

Fig. 13 is a plan view of the base plate of the magazine;

Fig. 14 is a corresponding view in side elevation, partly in longitudinal section;

Fig. 15 is a view of the base plate and associated parts showing also a stack of blades in position thereon;

Fig. 16 is a view of the magazine in side elevation showing one end in a longitudinal section; and

Fig. 17 is a view in perspective of the magazine spring.

The safety razor herein illustrated includes in its structure a tubular handle 10 to the upper end of which is rigidly secured a blade-supporting member or guard 11 which is generally rectangular in outline and provided with a shouldered convex blade-supporting face. Longitudinal slots are formed in the guard to provide marginal guard bars 12 which together with the razor cap determine the edge exposure of the shaving edge of the blade.

The blade-supporting face of the guard is provided centrally with a longitudinal blade-locating rib 13 to the upper face of which is permanently secured by rivets or otherwise an elongated blade-retaining or hold-down plate 14. The rib 13 extends above the face of the guard 11 and is spaced therefrom by a distance somewhat more than the thickness of the thickest blade which is to be used in the razor. Its upper face and the blade-retaining plate 14 are both curved transversely approximately concentrically with the convex face of the guard so that any flexible blade inserted between the guard and the retaining plate 14 is itself transversely flexed.

The guard, rib and retaining plate are drilled to provide a circular aperture 15 through which extends a spindle 17 carrying at its upper end a blade-clamping cap 16. The inner or blade-clamping face of the cap 16 is concaved transversely on a curve corresponding substantially to the transverse curvature of the guard 11. It is provided with an elongated recess 24 in which the retaining plate 14 may be received with clearance when the cap is drawn down to its blade-clamping position as suggested in Fig. 10. The cap 16 is also provided with a pair of spaced downwardly projecting pins 18 for which holes 19 are provided in the guard and through the blade-retaining plate 14. It will be understood that the pins 18 move freely in the holes 19 and thus maintain the cap and guard accurately in aligned relation. The retaining plate 14 is provided with concave end edges. All four of its corners are deflected upwardly or flared to a slight extent in order to facilitate the introduction of the blade ends beneath them.

As shown in Fig. 12 the lower end of the barrel of the handle 10 is closed by a hollow cylindrical nut 22 which is freely rotatable therein and internally threaded for engagement with the lower end of the spindle 17. The nut is held in place by a circular internal rib in the barrel 10 which fits into an annular groove in the shank of the nut. Thus by turning the nut 22 the spindle 17 and the cap 16 may be raised to disengage the blade or lowered to clamp it in shaving position upon the guard. The lower end of the spindle 17 is axially drilled and threaded to receive the threaded shank of a shouldered retaining screw 23, the head of which is of such dimensions as to pass freely into the end of the hollow nut 22 when the parts of the razor are assembled. The screw 23, of course, limits the movement of the nut 22 with respect to the spindle 17 and these two parts may be completely disengaged by first removing the screw 23 in case it should be desired to take apart the razor for cleaning or for repairs. The upper end of the spindle 17 is flattened on opposite sides beneath the cap 16 to afford clearance for the sides of the slot 21 of the blade.

The razor herein shown is designed for use with a slotted open-end blade 20 of the general character shown in Fig. 4, although not limited in this respect. That blade is generally rectangular in outline, sharpened in its opposite longitudinal edges, provided with corner notches defining elongated unsharpened portions at each end of the blade and provided with a longitudinal slot 21 opening through one end of the blade. The slot 21 is provided with a circular enlargement corresponding to the perforation 15 and forming a passage for the spindle 17. It is also provided with a square-sided enlargement 25 located between its central perforation and the open-end of the slot. The blade is of thin flexible steel of an order of .004"–.006" in thickness.

It will be understood that the blade 20 shown in Fig. 4 may be presented to the guard 11 by hand by slipping the open end of its slot 21 upon the rib 13 and pushing the blade inwardly beneath the blade-retaining plate 14 until its further movement is arrested by contacting the closed or solid end of the blade with the adjacent end of the rib 13. In this movement of presentation the blade is transversely flexed to a noticeable degree by the cooperation of the convex guard surface and concave under surface of the retaining plate 14. The spacing of the retaining plate is such as to accommodate beneath it any blade of appropriate thickness for the razor and by flexing the blade to develop a retaining friction which is sufficient to prevent its accidental displacement at all times, as in preparing the razor for shaving or in flushing it after the shaving operation. The blade 20 is shown in Fig. 2 in its transversely curved condition of presentation sandwiched between the upper surface of the guard and the under surface of the retaining plate 14. Similarly the used blade may be withdrawn by grasping the solid end of the blade where this is facilitated by the concave end edge of the retaining plate 14.

