Sept. 17, 1929. H. J. GAISMAN 1,728,728

SAFETY RAZOR

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Fig. 1

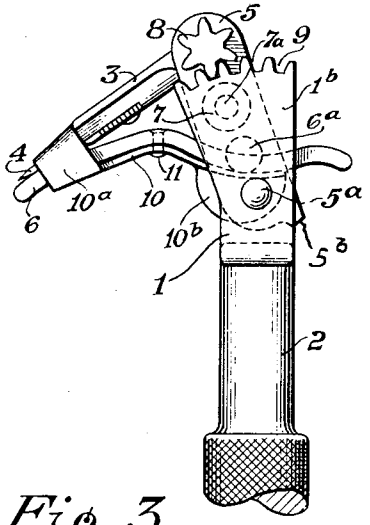


Fig. 2

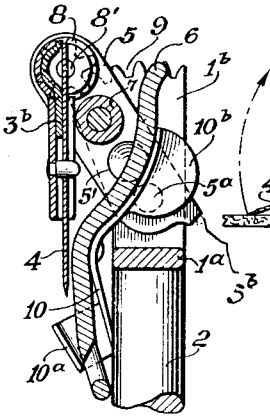


Fig. 1a

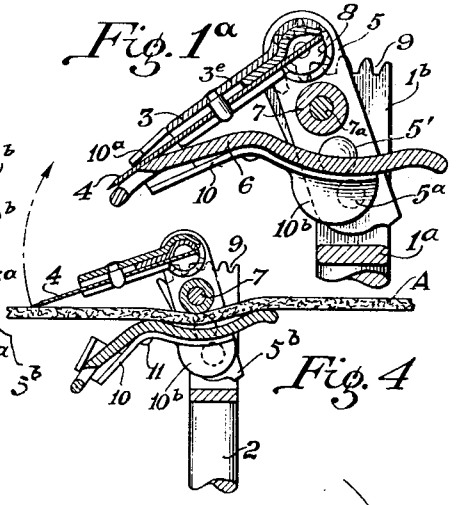


Fig. 4

Fig. 5

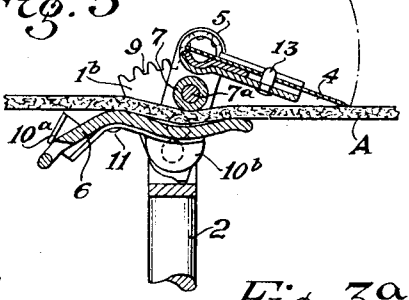


Fig. 3

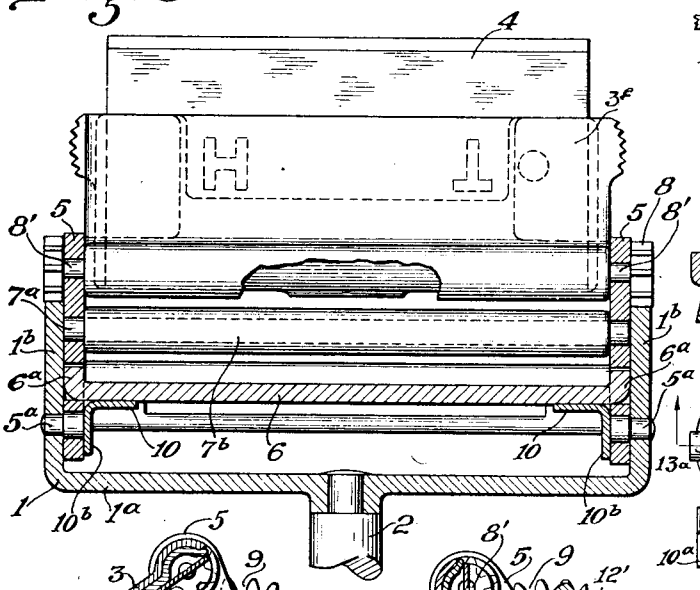


Fig. 3a

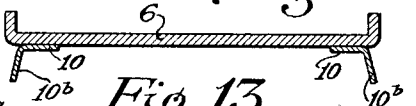


Fig. 13

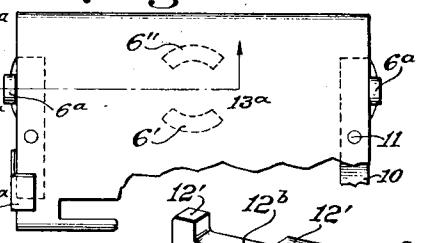


Fig. 13a

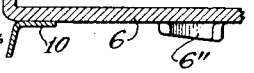


Fig. 14

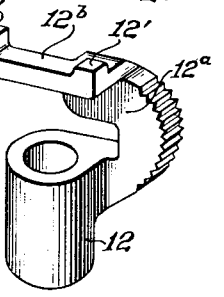


Fig. 11

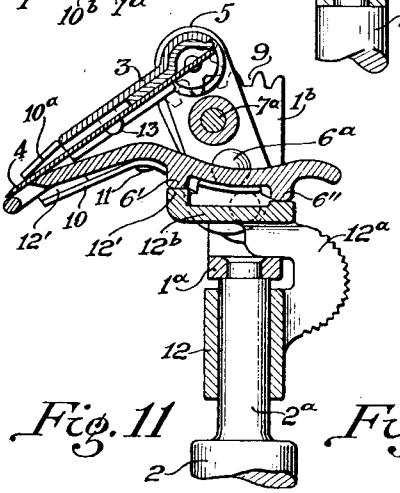
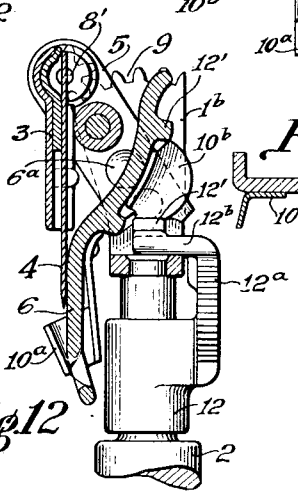


