Dec. 15, 1936. M. PARKER 2,064,176

DETACHABLE BLADE KNIFE

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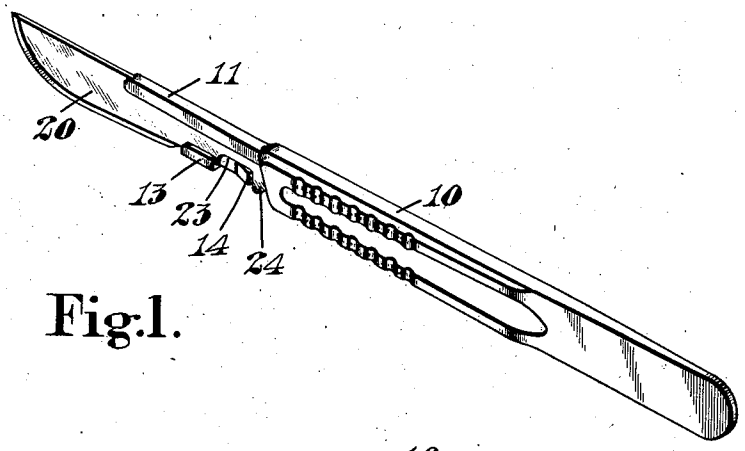


Fig:1.

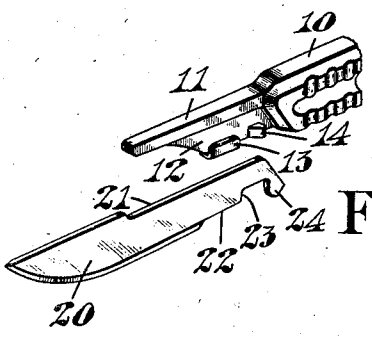


Fig:2.

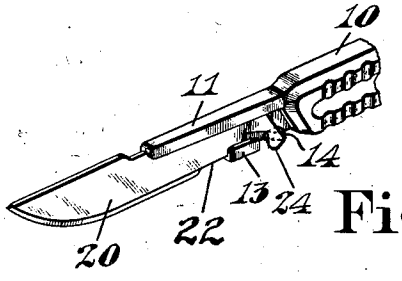


Fig:3.

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DETACHABLE BLADE KNIFE

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4 Claims. (Cl. 30—9)

This invention relates to knives of the type in which the blade is designed to be detachably connected to the handle so that after a blade has been used or dulled it may be detached and replaced by a fresh one. In one aspect, the present invention consists in an improved handle having novel blade-engaging means which are effective to maintain the position of the blade in the handle with accuracy and also with a high degree of security against displacement. The invention also includes within its scope a novel blade of the thin flexible type designed to cooperate with the blade-engaging elements of the handle.

The handle herein shown as embodying the invention is equipped at one edge of its blade-supporting portion with a relatively long flange which engages with the back edge of the blade while the blade is being inserted in the handle and also assists in maintaining the blade securely in operative position. The handle has also an oppositely-disposed short flange which similarly engages a relatively short length of the lower edge of the blade, or the blade shank, while leaving free to be torsionally flexed another portion of its lower edge. As herein shown, the short flange is located so that it engages the lower edge of the blade shank at a point in advance of its rear end or butt, with the result that the portion of the shank edge lying beyond the short flange is free to be flexed while the oppositely-disposed portion of the upper edge of the blade is held rigidly against flexing by the long flange. The handle and blade are provided with cooperating interlocking elements registering with that portion of the blade which is free to be flexed, and the torsional flexing of the blade in this locality is utilized to effect the engagement or disengagement of the blade from the handle.

An important feature of the invention, therefore, consists in a handle arranged to hold one edge of a blade against flexing while permitting a portion of its other edge to be torsionally flexed about a longitudinal axis or widthwise of the blade. The flexing of the blade is thus confined to a relatively limited area in the blade so that its resiliency is effective to maintain the blade against detaching movement with a relatively severe spring pressure. In other words, a firmer degree of locking pressure is secured by confining the flexing of the blade to a limited region within the outline of the blade rather than by flexing the whole blade in an area extending from edge to edge.

The blade herein shown as embodying the present invention is provided with a shank portion of a width to fit between the flanges of the handle and with a recess in its edge of a length to receive the short flange of the handle when the blade is assembled thereon, and such recess is arranged in part to define a finger piece by which the inner end of the shank may be flexed to disengage the blade from the interlocking holding means with which the handle is equipped.

These and other features of the invention will be best understood and appreciated from the following description of a surgical knife comprising one embodiment thereof which has been selected for purposes of illustration and shown in the accompanying drawing, in which

Fig. 1 is a view in perspective of the assembled knife;

Fig. 2 is a view in perspective showing the end of the handle and blade in separated relation; and

Fig. 3 is a similar view showing the blade as partially inserted in the handle.

The elongated handle 10 of the knife is flat and rigid in its construction, being corrugated transversely to supply a non-slipping hand grip. It is extended at its forward end in the form of an arm 12, which is reduced in cross section as compared to the body of the handle and provided with a web portion having a substantially flat blade-engaging face on one side. Upon the upper edge of the arm 12 is provided an elongated flange 11 channeled upon its inner face to receive the back edge of the blade, the channel extending continuously from the free end of the flange 11 to the body of the handle 10. The forward edge of the web portion of the arm 12 is inclined rearwardly toward the handle 10 and at its lower edge the arm 12 is provided with a short flange 13, also channeled on its inner face and cooperating with the channeled flange 11 to receive the shank of a blade presented by endwise movement between them.

