May 3, 1938. W. F. STEINMETZ ET AL 2,115,792

SAFETY RAZOR

Filed May 21, 1935 3 Sheets-Sheet 1

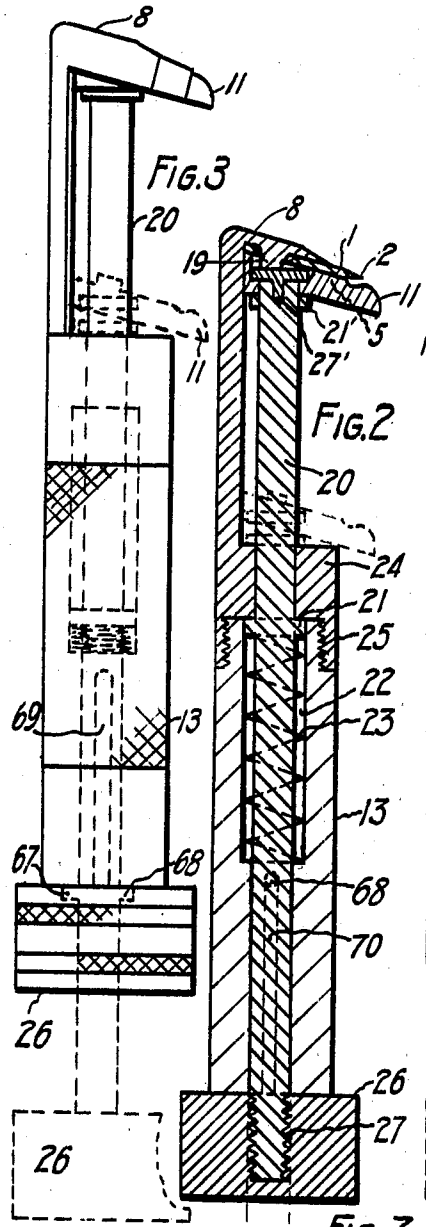


FIG. 3

FIG. 2

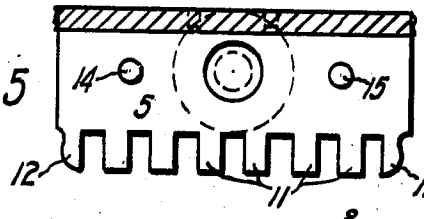


FIG. 5

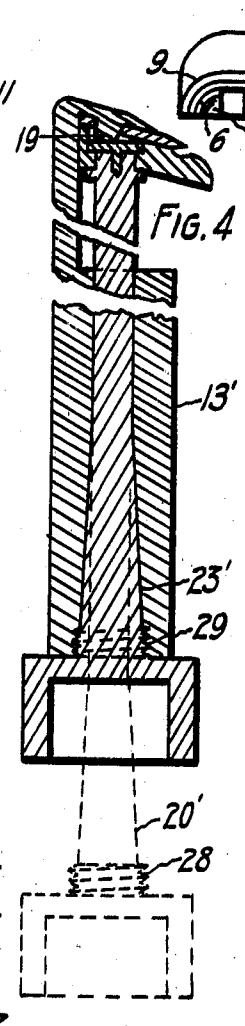


FIG. 4

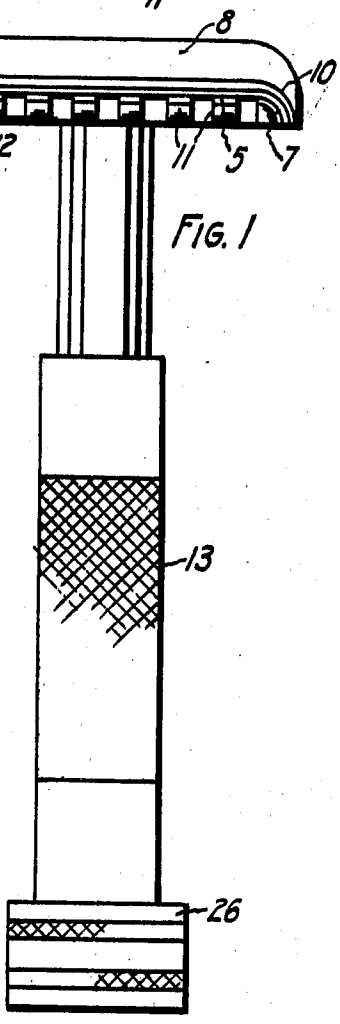


FIG. 1

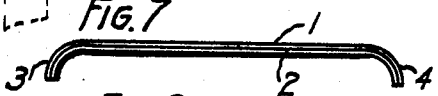


FIG. 7

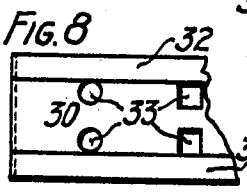


FIG. 8

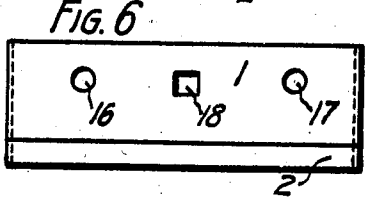


FIG. 6

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SAFETY RAZOR

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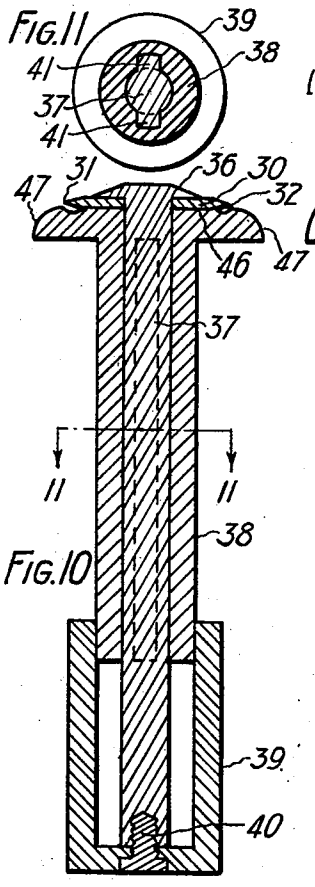


