

May 29, 1934.

H. STONEY

1,960,290

SAFETY RAZOR

Filed Feb. 6, 1934

2 Sheets-Sheet 1

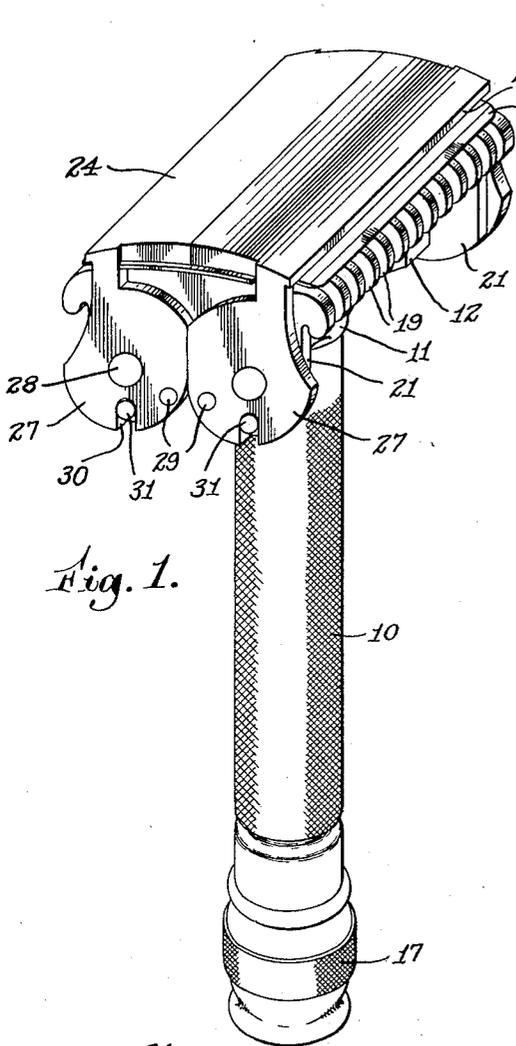


Fig. 1.

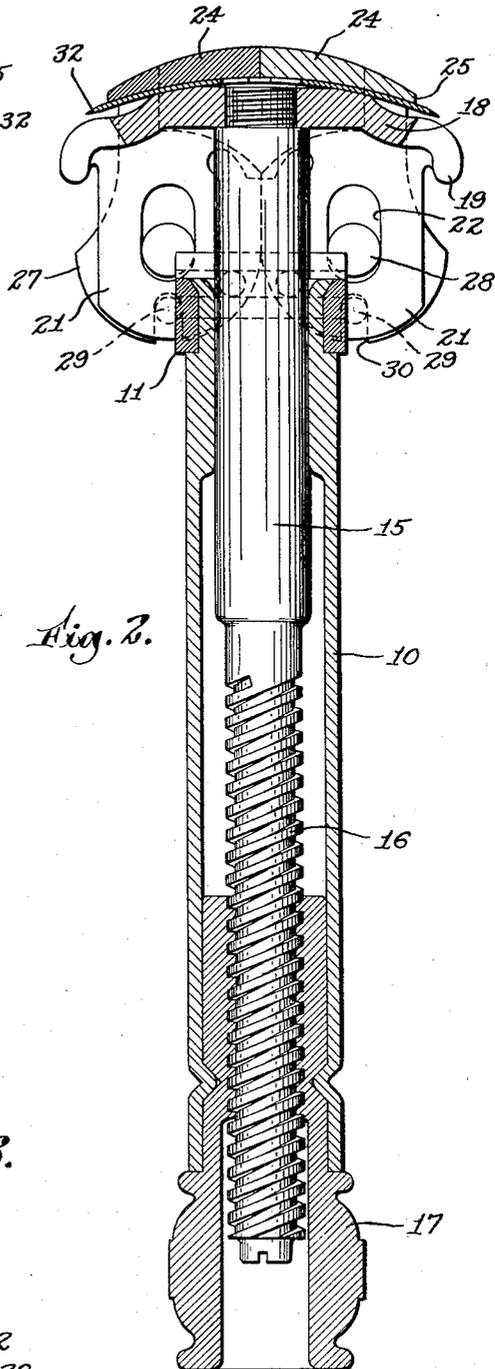


Fig. 2.

