

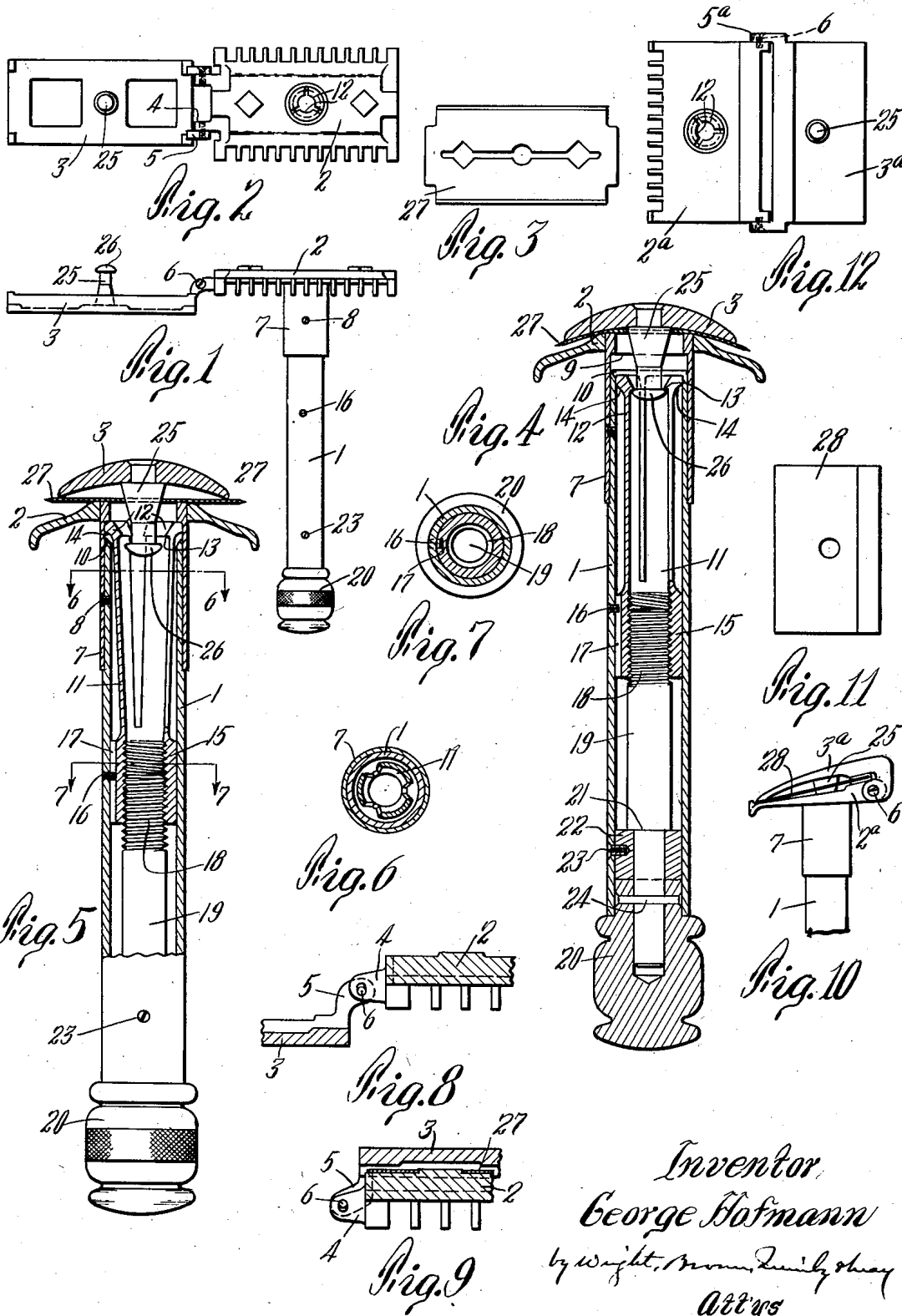
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SAFETY RAZOR

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SAFETY RAZOR

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This invention relates to safety razors of the type in which an independent blade is secured removably between clamping members, one of which is a guard to prevent the razor from cutting the skin over which it is passed in the course of shaving. Its object is to provide new and improved connection between the handle and the releasable clamp member, which enables such releasable clamp member to be permanently hinged to the complemental clamp or guard member, and also to be drawn against the blade with uniformity of pressure from end to end and from side to side. The characteristics in which the invention consist are made plain by the following description in connection with the drawing and the appended claims.

