M. C. SHARPNACK.

SAFETY RAZOR.

APPLICATION FILED NOV. 27, 1917.

1,298,802.

Patented Apr. 1, 1919.

2 SHEETS—SHEET 1.

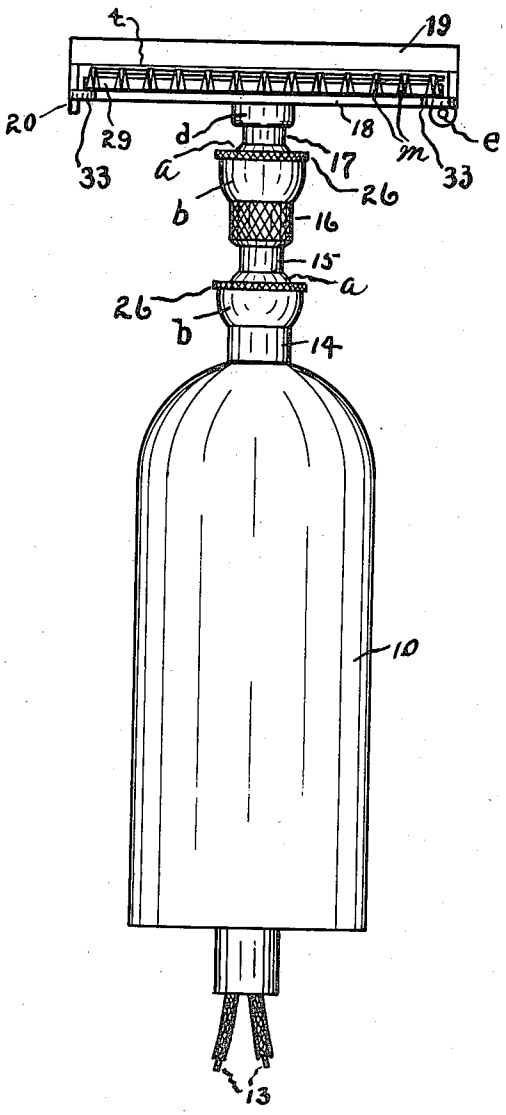

Fig. 1.

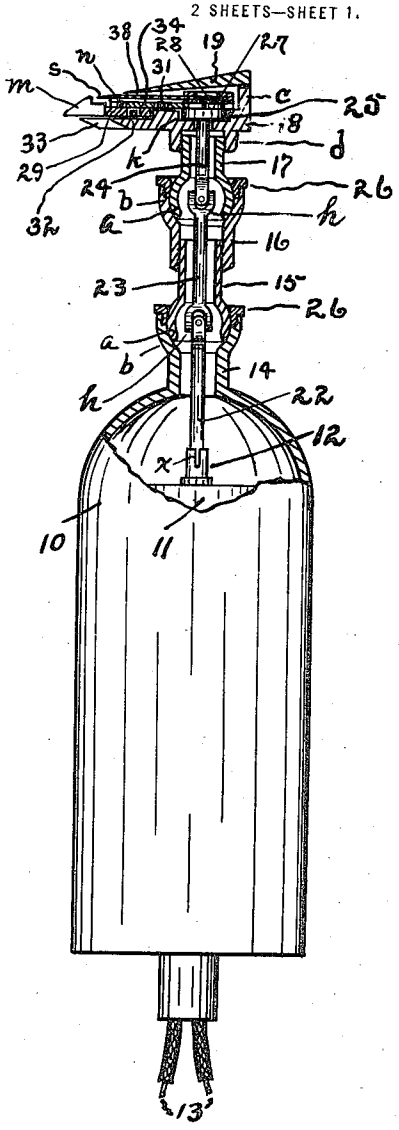

Fig. 2.

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2 SHEETS—SHEET 2.

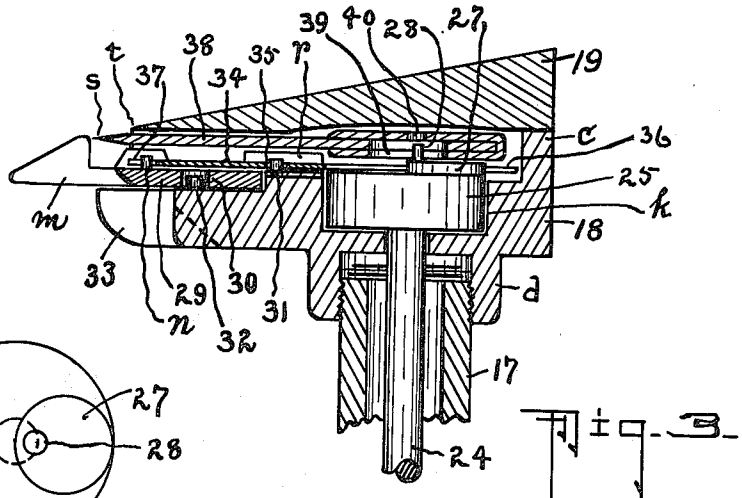

Fig. 3.

