No. 832,446. PATENTED OCT. 2, 1906.

F. E. V. BAINES.

PENCIL SHARPENER.

APPLICATION FILED FEB. 24, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

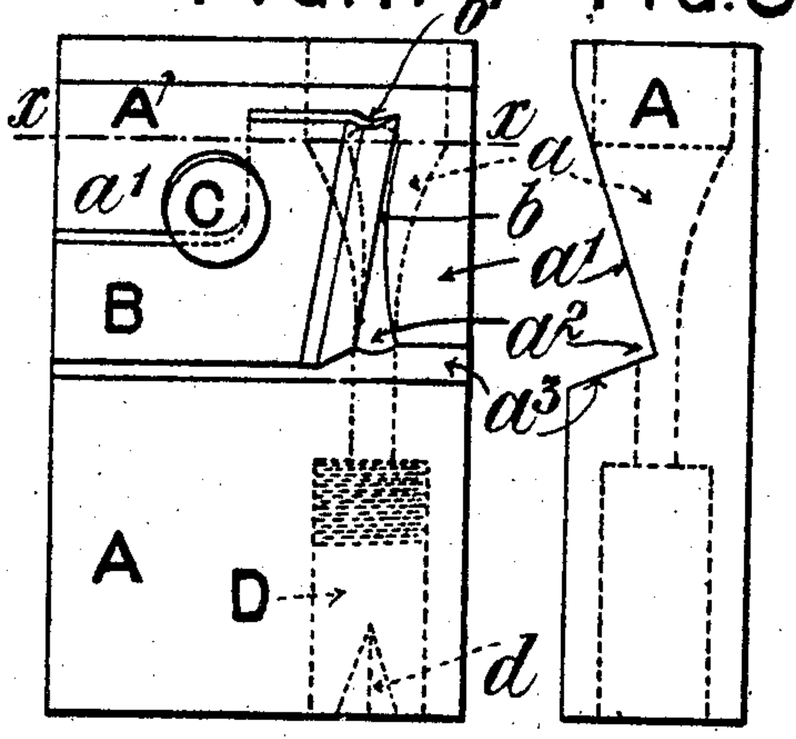


Fig. 3.

Fig. 4

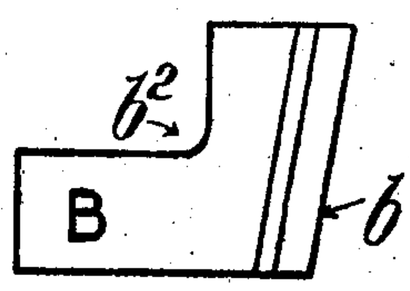


Fig. 7.

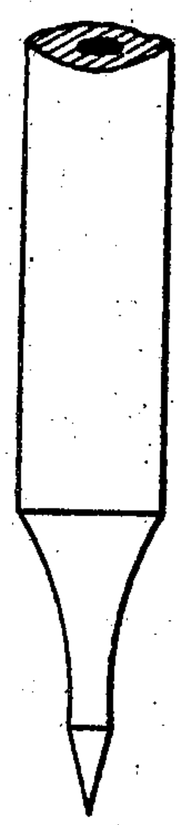


Fig. 2.

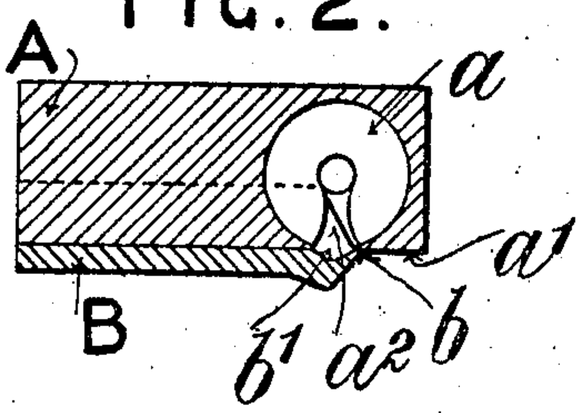


Fig. 5.

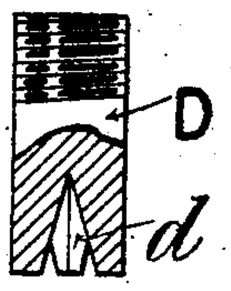


Fig. 6.

