Oct. 27, 1931. J. B. RHODES 1,829,016

SHARPENING DEVICE FOR SAFETY RAZOR BLADES AND THE LIKE

Filed March 24, 1930 3 Sheets-Sheet 1

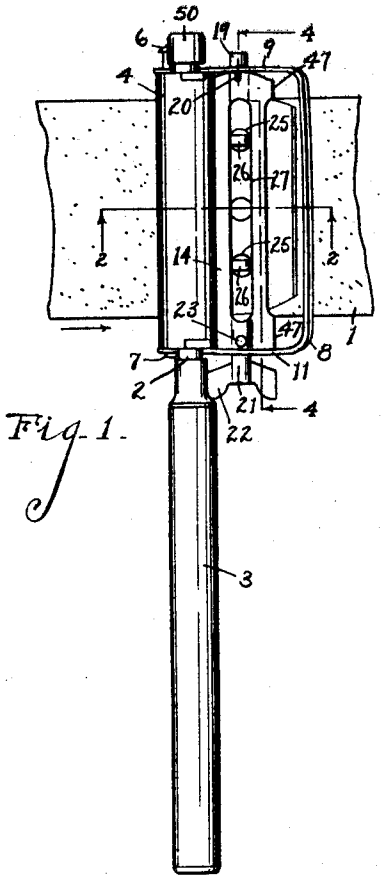


Fig. 1.

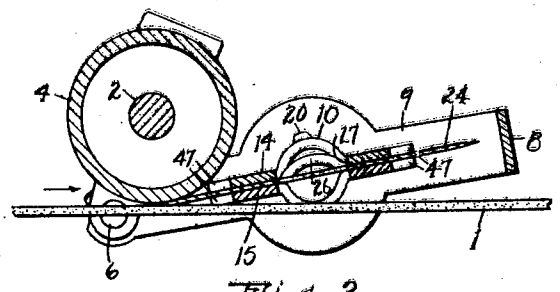


Fig. 2.

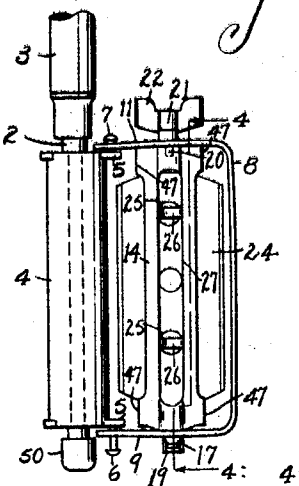


Fig. 3.

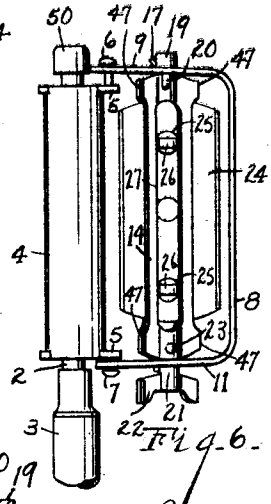


Fig. 6.

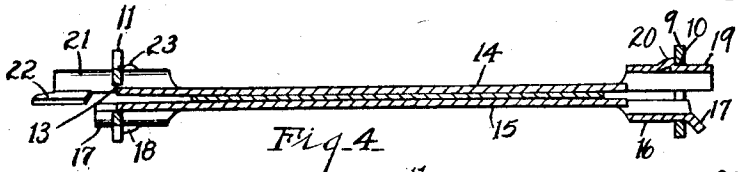


Fig. 4.

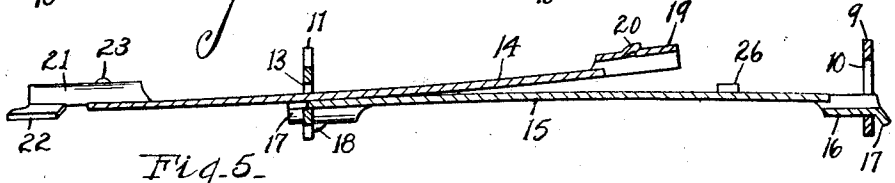


Fig. 5.