FIG. 11

FIG. 10

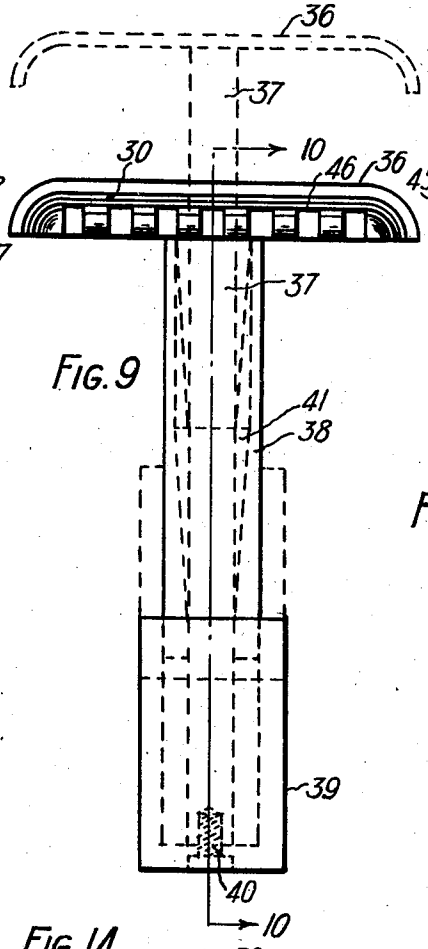


FIG. 9

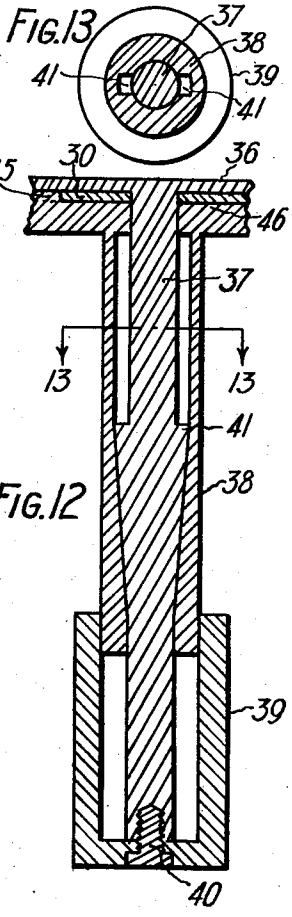


FIG. 13

FIG. 12

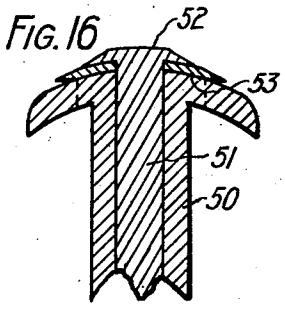


FIG. 16

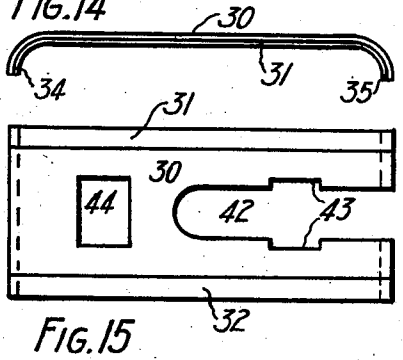


FIG. 14

FIG. 15



FIG. 17

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SAFETY RAZOR