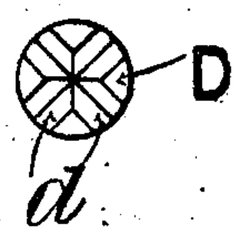


Fig. 22.

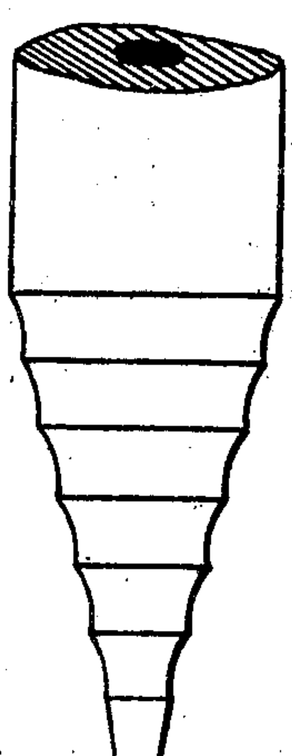


Fig. 18.

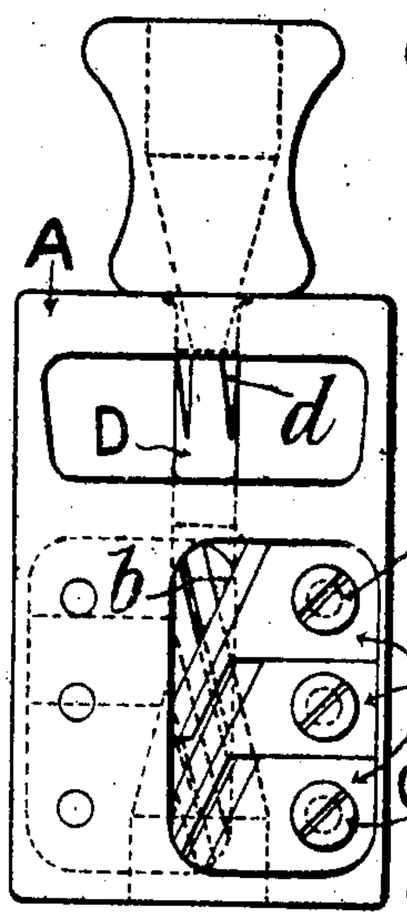


Fig. 19.

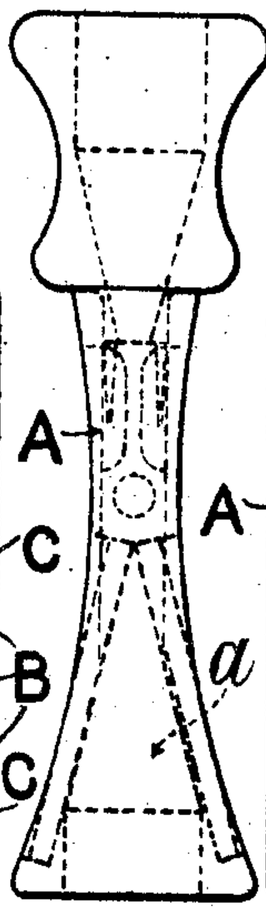


Fig. 20.

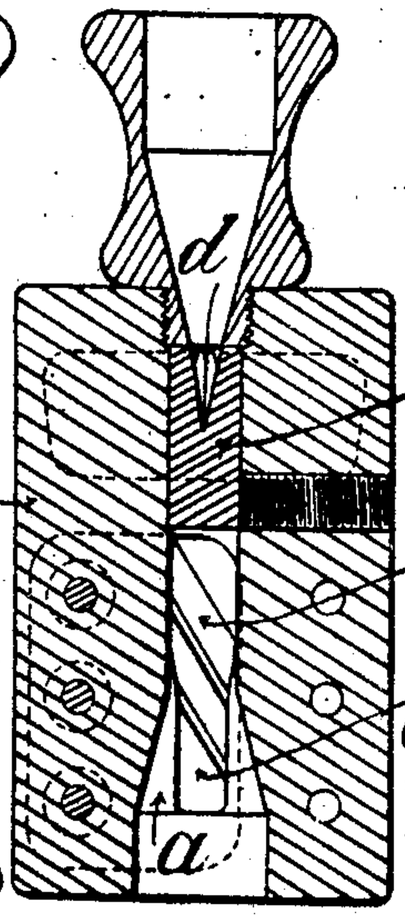


Fig. 21.

