

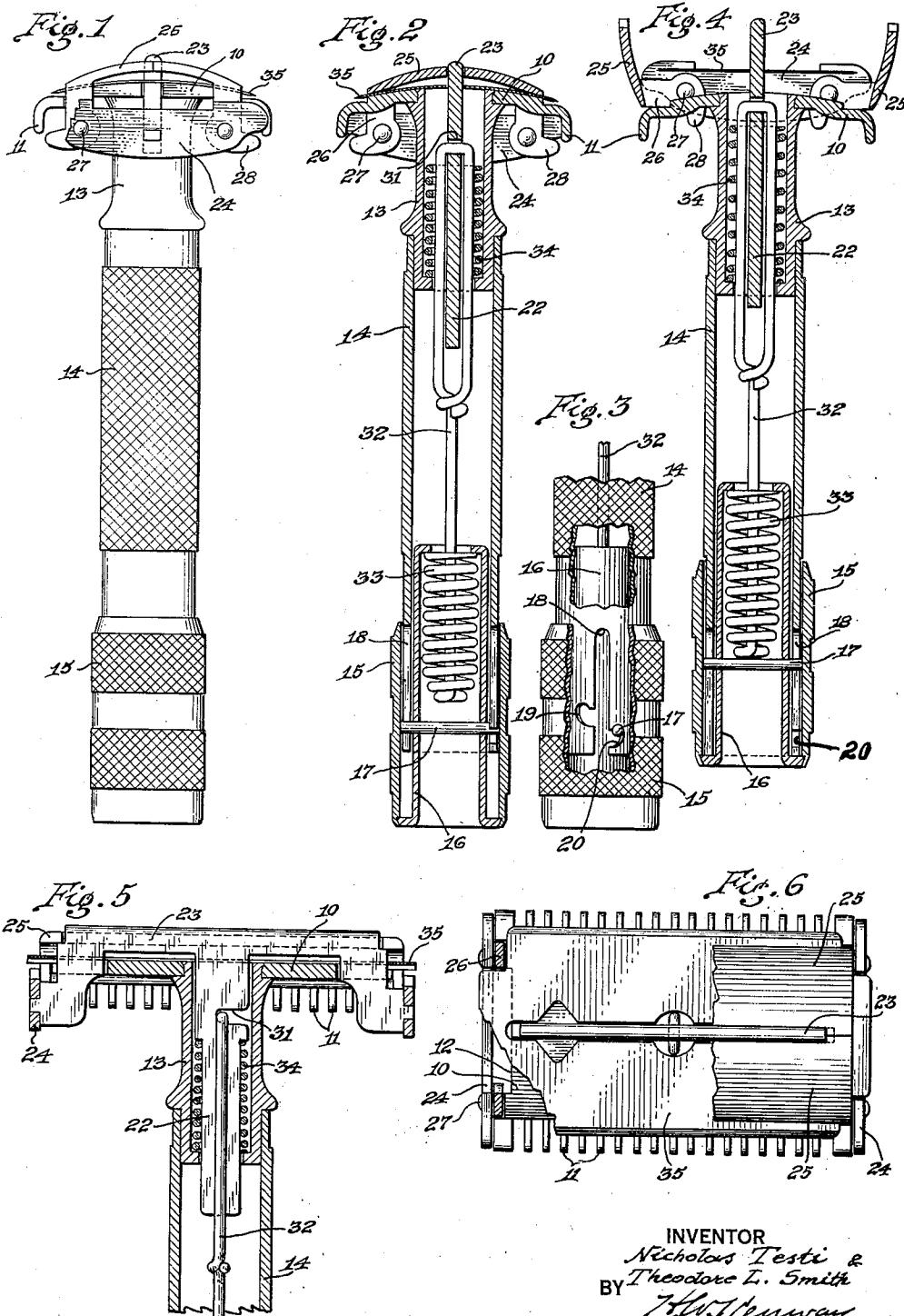
March 1, 1938.

