(No Model.)

2 Sheets—Sheet 1.

J. WATROUS.

PENCIL SHARPENER.

No. 431,422. Patented July 1, 1890.

FIG. 2.

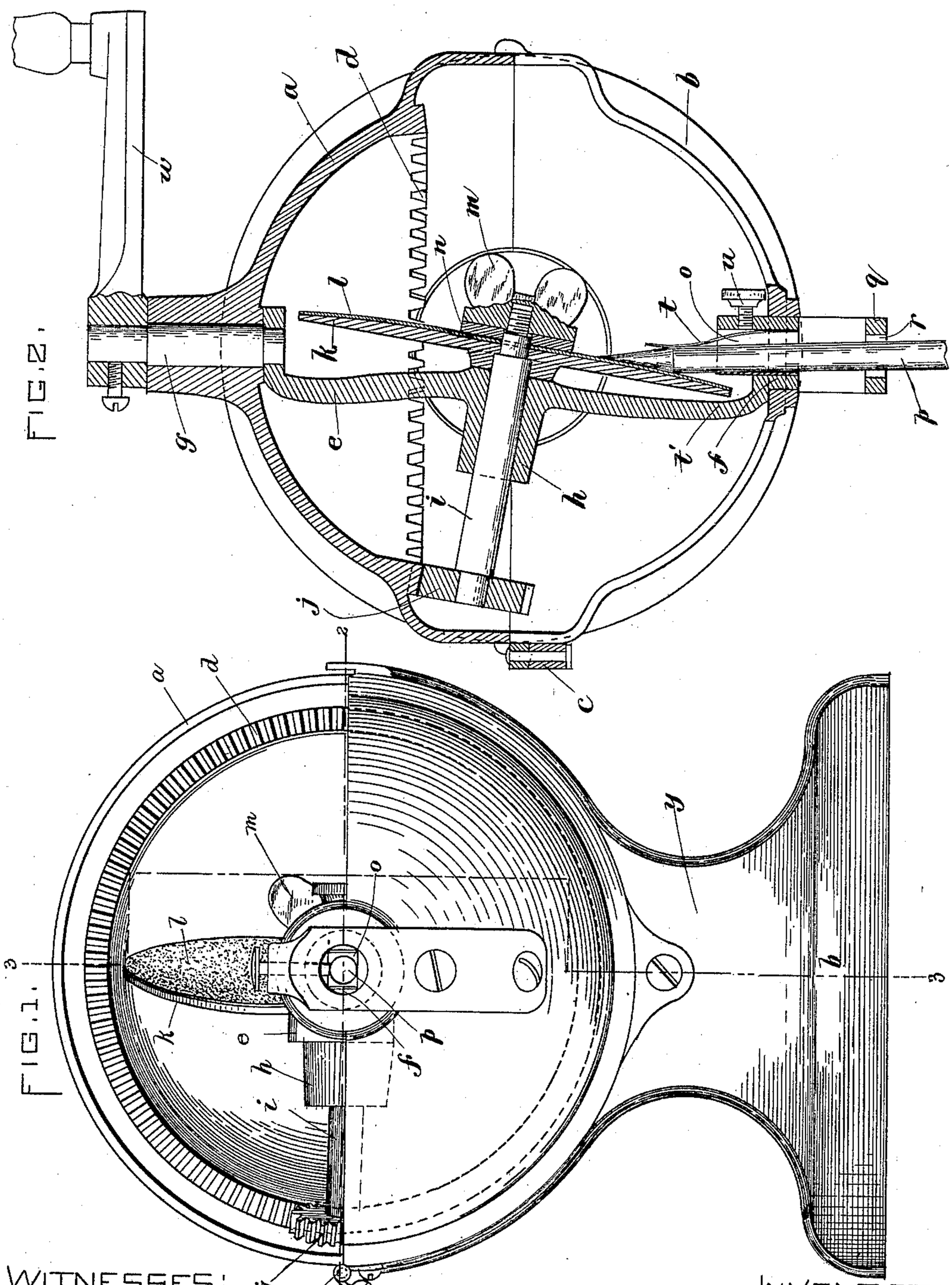

FIG. 1.

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K. E. Brown.