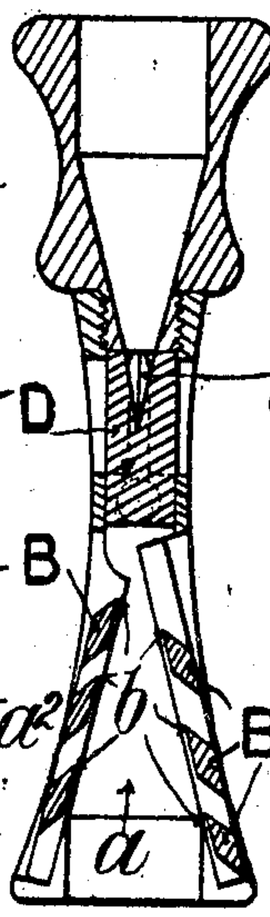
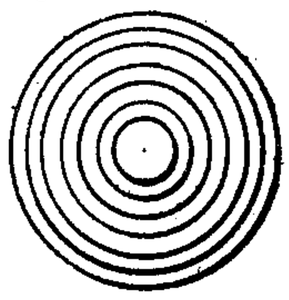


Fig. 23.



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2 SHEETS—SHEET 2.

Fig. 8.

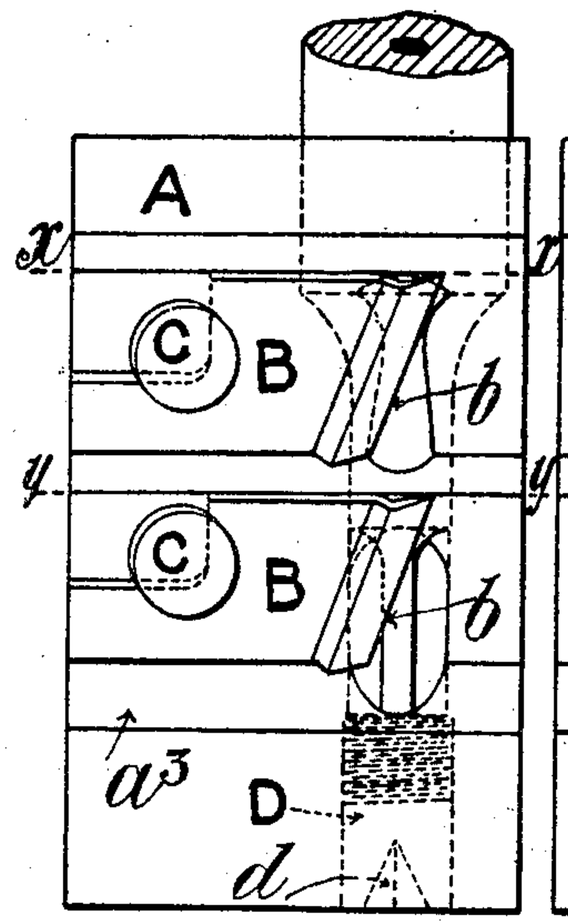


Fig. 11.

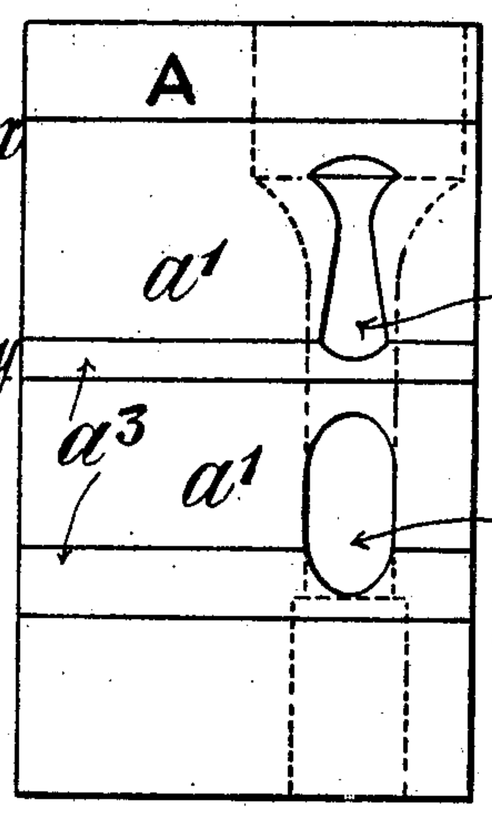


Fig. 12.