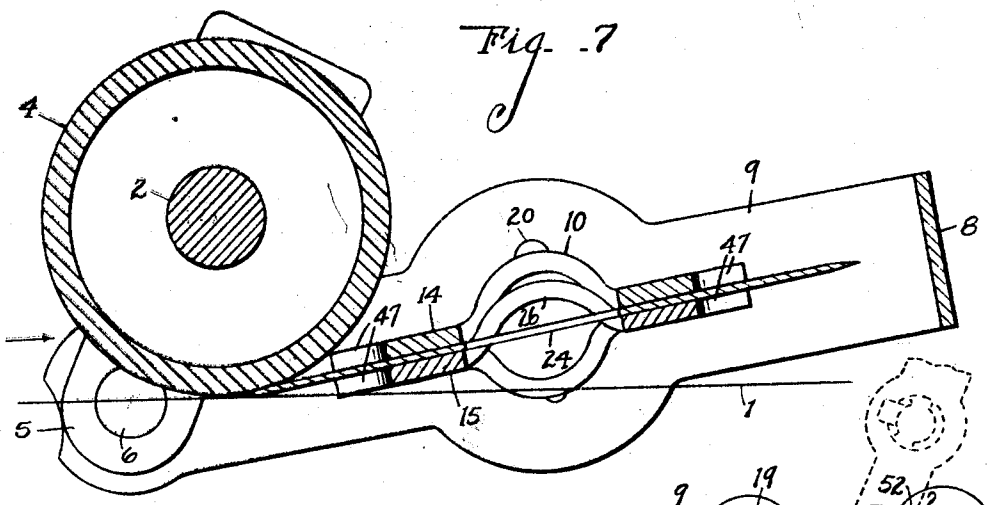
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SHARPENING DEVICE FOR SAFETY RAZOR BLADES AND THE LIKE

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Fig. 7



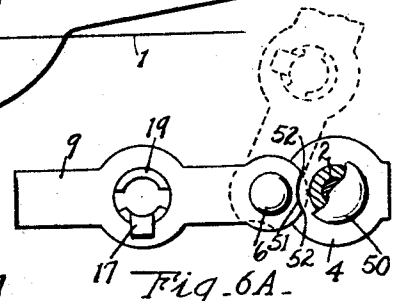


Fig. 6A.

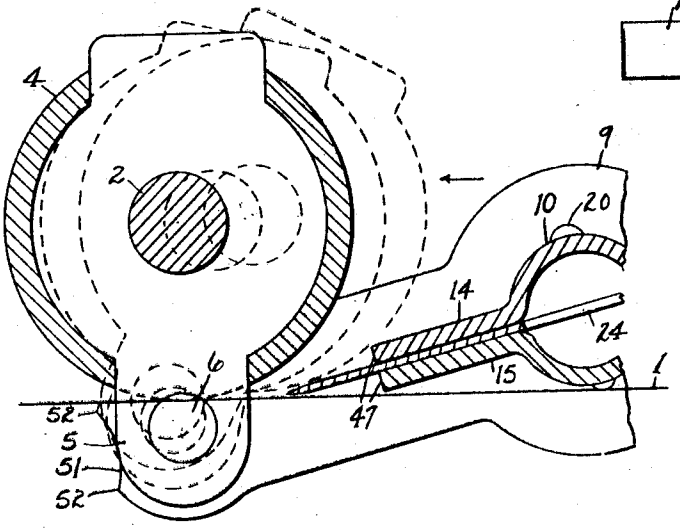


Fig. 8.

