March 18, 1930. M. B. BEHRMAN 1,751,227

SURGEON'S KNIFE

Filed July 6, 1925

Fig. 1.

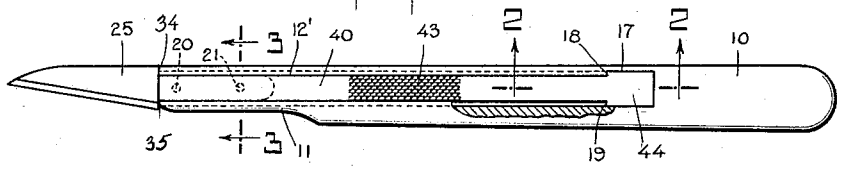


Fig. 2.

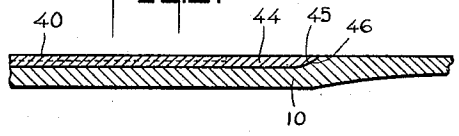


Fig. 3.

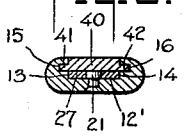


Fig. 4.

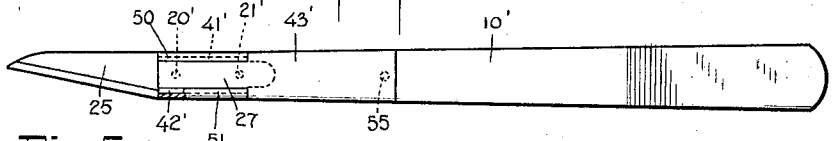


Fig. 5.

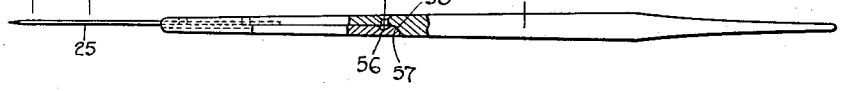


Fig. 6.

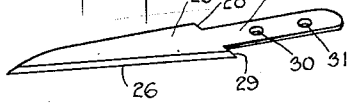


Fig. 7.

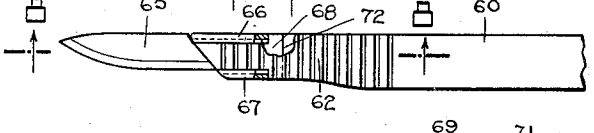


Fig. 9.

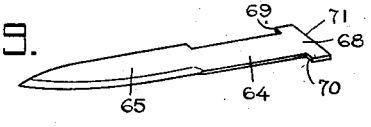
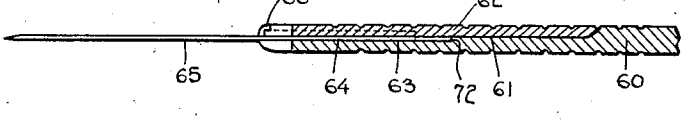


Fig. 8.



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UNITED STATES PATENT OFFICE

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SURGEON'S KNIFE

Application filed July 6, 1925. Serial No. 41,514.

My present invention relates generally to a surgeon's knife and more particularly to a detachable association between a blade and a holder particularly adapted for such purpose.

I have found that in instruments of this character, it is desirable not only that the blade be readily disassociated from the handle or holder for purposes of sharpening, replacement and sterilizing, but that the manner of associating the blade with the handle shall be such that the two shall be firmly secured, one to the other, so that in use, the possibility of accidental movement of the blade with reference to the handle shall be reduced to an absolute minimum.

One of the objects of my invention therefore is an arrangement whereby the means for securing the blade to the handle shall be of such character as to eliminate to a great extent any possibility of any accidental movement of the blade with reference to the handle or any possibility of any accidental operation of the locking parts which will render the holding means ineffective.

I have found that, where a holding means of this character is dependent upon the flexing of the blade, there is always the possibility of the user injuring himself because of the fact that the blade which is provided with an extremely sharp edge, must be gripped firmly so as to produce the proper flex therein, and that therefore in this operation, great care is required.

Another object of my invention is the provision of an arrangement of associating the blade with the holder so that no flexing or other similar manipulation of the blade is necessary in order to secure the blade in position or to release it, for purposes of removal.

A still further object of my invention is the provision whereby the blade can be released from its holder by a movement of the fingers of that hand in which the blade holder is held, and that thereby the other hand is free to permit of the substitution of a new blade.