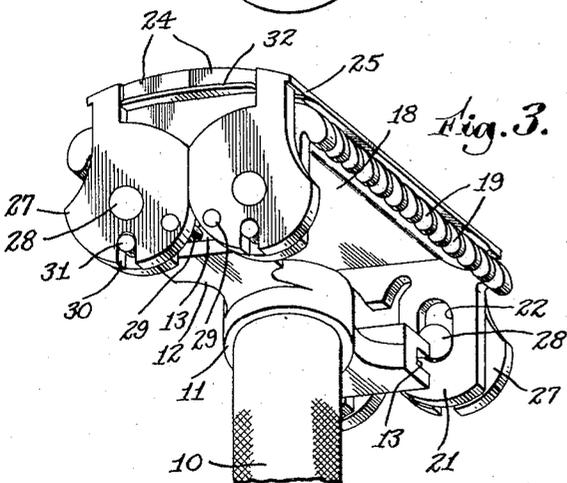


Fig. 3.

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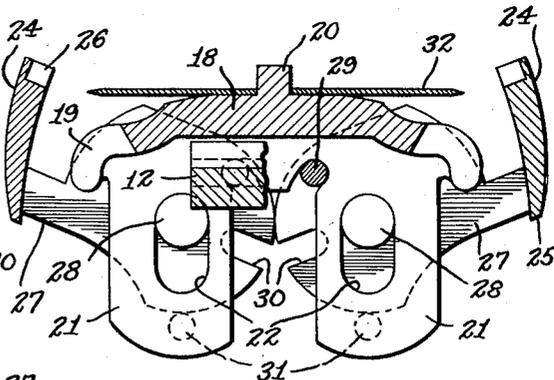
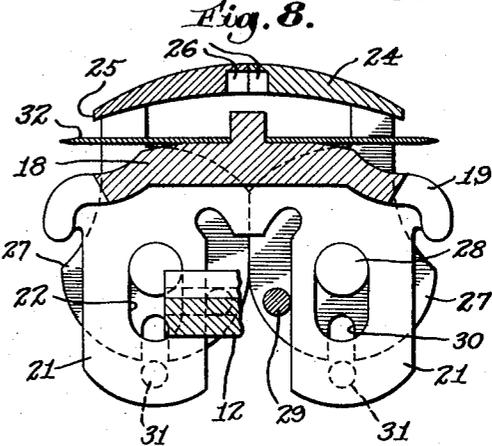
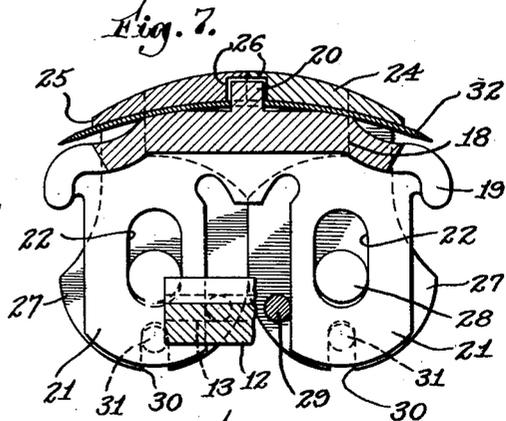
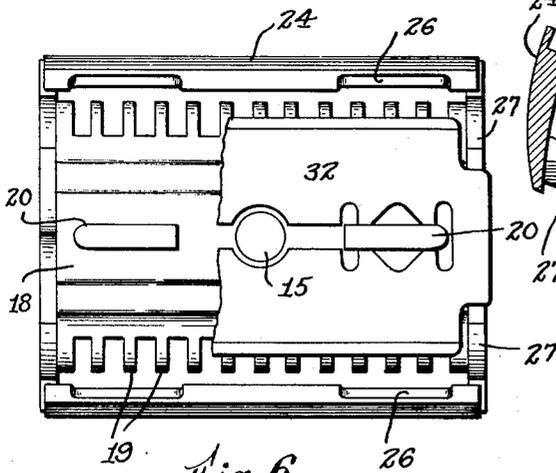
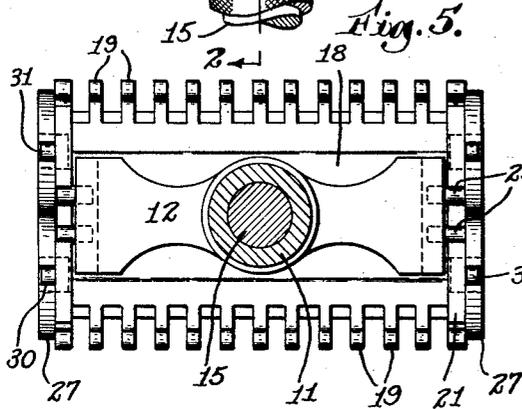
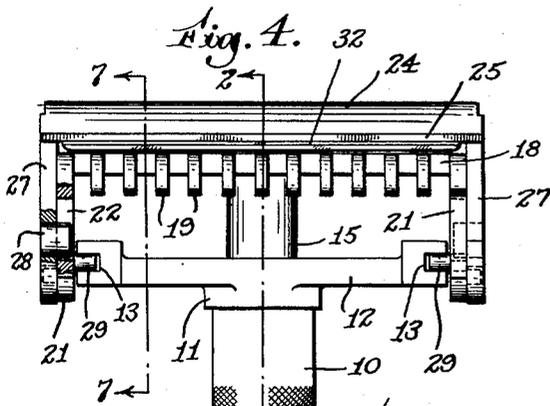


