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W. LE R. MARSHALL

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SHARPENER FOR RAZOR BLADES

Filed Sept. 23, 1931.

Fig. 1.

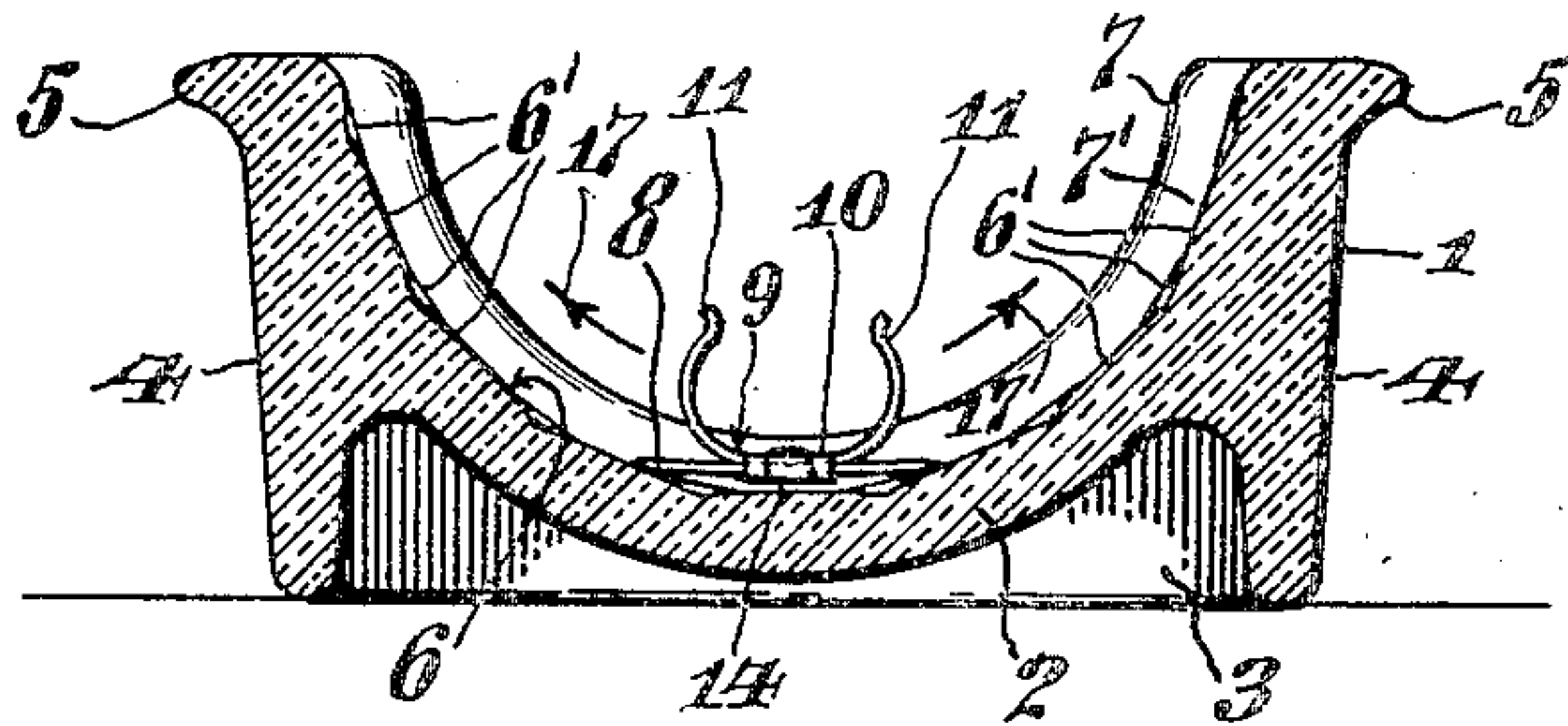


Fig. 2.

