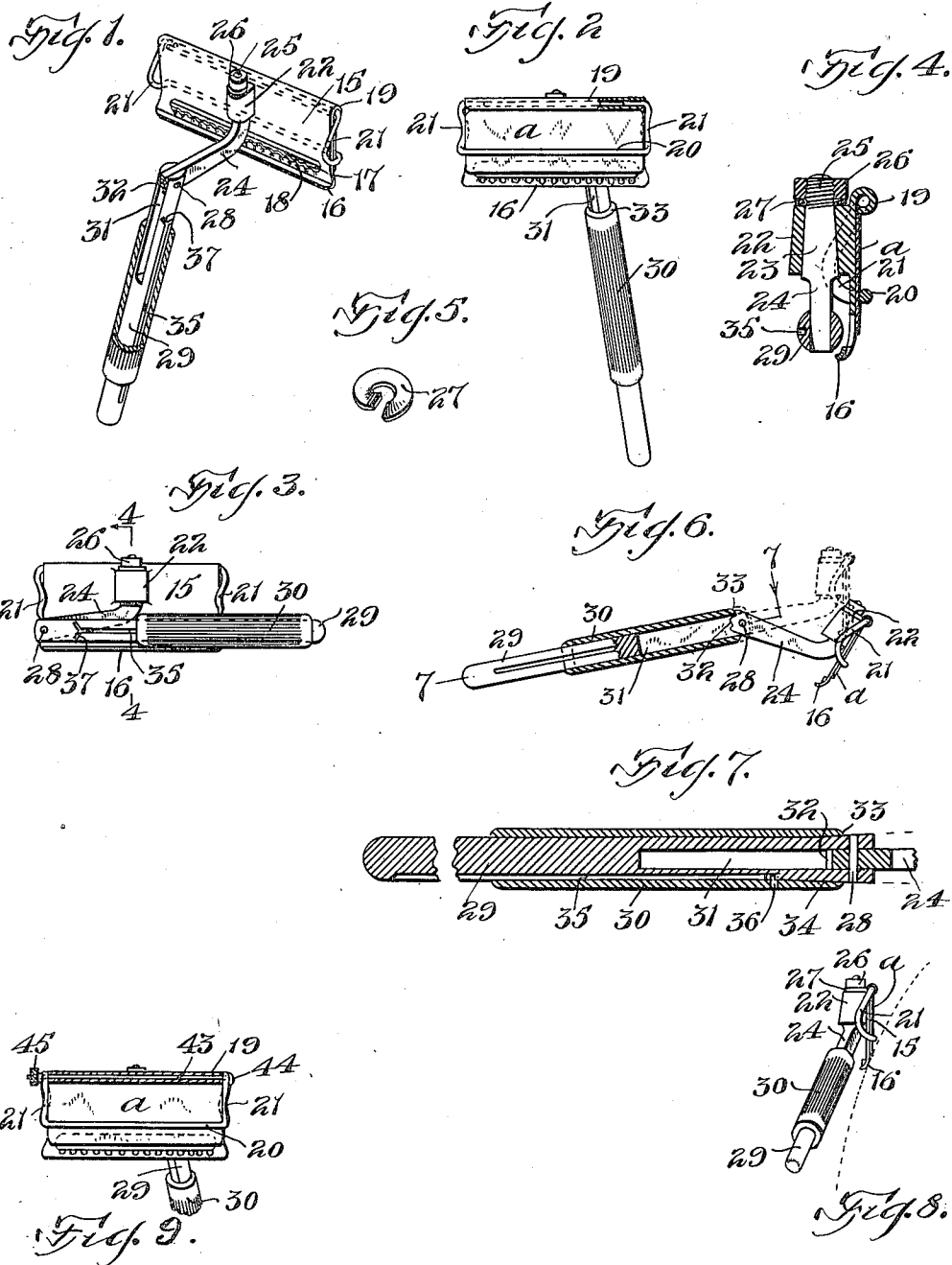


H. CHRISTIANSEN.
SAFETY RAZOR.
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Patented Feb. 13, 1912.



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UNITED STATES PATENT OFFICE.

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SAFETY-RAZOR.

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To all whom it may concern:

Be it known that I, HANS CHRISTIANSEN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Safety-Razors, of which the following is a specification.

This invention relates to razors of the type known as safety razors, and has particular reference to implements of this character of a type designed to enable the blade-holder and blade to be adjusted relatively to the handle.

One of the objects of the invention is to provide a safety razor having means whereby the blade can be adjusted at various angles relatively to the handle.

Another object is to provide a safety razor having means whereby it can be folded into an exceedingly small compass.

Another object is to provide improved means for clamping the blade against the holder so that it can be quickly removed, and quickly and firmly secured in position.

