D. C. WILLIAMS.

SAFETY RAZOR SHARPENER.

APPLICATION FILED APR. 8, 1911.

998,442. Patented July 18, 1911.

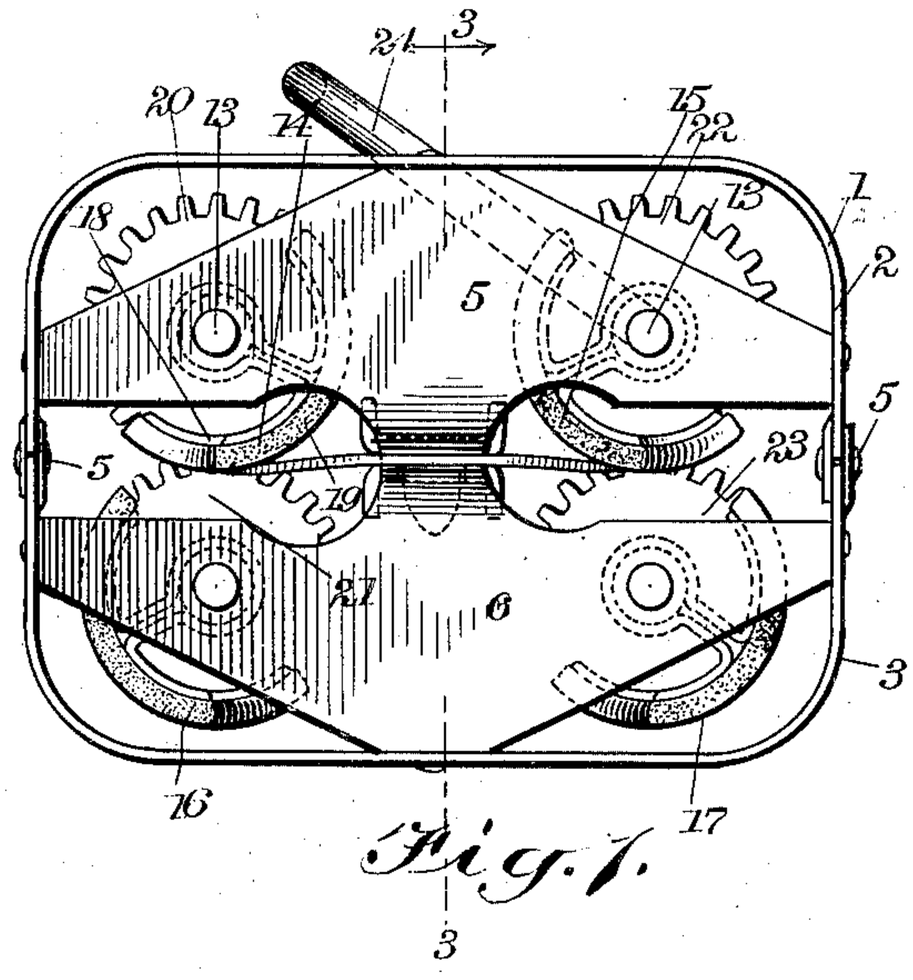


Fig. 1.