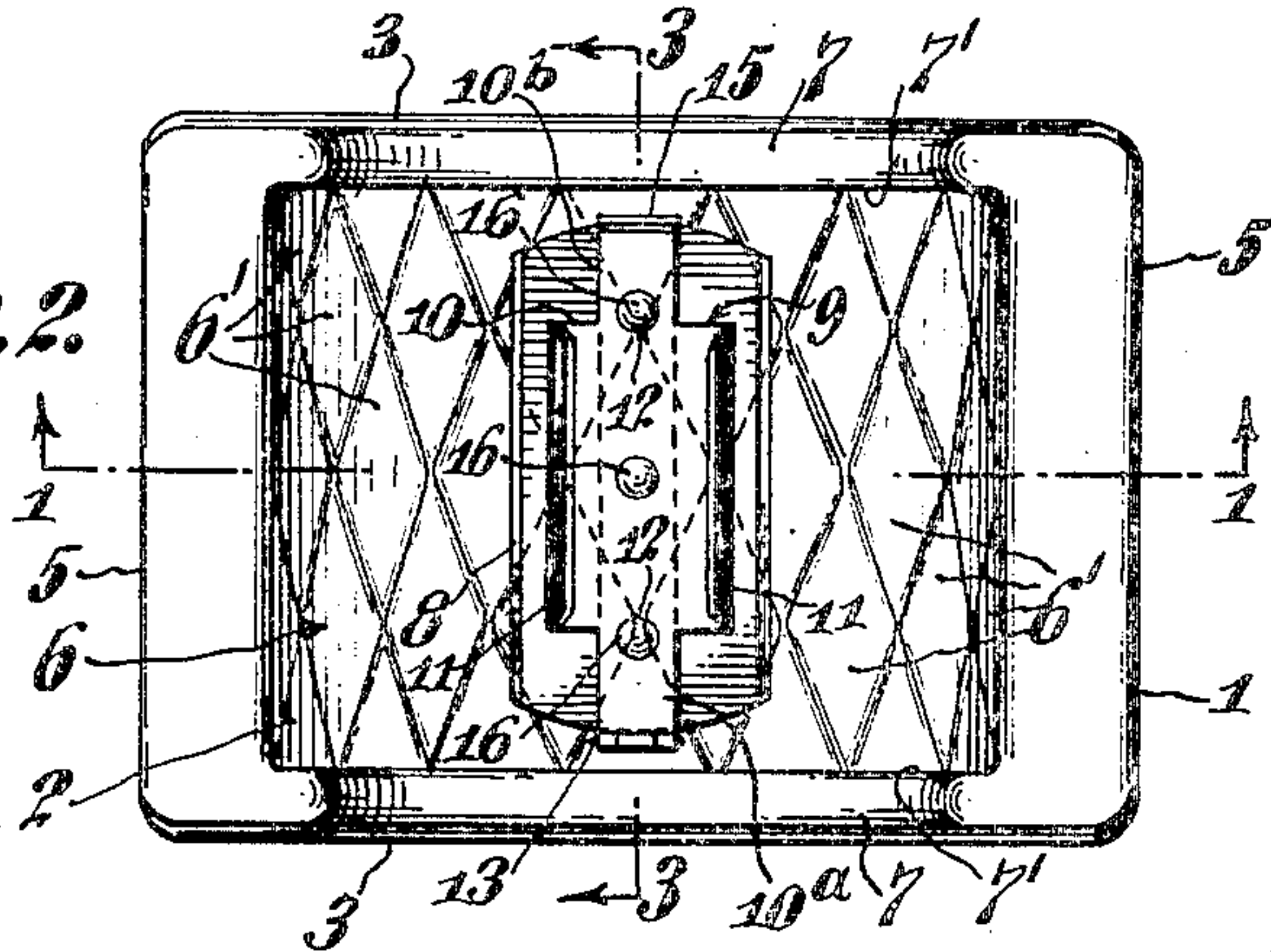


Fig. 5.