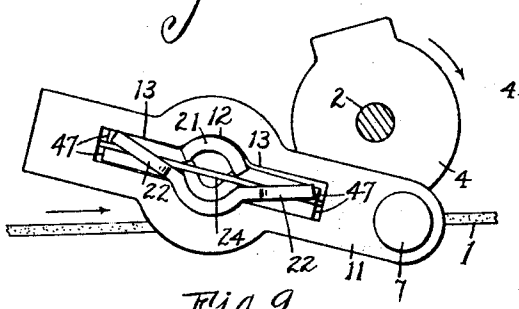
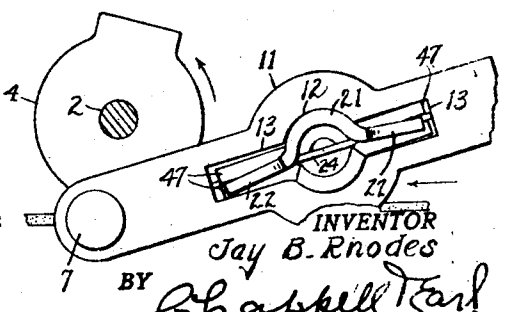


Fig. 9



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SHARPENING DEVICE FOR SAFETY RAZOR BLADES AND THE LIKE

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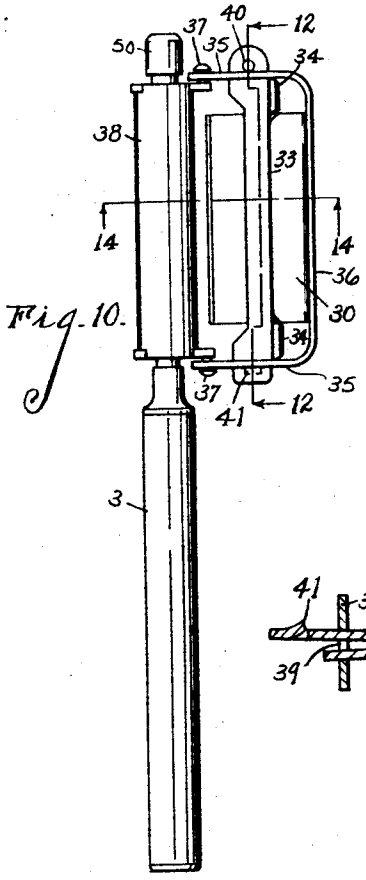


Fig. 10.

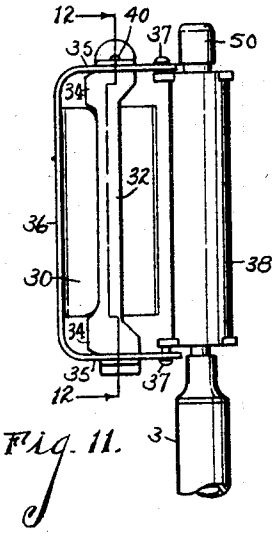


Fig. 11.

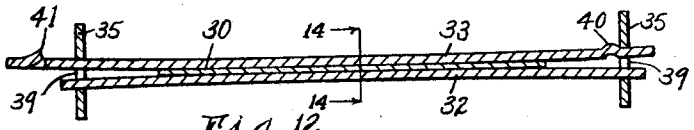


Fig. 12.

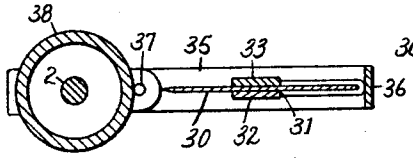


Fig. 14.

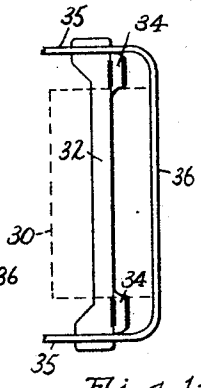


Fig. 13.

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Patented Oct. 27, 1931 1,829,016

UNITED STATES PATENT OFFICE

JAY B. RHODES, OF KALAMAZOO, MICHIGAN

SHARPENING DEVICE FOR SAFETY RAZOR BLADES AND THE LIKE

Application filed March 24, 1930. Serial No. 438,299.