Fig. 12



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Fig. 6

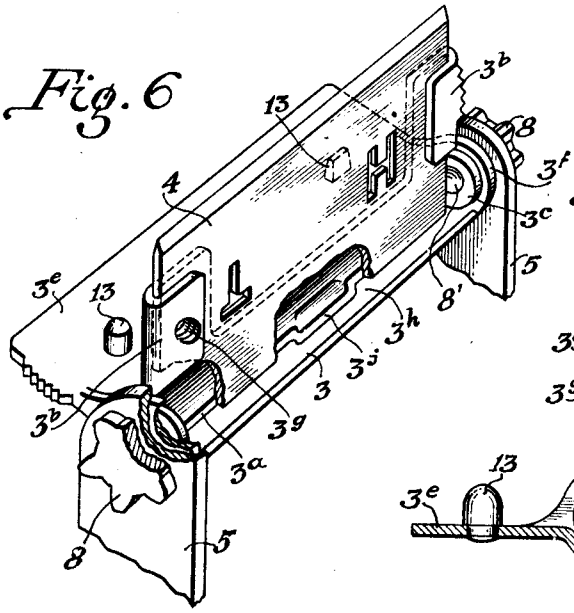


Fig. 8

Fig. 9

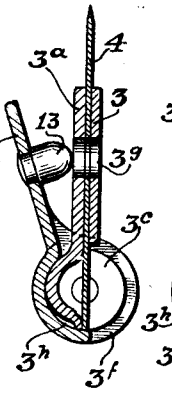


Fig. 10

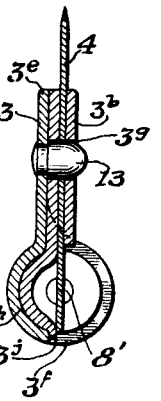
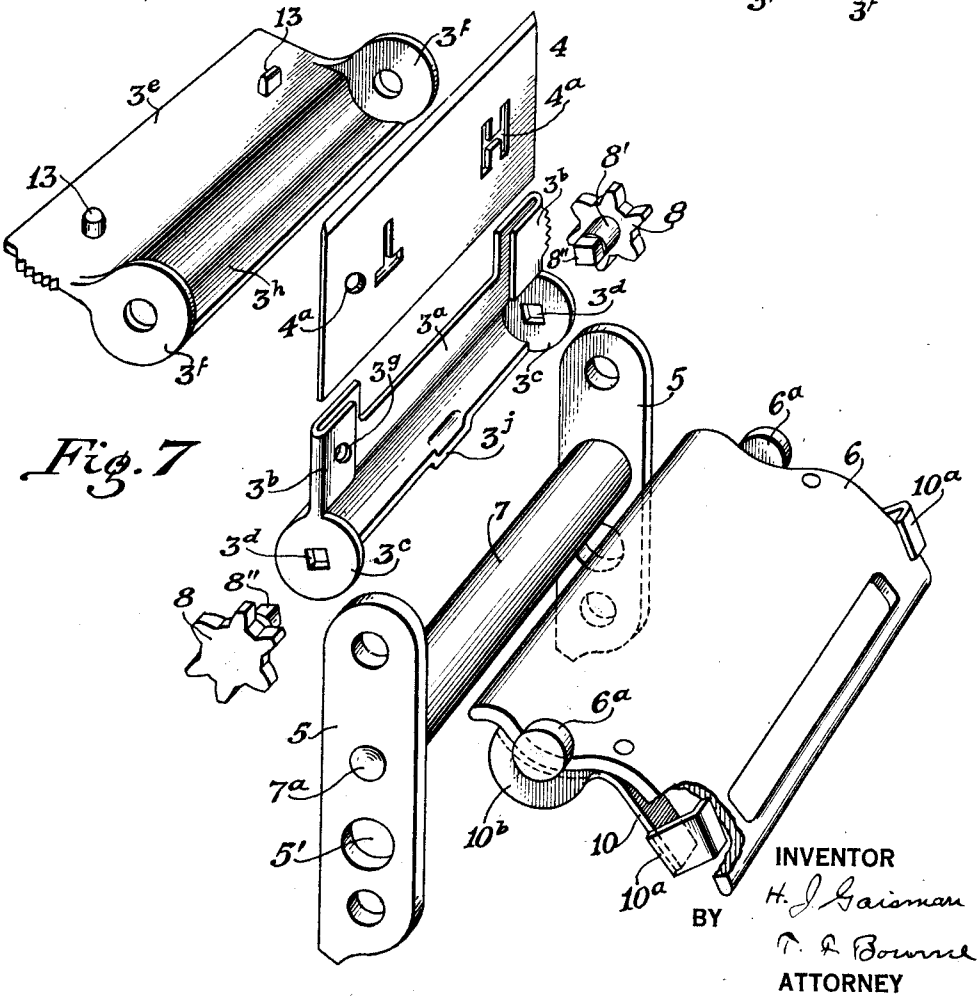


Fig. 7



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UNITED STATES PATENT OFFICE

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SAFETY RAZOR

Application filed July 9, 1927. Serial No. 204,440.

One of the objects of my invention is to provide a safety razor having a pivotally supported guard for a blade edge, which guard is included in strop tensioning means and may be folded with the blade relatively to the razor handle as a compact unit for packing and transportation.

Another object is to provide the guard with spring-acting blade retaining means to keep the guard and the blade in shaving relation.

A further object is to provide means for rocking a blade holder to present opposite sides of a blade edge to a strop for sharpening said edge, including a strop tensioning roll and a guard cooperative with the strop to cause the latter to operate the pivoted blade holder in conjunction with gearing that is caused to rock the blade holder when the tensioning means and the guard cooperate with the strop during reciprocations of the razor along the strop.

Another object of the invention is to provide a blade holder having two pivotally related members having means to retain a blade, one of which members has a portion adapted to oppose the blade when the latter is being inserted in the holder to properly position the blade in the holder, said members having cooperating spring-acting means to retain the blade in shaving position in the holder.

My invention comprises novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part hereof, wherein

Fig. 1 is a side view of a safety razor embodying my invention;

Fig. 1ª is a cross sectional view of Fig. 1;

Fig. 2 is a cross sectional view illustrating the blade and guard in collapsed positions;

Fig. 3 is a vertical section illustrating the parts in a different position from Fig. 1;

Fig. 3ª is a sectional detail of the guard;

Figs. 4 and 5 are sectional views illustrating the razor in stropping position;

Fig. 6 is a partly broken detail perspective view;

Fig. 7 is a view illustrating parts of the razor in detached relation;

Figs. 8, 9 and 10 are sectional details of the blade holder showing the parts in different positions;

Fig. 11 and 12 are sectional details illustrating a modification;

Fig. 13 is a broken plan view of the guard of Figs. 11 and 12;

Fig. 13ª is a sectional detail on line 13ª, 13ª, of Fig. 13, and

Fig. 14 is a perspective detail of part of Figs. 11 and 12.