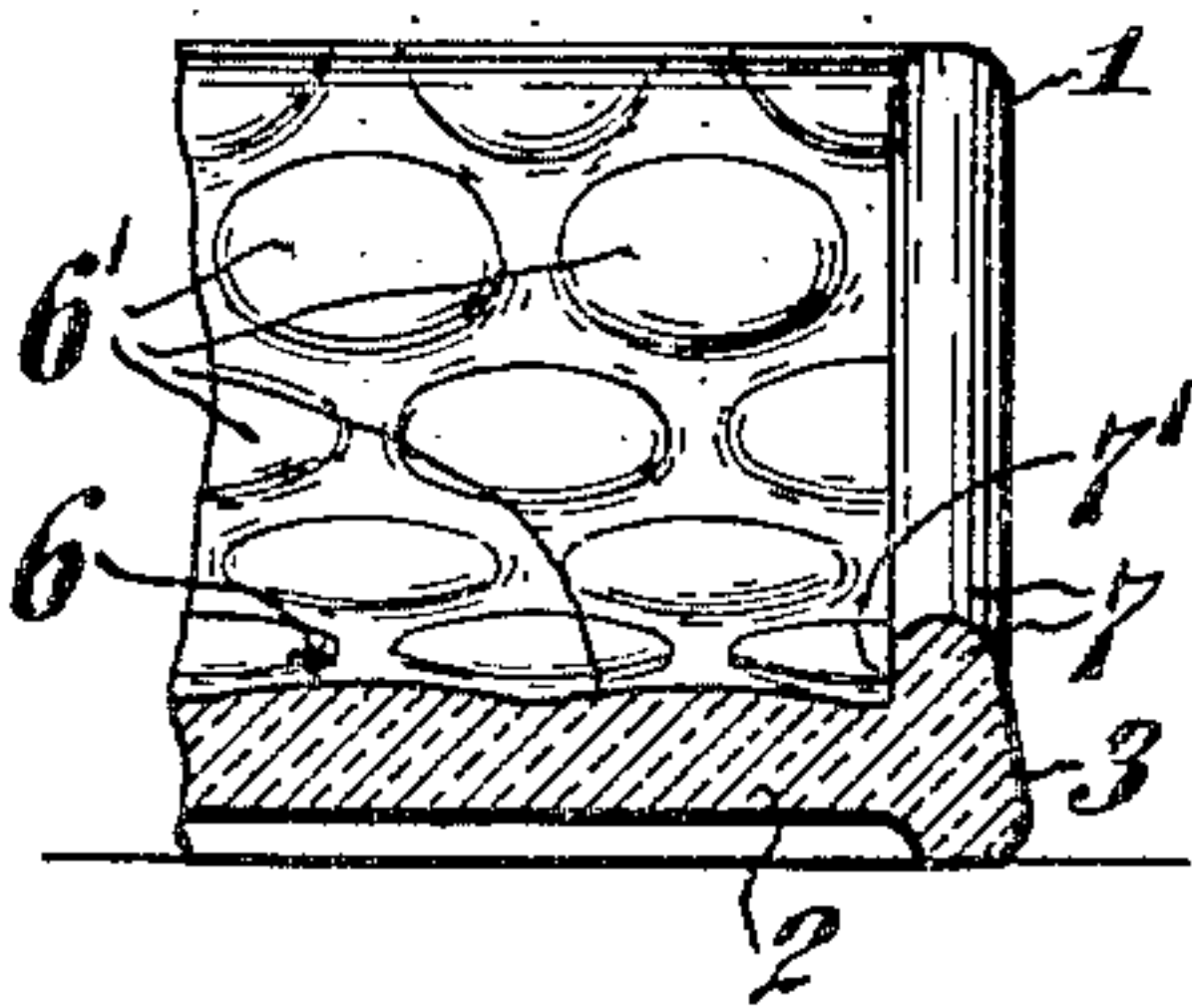


Fig. 3.

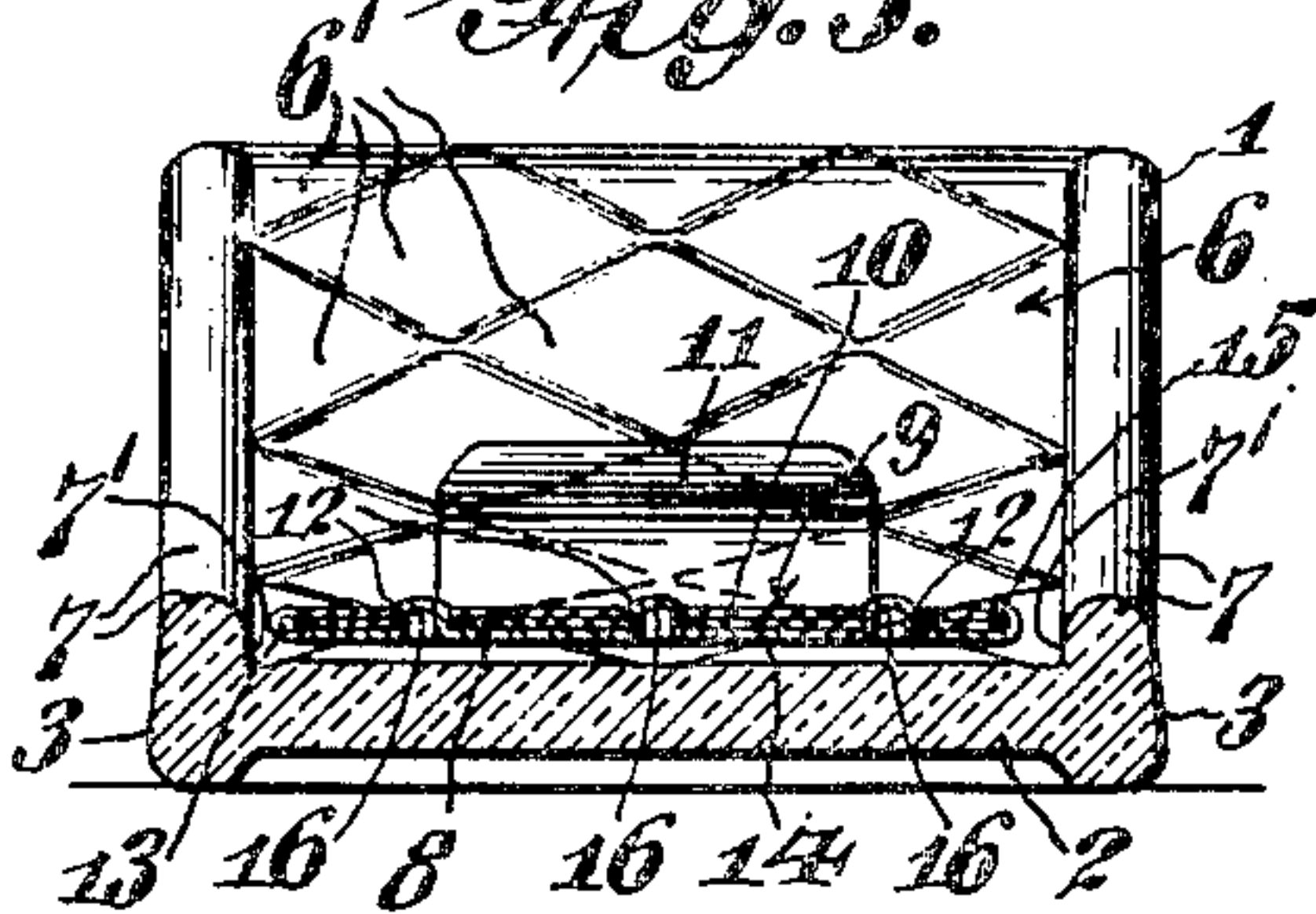


Fig. 6.

