Oct. 18, 1932. L. V. ARONSON 1,883,324

SAFETY RAZOR

Filed Dec. 27, 1930 2 Sheets-Sheet 1

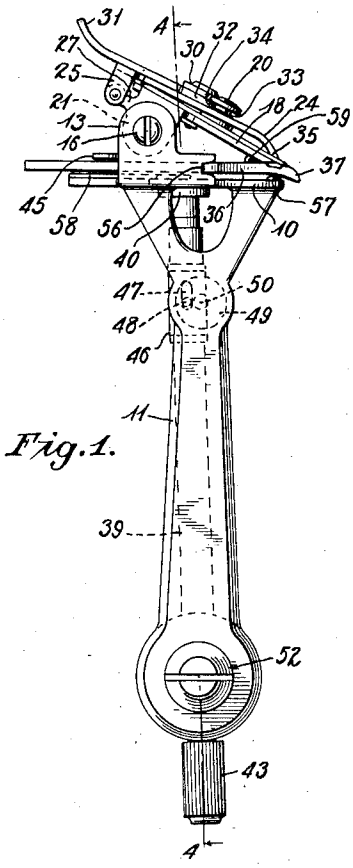


Fig. 1.

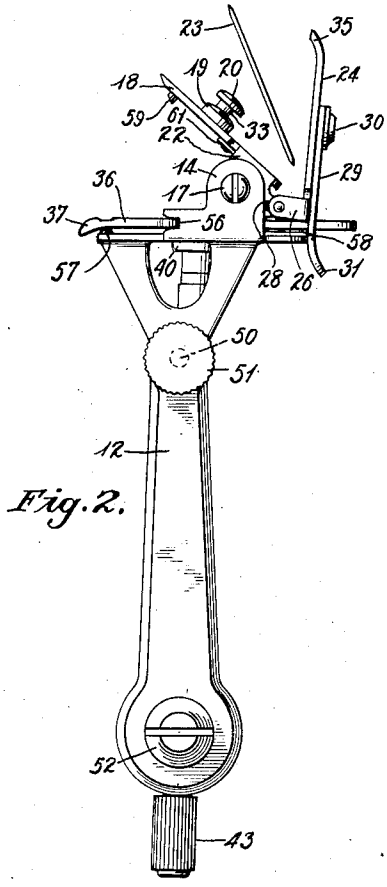


Fig. 2.

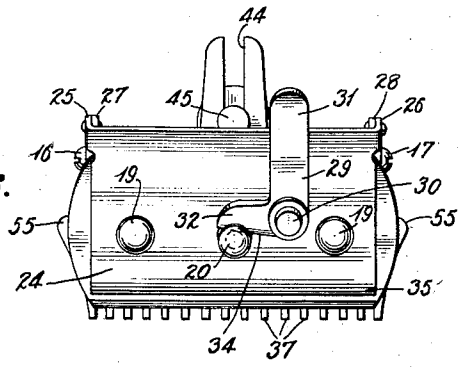


Fig. 3.

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SAFETY RAZOR

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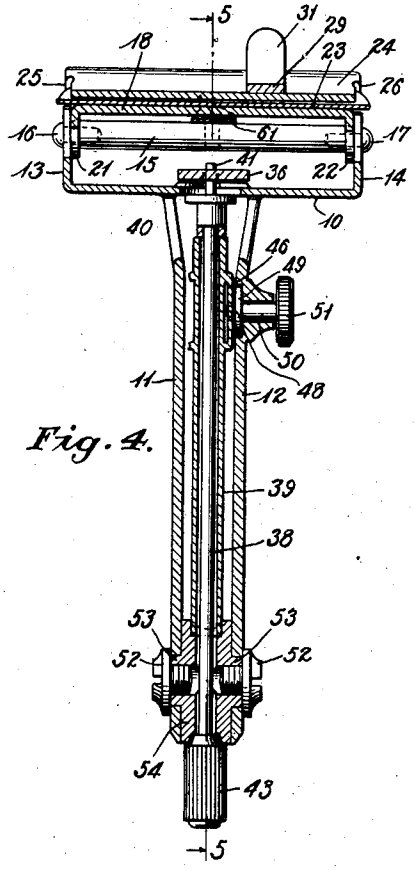


Fig. 4.