INVENTOR:
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by Wright Brown Quinby & Otts

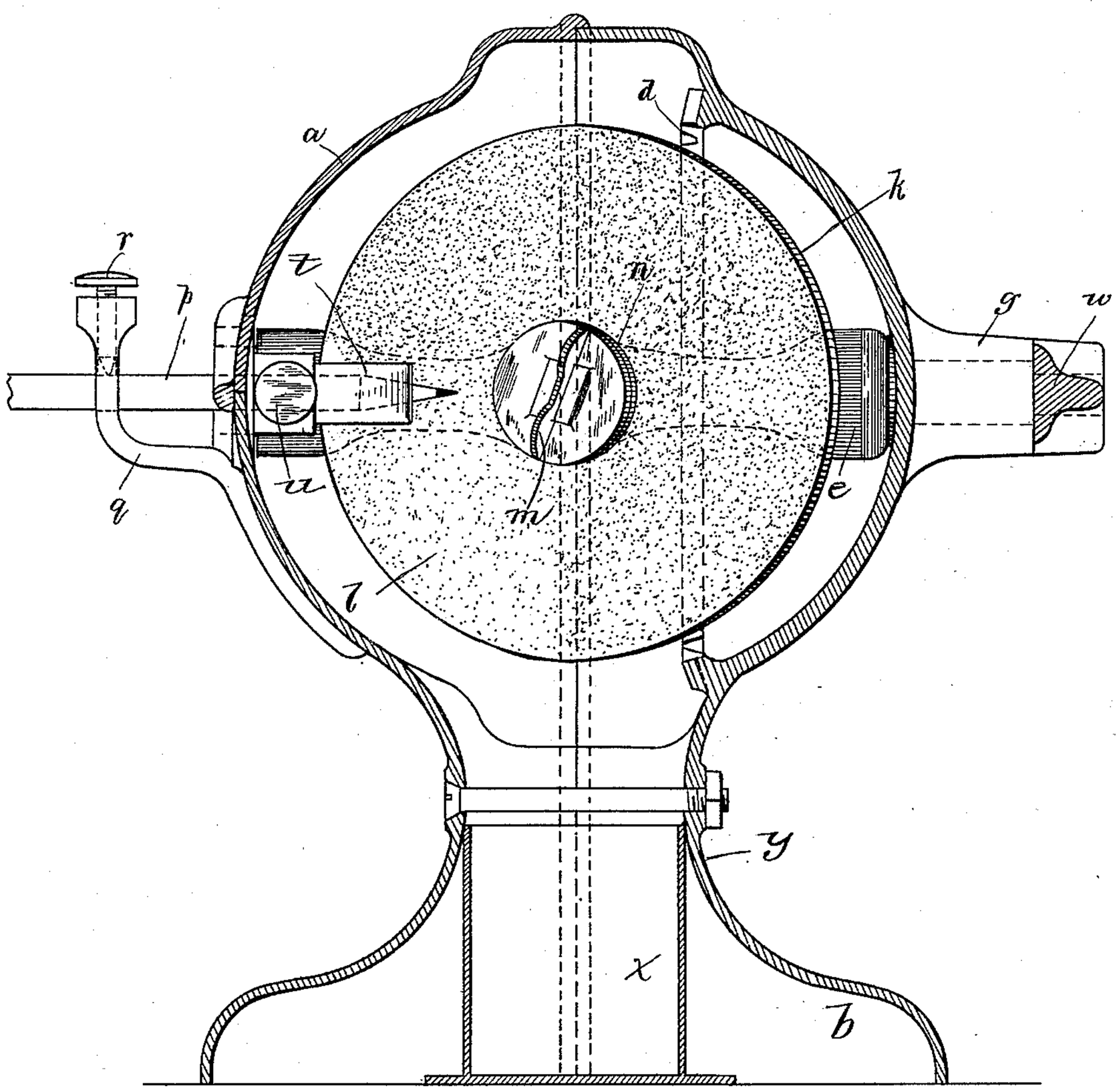
(No Model.) 2 Sheets—Sheet 2.

J. WATROUS.

PENCIL SHARPENER.

No. 431,422. Patented July 1, 1890.

FIG. 3.



WITNESSES:
A. D. Harrison.
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INVENTOR:
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UNITED STATES PATENT OFFICE.

JOSEPH WATROUS, OF FOXBOROUGH, MASSACHUSETTS.

PENCIL-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 431,422, dated July 1, 1890.

Application filed December 13, 1889. Serial No. 333,605. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WATROUS, of Foxborough, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Pencil-Sharpeners, of which the following is a specification.

This invention has for its object to provide a rapidly-operating pencil-sharpener adapted to form an elongated conical point on a pencil and to prevent the dust created by the sharpening operation from escaping into the room.

