Oct. 28, 1930. L. A. FLINKER 1,779,669

RAZOR STROPPER

Filed March 2, 1925 3 Sheets-Sheet 1

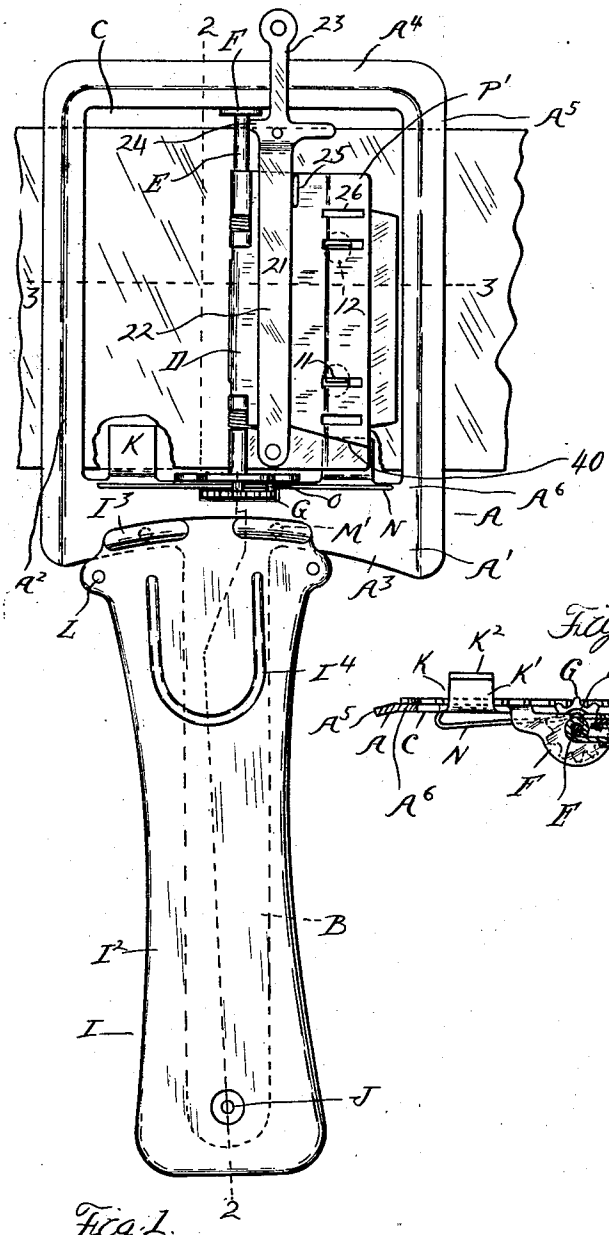


Fig. 1.

Fig. 3.

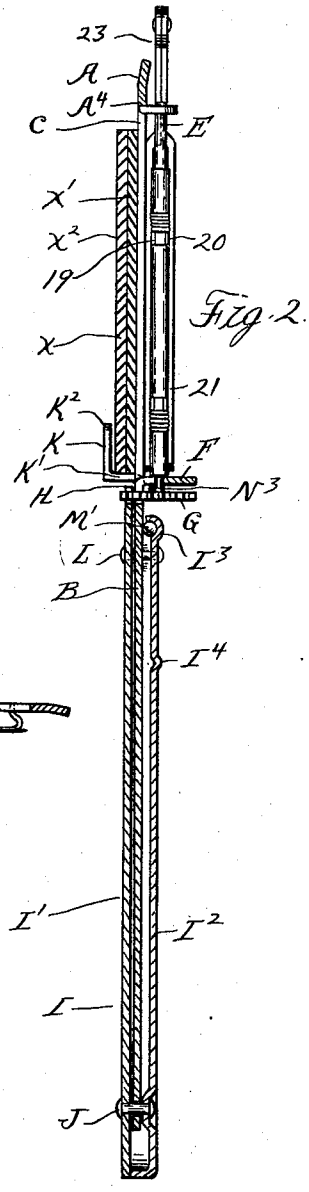


Fig. 2.