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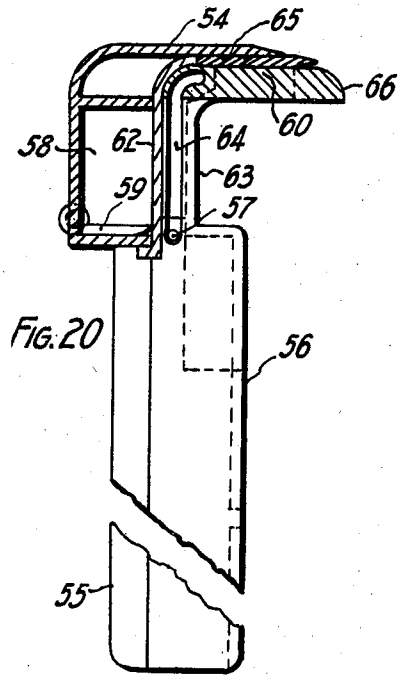


FIG. 20

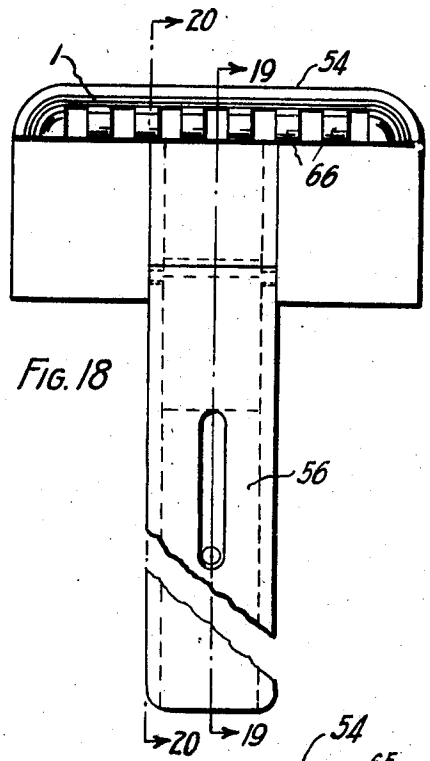


FIG. 18

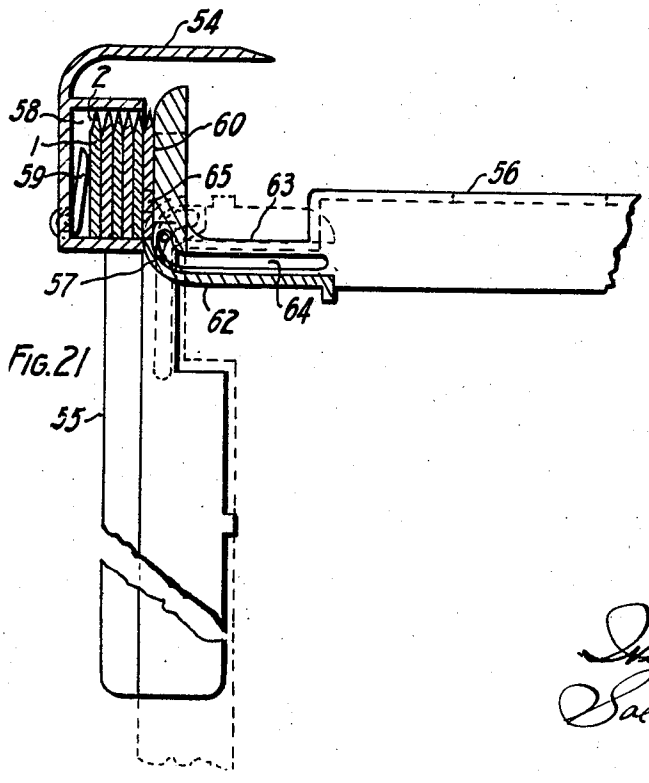


FIG. 21

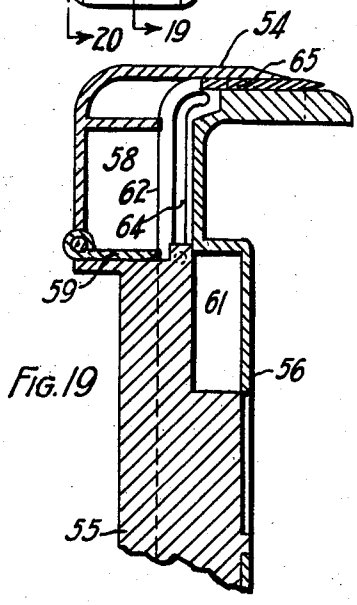


FIG. 19

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Patented May 3, 1938 2,115,792