With these and other objects in view, the invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

Of the accompanying drawings,—Figure 1 is a perspective view of a safety razor constructed in accordance with my invention, the view being from the rear of the blade-holder, the handle being broken out. Fig. 2 is a perspective view looking from the front of the blade-holder. Fig. 3 is a plan view of the razor folded. Fig. 4 is an enlarged sectional detail of the friction joints between the handle-arm and the blade-holder. Fig. 5 is a detail perspective view of the spring washer used in connection with the friction joint shown in Fig. 4. Fig. 6 represents a longitudinal sectional view through the razor, and showing by full and dotted lines two adjustments. Fig. 7 represents a section on line 7—7 of Fig. 6, but on a larger scale. Fig. 8 is a perspective view of the razor when adjusted to position to use it in a manner of holding similar to that of an ordinary razor. Fig. 9 is a front elevation, partly in section, of another modification in the mounting of the blade clamp.

All of the figures of the drawing, excepting Figs. 4 and 7, are substantially full size.

Similar reference characters indicate the same or similar parts in all of the views.

Referring first to the embodiment of the invention illustrated in Figs. 1 to 8, inclusive, the blade is indicated at *a*. Preferably, this blade is of exceedingly thin steel and having but one sharpened edge. I do not limit myself, however, to the particular type of blade illustrated, since any other well known form of blade might be employed, provided such blade be of a size to fit the holder. The blade-holder 15 is of sheet metal and preferably flat, excepting at its front and rear edges, its front side being adapted to support a flat blade and being wider than the blade, and its front edge portion being curved rearwardly, as at 16. The curved edge portion of the holder is formed with a longitudinal slot 17, and while the extreme edge of the curved portion is preferably smooth, so as to form practically a straight part to move easily over the skin, the part thereof which forms the outer edge of the slot 16 is corrugated as at 18 to more readily permit lather and severed hair to pass the guard and escape through the slot 16. The corrugated edge of the slot is offset inwardly from the blade-supporting side by the curvature of the said edge portion of the blade. The rear edge of the blade-holder 19 is provided with hinge members, as by rolling the piece of sheet metal over, as best indicated in Fig. 4. Pivottally mounted in this rolled over edge 19 is a wire clamp 20, said clamp having a straight elongated portion to bear against the outer surface of the blade *a*, and bent end portions or arms 21, the extremities of which are bent inwardly to form hinge members or pintles, which are inserted in the rolled edge 19 to form hinges on which the clamp may be swung, and portions of the arms 21 being curved, this curvature being not only rearwardly, as best shown in Fig. 4, but also curving somewhat inwardly or toward each other behind the end edges of the holder 15, as shown in Figs. 2 and 3. When the blade *a* is laid against the holder 15 with one edge against the thickened or rolled over portion 19, the clamp having been previously swung outwardly, said blade may then be quickly and firmly locked in place by the return of the clamp to the position shown in Figs. 3 and 4, the curved arms 21 of the clamp snapping past the end edges of the blade-holder. The curved arms 21 are so formed that when the clamp is in the position illustrated, the

straight elongated part thereof will bear firmly against the outer face of the blade and be locked in that position. To release the blade it is only necessary to press outwardly on the curved arms 21 so as to swing the clamp on its pivot in the rolled edge 19, the outward pressure being sufficient to spread the arms 21 outwardly as they pass the end edges of the holder 15. The said end edges constitute rigid locking members, while the curved arms 21 constitute resilient or yielding locking members adapted to cooperate with said rigid members in locking the clamp in its blade-securing position.