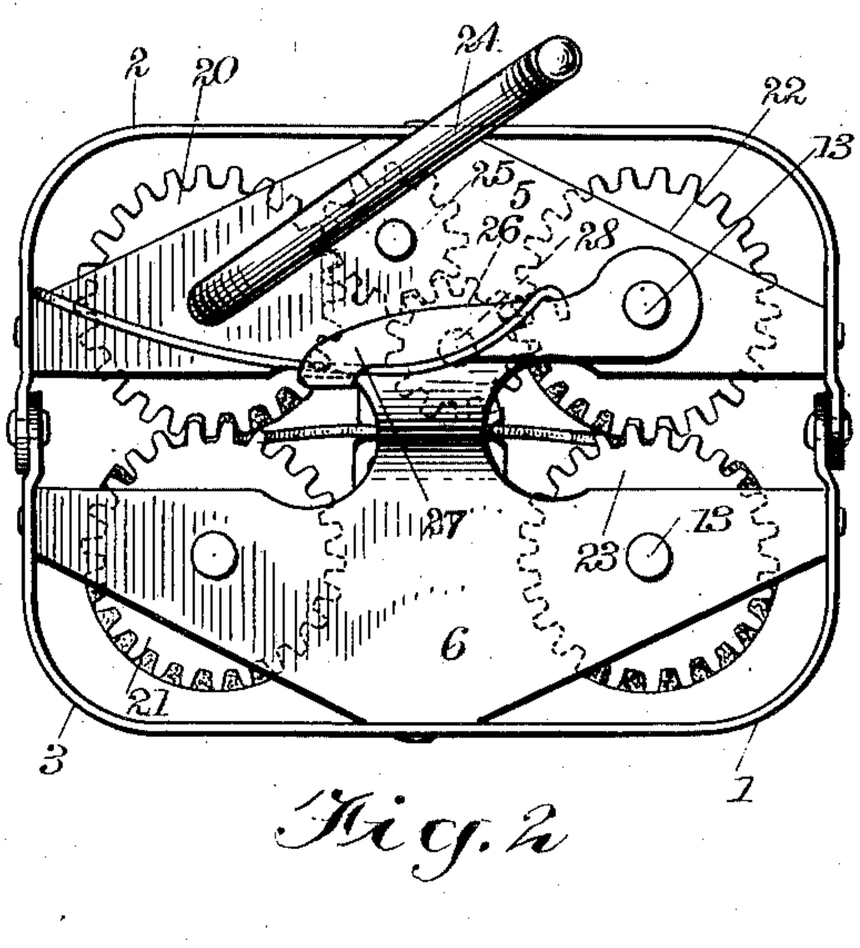
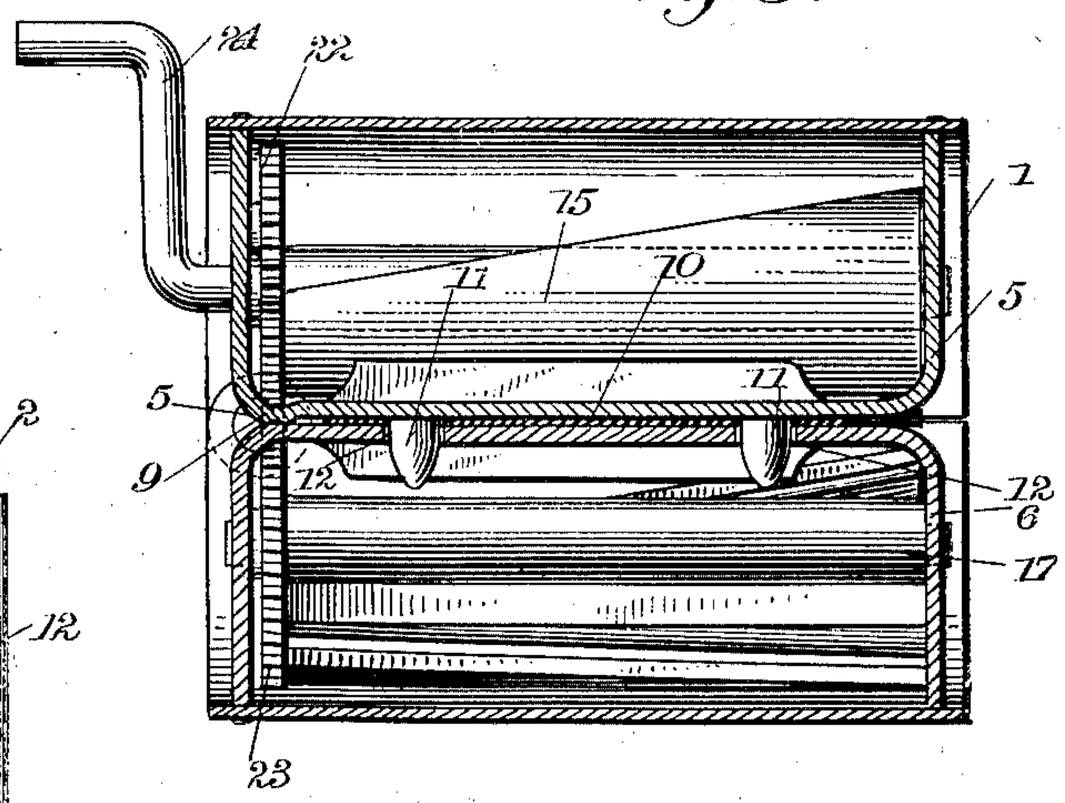


Fig. 2.

