

Aug. 30, 1938.

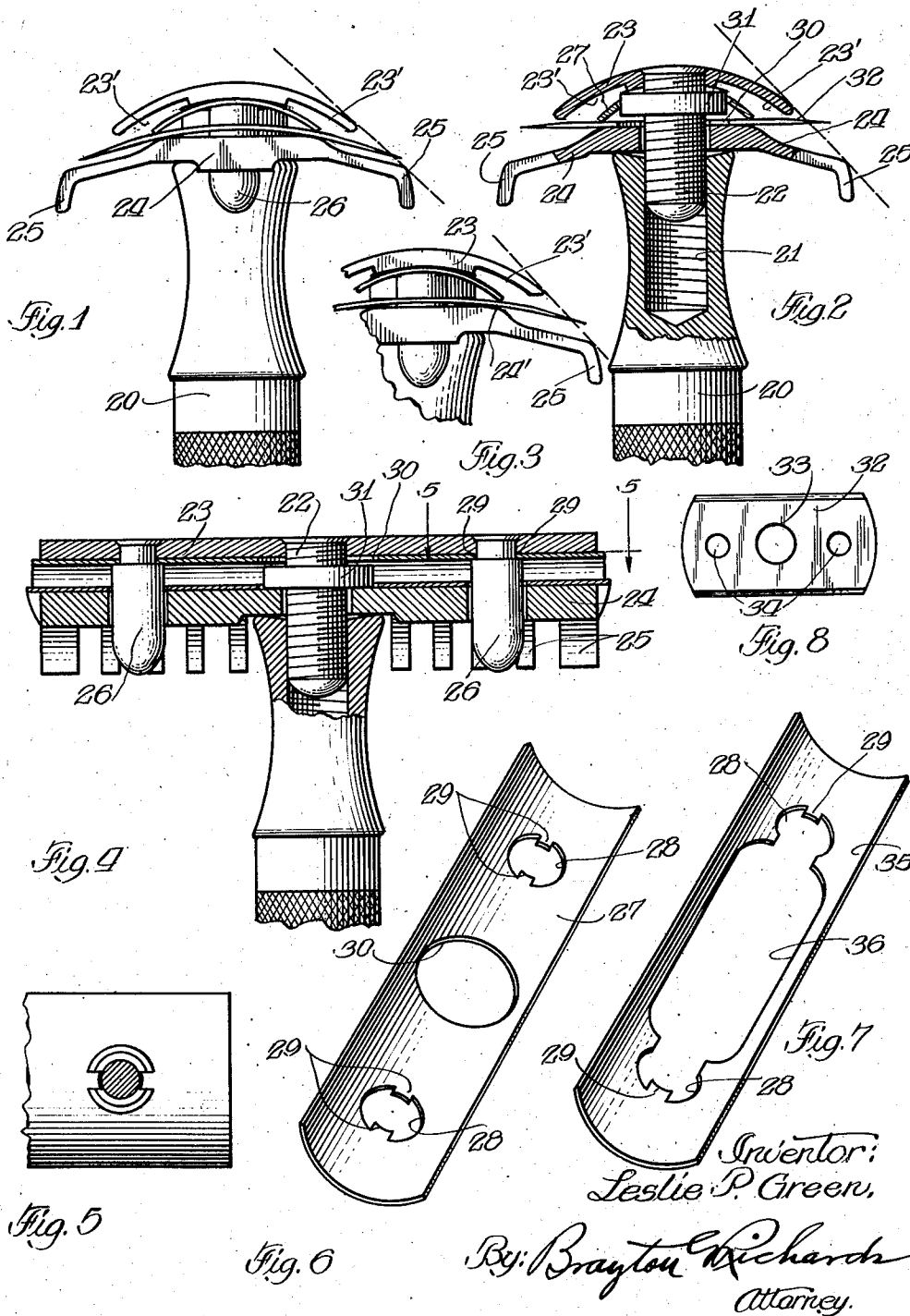
L. P. GREEN

2,128,772

SAFETY RAZOR

Original Filed Dec. 2, 1933

2 Sheets-Sheet 1



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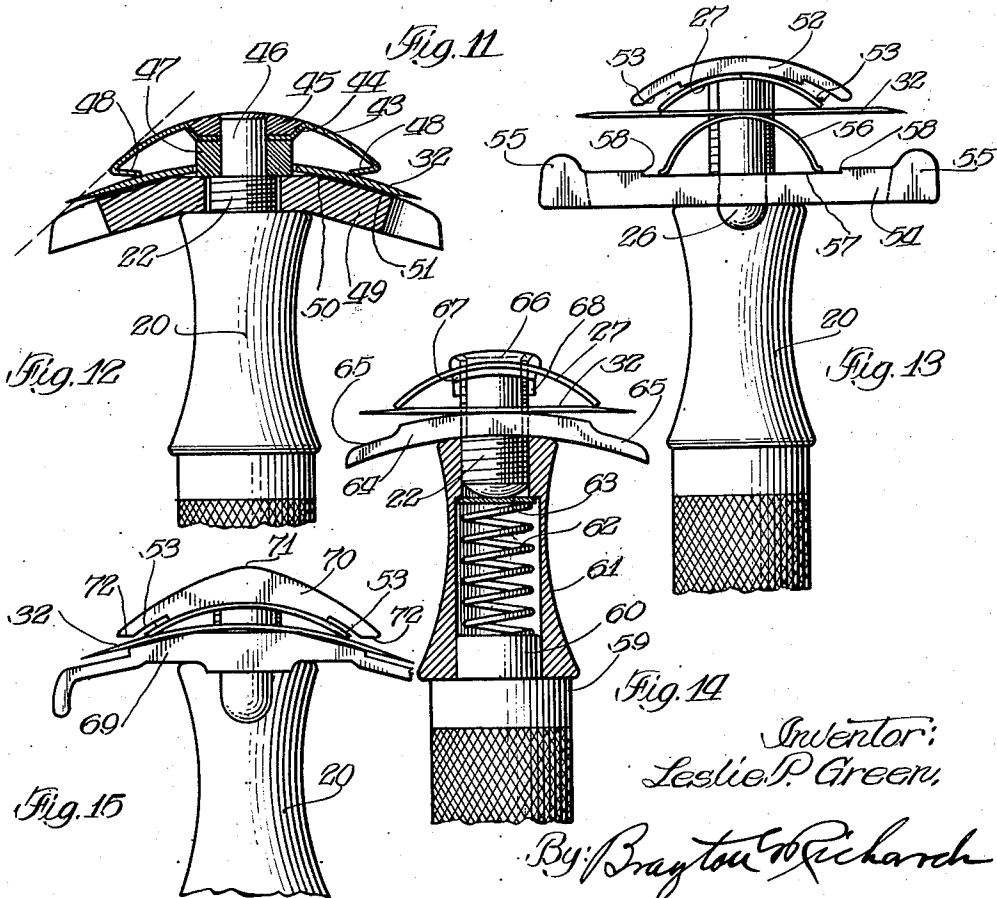
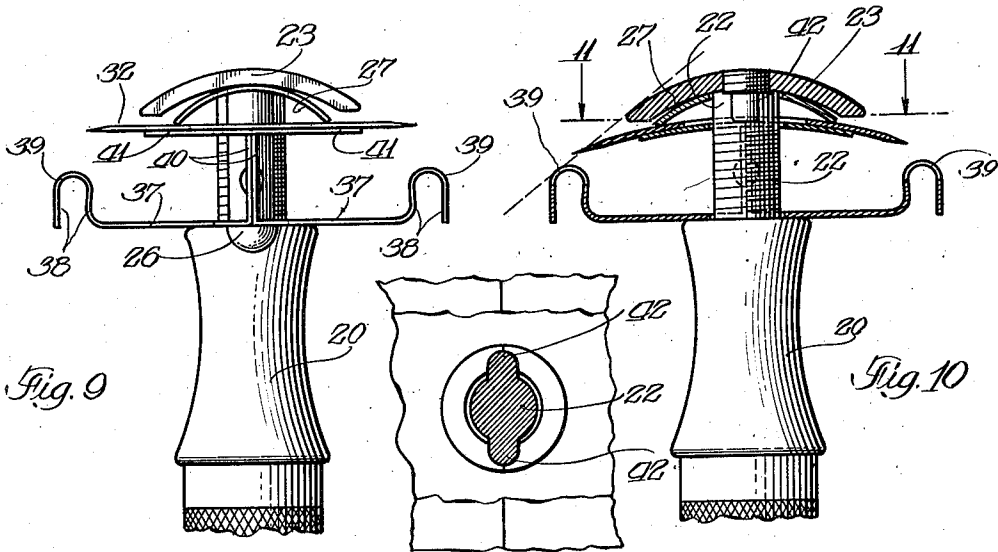
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SAFETY RAZOR

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SAFETY RAZOR

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Application December 2, 1933, Serial No. 700,694

Renewed January 25, 1938

8 Claims. (Cl. 30-73)

The invention relates to improvements in safety razors and has for its primary object the provision of an improved construction of the character indicated, capable of economical production and highly efficient in use.