Suitably connected with the rear face of the holder 15 is a hinge socket 22 (see Figs. 1 and 4), the orifice of which is tapered to fit a tapered hinge pintle 23 of an inner handle member 24, the end of said pintle 23 being threaded as at 25, to receive a nut 26. Between the nut and the end of the socket 22 is a spring washer 27, the construction being such as to constantly exert a tendency to draw the tapered pintle 23 into the tapered socket orifice to exert sufficient friction to hold the socket 22 on the pintle 23 and yet permit the socket to be turned when it is desired to adjust the angle of the blade-holder relatively to the handle. In practice I find that this tapered joint enables sufficient friction to be obtained to hold the blade-holder with sufficient firmness at any angle at which it is desired to use the razor. It will be noted that the axis of the socket of bearing 22 is in a plane parallel with the plane of the blade-supporting portion of the blade holder and at right angles to the longitudinal axis thereof. The other end of the handle member 24 is connected by a pivot or hinge pintle 28 with an outer handle member 29, said outer member having a sleeve 30 that is longitudinally adjustable for a purpose presently described. The outer member 29 is slotted as at 31, and the end of the inner member 24 extends into said slot. This slot 31 is of a length to permit the greater portion of the member 24 to fit within it when the sleeve 30 is slid along and the parts occupy the folded position shown in Fig. 3. The end of the member 24 within the slot 31 is formed as a toothed segment 32, either of the recesses between the teeth being adapted to be engaged by a thin or sharpened edge or tooth 33 at the end of the sleeve 30, when said sleeve is adjusted to the position shown in Fig. 6. In order that the sleeve 36 will remain in the position indicated in Fig. 6, the end of the outer member 29 is slightly tapered as at 34 (see Fig. 7,) the inner surface of the sleeve 30 being also preferably slightly tapered, so that when the sleeve is slid along to the position shown in Figs. 6 and 7, it will bind frictionally in that position, and by reason of its edge or tooth 33 engaging the toothed segment of the member 24, hold said member 24 in either one of several positions, as indicated by comparison of the full and dotted line positions of the member 24, shown in Fig. 6. To disengage the sleeve from the last mentioned position, to permit the angle of the member 24 to be varied, or to permit the razor to be folded up, as shown in Fig. 3, the sleeve is slidable on the member 29 and may be moved to the position shown in Figs. 1 and 3. To prevent the sleeve from slipping entirely off the member 29, the latter may be provided with a longitudinal groove 35, into which a pin 36 projects from the sleeve 30. The inner handle member 24 extends at an angle with its pintle 23, so that the inner member is adapted to either project outwardly from the back of the holder at an angle with the cutting edge of the blade, as shown by Fig. 1, or to extend beside the back of the holder and approximately parallel with the cutting edge, as shown by Fig. 3. It will be seen that two hinges are provided, one formed by the socket 22 and pintle 23, and having its axis substantially at right angles with the cutting edge of the blade *a*, while the other is formed by the pivot or pintle 28, and the end of the inner handle through which said pintle passes, the axis of the last mentioned hinge being substantially at right angles with the axis of the other hinge. This arrangement of hinges and the means provided for locking the two handle members together permit the following adjustments: First, when the handle members are interlocked the entire handle may be either extended backwardly from the holder to permit the razor to be used as a hoe; secondly, the entire handle (its members being interlocked) may be extended beside the back of the holder, the handle being in a plane approximately parallel with the cutting edge of the blade, and the outer end of the handle projecting from one end of the holder and blade so that the razor may be used like an ordinary razor. In either of these adjustments the handle members may be adjusted to form an angular handle, as shown by full lines, or a straight handle, as shown by full and dotted lines, (Fig. 6). Thirdly, the handle members being unlocked, the handle may be folded to materially reduce its length, as shown by Fig. 3, and swung inwardly against the back of the holder, thus enabling the razor to be packed in a relatively small case. When the handle is adjusted as shown in Fig. 3, the curved edge portion 16 of the holder projects partly across the outer side of the outer handle member, as shown by Fig. 4, and acts as a detent to prevent the unfolding of the handle. If it be desired that the member 24 shall occupy a position in alinement with the member 29, the tooth or edge 33 of the

sleeve is simply caused to extend outside of the last tooth of the segment 32, as indicated by dotted lines in Fig. 6. The adjustments described enable the razor to be handled or used very much in the same manner as an ordinary razor not of the safety type. This adjustment is shown in Fig. 8, where the parts occupy almost the position shown in Fig. 3, excepting that the outer handle member, when in the position of Fig. 8, is swung around into alinement with the inner member, instead of being folded against the latter, as shown in Fig. 3.

In Fig. 9 the blade clamp is practically the same as in the structure illustrated in Figs. 1 and 2, excepting that instead of the ends of the wire forming the pivots by extending into the rolled edge 19, the ends of the wire forming the spring clamp are formed with openings to receive a pintle 43, having a head 44 at one end and mounted in the rolled edge 19 of the blade-holder, a nut 45 being employed to hold the pintle in place.

As indicated in Fig. 1, the end of the groove 35 branches as at 37 both to the right and to the left, these branches not being at a right angle to the main portion of the groove 35, but nearly so, so as to act as cam grooves or branches to co-act with the pin 36 to force the sleeve positively to position to lock the arm 24 as hereinbefore described. When the sleeve 30 is slid from the position shown in Fig. 1 to the upper end of the groove 35 and then turned either to the right or left, the pin 36 travels along one of the cam branches 37 to force the interlocking edge or tooth 33 of the sleeve to position to lock the member 24.

In each of the above-described embodiments of my invention relating to the blade-clamping means, the clamp is permanently connected with the blade holder in such manner that it is adapted to move toward and from its blade-securing position, the holder and clamp being provided with co-operating hinge parts or members permitting these movements of the clamp. The clamp and holder are also provided with co-operating locking means which automatically hold the clamp positively in its blade-securing position and permit the displacement of the clamp by the application of pressure tending to separate the elements of said locking means. The holder equipped with a clamp and connecting and locking means therefor characterized as above stated, is adapted to be made in either of the simple and compact forms illustrated, the construction co-operating with the handle construction in reducing the device to a compact form for storage and in effecting any desired relation between the handle and blade desired to permit the razor to be manipulated in various ways and particu-

larly with the handle extending approximately lengthwise of the cutting edge.

