Oct. 6, 1953 B. BOWEN ET AL 2,654,149

SAFETY RAZOR

Filed Sept. 15, 1949 4 Sheets-Sheet 1

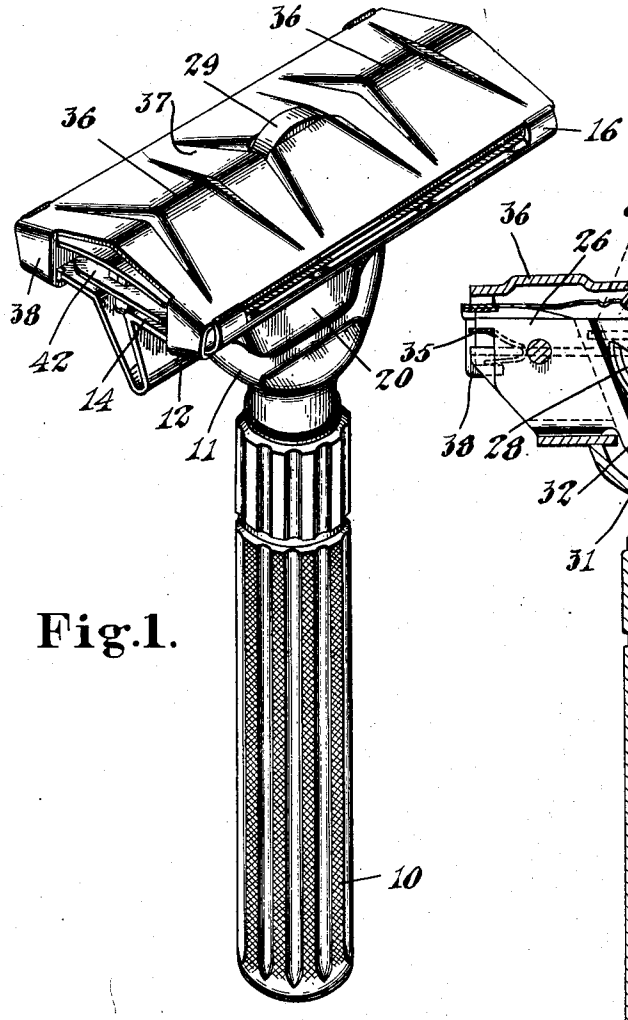


Fig.1.

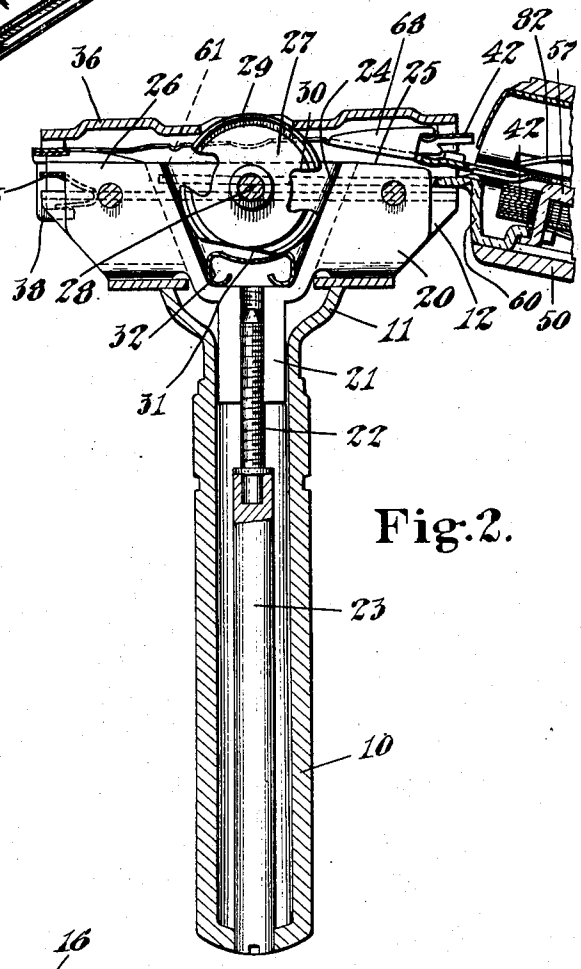


Fig.2.

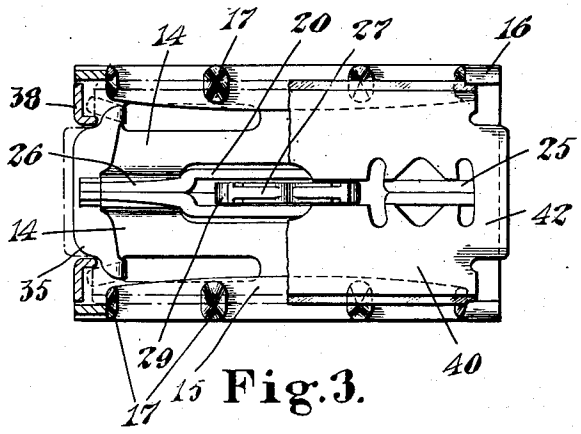


Fig.3.