T. L. SMITH ET AL

2,109,554

SAFETY RAZOR

Filed Jan. 3, 1936



INVENTOR
Nicholas Testi &
Theodore L. Smith
BY *H. J. Penway*
ATTORNEY

UNITED STATES PATENT OFFICE

2,109,554

SAFETY RAZOR

Theodore L. Smith, Concord, and Nicholas Testi,
Boston, Mass., assignors to Gillette Safety
Razor Company, Boston, Mass., a corporation
of Delaware

Application January 3, 1936, Serial No. 57,384

12 Claims. (Cl. 30—60)

This invention relates to safety razors of the type employing a sectional cap in combination with a guard or other blade-supporting member. The general object of the invention is to improve the convenience and safety of the blade-clamping and releasing operations and to facilitate the manufacture of safety razors of this type.

Users of safety razors prefer and demand a light, quick acting mechanism operative to release and fully expose the blade for purposes of cleaning or replacement, and rapidly and securely to clamp the blade in position for shaving. The present invention supplies this want as well as providing a razor having the desirable characteristics mentioned above.

With these ends in view an important feature of the invention consists in movable cap sections associated with a spring which may be manually energized and thus caused to move the cap sections into blade-clamping position and to maintain them in clamping position with an adequate and continuous pressure. By this construction the maximum degree of clamping pressure which it is possible to exert is limited so that breakage or distortion of the razor parts is obviated and yet sufficient clamping pressure is developed to conform the blade to the desired shape and clamp it securely in place. Moreover, a razor constructed in this manner has the advantage that the blade is either fully clamped in shaving condition or it is not clamped at all, and thus the user is relieved of the danger of picking up his razor and starting to shave with the blade improperly clamped and dangerous.

As a further feature, the present invention contemplates the provision of spring means for throwing the cap sections into wide open position whenever they are released from clamping pressure. Preferably, and as herein shown, the same spring may be utilized to lift the blade from the surface of the guard and thus present it in position for convenient removal or replacement. The result of this arrangement is that immediately upon release of the controlling element the razor is presented in wide open condition with the blade in elevated position where it may be conveniently grasped by its ends without danger of cutting.

Still another feature of the invention consists in provision for adjusting the amount of edge exposure of the blade in the razor by regulating the degree of clamping pressure exerted upon the blade shaping members of the razor. As herein shown, the spring, which is effective to close and

clamp the cap sections, is arranged to be energized by a sleeve or thimble which may be moved to selected positions in accordance with the preference of the user and positively latched with the blade either fully curved for minimum edge exposure or partially curved for a greater edge exposure.

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 drawing, in which,—

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

Fig. 2 is a similar view in central longitudinal section;

Fig. 3 is a detailed view of the lower portion of the handle;

Fig. 4 is a view similar to Fig. 2, showing the razor in open instead of closed condition;

Fig. 5 is a view of the razor head at right angles to that shown in Fig. 2; and

Fig. 6 is a plan view of the razor, with portions of the cap sections and blade broken away.

In the preferred embodiment of the present invention the guard 10 is utilized as a blade-supporting member for shaping the blade when the latter is clamped in shaving position. The guard is constructed of heavy sheet metal and has a slight transverse curvature in contour. It is provided along its longitudinal edges with guard teeth 11 of the usual construction. At each end the guard is provided with an elongated rectangular recess 12, see Fig. 6, for purposes of clearance and to provide shoulders for engaging and swinging the cap sections, as will presently be described.

The guard 10 is rigidly connected to the upper end of a tubular stem 13, as by having a flange on the end of the stem spun or otherwise headed into a counter-sunk recess in the center of the guard. The stem 13 is externally shouldered near its lower end to receive the handle barrel 14. Upon the lower end of the barrel is telescopically fitted a knurled thimble 15 and this is rigidly connected to and movable with an inner sleeve 16 which fits telescopically within the lower end of the barrel 14. For the purpose of connecting the two, the inner sleeve 16 is provided with an outwardly extending flange to the periphery of which the lower end of the thimble 15 is united. A cross-pin 17 extends horizontally between the sides of the sleeve 16 and into long slots 18 which are formed in the side walls of the barrel 14. Opening into the left-hand side of

each slot 18, as shown on one side in Fig. 3, is an undercut notch 19 and opening into the right-hand side of each slot 18 at a point lower down in the barrel is a similar undercut notch 20. The ends of the cross-pin 17 are free to travel vertically in the slots 18 and may be moved into locking engagement with either pair of notches 19 and 20 according to the preference of the user.