The main objects of this invention are:

First, to provide a sharpening device for safety razor blades and the like which may be easily manipulated even by an unskilled person and is very efficient, enabling the effective and uniform sharpening of the blade.

Second, to provide a sharpening device of this character in which the blade during the sharpening stroke is the only element in sliding engagement with the sharpening device.

Third, to provide a sharpening device of this character in which while the blade is in supporting engagement with the sharpening element during the sharpening stroke, is supported so that thin resilient blades cannot be distorted and the proper bevel of the blade is maintained.

Fourth, to provide a sharpening device which is adapted for use with either flexible sharpening elements such as strops or non-flexible sharpening elements.

Fifth, to provide a sharpening device having these advantages which may be easily manipulated in inserting or removing the blade.

Sixth, to provide a sharpening device having the above advantages which is very simple and economical in structure, at the same time the parts are strong and durable.

Objects relating to details and economies of my invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view of a sharpening device embodying my improvements shown in operative relation to a strop and with the parts in position occupied on a sharpening stroke to the right.

Fig. 2 is a central transverse section on line 2—2 of Fig. 1, the strop being shown in full lines.

Fig. 3 is a view with the handle partially broken away showing the mounting of the blade carrier and its holder in an embodiment designed for a double-edged blade.

Fig. 4 is a detail section on line 4—4 of Figs. 1 and 3 showing details of the blade holder.

Fig. 5 is a sectional view corresponding to that of Fig. 4 showing the manner of opening and closing the holder.

Fig. 6 is a view illustrating a step in the reversing of the blade holder in its carrier.

Fig. 6A is an end view with the parts in position shown in Fig. 6, further illustrating the position of the carrier during the blade reversing operation.

Fig. 7 is an enlarged detail section illustrating the position of the roller relative to the blade and blade carrier when on a stropping stroke toward the right or toward the direction of the arrow.

Fig. 8 is a fragmentary sectional view illustrating the reversing movement of the stopper.

Fig. 9 is a fragmentary view, the supporting spindle being sectioned, further illustrating the reversing movement, the position shown at the left being the position of the parts when on a right-hand stropping stroke and at the right being the position on the left-hand stroke or movement of the device.

Fig. 10 is a plan view of a modified form or embodiment of my invention adapted for a single edge blade.

Fig. 11 is a view of the opposite side from that shown in Fig. 10, the handle being broken away.

Fig. 12 is a detail section on a line corresponding to line 12—12 of Figs. 10 and 11 showing details of the blade holder.

Fig. 13 is a fragmentary view showing portions of the blade carrier and one of the blade holder members, the other being omitted.

Fig. 14 is a sectional view through the blade holder on line 14—14 of Figs. 10 and 12.

In the accompanying drawings, 1 represents a razor strop but it will be understood that the sharpening element may be of any suitable character; that is, either flexible or non-flexible. However, the sharpening element is preferably a flexible element.

I provide a supporting spindle 2 having a handle 3 disposed axially of the spindle. On the spindle 2 I mount a roller 4 for free rotative movement. The roller 4 is provided

with radially projecting ears 5, the ears having outwardly projecting headed pins or pivots 6 and 7 thereon. These pivots, it will be noted, are substantially spaced from the axial center of the spindle. These pivots engage the arms of the U-shaped carrier 8 which is formed of resilient material.

The arm 9 of the carrier is provided with a bearing or journal opening 10 while the arm 11 of the carrier has a bearing or journal opening 12 with slots 13 extending oppositely therefrom and opening thereto.

The blade holder comprises members 14 and 15 formed of resilient material, these members being longitudinally bowed toward each other as shown in Fig. 5. These members are preferably formed as stampings, the member 15 having journal members 16 and 17 at its ends rotatable in the bearings 10 and 12 of the carrier.

The journal member 16 terminates in a down-turned lug 17 coacting with the outer side of the arm 11 and with a thrust lug 18 coacting with the inner side of the arm 9.