It is contemplated, however, that the razor herein shown may be more conveniently used when fresh sharp blades are supplied to it by a magazine which will now be described. Referring first to Figs. 13–17 it will be seen that the magazine comprises an elongated base plate 30 of rectangular outline provided centrally and symmetrically with a rectangular well 31. From the bottom of this well projects an elongated blade-locating rib 33 and blade stops 34 and 35 which are arranged in alignment with the central rib 33, spaced equally from its ends and provided with triangular enlargements which are designed to fit the square-sided enlargements 25 in the slots of the blades. The rib and stops 34 and 35 project substantially above the walls of the well 31 and are designed to locate and retain a stack of blades 20 located thereon in longitudinally staggered relation and with alternate blades reversed in the direction of their slot openings. The location of the blades in the stack is best shown in Fig. 5 in which it will be seen that the uppermost blade is located with its solid end between the stop 35 and the right end of the rib 33

with its slot opening toward the left, whereas, the second blade in the stack is located with its solid end between the stop 34 and the left end of the rib 33, with its slot opening toward the right, and so on.

The blades are somewhat shorter than the overall length of the well 31 so that when the stack is located as above explained there is an opportunity for a forked lifting spring to be forcibly inserted beneath the assembled stack. The lifting spring 26 is shown in Fig. 17 as being longitudinally curved and slotted so that it may be pushed into the well 31 from either end, clearing the blade-locating rib and stops and being finally retained in position by the end walls of the well. It will be understood that the blade stacks may thus be assembled on the base plate conveniently and without any tendency toward being displaced and then the spring 26 may be slipped into place after the loaded base plate is inserted in the magazine casing. The base plate is reduced in thickness at each end to provide transverse shoulders 28 and 29. The base plate is provided in each side edge with a pair of recesses 32 into which the material of the magazine casing may be swaged to retain the two parts permanently in assembled relation.

The casing or shell 36 of the magazine comprises a metal tube of rectangular cross-section, as best shown in Figs. 7 and 11, and of such dimensions as to receive the base plate with a stack of blades 20 thereon and with the lifting spring 26 compressed to substantially horizontal position. The upper wall of the magazine casing is formed by a pair of inturned spaced flanges 37 and 38 which overlie the side portions of the blades 20 but leave exposed the central area of the blade which is uppermost in the stack. The outer corners of the flanges 37 and 38 are flared and are bent downwardly to form blade-engaging projections as shown in Fig. 11, that is to say, projections which engage the used blade upon the guard 11 and displace it initially when the magazine is brought into operative relation with the razor head as will be presently explained. After the casing has been assembled upon the base plate 30 depressions 43 are formed in its side walls which interlock with the recesses 32 above described. In the side walls of the casing elongated depressions are also formed which provide short internal longitudinal ribs 39. These ribs overlie and positively guide the guard bars 12 of the razor guard into contact with the shoulders 28 or 29 of the magazine.

The magazine casing is provided with a sliding feeding member 40 which embraces the sides of the casing 36 and is permanently connected to an internal flanged blade-engaging member 41, the outer edges of which run beneath the flanges 37 and 38 of the magazine casing 36. Stop pins 42 are provided in the flanges 37 and 38 near opposite ends thereof to limit the travel of the feeder 40 so that at each extremity of its stroke it clears the solid end of the blades which are located inside the respective stops 34 and 35. The rib 33 and stops 34 and 35 are of such height as to permit the solid end of a blade to pass above them in bowed condition while its longitudinal edges pass beneath the flanges 37 and 38.

In using the magazine above described it will be assumed that it is desired to eject and replace the blade shown in Fig. 8 as retained upon the guard 11 by the retaining plate 14. The cap 16 having been first lifted, the guard and magazine are brought together as suggested in Fig. 8, that is to say the right-hand end of the guard is telescoped into the left-hand end of the magazine, that being the end of the magazine in which the open end of the uppermost blade in the stack is disposed. In this preliminary movement of engagement of the guard and magazine the downwardly deflected corners of the flanges 37 and 38 engage the shoulders of the blade and displace it toward the left upon the guard for a substantial distance, for example, for about one-fourth of its length, but in any case far enough to locate the open-end of the blade well beneath the retaining plate 14 and in a position where the end edge of the blade is sandwiched between the fixed surface of the retaining plate 14 and the blade-engaging face of the guard 11. In this preliminary movement the internal ribs 39 of the magazine over-ride and guide the marginal guard bars of the guard as shown in Fig. 11, relative longitudinal movement being arrested by contact of the end of the guard with one or other of the shoulders 28 or 29.

The feeding device 40 is now at the right-hand end of the magazine in a position beyond the end of the uppermost blade where it slightly depresses the second blade in the stack as shown in Fig. 16. It is now moved toward the left advancing the uppermost blade in the stack, which is lifted by the spring 26 above the rib 33 and stop 34, with its open-end foremost into the opening between the right-hand end of the retaining plate 14 and the guard 11 beneath it. The entrance of the blade is facilitated, as already noted, by the flaring corners of the retaining plate and it has free passage beneath the plate without any obstruction until it encounters the right-hand end of the blade 20 which has already been displaced as above explained and as illustrated in Fig. 8. The contact between the two blades is made in substantially the location shown in Fig. 9, that is to say, in a location where the contacting ends of both blades are sandwiched between the retaining plate and the guard and consequently have no opportunity for vertical displacement which would result in one blade riding over the other and jamming. Movement of the feed slide 40 is continued until arrested by the pins 42 at the left-hand end of the magazine. When this occurs the blade 20 has been substantially ejected from the razor head and the new blade located in its place.