The flange 13 does not extend continuously to the body of the handle 10 but is interrupted at a substantial distance therefrom, and in the gap between the inner end of the flange 13 and the body of the handle the arm 12 is provided with a locking projection 14 having a forwardly-inclined wedge surface and a rearwardly-disposed locking surface which extends substantially at right angles to the flat blade-engaging face of the arm 12. The forward end of the body portion of the handle 10 is obliquely disposed where it joins the arm 12, as clearly shown in Figs. 2 and 3.

One form of blade adapted for use with the handle above described is illustrated in the drawing, although it will be understood that an assortment of blades of different shapes may be interchangeably employed with the handle. The blade 20 herein shown is constructed of thin flexible sheet steel and may be hardened and temperated by heat treatment or hardened by nitriding, according to the material employed in its composition. It is provided with a sharpened edge which meets the back flat edge of the blade in a curve and so forms a sharp point. The back edge of the blade is shouldered to form a straight edge 21 of a length corresponding to the flange 11 of the handle and which defines the back edge of the shank portion of the blade.

On its forward or operative edge the shank of the blade is defined by a relatively short straight edge 22 terminated at its rear end by a deep, straight-sided recess 23, and the rear end of this recess is defined by an outwardly-extending finger projection 24. The butt edge of the shank extends obliquely with respect to the longitudinal axis of the blade on an angle corresponding to the forward edge of the body of the handle 10. The length of the recess 23 is such that the short flange 13 may be received therein in the operation of assembling the blade. The finger projection 24 is correspondingly designed to fit between the inner end of the flange 13 and the locking projection 14.

In assembling the blade, the straight back edge 21 of the shank is first slipped into the channel of the flange 11 with the blade positioned longitudinally so that the short flange 13 registers with the recess 23. When so presented, it will be understood that the shank of the blade may lie flat against the flat blade-engaging face of the arm 12, its back edge 21 being held in the long channel of the flange 11. Having thus preliminarily positioned the blade, it may be forced home into locked position by inward endwise movement. In this movement the finger projection 24 will ride up upon the forward inclined face of the locking projection 14, and the projection 24 and adjacent portions of the blade shank will be flexed torsionally with reference to the straight back edge 21 of the shank which is positively held in position in the channel of the flange 11 and so acts as an axis about which torsion may take place in the limited area of the blade which is left free to flex. In the continued inward movement of the blade, the short straight portion 22 of the lower edge of the shank is carried into the channel of the short flange 13, and finally when the edge 22 has been fully inserted the finger projection 24 will snap over the locking projection 14 and the blade will reassume its flat condition, being firmly secured to the handle by the oppositely-disposed and cooperating channeled flanges 11 and 13 and the interlocking engagement of the recess 23 with the projection 14 of the handle. Preferably, the edges 21 and 22 of the shank are slightly tapered and in their final position fill the opposed channels with a slight wedging action.

When it is desired to disengage the blade 20 for purposes of replacement, the user has only to flex the finger projection 24 outwardly an amount sufficiently to carry it above the locking projection 14, and in this operation the flexing of the blade takes place in a torsional manner with respect to the straight edge 21 of the shank which is held in the channeled flange 11. With the finger projection 24 thus flexed, the blade may be pushed forwardly and disengaged from the handle when the short flange 13 is again brought into registration with the recess 23 of the blade. The step of engaging or disengaging the blade is well illustrated in Fig. 3, where the finger projection 24 is shown as being flexed torsionally by engagement with the inclined face of the locking projection 14 and the short straight edge 22 of the shank is shown as partially disengaged from the channel of the short flange 13.

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

1. A detachable blade knife comprising a handle having opposed blade-engaging flanges and a thin flexible blade having an unperforated shank of a width to fit between said flanges, one flange being relatively long and acting to hold one entire edge of the shank against flexing at all times, said long flange extending considerably in advance of the short flange to a point over the cutting portion of said blade, and the other flange being relatively short and leaving a portion of the other edge of the shank free to be torsionally flexed in disengaging the blade from the handle and a locking projection located on the opposite side of the handle from said long flange and substantially in line with said short flange.

2. A detachable blade knife comprising a handle having opposed edge-engaging flanges of unequal length, and a thin flexible blade provided with a shank of reduced width to fit between said flanges, the handle having a locking projection spaced from the shorter flange, and the blade shank being recessed so that it may be passed over said shorter flange and moved endwise to interlock with said projection, being meanwhile free for torsional flexing with reference to its edge engaged by the longer flange.

3. A detachable-blade knife comprising a handle having a flanged blade-supporting arm provided with an inwardly directed channel for receiving and supporting the rear edge of a blade and a short cooperating channeled flange for receiving and supporting a portion of the front edge of the blade, a thin flexible blade having rear and front edges adapted to cooperate with said channels and having a recess in its front edge of a length to receive said short flange with clearance therein and a second recess at the rear of said first recess arranged to clear said short flange upon presentation of said blade, and locking shoulders carried by the handle and blade adapted to engage to lock the blade to the handle upon longitudinal movement of the blade toward the handle from the position in which the flange of the handle receives the recess of the blade.

4. A thin flexible blade for use in detachable-blade knives, having a sharpened cutting portion and a shank, the blade having a relatively long and straight rear edge providing a substantial bearing support, the forward edge of the shank being relatively short and straight for a portion thereof whereby providing a substantial bearing support opposite to and cooperating with the rear edge support and having a locking projection at its extremity spaced from the short straight edge and in substantial alignment with such edge longitudinally of the blade, the shank having a recess within its forward edge spacing said straight portion from said projection.

MORGAN PARKER.