The holder member 14 is provided with a journal member 19 coacting with the bearing 10 of the arm 11 and with a thrust lug 20 engaging the inner side of this arm. At its other end the member 14 has a journal portion 21 coacting with the bearing opening 12 of the arm 9.

The member 14 is also provided with a finger piece 22 and with a detent 23 adapted to engage the inner side of the arm 9 when the blade holders are in their blade clamping position. In this position, the ends of the blade holders adjacent the finger piece engage within the slots preventing rotative movement of the holder within the carrier.

The embodiment illustrated in Figs. 1 to 9 inclusive is designed for holding a double-edged blade 24, having spaced holes 25 therein.

The holder member 15 is provided with lugs 26 adapted to engage with these holes while the member 14 has a longitudinal slot 27 into which the lugs may project.

To introduce the blade, the finger piece of the member 14 is grasped and pressed downwardly to disengage the detent 23 when the member may be withdrawn to permit the blade being laid upon the member 15 with the holes of the blade engaging the lugs 26. The member 23 is then pushed inwardly and its journal 19 engaged in the bearing opening 10 of the carrier arm 9, the blade being clamped between the holder members, as shown in Fig. 13, the ends, however, of the holder members flaring, as shown in Fig. 4, to yieldingly support the roller 4 when in stropping position as shown, for example, in Fig. 9, the slots 13 being of such size as to receive the ends of the holder in this flared relation, at the same time holding them under sufficient tension to effectively clamp the blade and retain the member 14.

The holder members are preferably cut away intermediate their ends providing shoulders 47 lying at the inner sides of the arms of the carrier when in blade clamping position.

When it is desired to reverse the blade, the finger piece is grasped and longitudinal pressure exerted thereon which, owing to the engagement of the thrust lugs 20 with the arm 11, springs that arm outwardly on its pin 6, releasing the ends of the holders from the slots 13 so that the holder may be rotated on its journals to turn it half over. Upon releasing the longitudinal pressure, the spring of the carried will re-engage the ends of the holders with the slots 13 thereby securing the holder against rotative movement.

It will be noted that the spindle is provided with an enlargement or cylindrical head 50 at its outer end and that the inner end of the arm 9 of the carrier is notched at 51 providing a pair of spaced stops 52 which are adapted when the arm 9 of the carrier is sprung to the position shown in Fig. 6 to coact with the head 50, limiting the swing of the carrier and preventing rotative movement of the roller during the blade reversing operation. This serves the double purpose of preventing the edge of the blade coming in contact with the roller and also holds the carrier in relatively fixed relation for convenience in manipulation; that is, permits the reversing of the blade holder for the operator grasping the finger piece 22. This reversing manipulation is illustrated in Fig. 6. The holder is partially turned from its stropping position. With the blade clamped within the holder, the device is placed upon the strop without regard to the position of the carrier. Assuming that the operator makes the first stroke toward the right of Fig. 2, and the carrier falls in front of the roller, the first action as the movement begins is for the roller to swing up out of contact with the strop, as shown in Fig. 2, resting upon the blade adjacent its edge and on the lugs or shoulders 27 of the upper holder member, the device being moved along with the blade as the strop contacting element. The pressure on the spindle through the handle will cause the holder members to yield, holding the blade downwardly in engagement with the strop under spring tension and under the thrust or pressure of the roller, as shown in Fig. 7. However, on the initial reversing movement, the roller swings away from the blade, releasing the spring holders so that the blade is lifted by the holders from engagement with the strop, as is indicated in Fig. 8. The roller is brought into engagement with the strop, thereby rotating the roller and swinging the carrier over the roller to the reverse position, this movement being illustrated by

dotted lines in Fig. 8. In Fig. 9 I show the parts in the position they would occupy at the end of a stroke, the movement of the roller on reversal being indicated by dotted lines.

It will be understood that the only time the roller is in engagement with the sharpening element is during this reversal. At other times or during the sharpening stroke, it is lifted from the sharpening element, riding upon the carrier and blade.

