

Aug. 31, 1965

L. K. KUHN

3,203,093

SAFETY RAZOR WITH ADJUSTABLE GUARD

Filed March 14, 1963

4 Sheets-Sheet 1

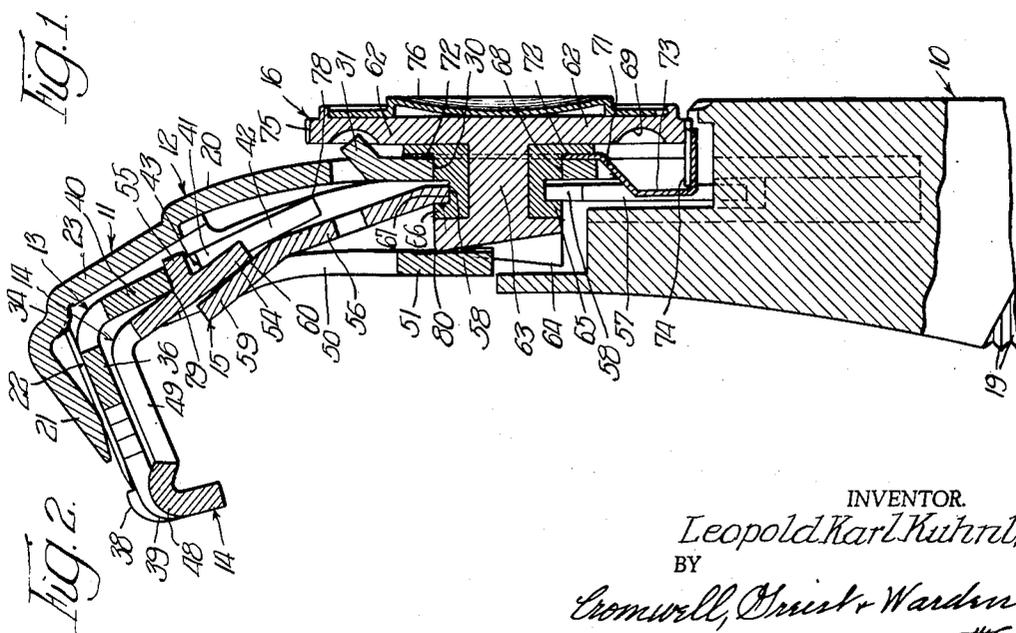
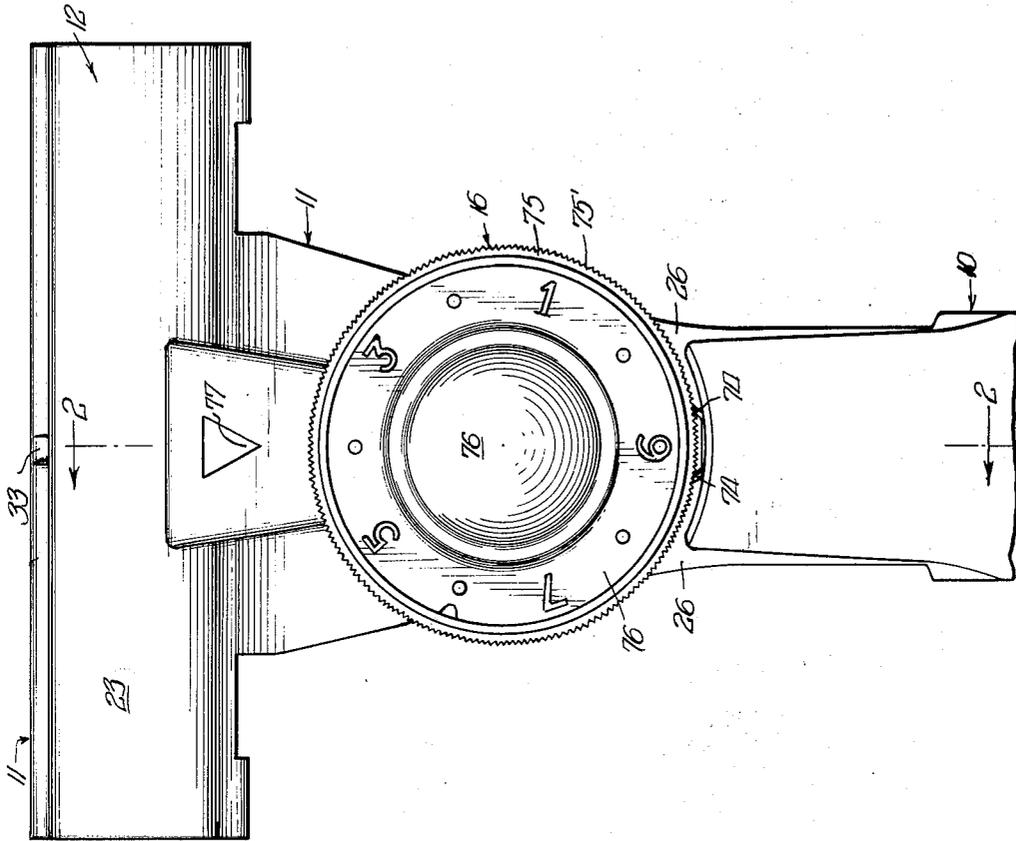


Fig. 1.