In the drawing, Fig. 1 is a side view of the razor with the clamp member disconnected from its clutch and swung aside in condition for placement or removal of a blade.

Fig. 2 is a plan view, as seen from above, of Fig. 1.

Fig. 3 is a plan view of a blade of the wafer type adapted to be used with this razor.

Fig. 4 is a sectional view on an enlarged scale taken through the axis of the handle and transversely to the complemental clamping members, showing the parts coupled together, with a blade in place, in condition for shaving.

Fig. 5 is a view similar to Fig. 4, but showing the clutch disengaged and the clamps in condition either for coupling to grip the blade or for separation to permit removal of the blade.

Figs. 6 and 7 are cross sections taken on lines 6-6 and 7-7 respectively of Fig. 5.

Fig. 8 is an enlarged sectional view showing the hinged connection between the clamping members, these members being in the relation shown in Fig. 1.

Fig. 9 is a view of the same parts shown in Fig. 8, but represented in position preparatory to gripping the blade.

Fig. 10 is a side elevation of a modified form of razor in which the clamping parts are hinged together on a longitudinal axis at one side instead of on a transverse axis at one end, as shown in Figs. 1 and 2.

Fig. 11 is a plan view of a type of blade usable with the razor shown in Fig. 10.

Fig. 12 is a plan view of the razor shown in Fig. 10, with the hinged clamp member turned aside.

Like reference characters designate the same parts wherever they appear in all figures.

This razor comprises three main parts, namely, a handle 1, a combined clamp and guard member 2, and a clamp member 3. For convenience of description the member 2 will be called the guard simply, and the member 3 will be called the clamp. These members are permanently connected together and provided with clutch means for drawing the clamp against the guard and gripping a blade between them; the permanent connection making it easy to open up the clamp for placement and removal of the blade and assuring that when the parts are so opened they will remain in the correct relation to one another.

The connection between guard 2 and clamp 3 is made by lugs 4 on the guard projecting from one end thereof, lugs 5 on the clamp projecting from the adjacent end of the clamp and flanking the lugs 4, and screws 6, one of which is set into each of the lugs 5 and projects into a hole in the adjacent lug 4. These holes are larger than the projections in the screw shanks which occupy them, or may be simply elongated in the same general direction as the length dimension of the handle. This is an important factor of the invention in that it enables the clamp to be moved bodily toward and away from the guard when placed over the latter to grip the blade.

The handle is a tube which is set at one end into a sleeve 7 and secured therein by a screw 8. Sleeve 7 is virtually a part of the guard. It may be made as an originally separate piece of tubing placed and secured in a central hole in the guard, or it may be made in one integral piece therewith. It is provided with an internal shoulder or equivalent stop abutment 9 to establish a definite limit to the outward movement of a clutch later described. However, such shoulder is

but one of several forms of limit stop which may be provided for the same purpose.

The end of the handle tube 1 within sleeve 7 is spaced from the shoulder 9 and is formed with an internal bevel 10 which serves as a cam to operate the clutch jaws referred to. An inner tube 11 is arranged within the handle sleeve 1 and is slotted longitudinally from the end adjacent to the guard at three or more locations spaced equiangularly about its axis. The substance of this sleeve between the slots form clutch jaws 12 which have interior latching shoulders 13 and exterior cam or wedging surfaces 14. The unslotted end part 15 of this clutch sleeve is cylindrical and is dimensioned to fit slidingly within the handle tube. It is prevented from rotating by a key, here shown as a screw 16 set into the side of the handle tube and protruding into a longitudinal groove 17 in the clutch sleeve. Between the sliding part 15 and the wedging surfaces, the clutch sleeve is reduced in diameter. Its jaws are of spring character and made with an outward set radially so that when unconfined they tend to spring apart, as shown in Fig. 5, and even more widely than there shown.