Fig. 9.

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UNITED STATES PATENT OFFICE

1,960,290

SAFETY RAZOR

Harry Stoney, Watertown, Mass., assignor to
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a corporation of Delaware

Application February 6, 1934, Serial No. 709,974

11 Claims. (Cl. 30—12)

This invention relates to safety razors of the type in which a thin flexible blade is clamped for shaving between co-operating blade-supporting members and maintained by them in a flexed condition. In one aspect the present invention comprises a novel razor construction in which such blade-supporting members are arranged for rapid and convenient movement to and from blade supporting position. In another aspect it comprises improvements in safety razors employing pivotally mounted cap sections which are arranged to be swung laterally or transversely in exposing the blade and also moved relatively to a guard or other blade-supporting member in clamping or releasing the blade.

In accordance with an important feature of the invention the blade clamping and releasing movements of the cap sections of my improved safety razor are effected by a movement at right angles to the surface of the blade and then, when such releasing movement has progressed to a point at which the cap sections entirely clear the unflexed blade, they are moved laterally to expose the blade preferably by simultaneously swinging or pivotal movement. Such mode of operation is advantageous in that it relieves the blade of the danger of contact from any portion of the cap sections and consequent dulling. As herein shown means are provided for locking the cap sections in closed condition while they occupy their blade-flexing position and in their final movement to such position as well as in their initial movement from such position; thus the cap sections may be positively guided toward and from the blade in closed condition and unlocked for separation only when sufficiently clear of the blade to obviate the possibility of any contact therewith.

Other features of my invention relate to novel mechanism for operating the cap sections in both of their movements, that is to say, in their right-line movement to and from blade-clamping position and in their swinging movement to and from blade-exposing position. As herein shown the cap sections have pin and slot connection with the blade-supporting member, which in this instance may be the guard. A handle operated actuating member is provided having also pin and slot connection with the cap sections. In this latter connection the slot is a transverse slot and the pins are driving pins which are movable freely and transversely in the slot, whereas in the case of the connection between the cap sections and the guard, the slots are vertical and the connecting pins move vertically in parallel slots. The two connections are so designed that the connect-

ing pins between the cap sections and the guard are first moved from one end to the other of the vertical slots and then, in the continued movement of the actuating member, the cap sections are swung about the same connecting pins as axes into open or blade-exposing position. This construction is effective in enabling the user to organize his razor rapidly for shaving and conveniently replace a blade after use whenever he may desire to do so.

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 in perspective on an enlarged scale of the razor and blade assembled in shaving condition;

Fig. 2 is a view in longitudinal section on a still larger scale;

Fig. 3 is a view in perspective of the razor head as seen from beneath;

Fig. 4 is a view of the razor head in front elevation with certain parts broken away;

Fig. 5 is a plan view of the razor as seen from beneath, the handle being shown in section;

Fig. 6 is a plan view of the razor as seen from above, showing the cap sections being shown in open position;

Fig. 7 is a cross-sectional view of the razor head on the line 7—7 of Fig. 4;

Fig. 8 is a similar view showing the cap and guard in vertically spaced relation; and

Fig. 9 is a similar view showing the cap sections in fully open position.

The tubular handle 10 of the razor is provided at its upper end with a head 11 having oppositely disposed and transversely-extending cross arms 12. The arms 12 are relatively wide and shallow in cross sectional area and each is provided in its outer end wall with a transversely-extending groove or slot 13 extending continuously across the end of the arm. Within the tubular handle 10 is provided an elongated spindle 15 which is arranged to be moved longitudinally within the handle and is provided with a long threaded stem 16 of slightly reduced diameter at its lower end. A tubular nut 17, rotatably engaged in the lower end of the handle 10, is threaded upon the stem 16 and serves to advance or retract the spindle 15 with reference to the handle 10.