UNITED STATES PATENT OFFICE

2,115,792

SAFETY RAZOR

William F. Steinmetz, New York, and Sol Rothschild, Brooklyn, N. Y.

Application May 21, 1935, Serial No. 22,520

19 Claims. (Cl. 30—40)

This invention relates in general to safety razors and more particularly to improvements in safety razor blades and blade holders.

In our Patent No. 2,053,642, we have disclosed a safety razor blade that is sufficiently flexible to be clamped, without fracture, in such positions as to provide effective straight and curved shaving edges both of which types of edges may be used for shaving purposes. The material, or the temper, of the body portion of the blade was described as differing from that of the cutting edge, in order that the cutting edge be efficient and the blade as a whole be capable of withstanding the bending strain imposed upon it when clamped in the position necessary to provide straight and curved shaving edges that would be available for shaving purposes.

Generally speaking, the desired shaving edge is one that is substantially straight or flat, the ends of which, however, are abruptly downwardly curved. These curved ends do not interfere with the normal shaving of a flat surface. The curved ends are highly desirable for use in reaching crevices and corners of the surface not accessible by the straight intervening portion of the shaving edge.

Instead of having the razor blade partake of the inherent qualities of flexibility outlined in the aforesaid copending application, we may produce the straight and curved shaving edge by other means more simple and inexpensive. To this end it is proposed to provide a blade having a highly efficient cutting edge and an extremely durable and rugged body portion and pre-form the blade as a whole in the desired shape. The blade, thus formed, when put in a holder, the blade seat, guard and clamp cover of which are correspondingly formed to receive such a pre-formed blade, is merely clamped in the desired position without distortion of the blade as a result of such clamping, whether the blade is pre-formed with a substantially flat shaving edge with downwardly abrupt turned cutting ends or pre-formed with transverse curvature or longitudinal curvature or any combination thereof. The necessity of flexibility is thus dispensed with and the element of undue clamping strain on the blade is likewise dispensed with in the obtaining of the effective straight and curved usable shaving edges.

It is, therefore, an object of the invention to provide a simple rugged razor blade pre-formed with usable straight and curved cutting edges.

Another object is to provide such a blade that will be adapted for use in a safety razor whether the latter be of the single blade holder or of the magazine type.

Another object is to provide such a blade whether it be of the single or double cutting edge type or whether the blade be of the continuous type, single blade or linked blade type.

Another object is to provide an improved razor, blade seat, blade guard, and clamping means for carrying such blades and maintaining the same in their pre-formed condition for availing the straight and curved cutting edges for shaving purposes.

A further object is to provide an improved razor of the magazine type wherein the feeding, clamping and ejection of blades is simply and effectively accomplished.

With the foregoing and other objects in view, the invention resides in the combination of parts and in the details of construction set forth in the following specification and appended claims, certain embodiments thereof being illustrated in the accompanying drawings, in which:

Figure 1 is a view in front elevation of one form of our safety razor employing a single edge razor blade.

Figure 2 is a view in vertical section taken through the razor of the type shown in Figure 1 showing in full lines the blade seat in shaving position for shaving purposes, and in dotted lines the blade seat removed from clamped position.

Figure 3 is a view in side elevation of that shown in Figure 2.

Figure 4 is a view similar to Figure 2 with a slightly modified form of manual clamping arrangement.

Figure 5 is a view in top plan with the blade clamp removed, showing the guard employed for the single edge razor blade.

Figure 6 is a view in top plan of a single blade, single cutting edge razor blade, pre-formed substantially flat with downwardly curved cutting edges.

Figure 7 is a view in side elevation of that shown in Figure 6.

Figure 8 is a fragmentary view in top plan of a double edge blade for use in a razor having a single guard.

Figure 9 is a view in front elevation of another form of our razor employing a double edge razor blade showing in full lines the blade in clamped position and in dotted lines the cover in unclamped position.

