(No Model.)

S. FORRESTER.

PENCIL SHARPENER.

No. 310,041. Patented Dec. 30, 1884.

Fig. 1.

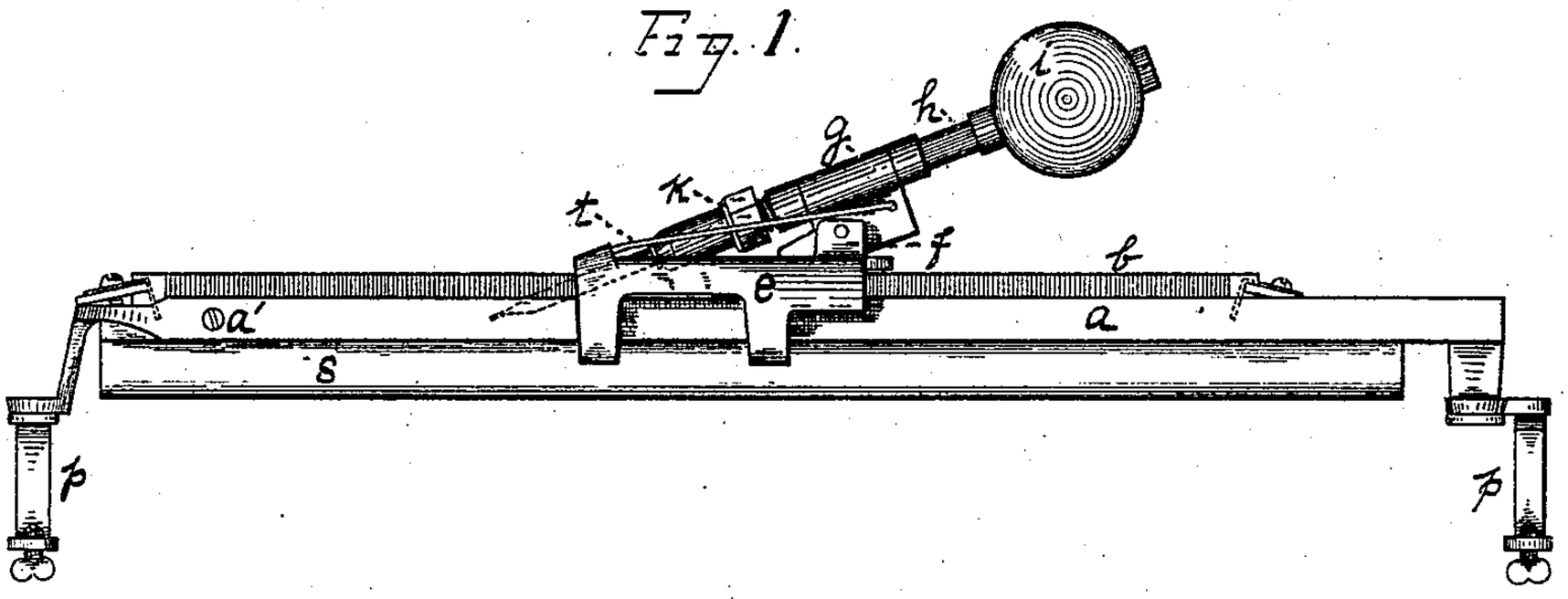

Fig. 2.