Fig. 2.

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4 Sheets-Sheet 3

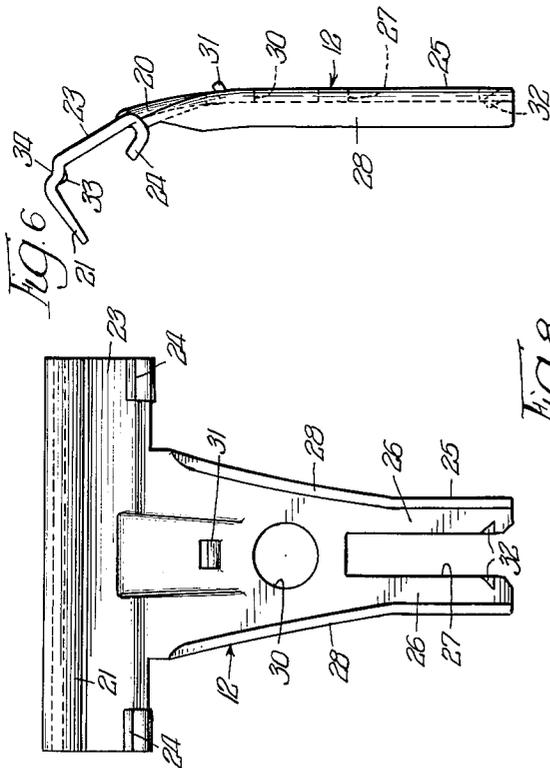
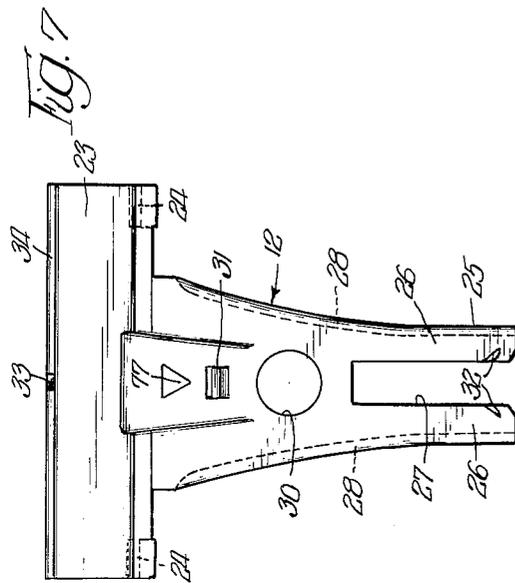


Fig. 5.

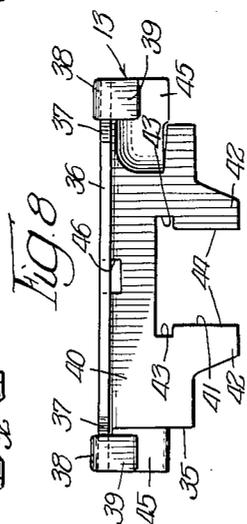
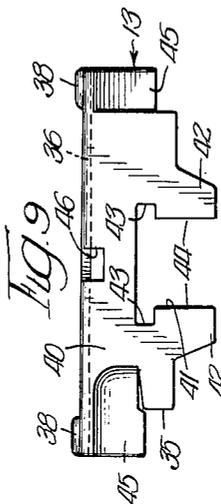


Fig. 8.

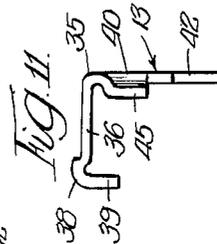


Fig. 9.

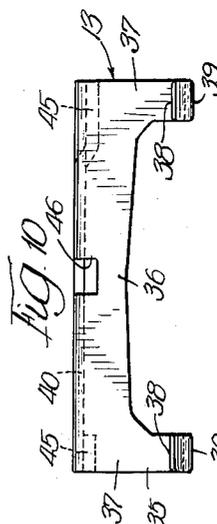


Fig. 10.

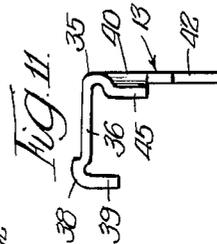


Fig. 11.