When the blade thus presented is to be ejected and the magazine used again it is reversed end for end. The reversal being necessary because the second blade in the stack has its open end directed away from the razor head as shown in Figs. 8 and 9 and because the feed slide has now been moved to the left-end of the magazine and positioned for delivery by movement toward the opposite end of the magazine.

It will be understood, of course, that the spring 26 pushes the stack of blades upwardly at all times and holds the uppermost blade in contact with the flanges 37 and 38 of the magazine casing where it may be moved endwise freely above the rib 33 and the stops 34 and 35. The function of the triangular enlargement of the stops is to retain positively the second blade in the stack from longitudinal movement while the uppermost blade is being withdrawn. Otherwise, the frictional engagement of the uppermost blade would tend to displace the second blade.

The user of the razor and magazine herein described may easily determine which end of the magazine should be brought into engagement

with the razor, and to which end of the razor the new blade should be presented, by noting in which end of the magazine or razor is located the open end of the blade to be delivered or ejected.

The concave retaining plate 14 serves, by maintaining the blade always in flexed condition, to increase and hold its stiffness substantially constant regardless of the cap position. Therefore, the cap may be adjusted freely to vary the edge exposure of the blade without danger of loosening it and permitting chatter or flutter of the shaving edge.

The present application is a division of my application Serial Number 461,702, filed October 12, 1942.

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

1. A magazine for safety razor blades, comprising an elongated casing having spaced flanges with inwardly deflected blade-pushing corners, an internal blade-locating rib, and a slidable feeding device in combination with a safety razor shaped to fit at one end within said casing and having a blade seat aligned with the rib of the magazine and with the blade-pushing corners of the casing, whereby a blade may be displaced on the blade seat independently of the feeding device.

2. A safety razor having opposed walls for yieldingly holding an open-end blade in place, in combination with a magazine having an opening shaped to receive the razor telescopically and a projection for initially displacing a blade in the razor between said walls, and a movable feeding device for advancing a blade from the magazine into ejecting contact with the said initially displaced blade.

3. A safety razor having opposed walls for holding a blade in curved condition, in combination with a magazine interfitting with said razor and having a projection for locating the magazine for blade delivery and for initially displacing a blade from shaving position in the razor, and separate means for advancing a blade from the magazine into the razor to make contact with the curved blade in the location into which it has been thus initially displaced.

4. A safety razor having opposed curved walls for holding a blade in transversely curved condition therein, in combination with a magazine interfitting with said razor and having means for holding a stack of slotted open-end blades in flat condition, the magazine itself being shaped to displace a blade already located in shaving position within the razor, and having a movable feeder therein for advancing a flat blade from the magazine to the blade curving walls of the razor and into ejecting contact with the curved blade.

5. A safety razor and magazine combination including a safety razor having a blade seat and a retaining plate spaced to engage between them a thin blade, and a magazine shaped to engage with the safety razor and having at a fixed part thereof a projecting arm arranged to pass adjacent to said blade seat and retaining plate and to contact a blade located in said razor and displace it initially.

6. A safety razor and magazine combination including a safety razor provided with means for sandwiching a blade in shaving position between fixed underlying and overlying surfaces, a magazine having means as a part thereof for registering the razor and magazine and for initially displacing a blade in the razor so that its end lies between said underlying and overlying surfaces, and blade feeding means associated with the magazine.

7. A safety razor and magazine combination including a safety razor having longitudinal guard bars at either side and means for holding a blade in shaving position between them, a magazine having a casing open at both ends with walls for engaging the guard bars in either end of the razor, and a blade feeding device in the magazine movable to deliver a blade from either end to the blade holding means to the razor.

8. A safety razor and magazine combination including a safety razor having guard bars at both edges, and a tubular magazine shaped to receive one end of the razor and provided with ribs for over-riding the said guard bars, means within the razor for positioning a blade in shaving position, and means in the magazine for feeding a fresh blade to said positioning means while the razor is held in positon by said ribs.

9. A safety razor and magazine combination including a safety razor having cap and guard members, a blade-retaining plate on the guard member, and means for separating the cap from the guard, and a magazine comprising an open-ended casing shaped to enclose one end of the guard member of the razor together with said retaining plate while the cap remains outside the magazine casing, and a feeding device in the magazine for delivering a blade therefrom to position between the guard member and the said retaining plate of the razor.

10. A safety razor and magazine combination including a safety razor having cap and guard members and means for locating a blade between them, and a magazine comprising a casing open at both ends and shaped to receive and enclose one end of the razor guard, means in the magazine for locating a stack of blades with the ends of the stack spaced substantially within the ends of the casing to provide clearance therein for the guard, and means for feeding a blade from the stack in the magazine to the blade-locating means of the razor while the magazine and razor are so engaged.

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