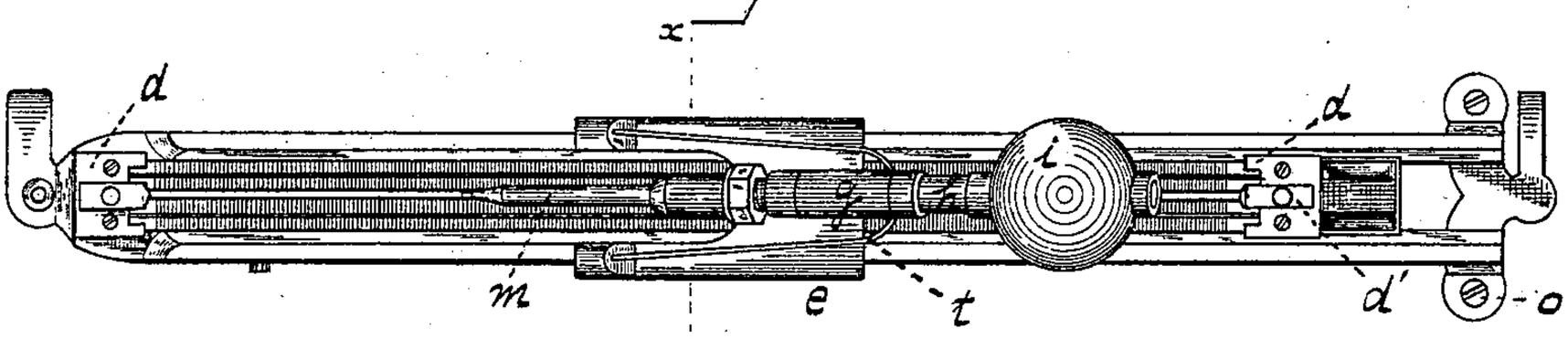

Fig. 5.

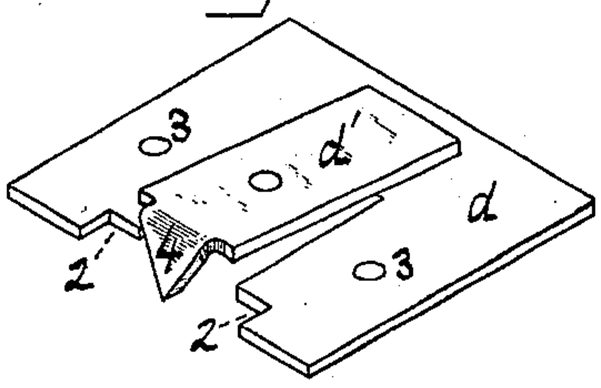

Fig. 3.

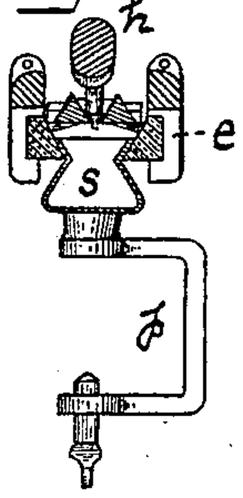

Fig. 4.

Fig. 6.

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PENCIL-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 310,041, dated December 30, 1884.

Application filed May 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL FORRESTER, of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Pencil-Sharpeners; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved pencil-sharpener. Fig. 2 is a plan view of the same. Fig. 3 is a vertical cross-section through the line *x x* of Fig. 2. Fig. 4 is a cross-section of the files of the sharpener on an enlarged scale, showing their relative adjustment to each other. Fig. 5 is a detached perspective view of that part of the apparatus by which the grinding-surfaces are adjusted and secured to the frame. Fig. 6 is a view of a pencil-point as made by that form of the sharpener shown in the drawings.

My invention relates to an improvement in apparatus for sharpening slate-pencils; and it consists, principally, in a sharpener having a concave or V-shaped sharpening-surface, in combination with means for moving a pencil over the same, together with several other improved devices for regulating the sharpness and length of the point of the pencil, and for conveniently collecting the débris or dust which results from the grinding process, as will hereinafter more fully appear.

Referring now to the drawings, *a* represents the frame of my improved pencil-sharpener. It consists, preferably, of two parallel bars or rods, connected at their extremities and placed at a proper distance apart to accommodate between them two files, *b b'*, which are adapted to grind or sharpen the pencil, which is rubbed over their surfaces. These files are preferably triangular in cross-section, as illustrated in Fig. 4, and are set parallel, with their bases in the same plane, but at a slight distance apart, so that there may be a space, *c*, between them. The files are secured to the frame *a* by means of plates *d d'*, notched so as to fit over the apices of the triangular files, and when screwed to the frame at their extremities to hold them firmly adjusted in place.

Mounted upon the parallel bars of the frame *a* is a sliding carriage, *e*, which is capable of being moved backward and forward upon the side bars of the frame as upon ways.

Pivotally mounted upon the carriage *e*, between cheeks *f* on the same, is a hollow cylindrical sheath or journal, *g*, having its bore arranged in the same plane, with the longitudinal space *c* between the files, and capable of being oscillated vertically upon its axis. The sheath *g* is designed to contain a hollow rotary pencil-holder, *h*, which is fitted therein, so that it may be turned axially upon the bore of said journal. At one extremity of the pencil-holder *h* is a suitable handle, *i*, for operating the same, and at the other end the hollow holder is slit, and provided with a screw-thread or other suitable device for accommodating a clutch or chuck, *k*, for securing the pencil during the sharpening process. In practice I have found that ordinary metallic tubing of proper bore is well adapted for use as a pencil-holder, and that the handle *i* should be made of spherical form. Thus constructed it is clear that the pencil-holder *h* is capable of three distinct motions—a motion with the sliding carriage *e* parallel to the files, a vertical oscillating motion with the sheath *g* upon its axis in the cheeks *f*, and a rotary motion within said sheath and axially with its bore.