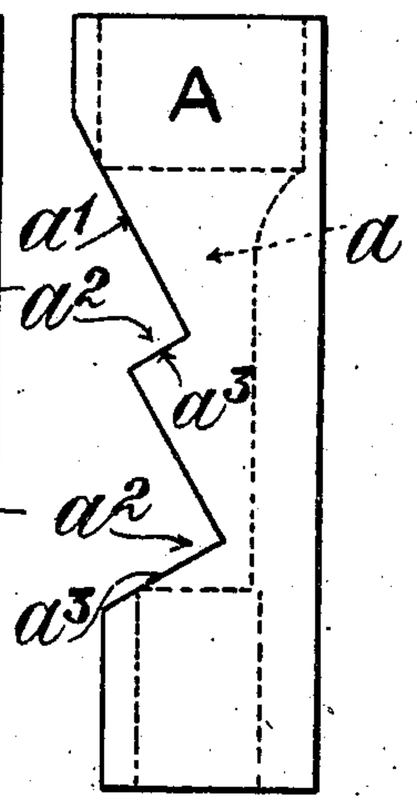


Fig. 17.

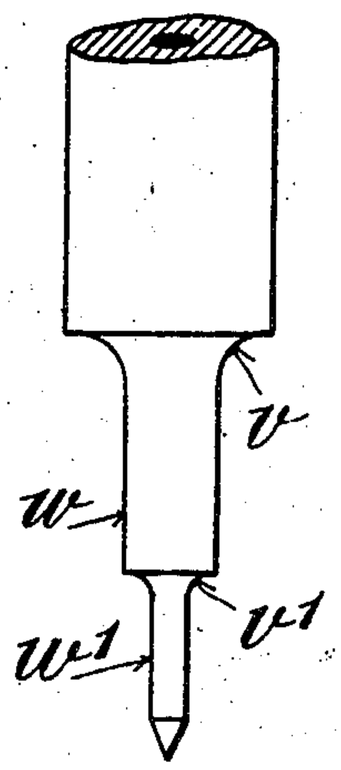


Fig. 9.

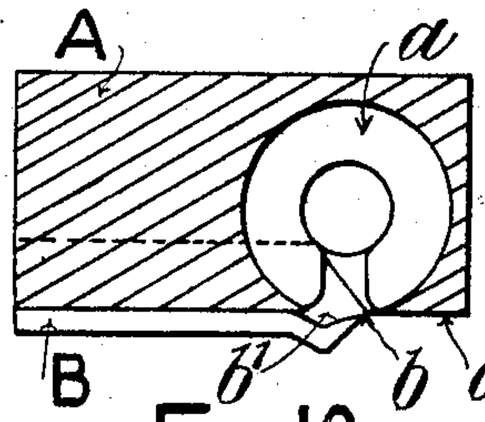


Fig. 13.

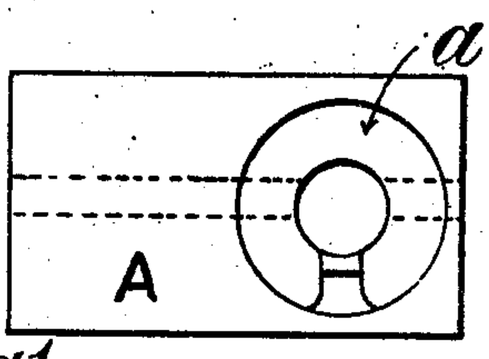


Fig. 15.

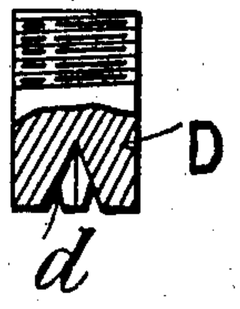


Fig. 16.