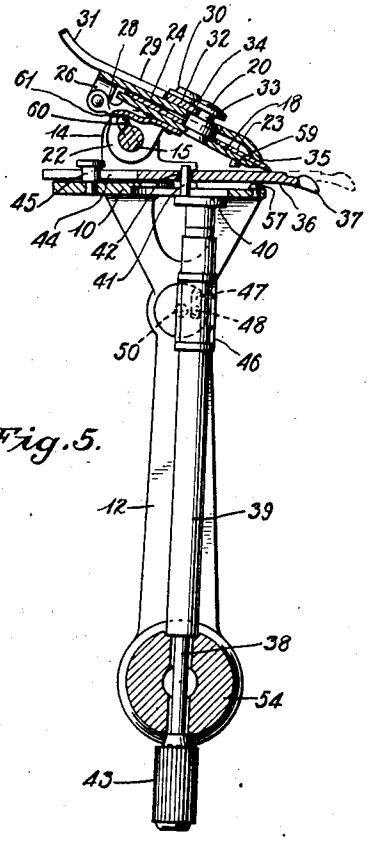


Fig. 5.

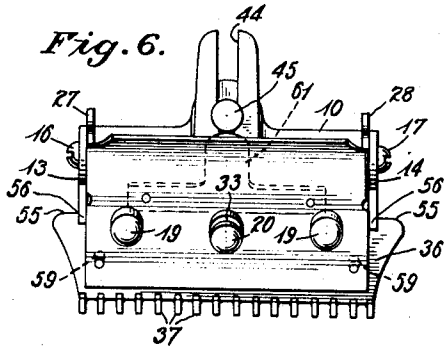


Fig. 6.

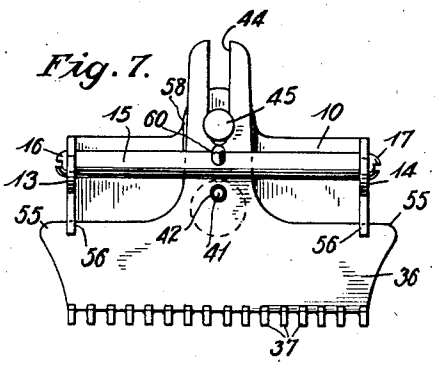


Fig. 7.

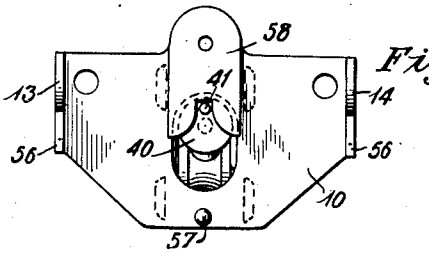


Fig. 8.

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Patented Oct. 18, 1932

1,883,324

UNITED STATES PATENT OFFICE

LOUIS V. ARONSON, OF NEWARK, NEW JERSEY

SAFETY RAZOR

Application filed December 27, 1930. Serial No. 505,123.

The invention relates to safety razors and has as an object the provision of a safety razor having self-contained means for sharpening the blade thereof.

It is a further object of the invention to provide a safety razor having a sharpening member hereinafter referred to as a hone, comprising a plate bearing the guard to coact with the blade in shaving upon an edge thereof.

It is a further object of the invention to provide a safety razor having a combined hone and guard plate with mechanical means to move the plate into position for sharpening the blade and from such position to the position wherein the guard coacts with the blade for the purpose of shaving.

It is a further object of the invention to provide a safety razor having means to preserve the proper relation between the guard and blade during shaving and to allow of tilting of the hone while the blade is being sharpened to ensure contact of the edge of the blade throughout its entire length with the surface of the hone.

It is a further object of the invention to provide a safety razor having means to support a flexible blade firmly upon both surfaces and to rigidly clamp the blade adjacent the edge between such holding means.

It is a further object of the invention to provide a safety razor having means to rigidly clamp upon both surfaces razor blades of widely varying character.

It is a further object of the invention to provide a safety razor having a movable combined hone and guard plate with means to positively prevent movement of the plate from shaving position to sharpening position while the device is in use for shaving.

It is a further object of the invention to provide a safety razor having a combined hone and guard plate which is readily removed from the structure for cleaning.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawings showing an illustrative embodiment of the invention and wherein:—

Fig. 1 is a side elevation;

Fig. 2 is a like view from the opposite side with the parts opened and the blade removed;

Fig. 3 is a plan view;

Fig. 4 is a vertical section on line 4—4 of Fig. 1;

Fig. 5 is a vertical section on line 5—5 of Fig. 4;

Fig. 6 is a plan view with the clamping plate removed;

Fig. 7 is a plan view with the entire blade holding assembly removed; and

Fig. 8 is a plan view with the hone and guard plate removed and with the sharpening motion producing mechanism in the position which it occupies while the razor is being used for shaving.