Fig. 3.



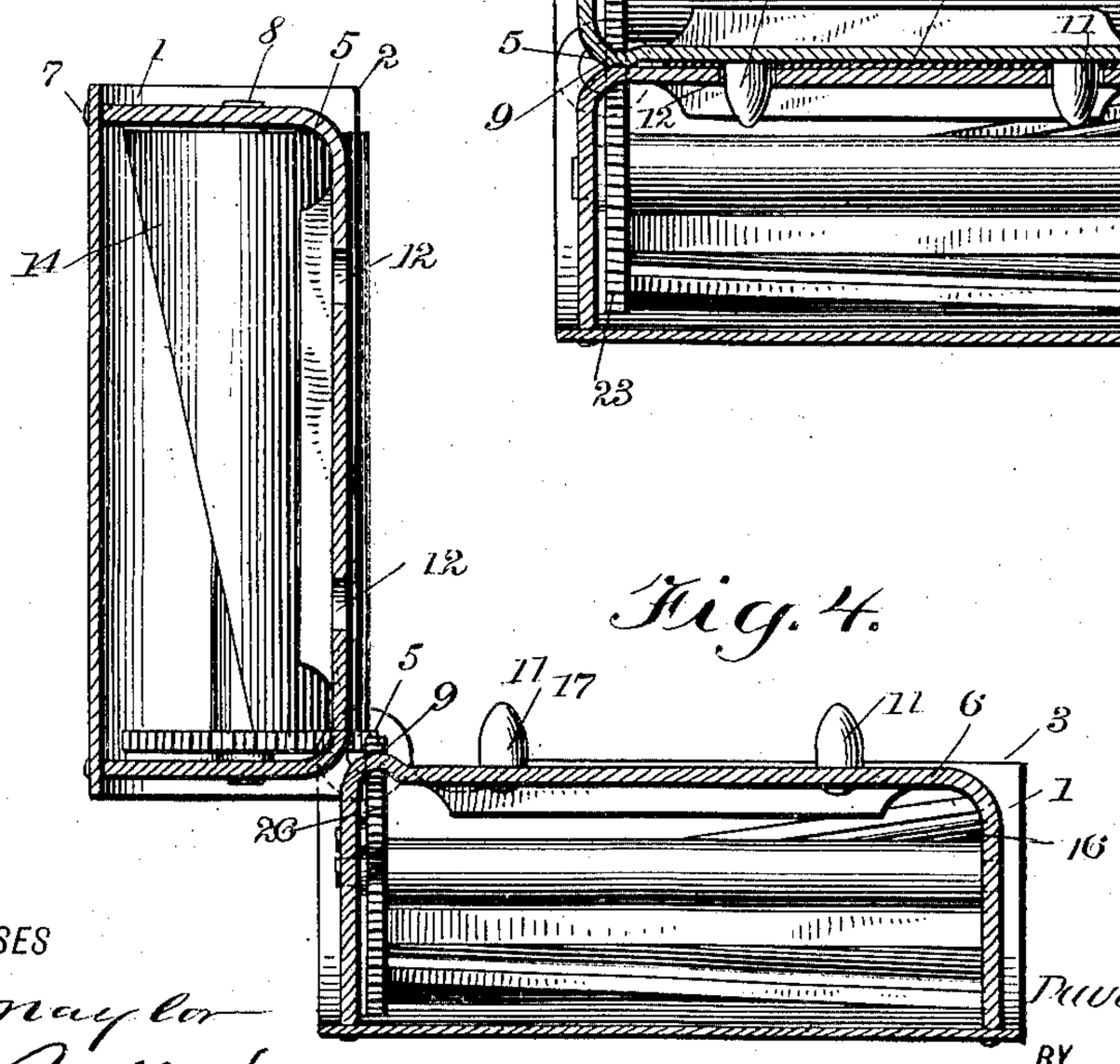


Fig. 4.