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RAZOR STROPPER

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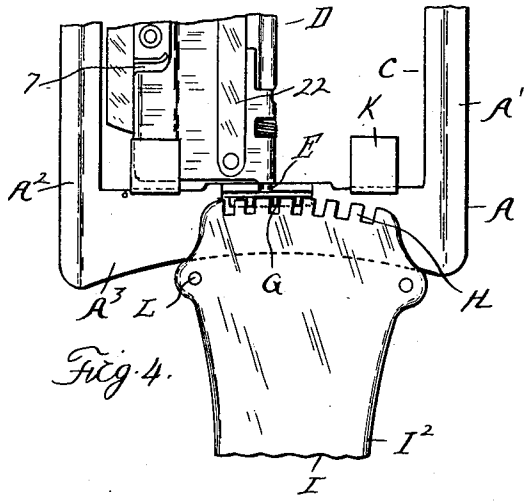


Fig. 4.

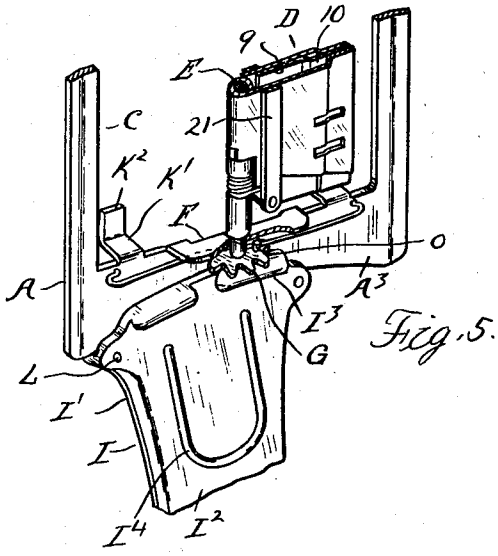


Fig. 5.

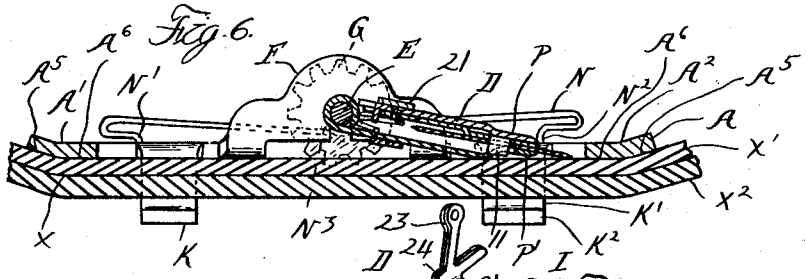


Fig. 6.

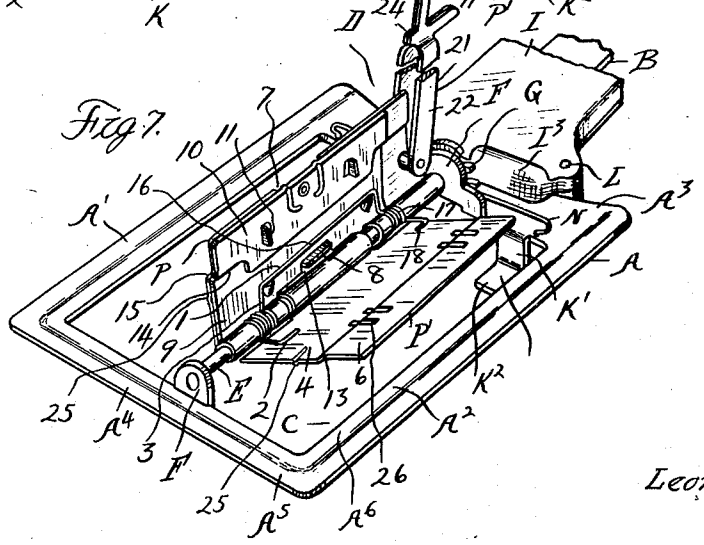


Fig. 7.

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RAZOR STROPPER

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Fig. 8.