Another object of the invention is the provision of an improved construction of the character indicated, so constructed and arranged as to increase or augment the flexibility of flexible razor blades when adjusted to shaving position and thereby materially improve the operation thereof.

Another object of the invention is the provision of an improved construction of the character indicated so arranged as to facilitate proper adjustments of the blade for shaving purposes.

Other objects will appear hereinafter.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the drawings forming a part of the specification, and in which

Fig. 1 is a partial end view of a safety razor constructed in accordance with the invention.

Fig. 2, a partial transverse section of the same with the parts shown in initial assembling positions.

Fig. 3, a fragmentary view illustrating the blade adjusted for a close shave.

Fig. 4, a partial longitudinal section of the razor with the parts in the position indicated in Fig. 1.

Fig. 5, a partial section taken substantially on line 5-5 of Fig. 4.

Fig. 6, a perspective view of a spring element employed in the construction shown detached.

Fig. 7, a similar view of a slightly modified form of spring construction.

Fig. 8, a view of the razor blade detached.

Fig. 9, an end view of a modified form of construction.

Fig. 10, a transverse section of the construction shown in Fig. 9 but showing the parts in different relation.

Fig. 11, a section taken substantially on line 11-11 of Fig. 10.

Fig. 12, a transverse section of another modified form of construction.

Fig. 13, an end view of still another modified form of construction.

Fig. 14, a transverse section of still another modified form of construction; and

Fig. 15, an end view of still another modified form of construction; and

The embodiment of the invention illustrated in Figs. 1, 2, 3, 4 and 5 comprises a handle member 20 of usual construction and function, provided with the usual threaded socket 21 in its end adapted and arranged to receive the usual central threaded stud 22 on a cap or clamping head 23 having undercut recesses 23'. A guard member 24 is provided at opposite edges with suitable guard teeth 25 and with a central and two lateral perforations to pass freely over the threaded stud 22 and the lateral guide posts 26 of the cap member 23.

Arranged immediately under the cap member 23 is a curved or arched spring member 27 having lateral perforations 28 adapted to fit loosely over the guide posts 26, there being tangs 29 at opposite sides of said perforations 28, said tangs serving as means for riveting the spring member 27 to the cap member 23 by means of the posts 26, as best shown in Fig. 4. The spring member 27 is also provided with a central enlarged opening 30 passing freely over the threaded stud 22 and also over a cylindrical stop member 31 at the base of said stud, as best shown in Figs. 2 and 3. A double-edged flexible blade 32 of usual or desired construction and having a central opening 33 to fit over the stud 22 and stop 31 and lateral openings 34 to fit over posts 26, is introduced between the spring member 27 and the guard 24. As shown, the guard 24 is provided with a central raised blade support having rounded bending shoulders 24' positioned along the edges thereof at each side as shown in Figs. 2 and 3, so that when the parts are loosened and the tension on spring 23 relieved as indicated in Fig. 2, the edges of the spring 27 will contact with the blade 32 substantially over the inner edges of the shoulders 24' but when the parts are drawn together by manipulation of the handle 20 so as to place the spring 27 under extreme tension as indicated in Fig. 1, the edges of the spring pass outwardly on the blade beyond the inner edges of the shoulders 24', thereby flexing the edges of the blades into the position shown in Fig. 1 in which said edges protrude but very slightly beyond the formation plane of contact between the cap 23 and the guard teeth 25, as indicated by the dotted line in Fig. 1.

In this position of the parts, the stop member 31 is in contact with the guard 24 thereby limiting further compression of the spring 27 and further downward flexing of the blade 32. As indicated in this position of the parts, the edges of the blade 32 project but slightly beyond the contact plane and are therefore in ultimate position for

safety adjustment and in position to shave not very closely to the skin.