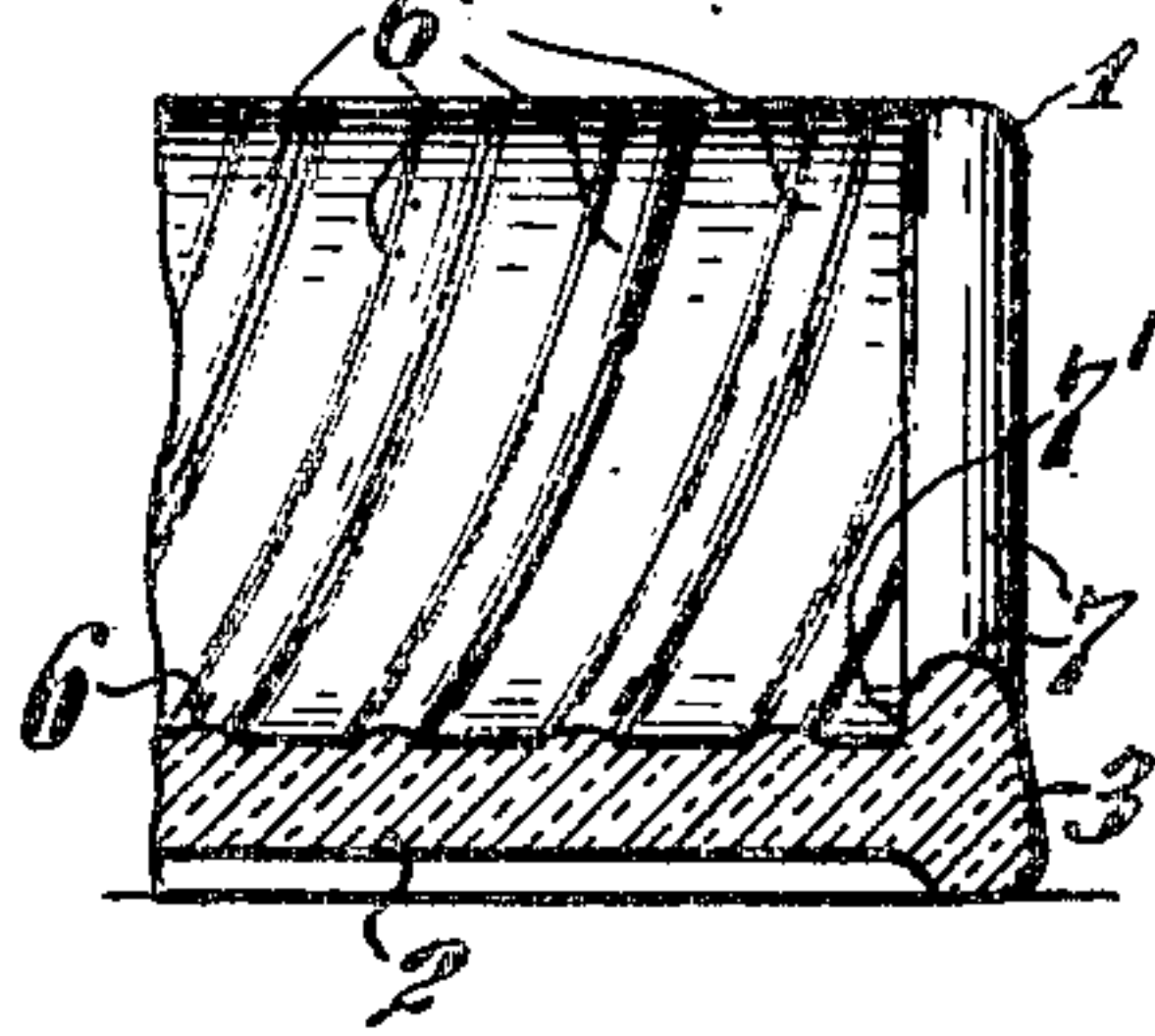
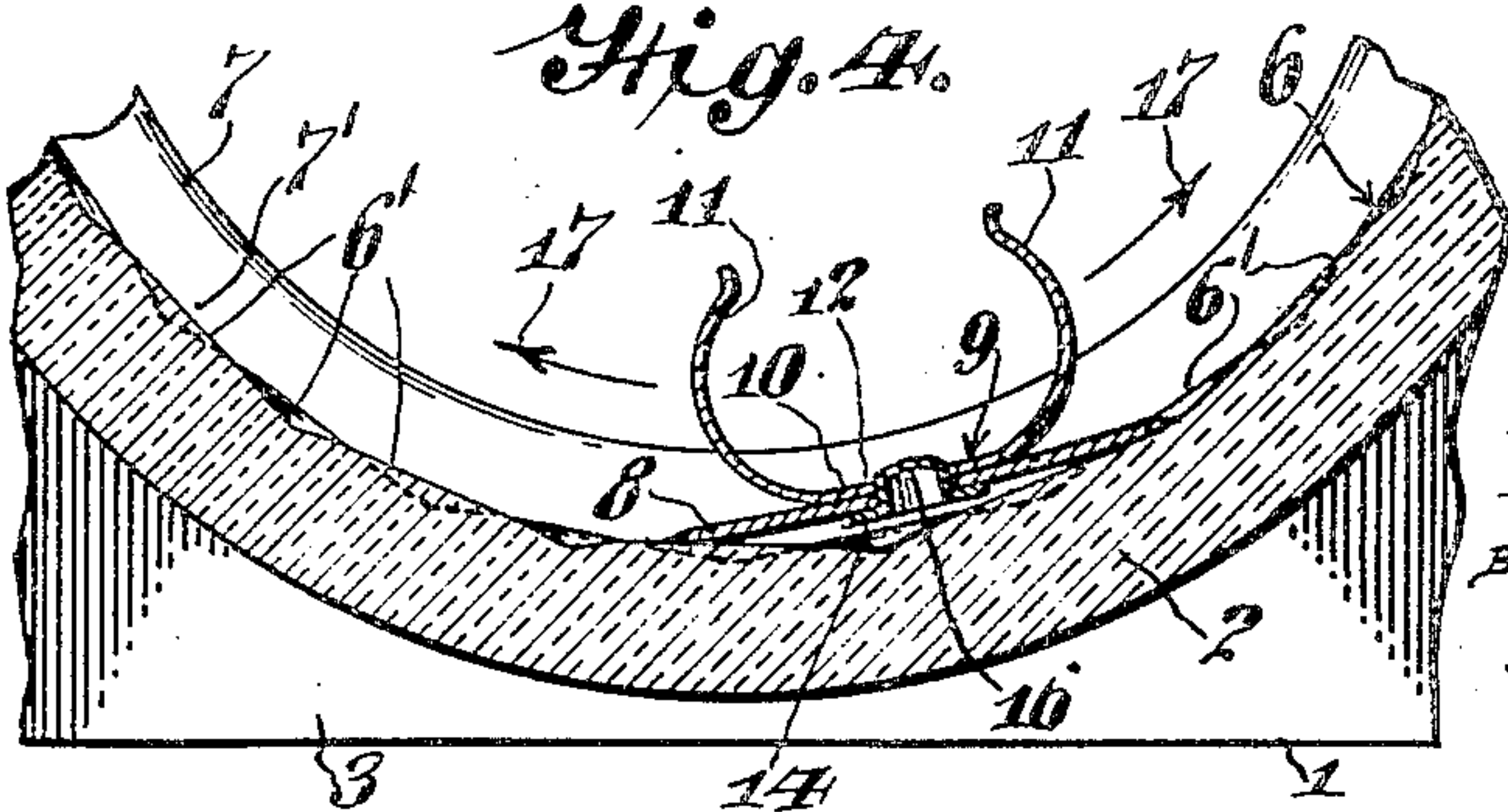