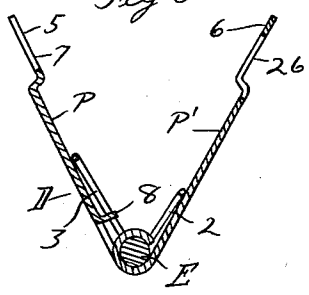


Fig. 9.

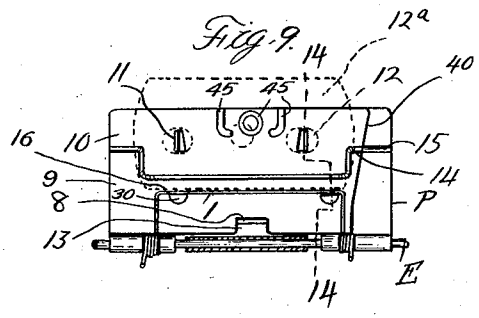


Fig. 13.

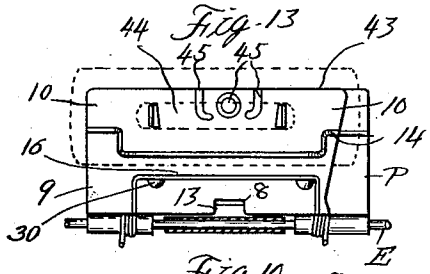


Fig. 12.

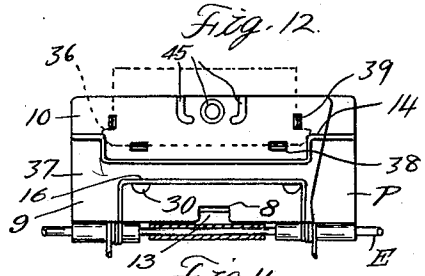


Fig. 10.

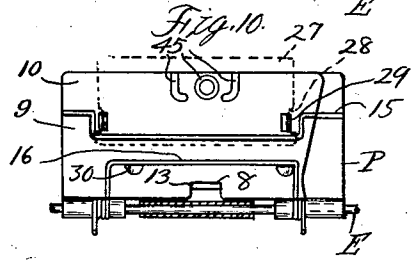


Fig. 11.

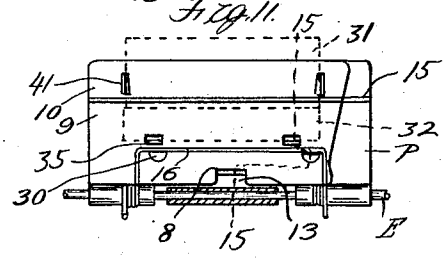


Fig. 14.

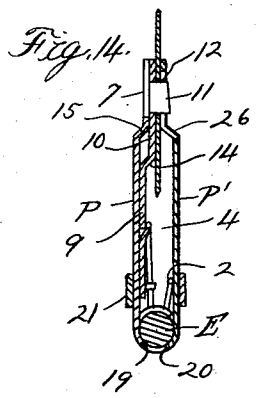
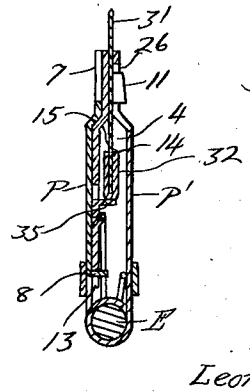


Fig. 15.



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UNITED STATES PATENT OFFICE

LEON A. FLINKER, OF DETROIT, MICHIGAN

RAZOR STROPPER

Application filed March 2, 1925. Serial No. 12,721.

The invention relates to razor stropping devices particularly designed for use in connection with the detachable blades of safety razors and the invention consists in the novel construction as hereinafter set forth.

This application is a continuation in part of application No. 591,916, filed October 2, 1922.