WITNESSES

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SAFETY-RAZOR SHARPENER.

998,442. Specification of Letters Patent. **Patented July 18, 1911.**

Application filed April 8, 1911. Serial No. 619,714.

To all whom it may concern:

Be it known that I, DAVID C. WILLIAMS, a citizen of the United States, and a resident of Arlington, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Safety-Razor Sharpener, of which the following is a full, clear, and exact description.

This invention relates to a new and improved sharpener for renewing the edge of razor blades, and particularly that type of blades known as safety razor blades and used in such safety razors as the "Gillette."

An object of this invention is to provide a blade sharpener which will automatically sharpen simultaneously a plurality of edges of a blade.

Another object of this invention is to provide a device which will alternately sharpen the opposite edges of a blade in a continuous manner.

A further object of this invention is to provide a razor blade sharpener which can be conveniently opened, and having a plurality of sharpening parts normally separated by the opening action, so as to render the device readily accessible for the purpose of removing or placing the blade to be sharpened, and wherein the driving connection between the various sharpening members will not be disturbed due to the opening action.

A still further object of this invention is to provide a plurality of coöperating sharpening members adapted to alternately sharpen opposite sides of a blade, and having a diagonal edge, whereby they will leave the blade gradually, eliminating a sudden flip of the blade, which might injure the same.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a front view in elevation; Fig. 2 is a rear view in elevation; Fig. 3 is a vertical section on the line 3—3 of Fig. 1, showing the parts in their closed position; and Fig. 4 is a section similar to Fig. 3, but inverted, showing the parts in their open position.

Referring more particularly to the separate parts of this invention as embodied in the form shown in the drawings, 1 indicates a casing, which, for the purpose to be described, is preferably bi-parted, so that it can readily open and permit access to the interior thereof. While this casing may be of any suitable character, it is preferably formed of two U-shaped stamped sheets 2 and 3, hinged together in any suitable manner, as by means of pins 4 passing through alined openings on extension lugs thereon, on each side, adjacent one of the edges. It will be seen from this arrangement that the casing can open to the position shown in Fig. 4. The parts of this casing are preferably made of springy sheet-metal, as described, so that brackets 5 and 6 can be automatically sprung in position therein. These brackets are also shown as being somewhat U-shaped in cross section, and having lugs 7, which are adapted to snap into slots 8 in the parts 2 and 3 of the casing.

It will be noted that the form and magnitude of the brackets 5 and 6 are such that when the casing is closed, the bridges thereof will come in close juxtaposition, to form rests for the razor blade. They are, however, prevented from coming too close along the greater portion thereof by a stop formed by an expanded portion, indicated at 9, so as to leave a space therebetween for a razor blade, indicated at 10. Inasmuch as the device is shown to be adapted in this instance for a Gillette blade, there are provided pins 11, which pass through apertures normally found in the Gillette blade, and corresponding apertures 12 in the bracket 6, whereby the blade is held in a fixed position in the casing during the sharpening action. It will be seen that the sides of the brackets 5 and 6 each have a pair of spaced openings, forming journal bearings for shafts 13. Each of these shafts supports a stropper. These stroppers are indicated by the numerals 14, 15, 16 and 17. These stroppers act in pairs, and when the casing is closed, the stroppers 14 and 16 coöperate with each other to sharpen the opposite sides of one edge of the blade, and the stroppers 15 and 17 coöperate with each other to sharpen the opposite sides of the other edge of the blade. While these

stroppers may be of any suitable character, it is preferred that they should be in the form of sections of rollers as indicated. The sections of rollers may be formed in any suitable manner, as by having a strip of metal 18 bent in a loop around the shaft 13 and then outward radially, where the two legs of the loop are flexed in an arcuate form to simulate sections of a cylinder, forming supporting elements for curved sections 19 of any suitable sharpening material, such as leather. These sections of leather may be secured to the strips of metal 18, which may be termed the shell of the stropper, in any suitable manner, as by being secured thereto with glue or the like.