Vertically movable within the bore of the stem 13 is the flat shank 22 of a cross-bar 23 which extends parallel to the face of the guard 10. The cross-bar 23 is provided with downwardly offset ends and each of these carries a transverse arm 24. Co-operating cap sections 25 are pivotally mounted by pivots 27 near the ends of the transverse arms 24. The pivots 27 are passed through downwardly or inwardly extending arms 26, one provided at each end of a cap section. Each of the arms 26, moreover, is provided with an outwardly extending tailpiece 28 which, when the cap sections are closed, as shown in Figs. 1 and 2, underlie the shoulders in the guard formed at the ends of the recesses 12.

The shank 22 is provided in one edge with a notch 31 in which is received the upper end of an elongated loop formed in a heavy spring wire 32 disposed in the barrel 14. At its lower end the wire 32 passes through a hole in the inner flanged end of the sleeve 16 and is coiled into a spring helix 33 within the sleeve. The lower end of the wire then passes upwardly through the helix 33 and the assembly serves as a pull compression spring which may be energized to exert a continuous downward pull upon the shank 22 and the cap sections 25 when the thimble 15 is moved downwardly upon the barrel 14 and the helix compressed. A compression spring 34 is located within the bore of the stem 13 and engages at its upper end beneath a shoulder formed in the stem 22, as best shown in Fig. 5. The compression spring 34 is weaker than the spring 33 and is compressed when the latter is compressed or energized. When the spring 33 is released, however, the compression spring 34 is permitted to act and to elevate the cross-bar 23, simultaneously throwing the cap sections 25 into their fully opened position.

A thin flexible blade 35 adapted for use in the razor above-described is shown in Fig. 6. The blade is provided with a longitudinal slot to receive the cross-bar 23 which thus positions it upon the guard. It is provided at each corner with a reentrant notch which provides clearance for the adjacent cap section arm 26 and defines an elongated unsharpened portion in each end of the blade which overlies one of the transverse arms 24. The cross-bar 23 with its transverse arms 24, therefore, acts as a carrier both for the cap sections 25 and for lifting the blade 35 upwardly from the guard 10 when the spring 34 is permitted to act. The lower end of the wire 32 is formed as a button and arranged to engage the cross-pin 17 as the razor approaches its full opened position. Under these conditions the wire 32 acts as a rigid strut and the expansive force of the helix 33 is utilized through this medium to lift the cross-bar 23 or to assist the compression spring 34 in doing so.

If, now, the thimble 15 is turned so as to bring the ends of the pin 17 into the straight slots 18, the spring 33 is thus released and permitted to expand, pulling the thimble 15 upwardly and releasing pressure upon the shank 22. Under these circumstances the spring 34 is free to lift the cross bar 23, bringing the tailpieces 28 against

the shoulders at the ends of the recesses 12 and swinging the cap sections 25 into their wide open position, as shown in Fig. 4. In this position the blade 35 is lifted by the transverse arms 24 of the carrier and held above the face of the guard 10, thus being conveniently presented for cleaning or replacement by the user. While the cap sections are opened the spring 33 remains expanded or relaxed and does not become effective until it is again placed under compression in the downward movement of the thimble 15.

If, now, it is desired to close the razor the user has only forcibly to pull down the thimble 15 and give it a slight twist to lock the ends of the cross pin 17 either in the notches 19 or 20. The notches 19 lock the thimble with the spring 33 compressed to a degree sufficient to conform the blade 35 substantially to the curvature of the guard 10, but not curved quite so much as it would be if the lower pair of notches 20 were utilized. When the cross pin 17 is locked in the notches 20 the spring 33 is subjected to maximum compression and the blade is fully conformed to the curvature of the guard. Accordingly, the user is provided with convenient means for regulating the edge exposure of his razor blade, the lighter pressure permitting the blade to straighten slightly and so extend further outwardly with reference to the guard teeth 11.