INVENTORS.
Charles L. Metzler & Billi Bowen.
BY
F. W. McCanna Atty.

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SAFETY RAZOR

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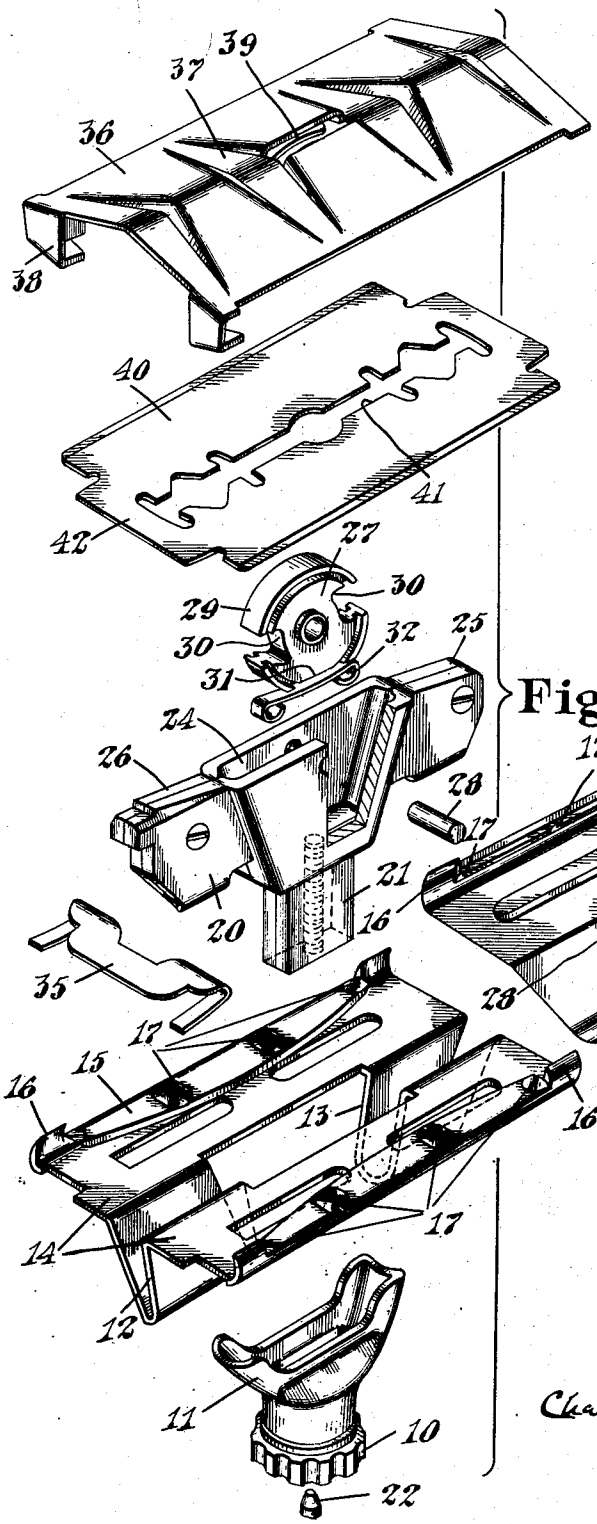


Fig. 5.

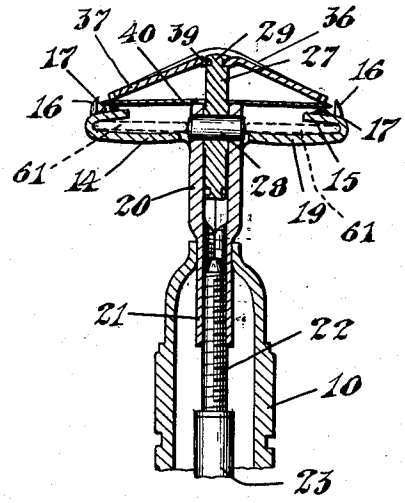


Fig. 4.