In the drawings:—

Figure 1 is a side elevation;

Figure 2 is a longitudinal section on the line 2—2 of Figure 1;

Figure 3 is a cross section on line 3—3 of Figure 1;

Figure 4 is a fragmentary view of the opposite side from that shown in Figure 1;

Figure 5 is a perspective view with the blade holder closed;

Figure 6 is an enlarged cross section showing the engagement of the blade with the strop;

Figure 7 is a perspective view of the blade holder when open;

Figure 8 is a cross section of the blade holder;

Figure 9 illustrates an adaptor positioned in the blade holder;

Figures 10 to 13 are similar views of adaptors for various constructions of blades;

Figure 14 is a cross section on the line 14—14 of Figure 9;

Figure 15 is a cross section on the line 15—15 of Figure 11.

Generally described, my improvement comprises a plate or frame A adapted to be laid upon the razor strop and drawn thereover by means of a laterally extending handle shank B. This frame or plate is cut away at C and has mounted thereon, to extend across said cut-away portion, the reversible blade holder D. This blade holder is mounted on a rock shaft E journaled in bearings F on the frame and has a pinion G secured thereto. I is a handle provided with rack teeth H engaging said pinion, said handle being pivotally connected at J to the outer end of the handle shank B. This pivotal connection permits a limited rocking movement of the handle with respect to the handle shank and the arrangement is such that when the plate A is moved through the medium of the handle, the rocking of said handle will actuate the rack and turn the pinion, reversing the blade holder in advance of any movement of the frame A.

More in detail, the frame A is preferably formed of a plate of sheet metal having the ears F struck up to form the bearings for the rock shaft E and also reversely struck-out ears K, on opposite sides of the rock shaft E. The ears K have the downwardly extending portions K′ for engaging the edge of the razor strop to guide the frame during the operation of the device and also have the laterally projecting portions K^2 for engaging the underside of the strop. The handle I is preferably formed of a pair of sheet metal members arranged on opposite sides of the shank B so as to embrace and conceal the same. One of these members preferably consists of a flat plate I′ having the rack teeth H formed by stamping a series of apertures at the inner end thereof, these being arranged in a segment concentric with the pivot J. The other member I^2 is preferably a sheet metal stamping depressed to form a housing for the handle shank B and secured to the plate I′ by suitable means such as the rivets L. The inner end of the handle member I^2 extends over the frame A and is provided with raised portions I^3 forming housings for the anti-friction bearings M. These bearings preferably consist of balls M′ arranged in the raised portions I^3 and engaging the frame to receive the lateral thrust between the handle and frame and to relieve the friction therebetween. The handle member I^3 is also preferably formed with a U-shaped struck-up portion I^4 forming a guide for the thumb when operating the device.

It is very essential that the blade should never be moved longitudinally of the strop in the direction of its exposed cutting edge. Thus, when the direction of movement of the frame is reversed it is necessary that the blade should be instantaneously moved out of contact with the strop before any relative movement longitudinally thereof. For accomplishing this result I have provided

a spring wire N secured to the frame A at its opposite ends N′ and N² and extending transversely to said rock shaft E adjacent to the pinion G. The spring is spaced from the frame A, but extends beneath the rock shaft E, there being a depressed portion N³ at this point. O is a pin projecting laterally from said pinion and arranged in the plane of said blade holder so that when the latter is in position to strop the blade the pin depresses the spring wire N. It will be understood that the friction between the frame A and the strop will hold the latter from movement until the lost motion is taken up between the rockable handle I and the shank B. However, the spring N functions as soon as the pressure on the handle I is reversed to turn the pinion through the medium of the pin O and to separate the sharp edge of the blade from the strop.

The frame A is preferably rectangular having the side members A′ and A² adapted to engage the strop X, the inner end member A³ connected to the handle shank B and the outer end member A⁴. In order to obtain sufficient friction between the frame and the strop it is desirable to have a flat surface on the under side of the side members A′ and A², but if this surface extends for the entire width of the members, only the outer edges will contact with the strop because the latter is never sufficiently flexible to make the sharp bend corresponding to the curvature of the strop when pressure is being applied due to the stropping of the blade. Therefore, in my construction the outer portions of the under surface of each side member is bevelled or curved upwardly as indicated at A⁵, while the inner portion is flat as indicated at A⁶. Thus, as shown in Figure 6, the strop X always lies on the inner portions of the side members whether much or little pressure is being applied and the blade, therefore, contacts with the strop at the desired angle. In the preferred construction the outer edge portions of the side members A′ and A² and the outer end member A⁴ are all bent upwardly, this not only providing the desired curvature, but also imparting rigidity to the frame. In the drawings the razor stropper is shown in engagement with a double strop X having the honing surface X′ on one side and the stropping surface X² on the reverse side.