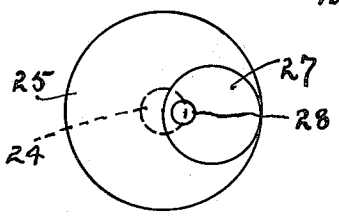

Fig. 4.

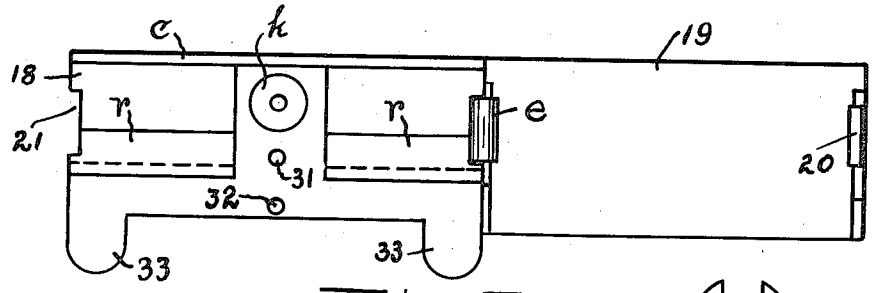

Fig. 5.

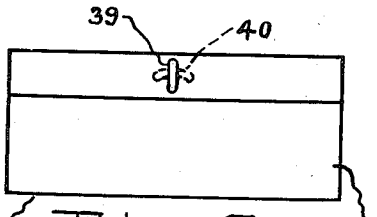

Fig. 8.

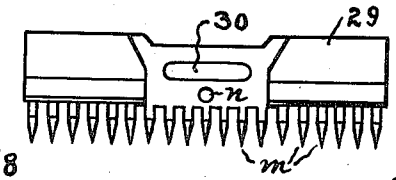

Fig. 6.

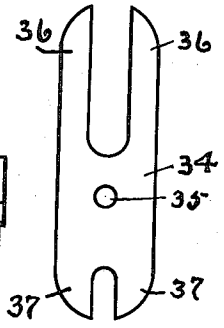

Fig. 7.

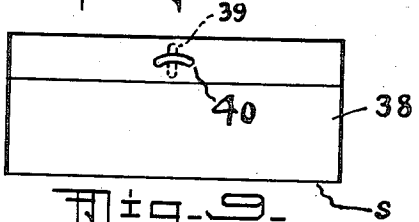

Fig. 9.

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UNITED STATES PATENT OFFICE.

MATTHEW C. SHARPNACK, OF JAMISON, NEBRASKA, ASSIGNOR OF TWO-THIRDS TO WILBUR V. BENNETT, OF OMAHA, NEBRASKA.

SAFETY-RAZOR.

1,298,802. Specification of Letters Patent. Patented Apr. 1, 1919.

Application filed November 27, 1917. Serial No. 204,138.

To all whom it may concern:

Be it known that I, MATTHEW C. SHARPNACK, a citizen of the United States, residing at Jamison, in the county of Keyapaha and State of Nebraska, have invented certain new and useful Improvements in Safety-Razors, of which the following is a specification.

This invention relates to an improvement in safety razors, and has for its object, broadly, to provide a shaving implement which will be convenient in use and durable, and may be economically manufactured. One of the specific objects in view is to provide means for reciprocating the guard longitudinally, another object being to reciprocate the shaving blade, the construction to be such that this blade may be maintained parallel with its frame and guard while moving in directions opposed to the guard, and may be so adjusted that it may have a limited swinging movement when reciprocated. Another specific object is to provide such a construction that the shaving blade may be disposed at any desired inclination with reference to the handle.

The invention includes the combination with the base upon which the guard and shaving blade are mounted, of a rock-lever mounted upon the base and engaging the guard, a tubular handle for containing an electric motor, a tubular flexible shank having a part rigid with the base and containing a flexible shaft for a connection with the shaft of the motor, a cam on the flexible shaft for actuating the rock-lever, and a projection on the cam for actuating the shaving blade, the guard and shaving blade thereby moving in directions opposed to each other, this being a great advantage in operation, and, on account of the construction, a limited transverse swinging movement of the shaving blade being also effected, which is a further advantage in the operation of shaving.

With the foregoing objects in view and others to be mentioned hereinafter, the invention presents a novel construction, combination and arrangement of parts as described herein and claimed, and as illustrated in the accompanying drawing, it being understood that minor changes may be made as may be found to be of advantage, without departing from the spirit of the invention or sacrificing any of its advantages, the scope of the invention being determined by the claims.

