(No Model.)

A. FORNANDER.

PENCIL SHARPENER.

No. 501,043. Patented July 4, 1893.

Fig. 1.

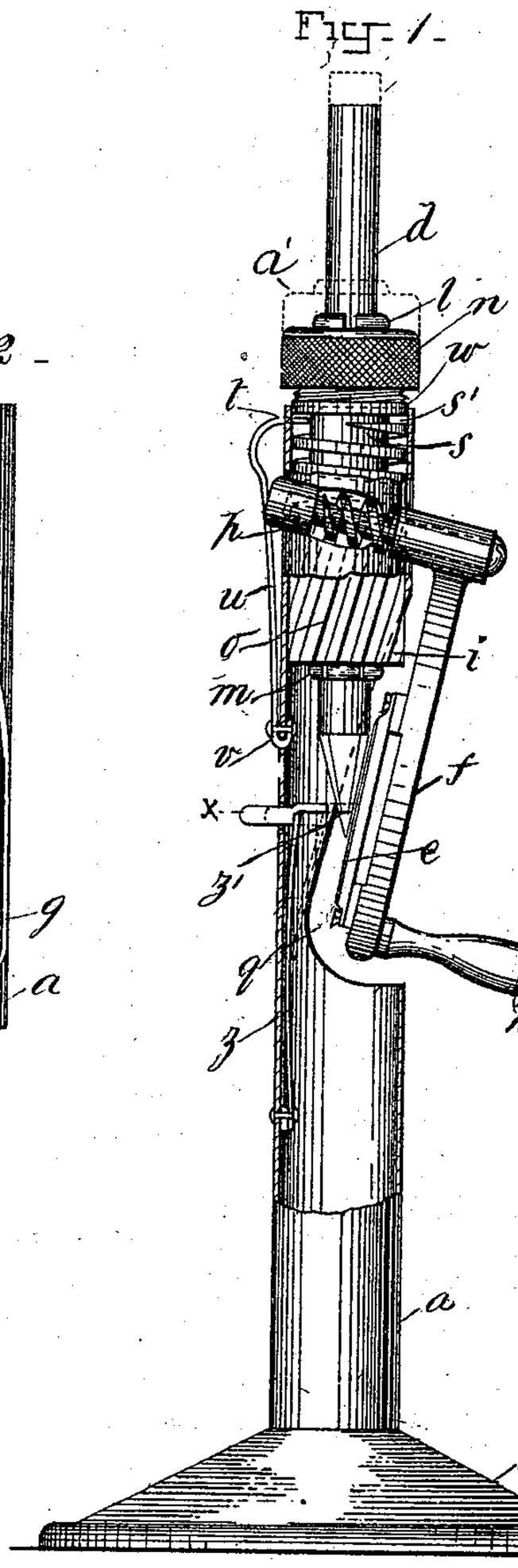

Fig. 2.

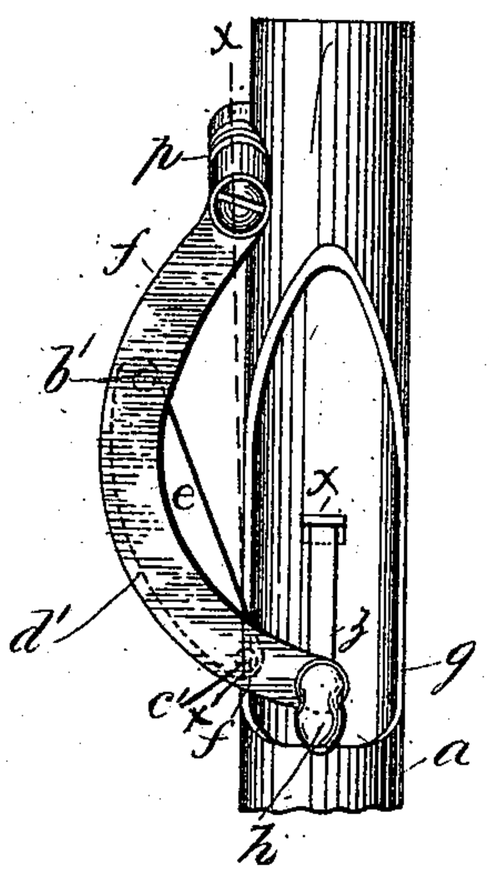

Fig. 3.