The blade holder of my improved device comprises a pair of cheek plates P and P′ preferably hinged to each other at the adjacent edges, one being rigidly attached to the rock shaft E and the other being rotatable thereon. Sleeved upon the rock shaft E is a torsional spring 1 having the portions 2 and 3 respectively bearing against the cheek plates P′ and P and normally holding the same angularly spaced from each other. The cheek plates are provided with the centrally recessed portions 4, the outer edges of these plates being arranged to form clamping faces 5 and 6 respectively. One of the plates is provided with the recess 7 at the free end thereof and the struck-out lug 8 adjacent the inner edge thereof.

In order to secure different blades within the blade holder, I preferably provide a series of adaptors arranged to be positioned within the blade holder and having formed thereon, lugs or other suitable means for positioning the particular blade which it is designed to carry. Thus, as shown in Figure 9, 9 is an adaptor preferably formed of sheet metal and having the raised portion 10 against which the blade is adapted to seat and provided with struck-out lugs 11 so spaced as to enter the apertures 12 in a particular safety razor blade. 13 is a slot for engaging the struck-out lug 8 in the blade holder. The shoulders 14 formed by the raised portion are adapted to engage corresponding shoulders 15 on the blade holder to further position the adaptor.

For retaining the adaptor in position there is a spring clip 16 arranged to bear against the adaptor and to engage shoulders formed by the struck-out lugs 30. In the preferred construction this spring clip is formed from the same spring wire that is used for urging the cheek plates towards open position, as illustrated in Figure 7. The spring wire forming the coil 1 has the portion 3 projecting radially of the rock shaft E′ bent to extend parallel to the shaft and then bent radially inward and coiled around the opposite end of the rock shaft as indicated at 17, the end 18 of the wire engaging the cheek plate P′. With this arrangement the tension of the spring wire serves a double function for it urges the cheek plates towards open position and also retains the adaptor plate on one of the cheek plates.

For limiting the divergence of the cheek plates when in open position, there are stops formed by shoulders 19 and 20 in the corresponding cheek plates. 21 is a lever pivotally attached to the cheek plate P at one end thereof and preferably at a point closely adjacent the rock shaft E. This lever has the outwardly extending arms 22 forming clamping members adapted to embrace the cheek plates P and P′ when the latter are in closed position. The members are united at their outer ends forming a handle 23 by which the lever is operated. 24 is a transversely extending member between the handle and the blade holder forming a guard for preventing the fingers from coming in contact with the edge of the razor blade. This transversely extending portion also forms a stop which engages the rock shaft E when the lever is substantially parallel to the rock shaft. Each of the cheek plates P and P′ are provided with the

slightly raised portions 25 forming a snap lock for the lever when it is in clamped position. The handle 23 extends beyond the outer end bar A^4 of the frame and when the device is not in engagement with the strop the handle can contact with the raised outer edge of the end bar forming a stop for limiting the rocking movement of the blade holder. However, when the device is placed upon the strop and the blade is contacting therewith as shown in Figure 6, there must always be a slight clearance between the handle and the frame, as otherwise, the blade would be held out of engagement with the strop. The cheek plate P′ preferably has the edge 40 cut away at a slight angle so as to permit the opening of the plate when the lever is withdrawn from the engagement therewith to the position shown in Figure 7.