In the accompanying drawing which illustrates one embodiment of the invention, Figure 1 is a side view of the device, and Fig. 2 is a similar view, a part of the handle and the entire shank for the handle being in section, the frame or housing for containing the guard-plate and the shaving blade being in transverse section.

Fig. 3 is an enlarged, sectional detail relating to Fig. 2. Fig. 4 is an enlarged plan view showing the cylindrical head of the operating shaft, together with its cam and projection. Fig. 5 is a plan view of the frame, its hinged cap being swung outwardly. Fig. 6 is a plan view of the guard-plate. Fig 7 is a plan view of the rock-lever. Figs. 8 and 9 are views showing the respective sides of the shaving blade.

Referring now to the drawing for a more particular description, numeral 10 indicates a tubular handle adapted to contain an electric motor 11 having a shaft 12 to be rotated by electrical energy from any source suitably applied, conductors 13 being shown in this connection. However, I may employ other means, electrical or otherwise, for causing a rotatable movement of the shaft 12.

The handle is provided with a flexible shank, consisting of any desired number of tubular sections, as indicated at 14, 15, 16 and 17, the sections 15 and 17 having parts spherical in form, as indicated at *a* for engaging in the sockets *b* of the respective sections 14 and 16, as best shown in Fig. 2.

A frame or container is employed to provide bearings and also to provide a housing for certain operating parts, said frame consisting of a base-plate 18 preferably having an upset flange *c* at its rear, longitudinal edge, its lower side being provided with an apertured boss *d* having a threaded connection with section 17 of the shank, said frame also being provided with a lid or cap 19 hingably connected at one of its ends with an end of the base-plate, as indicated at *e*, the end of the cap, opposite to the hinge, preferably being provided with a clasp or latch 20 for engaging the end of the base-plate when disposed in a recess 21 which is formed in said base-plate, the movable feature thus provided being convenient when access is desired to certain operating parts which are disposed upon the base, below said

cap, the cap also tending to maintain said operating parts in normal engagement.

As thus described, the base-plate 18 and parts mounted thereon may be disposed at any desired angle with reference to the handle, this being of great advantage during the operation of shaving. A flexible operating shaft is employed and disposed in the shank, and as indicated at *x* is removably connected with the shaft 12, said operating shaft consisting of the sections 22, 23 and 24, these sections being connected by the universal couplings *h*, as best shown in Fig. 2, the shaft-section 24 being provided with a cylindrical head 25 disposed normally in the recess *k* of the base 18.

It will be appreciated that the parts thus described may be readily assembled, and when necessary may be conveniently disconnected, the sockets *b* of members 14 and 16 being provided with ring-couplings 26 threaded therein for bearings upon the parts *a* of the sections 15 and 17, and during operation, the cylindrical head 25 will rotate within the recess *k* without appreciable vibration regardless of the degree of inclination of the base 18 with reference to the handle, the universal couplings mentioned being disposed centrally of the spherical parts *a* and centrally of the sockets *b*.

The cylindrical head 25 of the section 24 of the operating shaft is provided with a circular cam 27, its axis being non-concentric with the axis of the shaft-section 24 and cylindrical head 25, and the cam is provided with a projection or pivot-pin 28 which is also non-concentric with the axis of the shaft-section 24 and axis of the cam.

The guard which is employed consists of a plate 29 provided with numerous fingers *m* at one of its edges, as best shown in Fig. 6, said plate being provided adjacent to the fingers and midway between its ends with an upwardly projecting pivot *n*, and also provided longitudinally thereof, adjacent to the pivot *n*, with a slot 30.

The base-plate 18 is provided, as best shown in Figs. 3 and 5, with a pair of ridges *r*, these being disposed longitudinally of said base-plate and in alinement with each other. The base-plate is also provided, midway between the inner ends of the ridges *r* with a pivot-pin 31, and adjacent thereto and outwardly thereof with an additional pivot-pin 32. Numerals 33 indicate a pair of ledges or extensions with which the base-plate is also provided, these extensions being disposed at the ends to project transversely and forwardly from said base-plate.

The guard is adapted to be disposed upon that part of the base-plate 18 outwardly of the ridges *r* and upon members 33, its slot 30 receiving the pivot-pin 32 of the base-plate.

In order that the guard may be reciprocated longitudinally while disposed as mentioned, a rock-lever 34 is provided, said lever consisting of a flat plate best shown in Fig. 7, having an aperture 35 between its ends for use in connection with its pivotal mounting, and provided at its respective ends with the pairs of prongs 36 and 37.