Fig. 4.



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SHARPENER FOR RAZOR BLADES

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This invention relates to razor blade sharpeners and more particularly to devices adapted for sharpening the thin flexible blades of a safety razor.

One of the objects of the present invention is to provide a simple, compact, easily manipulated device, operable to quickly and easily make the dull edge of a safety razor blade keen and smooth.

A further object of this invention is to provide a device which may easily be kept clean or may be cleaned, and that does not wear or appreciably deteriorate even when used over long periods.

A further object of my invention is to provide a razor blade sharpening surface which is substantially semicylindrical and which is composed of relatively smooth glass or the sharpening surface of which is of glass, said surface being provided with a plurality of substantially abutting plane surfaces, all tangent to a common cylindrical surface, said surfaces being arranged in parallel series in a direction parallel to a circular element of the cylindrical surface and the surfaces of any two adjacent series being arranged in a staggered relationship.

A further object of the present invention is to provide a substantially semicylindrical sharpening surface of glass covered with a plurality of relatively small plane surfaces arranged in a staggered relationship with respect to each other so that when a razor blade is rubbed on said surface moving in a direction substantially parallel to an element of said cylindrical surface and with the edge or edges extending substantially normal thereto, the edge is subjected to a progressive "set," one portion of the blade being in engagement with one of the said plane surfaces and other portions of the blade being acted upon by other relatively small plane surfaces as the blade is so oscillated manually in engagement with said substantially cylindrical glass surface.

A further object of this invention is to provide a holder adapted to securely hold a safety razor blade and to resiliently clasp around a finger and so constructed as to enable one to securely attach a safety razor

blade thereto and to permit one to rub the blade on the glass surface above described and to apply pressure to the blade sufficient to flex the blade and effect a sharpening thereof efficiently and without the danger of the sharp edges of the blade coming into accidental contact with the hands of the operator during the sharpening operation.