Figures 9 to 15 illustrate a number of different modifications of adaptors, each of which is designed for a particular type of safety razor blade. Each adaptor is provided with a raised portion 10, shoulders 14, slot 13 and lugs 30 so that all of them fit the blade holder and are retained in engagement with the cheek plate P by the spring clip 16. The adaptors differ from each other however, in the arrangement of the lugs for engaging the various blades. In Figure 9 the lugs 11 correspond to apertures 12 in a blade 12^a and the raised portion 10 is of greater width between the lugs than at the ends of the adaptor. This provides a greater bearing surface for the blade and limits the extent of the shoulders 14 to the end portions of the adaptor. The construction shown in Figure 10 is designed for a single edged razor blade 27 having recesses 29 in the sides of the blade and therefore, the adaptor has its raised portion 10 of the same width across the entire face. The blade is positioned by having the lower edge resting upon the lugs 35 and the sides of the blade arranged between the lugs 41.

In Figure 12 the blade 42 has projecting ends 36 and the adaptor is provided with lugs 39 engaging said ends and lugs 38 engaging the lower edge of the blade. The adaptor in Figure 13 is similar to that shown in Figure 9 and is designed to support a blade 43 having an elongated aperture 44. It will be noted that the adaptors illustrated in Figures 9, 10, 12 and 13 all have the struck-out portions 45 formed in the metal adjacent the recess 7 of the cheek plate P. These portions are for the purpose of compensating for the drawing of the metal during the pressing of the same, since it has been found that without these portions the metal is warped and the adaptors do not lie flat upon the cheek plates.

What I claim as my invention is:—

1. A razor stropping device comprising a plate cut away to form an opening with side and end bars adjacent thereto and having an integral handle shank projecting laterally from one of said end bars, a blade holder, a rock shaft on which said blade holder is mounted extending across said opening centrally between said side bars and journaled in bearings on said end bars, a pinion on said rock shaft adjacent to one of said bearings and extending through a slot in said end bar provided with a handle shank, a handle pivotally attached to said handle shank at the outer end thereof and having a portion at its inner end extending beneath the end bar, said portion having a rack formed integrally at the end thereof for engaging said pinion.

2. A razor stropping device comprising a plate cut away to form an opening with side and end bars adjacent thereto and with a handle shank projecting laterally from one of said end bars, a blade holder, a rock shaft on which said blade holder is mounted extending across said opening centrally between said side bars and journaled in bearings in said end bars, a pinion on said rock shaft, a hollow handle embracing said handle shank and pivotally attached thereto at the outer end thereof, the inner end of said handle being bifurcated to embrace the end bar of said plate, and a rack formed on one of the furcations of said handle engaging said pinion, whereby the rocking movement of said handle will reverse said blade holder, said handle being relatively wide where it embraces the end bar and having bearing engagements on the end bar spaced toward the outer edges of the handle to accurately maintain the plane of movement of the handle parallel with that of the plate.

3. A razor stropping device comprising a plate cut away to form an opening with side and end bars adjacent thereto, said end bars having central ears struck up therefrom on one side of said plate with oppositely extending ears on one of said end bars, a handle shank extending laterally from the last-mentioned end bar, a blade holder, a rock shaft on which said blade holder is mounted extending across said opening centrally between said side bars and journaled in said first-mentioned ears, a pinion on said rock shaft extending through a slot in the end bar adjacent to the journal ear, a hollow handle pivotally attached to the outer end of said shank, the inner end of said handle being bifurcated to embrace the end bar of said plate, one of the furcations having a series of apertures therein forming a rack for intermeshing with said pinion and said oppositely extending ears forming guides for engaging the edge of the razor strop.

4. A razor stropping device comprising a frame or plate for contact with the razor strop, a rotatable blade holder, a pinion on said blade holder, a handle for actuating said frame having a limited lost motion connection therewith, the inner end of said handle

being bifurcated to embrace the frame or plate, a rack formed on one of the furcations of said handle for engaging said pinion, and an anti-friction bearing in the other furcation of said handle for receiving the lateral thrust between said handle and frame.

5. A razor stropping device comprising a frame or plate having a cut away portion and adapted to contact with the razor strop, a blade holder pivotally mounted on said frame and located in the cut away portion thereof, a handle for actuating said frame having a limited lost motion connection therewith, the inner end of said handle being bifurcated for embracing the frame or plate, one of the furcations of said handle being formed with rack teeth, a pinion on said blade holder engaging said rack teeth, the other of said furcations having a bearing cage, and an anti-friction roller in said cage engaging said plate for receiving the lateral thrust between the handle and the frame.