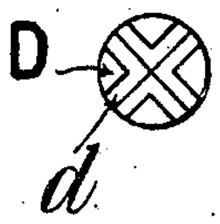


Fig. 10.

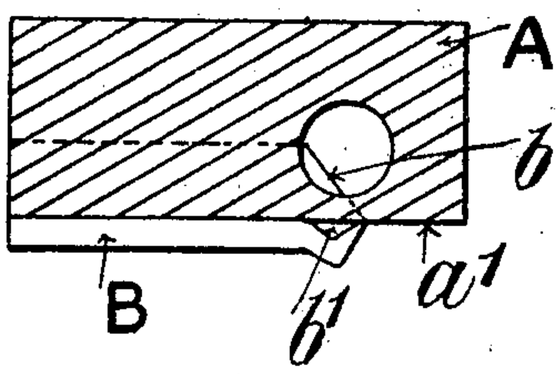
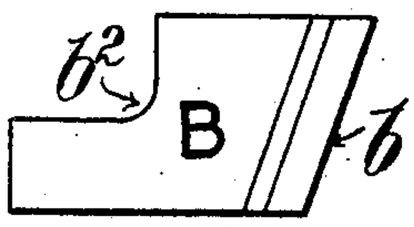


Fig. 14.



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UNITED STATES PATENT OFFICE.

FREDERICK EDWARD VESEY BAINES, OF GREENWICH, ENGLAND.

PENCIL-SHARPENER.

No. 832,446. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed February 24, 1906. Serial No. 302,746.

To all whom it may concern:

Be it known that I, FREDERICK EDWARD VESEY BAINES, a subject of the King of Great Britain and Ireland, residing at 16 Gloucester Place, Greenwich, in the county of Kent, England, have invented a new and useful Improvement in Pencil-Sharpeners, of which the following is a specification.

This invention relates to that type of so-called "pocket pencil-sharpeners" which consists of an internally-coned part, hereinafter called the "body part," having a cut-away part forming a longitudinal opening therein and of a fixed cutting-blade projecting through said opening. This type of pencil-sharpener having no moving parts is inexpensive to construct and is convenient and portable in form; but as at present made it is deficient in practical utility, owing to the fact that the cutting edge of the blade operates against the grain of the wood of the pencil, and consequently does not cut it easily or cleanly, and, further, it is apt to cause a lateral strain upon the graphite or "lead" of the pencil, which tends to break it as soon as the edge of the cutting-blade loses its sharpness. In pencil-sharpeners of this type the cutting edge of the blade has hitherto been located either parallel with one side of the coned hole in the body part and on one side of the axis thereof or at such an angle therewith that the front end of the blade—*i. e.*, the end nearest to the smaller end of the coned hole—is in advance of the rear end, with the result that the blade always cuts against the grain of the wood forming the sheath of the lead or graphite of the pencil.

According to the present invention the blade is so mounted on the body part with respect to the coned hole that its cutting edge lies across the longitudinal slot in the said body part, with the result that the point produced on the pencil is not a straight-sided cone, but a cone the sides of which are concave or inwardly curved. A blade to be operative in this position must not have a flat under side, as is common with blades used for these devices, but must be formed with a clearance on its under side immediately behind the cutting edge, which clearance can be produced by "backing off" or undercutting either by grinding or shaping.

The number of blades employed in each sharpener depends upon the shape it is desired to give to the point of the pencil, which may be varied from a single concave-sided cone, which can be produced by a single blade, to a series of concave-sided cones either merging into one another or separated from one another by parallel parts, so as to give the point a stepped shape, which requires a plurality of blades. When more than one blade is employed, they are arranged in advance of one another—*i. e.*, in echelon—so as to produce a continuous cutting effect. The distance apart the blades are fixed, the plane in which they lie with respect to the side of the cone-shaped hole, and the angle their cutting edges make with the axial line of the said hole determine the shape that is given to the point of the pencil. When a plurality of blades is employed, they may conveniently be arranged on more than one side of the coned hole.