As shown the device comprises a frame plate 10 rigidly mounted upon handle members 11, 12. To pivotally support a blade holding assembly the frame plate 10 is shown as formed with upstanding ears 13, 14 between which is rigidly mounted a bar 15 held between said ears by means of screws 16, 17.

To support a blade, a base plate 18 carrying blade positioning studs 19, 20 is rotatably mounted upon the bar 15, the plate having downturned ears 21, 22 which are perforated to engage the bar 15 for the purpose. To clamp a thin blade 23 upon the base plate 18, there is shown a cap member 24 having downturned ears 25, 26 pivoted upon projecting portions 27, 28 carried by the base plate 18. To cause the cap plate to clamp the blade against the base plate, a latch member 29 is shown as pivoted at 30 upon the cap plate, which latch as shown is in the form of a bell crank having the finger engaging portion 31 and the latch projection 32 engaging a peripheral slot 33 in the projecting end of stud 20. A positive clamping action of the latch is provided by virtue of a cam surface 34 carried by the edge of projection 32 which squeezes into the slot 33 applying pressure upon the edge 35 of the cap plate against the blade adjacent its edge, which pressure is reacted against by the extreme edge of the base plate 18.

The cap plate 24 is shown as arched between its edges to ensure that the pressure

shall be applied closely adjacent the edge of the blade as described.

To sharpen the edge of the blade and to provide a guard for coaction with the edge of the blade in shaving, a combined hone and guard plate 36 is shown, the plate being provided with guard teeth 37 on its forward edge. To cause a lapping or oscillatory movement of the hone when used to sharpen the blade, there is shown a drive shaft 38 housed in a tubular member 39, the drive shaft carrying a disc 40 upon its upper end, which disc is provided with a crank pin 41 loosely engaging a perforation 42 in the hone plate.

To modify the motion of the hone plate imparted thereto by the crank pin 41 upon revolution of the shaft 38 by force applied to the knurled extremity 43 thereof, the hone plate is rearwardly extended and slotted as at 44, which slot engages a guide stud 45. By combined action of the crank pin 41 and the guide 45, the hone will be driven in such manner that all active points in its surface in contact with the edge of the blade will move in ellipses and since the major axes of these ellipses will be out of perpendicular to the edge of the blade, the motion of the hone will be predominantly parallel with the edge of the blade, thus tending to effectively prevent formation of a wire edge upon the blade.

To move the guard and hone plate from shaving to sharpening position, the tube 39 in which the drive shaft 38 is journaled is shown as carrying mounted thereon a plate 46 formed with a slot 47 coacting with a crank pin 48 carried by disc 49 driven by a shaft 50 journaled in the handle member 12 and driven by a knurled head 51 which may be manipulated by the thumb and finger of the user.

The slot 47 is shown as terminating downwardly closely adjacent the axis of the shaft 50, the result being that when the knurled head 51 is turned to project the hone and guard plate to the position shown in Fig. 5, the pin 48 will strike the bottom of the slot, thus limiting the outward movement of the hone plate.

During revolution of the knurled head 51, the tubular member 39, carrying with it the drive shaft 38, revolves about the common axis of cap screws 52 and about hollow internally screwthreaded bosses 53 carried by perforated disc 54. An end of the tube 39 engages in a countersink in the member 54 and the shaft 38 passes through the same.

To positively limit the rearward movement of the hone plate 36, the rear corners 55 thereof engage in stop members 56 formed upon forward projecting portions of ears 13, 14. Since the crank pin 41 cannot be revolved without producing a lateral oscillation of the hone plate, it is impossible to revolve the shaft 38 when the corners of the hone plate engage the said stops 56.

To assist in preventing rotation of the pin 41 while the hone plate is in shaving position as well as to center said pin in its retracted position, the forward portion of raised portion 50 is formed with a recess 62 in the path of movement of crank pin 41 when the plate is moved to shaving position. The sides of this recess are formed to cam the pin to the central rear position if not accurately so positioned when the hone plate is moved backwardly and to prevent any movement of rotation of the crank pin when fully seated in the recess.