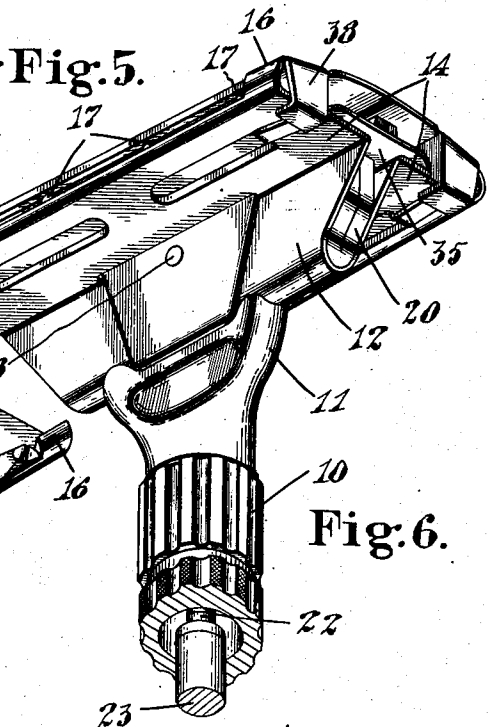


Fig. 6.

INVENTORS.
Charles L. Metzler & Billi Bowen.
BY
Atty.

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SAFETY RAZOR

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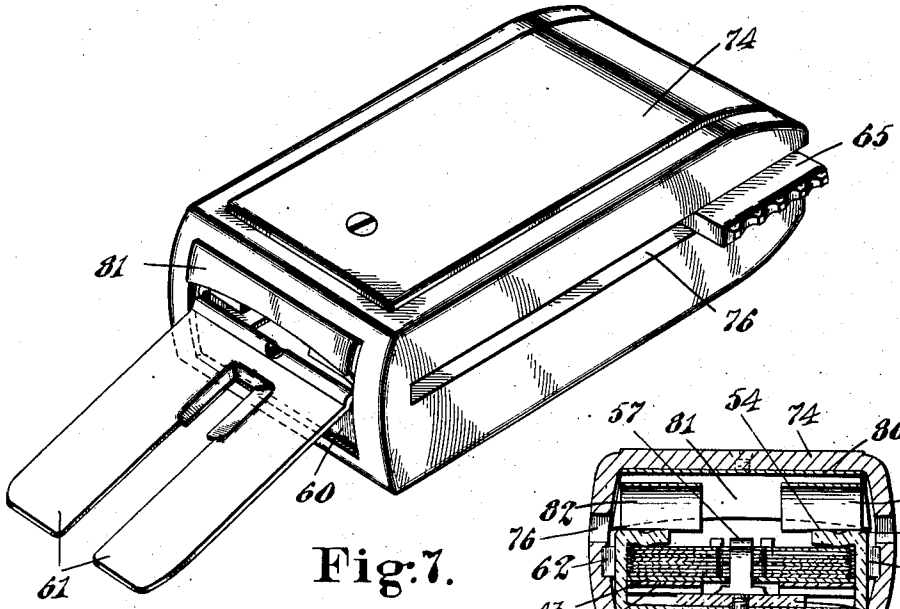


Fig.7.

Fig.8.

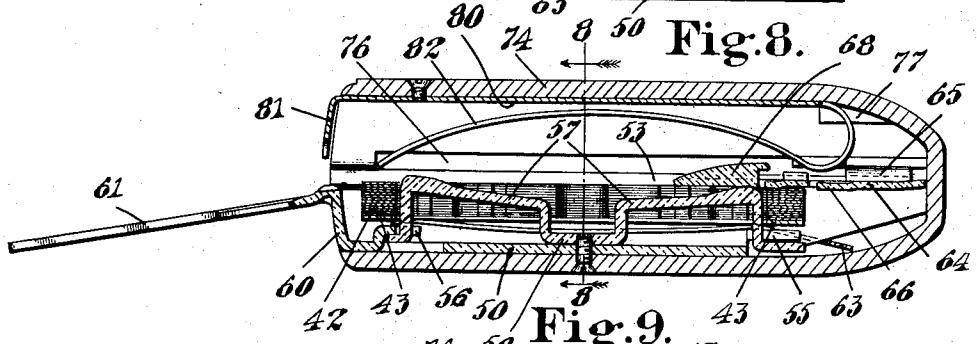


Fig.9.

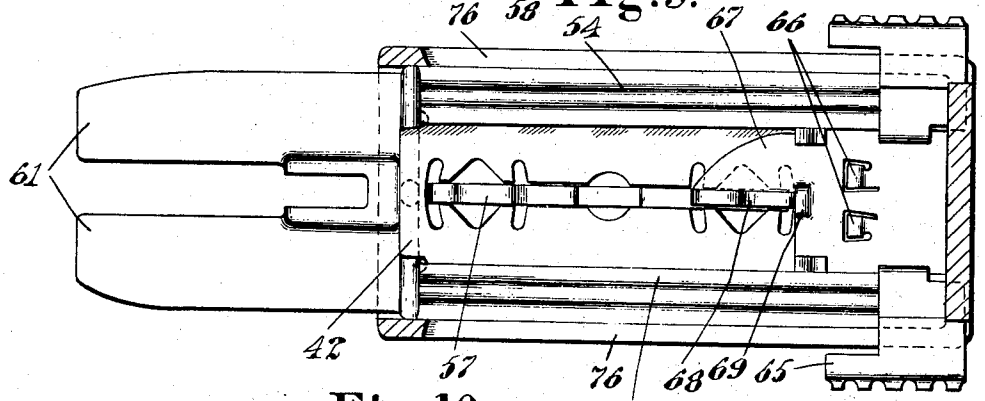


Fig.10.