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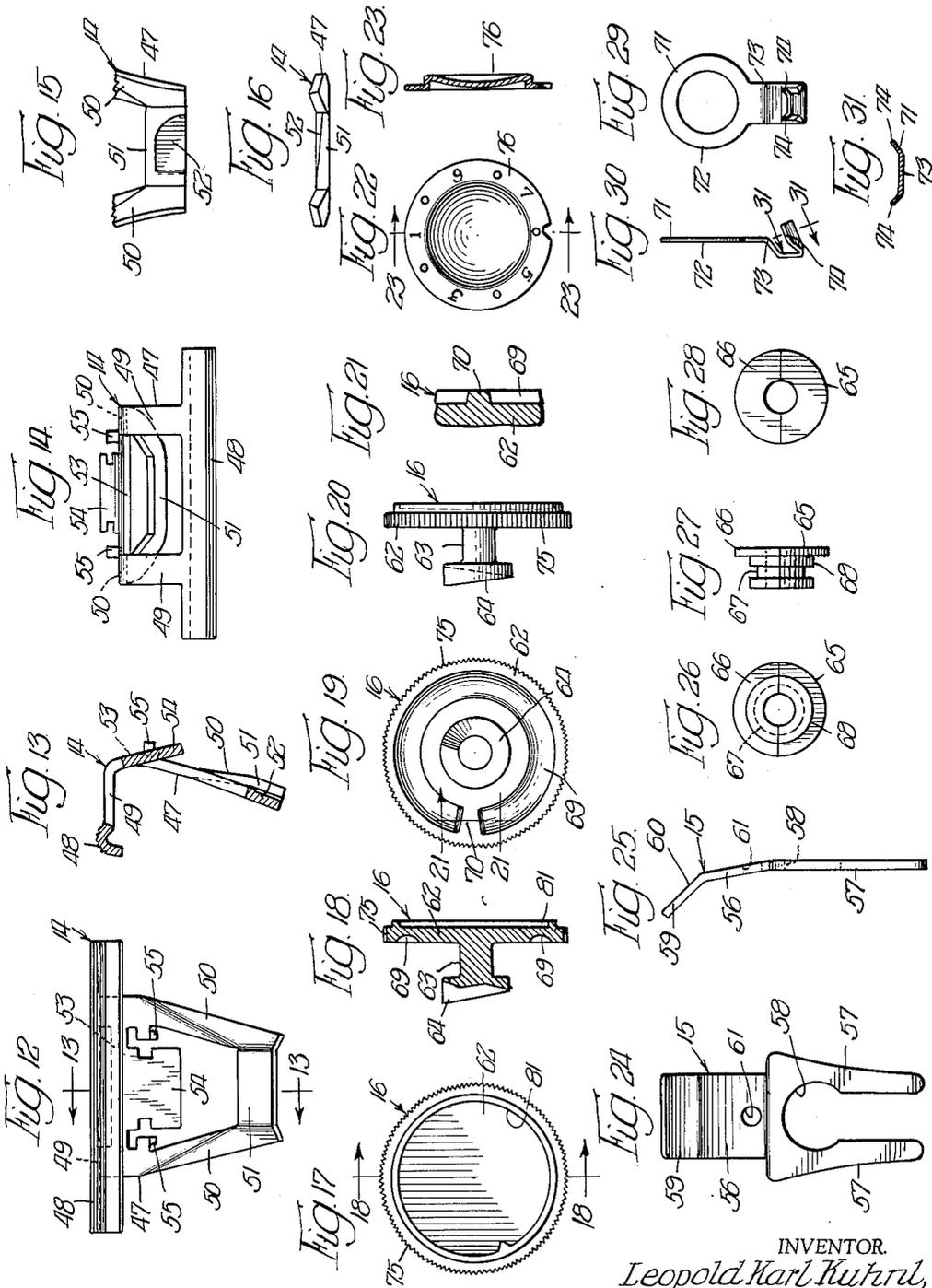
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SAFETY RAZOR WITH ADJUSTABLE GUARD

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4 Sheets-Sheet 4



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3,203,093

SAFETY RAZOR WITH ADJUSTABLE GUARD
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 sharp, Inc., Milford, Conn., a corporation of Delaware
 Filed Mar. 14, 1963, Ser. No. 265,246
 10 Claims. (Cl. 30-63)

This invention has to do with safety razors of the type shown in Kuhn Patent No. 2,911,713, in which single-edge blades are adapted to the inserted endwise into the head of the razor from a separate blade filled magazine and clamped in shaving position in the head in readiness for use.