The arms 21 included in the form of clamping member shown by Figs. 1, 2, 3, 4, 6, 8 and 9, by reason of the fact that they project across the ends of the holder and outwardly from its inner side, constitute push pieces whereby the elongated clamp 20 may be forced away from the holder to release the blade. Said arms also constitute stops which bear against the opposite ends of the blade and prevent endwise displacement thereof in either direction.

I claim:—

1. A safety razor comprising a blade holder, a handle pivoted to the back of the blade holder in a plane parallel with the plane of the blade supporting portion and at right angles to the longitudinal axis of the blade holder, whereby said handle may swing into a position parallel with said axis, and means for permitting adjustment of the relative angle of said blade holder and handle when the parts are swung into parallel position.

2. A safety razor comprising a blade holder, an angular arm pivoted to the back of the blade holder in a plane parallel with the plane of the blade supporting portion and at right angles to the longitudinal axis of the blade holder, said arm having a member adapted to extend parallel with said axis, and a handle pivoted to said member to permit relative angular adjustment of said handle and arm irrespective of the relative positions of said arm and blade holder.

3. A safety razor comprising a blade holder, an angular arm pivoted to the back of the blade holder in a plane parallel with the plane of the blade supporting portion and at right angles to the longitudinal axis of the blade holder, said arm having a member adapted to extend parallel with said axis, a handle pivoted to said member to permit relative adjustment of said handle and arm irrespective of the relative position of said arm and blade holder, and means for interlocking said arm and said handle in different relative positions.

4. A safety razor comprising a blade holder, an angular arm pivoted to the back of the blade holder in a plane parallel with the plane of the blade supporting portion and at right angles to the longitudinal axis of the blade holder, said arm having a member adapted to extend parallel with said axis, said member having a notched outer end, a handle pivoted to said member to permit relative angular adjustment of said handle and arm irrespective of the relative position of said arm and blade holder, and means for engaging said notched end to lock said arm and handle in different relative positions.

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5. A safety razor comprising a blade holder, an angular arm pivoted to the back of the blade holder in a plane parallel with the plane of the blade supporting portion and at right angles to the longitudinal axis of the blade holder, said arm having a member adapted to extend parallel with said axis, said member having a notched outer end, a handle pivoted to said member to permit relative angular adjustment of said handle and arm irrespective of the relative position of said arm and said blade holder, and a slidable sleeve mounted on said handle and adapted to engage said notched end to lock said arm and handle in different relative positions.

6. A safety razor comprising a blade holder provided with a rearwardly curved edge portion, a handle, and a pivot connecting said handle and said holder and extending transversely of the latter whereby said holder may be swung parallel with said handle or at right angles to the latter in shaving, said curved edge portion serving as a detent to engage the handle when the latter is parallel with the blade holder.

7. A safety razor comprising a substantially flat blade holder, an elongated clamping member formed of wire having its ends pivotally supported in said blade holder and adapted to secure a flat blade against one side of the latter, portions of said wire being curved to form stops to prevent endwise movement of the blade, said wire being also provided with means for frictionally engaging said blade holder.

8. A safety razor comprising a substantially flat blade holder, an elongated clamping member formed of a wire having its ends pivotally supported in said blade holder and adapted to secure a flat blade

against one side of the latter, portions of said wire at each end of said clamping member being curved to form stops to prevent endwise movement of the blade, said curved portions being also bent toward each other to frictionally engage the adjacent edges of the blade holder.

9. A safety razor comprising a substantially flat blade holder, an elongated clamping member adapted to secure a flat blade against one side of the latter and having arms at its ends pivotally supported in said blade holder, and said arms forming stops to prevent endwise movement of the blade, and push pieces whereby the clamp may be displaced.

10. A safety razor comprising a blade holder having a rearwardly projecting tapered socket the axis of which is in a plane parallel with the blade holder and at right angles to the longitudinal axis thereof, a handle having a taper pintle projecting from one end at an angle thereto and formed to fit said socket, the pintle having at its smaller end a screw threaded portion which projects from the smaller end of the socket, a nut engaged with said threaded portion, and a spring washer interposed between the nut and the socket, and adapted to press the tapered surface of the pintle against the tapered surface of the socket, and maintain a constant frictional resistance to a turning movement of the blade holder relative to the handle, the nut permitting said resistance to be adjusted.

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

HANS CHRISTIANSEN.

Witnesses:

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P. W. PEZZETTI.