For the attainment of these objects and such other objects as may hereinafter appear or be pointed out, I have illustrated embodiments of my invention in the drawing wherein—

Fig. 1 is a top plan view partly broken away of one embodiment of my invention;

Fig. 2 is a section taken longitudinally through part of the knife, on lines 2—2 of Fig. 1;

Fig. 3 is a transverse section taken on line 3—3 of Fig. 1;

Fig. 4 is a view similar to that of Fig. 1 illustrating another embodiment of my invention;

Fig. 5 is a side elevational view partly broken away of the embodiment of Fig. 4;

Fig. 6 is a perspective view of the type of knife employed in the embodiment of Figs. 1 and 4;

Fig. 7 is a top plan view of the blade holding portion of a still further embodiment;

Fig. 8 is a longitudinal section taken on line 8—8 of Fig. 7; and

Fig. 9 is a perspective view of the blade employed in the embodiment of Fig. 7.

Upon viewing Fig. 1 of the drawing, it will be observed that I here show a surgical knife comprising a holder and a blade removably associated therewith.

The holder consists of a base plate which provides the handle or hand grip 10 and the blade support 11 projecting from one end thereof. This blade support is preferably in the form of a bar having a channel 12′ formed longitudinally thereof, side walls 13 and 14 of the channel projecting upwardly from the bottom thereof and being provided with the oppositely positioned undercut grooves 15 and 16. The channel 12′ is extended into the handle portion and is widened at its rear end 17 so as to provide the shoulders 18 and 19 at the forward portion of this widened part for purposes that will shortly be pointed out.

In the forward part of the channel 12′, I provide the two pins 20 and 21 which project upwardly from and are carried by the bottom of the channel to the extent to be shortly pointed out.

In Fig. 6 of the drawing, I show the type of blade which I prefer to employ with the embodiment of Fig. 1 and this blade 25 comprises the cutting edge 26 and the rearwardly projecting portion 27 joined to the body of

the blade by the shoulders 28 and 29 and in this rearwardly projecting portion are provided the holes or openings 30 and 31.

Upon viewing Fig. 1 of the drawing, it will be observed that the width of the narrower part of the channel 12′ in the holder is such that this rearwardly projecting portion 27 of the blade of Fig. 6 can be easily received between the walls 13 and 14 and seated upon the bottom of the channel 12′ as shown in Fig. 3 of the drawing and the pins 20 and 21 are so positioned and dimensioned as to be conveniently received within the openings 30 and 31 and the height of the pins is substantially that of the thickness of this rearwardly projecting portion 27 of the blade, so that the tops of the pins 20 and 21 will be substantially flush or slightly below the upper surface of this rearwardly projecting portion 27.

The length of the projecting portion 27 and the position of the shoulders 28 and 29 are such with reference to the position of the pins 20 and 21 and the openings 30, 31 through the blade that the shoulders 28 and 29 on the blade abut against the shoulders 34 and 35 formed at the front terminal faces of the walls 13 and 14.

The grooves 15 and 16 formed in the side walls 13 and 14 of the channel in the holder are positioned at such a distance above the bottom of the channel that the bottoms of these grooves are substantially flush with the top of the projecting portion 27 of the blade when in position as will be observed upon viewing Fig. 3 of the drawing.

For purposes of locking the blade in position, I employ a locking slide 40 which as shown in cross-section of Fig. 3 of the drawing, is in the form of a relatively elongated flat piece of metal having the lips or flanges 41 and 42 projecting longitudinally and oppositely from the lower ends of the side edges thereof; these lips or projections 41 and 42 being of a dimension so as to be received snugly within the grooves 15 and 16 and the width of the upper portion of this locking slide 40 and the height of said slide being such that the slide will be substantially flush with the upper surface of the holder except at a point 43 intermediate the ends thereof which is roughened and corrugated and preferably raised for purposes that will be understood as the operation of releasing the blade is explained.

The rear end of this slide is preferably widened as shown at 44 in Fig. 1 so as to be of the same dimensions as the enlarged rear end 17 of the channel and this locking slide 40 is further bevelled at its rear end 45 as shown in Fig. 2 similarly but reversely as is the rear end of the channel as shown in 46 of said figure.