The sliding part 15 of the clutch sleeve is internally threaded and is engaged with the threads 18 of an operating shaft 19, the outer end of which is coupled with a knob 20. That part of the shaft which connects with the knob is of smaller diameter than the body of the shaft, and passes through a bearing sleeve 22, secured in the handle by a screw 23, or otherwise, and serving both as a lateral bearing and a thrust bearing for the shaft. The knob or handle 20 has a socket into which the extremity of the shaft passes and in which it is secured by a pin 24. The inner end of this knob enters the outer end of the handle tube and abuts against the outer side of bearing sleeve 22. In assembling the parts of the razor, the shaft, knob and bearing sleeve are all assembled outside of the handle, with the bearing sleeve confined between the inner end of the knob and shoulder 21 on the shaft, and then inserted into the handle.

It will be apparent that by rotating the knob in one direction the clutch jaws may be advanced toward the guard plate until they pass beyond the beveled cam face 10 of the handle tube, whereupon they spring apart, as shown in Fig. 5; while by rotation of the knob in the other direction, the jaws are withdrawn into the handle tube and squeezed together by co-action of their wedge surfaces 14 with the cam shoulder 10. Such movements of the clutch jaws in opposite directions may be limited on the one hand by shoulder 9 and on the other by the end of the screw thread 18, or by equivalent abutment stops of other character which may be

substituted. Thus, for instance, limit stops may be placed in the groove 17 at opposite sides of the key 16.

The clamp carries a stud 25 having a narrow neck portion and a widened head 26. This stud is adapted to pass through the central hole in the guard and into the sleeve 7, and between the clutch jaws when the latter are in the position shown in Fig. 5. At such times the latching shoulders of the clutch jaws are spread apart more widely than the rim of the stud head 26, so that the latter is free to pass between them. But when the clutch sleeve is drawn outward, its jaws are first brought radially inward until their shoulders overlap the rim of the stud head, and further movement of the jaws pulls the clamp against the guard by means of the coupling afforded by this stud.

The clutch coupling and hinge co-operate in enabling the clamp to be drawn bodily and pressed equally in all parts against the blade 27. That blade is one of the flexible wafer type which is bent out of a plane into a cylindrical arc when the clamp is tightened. In effect the single line contact between the head 26 and the clutch jaw latches 13 provides a ball and socket joint, which, aided by the loose hinge connection of the clamp, permits the clamp to move in any direction necessary to distribute and equalize its pressure over all parts of the blade on which it bears. While ample force may be thus applied to flex and grip the blade, nevertheless there is nothing rigid in the coupling except in the direction of the tensile stress: that is, nothing to cause rigidity in the line of connection with the handle, such as is found in screw connections between the handle and clamp of razor designs heretofore known.

The difference between a razor above described and that shown in Figs. 10, 11 and 12, is simply that the latter is designed to use a single edged blade 28 and its clamp is hinged to one side of the guard on a longitudinal axis, but the characteristics of the hinge and the coupling means for the clamp are substantially identical with those previously described.

What I claim and desire to secure by Letters Patent is:

1. A safety razor comprising a guard having a hole through it, a clamp hinged loosely to said guard for placement in blade-clamping relation therewith and in open position for reception and removal of blades, the clamp having a headed stud adapted to pass through the hole in the guard when the clamp is in blade-securing position, a tubular handle secured at one end to the guard with its bore in register with the hole therein, separable clutch jaws movable endwise within the handle arranged to overlap and engage the head of said stud while the latter pro-

jects into the handle, means to prevent the jaws from protruding beyond the blade-supporting face of the guard, and a shoulder in the handle, located inwardly of such blade-supporting face in position to crowd the jaws together when moved lengthwise away from their position of nearest approach to said face.

2. A safety razor, comprising a tubular handle, a guard member secured to one end of said handle and having an opening through which access exists to the interior of the handle, a clamp hinged to the guard member on an axis transverse to the length dimension of the handle, a headed stud protruding from the central part of the clamp adapted to enter the handle when the clamp is in blade-gripping relation to the guard member, a clutch longitudinally movable and having its entire range of such movement in the interior of the handle, said clutch comprising jaws adapted to overlap the rim of the stud head, said clutch in its uppermost position being free from engagement with said stud when the latter is inserted into said handle to insure the engagement of said jaws with the stud when the clamp is placed in proper closed position relative to the blade and guard, and means for moving the clutch to engage the jaws with the stud.

In testimony whereof I have affixed my signature.

GEORGE HOFMANN.

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