The invention consists, first, in the combination of a casing or holder having a gear within it, a fixed face or crown, an offset holder or carrier fitted to rotate in said casing and extending across the same, said holder having trunnions which are journaled in bearings in the casing, one of said trunnions being hollow and acting as a receiver for the pencil to be sharpened, a shaft journaled in a bearing formed on said holder and having at one end a pinion meshing with said crown-gear and at the other end a disk, one side of which is adapted to grind or cut away a pencil presented to it, the arrangement being such that when the shaft or holder is rotated by means of a crank attached to one of its ends the disk will be caused by the offset form of said shaft to revolve about the pencil inserted in the hollow of the trunnion of the shaft and at the same time rotated on its own axis by the engagement of the pinion connected to it with the fixed gear in the casing, so that the abrasive surface acts to rapidly cut away the pencil while it is revolving about it, the abrasive face or side of the disk being set obliquely to the longitudinal axis of the pencil, so that the abrasive surface forms a conical point on the pencil.

The invention also consists in certain details and combinations of parts, all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of my improved pencil-sharpener, the casing being opened to show the interior. Fig. 2 represents a section on line 2 2 in Fig. 1. Fig. 3 represents a section on line 3 3, Fig. 1.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the casing, which is preferably spherical, or nearly so, in form, and is provided with a foot or base *b*. A portion *a'* of the upper part of the casing is removable and is connected by a hinge *c* to the main part of the casing, said movable part constituting a lid or cover whereby access can be had to the interior of the casing. When said cover is closed, the sharpening mechanism hereinafter described is entirely covered, so that no dust can escape into the room during the sharpening operation.

d represents a face or crown gear, which is formed on or rigidly attached to the interior of the casing, and is preferably cast with the casing, said gear forming a complete circle.

e represents a holder or carrier, which is provided at its ends with trunnions *f g*, said trunnions being journaled in bearings formed for them in the casing *a*. The trunnions are offset from the main portion of the holder or carrier *e*, as shown in Fig. 2, and the carrier *e* is provided at its central portion with a boss or bearing *h*, in which is journaled a shaft *i*, having on its outer end a pinion *j*, which meshes with the crown-gear *d*. To the opposite or inner end of the shaft *i* is rigidly attached a disk *k*, which is adapted to grind or cut away a pencil *p* presented to its outer side. I have shown the disk provided with a circular sheet *l* of sand-paper or other suitable abrasive material, the latter being clamped to the central portion of the disk *k* by any suitable means. The preferred clamping means are a thumb-screw *m* and a washer *n*, pressed thereby against the sand-paper sheet *l*, the nut being engaged with the threaded end of the shaft *i*, which projects through the disk *k*. The sand-paper sheet *l* has a central hole in which to receive the projecting end of the shaft *i*. If desired, however, the disk *k* may be made of any suitable abrasive material, as emery, instead of being provided with a detachable abrasive surface.

The trunnion *f* is provided with an orifice *o*, extending through it to receive the pencil *p* and hold the same in position to be acted upon by the abrasive disk *k*, as seen in Fig. 2. An arm *q* attached to the exterior of the

casing is provided with a guide-orifice *r*, which is in line with the orifice *o* in the trunnion *f*, and assists the orifice *o* in guiding and holding the pencil, the arm *q* having a vertically-movable stud or pin *r'*, which is adapted to be pressed by the operator against the portion of the pencil that is contained in the orifice *r* to firmly hold the pencil and prevent its longitudinal displacement. To the trunnion *f* is attached a spring *t*, which is arranged to bear with a yielding pressure on that part of the pencil which is presented to the disk *k*, and hold the pencil in yielding contact with the abrasive surface of the disk. The pressure of the spring *t* may be regulated by means of a set-screw *u* working in a threaded socket in the trunnion *f*.

The bearing *h* in which the shaft *i* is journaled is so arranged that the disk *k* stands obliquely to the pencil *p* as the latter is held by the devices above described, so that the action of the abrasive surface of the disk upon the pencil forms a conical end or point on the latter.

It will be seen that when the holder or carrier *e* is rotated by means of a crank *w* affixed to the trunnion *g*, said carrier and the disk *k* will be revolved about the pencil and the pinion *j* will be at the same time caused to travel in a circle in contact with the gear *d*, so that the disk *k* will be rotated while revolving about the pencil. These two movements of the disk cause its abrasive surface to rapidly cut away the pencil and form a conical point thereon, as will be readily seen. The spring *t* keeps the pencil in sufficiently close contact with the abrasive surface as the material of the pencil is worn away, the spring feeding the pencil laterally against the abrasive surface as the work progresses. The dust formed by the sharpening operation falls to the bottom of the casing and is there collected in a cylindrical box *x*, which is inserted in the hollow neck that connects the base *b* with the casing *a*. Said box is preferably held in place by friction, and is adapted to be readily removed for the discharge of its contents.

It will be seen that when the cover of the casing is closed no dust can escape during the sharpening process, so that the device is free from objection in this respect.