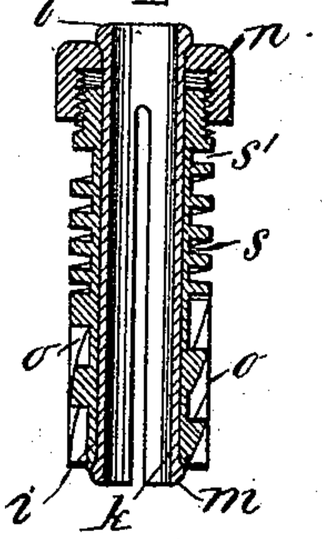

Fig. 4.

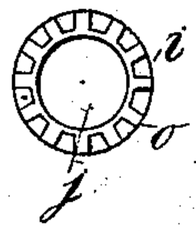

Fig. 5.

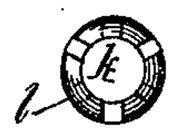

Fig. 6.

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UNITED STATES PATENT OFFICE.

ALFRED FORNANDER, OF NEW YORK, N. Y., ASSIGNOR TO EBERHARD FABER.

PENCIL-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 501,043, dated July 4, 1893.

Application filed October 11, 1892. Serial No. 448,487. (No model.)

To all whom it may concern:

Be it known that I, ALFRED FORNANDER, a subject of the King of Sweden and Norway, and a resident of New York city, in the county and State of New York, have invented certain new and useful Improvements in Pencil-Sharpeners, of which the following is a specification.

My invention consists in novel contrivances of holding, rotating and feeding mechanism for the pencil, and a swinging knife whereby the points may be sharpened substantially the same as with a knife held in the hand but with more regularity and much quicker, with less breaking of the leads and regular hexagon or octagon points can be made coincident with the like shapes of the body of the pencil, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1, is partly a side elevation and partly a sectional elevation of my improved sharpener as when made to rest on a stand, with a pencil in it as for being sharpened. Fig. 2, is a side elevation of a portion of the same in a view at right angles to that of Fig. 1. Fig. 3, is a sectional elevation of part of the holding, rotating and feeding mechanism. Fig. 4, is an end view of part of the apparatus of Fig. 3. Fig. 5, is an end view, and Fig. 6, a side view of the expansible gripping tube forming part of the holding device.

I provide a tubular stock *a*, which may be set upright on a base *b*, or be attached to any other support, or it may be used without the base or other support by holding the lower portion of the stock in hand.

It is not essential that the stock be tubular throughout its entire length, but as a socket of some length is needful I have chosen a tube in this case as the most favorable for my purpose. With such a stock having the notch *q*, in one side or any equivalent shape permitting the knife to sweep across the longitudinal axis of the stock in an oblique plane as indicated in Fig. 1, I provide a holder for carrying the pencil *d*, to be sharpened, said holder adapted to rotate and slide in the tubular portion of the socket so as to feed the point end of the pencil forward to the cutter *e*, and turn it about subject to the repeated strokes of the cutter which is carried on the arm *f*, which swings through the notch *q*, in a plane which has the angular relation to the longitudinal axis of the pencil due to the desired taper of the point, said arm having a crank pin *h*, by which to turn it by hand. The said holder consists of the cylinder *i*, adapted in size to fit the bore of the stock, so as to work freely, and having a longitudinal bore *j*, through it in which the split expansible tube *k*, having flared heads *l*, *m*, is fitted with cap *n*, screwed on one end of the cylinder to effect the contraction of the split tube to grip the pencil and allow it to expand for releasing the pencil, said tube also extending through the cap *n*, which has a central hole through it the same size as the bore of the cylinder; the end of the split tube having head *m* may be contracted sufficiently to be inserted through the cap and the cylinder; when the cap is screwed on the cylinder to the extent of its range the split tube expands sufficiently to permit the pencil to be inserted, then screwing the cap in the reverse direction draws the heads within the holes and contracts the tube so as to grip and hold the pencil.