By adjusting the handle 20 to relieve the tension on the spring 27, the flat edges will be caused to assume the position indicated in Fig. 3, adapted for closer shaving, and when adjusted to the positions indicated in Fig. 2, the edges of the blade are adapted for even closer shaving. During such adjustments, it is to be noted that when the extreme tension on the spring 27 is first relieved, and throughout approximately half of the arc of the blade adjustment, the outer edges of the cap draw away from the top of the blade at a greater speed than the blade edges draw away from the top of the guard, thereby providing a triple adjustment between the cap edge, blade edge and guard edge, whereby the cap edges also operate to guard the blade edges and maintain a minimum of blade exposure while providing a maximum of spacing between the blade edges and the guard edges. Although the most serviceable or practical range of adjustment is that between the positions shown in Fig. 1 and Fig. 3 upon further adjustment of the handle 20 to further relieve the tension on the spring 27, the blade edge draws further away from the guard teeth but more closely approaches the corresponding cap edge as indicated in Fig. 2. Thus a wide variety of shaving positions for the blade is permitted starting with the position indicated in Fig. 2 when the edge of the blade projects considerably beyond the shaving plane indicated by the dotted line.

In all of such positions of the blade, however, the edges of the blade will be held under tension by the edges of the spring 27 and frictional resistance will be so exerted on the threads of stud 23 as to properly hold the parts frictionally in all of such adjusted positions. By arranging the openings in the spring 27 to correspond roughly with those in the blade 32, the stiffness of the spring 27 at different positions will be varied to correspond approximately with the stiffness of the blade at corresponding positions, thereby equalizing the pressure of the spring to correspond with the stiffness of the blade so as to maintain the shaving edges of the blade substantially in a straight line during all positions of adjustments. Thus a safety razor construction is provided, especially adapted for use in conjunction with double-edged blades which will hold the edges of said blades under suitable shaving tension during all positions of adjustment; which will maintain the shaving edges of the blade substantially in a straight line; and which will exert sufficient friction on the threads of the adjusting stud so as to hold the parts in various positions of adjustment and spring tension during use.

In the modified form of spring construction illustrated in Fig. 7, the spring member 35 is provided with a central elongated slot or opening 36 so as to adapt the spring for use with blades which are correspondingly slotted. Otherwise the construction and operation is the same as that of spring 27.

In the modification illustrated in Figs. 9, 10 and 11, a different form of guard member is provided, made of two spring metal parts 37 having upwardly bent channels 38 at their outer edges, said channels being provided with transverse slots 39 as indicated, to form suitable guard teeth.

The inner edges of the members 37 are bent upwardly and riveted together at 40 and then outwardly at 41 to form spring rests for the blade 32. The threaded stud 22 is provided with lateral

stop extensions 42 arranged to contact with the guard member as shown to limit the approach of the spring 27 to the blade 32 as before. The manipulation and operation of this form of construction is substantially the same as that already indicated, except that the flexibility of the guard members 41 add additional flexibility to the blade edges. The construction is such that the guard member may be readily constructed, if desired, out of spring metal stampings.

In the form of construction illustrated in Fig. 12, a different form of spring member 43 is provided having a central longitudinal recess 44 in which is seated a narrow clamping cap or head 45 secured therein by a riveted stem 46 on the stud 22, as shown. A stop member 47 is also secured in place by the stem 46. The edges of the spring member 43 are turned inwardly as shown to form spring recesses 48 contacting with the blade 32 to increase the flexibility of such contact. The guard member 49 employed in this arrangement is also of slightly different form from that already illustrated and described and is provided with longitudinal bending edges or apices 50 and outer flat blade supporting surfaces 51. This arrangement provides a simple and effective spring mounting and at the same time increases the flexibility in the shaving edges of the blade.

In the form of construction illustrated in Fig. 13, a different form of clamping cap or head 52 is provided, having recesses 53 in its opposite sides. A slightly different form of guard member 54 is also provided, having different forms of guard teeth 55 at its edges, as shown.

A curved or arched spring 56 is also arranged under the blade 32 with its edges resting in a central recess 57 in the guard member defined at its sides by the shoulders 58. By this arrangement, when the clamping cap 52 is tightened, the edges of the spring 27 are left free by the action of the recesses 53, thereby increasing the flexibility in the shaving edges of the blade 32, a result which is also augmented by the interposing of the spring 56. In the course of adjustment, when the spring 56 has been placed under sufficient tension, the edges thereof contact with shoulders 58 thereby furnishing a rigid support for the central portion of the blade 32, and a clamping stop.