The blade-supporting member of the razor comprises a guard 18 which is shown as having a threaded connection with the upper end of the

spindle 15. The guard member 18 is rectangular in outline and provided along its opposite side edges with guard teeth 19. Its upper face is somewhat convex in contour being provided with parallel fulcrum shoulders over which the blade 32 may be flexed when the cap sections are moved into clamping engagement therewith. Projecting from the upper face of the guard 18 is a pair of spaced ribs 20 designed to locate the blade accurately in position upon the guard. The guard is provided further at each of its corners with a downwardly-extending arm 21 having a vertical slot 22 therein. From the foregoing description it will be apparent that when the nut 17 is turned the spindle 15 with the guard 18 is raised or lowered relatively to the cross arms 12. In Figs. 2 and 7 the guard is shown in position at the upper limit of its movement and most remote from the cross arms 12. In Fig. 9 the guard is shown in its lowermost position, in which it just clears the cross arms 12, and in Fig. 8 it is shown in an intermediate position.

Two cap sections 24 are mounted in the razor head for relative pivotal movement and also for straight line movement toward or from the guard 18. The cap sections are slightly longer than the guard and they are of sufficient width to flex a blade over the fulcrum shoulders of the guard when arranged in edge engagement with each other. The outer longitudinal edge 25 of each cap section is designed to bear upon the surface of the blade adjacent to the cutting edge thus flexing and supporting the flexed blade. The adjacent inner edges of the cap sections 24 are provided with registering recesses 26 to fit the short blade locating ribs 20 when the cap sections are closed and moved into blade-clamping position.

Each cap section is provided at its two outer corners with downwardly-extending arms 27 having connection therewith through a narrow neck, the arrangement being such as to leave unobstructed the central portion at the end of the closed cap sections and permit the elongated central unsharpened portion of a blade to project longitudinally out from beneath the cap sections and between the necks of the arms 27. Each of the arms 27 is provided with an inwardly extending pivot pin 28 which is arranged to slide and to turn in the slots 22 of one of the arms 21. The cap sections 24 are thus connected to the arms of the guard for a limited vertical movement and also for angular or pivotal movement about the axes of the pins 28 toward and from each other or from a blade-clamping position above the guard to a blade-exposing position at either side thereof.

Each arm 27 is also provided with a driving pin 29 which is longer than the pivot pins and which extends inwardly past the guard arm 21 and into the slot 13 in the end of one of the cross arms 12. The driving pins 29, as best shown in Figs. 7 to 9, are located in off-set relation to the vertical guide slots 22 and to the path of movement of the pivot pins 28. It follows, therefore, that when the guard 18 is moved upwardly with respect to the cross arms 12, that is to say out of the position shown in Fig. 9, the cap sections 24 will be rocked inwardly toward each other until their movement is arrested by contact of their inner longitudinal edges. The closing pivotal movement of the cap sections carries them from the position shown in Fig. 9 to the position shown in Fig. 8. When the cap sections have thus been brought into contact and further pivotal movement therefore positively prevented, further

downward movement of the driving pin 29 is effective to move the closed cap sections bodily downwardly in a straight line path carrying the pivot pins 28 from the position shown in Fig. 8, at the upper end of the grooves 22, to the position shown in Fig. 7 wherein the pivot pins have reached substantially the lower end of the grooves 22. It will be apparent that the up and down movement of the driving pin 29 is caused by the up and down movement of the cross arms 12 or by the relative separating movement of the cross arms with respect to the guard 18. The transverse component of movement of the driving pins 29 about the axis of the pivot pins 28 is taken up in transverse movement along the grooves 13 and the operative connection between the driving pins 29 and the cross arms 12 is therefore continuously maintained.

Each of the cap section arms 27 is provided in its lower edge with a guide slot 30 which, in the closed positions of the cap sections, is vertically disposed and registers with a guide pin 31 projecting outwardly from each guard arm 21 adjacent to the lower end thereof. In contour the lower ends of the cap section arms 27 are curved concentrically about the axes of the pivot pins 28, so that swinging movement of the cap sections may take place without any binding of the arms. The guide pins 31 and the guide slots 30 cooperate to lock the cap sections together and to insure a right line or vertical movement of the cap sections in their blade clamping movement and throughout their initial blade releasing movement. While the pin and groove are engaged the action of the driving pins 29, even though offset with respect to the guided line of movement of the cap sections, is confined in its effect to a movement of translation and it is only after the cap sections have been separated from the guard sufficiently to carry the guide pins 31 out of the grooves 30 that the cap sections are freed to partake of an angular movement about the axis of their pivot pins 28.