For causing the rotation of the cylinder of the holder it is in this example provided with long spiral teeth *o*, on its exterior for a portion of its length and the pivot shaft of the cutter carrying arm has worm teeth *p*, engaging said teeth *o*, through an opening in the side of the stock so that as the arm is turned by the operator to work the cutter the holder is slowly revolved; the length of the teeth *o*, permits the holder to be moved lengthwise at the same time, for which the spiral groove *s*, is cut in the other exterior portion of the cylinder not having the teeth *o*, and a stud pin *t* projects from the wall of the stock into said groove to effect the said lengthwise movement; this stud pin is one extremity of a spring *u*, extending along the stock and secured to it at *v*, as a means of readily withdrawing the stud pin to permit the the holder to be readily put in and taken out of the stock. The spiral groove terminates in a true circumferential part *s*, next to the collar *w*, which reaches the stud pin *t*, when the pencil point is sufficiently sharpened and the feed movement of the pencil then ceases.

Other means of rotating and feeding the holder may of course be employed and it is to

be understood that in the above described means for this purpose I represent only one example of what may be used.

I have also provided a gage by which to set the worn pencil in the proper relation to the cutter to begin with. It consists of the push piece *x*, arranged to slide radially in the stock and projecting outward sufficiently to be pushed inward by the finger, and mounted on a spring support *z*, which normally holds the gage outward clear of the center space along which the pencil feeds when being sharpened. When the pencil is to be inserted the gage is pressed inward so that the inner end reaches a little beyond the center of the stock as indicated by the dotted lines *z'*. The pencil is then set with the worn point touching the gage and is secured in the clutch by the cap *n*, the holder being first withdrawn the distance the pencil is to feed toward the cutter for being sharpened as indicated by the dotted lines *a'* Fig. 1. The holder may be so withdrawn by screwing it backward on the stud pin *t*, or said stud pin may be sprung out clear of the groove *s*, and the holder pulled out directly.

The cutter *e*, is adjusted with the inner end *b'* in the angular advance of the outer end *c'* shown by the dotted lines *x*—*x*, Fig. 2, and thereby begins the cut at the base of the point and cuts with a shear that greatly facilitates the work and prevents breaking the points. The cutter is also made with convex bit shown by the dotted lines *d'* by which the shear is greater at the point of the lead which is still more favorable in preventing the breaking of the lead. The worm *p* and the toothed cylinder of the holder are in this example geared in the proportion of six turns of the cutter to one of the holder, which makes hexagon points. If it is desired to make octagon points the proportions will be eight to one, and they may be proportioned accordingly for other forms of points.

I claim—

1. A pencil sharpener consisting essentially of a rotating cutter and a rotating pencil holding cylinder for turning the point of the pencil relatively to the cutter, the said cylinder also having lengthwise feeding movement for the pencil and automatic mechanism therefor substantially as described.

2. In a pencil sharpener the combination of the rotating and lengthwise feeding pencil holding cylinder, and the rotating cutter having the angular advance of the inner end to shear cut the pencil substantially as described.

3. In a pencil sharpener the combination of the tubular stock, the rotating and lengthwise feeding pencil holding cylinder in the said tubular stock, the rotating cutter geared with the cylinder, the spiral feeding groove in the cylinder and the feed stud engaging the spiral groove substantially as described.

4. The combination of the holding and feeding cylinder having the central bore, the split tube having the head on each end and inserted in said bore, and the adjusting cap on the end of the cylinder substantially as described.

5. The combination of the setting gage with the tubular stock, rotating and lengthwise feeding cylinder, and point cutting knife, said gage adapted to be temporarily set in the gaging position, and be normally retired therefrom substantially as described.

Signed at New York city, in the county and State of New York, this 4th day of October, A. D. 1892.

ALFRED FORNANDER.

Witnesses:
W. J. MORGAN,
A. P. THAYER.