6. A razor stropping device comprising a frame or plate having a cut away portion and adapted to contact with the razor strop, a blade holder pivotally mounted on said frame and located in the cut away portion thereof, a pinion on said blade holder, a handle shank projecting from said frame, a handle member pivotally attached at its outer end to the outer end of said handle shank, the inner end of said handle member being bifurcated to embrace said frame or plate, one of the furcations of said handle member being formed with teeth for engaging said pinion, the other furcation of said handle having a raised portion forming a bearing cage, and a ball bearing in said bearing cage for receiving the lateral thrust between the handle and the frame.

7. In a razor stropping device, the combination with a frame having a cut away portion and adapted to contact with the strop, of a rockable blade holder mounted on said frame centrally of said cut away portion, a pinion on said rockable blade holder, a handle having a lost motion connection with said frame and provided with a rack for engaging said pinion to reverse said blade holder, a spring connected at its opposite ends to said frame and extending transversely of said rock shaft, and a pin on said pinion arranged to engage said spring intermediate its ends just before the blade contacts with the strop.

8. In a saftey razor stropping device, a rock shaft, a check plate rigidly secured thereto, a second cheek plate hingedly mounted on said rock shaft, a stop permitting a limited angular movement of said cheek plate, a torsional spring on said rock shaft bearing on said plates to urge the same towards open position, a bifurcated lever pivoted on one of said cheek plates at one end of the same adjacent said rock shaft, said lever being adapted to embrace said cheek plates and permit the same to project through the bifurcated portion thereof, a slightly raised portion on the opposite end of one of said cheek plates, a handle, a transverse member on said handle, one end of said transverse member forming a stop engaging said rock shaft and the other end forming a finger guard.

9. In a razor stropping device, the combination of a blade holder having hingedly connected cheek plates, said plates having clamping faces at their outer sides forming a central longitudinal recess between the same and said hinged connection, an adaptor plate having shoulders engaging corresponding shoulders on one of said cheek plates, a spring clip bearing against said adaptor plate, and lugs on said adaptor plate for engaging a razor blade, the other cheek plate being recessed corresponding to the lugs on said adaptor plate.

10. In a razor stropping device, the combination of a pair of hingedly connected cheek plates having adjacent raised clamping faces forming longitudinal shoulders, one of said plates having a projecting lug, a one piece readily removable adaptor plate having an offset portion engaging the raised portion of said cheek plate and having also a recess engaging said lug, and struck-out lugs on said adaptor for engaging a razor blade.

11. In a razor stropping device, the combination of a pair of hingedly connected cheek plates having cooperating raised outer clamping faces forming longitudinal shoulders, an adaptor plate having a raised portion engaging the raised portion of one of said plates, means for preventing relative longitudinal movement of said cheek plate and adaptor plate, a spring clip bearing against said adaptor plate, and struck-out lugs on the raised portion of said adaptor plate, the other cheek plate having recesses in its raised clamping face corresponding to the last-mentioned lugs.

12. In a razor stropping device, the combination of a pair of hingedly connected cheek plates, a torsional spring having portions bearing against each of said plates to urge the same toward open position, one of said portions forming a clip, an adaptor plate insertable between said spring clip and one of said plates, corresponding shoulders on said cheek plate and said adaptor plate for positioning the latter, lugs on said adaptor plate engageable with a razor blade, and means for clamping said cheek plates in closed position.

13. In a razor stropping device, the combination with a rock shaft having a pair of cheek plates thereon, one of said plates being hinged on said rock shaft, a spring wire coiled upon said rock shaft at opposite ends thereof, the ends of said wire bearing

against one of said cheek plates, and the portion of said wire connecting said coils being arranged to bear against the other of said cheek plates to form a spring clip, and a blade supporting adaptor plate secured to one of said cheek plates, said spring clip bearing against the same.