Similar numerals of reference indicate corresponding parts in the several views.

The main frame 1 of the razor may be of any suitable construction, being shown comprising a base 1ª and spaced uprights 1ᵇ. At 2 is a handle which may be connected with base 1ª in any suitable or well known way. A blade holder 3 for a blade 4 is pivotally carried to rotate or rock by and between spaced arms 5 that are pivotally carried by the uprights 1ᵇ by means of pivots 5ª, (Fig. 3). At 6 is a guard for the blade edge, which is pivotally supported by and between the arms 5. In the example illustrated the pivots 6ª of the guard are shown in the form of ears struck up in annular form and extending laterally from the metal at the edges of the guard and journaled in holes 5′ in the arms 5, (Figs. 3 and 7). At 7 is a strop tensioning roller journaled on the arms 5 between the blade holder and the guard. The strop tensioning roller is shown comprising a shaft 7ª journaled at its ends in the arms 5 and provided with a tube or sleeve 7ᵇ through which the shaft passes, the ends of the tube opposing the arms 5, (Fig. 3). The blade holder 3 is shown provided with outwardly extending pivots 8′ at its ends that are journaled in the outer ends of the arms 5 and are provided with gears 8 that are respectively in mesh with segmental gears or racks 9 located at the outer ends of the uprights 1ᵇ of the main frame, whereby the cooperation of the gears and racks will cause the blade holder to be rotated or rocked when the arms 5 move back and forth within the main frame. By reason of the connection of the guard, the

strop tensioning roll and the blade holder with arms 5 the latter are maintained in relative operative positions. The arms 5 are shown provided with edge projections 5^b adapted to engage base 1^a to prevent unmeshing of the gears when the arms 5 swing to the right, as in Fig. 5, but in the absence of a strop.

The guard 6 is provided with means to retain the blade in shaving relation to the guard. In the example illustrated the guard is provided with springs 10 at opposite ends, shown in the form of leaf springs riveted to the guard at 11 between the ends of the springs, the outer ends of said springs being provided with jaws 10^a that freely embrace the adjacent ends of the guard and receive the blade 4 between the guard and the jaws. When the guard and blade are swung up to shaving position, as from the position shown in Fig. 2 to the position shown in Figs. 1 and 1^a, the jaws 10^a of the springs 10 will receive the blade and engage the same resiliently so as to lock or hold the blade against the guard for shaving purposes, since the blade and the jaws will slide relatively one to another. A feature of the construction is that the guard and blade may be moved with relation to one another in such a way as to present the blade edge more or less forwardly respecting the guard for close or coarse shaving. The blade will strain against the spring jaws, as the blade enters between the jaws and the guard, for causing the position of the blade to be set flat against the guard with the jaws holding the parts together. Means are provided to retain the guard in shaving relation to the blade. In the example illustrated in Figs. 1 to 5 the inner ends of the springs 10 are bent laterally at 10^b, in the nature of ears or lugs which preferably have a normal outward inclination, as illustrated in Fig. 3^a, so as to bear resiliently and frictionally against the adjacent arms 5, assuming a position such as illustrated in Fig. 3, to retain the guard in set relation to the arms. The parts 10^b prevent the guard from swinging too freely and hold the same frictionally in any desired required position, to permit the insertion of a strop between the guard and the tensioning means 7, and to retain the guard, the arms and the blade holder in folded position, as in Fig. 2.

When a strop A is passed through the razor it will be located between the guard and the tensioning means 7, the guard being shown curved on opposite sides of a plane through the guard and the tensioning means, whereby when the razor is reciprocated along the strop, the latter being held taut, the arms 5 will be caused to rock and as they carry the gears 8 along the racks 9 the blade holder will be rocked to present opposite sides of the blade edge to the strop. When the razor is moved toward the right in Fig. 4 the blade edge will drag on the strop and when the direction of reciprocation of the razor is reversed the arms 5 will be temporarily retained by the grip of the tensioning means 7 and the guard against the strop. Thereupon the racks 9 will move toward the left in Fig. 4 and cause the gears 8 to initially raise the blade edge from the strop to prevent the blade from cutting the strop, and when the parts assume the position shown in Fig. 5 the blade will have been rocked to present the adjacent edge against the strop. As the razor is moved to the left in Fig. 5 along the strop the edge of the blade will be sharpened and when the direction of the movement of the razor along the strop is reversed the racks and gears will cause the blade edge to be raised from the strop to prevent cutting the latter and the position of the blade will be reversed, and so on during each reciprocation of the blade along the strop. By reason of the pivotal support of the guard by the rockable arms 5 the guard will be permitted to maintain a proper cooperative relation to the strop in either position of said arms and the blade holder during the stropping operation, such as illustrated in Figs. 4 and 5, the curved portion of the guard that opposes the stropping roller 7 accommodating the various positions of the guard with respect to the strop. When the blade is not to be used the guard may be swung down along the handle and will be retained by the frictional action of the parts 10^b against the arms 5, and the blade may be swung along the guard, as illustrated in Fig. 2, providing a compact relation of the part for packing and transportation.