The shafts 13 of the stroppers 14 and 16 are connected in driving relation by gears 20 and 21, and the shafts of the stroppers 15 and 17 are connected in driving relation by gears 22 and 23. One of these shafts may be provided with a hand crank 24, for the purpose of driving all of the stroppers. Two of these gears, such as the gears 20 and 22, are connected in driving relation with each other by intermediate gears 25 and 26, preferably so that the stroppers 14 and 15 and 16 and 17 respectively are driven in opposite directions, so that the stropping action will always be with the cutting edge, and not against it. A peculiar thing to be noted about this gearing connection is that the gears 20, and 21 and 22 and 23 mesh along a line which is in approximate alinement with, or included in, the pivotal axis of the two parts 2 and 3 of the casing 1, so that when these parts of the casing are swung open, as indicated in Fig. 4, the gears will not come out of mesh, so that there is no inconvenience in opening and closing the casing for the purpose of putting in or taking out the blade to be sharpened. It will be further noted that the stroppers are so arranged relative to each other, and the gears so intermeshed that the stroppers 14 and 15 will be moving away from each other in synchronism, and likewise the stroppers 16 and 17 will be moving away from each other in synchronism, but that the stroppers 14 and 15 will be in contact with the blade 10 while the stroppers 16 and 17 are out of contact with the blade 10, and vice versa. It will be seen that when either of the pairs of upper or lower stroppers are in contact with the blade, the blade is flexed on both sides, either down or up, according to whether the upper or lower stroppers are in contact therewith. This is due to the fact that the stroppers are of sufficient diametrical magnitude to overlap the path of each other in the superposed pairs, so that the sharpening action is materially increased and made positive.

It will be noted that the edges of the section of each sharpener are not straight, but slanting or diagonal, so that they come in contact with the blade gradually and leave the blade gradually. This prevents any excessive flipping or snapping of the blade at the edge thereof, thus guarding against destroying the fine edge, and in fact, if any injury is done whatsoever, it will be only at one extreme corner, and there inappreciable.

In order that the device may not be run in the wrong direction and thus have the blade cut into the sharpening layer 19 of each stropper, there is provided an automatic lock 27, which is shown in the form of a spring-pressed pawl 28, automatically held in engagement with one of the gears 20 in such a manner as to permit it to slip in the proper direction, but to prevent it from rotating in the wrong direction. This pawl may be pivotally supported in any suitable manner, as by being rotatably mounted on one of the shafts 13.

The operation of the device will be readily understood when taken in connection with the above description. When it is desired to sharpen a blade, the casing is swung open, and the blade placed in position between the bridges of the brackets 5 and 6, so that the pins 11 will pass through the openings provided in the blades. The casing is then closed by swinging the parts thereof together. The crank 24 is then rotated to the right or in a clockwise direction, thereby rotating all of the stroppers simultaneously, so that they will all wipe the edges of the blade outwardly. The two stroppers located on one side of the blade will flex both edges of the blade away from them, exerting a sharpening pressure during the wiping action. In leaving the blades, the action will be gradual, due to the diagonal cut of the end of the section of each stropper, so that in place of the blade slipping suddenly from the stropper, the action will be gradual, and the flip will take place only at one corner of the blade, so that there will be no material damage to the edge of the blade. As soon as one set of stroppers on one side of the blade have finished their action, the other set on the opposite side of the blade will come in contact with the blade gradually due to the diagonal edge, and flex it in the opposite direction, simultaneously sharpening both edges of the blade on the same side. The action is continuous, the stroppers on opposite sides of the blade alternately sharpening opposite sides of the same edge. When the device has been run sufficiently, it will be found that both edges have been sharpened on both sides in a quick and positive manner, giving a fine, even edge.

When it is desired to remove the blade, it is merely necessary to swing the parts of the casing apart and pick out the blade. The fact that the line of contact of the gears

is substantially in alinement with the pivotal axis of the parts of the casing permits this to be done without disengagement of the gears, so that there is no inconvenience in opening and closing the casing.

While I have shown one embodiment of my invention, I do not wish to be limited to the specific details thereof, but desire to be protected in various changes, alterations and modifications which may come within the scope of the appended claims.