The primary purpose of the invention is to provide, in a safety razor of the type described, new and improved means for quickly and accurately adjusting by means of a readily accessible indicating dial the position of the guard relative to the cutting edge of the blade, whereby to vary at any time the closeness with which the razor will shave in accordance with the wishes of the user.

While the foregoing statement is indicative in a general way of the nature of the invention other objects and advantages will be apparent to those skilled in the art upon a full understanding of the construction, arrangement and operation of the razor and its component parts.

A preferred embodiment of the invention is presented herein by way of exemplification but it will of course be appreciated that the invention is susceptible of incorporation in other forms coming within the spirit of the invention and the scope of the appended claims.

In the accompanying drawings:

FIG. 1 is a rear face view of the head of a safety razor constructed in accordance with the invention;

FIG. 2 is a vertical section through the head, taken on approximately the line 2-2 of FIG. 1;

FIG. 3 is a front face view of the head;

FIG. 4 is an exploded view showing in side edge elevation the several component parts which together make up the head;

FIG. 5 is a front face view of the main frame, prior to assembly;

FIG. 6 is a side edge view of the frame;

FIG. 7 is a rear face view of the frame;

FIG. 8 is a front face view of the blade seat, prior to assembly;

FIG. 9 is a rear face view of the seat;

FIG. 10 is a top plan view of the seat;

FIG. 11 is a side edge view of the seat;

FIG. 12 is a front face view of the guard bar, prior to assembly;

FIG. 13 is a section through the guard bar, taken on approximately the line 13-13 of FIG. 12;

FIG. 14 is a top plan view of the guard bar;

FIG. 15 is a fragmentary rear face view of the lower end of the guard bar;

FIG. 16 is a bottom edge view of the lower end of the guard bar;

FIG. 17 is a rear face view of the adjusting cam, prior to assembly, with the numbered facing disk removed;

FIG. 18 is a diametric section through the cam, taken on approximately the line 18-18 of FIG. 17;

FIG. 19 is a front face view of the cam;

FIG. 20 is a side edge view of the cam;

FIG. 21 is a fragmentary section through the cam, taken on approximately the line 21-21 of FIG. 19;

FIG. 22 is a rear face view of the numbered facing disk, prior to assembly;

FIG. 23 is a diametric section through the disk, taken on approximately the line 23-23 of FIG. 22;

FIG. 24 is a front face view of the main spring, prior to assembly;

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FIG. 25 is a side edge view of the main spring;

FIG. 26 is a front face view of the split bushing, prior to assembly;

FIG. 27 is a side edge view of the bushing;

FIG. 28 is a rear face view of the bushing;

FIG. 29 is a rear face view of the ratchet spring, prior to assembly;

FIG. 30 is a side edge view of the ratchet spring; and

FIG. 31 is a fragmentary section through the lower end of the ratchet spring, taken on approximately the line 31-31 of FIG. 30.

The improved razor includes a handle 10 and a head 11 at the upper end of the handle, which head is composed primarily of a main frame 12, a blade seat 13, a guard bar 14, a main spring 15, and an adjusting cam 16. These parts are shown in FIG. 4 in spaced apart relation before being assembled, and are shown in FIGS. 1, 2 and 3 after being assembled.

The handle 10—which is preferably molded from a suitable plastic material but may be made of metal or of any other material—is provided in the sides of its upper end with vertically extending grooves 17, within which grooves complementary side portions of the lower end of the main frame 12 are rigidly secured. The upper end of the handle is also irregularly recessed at 18 to accommodate portions of the main spring 15 and portions of the adjusting cam 16. The handle may be of any desired length (only the upper portion of the same being shown) and may be of any desired cross sectional shape. The rear and side faces of the handle are preferably formed with fine transverse ribs 19, in order to afford a good handgrip as well as enhance the aesthetic appearance of the razor as a whole.

The main frame 12 of the head is a rigid sheet metal member of generally T-shaped form as viewed from the front or rear (see FIGS. 5, 6 and 7). The upper portion of the frame 12 is curved forwardly at 20 and terminates at its upper end in a narrow forwardly and downwardly inclined flange 21, which flange constitutes the cap against the underside of which a flat single-edge blade 22 of conventional shape is adapted to be clamped in shaving position, as in the razor of Kuhn Patent No. 2,911,713.

Immediately beneath the flange 21 the frame 12 is provided with a flat downwardly extending section 23, which section forms the rear wall of the expansible channel in which the positioning and spreading key of the usual blade dispensing magazine (not shown) is adapted to be inserted, the bottom of the channel for the key being formed by two forwardly and upwardly turned ears 24 at the ends of the bottom of the section 23.