In the form shown in Figs. 11 to 14 means are provided to adjustably retain the guard in different positions respecting the blade edge, arranged as follows: A sleeve 12 is slidably journaled upon the reduced end 2^a of handle 2 and said sleeve is provided with an offset portion 12^a, forming a finger piece, shown provided with a laterally disposed member 12^b having spaced lugs 12′ adapted to engage spaced inclined projections 6′, 6″ on the bottom of the guard, the under surfaces of which projections are shown inclined, (Fig. 13^a). The arrangement is such that when the sleeve 12 is turned to the position shown in Fig. 11 the lugs 12′ will engage the projections 6′, 6″ and the portion 12^a will bear against base 1^a to retain the guard in a locked position respecting the blade, and by reason of the inclination of the projections 6′, 6″ the lugs 12′ may be set in different positions to cause the guard to be projected more or less respecting the blade edge for a close or coarse shave. When the sleeve 12 is turned to the position shown in Fig. 12 the guard will be released for stropping, and may be swung down in the direction of the handle for storage.

The blade holder illustrated comprises a

member 3^a, shown in plate-like form, having guides or jaws 3^b at opposite ends, which may be folded from the metal of the plate, into which guides or jaws the adjacent edges of the blade 4 will be slid. The member 3^a is shown provided with laterally disposed ears or webs 3^c provided with polygonal holes 3^d that receive the correspondingly shaped ends of the pivots 8', whereby the gears 8 will rotate the member 3^a, (Fig. 7). A second member 3^e of the blade holder is pivotally supported to rotate relatively to the member 3^a and is shown provided with laterally disposed ears or webs 3^f provided with holes receiving the annular portions of the pivots 8', whereby the members 3^a and 3^e are journaled to rotate relatively to one another. The blade 4 is shown provided with spaced openings 4^a adapted to receive spaced projections 13 carried by and projecting from the member 3^e of the blade holder. One of the jaws 3^b is provided with apertures or holes 3^g through which one of the projections 13 is adapted to pass, as well as through the adjacent opening 4^a in the blade for retaining the blade in set position in the blade holder. The member 3^e of the blade holder is provided with a curved inner portion 3^h substantially concentric with the pivots 8' and the member 3^a is provided with a projection 3^j that is adapted to cooperate with the curved portion 3^h to retain the blade holder members 3^a and 3^e in closed blade retaining position, (Fig. 10). The relative arrangement of the blade holder parts is such that when the members 3^a and 3^e are separated the curved portion 3^h will oppose the guides or jaws 3^b in such a way that when the blade is inserted into said jaws the rear edge or heel of the blade will be stopped by engagement with the portion 3^h, whereby to register an opening 4^a in the blade with the openings 3^g of member 3^a, (Fig. 8), the projection 3^j bearing against the portion 3^h in a spring-like or resilient manner. When the members 3^a and 3^e are closed to retain the blade the corresponding projection 13 will pass through the openings 3^g and 4^a to retain the blade from displacement, and the projection 3^j will snap against the adjacent edge of the portion 3^h, as illustrated in Fig. 10, to retain the parts assembled. When the members 3^a and 3^e are spread apart from the position shown in Fig. 10 the resiliency of the blade holder members will permit them to pass one another and assume the positions shown in Figs. 8 and 9.

While I have set forth two gears 8 and two segmental gears or racks 9 respectively on opposite sides of the razor it will be understood that a single gear 8 and corresponding segmental gear or rack 9 may be used on one side of the razor only if preferred.

My invention is not limited to the details of construction set forth, as the same may be varied, within the scope of the appended claims, without departing from the spirit of my invention.

