

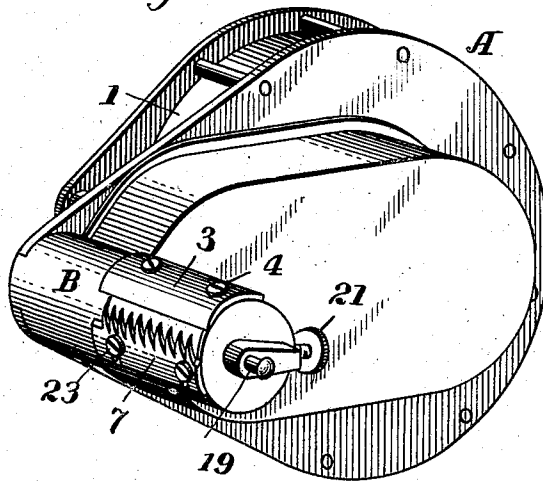
W. L. CROUCH.  
SHAVING APPARATUS.  
APPLICATION FILED FEB. 28, 1908.

907,974.

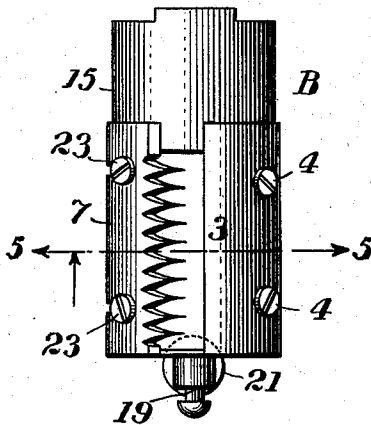
Patented Dec. 29, 1908.

2 SHEETS—SHEET 1.

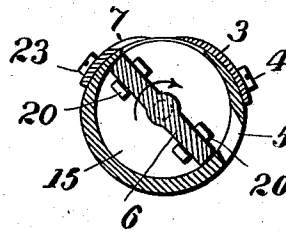
*Fig. 1.*



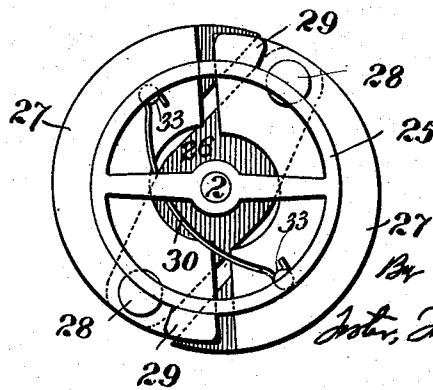
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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2 SHEETS—SHEET 2.

Fig. 2

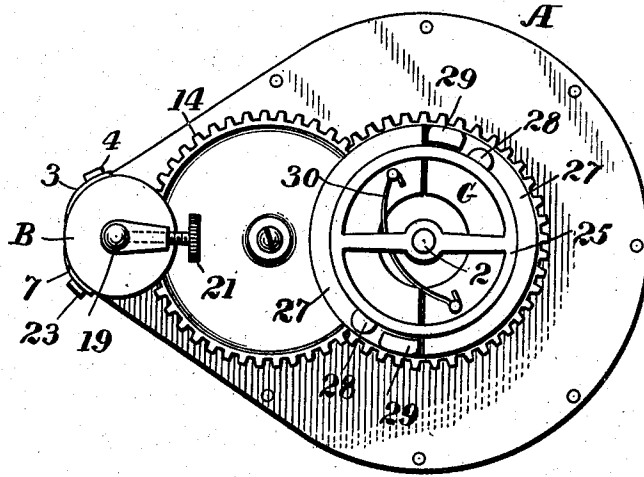
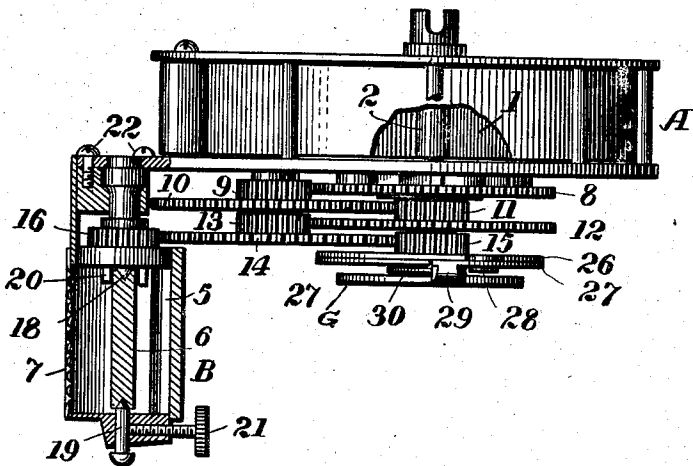


Fig. 3.