The pivotal mounting of the rock-lever is upon the pin 31 of the base-plate, its pair of prongs 36 engaging opposed parts of the periphery of the cam 27 and its pair of prongs 37 engaging opposed sides of the pivot *n* of the guard-plate, and it will be understood that the rotatable movement of the operating-shaft will cause the guard to be reciprocated longitudinally, said guard being supported upon the plate 18 and extensions 33.

The rectilinear cutting edge of the shaving blade 38 is indicated at *s*, and in order that this blade may be reciprocated longitudinally it is provided with a transverse slot 39 in one of its sides near its rear edge, for engagement therein of the pivot-pin 28 of the cam 27, the longitudinal movements of the blade being limited to a distance substantially equal to the diameter of the cam, said movements being in directions opposite to the movements of the guard-plate. One of the benefits to be derived by this construction is that the cutting is performed by the blade while moving longitudinally of the guard-plate instead of at right-angles thereto, said blade moving in directions transverse to the fingers *m* of the guard-plate. Also the shaving blade will effectively perform its functions with a lesser degree of sharpness than by any construction not having this movement, and the shaving blades, on account of this movement remain in a sharpened condition for longer periods than usual.

Numeral 40 indicates a slot formed in the blade longitudinally thereof for receiving therein the pivot-pin 28, the last named slot being formed in that side of the blade opposite to the slot 39 and having a limited curvature, the result, during operation, being that the blade will have a limited swinging movement from the rotatable movement of the operating-shaft, parts of the cutting edge *s* being disposed outwardly from the convergent edge *t* of the cap 19, farther than other parts thereof, during each rotation of the operating-shaft, which greatly facilitates the operation of shaving.

When it is desired that the shaving blade shall have a limited swinging movement instead of the limited longitudinal reciprocation, an operator, after detaching the latch 20 from the base-plate, may cause the cap to swing to the position shown in Fig. 5, and the blade 38 may then be readily inverted for that purpose, the pin 28 then engaging in the slot 40; and the parts are so proportioned that when the cap is closed, the operating parts, while removably connected,

will be maintained in connected relation between the base-plate and cap, and the reciprocation of the guard-plate and shaving blade, as above described, will not be accompanied by appreciable vibration.

It will be noted that the parts employed are few and simple, considering the several movements effected for the shaving blade and guard, all of these movements being automatic so far as any attention of an operator is concerned. The movements of these parts, as to length, may of course be decreased or increased by employing a cam of lesser or greater diameter, the pin 28 being disposed at lesser or greater distances from the axis of the shaft which causes actuation.

Having fully described my invention, what I claim and desire to secure by Letters Patent is,—

1. In a safety razor, a handle provided with a tubular shank, a base-plate removably mounted on the shank and provided with a recess, a shaft within the shank, said shaft having a cylindrical part disposed in said recess and provided with a cam and a projection, a guard-plate on the base-plate, a rock-lever mounted on the base-plate in engagement with the cam and guard-plate, a shaving blade on the base-plate in engagement with said projection, said cam and projection being non-concentric with the axis of the shaft for causing reciprocation of the guard-plate and shaving blade.

2. In a safety razor, a tubular handle provided with a shank, a base-plate provided with a recess and mounted on the shank, a shaft within the shank, said shaft having a cylindrical part disposed in the recess of the base-plate, a rock-lever mounted on the base-plate engaging the cam and guard-plate, an elongated shaving-blade on the base-plate, said blade having a slot formed in one of its sides at substantially right-angles to its longitudinal axis engaged by said projection, a cap connected with the base-plate for covering a part of the shaving-blade, said shaft being revoluble to cause longitudinal reciprocation of said guard-plate and shaving-blade.

3. In a safety razor, a handle having a shank provided with an apertured base-plate, a revoluble shaft provided with a cam and a projection, said shaft being carried by the handle and shank and having a part disposed in the aperture of the base-plate, a guard-plate on the base-plate, a shaving blade engaging the base-plate and having a slot engaged by said projection, a rock-lever engaging the cam and guard-plate and mounted on the base-plate, the cam being non-concentric with the axis of the shaft for causing reciprocation of the guard-plate by the revoluble movements of the shaft, and the projection being non-concentric with the axis of the shaft for causing reciprocation of the shaving blade by said revoluble movements of said shaft.

4. In a safety razor, a handle member provided with an apertured base-plate, a revoluble shaft traversing the base-plate and carried by the handle and provided with a cam, a guard-plate on the base-plate, a shaving blade on the base-plate, a rock-lever engaging the cam and guard-plate and mounted on the base-plate, said cam being non-concentric with the axis of the shaft for causing reciprocation of the guard-plate by the revoluble movements of the shaft.

In testimony whereof, I have affixed my signature in presence of two witnesses.

MATTHEW C. SHARPNACK.

Witnesses:

HIRAM A. STURGES,

ARTHUR H. STURGES.