Figure 10 is a view in section taken along line 10—10 of Figure 9.

Figure 11 is a view in section taken along line 11—11 of Figure 10.

Figure 12 is a view in vertical section taken through the razor shown in Figure 9 at right angles to the section shown in Figure 10.

Figure 13 is a view in section taken along line 13—13 of Figure 12.

Figure 14 is a view in front elevation of a double edge razor blade pre-formed in the shape illustrated.

Figure 15 is a top plan view of that shown in Figure 14.

Figure 16 is a fragmentary view in vertical section taken through a modified form of razor employing a convexly curved blade seat and correspondingly pre-formed curved blade and blade cover.

Figure 17 is a side view of a blade pre-formed with a transverse curvature to fit the razor shown in Figure 16.

Figure 18 is a view in front elevation of a magazine type of safety razor.

Figure 19 is a view in section taken along line 19—19 of Figure 18.

Figure 20 is a view in section taken along line 20—20 of Figure 18, showing the blade in clamping position.

Figure 21 is a view similar to Figure 20 showing a blade being taken from the magazine and showing by dotted lines the position of the blade seat when ejecting a blade.

Referring more particularly to the drawings, it is to be understood at the outset that the principal feature of our invention is to provide a rugged blade with an effective cutting edge which blade is pre-formed in the desired shape whether it is curved transversely or longitudinally for various purposes, the pre-formed feature taking the place of the necessity of heat treating or combining materials or metals for providing transverse or longitudinal flexibility in the blade in order that it may assume under clamping strains the desired shape. Likewise we contemplate the use of various types of razors of the single blade and magazine type and whether either or both types employ single or double edge blades of either the pre-formed transversely or longitudinally curved blade.

Accordingly we have shown in Figures 6 and 7 a single edge safety razor blade of the preferred type having a main body portion 1 and a longitudinally extending cutting edge 2. As shown in Figure 7, both the body portion and the cutting edge are pre-formed with downwardly curved ends 3 and 4 in contrast to the intervening substantially straight portion.

In Figure 8 we show substantially the same type of blade, for use in such single blade types of razors as described, having a main body portion 30 and longitudinally extending cutting edges 31 and 32.

In Figures 1, 2, 3 and 4 we have shown suitable single blade types of razors for employing blades of the types shown in Figures 6, 7 and 8. For instance in Figures 1, 2 and 3, the razor includes a blade seat 5 with downwardly curved ends 6 and 7 appropriate to receive the blade 1 with its curved ends 3 and 4. Likewise the clamping cover 8, attached to and made part of the handle, is correspondingly formed with downwardly curved ends 9 and 10. Also the flat and curved portions of the razor blade, held on its flat and curved seat by the correspondingly flat and curved clamp cover, is provided with a guard comprising a series of teeth 11, the outer ones 12 of which have their surfaces curved as shown in Figures 1 and 5 for guarding the shaving edge of the blade throughout its flat and curved portions.

The razor of this type also includes positioning studs 14 and 15 formed in the blade seat to engage the apertures 16 and 17 respectively of the blade. In addition to this positioning means there may also be provided an aperture 18 in the blade to be engaged by the inclined stud 19 carried by the clamp cover. In the case of the double edge blade a like set of apertures may be arranged to engage the positioning studs 14, 15 and 19 to function with the cutting edge in use. The user may use one edge and then turn the blade around and use the other.

The handle 13 is counterbored to receive a longitudinally movable shank 20 provided with a flange 21 to engage the upper and lower limits of the enlarged hollow portion 22 of the handle, and another flange 21' upon which the blade seat 5 is moveably seated. A countersunk portion is provided in the seat to accommodate a set screw 27' which set screw is screwed in the shank 20 and has a flanged head the size of the shank flange 21'. By this construction the shank 20 is made to be rotatable within the blade seat 5. A compression spring 23 urges the shank upwardly by engaging the flange 21, thus providing a clamping action on the blade when pressed against the clamp 8, the clamp 8 being part of the stationary portion of the handle 24. The upper portion 24 of the razor is screw threaded at 25 to the handle 13. On the lower portion of the shank 20 are provided two guide pins 67 and 68, Figures 2 and 3, which engage in the guide grooves 69 and 70 respectively in the lower hollow portion of the handle 13. The extreme lower portion of the handle 13 is formed by a nut 26 screw threaded to receive the screw threaded portion 27 of the shank 20, so that when it is drawn against the action of the spring 23 it releases the clamp action on the blade seat and when extended fully it forces the seat and blade to be engaged and clamped in place against the clamp cover. It will be observed that should the operator desire to lock the blade seat down as shown by the dotted lines in Figure 3 he may do so by drawing the shank down until the pins 67 and 68 are on the outside of the lower hollow portion of handle 13 and then by giving the nut 26 a slight twist in either direction the shank 20 rotates and the pins hold the shank against the action of the spring 23.