A further object of this invention is to provide a substantially cylindrical sharpening surface of glass in which the diameter or radius of the cylindrical surface is such that when a flexible blade of a razor is pressed thereagainst and is flexed, with the cutting edges of the blade at right angles to an element of the cylindrical surface, the surface glass is substantially coincident with the tapered or beveled edge of the blade.

Other objects of this invention will appear in the specification and claims below.

Referring to the drawing forming a part of this specification and in which the same reference characters are employed throughout the various views to designate the same parts,

Fig. 1 is a vertical transverse section of my improved razor sharpener block taken on the line 1—1 of Fig. 2, but with the blade holder in end elevation.

Fig. 2 is a plan view of the device shown in Fig. 1.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a vertical sectional view similar to Fig. 1 but on a scale sufficiently enlarged to diametrically illustrate the relation of the curved surface to the beveled edge of the blade and to show relative positions in staggered arrangement of the plane surface in one circular series to the plane surface of the next adjacent circular series of plane surfaces.

Figs. 5 and 6 indicate a modified type of sharpening surface which may be used in the practice of this invention.

My improved razor blade sharpening device comprises a glass block 1, preferably of pressed glass, and consisting of a substantially semicylindrical shell 2, provided with

downwardly depending end walls 3—3 and tapering side walls 4—4 diverging slowly upwardly, the walls 3—3 and 4—4 extending downwardly a little below the lowest portion of the shell 2 and to form a base or support upon which the block securely stands.

At the top edges of the side walls 4—4 are provided slightly overhanging flanges 5—5 the purpose of which will appear below.

The above construction provides a block with a substantially semicylindrical concave open-ended channel 6 extending across the top of the block. The said substantially cylindrical surface terminates, however, in relatively low flanges or beads 7—7 which are preferably provided with relatively vertical inner walls 7', 7'. This substantially semicylindrical surface 6, bounded by the flanges 7—7 constitutes the sharpening surface of the device.

The particular feature of the substantially semicylindrical concave sharpening surface 6 is that it is composed of a large number of relatively small, like, plane surfaces 6'. These plane surfaces 6' may be pressed into or formed in the normally cylindrical inner surface in any suitable manner. They are preferably arranged in a plurality of parallel series, each series being parallel to an element of the cylindrical surface 6. In any pair of laterally adjacent series, the plane surfaces of one series bear a staggered relationship with respect to the other series. Each plane surface 6' is preferably a diamond-shaped plane with the long diagonal of each diamond-shaped figure lying in a plane parallel to the generatrix of the cylindrical surface 6, as is clearly shown in Figs. 2 and 3. The length of the substantially cylindrical surface 6 between the inner surface of the beads or flanges 7 is a little greater than the length of a safety razor blade 8, as is also shown in Figs. 2 and 3.

In addition to the block 1, I provide a blade holder 9 which preferably comprises a substantially rectangular base plate 10 preferably substantially smaller than the blade 8 and provided with integrally narrow extensions 10^a, 10^b projecting centrally from the ends of this plate to a point beyond the ends of the safety razor blade 8. This plate 10 with its extensions 10^a and 10^b forms the base of the blade holder against which the safety razor blade may be held and secured in any suitable manner. From the opposite sides of the plate extend upwardly resilient finger-clasping arms 11—11, each substantially semicircular, in the main, but the upper ends of the arms are spaced from each other and diverge slightly outwardly to facilitate the insertion of a finger of the operator downwardly therebetween. These arms 11—11 are preferably integral with

the plate 10. The whole blade holder 9 is preferably made of stiff sheet steel, stamped and pressed into the shape above described. The bottom of the plate 10 may be slightly cylindrically convex, transversely.

Centrally of the plate 10 and its extensions 10^a and 10^b are preferably provided two or more aligned openings 12 spaced from each other to register with the conventional openings in a safety razor blade when it is placed thereon.

Hinged to the end of one of the extensions of the plate 10, as for instance, to the end of the extension 10^a on a pintle 13 is a strap 14 also preferably made of thin sheet steel, of a width equal to that of the extensions 10^a and 10^b and of a length substantially equal to the over-all length of the plate 10 with its extensions 10^a and 10^b. The free end of the strap 14 is preferably provided with a resilient lip 15 adapted to snap and to take over the free edge of the opposite extension 10^b so that when the strap is thus fastened to the plate and its extensions, it lies flat against the underside of the said plate and its said extensions. The strap 14 is preferably provided with slight projections 16 rising from the surface of the strap 14 which is adjacent the plate 10 and in registration with the openings 12 when the strap is clasped to the bottom of the plate.

To secure a safety razor blade 8 to the holder one unclasps the free end of the strap 14 from the end of the extension 10^b, places a blade on the bottom of the plate 10 with the openings in the blade in registrations with the openings 12 in the plate and then swings the strap 14 downwardly against the blade inserting the slight projections 16 into the openings in the blade and he then snaps the lip 15 over the free end of the extension 10^b. The projections 16 are slight. They do not extend very much above the surface of the strap 14. They may extend through the blade 8 and into the openings 12 in the plate 10.