INVENTORS.
Charles L. Metzler & Billi Bowen.
BY
A. W. Kenway, Att'y

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SAFETY RAZOR

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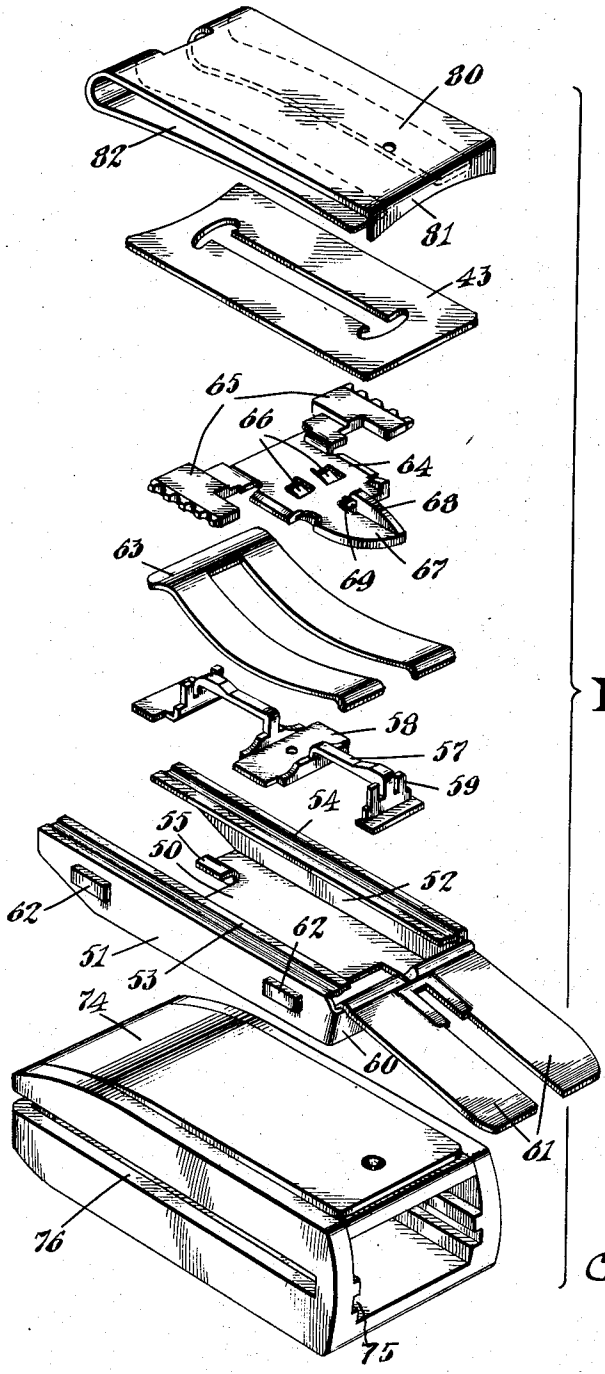


Fig:11.

INVENTORS.
Charles L. Merzlee.
BY Billi Bowen.
H. W. Kenway Atty.

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2,654,149

UNITED STATES PATENT OFFICE

2,654,149

SAFETY RAZOR

Billi Bowen, New York, N. Y., and Charles L. Metzler, Palisades Park, N. J., assignors to The Gillette Company, a corporation of Delaware

Application September 15, 1949, Serial No. 115,932

13 Claims. (Cl. 30—64)

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This invention comprises a new and improved safety razor and new and improved magazine for safety razor blades. It also includes within its scope a novel razor and magazine combination.

The safety razor is organized as a permanent assembly having no loose or separable parts and at the same time is constructed and arranged so that a fresh sharp blade may be easily and rapidly presented thereto directly by the user or with the assistance of a magazine without danger either of impairing the keen edge of the blade by accidental contact with any part of the razor or of cutting the user's fingers.

To this end an important feature comprises a resilient blade-supporting or guard member having projections or contact points that tend always to engage and locate the blade by spring action but are capable of being expanded or separated to receive a fresh blade or to release a used blade.