This effectively holds the blade in engagement with the sharpening element, preventing undue flexing or bending of the blade and also applies the spring pressure described so that as soon as reversing movement begins, the spring holder members lift the edge of the blade from the sharpening element, preventing cutting thereof.

The user is not required to pay any attention to the position in which the carrier is applied to or falls upon the strop, merely manipulating the device much the same as an ordinary razor is manipulated in stropping except of course no reversing movement is required on the part of the operator, this being automatic.

The blade, during the stropping movement, is pushed forwardly on the strop so that it is impossible to cut the same during the stroke and the blade is supported so that it may be firmly pressed to the sharpening element.

In the modification shown in Figs. 10 to 14 inclusive, I show my improvements adapted for a single-edge blade 30. In this case, the blade is provided with a longitudinal shoulder 31, the holder members 32 and 33 clamping the blade in front of this shoulder. The members 32 and 33 are preferably inwardly bowed as described, the member 32 having lugs 34 adjacent its ends engaging within the arms 35 of the bail-shaped holder 36, these arms being pivoted to the pivots 37 on the roller 38.

The holder member 33 is longitudinally movable in the slots 39 of the carrier arms, a detent 40 being provided to retain the member 33 in its engaged position, a stop 41 limiting the engagement movement of this holder member. Aside from the holder features, the structure is the same as that previously described.

My improved sharpening device is very efficient, may be successfully used by inexperienced operators without cutting or mutilating the sharpening element, the parts are simple and economical to produce and very easily assembled. The blades may be quickly inserted or removed and the double-edge blade may be quickly reversed as described without removing from the holder.

I have illustrated my improvements in two commercial embodiments thereof which have proven highly satisfactory. I have not attempted to illustrate or describe other embodiments or adaptations as I believe this disclosure will enable those skilled in the art to embody or adapt the same as may be desired.

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

1. In a sharpening device, the combination with a spindle provided with a handle disposed axially of the spindle, of a roller rotatable on the spindle and provided with radial pivot lugs at its ends, a U-shaped blade carrier having its arms pivotally mounted on the outer sides of said lugs so that the roller may swing between the arms of the carrier, and a blade holder comprising a pair of inwardly bowed resilient members mounted on the arms of said carrier, the ends of said blade holders when clamped upon a blade constituting springs and being provided with roller supporting shoulders disposed so that upon a work stroke the roller rests upon the blade and said holder.

2. In a sharpening device, the combination with a spindle provided with a handle disposed axially of the spindle, of a roller rotatable on the spindle and provided with radial pivot lugs at its ends, a U-shaped blade carrier having its arms pivotally mounted on the inner sides of said lugs so that the roller may swing between the arms of the carrier, and a blade holder comprising a resilient member mounted on the arms of said carrier and disposed so that upon a work stroke the roller engages the upper side of the blade and said holder.

3. In a sharpening device, the combination with a spindle provided with a handle disposed axially of the spindle, of a roller rotatable on the spindle and provided with radial pivot lugs at its ends, a U-shaped blade carrier having its arms pivotally mounted on the outer sides of said lugs so that the roller may swing between the arms of the carrier, and a blade holder mounted on the arms of said carrier and disposed so that upon a work stroke the roller rests upon the blade and said holder.

4. In a sharpening device, the combination of a handle, a roller rotatably mounted on said handle, a blade carrier pivotally mounted on said roller in radially spaced relation to its axis, said carrier being provided with a blade holder adapted to support a blade so that on a work stroke the roller engages the upper side of the blade adjacent its edge, and the roller contacts with the sharpening element on the reversing of the stroke to swing the carrier to the opposite side of the roller, and spring means acting to lift the edge of the blade from the sharpening element when the pressure of the roller thereon is relieved as by reversal of stroke.