Assuming that the blade 25 has been positioned in its predetermined association with the projecting portion 27 in the channel 12′ and the pins 20 and 21 in engagement with the holes 30 and 31 on such projecting portion, the blade is then locked in position in the following manner:—

The locking slide 40 is caused to have the lips 41 and 42 positioned in registry with the rear ends of the grooves 15 and 16 in the side walls of the channel and then is slid along the channel, and as will be understood in this operation, the rear end of the locking slide will assume a position over the rearmost portion of the handle and in this position the rear end of the locking portion 40 will be slightly flexed upwardly until the position of the full insertion is reached upon which the rear end 44 of the locking member will be received in the widened part of the extended part of the channel 12′ and will resume its normal unflexed portion and seat itself on the curved rear end 46 of the seat in the channel in the blade support, and the length of the locking slide 40 is such that when the slide has reached this position, the forward end of the slide will terminate substantially along the line of the front end of the holder.

The blade is released preferably by applying the thumb to the roughened portion 43 with the downward backward pressure sufficient to flex the rear end 45 upwardly along and over the curved end 46 of the channel so as to move the locking slide rearwardly a sufficient distance to fully expose the blade upon which the blade can be removed for any purpose whatsoever and a new blade inserted.

Where it is desired to completely remove the slide 40 as when it is desired to sterilize the instrument with the parts disassociated, the slide is given a full movement to the rear until the lips 41 and 42 thereof are fully disengaged from the grooves 15 and 16 upon which the locking slide 40 is fully disengaged from the holder and can be removed.

In Fig. 4 of the drawing, I show a further embodiment of the invention in which the slide 43′ is made much shorter than the corresponding locking slide in Fig. 1 of the drawing, and in which the forward end of the holder 10′ is cut or thinned down as shown in Fig. 5 of the drawing except at the side edges of the front of the holder, where sufficient metal is left to provide the overhanging side walls 50, 51 beneath which the lips 41′, 42′ extending outwardly and oppositely from the sides of the lower edge of the forward end of the locking member 43′ are received. The projecting portion 27 of the blade is of a width so as to be readily insertable between these two projecting overhanging walls 50 and 51 and the openings 30 and 31 of the blade of Figure 6 are received over the pins 20′, 21′ as described in connection with the first embodiment.

Due to the shortness of the overhanging

walls 50 and 51 which define the length of the channel within which the locking member 43′ is received, I preferably provide in the rear end of the thinned down portion of the handle the upstanding pin 55 arranged to register with a depression 56 in the rear end of the locking holder when the locking member is fully inserted and the rear end of the locking member is curved as shown at 57, so that upon the application of pressure downwardly and backwardly upon the forward end of this locking member or slide, the curved end of the locking member will be forced upwardly over the adjacent curved shoulder 58 of the handle member, so as to permit of the disengagement of the locking member from the pin 55 and of the rearward movement of this handle.

In Figures 7 and 8 of the drawing, I show a still further embodiment of my invention, in which the handle member 60 is cut down and made thinner, as shown at 61 so as to form the seat for the locking member 62 and is still further cut down at its forward end 63 so as to form the seat for the rearward projecting portion 64 of the blade 65.

The forward portion of the holder is provided at its side edges with the upstanding overhanging walls 66 and 67 which terminate forwardly of the point at which the blade seat 63 terminates so that transversely of the blade and rearwardly of the upstanding walls 66 and 67, there is formed a seat across the full width of the portion 63 of the holder in which is received the rear end 68 of the blade end which, as shown, is wider than the remaining portion of the rearward projecting portion 64 and forms what is in effect a cross piece. The forward shoulders 69 and 70 of this cross piece form abutment shoulders which abut against and are received immediately in back of the rear ends of the walls 66 and 67. In other words, when the blade is put in position on this seat 63 which is permitted by the fact that the projecting portion 64 is narrower than the distance between the walls 66 and 67 except at the part 68, the part 68 will be received in back of these walls and in the depression formed therein, with the forward shoulders 69 and 70 in abutting relation to the rear ends of the walls 66 and 67 and its rear wall 71 in abutting relation to the rear wall 72 of the seat 63.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is

1. In a device of the character described, a blade holder base plate including a hand grip portion, a blade seat extending from one end thereof and positioned below the upper surface of the base plate and means for holding the blade on said seat, said means including a member carried by the base plate and hand grip portion and arranged to have a sliding engagement with reference thereto, to and from a position over the blade seat, and undercut means extending upwardly from the base plate for holding said member in sliding association with the holder.