14. In a razor stropping device the combination with a blade holder having a pair of hingedly connected cheek plates, of an adaptor having means for engaging one of said cheek plates to position the same in the blade holder, a spring clip adapted to bear against said adaptor plate, lugs on said adaptor plate engaging said spring clip to prevent accidental disengagement of the same, and lugs on said adaptor for engaging the razor blade.

15. A razor stropping device comprising a frame having strop engaging side bars and end bars, the four bars being connected to form a closed path, an oscillatable blade holder supported intermediate of and carried by end bars of said frame, means for oscillating the holder and connected to and forming part of the inner end bar, the side bars and the outer end bar being formed of relatively wide strop engaging surfaces in the general plane of the frame and also formed with relatively wide upturned outer edges, the upturned outer edges of the side bars conforming to the curvature of the strop, and the upturned outer edges of the side bars and outer end bar assisting in reinforcing the frame.

16. In a razor stropping device, a blade holder comprising a pair of cheek plates hingedly connected along adjacent edges thereof to permit opening and closing of the same, a lever pivoted adjacent the hinged part of one of said plates and adapted to be moved to extend longitudinally thereof and embracing both of said cheek plates, a single readily removable adaptor adapted to be permanently positioned relative to one of said cheek plates for a particular style of razor blade, and a spring for normally urging said plates toward open position, a portion of said spring also bearing against said adaptor plate to normally hold the same in said permanent position for a particular type of razor blade.

17. A razor stropping device comprising, a plate cut away to form an opening with side and end bars adjacent thereto, and a handle shank projecting laterally from one of the said end bars, a blade holder, a rock shaft on which said blade holder is mounted extending across said opening centrally between the said side bars and journaled in bearings on said end bars, a pinion on said rock shaft adjacent the end bar with the handle shank, a handle embracing the handle shank and pivotally connected thereto at the outer end thereof, a portion of said handle extending under said end bar adjacent the pinion and having teeth formed at the end thereof for engagement with said pinion, and another portion of the said handle extending above said end bar, said later portion of the handle being relatively wide and having antifriction bearing engagements on the end bar spaced toward the outer edges of the handle, and a thumb rest intermediate said points of engagement adapted to equalize the pressure thereon.

18. A razor stropping device comprising, a frame or plate having a cut away portion and adapted to contact with a razor strop, said frame comprising strop engaging members connected by end bars, a blade holder and rock shaft pivotally mounted on said end bars and located on the cut away portion between the strop engaging members, a handle for actuating said frame or plate having a limited lost motion connection therewith, a pinion on said rock shaft positioned adjacent the end bar nearest the handle and extending below the inner edge of said end bar, a part of said handle extending below said end bar and having teeth formed on the end thereof for engagement with the pinion, said teeth and pinion meshing at a point below and between said strop engaging members and below and adjacent the inner edge of said end bar, and a lug adjacent to each of said strop engaging members and projecting laterally from the said end bar for forming a guide for the edge of the strop and to prevent the strop from coming in contact with said pinion or the teeth on the end of the said handle.

19. In a razor stropping device, the combination with a blade holder having a pair of hingedly connected cheek plates, and means for clamping said plates together, of a one-piece readily removable adaptor engaging only one of said cheek plates and having means for freely engaging said one cheek plate to position the adaptor in the blade holder, and permanently positioned lugs on said adaptor for engaging a particular style of razor blade.

20. In a razor stropping device, the combination with a blade holder having a pair of hingedly connected cheek blades of a removable adaptor member having means for engaging only one of said cheek plates, and a spring bearing against said adaptor member to normally prevent disengagement from said single cheek plate.

21. In a razor stropping device, a blade holder comprising a pair of cheek plates hingedly connected along adjacent edges thereto to permit opening and closing of the same, a lever pivoted adjacent the hinged part of one of said plates and adapted to be moved to extend longitudinally thereof and to embrace both of said cheek plates, and a single readily removable adaptor contacting with the interior surface of only one of

said cheek plates and having means for freely engaging said one cheek plate to position the adaptor in the blade holder and having lugs for engaging a particular style of razor blade.

In testimony whereof I affix my signature.

LEON A. FLINKER.