5. In a sharpening device, the combination of a handle, a roller rotatably mounted on said handle, and a blade carrier pivotally

mounted on said roller in radially spaced relation to its axis, said carrier being provided with a blade holder adapted to support a blade so that on a work stroke the roller engages the upper side of the blade adjacent its edge, and the roller contacts with the sharpening element on the reversing of the stroke to swing the carrier to the opposite side of the roller.

6. In a sharpening device, the combination with a handle, of a roller rotatably mounted on said handle, a carrier pivotally connected to said roller at points radially spaced from its axis, and a blade holder comprising a resilient blade supporting member mounted on said carrier and positioned relative to the roller so that on a work stroke the roller rests upon the blade holder and in supporting engagement with the upper side of the blade adjacent its edge.

7. In a sharpening device, the combination with a handle, of a roller rotatably mounted on said handle, a carrier pivotally connected to said roller at points radially spaced from its axis, and a blade holder on said carrier adapted to yieldably support the blade and so that on a work stroke the roller engages the blade holder and the upper side of the blade adjacent its edge.

8. In a sharpening device, the combination with a spindle provided with a handle, of a roller freely rotatable on said spindle, a carrier pivotally connected to said roller at points radially spaced from its axis, and a blade holder rotatably mounted on said carrier and adapted to support a blade so that on a work stroke the roller engages the upper side of the blade adjacent its edge.

9. In a sharpening device, the combination with a spindle provided with a handle, of a roller freely rotatable on said spindle, a carrier pivotally connected to said roller at points radially spaced from its axis, and a blade holder mounted on said carrier and adapted to support a blade so that on a work stroke the roller engages the upper side of the blade.

10. In a sharpening device, the combination with a handle, of a roller rotatably mounted on said handle, and a blade carrier pivotally connected to said roller and provided with a blade holder adapted to support a blade so that on a work stroke in either direction, the edge of the blade lies between the sharpening element and the roller and in supporting engagement with the roller.

11. In a sharpening device, the combination with a handle, of a roller rotatably mounted on said handle, a carrier pivotally connected to said roller at points radially spaced from its axis, and a blade holder on said carrier supporting a blade so that on a work stroke, the roller engages the upper side of the blade adjacent its edge.

12. In a sharpening device, the combination with a spindle provided with a handle disposed axially of the spindle, of a roller freely rotatable on said spindle and provided with radial peripherally projecting lugs, said lugs having outwardly projecting pivots disposed longitudinally of the roller, a resilient U-shaped blade carrier having its arms mounted on said pivots, one of the arms engaging its pivot for sliding movement on the pivot, said arm having a bearing opening therein, the other arm having an aligned bearing opening with a slot extending therefrom, and a pair of bowed resilient blade holder members having journal portions at their ends rotatable in said bearing openings of said arms, one of said holder members being provided with a lug engaging the inner side of the lug of said slotted arm and a lug engaging the outer side of the other carrier arm, the other holder member being slidable in said bearing openings of said arms and provided with a finger piece at one end and a detent at its finger piece end detachably engageable with the inner side of the slotted arm and with a thrust lug engaging the inner side of the other arm, the ends of said holder members engaging said slots when aligned therewith thereby supporting the holder, said holder members being disengaged from said slot to permit rotation of the holder by springing the opposite arm as by means of a longitudinal thrust on the holder member having the finger piece.

13. In a sharpening device the combination with a spindle provided with a handle disposed axially of the spindle, of a roller freely rotatable on said spindle and provided with radial peripherally projecting lugs, said lugs having outwardly projecting pivots disposed longitudinally of the roller, a resilient U-shaped blade carrier having its arms mounted on said pivots, one of the arms engaging its pivot for sliding movement on the pivot, said arm having a bearing opening therein, the other arm having an aligned bearing opening with a slot extending therefrom, and a pair of bowed resilient blade holder members having journal portions at their ends rotatable in said bearing openings of said arms, one of said holder members being slidable in said bearing openings of said arms and provided with a finger piece, the ends of said holder members engaging said slots when aligned therewith thereby supporting the holder, said holder members being disengaged from the slot to permit rotation of the holder by springing the opposite arm as by means of a longitudinal thrust on the holder member having the finger piece.