The outer surface of the disk *k* is made slightly convex, as shown in Fig. 2, so that the conical point of the pencil is given a slight longitudinal concavity, this form being preferable to an absolutely true conical form, because it exposes more of the lead and makes a more durable point.

It will be seen that the abrasive material can be readily removed and replaced by a new piece or sheet by simply removing the clamping-nut *m* and the washer *n*.

To prevent the pencil-point from catching the edge of the sand-paper sheet *l* when the pencil is being inserted in the casing, I provide a guard-strip *t'*, which is attached to the trunnion *f* and projects into the casing between the pencil and the margin of the sheet *l*, so that the pencil cannot touch the margin of the sheet, as shown in Fig. 2.

I am aware that a pencil-sharpener has before been made in which a disk armed with knives is revolved about the pencil to be sharpened and at the same time rotated on its own axis; hence I do not claim, broadly, a pencil-sharpening disk having the planetary movement here shown and described.

I claim—

1. In a pencil-sharpener, the combination of a casing, a carrier or holder extending across the interior of the casing and having offset trunnions at its opposite ends journaled in bearings in the body of said casing, one of said trunnions having a pencil-receiving orifice, a bearing on said holder arranged obliquely to the axial line of said trunnions, a shaft journaled in said bearing, a disk affixed to one end of said shaft and provided with an abrasive or cutting surface arranged obliquely to the longitudinal axis of a pencil inserted in the hollow trunnion, a pinion affixed to the outer end of said shaft, and a gear affixed to or formed on the interior of the casing and meshing with said pinion, all arranged and operating substantially as described.

2. In a pencil-sharpener, the combination of a casing, a carrier or holder having offset trunnions journaled in bearings in said casing, one of said trunnions having a pencil-receiving orifice, an arm outside of the casing having a pencil-guiding orifice *o* in line with the orifice of the hollow trunnion, and a movable stud *r'* projecting into the orifice *o*, a shaft journaled in a bearing on said holder, a disk affixed to one end of said shaft and provided with an abrasive or cutting surface arranged obliquely to the longitudinal axis of a pencil inserted in said orifice, a pinion affixed to the outer end of said shaft, and a gear affixed to or formed on the interior of the casing and meshing with said pinion, all arranged and operated substantially as described.

3. In a pencil-sharpener, the combination of the casing, the holder or carrier extending across the interior of the casing, and having offset trunnions at its opposite ends journaled in bearings in the body of the casing, one of said trunnions having a pencil-receiving orifice, the disk affixed to one end of a shaft journaled in a bearing on said carrier, a sheet of sand-paper or other abrasive material detachably secured to one side of said disk, and means, substantially as described, for revolving the carrier and at the same time rotating the disk and its abrasive facing, as set forth.

4. In a pencil-sharpener, the combination of the disk, having its acting side made convex, and means for revolving said disk about a pencil presented to its convex side and at the same time rotating said disk, as set forth.

5. In a pencil-sharpener, the combination of the casing, the holder or carrier *e*, having the offset trunnions *f g* and crank *w*, said trunnion *f* having a pencil-receiving orifice *o*, the disk *k*, mounted on a shaft which is journaled in a bearing on the carrier *e*, means, substantially as described, for revolving said carrier and at the same time rotating said disk, a spring attached to the trunnion *f*, and arranged to press a pencil inserted in the orifice *o* against the abrasive surface of the disk *k*, as set forth.

6. In a pencil-sharpener, the combination of the casing, the holder or carrier *e*, having the offset trunnions *f g* and the crank *w*, said trunnion *f* having a pencil-receiving orifice *o*, the disk mounted on a shaft which is journaled in a bearing on the carrier *e*, an abrasive facing detachably secured to one side of said disk, means, substantially as described, for revolving said carrier and at the same time rotating said disk, a spring attached to the trunnion *f*, and arranged to press a pencil against the abrasive surface of the disk, and a screw *u*, to regulate the pressure of said spring.

7. In a pencil-sharpener, the combination of the casing, the holder or carrier *e*, having the offset trunnions *f g* and the crank *w*, said trunnion *f* having a pencil-receiving orifice *o*, the disk mounted on a shaft which is journaled in a bearing on the carrier *e*, an abrasive facing detachably secured to one side of said disk, and a guard *t'*, attached to the trunnion *f* and interposed between the orifice in the trunnion and the margin of the abrasive facing, whereby a pencil is prevented from coming in contact with said margin, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 4th day of December, A. D. 1889.

JOSEPH WATROUS.

Witnesses:
C. F. BROWN,
A. D. HARRISON.