To cause an even pressure of the edge of the blade upon the hone during the sharpening operation, the hone is shown as supported solely at a position below the center of the blade as by means of a stud 57, the hone being capable of rocking laterally about this stud if the edge of the blade tends to press unevenly thereupon, the rearwardly projecting portion of the hone plate being also centrally supported by means of the raised portion 58 of the frame plate 10.

To provide for an even relation of the edge of the blade to the guard while shaving, the base plate 18 is provided with a pair of studs 59, one adjacent each outer corner thereof, as clearly indicated in Fig. 6, which studs bear upon the hone and guard plate in the rear of the guards when the hone plate is retracted to bring the guard into action.

When the blade is clamped in the blade supporting assembly, pressure upon the rearwardly projecting portion 31 of the latch will elevate the blade holding assembly about the bar 15 and with the hone plate projected to the position of Fig. 5 and the shaft 38 revolved for greatest forward projection of the hone plate, the hone plate may be readily lifted off from the crank pin 42 and slipped out of the device for cleaning and may be as readily returned.

To cause pressure of the edge of the blade against the guard in shaving and against the hone in sharpening, the bar 15 is shown as provided with a projecting stud 60 coacting with the spring member 61 rigidly carried by the plate 18.

When the blade holding assembly is tilted to the position of Fig. 2, the spring 61 moves about the end of the stud to a position where it will hold the blade holding assembly in the elevated position shown in Fig. 2.

The operation of the device will be clear from the foregoing description and it will be seen that an exceedingly efficient sharpening position is given the hone, that the number of the parts is reduced to its lowest terms, that widely varying forms of thin flexible blades now on the market may be utilized in the device, and that each of said forms of blade will be rigidly clamped adjacent its

shaving edge to carry out the process of shaving in the most efficient manner. Also that a very efficient sharpening movement is given the hone and that the blade is rigidly carried in its correct relation of angularity to the surface of the hone while being sharpened.

The hone plate 36 may be formed of a wide range of materials, it being understood that the term "hone" is used in the foregoing description and in the following claims in the sense of any razor sharpening material suitable for this use including metals, glass, fine gritted stone, leather, or the like.

Minor changes may be made in the physical embodiment of the invention within the scope of the appended claims without departing from the spirit thereof.

I claim:

1. A safety razor comprising, in combination, a support, a blade mounted thereon, a hone plate having a plane honing surface and movably mounted on said support, guard teeth carried by an edge of said plate, means to move said plate from shaving to honing position and drive means carried by said support to cause relative movement between said blade and hone with the latter in honing position.

2. A safety razor comprising, in combination, a support, a blade mounted thereon, a hone plate having a plane honing surface and movably mounted on said support, guard teeth carried by an edge of said plate, means to move said plate from shaving to honing position, drive means carried by said support to cause relative movement between said blade and hone with the latter in honing position, means to prevent such relative movement while said plate is in shaving position and means to maintain said plate in honing position during said relative movement.

3. A safety razor comprising, in combination a support, a blade mounted thereon, a hone plate movably mounted on said support, guard teeth carried by an edge of said plate, means to move said plate from shaving to honing position, said means constructed and arranged to maintain said plate in shaving and honing positions respectively when moved thereto, drive means carried by said support to cause relative movement between said blade and plate while the latter is in honing position and means to positively prevent such movement while the plate is in shaving position.

4. A safety razor comprising, in combination, a support, a blade mounted thereon, a combined hone and guard plate movably mounted on said support, means to move said plate between fixed limits to shaving and honing positions and means carried by said support to cause relative movement between said blade and plate while the latter is retained at the honing limit of movement to honing position.

5. A safety razor comprising, in combination, a handle, a frame plate fixed thereon, a drive shaft, a crank pin operated thereby, a hone slidable on said plate and movable by means of said pin, a journal for said shaft, means to pivotally mount said journal on said handle for movement in an axial plane of the shaft, a lever pivoted on the handle to move said journal about its pivot whereby to move said hone between honing and shaving positions and a blade mounted on said plate with its edge in contact with the hone while in honing position.

6. A safety razor comprising, in combination, a support, a hone plate movably mounted thereon, guard teeth carried by an edge of said plate, a blade mounted in the support with its edge in position adjacent said guard and a path of movement of said hone, means to drive said hone to sharpen the blade, actuating means for said drive means, a movable mounting for said actuating means and means to move said mounting to shift said hone between shaving and honing positions.