2. In a device of the character described, a blade holder base plate including a hand grip portion, a blade seat extending from one end thereof and positioned below the upper surface of the base plate and means for holding the blade on said seat, said means including a member carried by the base plate and hand grip portion and arranged to have a sliding engagement with reference thereto, to and from a position over the blade seat, and means for holding said member in sliding association with the holder, said means comprising undercut longitudinally extending walls extending upwardly from the base plate and between which the blade is adapted to be received.

3. In a device of the character described, a blade holder base plate including a hand grip portion, a blade seat extending from one end thereof and positioned below the upper surface of the base plate and means for holding the blade on said seat, said means including a member carried by the base plate and hand grip portion and arranged to have a sliding engagement with reference thereto, to and from a position over the blade seat, and means for holding said member in sliding association with the holder, said means comprising undercut walls between which the blade is adapted to be received, and laterally and oppositely extending lips upon the member adapted to be received in the undercut in the walls.

4. In a device of the character described, a blade holder base plate comprising a hand grip portion, a blade seat extending from one end thereof and positioned below the upper surface of the base plate and means for holding the blade on said seat, said means including a locking member carried on the base plate and hand grip portion and arranged to have a sliding engagement therewith, said member having its upper surface substantially flush with the upper surface of the hand grip portion, and means for holding said member in such sliding engagement comprising overhanging walls.

5. In a device of the character described, a blade holder base plate comprising a hand grip portion, a blade seat extending from one end thereof and positioned below the upper surface of the base plate and means for holding the blade on said seat, said means including a locking member carried on the base plate and hand grip portion and arranged to have a sliding engagement therewith, said member having its upper surface substantially flush with the upper surface of the hand grip portion, and means for holding said member in such sliding engagement comprising overhanging walls, the walls termi-

nating short of the rear end of the locking member when the locking member is fully inserted.

6. In a device of the character described, a blade holder base plate comprising a hand grip portion, a channel therein a portion of which is adapted to serve as a seat for the blade, means for holding the blade on its seat including a locking member slidably received in said channel, means for holding said member in slidable engagement with the channel, said means comprising overhanging walls extending upwardly from the base plate and terminating short of the locking member when fully inserted, the rear end of the locking member having its lower surface curved.

7. In a device of the character described, a blade holder base plate comprising a hand grip portion, a channel therein, a portion of which is adapted to serve as a seat for the blade, means for holding the blade on its seat including a locking member slidably received in said channel, means for holding said blade locking member in slidable engagement with the channel, said means comprising overhanging walls terminating short of the locking member when fully inserted, the rear end of the locking member having its lower surface curved, the rear end of the channel also having its lower surface curved whereby a rearward movement of the locking member will force the portion thereof adjacent the rear end of the channel onto the upper surface of the hand grip portion.

8. In a device of the character described, in combination, a blade holder base plate comprising a hand grip portion having a seat formed in its forward end below the surface of the hand grip adapted to receive a locking member, a second seat formed below the level of the first-mentioned seat and adapted to receive a blade, a blade adapted to be received on said second seat, and of such thickness as to have its upper surface when it is positioned on said seat flush with the surface of the first-mentioned seat and a means for holding the blade on its seat including a locking member received on said first-mentioned seat arranged to have a slidable engagement with the handle to and from a position over the blade.

9. In a device of the character described, in combination, a blade holder comprising a hand grip having a seat formed in its forward end below the surface of the hand grip adapted to receive a locking member, a second seat formed below the level of the first mentioned seat and adapted to receive a blade, a blade adapted to be received on said second seat, and of such thickness as to have its upper surface when it is positioned on said seat flush with the surface of the first-mentioned seat and means for holding the blade on its seat including a locking member received on said first-mentioned seat arranged to have a slidable movement relatively to and from a position over the blade in engagement with the hand grip portion, and coacting means upon the base plate and hand grip portion for normally holding said locking member against such sliding movement.

10. In a device of the character described, in combination, a blade holder comprising a hand grip having a seat formed in its forward end below the surface of the hand grip adapted to receive a locking member, a second seat formed below the level of the first-mentioned seat and adapted to receive a blade, a blade adapted to be received on said second seat, and of such thickness as to have its upper surface when it is positioned on said seat flush with the surface of the first mentioned seat and means for holding the blade on its seat including a locking member received on said first-mentioned seat arranged to have a slidable movement relatively to and from a position over the blade in engagement with the base plate and hand grip portion, and coacting means upon the hand grip portion and locking member for normally holding said locking member against sliding movement, said means comprising curved surfaces.

In witness whereof, I have signed this specification this 1st day of July, 1925.

MARCUS B. BEHRMAN.