The operation of my improvement is as follows: A slate-pencil, *m*, is inserted within the tubular holder *h*, so that the end to be sharpened may extend beyond the chuck *k*. The spherical handle *i* is then raised by the hand of the operator until the end of the slate-pencil strikes the V-shaped grinding-surface presented by the adjacent files *b b'*. If, now, the carriage *e* be moved backward or forward along the frame *a*, and a slight upward pressure at the same time given to the spherical handle *i*, the pencil *m* will be rubbed upon the surface of the files and ground to a point. In order to give regularity to the point of the pencil, the handle *i* should be turned during the reciprocating movement of the carriage, so as to present each portion of the point to the action of the files.

The side of the frame *a* may be provided with a suitable stop or projection, *a'*, which will limit the movement of the carriage *e* and

prevent the pencil-point being struck against the end of the frame *a* and broken or blunted.

In order to prevent the sheath *g* from a too great movement upon its bearings in the cheeks *f*, its base or shank should be somewhat elongated on both sides of the axis, as shown in Fig. 1, so that the elongations may strike upon the top of the sliding carriage *e* and prevent the oscillating motion of the pencil-holder *h*, except within certain limits. The forward end of the elongated shank should be long enough to prevent the end of the chuck from striking against the files.

The object of the longitudinal space *c* between the bases of the files *b b'* is to allow the point of the pencil to project therethrough, and by this means to secure as long a point as desirable. The sharpness of the pencil-point may also be regulated by varying the width of this space, it being made narrow for a sharp point, and wider if a blunter point be desired. The width of the space *c* between the files is regulated by the device shown in Fig. 5, in which the pieces which hold the files *b b'* at their extremities upon the frame *a* are each composed of two superposed plates, *d d'*, the lower ones, *d*, of which are provided with notches 2, almost large enough to inclose the bases of both files when resting thereon, and the upper plates, *d'*, are wide enough to rest within the V-shaped opening between the files and to press against their inclined sides.

The files having been placed upon the frame *a*, as shown in the drawings, the plates *d* are placed at their extremities, so that the sides of the notch 2 may impinge upon their outer inclined faces. The plates are then screwed down to the frame *a* by means of suitable screws, 3, and in descending the sides of the notch 2, pressing against the outer faces of the files, force the files together. When the desired adjustment is thus reached, the end of the other plates or tongues, *d'*, are placed within the V-shaped opening and screwed down to the frame *a* and over the plate *d*. As is evident, this will press the files outward against the sides of the notches 2, and will hold them securely in place. When in this position the files are susceptible of very delicate adjustment by raising or lowering the plates *d d'* by means of their screws. Thus, to bring them together, the plate *d* is lowered and the plate or tongue *d'* raised, and to separate the files the process is reversed. I prefer to make the plate *d'* with a wedge-shaped tongue, 4, to conform with the shape of the grinding-surfaces of the files. If desired, the two plates *d d'* may be made integral by slitting a metallic plate in any suitable manner.

The sharp corners of the files are slightly ground or rounded, as shown in Fig. 4, so that the pencil-point may not be broken or cut off by friction against them.

The frame of my improved pencil-sharpener may be secured to a table by means of screws *o* or clamps *p*, or other equivalent devices.

A suitable pan, *s*, is mounted on slides on the frame *a*, beneath the longitudinal space *c*, so as to catch and retain the ground dust from the pencils, or the pan can be fixed thereunder, as desired.

The files *b b'* may be used for a long time, since they each possess three grinding-surfaces, and when one pair of faces has been worn smooth the files may be removed and turned, so as to present fresh surfaces to the pencil. By making the file sufficiently thick, so that during the grinding operation only one-half of the faces comes in contact with the pencil, it is clear that each face of the files may be used until worn twice by proper change in their position, and, as there are three faces, a set of files may be worn out and readjusted six times before they become useless. For this purpose I prefer to make the teeth of the files vertical and parallel, so that when a pair of faces is reversed and the top thereof becomes the grinding part, the teeth thereon may correspond and cut more evenly. In such case it will be found more convenient to press the pencil against the files only during the backward stroke of the carriage, and to raise it therefrom by depressing the handle *i* during the forward stroke of the same.