Although the blades hereinbefore described may be employed for cutting both the wood and the lead or graphite of the pencil, it is preferred to employ them for cutting the wood part only and to provide a separate cutting device for sharpening the lead or graphite. Such a cutter consists of a wholly or partially cone-shaped thimble of steel or other suitable metal, the open end of which is slotted in several places, so as to form V-shaped depressions, the junction of the inner edges of the said depressions with the interior of the thimble producing the cutting edges. When such an auxiliary cutter is employed, it is preferably arranged axially with the coned hole having the blades for cutting the wood part of the pencil; but this is not obligatory. When so located, however, in inverse position, it conveniently forms a stop for the end of the lead of the pencil to bear against when the other part of the sharpener is being used, and thus prevents the wooden part of the pencil being cut to waste. The cutter for the lead may be mounted in a coned hole of the same angle as the larger one in inverse position, so that when the shaped part of the wood engages the plain end it operates as a stop by preventing the forward movement of the pencil to prevent the lead part being cut away to waste. The coned holes may either or both be provided with cylindrical extensions to form guides for the pencil.

In order that this invention may be fully understood, I will more particularly describe

it, making reference to the accompanying drawings, in which—

Figure 1 is a view in front elevation of a sharpener constructed according to this invention having one cutting-blade. Fig. 2 is a view in transverse section thereof on line $x\,x$ of Fig. 1. Fig. 3 is a view in side elevation of the body part. Fig. 4 is a view in front elevation of the cutter for cutting the wooden part of the pencil. Figs. 5 and 6 are views in elevation, partly in section and plan, respectively, of the cutter for cutting the lead or graphite of the pencil; and Fig. 7 is a view showing the shape of the point of a pencil cut with this sharpener. Fig. 8 is a view in front elevation of a sharpener having two cutting-blades. Figs. 9 and 10 are views in transverse section on lines $x\,x$ and $y\,y$, respectively, of Fig. 8. Figs. 11, 12, and 13 are views in front elevation, side elevation, and plan, respectively, of the body part. Fig. 14 is a view in front elevation of the cutter for cutting the wooden part of the pencil. Figs. 15 and 16 are views in elevation, partly in section, and plan, respectively, of the cutter for cutting the lead or graphite of the pencil; and Fig. 17 is a view showing the shape of the point of the pencil cut by this sharpener. Figs. 18 and 19 are views in front and side elevation, respectively, of a sharpener having a plurality of blades. Figs. 20 and 21 are similar views in longitudinal section thereof; and Figs. 22 and 23 are views in elevation and plan, showing the shape of the point of the pencil cut with this sharpener.

Throughout the views similar parts are marked with like letters of reference.

Referring to Figs. 1, 2, 3, 4, 5, and 6, the body part A has the usual coned hole a to receive the pencil, and it is cut away on one side at an angle corresponding to the angle of the tapered hole a—*i. e.*, to the average angle of the concave-sided cone it is intended to shape the point of the pencil to—so as to expose the coned hole a in the shape of a longitudinal slot or opening a^2. On the face a' of the cut-away part of the body A is mounted the cutting-blade B in such a position that its cutting edge b lies across the axial line of the coned hole, and therefore of the longitudinal slot or opening a^2 in the body part. To give the cutting edge b of the blade the necessary clearance on the under side to enable it to become operative, it is shaped or formed with an undercut b', as shown. The knife may be fixed to the body part in any suitable manner, a convenient one being to fit it against a projection, such as a^3 on the face a', and to lock it in position by a single screw C, threaded into the face a' and engaging by its head a corner b^2, formed in the blade by cutting or shaping, as shown. The position of the cutting-blade may be so arranged as to cut away both the wood and the lead of the pencil; but it is preferable to employ a separate cutter for the lead part. Such a cutter may consist of a steel bush D, having a series of radially-arranged V-shaped slots d, cut or formed in one end, as shown in Figs. 5 and 6. This cutter may be located in any convenient part of the body part A, but preferably axially with respect to the coned hole a, in which case the base of the cutter can conveniently form a stop for the lead of the pencil to abut against, and so prevent the wood of the pencil being cut to waste. This type of sharpener having one blade is only adapted to sharpen pencils of a small diameter.