When the thimble is pulled down the wire connection 32 acts yieldingly to pull down the carrier and the shoulders at the ends of the recesses 12 act upon the arms 26 to swing the cap sections upwardly and inwardly. Subsequently they are moved downwardly in closed position into blade-clamping position. When the thimble is once latched in position the cap sections 25 are maintained continuously under a heavy yielding pressure with no danger of loosening and no danger of improper position. In other words, the razor is either fully opened or fully and safely clamped and there is no opportunity for the user to pick up his razor in partially clamped condition.

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

1. A safety razor comprising a blade-supporting member, cap sections pivotally mounted in the razor for swinging movement toward or away from said member, a spring associated with said sections and being in relaxed condition when the sections are open, and manually operated means for energizing the spring to cause both cap sections to exert a continuous clamping pressure upon a blade beneath them.

2. A safety razor comprising a blade-supporting member, cap sections pivotally mounted in the razor for swinging movement toward or from said member, a pull spring connected to said sections and being normally relaxed when the cap sections are open, and a rotatable and longitudinally movable controlling device for energizing the spring when it is desired to close the cap sections.

3. A safety razor comprising a guard having a curved blade-supporting face, a carrier movable with respect to said face to engage a blade resting thereon, cap sections pivotally mounted on the carrier for swinging movement toward or away from said face, a spring connected to said carrier and in relaxed condition when the sections are open, and manually operated means for energizing the spring to cause the cap sections to exert a continuous clamping pressure on a blade beneath them on the guard.

4. A safety razor comprising a blade-supporting member, cap sections pivotally mounted in the razor for swinging movement toward or from said member, connections for closing said sections including a spring arranged to be manually energized to cause said sections to exert a clamping pressure on the blade, and a separate spring for opening said sections when the pull spring is released.
5. A safety razor comprising a blade-supporting member, cap sections pivotally mounted in the razor for swinging movement toward or from said member, a pull spring connected to said sections and arranged to be latched in energized condition with the cap sections closed under clamping pressure and to be released when said cap sections are opened, and independent spring-actuated means for opening said sections.
6. A safety razor comprising a blade-supporting member, a handle connected thereto, cap sections pivotally mounted in the razor for swinging movement toward or from said member, a sleeve bodily movable within the handle, a spring confined within said sleeve and being relaxed while the cap sections are opened, and means for latching the sleeve in position to energize the spring and thereby impart through the spring a closing pressure to the cap sections.
7. A safety razor comprising a blade-supporting member, cap sections pivotally mounted in the razor for swinging movement toward or from said member, a spring associated with said sections, manually operated means for energizing the spring to cause both cap sections to exert pressure upon a blade beneath them, and a separate spring for opening said cap sections when the spring first mentioned is released.
8. A safety razor comprising a blade-supporting member, cap sections pivotally mounted in the razor for swinging movement toward or from said member, a pull spring connected with said sections for closing them with clamping pressure on a blade and arranged to be fully released when

the cap sections are opened, and a second spring for throwing the cap sections into open position.

9. A safety razor comprising a blade-supporting member, a movable blade carrier having a pair of cap sections pivotally mounted thereon to swing toward or from the said blade-supporting member, a spring connected to the carrier and arranged to be manually energized to cause the cap sections to exert continuous pressure on a blade beneath them, and a second spring acting when the first is released to lift the carrier and open the cap sections.

10. A safety razor comprising a blade-supporting member, a movable blade carrier having a pair of cap sections pivotally mounted thereon, a spring acting normally to open the cap sections, and a manually controlled spring tension member for forcibly closing the cap sections and holding them under yielding blade-clamping pressure.

11. A safety razor comprising a blade-supporting member, a pair of cap sections pivotally mounted in the razor to swing toward said member into blade-clamping position, and manually operated mechanism for clamping said cap sections including a spring which is relaxed while the cap sections are opened and which is arranged to transmit and limit the maximum clamping pressure which may be imparted to the sections.

12. A safety razor comprising a blade-supporting member, a handle connected thereto, a double-edged blade upon the blade-supporting member, cap sections pivotally mounted in the razor for swinging movement toward or from the blade, a sleeve movable within the handle, a spring confined within said sleeve and means for latching the sleeve in different positions to energize the spring with a regulated tension and thereby impart a predetermined closing pressure to the cap sections.

THEODORE L. SMITH.
NICHOLAS TESTI.