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

1. The combination with a casing comprising a plurality of parts hinged together, of a bracket secured to each of said parts and coming in close juxtaposition to each other to form supports for a razor blade, a pair of stroppers movably mounted, one in each of said parts, interconnecting gearing between said stroppers, and means for rotating said stroppers.

2. The combination with a casing comprising two parts hinged together, of a bracket in each part, said brackets coming in close juxtaposition to each other so as to support a razor blade placed therebetween, a pair of stroppers rotatably mounted in each of said parts, intermeshing gearing connecting each of said stroppers in one of said parts with said stroppers in the other of said parts, in pairs, so as to drive them in unison, and connecting-gears between the gears on one pair of stroppers in one of said parts.

3. The combination with a casing comprising a pair of U-shaped members hinged together, of a bracket secured to each of said members and adapted to coöperate with each other to form supports for a razor blade, a plurality of stroppers rotatably mounted in each of said brackets and adapted to coöperate with the corresponding stroppers in the opposed bracket, intermeshing gearing for connecting all of said stroppers to rotate in unison, each pair of stroppers rotating in opposite directions, the path of travel of each stropper in each pair overlapping the path of travel of the other stropper in the same pair, and means for rotating said stroppers.

4. The combination with a casing, of a plurality of stroppers rotatably mounted in said casing and arranged in superposed pairs, means for supporting a blade intermediate the stroppers of each pair, so that both edges of the blade may be sharpened simultaneously, said stroppers being sectional, and gearing connecting said stroppers so that one member of each pair will be in engagement with the razor blade at one time, and the other member of each pair in engagement with the razor blade at another time.

5. The combination with a casing, of a plurality of stroppers rotatably mounted in said casing and arranged in superposed pairs, means for supporting a blade intermediate the stroppers of each pair, so that both edges of the blade may be sharpened simultaneously, said stroppers being sectional, and gearing connecting said stroppers so that one member of each pair will be in engagement with the razor blade at one time, and the other member of each pair in engagement with the razor blade at another time, the paths of travel of said stroppers overlapping each other so that said blade is flexed first to one side and then to the other side.

6. The combination with a casing comprising two parts pivotally connected together, of a pair of coöperating stroppers rotatably connected to said casing and adapted to coöperate with each other and sharpen a razor blade placed in juxtaposition thereto, and a gear connected to each of said stroppers, said gears intermeshing and contacting along a line substantially within the pivotal axis about which said parts of said casing pivot, so that when said casing is open, said gears will remain in mesh with each other.

7. The combination with a casing having two parts movable relative to each other, of means on said parts coöperating with each other to hold a safety razor blade intermediate its edges so that the edges thereof will project freely, and two pairs of cooperating stroppers adapted to sharpen both edges of said blade simultaneously.

8. The combination with a casing having two parts movable relative to each other, of means on said parts coöperating with each other to hold a safety razor blade intermediate its edges, so that the edges thereof will project freely, and two pairs of coöperating stroppers adapted to sharpen both edges of said blade simultaneously, the stroppers in each pair being adapted to alternately engage said blade.

9. The combination with a casing having two parts movable relative to each other, of means on said parts coöperating with each other to hold a safety razor blade intermediate its edges, so that the edges thereof will project freely, two pairs of coöperating stroppers adapted to sharpen both edges of said blade simultaneously, the stroppers in each pair being adapted to alternately engage said blade, and means for rotating all of said stroppers in unison.

10. The combination with a casing comprising a plurality of parts movable relative to each other so as to open and close the casing, of coöperating brackets on said parts, adapted to secure a safety razor blade between them, one of said brackets having a stop to limit the approach of said brackets

toward each other, and a plurality of stroppers for sharpening said blade.

11. The combination with a casing, of means for supporting a blade in said casing, and a stropper for sharpening said blade, comprising a shaft, a strip of metal bent in a loop around said shaft and extending radially therefrom for a portion of its length, with the legs of said loop curved to simulate the surface of a cylinder, and a strip of leather bent in the form of a section of the surface of a cylinder and secured to said strip of metal to form a sharpening surface.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DAVID C. WILLIAMS.

Witnesses:

H. WHITING,

PHILIP D. ROLLHAUS.