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# UNITED STATES PATENT OFFICE.

WALKER LEE CROUCH, OF BEAVER FALLS, PENNSYLVANIA.

## SHAVING APPARATUS.

No. 907,974.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed February 28, 1908. Serial No. 418,317.

### *To all whom it may concern:*

Be it known that I, WALKER LEE CROUCH, a citizen of the United States, residing at Beaver Falls, Pennsylvania, have invented certain new and useful Improvements in Shaving Apparatus, of which the following is a specification.

My invention relates to shaving apparatus, and especially of that class in which a motor is employed, although some of the parts may be used in shaving appliances where the cutting is effected by hand, and my invention consists of an apparatus in which there is a stationary cutter with a straight edge and a rotatable beater blade, together with means for supporting and operating and driving the parts, as fully set forth hereinafter and illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view of my improved apparatus; Fig. 2 a side view, the cap of the casing removed; Fig. 3 a plan of Fig. 2, in section, through the cylinder carrying the cutter; Fig. 4 a detached view, enlarged, of said cylinder; Fig. 5 a section on the line 5—5 Fig. 4; Fig. 6 an enlarged detached view of the governor.

The parts of the apparatus are supported by a frame or casing A, preferably inclosed to protect a spring 1, which serves, when wound up, to drive a shaft 2, but any other suitable character of motor may be employed. Preferably the casing A is so constructed that it may be readily supported in the hand and constitutes in effect the handle of the apparatus.

From one side of the casing A, near one end, extends laterally a hollow cylinder B, which supports the cutting means. As shown the cutting means consists of a cutter blade 3, having a sharp, straight edge, and supported by bolts 4 to project over a slot of the cylinder, with the said edge in close proximity to the path traveled by the edge of what I term a "beater" blade 6, which rotates about an axis that is parallel to the edge of the cutter blade 3. By this arrangement I avoid that character of shearing action which tends to cut the hair of the beard diagonally, forming sharpened projecting ends, such as results when an ordinary razor is

used, or where the cutters are of a character to first bend down and then shear the hairs while lying towards the surface of the skin. It will be seen on reference to Fig. 5 that the hairs projecting across the cutting edge of the cutter 3 are met by the side of the beater blade 6 which drives them towards the cutting edge, which is relatively stationary, and thereby shears them with a transverse cut close to the skin.

In order to permit the cutter blade to be pressed closely against the face without danger of the latter being wounded by the beater blade, I prefer to make use of a guard 7 having fingers projecting toward but separated from the edge of the cutter blade, the said guard, like the cutter blade, being arranged with its fingers in close proximity to the path traversed by the edge of the beater blade.

The beater blade is driven in any suitable manner from the shaft of the motor, and preferably, through a multiplying gear. As shown there is a series of toothed gears and pinions 8, 9, 10, 12, 13, 14, 15, 16, the gear 8 being connected to the shaft 2, and driving the gear 9 and the pinions 11 and 15 turning on said shaft, and the gear 14 driving a pinion 16, which latter turns about an axis concentric with the axis of the beater blade.

In order to avoid the effects of the wearing of a shaft carrying the beater blade, I mount the latter upon two pins 18, 19, with pointed ends fitting sockets in the ends of the beater blade, and one or both of these pins may be adjustable, constituting center pins about which the beater blade is rotated, and driven by means of lugs 20, projecting from the pinion 16, so as to bear against the side of the beater blade at one end. Preferably the pin 18 is fixed to and projecting at right angles from a plate of the casing A, while the pin 19 can slide longitudinally and is secured in place by a set screw 21.

In order to permit access to the parts of the cutting means, the cylinder B is preferably secured detachably to the casing A, and for this purpose it has at the inside a block which is recessed to receive the pin 18, and is secured to the plate of the casing by screws 22, as shown in Fig. 3.

Preferably the toothed guard 7 is adjustable, having slots through which may pass set screws 23 that bolt it to the exterior of the cylinder B with its fingers or teeth projecting into the slot of the cylinder. At the opposite side of the cylinder is another slot or opening 5 and this in connection with the use of a flat beater blade insures the discharge of the cuttings both by the centrifugal action of the said blade and by the air current resulting from its rotation.