Having now described my invention what I claim is:—

1. A safety razor comprising a frame, arms pivotally carried by the frame, a blade holder pivotally carried by the arms, means cooperative between the frame and the blade holder for rocking the latter for stropping a blade edge, a guard pivotally supported by said arms, for movement relatively thereto and to the frame, and strop tensioning means carried by said arms.

2. A safety razor as set forth in claim 1, in which the means for rocking the blade holder include a gear connected with the blade holder and a segmental gear carried by the frame.

3. A safety razor as set forth in claim 1, in which the strop tensioning means includes a roller spaced from the guard to receive a strop therebetween for controlling the arms.

4. A safety razor as set forth in claim 1, in which the strop tensioning means includes a roller spaced from the guard to receive a strop therebetween, said guard having a curved portion opposed to the roller to receive the strop therebetween for rocking the arms.

5. A safety razor as set forth in claim 1, provided with means to retain the pivotal guard in shaving relation to the blade.

6. A safety razor as set forth in claim 1, in which the guard is provided with means to frictionally engage the arms to retain the guard in a folded position and for inserting a strop.

7. A safety razor as set forth in claim 1, in which the guard is provided with a spring cooperative with the adjacent arm to retain the guard in a folded position and for inserting a strop.

8. A safety razor comprising a frame, a blade holder, and a pivotally supported guard for cooperation with a blade, said guard having a spring provided with a jaw to receive and engage the blade when the guard swings toward the blade holder, for retaining the guard and blade in shaving relation.

9. A safety razor as set forth in claim 8, in which the spring is provided with a portion to frictionally engage a member of the razor to retain the guard and the blade in shaving relation.

10. A safety razor as set forth in claim 8, in which a spring is secured to the guard, said spring at the outer end being provided with the jaw enclosing an adjacent portion of the guard to cooperate with a blade for retaining the guard and the blade in shaving relation, said spring at the inner end having a portion to engage a member of the razor to retain the guard and the blade in shaving relation.

11. A safety razor comprising a frame provided with a gear, arms pivotally carried by the frame to move relatively to said gear, a blade holder pivotally supported by the arms and provided with a gear in mesh with the first named gear for operating the blade holder gear during movement of said arms relatively to the first gear, strop tensioning means carried by the arms, a guard carried by said arms, and means to retain a blade in shaving relation to the guard.

12. A safety razor as set forth in claim 11, in which the guard is pivotally carried by the arms and spaced from the strop tensioning means for the passage of a strop therebetween.

13. A safety razor comprising a frame provided with a gear and having a handle, arms pivotally carried by the frame and provided with a blade holder having a gear in mesh with the first named gear, strop tensioning means carried by the arms, a guard pivotally carried by the arms, and a sleeve movably carried by the handle and provided with means to cooperate with the guard to retain the latter in shaving position respecting the blade.

14. A safety razor as set forth in claim 13, in which the sleeve is provided with projections and the guard is provided with complemental projections, the sleeve having means cooperative with the frame for retaining the guard in shaving position respecting the blade.

15. A safety razor as set forth in claim 13, in which the sleeve is provided with projections and the guard is provided with complemental projections, the sleeve having means cooperative with the frame for retaining the guard in shaving position respecting the blade, the second named projections having inclined portions to cooperate with the first named projections for retaining the guard in different set positions with respect to the blade.

16. A blade holder comprising members pivotally connected together, one of said members having guiding means for slidably guiding a blade, the other member having means cooperative with the first named member and with the blade for retaining the latter in operative position in the holder, the second named member having a portion adapted to oppose the blade when said members are separated for location of the blade in proper position in the holder.

17. A blade holder comprising members pivotally connected together, one of said members having guiding means for slidably guiding a blade provided with an opening, the other member being provided with a projection to enter said opening and to enter a complemental opening in a blade to retain the blade in operative position in the holder.

18. A blade holder comprising members pivotally connected together, one of said members having apertured guiding means for slidably guiding a blade, the second member having a projection to enter the apertured guiding means, and a portion adapted to oppose the blade when the members are separated, for registering an opening in the blade with the aptreure in the guiding means for retaining the blade in operative position in the holder.

19. A blade holder as set forth in claim 18, in which one of the members has a projection to cooperate with a portion of the other member in a resilient manner to retain said members in closed position with a blade therebetween.

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