Another feature of the invention consists in the combination with an expansible blade-supporting member of a rocking connecting element of novel construction which, while continuously engaging the cap member of the razor at the same time permits the free passage of a slotted blade between the cap and the blade-supporting members of the razor.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings, in which:

Fig. 1 is a view of the razor in perspective and on an enlarged scale;

Fig. 2 is a corresponding view in longitudinal section;

Fig. 3 is a plan view of the razor showing the cap removed;

Fig. 4 is a view of the razor in cross section;

Fig. 5 is a view in perspective showing the parts of the razor in exploded relation;

Fig. 6 is a view of the razor in perspective as seen from beneath, showing portions of the handle broken away.

Fig. 7 is a view in perspective of the magazine.

Fig. 8 is a cross sectional view of the magazine on the line 8—8 of Fig. 9.

Fig. 9 is a view in longitudinal section.

Fig. 10 is a plan view of the magazine with its cover portion removed, and

Fig. 11 is a view in perspective showing the parts of the magazine in exploded relation.

The handle of the razor comprises an outer tubular portion 10 fluted and knurled for ornamental finish and merging at its upper end into

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an integral forked bracket 11. The blade supporting or guard member is seated in the bracket 11 and comprises a sheet of resilient metal folded to form a downwardly-projecting U-shaped rib 12 and this rib is cut out centrally to provide an opening 13 with downwardly-tapering edges, as best shown in Fig. 5. The side walls of the U-shaped rib 12 merge at their upper edges into flat, longitudinally slotted side sections 14 that lie substantially in a common plane. These are provided at their respective outer edges with inturned flanges 15 and are also provided with upstanding corner lugs 16 for engaging the corners of the blade when permitted to do so and positioning it in the razor. Each of the inturned flanges 15 is provided with four upstanding conical bosses 17 which, as shown in Fig. 4, support the opposite edge portions of the blade with clearance above the surface of the flanges 15 and in a plane between the lugs 16. The outer folded edge of the flanges 15 constitute the lower guard members of the razor. The flanges are biased inwardly by the resilient loop of the rib 12 to an initial position in which the lugs 16 bear firmly upon the ends of an interposed blade, as will be presently explained.

The blade-supporting member above described is held in place by a T-shaped connecting member 20 formed of two sheet metal side pieces held together in vertical position by screws as shown in Fig. 5. This member includes in its structure a cross-piece which lies in the fold of the rib 12 and a rectangular downwardly-projecting stem 21 which is shaped to pass downwardly into the bracket 11 and into the upper end of the tubular portion 10 of the handle and is provided with a threaded bore in its lower end. In this fits the upper end of a threaded pin 22 having a square head on its lower end which fits in a corresponding socket in the upper end of a second pin 23 having a screw driver slot in its lower end and fitting rotatably into the lower end of the handle 10. Accordingly by turning the pin 23 in the proper direction the stem 21 and the connecting member as a whole may be drawn downwardly and into clamping engagement with the inside of the rib 12 of the blade supporting member. The two side pieces of the connecting member 20 are shaped to form an elongated inner chamber 24 and externally to fit the downwardly tapering edges of the opening 13 in the U-shaped rib 12. The walls of the chamber 24 project out through the opening 13 while the solid end portions of the connecting member substantially fill the rib 12 and positively limit the approaching movement of the side walls. At one end the two

side portions of the connecting member are shaped to provide a shallow outwardly tapering rib 25 and at the other end they are correspondingly formed into a steeper rib 26 terminating in an abrupt shoulder as shown in Fig. 5.

Within the chamber 24 a disk 27 is rotatably mounted upon a transverse pivot 28 extending into both walls of the chamber 24. The member 20, therefore, not only connects the blade supporting member to the handle but serves as a carrier for the disk 27. This disk 27 provides a permanent rotary connection with the cap of the razor. To that end, it is provided with a peripheral flange 29 defined in part by undercut ways. A pair of recesses 30 are formed in the circumference of the disk about 120 degrees apart, and in the periphery between these two recesses is formed a flat 31. In the bottom of the chamber 24 is provided a bowed spring 32 which yieldingly retards rotation or oscillation of the disk 27 and at the time tends to throw it into the position shown in Fig. 5, that is to say, a position in which one of the notches 30 faces or opens toward that end of the razor at which the blade is to be presented viz. the right-hand end as shown in Figs. 2 and 3.

A U-shaped clip 35 is clipped over one end of the blade-supporting member as shown in Fig. 3 for the purpose of masking the opening of the U-shaped rib 12 beyond the ends of the retaining member 26.

The cap 36 corresponds in contour to the contour of the blade-supporting member and is provided with a series of transverse corrugations 37 for stiffness and for ornamental purposes. It is provided at one end with a pair of hooked corner lugs 38 which extend downwardly and engage with clearance beneath the corners of the blade-supporting member outside its blade-engaging lugs 16. The cap 36 is also provided with a central longitudinal flanged slot 39 enlarged slightly at its ends and shaped to receive the flange 29 of the rotary disk 27. This connection permits the disk 27 to be rocked through an angle of 120 degrees to bring one or other of the notches 30 into blade-receiving position and to permit passage of the solid end of a blade through the razor between the cap and guard members thereof with the rocking of the disk, all without disengaging the cap. When the disk is rocked, connection with the cap is continuously maintained, but the actual point of connection shifts along the circumferential flange 29 of the disk to that point which happens to be uppermost and in engagement with the flanged edges of the slot 39. The marginal edges of the cap constitute the upper edge guarding elements of the assembled razor.