The frame 12 is abruptly reduced in width below the flat section 23 and tapers downwardly into a handle attaching section 25. The section 25 is divided into two laterally spaced downwardly projecting fingers 26 by a centrally arranged slot 27, which slot extends upwardly a substantial distance from the lower end of the section 25.

The downwardly tapering side edges of the frame 12 are provided below the section 23 with narrow forwardly turned side flanges 28, and the lower portions of the flanges 28 merge into and fit flush within shallow recesses 29 which are formed in the sides of the upper end of the handle 10 alongside the previously described grooves 17.

Above the slot 27 the frame 12 is provided with a centrally arranged circular aperture 30 for the reception of the journaling portion of the adjusting cam 16, and above the circular aperture 30 the frame is provided with a small centrally arranged rearwardly bent ear 31, which ear acts as a stop to limit in both directions the extent to which the adjusting cam 16 can be turned.

The downwardly projecting fingers 26, which serve to connect the frame 12 rigidly with the upper end of the

handle 10, are preferably provided with a plurality of small sharp angularly deflected spurs 32, which spurs are adapted to embed themselves in the relatively soft material of the handle upon assembly to prevent any loosening up of the frame with respect to the handle.

As is customary in safety razors of this type, a minute centrally arranged forwardly projecting boss 33 is provided just below the rear edge of the forwardly projecting flange 21, in a small forwardly offset ledge 34 at the upper edge of the section 23, for single point engagement with the unsharpened rear edge of the blade 22 at the center only of the latter.

The blade seat 13 (see FIGS. 8 to 11, inclusive) is a sheet metal member 35 of generally angular cross section as viewed from either end. It is movably positioned in the head below the forwardly projecting flange 21 of the frame 12, in front of the flat rear section 23 of the frame. The member 35 is provided with a narrow forwardly projecting top flange 36 on which the blade 22 is adapted to seat. The ends 37 of the flange 36 project forwardly beyond the intermediate portion of the flange and are provided adjacent their forward extremities with slightly raised positioning stops 38 for gauging abutment with the extremities of the sharp front edge of the blade. Below the stops 38 the ends 37 are provided with downwardly turned ears 39.

The member 35 is provided at the rear edge of the forwardly projecting top flange 36 with a downwardly extending flange 40, which flange is provided in the lower portion thereof with a wide centrally arranged downwardly opening slot 41. The slot 41, which divides the lower portion of the flange 40 into two laterally spaced downwardly extending fingers 42, is formed at its upper end with small lateral enlargements which serve as fulcruming sockets 43 for the guard bar 14. The inner edges 44 of the fingers 42 are parallel with each other, while the outer edges of the fingers taper downwardly.

When the blade seat 13 is assembled with the main frame 12 the lower ends of the fingers 42 are positioned against the back of the main frame, below the section 23 and between the upper ends of the curved side flanges 28. When thus positioned the flange 40 of the blade seat 13 constitutes the front forwardly movable wall of the expansible channel in which the key of the blade dispensing magazine (not shown) is adapted to be inserted when feeding a blade into the head. The flange 40 is provided at the ends of the same with short forwardly offset downwardly projecting ears 45, which ears are arranged with their lower edges in directly opposing vertically abutable relation to the upper edges of the upwardly projecting ears 24 at the ends of the section 23 of the main frame 12. The flange 40 is also provided with a small centrally arranged recess 46, which recess affords clearance for the forwardly projecting boss 33 on the ledge 34 at the upper edge of the section 23 of the main frame.

The guard bar 14 (see FIGS. 12 to 16, inclusive) is a rigid sheet metal member 47 of generally openwork formation. The member 47 is provided at its upper front edge with a narrow transversely elongated bar 48, which bar is curved downwardly and forwardly and is serrated longitudinally. The bar 48 is of such length as to fit closely but movably between the inner confronting faces of the downwardly turned ears 39 on the front ends of the blade seating flange 36 of the blade seat 13, and is supported adjacent its ends on the front ends of two laterally spaced rearwardly extending arms 49.

At the rear ends of the arms 49 two laterally spaced downwardly extending arms 50 are provided, which arms converge downwardly to some extent and are connected together at their lower ends by a narrow cross web 51 which is forwardly offset intermediate its ends. The rear face of the offset portion of the cross web 51 is progressively reduced in thickness for a distance from side to side to form an inclined cam follower surface 52, for coaction with the adjustable cam 16.

The downwardly extending arms 50 are also connected together at their upper ends by a narrow cross web 53, which cross web supports a short centrally arranged downwardly depending foot 54, for coaction with the main spring 15. The arms 50 are spaced from the sides of the foot 54 and are provided adjacent their upper ends with small rearwardly projecting studs 55, for pivotal engagement in the sockets 43 in the blade seat 13.