The modification shown in Figure 4 differs materially from that form shown in Figures 1, 2 and 3 in that it employs no spring such as that shown at 23. Instead, the shank 20' is tapered and the hollow portion of the handle 13' is accordingly tapered at 23' to fit the shank. Also the shank and handle are appropriately screw threaded at 28 and 29 respectively for engagement.

As previously stated the blade may be double edged as shown for instance in Figure 8 in which the body portion is shown at 30 with two longitudinal cutting edges 31 and 32 and apertures 33 for engagement by blade positioning studs. These blades are likewise preferably pre-formed so as to have a substantially flat portion and also curved body and cutting edge end portions 34 and 35.

One type of safety razor for carrying and making both cutting edges effective at the same time of such a blade of the type shown in Figure 8

or Figures 14 and 15 is shown in Figures 9 and 13 inclusive. Here the clamp cover 36 is carried by the shank 37 extending longitudinally of and movable in the hollow handle 38 as the shank 20 is movable in the hollow handle as shown in Figures 1 to 4. The handle 38 may be provided with a hollow sleeve 39, screw threaded to receive a bolt 40 for securing the shank to the sleeve 39. As shown in Figures 12 and 13 the shank is tapered at 41 to fit snugly into correspondingly tapered grooves in the handle 38 to maintain a snug fit when the shank is pulled down far enough to cause the clamp cover to firmly clamp the blade on its seat. To release the clamp cover it is merely necessary to push upwardly on the sleeve 39. A blade of the type shown in Figure 15 may then be slipped lengthwise on to the blade seat, the longitudinal open slot 42 thus engaging the shank. The rectangular portion 43 of slot 42 and the rectangular aperture 44 in the blade are to receive positioning studs that may be carried either by the clamp cover or blade seat one of which is shown at 45 in Figure 12. It is to be understood that the slot 42 may take any shape in which case the positioning stud 45 would take a corresponding shape and the separate aperture 44 may be dispensed with if desired. The blade seat 46 is preferably substantially flat with downwardly curved ends to conform with the form of the blade shown in Figure 14 to adequately receive the same. The clamp cover is likewise appropriately shaped to engage the flat and curved portions of the razor blade to hold the same firmly on the correspondingly shaped seat. Furthermore, the blade seat is formed with a blade guard 47 on the front and rear sides of the razor to guard both shaving edges of the blade. These guards are so formed as to adequately guard the flat and curved portions of the razor blade shaving edges for shaving purposes in a manner similar to the guard shown in Figure 5.

As shown in Figure 17 the blade 48 with either a single or double shaving edge 49 may be preformed so as to be curved transversely and straight longitudinally or it may be curved transversely and longitudinally to the same extent as shown in Figure 14. To hold such a type of transversely curved blade there may be employed a handle 50 and a relatively movable shank 51 carrying a clamp cover 52 in a similar manner to that described in connection with Figures 9, 10 and 11. Here, however, the blade seat 53 and clamp cover are appropriately correspondingly curved to fit the curvature of the blade. In the event that this blade is also curved longitudinally as that blade shown in Figure 14, the blade seat, clamp cover and guards are curved similarly to those shown in Figure 9.

The invention also contemplates the use of any or all types of blades hereinabove described in a magazine type of safety razor as well as in the single blade razors described. Accordingly, we have shown in Figures 18 to 21 inclusive a magazine type razor employing blades 1 having a shaving edge 2 of the type shown in Figures 6 and 7. Here the cover 54 remains stationary and is a part of the stationary portion 55 of the handle. The handle also includes a movable portion 56, which is pivotally connected by a pin 57 to the stationary portion of the razor. A magazine chamber 58 is provided to receive a plurality of blades in the position shown in Figure 21. A spring operated pawl 59 urges the blades forwardly. When it is desired to advance a blade into shaving position, the handle 56 is drawn down to the position shown by the dotted lines in Figure 21 and then rotated counterclockwise away from the handle 55. This brings the blade seat 60 away from the cover into the position shown in Figure 21. A hollow space 61 is provided to allow for this relative movement of the handle portions. The spring operated pawl forces one of the blades against the blade seat. The width of the wall portion 62 of the movable handle 56 is approximately equal to the width of the body portion of the blade. Hence, as the handle 56 is moved back about its pivot toward the stationary handle portion 55, the wall 62 pushes the blade upwardly in unison with the movement of the blade seat and the wall 62 cooperates with the spring pressed pawl to keep the intervening blades in proper alignment on their ends. During this movement the elongated slot 64 is engaged by the pin 57. The blade seat is provided with positioning studs 65 to engage apertures in the blade to properly position it on the blade seat.