Having thus secured a blade to the holder, the operator then presses his finger down between the free ends of the arms 11 into the substantially circular opening therebetween, so that the arms 11 clasp around his finger, then taking the block 1 in his other hand, moves his finger, with the blade holder on it into the open end of the block, pressing the edges of the blade against the substantially cylindrical sharpening surface 6 of the sharpener. He then rubs the blade back and forth, a few times, in the directions indicated by the arrows 17, Fig. 1, pressing the edges of the blade hard against the sharpening surface 6. This pressure should be sufficient to substantially flex the blade 8 and a substantial flexure of the blade is not prevented by the strap 14. The strap is so thin that it does not

engage the surface 6 until the blade is flexed much more than it can readily be flexed by the pressure exerted by one finger. However, the contact of this strap 14 with the cylindrical surfaces 6 would not interfere with the sharpening of the blade provided the blade is flexed sufficiently to cause the edges to bear hard against the surface 6. In so rubbing the blade, under pressure, back and forth over the sharpening surface 6, the beveled surface of the blade which terminates in the cutting edge is brought into substantial parallelism or substantial coincidence with the substantially cylindrical sharpening surface with which it is in engagement, as is indicated in the enlarged diagrammatic view, Fig. 4.

After one pair of edges has thus been dressed, sharpened or "set", the blade is removed from the holder and turned or reversed in the holder to bring the opposite edges into a position where they be similarly rubbed against the sharpening surface 6 of the block.

But the essential feature of the present invention resides in the fact that the sharpening surface is not, strictly speaking, a purely cylindrical surface. It comprises a large number of plane surfaces, cylindrically arranged and all tangent to a common cylindrical surface concentric with the axis of the substantially semicylindrical surface 6, and arranged in a plurality of circular series of plane surfaces, the plane surfaces of one series being in staggered relationship with respect to the plane surfaces of the next adjacent series. Whether these surfaces are diamond-shaped, as shown in Figs. 1 to 4, or spaced and circular, or spiral, the edges of each surface are not abrupt. The juncture of one diamond-shaped figure to the adjacent lateral diamond-shaped surface, is more in the nature of slightly rounded depressions. The deviation from a strictly cylindrical surface can be only perceived by the sense of touch by very lightly and carefully rubbing a finger back and forth on the surface 6. When the sharpening surface is such as is indicated in Fig. 5, wherein the plane surfaces are not contiguous but are slightly spaced, the edges of such plane surfaces do not rise abruptly but rise slowly and are rounded into a plane surface. When all the advantages of the invention are not required, the substantially semicylindrical sharpening surface may be provided with spirally disposed parallel ridges or ribs, slightly rising from the cylindrical surface and having slowly rising sides, which successively act on different parts of the edge, but do not provide the appreciable plane surfaces present in the other modifications.

The sharpening surfaces of my improved razor blade sharpener are smooth and

glassy. The glass surfaces of my improved sharpener are not etched or roughened. I believe that the action of the glass on the razor blade is not a true abrasive or erosive action resulting in a wearing down of the metal of the blade, but I believe the action to be a dressing action in which the minute laterally deflected teeth, comprising the cutting edge of dull razor blade, are consecutively bent back and "set" into the plane of the blade due to the pressure applied to the edge in pressing it hard against the smooth sharpening surface 6 of the block 1. Moreover, I believe that the rapid results, that is to say, the quick sharpening of the blade is due to the character of the glass surface that I provide. As the blade is oscillated back and forth over the staggered surfaces, the whole length of the blade is not being simultaneously acted upon in the same way. One part or fraction of the edge of a blade first strikes the edge of a plane surface and as it slides over that surface, more and more of that portion on the blade is acted upon by the plane surface as it engages a wider portion of that small plane surface, and then an adjacent point on the blade engages an adjacent staggered plane surface and that portion of the blade is similarly acted upon, with the result that the pressure applied to the blade in pressing it down against the sharpening surface is really effective at a given moment on portions or sections of the entire length of the blade. The pressure applied to the blade, as a whole, is thus concentrated at any time on only a fraction of the length of the blade, and, therefore, it is higher at the points where the edge is actually in contact with the sharpening surface. This pressure, therefore, is probably highly effective in bending and "setting" the outwardly deflected minute saw teeth of the dull edge of a razor back into the plane of the blade.

I am aware it has heretofore been attempted to utilize a glass surface upon which to sharpen a blade, but, so far as I know, such surfaces have always been single plane surfaces, like the flat top of a hone or smooth cylindrical surfaces against which a blade is rubbed. By providing a sharpening surface composed of a plurality of plane surfaces arranged generally in circular series, all being tangential to a common cylindrical surface, the plane surfaces being relatively small, numerous, highly polished and glassy and arranged in staggered relationship so that the contiguous or adjacent polished surfaces are not acting upon the blade simultaneously in the same manner, I have provided a highly efficient and simple means for providing a dull safety razor blade with an edge which is sharper and better than has heretofore been produced and that, in a much shorter time, and

with very few double strokes or oscillations.

The sharply rising inner walls at the ends of the sharpening surface prevent the sharp blade from projecting beyond the ends of the cylinder or where it might cut the hand of one using the device and the overhung edge or flanges protect the ends of the fingers and thumb used in holding the sharpener in the hand should the stroke carry the sharp edge of the razor above the upper boundaries of the sharpening surface. The ends of the fingers and thumb are below the said flanges.