In power driven razors, especially those in which springs are used as motive power, it is desirable to prevent a variation of speed, resulting from variations of power, and I therefore combine with the motor a suitable governor. As shown there is a governor G consisting of a ring 25, which may be a stationary ring secured to the end of the shaft 2, and a cross-plate 26, carried by the pinion 15, which turns freely on the shaft 2 and supports two curved levers 27, 27, each pivoted at 28 near one end to the plate 26, and having upon the short end a shoe 29, adapted to bear on the edge of the ring 25, when the long ends of the levers are swung outward by centrifugal action, so that any increase of speed causes an increased friction of the shoes against the ring, a uniform speed of the driven parts being thus secured. A spring 30 has hooked ends engaging studs 33 on the levers and serves to draw the long arms of the levers toward each other to swing the levers to carry the shoes away from the ring.

Without limiting myself to the precise construction and arrangement of parts shown, I claim:

1. The combination in a power-actuated razor, of a blade having a straight cutting edge, and a rotatable blade with a straight edge, the cutter blade arranged with its edge in close proximity to the path traversed by the edge of the rotatable blade.

2. The combination in a power-actuated razor, of a blade having a straight cutting edge, a rotatable blade with a straight edge, the cutter blade arranged with its edge in close proximity to the path traversed by the edge of the rotatable blade, and a slotted hollow casing supporting the cutter blade and inclosing the rotatable blade.

3. The combination in a power-actuated razor, of a blade having a straight cutting edge, a rotatable blade with a straight edge, the cutter blade arranged with its edge in close proximity to the path traversed by the edge of the rotatable blade, and a toothed guard arranged with its teeth extending toward the cutter blade with an intervening space.

4. The combination in a power-actuated razor, of a blade having a straight cutting edge, a rotatable blade with a straight edge, the cutter blade arranged with its edge in

close proximity to the path traversed by the edge of the rotatable blade, a toothed guard arranged with its teeth extending toward the cutter blade with an intervening space, and means for supporting the guard adjustably to and from the cutter blade.

5. The combination in a power-actuated razor, of a blade having a straight cutting edge, a rotatable blade with a straight edge, the cutter blade arranged with its edge in close proximity to the path traversed by the edge of the rotatable blade, a toothed guard arranged with its teeth extending toward the cutter blade with an intervening space, and a casing supporting the guard and cutter blade and inclosing the rotatable blade.

6. The combination in a power-actuated razor, of a cutting blade having a straight cutting edge, a rotatable blade with a straight edge coacting with that of the cutter blade, and a disk rotatable about the axis of the rotatable blade and provided with lugs for engaging the rotatable blade at one end.

7. The combination of a motor casing having a drive shaft extending laterally through the same, a motor within the casing connected to drive the shaft, a series of multiplying gears carried by said shaft, and a hollow cylinder B at right angles to said casing, a cutter blade supported thereby, a rotatable blade within the casing B, and means for driving said blade from one of the multiplying gears.

8. The combination with the motor, rotatable blade and cutter blade, of a multiplying driving gear between the motor and rotatable blade, and a governor arranged concentric with and controlling the speed of said gear.

9. The combination with a fixed cutter blade having a straight cutting edge, of a blade extending radially from an axis parallel to said edge, a fixed center pin having a pointed end fitting a socket at one end of the rotatable blade, a movable pointed center pin supporting the other end, and a driving pinion provided with lugs engaging one end of said blade.

10. The combination with the motor casing of a hollow cylinder extending laterally and detachable from said casing, a cutter and rotatable blade supported by said cylinder, and driving gears between the gear and the rotatable blade.

11. The combination with the motor casing of a pin extending laterally from said casing, a hollow cylinder supported detachably on said pin, a rotatable blade in said cylinder having a bearing on one end of said pin, and a center pin supporting the other end of said rotatable blade.

12. The combination with the rotatable flat blade and with a cutter blade of a cylinder inclosing the rotatable blade and support-

ing the cutter blade and provided with a slot through which the cuttings may be driven by the rotatable blade.

13. The combination in a power driven razor, of cutting devices, a motor, an intermediate shaft and driving gear, and a governor arranged to act on said gear shaft.

In testimony whereof I affix my signature in presence of two witnesses.

WALKER LEE CROUCH.

Witnesses:

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ARTHUR L. BRYANT.