Assuming that the razor is clamped in shaving position as shown in Figs. 1 to 7 and that the user desires to release and remove the blade 32, the nut 17 is turned in a direction to lower the guard 18. The guard 18 is, thereupon, moved downwardly in a straight line, the cap sections 24 being meantime locked against angular separation by the engagement of the guide pins 31 and the slots 30. As soon as the blade releasing movement of the guard has progressed sufficiently to carry the guide pins 31 out of the lower end of guide slots 30, the relative downward movement of the pivot pins 28 with respect to the driving pins 29 becomes effective to rock the cap sections outwardly into the position shown in Fig. 9, in which the blade 32 is fully exposed and remains supported upon the guard 18 in convenient position to be removed by the user without obstruction and without danger of cutting himself. Downward movement of the spindle 15 and the guard 18 may be continued until the pivot pins 28 reach the upper end of the guide slots 22, and in this position the upper surface of the head 11 or the cross arms 12 is brought into engagement with the lower surface of the guard 18 so that further movement is arrested.

After the blade has been replaced the blade-clamping operation may be effected in the reverse manner, that is to say, the nut 17 is turned in a direction to elevate the guard member 18 upon which the new blade has been placed. The cap sections being free to rock, the initial movement

of the nut 17 causes the cap sections to swing together from the position shown in Fig. 9 to the position shown in Fig. 8, this movement taking place freely about the axis of the pivot pins 22 which occupy at this time their position in the upper ends of the guide slots 22. When this has been accomplished further vertical movement of the driving pins 29 is effective to move the cap sections downwardly with respect to the guard, or to move the guard upwardly with respect to the cap sections, and in this final movement the blade is placed in a condition of pronounced transverse curvature by relative right line movement of the clamping parts of the razor.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A safety razor having a blade support, cap sections mounted thereon for movement toward and from the support and also for pivotal movement, and a relatively movable handle member having pivotal connection with said cap sections at points offset with respect to their axes of pivotal connection with the blade support.

2. A safety razor having a blade support, cap sections having pin and slot connections therewith arranged to guide the closed cap sections for limited straight line movement toward or from said blade support, and a handle member movable toward and from the blade support and having pivotal connection with each of the cap sections at a point out of line with their connection to said support.

3. A safety razor including in its organization a blade-support, cap sections having pin and slot connections with said support permitting straight line movement of the cap sections for clamping or releasing a blade from said support, and means for positively limiting the closed cap sections to straight line movement during a portion of their travel and thereafter releasing them for angular movement.

4. A safety razor including in its organization a blade-support, cap sections mounted to swing about axes beneath said support and to move bodily with respect thereto toward or from the face of said blade-support, and means for holding the cap sections in contiguous position during such bodily movement thereof arranged to release the sections at a predetermined distance of separation from said support.

5. A safety razor including in its organization a blade-support and a handle member arranged for relative movement, cap sections connected to said

support for bodily movement toward and from the same in closed condition and also for pivotal movement, pivotal connections between said cap sections and handle member, and locking means for maintaining the cap sections in substantially closed relation during their bodily movement.

6. A safety razor comprising a blade-support, cap sections connected thereto for both pivotal and right line movement, an actuating member having a transverse slot therein, and a driving pin on each cap section free to move transversely in the slot during the pivotal movement of the cap sections.

7. A safety razor comprising a blade-support having downwardly extending arms with vertical slots therein, cap sections having connecting pins extending into said slots, an actuating member having a transverse slot, and driving pins on each cap section located in offset relation to the connecting pins and free to move toward or from each other in said slot when the actuating member is moved relatively to said blade-support.

8. A safety razor of the character defined in claim 7, further characterized by the provision of means for locking the cap sections against separation during the movement of the connecting pins along said vertical slots.

9. A safety razor comprising a guard having downwardly projecting arms provided with slots which are parallel to each other, cap sections also provided with downwardly projecting arms having connecting pins movable in said slots and driving pins movable vertically in the space between the arms of the guard, and a handle-operated actuating member movable relatively to the guard and having a transverse slot in which the driving pins are freely movable in transverse direction.

10. A safety razor comprising a guard having fulcrum shoulders, a flexible blade adapted to be flexed thereover, a cap comprising separable sections having pin and slot connections with the guard, means for locking the sections together while in blade-flexing position, and a handle-operated actuating member having pin and slot connection with the cap sections for moving them first into unlocked position and then causing them to swing into blade-exposing position.

11. A safety razor comprising a guard, cooperating cap sections having vertical slot and pin connections with the guard, and a handle-operated actuating member having transverse slot and pin connections with the cap sections.

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