As shown in Figure 18 the blade seat 60, cover 54, blade 1 and guard 66 are preferably substantially straight throughout and longitudinally curved at their ends in accordance with the manner and purpose described in connection with Figures 1 to 7 inclusive.

It is, of course, to be understood that while we have shown several types of razor blade holders particularly adapted for using blades having a pre-formed curvature, the holders shown and described are equally suitable for using straight blades not having the pre-formed curved features described in connection with our improved blades.

We claim:—

1. In a magazine safety razor, a blade seat and a clamp cover, a magazine for carrying a plurality of blades, means for moving said blade seat into a position of alignment with the blades stored in said magazine and with a blade thereon to a position adjacent said cover for clamping said blade between the seat and cover, means for forcing a blade on to said seat when in alignment with the blades in said magazine.

2. In a magazine safety razor, a handle including a stationary part and a pivotally movable part, a clamp cover carried by said stationary handle, said blade seat being carried by said movable handle and movable thereby into a position of alignment with the blades stored in said magazine and with a blade thereon to a position adjacent said cover for clamping said blade between the seat and cover.

3. In a magazine safety razor, a handle including a stationary part and a pivotally movable part, a clamp cover carried by said stationary handle, said blade seat being carried by said movable handle and movable thereby into a position of alignment with the blades stored in said magazine and with a blade thereon to a position adjacent said cover for clamping said blade between the seat and cover, resilient means for forcing a blade onto said seat when in alignment with the blades in said magazine.

4. In a magazine safety razor, a handle including a stationary part and a pivotally movable part, a clamp cover carried by said stationary handle, said blade seat being carried by said movable handle and movable thereby into a position of alignment with the blades stored in said magazine and with a blade thereon to a position adjacent said cover for clamping said blade between the seat and cover, resilient means for forcing a blade onto said seat when in alignment with the blades

in said magazine said movable handle having a wall portion disposed at the rear side blade seat and elevated with respect to the upper surface thereof to approximately the width of a razor blade for limiting the feeding of but one blade at a time to said seat and for maintaining a predetermined orderly relationship of the remaining blades in said magazine.

5. In a magazine safety razor, a handle including a stationary part and a pivotally movable part, a clamp cover carried by said stationary handle, said blade seat being carried by said movable handle and movable thereby into a position of alignment with the blades stored in said magazine and with a blade thereon to a position adjacent said cover for clamping said blade between the seat and cover said blade seat and cover being substantially straight with downwardly curved ends, each of said blades with their cutting edges pre-formed substantially straight with downwardly curved ends, a blade guard for guarding the straight and curved cutting edges.

6. In a magazine safety razor, a handle including a stationary part and a pivotally movable part, a clamp cover carried by said stationary handle, said blade seat being carried by said movable handle and movable thereby into a position of alignment with the blades stored in said magazine and with a blade thereon to a position adjacent said cover for clamping said blade between the seat and cover, resilient means for forcing a blade onto said seat when in alignment with the blades in said magazine said movable handle having a wall portion disposed at the rear said blade seat and elevated with respect to the upper surface thereof to approximately the width of a razor blade for limiting the feeding of but one blade at a time to said seat and for maintaining a predetermined orderly relationship of the remaining blades in said magazine said blade seat and cover being substantially straight with downwardly curved ends, each of said blades with their cutting edges pre-formed substantially straight with downwardly curved ends, a blade guard for guarding the straight and curved cutting edges.

7. A safety razor comprising a clamp cover, a blade seat and a guard, means for positively holding a blade on said seat in proper shaving position with relation to said guard, a magazine for separate blades and means including said seat for feeding blades in succession from the magazine to the shaving position in clamping relation to said clamp cover.

8. A safety razor comprising a clamp cover, a blade seat and a guard, means including stationary positioning studs on said seat for positively holding a blade on said seat in proper shaving position with relation to said guard, said means being independent of said guard, a magazine for separate blades, and means for feeding blades from the magazine to the positive proper shaving position between the guard and the clamp cover.