The razor herein described is designed to receive a double-edged longitudinally slotted blade 40 of well-known commercial type, that is to say, a blade such as that shown in Figs. 3 and 5 having a longitudinal slot 41 provided with enlarged portions of various shapes and having corner notches which define elongated unsharpened end portions 42.

The razor is represented in Fig. 3 as provided with a blade 40 which is engaged and held firmly at its corners in shaving position by the corner lugs 16 of the blade-supporting member. The blade 40 at the same time receives the ribs 25 and 26 of the retaining member with clearance in its longitudinal slot 41. When now it is desired to release the blade 40 for removal the key of a magazine or other tapering blade may be inserted endwise in the razor in such fashion as to engage the two opposed inner edges of the inturned flanges 15 of the blade-supporting member. The resilient U-shaped rib 12 readily permits the two side portions 14 of this member to be expanded or separated, thereby releasing the blade from the lugs 16 and permitting it to rest freely upon the bosses 17 where it is free for longitudinal movement. In the outward movement of the blade, the solid end portion 42 will pass into one of the recesses 30 of the disk 27 and in its continued outward movement the disk will be rocked 120 degrees to the releasing position shown in Fig. 5. The disk is centered in this position by action of the spring 32 upon its flat side 31. The blade then may be removed fully from the razor by the user leaving the disk 27 in position for the reception of a new blade. When a new blade is presented, its solid end portion will pass the rib 25, enter the recess 30 of the rotary disk, positioned as shown in Fig. 5, and rock the disk 27 to the position shown in Fig. 2. Finally, the blade is arrested when fully inserted by the engagement of the corner notches in its advancing end with the lugs 38 as indicated in Fig. 3. The key or spreader may now be withdrawn and the side portions of the blade clamping member at once contract, bringing the blade-locating lugs 16 into firm engagement with the corners of the blade.

It will be understood that a slotted blade may be presented by hand to the safety razor thus far described. It is usually desirable, however, to supply blades to the razor from a magazine without necessitating the user to handle the blades. A novel magazine suitable for that purpose and also for the purpose of receiving used blades is shown in Figs. 7–10 and will now be described.

The illustrated magazine comprises an inner box or tray member having a bottom 50, side walls 51 and 52 and overhanging top flanges 53 and 54 which are spaced substantially from each other in position to overlie both edges of a blade stack in the magazine. Two overhanging tongues 55 and 56 may be struck upwardly from the bottom of the magazine for the purpose of acting as retainers for a spider in which is incorporated a blade-locating rib disposed symmetrically in the longitudinal axis of the magazine. This spider, as best shown in Figure 11, is formed of resilient sheet metal and includes a pair of bridge sections 57 which rise in opposite directions from an intermediate rectangular pad 58. Smaller pads are formed at the outer ends of the bridge sections and from these extend upright posts 59. In placing this spider in the tray member of the magazine, its two end pads are caught beneath the tongues 54 and 55, while the center pad 58 is secured in place by a screw passing through the bottom of the magazine as shown in Fig. 9.

The bridge sections 57 are thus located so that they extend slightly above the plane of the inner faces of the flanges 53 and 54 but are free to be resiliently depressed. Clearance for such depressing movement is provided by the space beneath the tongues 54—55. The width of the bridge sections is such as to permit them to extend freely into the blade slots 41 and the posts 59 similarly extend into the transverse enlargements at the ends of the blade slots. The blades are thus accurately held in vertical stack formation with the uppermost blade pressed yieldingly into contact with the flanges 53 and 54. The outer ends of the bridge sections 57 are beveled in both directions so that the sections may be temporarily

depressed by cam action of the feed slide in passing over them.

In loading the magazine, a rectangular slotted pressure plate 43 is first placed in the tray member upon the spider and then a stack of 10 or 20 slotted blades is placed above the plate. Subsequently, a forked spring 63 is slipped inwardly beneath the plate 43 with its concave portion against the bottom 50 and its bowed ends against the plate 43. The blade stack is thus resiliently lifted in the manner already explained. The plate 43 is slightly wider than the blades resting upon it and consequently tends to guard their edges from any possible contact with the spring 63.