14. In a sharpening device, the combination with a spindle provided with a handle, of a roller rotatable on said spindle, a resilient U-shaped blade carrier having its arms pivotally mounted on said roller in radially

spaced relation to the axis of the spindle, one of the arms engaging its pivot for sliding movement thereon, said arm having a bearing opening therein, the other arm having a bearing opening and a slot, and coacting blade holder members having journal portions at their ends rotatable in said bearing openings of said arms, one of said holder members being provided with a lug engaging the inner side of the lug of said slotted arm and a lug engaging the outer side of the other carrier arm, the other holder member being slidable in said bearing openings of said arms and provided with a finger piece at one end and a detent at its finger piece end detachably engageable with the inner side of the slotted arm and with a thrust lug engaging the inner side of the other arm, the ends of said holder members engaging said slot when aligned therewith thereby supporting the holder against rotation, said holder members being disengaged from said slot to permit rotation of the holder by springing the opposite arm as by means of a longitudinal thrust on the holder member having the finger piece.

15. In a sharpening device, the combination with a spindle provided with a handle, of a roller rotatable on said spindle, a resilient U-shaped blade carrier having its arms pivotally mounted on said roller in radially spaced relation to the axis of the spindle, one of the arms engaging its pivot for sliding movement thereon, said arm having a bearing opening therein, the other arm having a bearing opening and a slot, and coacting blade holder members having journal portions at their ends rotatable in said bearing openings of said arms, the other holder member being slidable in said bearing openings of said arms and provided with a finger piece at one end, the ends of said holder members engaging said slot when aligned therewith thereby supporting the holder against rotation, said holder members being disengaged from said slot to permit rotation of the holder by springing the opposite arm as by means of a longitudinal thrust on the holder member having the finger piece.

16. In a sharpening device, the combination with a spindle provided with a handle, of a roller rotatable on said spindle, a resilient U-shaped blade carrier having its arms pivotally mounted on said roller in radially spaced relation to the axis of the roller to permit springing the arms, and a blade holder rotatably mounted on said arms and detachably engageable with one of the arms for holding against rotation, said holder being released from said arm by the springing of said arms.

17. In a sharpening device, the combination with a spindle provided with a handle, of a roller rotatable on said spindle, a resilient U-shaped blade carrier having its arms pivotally mounted on said roller in radially spaced relation to the axis of the roller to permit springing the arms, and a blade holder rotatably mounted on said arms and provided with arm engaging parts releasable by springing of the carrier arm.

18. In a blade sharpening device, the combination with a spindle provided with a handle, said spindle having a cylindrical enlargement at its outer end, of a roller rotatable on said spindle, a resilient U-shaped blade carrier having its arms pivotally mounted in said roller in radially spaced relation to the axis of the roller to permit springing of the outer arm, the outer arm to coact with said enlargement when sprung outwardly, and a blade holder reversably mounted on said arms and provided with arm engaging parts releasable by the springing of said outer arm.

19. In a sharpening device, the combination with a spindle provided with a handle, of a roller rotatably mounted on said spindle, a resilient U-shaped blade carrier having its arms pivotally mounted on said roller in radially spaced relation to the axis of the roller and to permit springing of one of the arms, said carrier and spindle being provided with coacting stops which are brought into coacting relation by the springing of the carrier arm, and a blade holder reversably mounted on said arms and provided with parts releasably engageable with one of said arms.

20. In a sharpening device, the combination with a spindle provided with a handle, of a roller rotatably mounted on said spindle, a blade carrier pivotally mounted on said roller in radially spaced relation to the axis of the roller, a blade holder reversably mounted on said carrier, and coacting stop means on said carrier and spindle acting to support the carrier and roller in relatively fixed relation to said spindle during the reversing of the holder.

In witness whereof I have hereunto set my hand.

JAY B. RHODES.