The main spring 15 (see FIGS. 24 and 25) includes an upwardly projecting centrally arranged leaf portion 56 and two laterally spaced downwardly projecting leaf portions 57. The space between the upper ends of the leaf portions 57 is circularly enlarged to define a shoulder portion 58. The upper end 59 of the leaf portion 56 is bent forwardly at an angle for horizontal line contact at about the point 60 with the lower edge of the foot 54 of the guard bar 14. A small hole 61 may advantageously be provided in the base of the upper leaf portion 56 to receive the point of a tool and thereby facilitate upward and downward movement of the main spring into or out of position.

The adjusting cam 16 (see FIGS. 17 to 21, inclusive) is characterized by a circular dial plate 62, a trunnion 63 in front of the plate, and a forwardly facing helical cam 64 in front of the trunnion. When the components of the head 11 are assembled, as shown particularly in FIG. 2, the trunnion 63 is journaled in a split bushing 65 (see FIGS. 26 to 28, inclusive), and the bushing 65, together with the trunnion 63, is positioned in the circular aperture 30 in the main frame 12, with the dial plate 62 closely adjacent to but spaced from the rear face of the frame.

The bushing 65 is provided at its rear end with a radial rim 66, which rim serves to space the dial plate 62 from the rear face of the frame 12, and the bushing is provided near its front end with an annular groove 67—leaving between the groove 67 and the rim 66 an annular shoulder 68. The annular shoulder 68 fits within the circular aperture 30 in the main frame 12, while the annular groove 67 receives and interlocks with the upper edge of the enlargement 58 in the main spring 15, pressing the upper end 59 of the leaf portion 56 of the spring under substantial rearward pressure against the depending foot 54 of the guide bar 14—all as shown in FIG. 2.

The dial plate 62 can be rotated substantially a full turn in either direction but is limited in its rotary movement by the rearwardly bent ear 31 on the back of the main frame 12, which ear rides in an annular groove 69 in the concealed face of the dial plate. The groove 69 is interrupted at one point in its circumference by a small radial web 70, which web will ultimately move into abutment with either one side or the other of the ear 31 to stop the dial plate from turning further.

The dial plate 62 can be turned easily in either direction with the fingers of one hand when holding the handle 10 of the razor in the same hand, but is yieldably maintained by a ratchet spring 71 (see FIGS. 29 to 31, inclusive) in any position of adjustment in which it has been set. The spring 71 has an eye portion 72 which fits about the annular shoulder 68 of the trunnion 63 of the adjusting cam 16 and is clamped non-rotatably between the rear face of the main frame 12 and the front face of the rim 66 of the trunnion, as shown in FIG. 2. Below the eye portion 72 the spring 71 has a depending portion 73 which is turned upwardly at its lower end and transversely curved at that end to form two small laterally spaced ratchet teeth 74. The rim 75 of the dial plate 62 is finely serrated at 75', and the ratchet teeth 74 press resiliently upward against the serrated rim, thereby imposing on the dial plate a light but controlled resistance against turning.

Any position of adjustment of the dial plate 62 is visibly indicated by the indicia on a thin facing disk 76 (see FIGS. 22 and 23), which disk is secured to the rear face of the dial plate. The indicia may take any form, such as consecutive numbers from 1 to 9 about the disk. Any particular setting of the dial plate 62 will be indicated by

whatever number is radially opposite an indicating mark 77 adjacent the dial plate on the rear face of the main frame 12.

The several above described components of the head 11 (see particularly FIGS. 2 and 4) may be assembled as follows:

The two halves of the split bushing 65 are first fitted together about the trunnion portion 63 of the adjusting cam 16, the eyelet portion 72 of the ratchet spring 71 is then fitted over the shoulder 68 of the bushing 65 in position against the rim 66 of the bushing, and the cam portion 64 of the adjusting cam is then inserted forwardly through the circular aperture 30 in the back of the main frame 12, bringing the eyelet portion 72 of the ratchet spring snugly up against the rear face of the main frame and bringing the annular groove 69 in the front face of the dial portion 62 of the adjusting cam into the plane of the rearwardly projecting ear 31 on the back of the main frame.

The blade seat 13 is then positioned beneath the cap 21 of the main frame, with the blade seating flange 36 against the underside of the cap, and with the lower ends of the fingers 42 against the front face of the main frame at 78. The guard bar 14 is next nested within the blade seat 13, with the cross bar portion 48 between the ears 39 on the blade seat, with the positioning studs 55 projecting rearwardly into the sockets 43 in the blade seat, with the upper ends of the downwardly extending arms 50 fulcrumed against the lower portion of the downwardly extending flange 40 of the blade seat at 79, and with the cross web 51 in engagement with the front helically shaped face of the cam portion 64 of the adjusting cam at 80.