7. A safety razor comprising, in combination, a support including a plate having an opening with a recess in one side thereof, a crank shaft mounted on said support in a journal movable between honing and shaving positions, a crank pin driven by said shaft to revolve in said opening, a hone slidable on said plate and having an opening engaging said pin, guard teeth carried by said hone, a blade mounted on said plate with its edge in position to coact with said guard teeth when said journal is in shaving position and to contact said hone in honing position of said journal, said pin entering said recess to prevent movement of the pin when revolved to position of greatest retraction of the hone and the journal is in shaving position.

8. A safety razor comprising, in combination, a support comprising a handle and a plate secured substantially perpendicularly thereto at an end thereof, an elongated journal pivoted to said handle adjacent its end remote from said plate, a shaft journaled upon said handle adjacent said plate, a crank pin driven by said shaft and engaging a slot formed in a wall of said journal axially thereof whereby movement of said crank oscillates said journal about its pivot, a drive shaft mounted in said journal, a crank pin carried by said drive shaft, a hone plate slidable on said plate and having an opening engaged over said last named pin, a blade mounted on said plate, the edge of the blade contacting the hone in one position of said first named crank pin.

9. A safety razor comprising, in combination, a hollow handle, a frame plate mounted

at an end thereof, a drive shaft extending within the handle, a journal for said shaft pivotally mounted in said handle remote from said plate, on an axis perpendicular to the axis of said shaft, finger engageable means carried by said shaft adjacent said pivot for drive thereof, a combined hone and guard plate slidably mounted on said plate, blade support means mounted on said frame plate to hold a blade to coact with said guard and hone respectively, means to cause honing movement of said combined plate when said shaft is revolved and means to move said shaft and combined plate between shaving and honing positions with movement of the shaft journal about its pivot.

10. A safety razor comprising, in combination, a frame, a combined hone and guard plate slidably mounted thereon, a blade holder mounted on said frame above said plate, said plate movable between honing and shaving positions, resilient means acting on said holder to press the edge of a blade carried thereby toward said plate and means carried by the holder contacting said plate when in shaving position to position the edge of the blade relative to the guard.

11. A safety razor comprising, in combination, a frame, a combined hone and guard carrying plate slidably mounted thereon, means to move said plate between honing and shaving positions, means to cause honing movement of the plate while in honing position, a blade mounted on said frame to coact with said guard in shaving and to contact said hone when in honing position and means carried by the frame to contact the rear edge of said plate in shaving position to align the guard and blade edge.

12. A safety razor comprising, in combination, a frame, a combined hone and guard carrying plate slidably mounted thereon, means to move said plate between honing and shaving positions, means to cause honing movement of the plate while in honing position, a blade mounted on said frame to coact with said guard in shaving and to contact said hone when in honing position and means rigidly carried by the frame overlying the rear edge of the plate in shaving position to prevent separation of the plate from the frame.

13. A safety razor comprising, in combination, a frame, a combined hone and guard carrying plate slidably mounted thereon, means to move said plate between honing and shaving positions, means to cause honing movement of the plate while in honing position, a blade mounted on said frame to coact with said guard in shaving and to contact said hone when in honing position and a flange carried by said frame at each side of the center thereof and standing in the rear of the rear edge of the hone plate, said flanges formed with forwardly open recesses providing portions overlapping the rear edge of the plate in shaving position and said rear edge then abutting the vertical portions of the recesses.

14. A safety razor comprising, in combination, a frame having an opening formed with a recess, a shaft journaled on said frame movable between honing and shaving positions, a crank pin driven by said shaft to revolve in said opening when the shaft is in honing position and entering said recess when said shaft is in shaving position to be locked from rotation, a hone plate having an opening engaged by said crank pin, and a blade mounted on said frame in shaving position and to be sharpened by said hone when the latter is in honing position.

15. The combination in a safety razor, of a pivotally mounted inner clamping plate, an outer clamping plate, a stud supported in one of said plates and projecting through a hole in the other plate, said stud being provided with a flange at its free end, a lever provided with a wedge-shaped end engageable under said flange and pivotally supported on said other plate, and an operating arm on said lever projecting beyond the edges of said plates for operating said lever to secure said plates together and to rock said plates about the pivotal support.

In testimony whereof I hereunto set my hand.

LOUIS V. ARONSON.