Referring to Figs. 8, 9, 10, 11, 12, 13, 14, 15, and 16, which illustrate a sharpener for use with pencils of the usual size, two cutting-blades B are employed, and they are so arranged with respect to one another that the point of the pencil is formed, as shown in Fig. 17, of two concave-sided coned parts $v\,v'$ and two straight or parallel parts w and w', thus making the point a long one. The desired length of point can be obtained either by increasing the lengths of the straight or parallel parts or by increasing the number of both the concave-sided coned parts and the straight or parallel parts by the employment of more cutting-blades.

Referring to Figs. 18, 19, 20, and 21, when it is desired to form the point of the pencil of a series of concave-sided cones merging into a one another, as shown in Fig. 22, it is necessary to employ a larger number of cutting-blades, in which case the blades are preferably arranged in two groups, one on each side of the body part, as shown, the arrangement being such that the blades of one group take up the cut from the blades of the other group, and so between them produce a continuous cut, as diagrammatically shown in Figs. 22 and 23.

I wish it to be understood that this invention is applicable not only to sharpeners in which the necessary rotary action is produced by the two hands of the operator, but it is also applicable to those instruments in which the rotary motion is obtained mechanically.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination in a pencil-sharpener, of a body part having a coned hole therein and a cut-away part forming a longitudinal slot or opening into said coned hole, and of a cutting-blade "backed off" or undercut on its under side immediately behind the cutting edge, the said blade being mounted on said cut-away part of the body part so that its cutting edge lies across the said longitudinal slot or opening in said body part, as set forth.

2. The combination in a pencil-sharpener of a body part having a coned hole therein and stepped cut-away parts forming a longitudinal slot or opening into said coned hole and of two or more "backed off" cutting-

blades so mounted on the stepped portions of the cut-away part of the body part that their cutting edges lie parallel with each other across the longitudinal slot or opening in the body part, as set forth.

3. The combination in a pencil-sharpener, of a body part having a coned hole therein and oppositely-arranged cut-away parts forming longitudinal slots or openings into said coned hole, and of two cutting-blades each having a plurality of cutting edges mounted on said cut-away parts of the body part so that said cutting edge lies across the axis of the coned hole, the inclination of the said cutting edges being such that the ends of said edges nearest to the larger end of the coned hole are in advance of the other ends of said cutting edges in relation to the direction in which the pencil is rotated to be sharpened, as set forth.

4. The combination in a pencil-sharpener, of a body part having a coned hole therein and a cut-away part forming a longitudinal slot or opening into said coned hole, and of a cutting-blad "backed off" or undercut on its under side immediately behind the cutting edge the said blade being mounted on said cut-away part of the body part so that its cutting edge lies across the said longitudinal slot or opening in said body part, the inclination of the cutting edge of the said blade being such that the end of said edge nearest to the larger end of the coned hole is in advance of the other end of said cutting edge in relation to the direction in which the pencil is rotated to be sharpened, as set forth.

5. The combination in a pencil-sharpener, of a body part having a coned hole therein and a cut-away part forming a longitudinal slot or opening into said coned hole, and of a plurality of cutting-blades "backed off" or undercut on their under sides immediately behind their cutting edges the said blades being mounted on said cut-away part of the body part in echelon, each with its cutting edge at an angle with and intersecting the said longitudinal slot or opening in said body part, the inclination of the cutting edges being such that the ends of said edges nearest to the larger end of the coned hole are in advance of the other ends of said cutting edges in relation to the direction in which the pencil is rotated to be sharpened, as set forth.

6. The combination in a pencil-sharpener, of a body part having a coned hole therein and a plurality of cut-away parts forming longitudinal slots or openings into said coned hole, and of a plurality of cutting-blades "backed off" or undercut on their under sides immediately behind their cutting edges, the said blades being arranged in groups on said cut-away parts of the body part the blades of each group having their cutting edges at an angle with and intersecting one of the longitudinal slots or openings in said body part, the inclination of the cutting edges being such that the ends of said edges nearest to the larger end of the coned hole are in advance of the other ends of said cutting edges in relation to the direction in which the pencil is rotated to be sharpened, as set forth.

FREDERICK EDWARD VESEY BAINES.

Witnesses:
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H. D. JAMESON.