The tray member is provided with a front wall 60 from which projects a forked key or pilot spreader 61 disposed in the plane at a slight downward inclination to the main axis of the magazine as a whole. A pair of rectangular bosses 62 project externally from each side wall 51 and 52 of the tray member. These bosses serve to guide the tray into its enclosing casing, as will be presently described. The two side walls are beveled upwardly and rearwardly at their rear ends, with the result that the bottom 50 and the tray member extending between them is substantially shorter than the ribs 53 and 54 which constitute the top of the tray.

A feed slide 64 is arranged to slide freely upon the flanges 53 and is provided with oppositely-extending fingerpieces 65 which are undercut to fit the flanges 53 and 54. In the body of the feed slide is cut a pair of feed dogs 66. These are depressed so that their forward edges project below the under surface of the feed slide by approximately the thickness of a single blade. The feed slide is provided with a forwardly-extending pilot 67 from which arises a hook 68 having a curved and sloping front edge and being undercut in its vertical rear edge to form a blade-engaging hook which, as will be presently explained, is used to retract used blades, one by one, from the razor. In the body of the feed slide, directly behind the hook 68, is formed a depressed portion 69 in the forward edge of the slide. This depressed portion provides a cam surface which serves to depress the yielding bridge sections 57 when the feed slide passes over them.

The tray member above described is enclosed in a casing 74 which preferably is molded of plastic resinous material. The casing has integral top, bottom and rear walls. It has also side walls from which inwardly project ribs forming guideways 75 for the reception of the rectangular lugs 62 of the tray. The side walls are also provided with longitudinal slots 76 through which project the fingerpieces 65 of the feed slide. The front end of the casing 74 is open and the lower portion thereof is filled by the front wall 60 of the tray.

The upper portion of the casing is converted into a used-blade receptacle by means of a spring member having a flat top 80 terminating at its forward end in a downturned front wall 81 and its rear end in a forked forwardly-extending spring 82. The flat top 80 of this member fits against the inner surface of the top of the casing 74 while its downturned front wall 81 partially fills the opening in the front of the casing. The top of the casing is provided with an internal lug 77 which is seated between the forks of the spring 82 and so locates the spring within the casing. The spring is further secured at its forward end by a screw passing through the top of

the casing into it. The forked portion 82 of the spring is upwardly convex and rests with the forward end of one fork upon each of the flanges 53 and 54 of the tray, as shown in Fig. 8. It thus serves to deflect a used blade introduced beneath the wall 81, upwardly toward the flat top 80 of the spring at the roof of the casing where the blade will not interfere with the feed slide movement. As used blades accumulate, they are confined between the portions 80 and 82 of the spring.

After the loaded tray and the spring member 80—82 have been assembled within the outer casing 74, the tray is fastened in place by a screw inserted through the bottom of the casing and threaded into the center pad 58 of the spider, though any other fastening means may be utilized if preferred.

The exit or discharge opening of the magazine is formed between the lower edge of the wall 81, supplied by the spring member, and the inner end of the key 61 which is rolled over the upper edge of the front wall 60 of the tray. The rolled edge of the key is provided with a central clearance slot for the depressed lug 69 of the feed slide.

The operation of the razor and magazine will now be described. The razor may reach the hands of the user containing a fresh blade or in empty condition. In either case, one of the notches 30 of the connecting disk 27 will face the blade-receiving end of the razor and be in position to receive the solid end of a fresh blade. Normally, the blade-supporting member or guard is in its contracted condition with the corners of a blade gripped between the lugs 16 and bowed upwardly and pressed against the cap 37. Its edges then occupy shaving position between the edges of the cap and of the blade-supporting member and present the proper blade exposure for shaving. When it is desired to remove the used blade or to insert a fresh blade or to carry out both functions, the forked pilot 61 of the magazine is forced into the passage provided between the expansible side portions of the blade-supporting member, as indicated in Fig. 4 where the pilot 61 is shown in dotted lines. This expands the side portions of the blade-supporting member by wedging action, withdrawing the corner lugs 16 from contact with the blade and permitting the blade to rest in flat position upon the ribs 25—26. The cap is thus relieved of pressure and there is thus provided sufficient lost motion in its connection with the guard member to permit the cap to rock sufficiently to admit the end of a fresh blade when presented beneath it.

The feed slide 64 is then advanced in the magazine. The feed dogs 66 pick up the uppermost blade 40 in the stack and advance it in a path determined by the flanges 53 and 54 of the magazine, that is to say, a path inclined slightly upwardly with respect to the pilot 61, which is received in substantially horizontal position in the razor. The advancing blade passes beneath the used blade, its solid end enters one of the notches 30 of the connecting disk, the disk rocks with the blade, and the blade is advanced longitudinally, fully into position wherein its shoulders engage the corner lugs 36 of the cap. Meanwhile the used blade has been lifted out of engagement with the shoulder of the rib 26 and is accordingly free to be withdrawn from the razor. The beveled hook 68 of the feed slide has now passed under the solid end of the used blade and into the slot of the blade, so that its rearwardly-extending hook now engages the rear solid end of

the blade. The feed slide is then retracted, drawing the used blade with it back into the magazine. The rearwardly moving end of the used blade encounters the ends of the spring 82 which are resting upon the flanges 53 and 54 and the blade is deflected upwardly by them so that the blade passes inwardly above the forked spring 82. The spring itself is temporarily flattened since the blade is still engaged by the hook 68 of the feed slide.