The block is of a size and shape adapted to rest in the palm of the hand with the fingers pressed against the sides of the block beneath the protective flanges.

While I have found that a sharpening surface, composed of glass and covered with a plurality of relatively small geometric figures presenting plane surfaces, provides the best means which I have discovered for the purposes specified, my invention is not to be construed as being limited to the use of the glass alone, since it is possible that other materials which are sufficiently hard, which will take a high polish, and in which small geometric figures may be imprinted or impressed, may be used instead of glass. For this reason the material of the sharpening device is referred to herein by its physical characteristics, that is to say, as being hard, smooth, non-abrasive with respect to and not abraded by the steel razor blade, and as being capable of receiving a high polish. Since the sharpening of the blade appears to be due to a rectification or straightening out or bending into alignment of the laterally deflected minute saw-teeth which characterize the cutting edge of a dull razor blade, other hard non-abrasive materials capable of being provided with a glossy or glassy surface texture, and capable of having formed therein slightly elevated or depressed figures bounded by smooth minute walls gently curving into the surface of said figures might be utilized in the practice of this invention and are, therefore, fully within the spirit and scope of the present invention.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States is:

1. A sharpener for razor blades, comprising in combination a block having a concave substantially semicylindrical smooth glass sharpening surface in the top thereof, said sharpening surface comprising a plurality of circumferential series of relatively small similar substantially plane surfaces, all tangential to a common cylindrical surface, the surfaces of one series being in staggered relationship with respect to the surfaces of the adjacent series.

2. A sharpener for razor blades, comprising in combination a block having a concave

substantially semicylindrical smooth glass sharpening surface in the top thereof, said sharpening surface comprising a plurality of circumferential series of contiguous diamond-shaped plane surfaces, all tangential to a common cylindrical surface, the surfaces of one series being in staggered relationship with respect to the surfaces of the adjacent series.

3. A sharpener for safety razor blades, comprising in combination a block provided with a concave substantially semicylindrical glass sharpening surface in the top thereof, said surface comprising a plurality of series of substantially plane contiguous small surfaces all tangential to a common cylindrical surface and with the plane surface of one series in staggered relationship with respect to the plane surfaces of the adjacent series, and a flange extending outwardly from the top edges of the sides of said block to prevent the fingers of the holder of said block from projecting into the path of the blade being sharpened.

4. A sharpener for safety razor blades comprising in combination a block provided with a concave substantially semicylindrical glass sharpening surface in the top thereof, said surface comprising a plurality of series of substantially plane contiguous small surfaces all tangential to a common cylindrical surface and with the plane surface of one series in staggered relationship with respect to the plane surfaces of the adjacent series, the ends of said sharpening surface being provided with a square shoulder to prevent the end of a blade being sharpened from projecting beyond the ends of said block.

5. A sharpener for safety razor blades, comprising in combination a block provided with a concave substantially semicylindrical glass sharpening surface in the top thereof, said surface comprising a plurality of series of substantially plane contiguous small surfaces all tangential to a common cylindrical surface and with the plane surface of one series in staggered relationship with respect to the plane surfaces of the adjacent series, the ends of said sharpening surface being provided with inwardly projecting beads presenting square shoulders to prevent the end of a blade being sharpened from projecting beyond the ends of said block.

6. A sharpener for safety razor blades, comprising in combination a block provided with a concave substantially semicylindrical glass sharpening surface in the top thereof, said surface comprising a plurality of series of substantially plane contiguous small surfaces all tangential to a common cylindrical surface and with the plane surface of one series in staggered relationship with respect to the plane surfaces of the adjacent series, the ends of said sharpening surface being provided with means to pre-

vent the end of a blade being sharpened from projecting beyond the ends of said block, and a flange extending outwardly from the top edges of the sides of said block to prevent the fingers of the holder of said block from projecting into the path of the blade being sharpened.

7. A sharpening device for razor blades comprising a block of smooth polished material as hard and as rigid as glass and which is not substantially abrasive to or substantially abraded by the steel of a razor blade when rubbed thereon, and having a sharpening surface composed of a plurality of relatively small figures lying in different planes, making slight angles to the plane of the top surface of said block, and with each other, each small figure presenting a smooth polished upper surface bounded by smooth minute sloping walls gently curving into the plane of said upper surface.

8. A sharpening surface for razor blades comprising a block of smooth polished non-abrasive material as hard and as rigid as glass and which is not substantially abrasive to or abraded by the steel of a razor blade when rubbed thereon, and presenting a sharpening surface covered with small geometric figures imprinted in said sharpening surface and lying slightly out of the general plane of the sharpening surface, the top surface of each of said figures being smooth and highly polished and making slight angles with the general plane of said sharpening surface and with each other and being bounded by minute sloping polished walls gently curving into the upper surface of the figure bounded thereby.

In witness whereof, I have hereunto set my hand this 22nd day of September, 1931.

WALTER LE ROY MARSHALL.

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