In the modified form of construction illustrated in Fig. 14, the handle member 59 is provided with a central stud 60 securing it as shown to a sleeve 61 containing a compression spring 62 and a friction washer 63, as shown. This arrangement furnishes additional friction on the threads of the stud 22 for holding the parts in adjusted positions. In this form of construction, also, the guard member 64 is of slightly different form and is provided with downwardly off-set guard teeth 65. The spring 27 is also secured between a relatively narrow clamping cap or head 66 and the underlying strip or plate 67, having a stop 68, as shown. Otherwise the construction and operation is the same as that already described.

In the construction illustrated in Fig. 15, a different form of guard member 69 is employed and a cap member 70 co-operates therewith having a shape which forms a longitudinal peak 71 at the center thereof and flat shoulders 72 at the edges beyond the recesses 53.

By the provision of the peak 71, a little different contact with the face of the user is afforded.

Otherwise the construction and operation is the same as already described.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

I claim:

1. A safety razor comprising a double edged flexible blade; a guard member on one side thereof, a centrally arched curved leaf spring contacting with said blade along lines spaced back from and substantially parallel with each edge thereof, the central part of the blade being free at both sides of the center for centrally arching toward said spring; and means for adjusting the tension of said spring.

2. A safety razor comprising a double edged flexible blade; a guard member on one side thereof provided with a central raised blade support having blade bending shoulders at each side edge; a centrally arched curved leaf spring contacting with said blade along lines spaced back from and substantially parallel with each edge thereof and substantially over said bending shoulders, the central part of the blade being free at both sides of the center for arching toward said spring; and means for adjusting the tension of said spring.

3. A safety razor comprising a double edged flexible blade having a perforation; a guard member on one side thereof; a clamping member on the other side thereof; a centrally arched curved leaf spring interposed between said clamping member and said blade and contacting with said blade along lines spaced back from and substantially parallel with each edge thereof, the central part of the blade being free for flexing; means for adjusting said clamping and guard members toward and away from each other; and a stop permanently attached to one of said members and operating freely through the perforation in said blade to contact with the other of said members, to limit the approach of said members without interfering with the flexing of said blade.

4. A safety razor comprising a double edged flexible blade having a perforation; a guard member on one side thereof provided with a central raised blade support having blade bending shoulders at each side edge; a clamping member on the other side of said blade; a centrally arched curved leaf spring interposed between said clamping member and said blade and contacting with said blade along lines spaced back from and substantially parallel with each edge thereof and substantially over said bending shoulders, the central part of the blade being free for flexing; means for adjusting said members toward and away from each other; and a stop permanently attached to one of said members and operating

freely through the perforation in said blade to contact with the other of said members to limit the approach of said members without interfering with the flexing of said blade.

5. A safety razor comprising a double edged flexible blade; a guard member on one side thereof; a clamping member on the other side thereof; a centrally arched curved leaf spring interposed between said clamping member and said blade and contacting with said blade along lines spaced back from and substantially parallel with each edge thereof, the central part of the blade being free for flexing, said clamping member extending over said line of contact and guarding the same from injury; and means for adjusting the tension of said spring.

6. A safety razor comprising a double edged flexible blade; a guard member on one side thereof provided with a central raised blade support having blade bending shoulders at each side edge; a clamping member on the other side of said blade; a centrally arched curved leaf spring interposed between said clamping member and said blade and contacting with said blade along lines spaced back from and substantially parallel with each edge thereof and substantially over said bending shoulders, the central part of the blade being free for flexing and said clamping member extending over said line of contact and guarding the same from injury; and means for adjusting the tension of said spring.

7. A safety razor comprising a double edged flexible blade having a perforation; a guard member on one side thereof; a clamp member on the other side thereof in the form of a centrally arched curved leaf spring contacting with said blade along lines spaced back from and substantially parallel with each edge thereof, the central part of the blade being free for flexing; means for adjusting said clamping and guard members toward and away from each other; and a stop permanently attached to one of said members and operating freely through the perforation in said blade to contact with the other of said members, to limit the approach of said members without interfering with the flexing of the blade.

8. A safety razor comprising a double edged flexible blade having a perforation; guard member on one side thereof; a clamping member on the other side thereof in the form of a centrally arched curved leaf spring having the edges turned inwardly and contacting with said blade along lines spaced back from and substantially parallel with each edge thereof, the central part of the blade being free for flexing; means for adjusting said clamping and guard members toward and away from each other; and a stop permanently attached to one of said members and operating freely through the perforation in said blade to contact with the other of said members, to limit the approach of said members without interfering with the flexing of the blade.

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