After the main frame 12, blade seat 13 and guard bar 14 have been brought together in this manner the assembly of the head is completed by the insertion of the main spring 15. The spring 15 is inserted upwardly between the cross web 51 of the guard bar and the front face of the cam 63 into a preliminary position well above its final position, with the circular opening shoulder 58 in the spring in axial registration with the cam portion 64. With the spring held in this preliminary position the intermediate portion of the spring is bowed rearwardly by suitable means under substantial pressure and, after the intermediate portion of the spring has been forced rearwardly far enough to bring it into the plane of the groove 67 in the bushing 65, the spring while still in its fixed position is forced downwardly, preferably by means of a sharp pointed tool inserted in the hole 61, until the upper edge shoulder 58 of the opening in the spring has moved downwardly into forwardly interlocked association with the upper edge of the front wall of the groove 67 in the bushing. The establishment of this interlocking association between the spring and the bushing serves to hold all the parts of the head securely in finally assembled and operative relation.

As thus assembled, the stress set up in the flexed main spring 15 acts directly on the lower edge of the foot 54 of the guard bar 14 at 60 to press the guard bar upwardly and rearwardly and at the same time to fulcrum it on the lower edge of the downwardly extending flange 40 of the blade seat at 79. It also acts indirectly through the guard bar 14 on the blade seat 13 to press the latter upwardly and rearwardly. And it also acts at the same time to cause the cross web 51 of the guard bar to press against and follow the front helically shaped face of the cam portion 64 of the adjusting cam.

It will be understood from the foregoing that when the dial portion 62 of the adjusting cam is rotated in either direction, the cross web 51 of the guard bar is caused by the cam portion 64 to move either forwardly or rearwardly in following the front face of the cam portion 64. Because of the fulcruming of the guard bar 14 against the blade seat 13 at 79 the blade guarding portion 48 of the guard bar is caused at the same time to move either upwardly or downwardly from its guarding position just

below and in front of the front edge of the blade 22, its direction of movement depending upon the direction in which the dial portion 62 of the adjusting cam is turned.

The upper portion 56 of the spring 15 is of slightly less width than the slot 41 in the blade seat 13, and the foot 54 on the guard bar 14 is also of slightly less width than the slot 41, in order to enable these parts to nest together when assembled without interfering with the movement of either the upper portion 56 of the spring or the foot 54.

After the assembly of the head has been completed, the downwardly projecting fingers 26 of the head are forced downwardly into the grooves 17 in the sides of the upper end of the handle 10, where they are held securely by reason of the tight fit provided and also by reason of the embedding spurs 32.

The numbered disk 76 may be secured, by cementing or other means, to the rear face of the dial portion 62 in a shallow recess 81 provided for that purpose, and this may be done either before or after the components making up the head have been assembled.

I claim:

1. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed intermediate its upper and lower ends against the seat member, a finger piece which is journaled on the main frame, a cam which is connected with the finger piece for rotation with the latter, a cam follower on the lower end of the guard member in engagement with the cam, and a spring in engagement with the guard member, which spring presses the guard member against the seat member, acts through the guard member to press the seat member against the main frame, causes the cam follower at the lower end of the guard member to follow the cam, and causes the blade guarding portion at the upper end of the guard member to move toward and away from the front edge of the blade, depending on the direction of rotation of the finger piece.

2. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap and has a downwardly extending rear portion, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, and having a downwardly extending rear portion, the downwardly extending rear portion of the guard member being positioned in front of and fulcrumed intermediate its upper and lower ends against the downwardly extending rear portion of the seat member at a point above the lower end of the latter, a finger piece which is journaled on the main frame, a cam which is connected with the finger piece for rotation with the latter, a cam follower on the guard member in engagement with the cam, and a spring in engagement with the guard member, which spring presses the guard member against the seat member, acts through the guard member to press the seat member against the main frame, causes the cam follower on the guard member to follow the cam, and causes the blade guarding portion at the upper end of the guard member to move toward and away from the front edge of the blade, depending on the direction of rotation of the finger piece.

3. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively

movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed intermediate its upper and lower ends against the seat member, a cam which is movably mounted on the main frame in engagement with the guard member for rocking the guard member about its fulcrum whereby to move the blade guarding portion of the guard member toward and away from the front edge of the blade, and a spring in engagement with the guard member, which spring presses the guard member against the seat member and acts through the guard member to press the seat member against the frame.

4. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed intermediate its upper and lower ends against the seat member, a finger piece which is journaled on the main frame, a cam which is connected with the finger piece for rotation with the latter, a cam follower on the lower end of the guard member in engagement with the cam, and a spring in engagement with the guard member, which spring presses the guard member against the seat member, acts through the guard member to press the seat member against the main frame, causes the cam follower at the lower end of the guard member to follow the cam, and causes the blade guarding portion at the upper end of the guard member to move toward and away from the front edge of the blade, depending on the direction of rotation of the finger piece, said cam being provided with an annular groove, and said spring being provided intermediate its upper and lower ends with a shoulder, which shoulder extends into the groove and interlocks with the front wall of the latter to establish and maintain the pressure of the spring against the guard member.

5. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed against the seat member, a dial which is journaled on the main frame, a cam which is connected with the dial for rotation with the latter, a cam follower on the guard member in engagement with the cam for rocking the guard member on its fulcrum to change the position of the blade guard portion of the guard member with respect to the front edge of the blade, and a spring in engagement with the guard member, which spring presses the guard member against the seat member and acts through the guard member to press the seat member against the main frame.

6. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed against the seat member, a dial which is journaled on the main frame, a cam which is connected with the dial for rotation with the latter, a cam follower on the guard member in engagement with the cam, and a spring in engagement with the guard member, which spring presses the guard member against the seat member and acts through the guard member to press the seat

member against the main frame, said dial being provided in the face of the same which confronts the main frame with an annular groove and a stop in the groove, and the main frame being provided with a projection which extends into the groove for engaging with the stop and thereby limiting the extent to which the dial can be rotated in either direction.

7. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed against the seat member, a dial which is journaled on the main frame, a cam which is connected with the dial for rotation with the latter, a cam follower on the guard member in engagement with the cam, and a spring in engagement with the guard member, which spring presses the guard member against the seat member and acts through the guard member to press the seat member against the main frame, the rim of said dial being serrated, and a ratchet spring non-rotatably associated with the main frame between the latter and the dial, which ratchet spring is provided with one or more teeth in resiliently yieldable engagement with the serrated rim of the dial.

8. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed against the seat member, an adjusting cam which includes a dial portion, a trunnion portion and a cam portion, a split bushing encircling the trunnion portion, which bushing includes an annular groove, an annular shoulder and an annular rim, the annular rim of the bushing being positioned in an annular aperture in the back of the main frame, with the annular rim behind the main frame and the annular groove in front of the main frame, a cam follower on the guard member in engagement with the cam portion, and a spring in engagement with the guard member, which spring presses the guard member against the seat member and acts through the guard member to press the seat member against the frame member, said spring being provided intermediate its upper and lower ends with a shoulder, which shoulder extends into the annular groove in the bushing and interlocks with the front wall of the latter to establish and maintain the pressure of the spring against the guard member.

9. In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap and has a downwardly extending rear portion, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, and having a downwardly extending rear portion, the downwardly extending rear portion of the guard member being positioned in front of and fulcrumed intermediate its upper and lower ends against the downwardly extending rear portion of the seat member at a point above the lower end of the latter, said guard member also having a downwardly extending foot below its fulcruming point, a finger piece which is journaled on the main frame, a cam which is connected with the finger piece for rotation with the latter, a cam follower on the lower end of the guard member in engagement with the cam, and a spring having a forwardly bent upper end portion in line contact with the lower edge of

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the foot on the guard member, which spring presses the guard member upwardly and rearwardly against the seat member, acts through the guard member to press the seat member upwardly and rearwardly against the main frame, causes the cam follower on the lower end of the guard member to follow the cam, and causes the blade guarding portion at the upper end of the guard member to move toward and away from the front edge of the blade, depending on the direction of rotation of the finger piece.

10 In a safety razor for single-edge blades, which razor includes a main frame having a forwardly projecting cap which is adapted to overlie the blade, and a relatively movable seat member which supports the blade against the underside of the cap, the provision of a relatively movable guard member having a blade guarding portion at its upper end in front of and below the front edge of the blade on the seat member, which guard member is fulcrumed intermediate its upper and lower ends against

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the seat member, a cam which is movably mounted on the main frame in engagement with the guard member for rocking the guard member about its fulcrum whereby to move the blade guarding portion of the guard member toward and away from the front edge of the blade, and a spring in engagement with the guard member, which spring presses the guard member against the seat member, the fulcrum between the guard member and the seat member including positioning studs on the guard member which project rearwardly into and fit loosely within complementary recesses in the seat member.

References Cited by the Examiner

UNITED STATES PATENTS

3,067,512	12/62	Randol	-----	30-62
3,111,756	11/63	Kruger et al.	-----	30-63

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