In the ensuing forward movement of the feed slide, the used blade is disengaged and moved by the spring 82 upwardly toward or against the flat top 80 of the spring which forms the ceiling of the used blade compartment. The pilot of the magazine is now removed from the razor and the fresh blade which has been deposited therein is automatically engaged and accurately positioned by the contracting action of the side portions of the razor.

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

1. A safety razor having a blade-supporting member consisting of two similar sections lying in a common plane, blade-locating lugs at the outer corners of said sections, a resilient U-shaped rib connecting said sections and permitting them to be forcibly spread from an initial contracted condition into a spaced blade-releasing condition, the U-shaped rib acting to limit the contracting movement of the sections of the blade-supporting member.

2. A safety razor having a blade-supporting member of resilient sheet metal bent to provide in an integral structure elongated side sections having a connecting rib and inturned marginal flanges for supporting a blade, and corner lugs projecting above the level of the flanges in position to engage the corners of a blade resting on the flanges, and a series of spaced bosses on the flanges supporting a blade out of continuous contact with said flanges.

3. A safety razor comprising cooperating blade-engaging members, one having two side portions separated by a U-shaped resilient rib with an opening therein, a handle, a T-shaped member extending from the handle into said blade-engaging member, filling the opening in said rib and provided with an internal chamber, and a rocking disk mounted in said chamber and having connection with the second of said blade-engaging members.

4. A safety razor comprising a blade-supporting member having a longitudinal median channel with an opening therein, a handle, and a T-shaped connecting member lying with its head in said channel and its shank in said handle after passing through the opening into said channel.

5. A safety razor comprising cooperating blade-clamping members having between them a connecting rocking disk adapted to be displaced by a slotted blade in passing endwise into position between them, said disk having circumferentially-spaced recesses for accommodating the solid end of the blade in its said passage when the disk is rocked from either of two different initial positions.

6. A safety-razor comprising cooperating blade-clamping members having between them a connecting element in the form of a rocking disk with a circumferential flange and spaced recesses extending through said flange and into the body of the disk, each of said recesses being of sufficient size to accommodate the solid end of a slotted blade when advanced between the blade-clamping members, thereby permitting a fresh blade to be inserted in the razor either when empty or when it holds a used blade.

7. A safety razor comprising a blade-supporting member having resiliently expansible side portions, a cooperating cap, and a rotary disk connecting the blade-supporting member to the cap and having spaced blade-receiving notches in its circumference, the disk permitting the cap to rock in receiving a slotted blade, and the expansible side portions acting to bow the blade transversely towards the cap when in their normal operating position.

8. A safety razor comprising a contractible and expansible blade-supporting member having upstanding corner lugs and a central depending rib, and a cooperating cap connected to said blade-supporting member, the blade-supporting member serving to support a slotted blade in flat condition thereon when the blade-supporting member is expanded and to bow the blade upwardly by engagement of the lugs at its corners when the blade-supporting member is contracted.

9. A safety razor comprising a guard having blade-supporting portions, a cap having lost-motion connections with the guard, said guard having normally contracted blade-engaging means for bowing a blade transversely and thereby holding the cap in the position taking up the lost motion in its connections with the guard.

10. A safety razor comprising a contractible guard having blade-supporting areas, and a cap loosely connected to the guard for rocking about a transverse axis, said guard having laterally spaced blade-engaging projections for bowing an interposed blade transversely and thereby holding the cap against rocking motion.

11. A safety razor having cooperating cap and guard members, a rocking connector having spaced radial notches therein adapted to receive one end of a slotted blade, and spring means tending to hold the connector with one notch or the other in a predetermined blade-receiving position.

12. A safety razor having a blade-supporting member and a cooperating cap, a rotary connecting disk mounted in the blade-supporting member and having in its circumference spaced notches to receive the solid end of a slotted blade introduced beneath the cap, and spring means yieldingly holding the disk with said notches in predetermined radial positions.

13. A safety razor having a blade-supporting member and a cooperating cap, a handle fast to the blade-supporting member, an inner carrier movably retained in said blade-supporting member, a rotary connecting disk mounted in the carrier and engaged at its circumference with the cap, and means in the handle for securing the carrier in the blade-supporting member while connection with the cap is maintained.

BILLI BOWEN.
CHARLES L. METZLER.

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