In order to impart steadiness and regularity to the motion of the tubular holder *h*, a suitable spring, *t*, may be affixed to the shank of the casing *g* and to the forward part of the bed of the sliding carriage *e*, the action of which is to tend to raise the handle *i* and to press the pencil against the files.

The advantages of my improvement are its simplicity, ease of operation, and durability. It may be made of any desired size, and adapted for use in school-rooms or for personal convenience. The arrangement of the files *b b'* is such that they can be readily adjusted or replaced when worn out.

The form of pencil-point made by such a machine as I have described is shown in Fig. 7, the point being long and sufficiently thick to endure considerable use before another sharpening is required; but, as I have stated, the size and shape of the point may be varied by varying the distance between the bases of the files.

I do not desire to limit myself to the use of three-cornered files, nor to the use of metallic files, since the grinding-surfaces may be made of suitable roughened plates inclined to each other so as to form a V-shaped or concave device.

Having thus described my improvement so that others skilled in the art to which it appertains may manufacture and use it, what I claim as my invention, and desire to protect by Letters Patent, is—

1. A pencil-sharpener having a suitable grinding-surface and a reciprocating carriage mounted above said surface on suitable ways situate parallel therewith, said carriage being movable backward and forward on said ways, and provided with a pencil-holder for

pressing a pencil against said grinding-surface during said reciprocating motion, substantially as and for the purpose described.

2. The combination, in a pencil-sharpener, of a V-shaped grinding surface having a longitudinal space at the base of the same with a reciprocating carriage mounted above said grinding-surface, and a pencil-holder pivotally mounted upon said carriage and capable of a vertical oscillatory motion thereon, so as to raise or depress the extremity of a pencil from or against said grinding-surface, substantially as and for the purpose described.

3. The combination, with the oscillatory pencil-holder *h*, mounted upon the reciprocating carriage *e* of a pencil-sharpener, of the spring *t*, which bears upon said carriage and upon said oscillatory pencil-holder, so as to be capable of forcing the point of a pencil contained within said holder upon a suitable grinding-surface, substantially as and for the purposes described.

4. The combination, in a pencil-sharpener, of a reciprocating carriage mounted over a suitable grinding-surface with a pencil-holder pivotally mounted within a sheath or casing, *g*, upon said carriage, and capable of a vertical oscillatory motion and a longitudinally rotary motion within said sheath, so as to raise or depress the extremity of a pencil from or against said grinding-surface and to rotate the same thereon, substantially as and for the purpose described.

5. The combination, with the reciprocating carriage of a pencil-sharpener, of a tubular pencil-holder, *h*, mounted thereon and capable of a longitudinal rotation upon the same, said holder having a suitable clutch for holding a pencil placed therein, and a handle or knob, *i*, for imparting rotation thereto, substantially as and for the purposes described.

6. The combination, in a pencil-sharpener, of the two adjacent files *b b'*, each polygonal in cross-section, and having more than one grinding-surface, said files being removable and readjustable in said sharpener, so as to afford fresh grinding-surfaces, substantially as and for the purpose described.

7. The combination, in a pencil-sharpener, of the two adjacent files *b b'*, each polygonal in cross-section, and having more than one grinding-surface, said files being removable and readjustable in said sharpener, so as to afford fresh grinding-surfaces, and having ground or rounded edges, substantially as and for the purposes described.

8. The combination, with a pencil-sharpener having a V-shaped grinding-surface and a longitudinal space at the base of the same, of a removable pan or tray, *s*, situate beneath said longitudinal space, and capable of collecting the dust from said grinding-surface as it falls through said longitudinal space, substantially as and for the purposes described.

9. As a device for adjusting and securing the grinding-tools of a pencil-sharpener, the plate *d*, notched so as to impinge upon the outer inclined faces of said grinding-tools, and the tongue *d'*, for engaging the inner faces of the same, both combined and arranged substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 7th day of May, A. D. 1884.

SAMUEL FORRESTER.

Witnesses:
W. B. CORWIN,
THOMAS W. BAKEWELL.