9. A safety razor comprising a handle with a clamp cover at the top, a blade seat including positive positioning means thereon and a guard, a magazine for holding a plurality of blades, said magazine being connected to said handle, means for moving said blade seat relative to said clamp cover and said magazine to positively and successively feed said blades from the magazine to proper shaving position between said guard and the clamp cover.

10. A safety razor comprising a handle with a clamp cover at the top, a blade seat including means for positively positioning the blade with relation to a guard thereon, a magazine for holding a plurality of blades connected with said handle, said magazine being adapted to swing over said blade seat, said magazine and blade seat having means to positively feed blades from the magazine to proper shaving position in relation to said guard between the clamp cover and said guard.

11. A safety razor comprising a handle with a clamp cover at the top, a blade seat including blade positioning means thereon and a guard, a magazine for holding a plurality of blades in said handle, said magazine being swingable so that its open side abuts on the blade seat, a spring actuated pawl contained in said magazine for ejecting a blade on said seat, and means on said seat for positively retaining said blades in proper shaving relation with relation to said guard thereon when the magazine is swung back to its normal position.

12. A safety razor comprising a handle with a clamp cover at the top, a blade seat including blade positioning means thereon and a guard, a magazine for holding a plurality of blades in said handle, said magazine being swingable so that its open side abuts on the blade seat, a spring actuated pawl contained in said magazine for ejecting a blade on said seat, and means on said seat for positively retaining said blade in proper shaving relation with relation to said guard thereon when the magazine is swung back to its normal position and means for clamping the blade between the clamp cover and the blade seat when the magazine is swung into said normal position.

13. A safety razor comprising a clamp cover and a blade seat including a guard, positioning means on said blade seat including positioning studs and an elevated wall portion disposed rearwardly of said seat for holding a blade in positive shaving relation to said guard to cooperate with said clamp cover to positively retain the blade in shaving relation to the guard independently of said guard, a magazine for separate blades, cooperative means for successively taking blades from the magazine on to said blade seat and engaging the positioning means and taking the blades to the shaving position against said clamp cover.

14. A safety razor including a device for holding a blade in shaving position, said device including a clamp cover and a blade seat, a handle, a blade magazine within said handle, and means for advancing a blade sidewise from said magazine onto said blade seat and thence to the shaving position in said holding device.

15. In a safety razor, a magazine and a plurality of separate blades housed therein, a clamp cover, a blade seat and a guard, means for ejecting a blade from said magazine, a single control means for moving said seat into alignment with said magazine and for simultaneously uncovering the blades in said magazine so that the top blade therein is accessible and is ejected from said magazine onto said seat, said single control means being adapted to close said magazine, after the blade is ejected therefrom, and to move said seat back to the shaving position with a blade thereon.

16. A safety razor comprising a handle having a magazine connected therewith adapted to hold a stack of blades, said magazine having an opening for the passage of blades, a clamp cover, a blade seat including a guard, said seat being adapted to be swung into alignment with the blades in said magazine so that the entire length and

width of said blade seat abuts the opening of said magazine for receiving a blade directly on its entire flat main body surface at the same time as the blade is expelled from said magazine.

17. In a safety razor a hollow handle with a clamp cover thereon, a shank rotatably and slidably mounted in said handle, a blade seat rotatably mounted on said shank, a spring in said handle urging the shank to releasably hold said blade seat adjacent said cover, said shank and hollow handle having guide grooves and pins engaging with each other, said pins acting to retain the blade seat away from the clamp cover against the action of the spring when drawn out of and turned beyond the limits of the grooves in said hollow handle.

18. In a safety razor employing a blade, a hollow handle with a clamp cover thereon, a shank rotatably and slidably mounted in said handle, a blade seat rotatably mounted on one end of said shank, said shank having a taper on its other end and a threaded portion on the base of said taper, and engaging in a male and female relationship in a corresponding tapered bore and thread in said hollow handle.

19. In a safety razor, a magazine and a plurality of separate blades housed therein, a clamp cover, a blade seat and a guard, means for ejecting a blade from said magazine, a single control means for moving said seat into alignment with said magazine and for simultaneously uncovering the blades in said magazine so that the top blade therein is accessible and is ejected from said magazine onto said seat, said single control means being adapted to close said magazine, after the blade is ejected therefrom, and to move said seat back to the shaving position with a blade thereon, and means for preventing the ejection of more than one blade when the seat is so moved.

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