

(No Model.)

J. D. MILLS.  
PENCIL SHARPENER.

No. 448,723.

Patented Mar. 24, 1891.

Fig. 1.

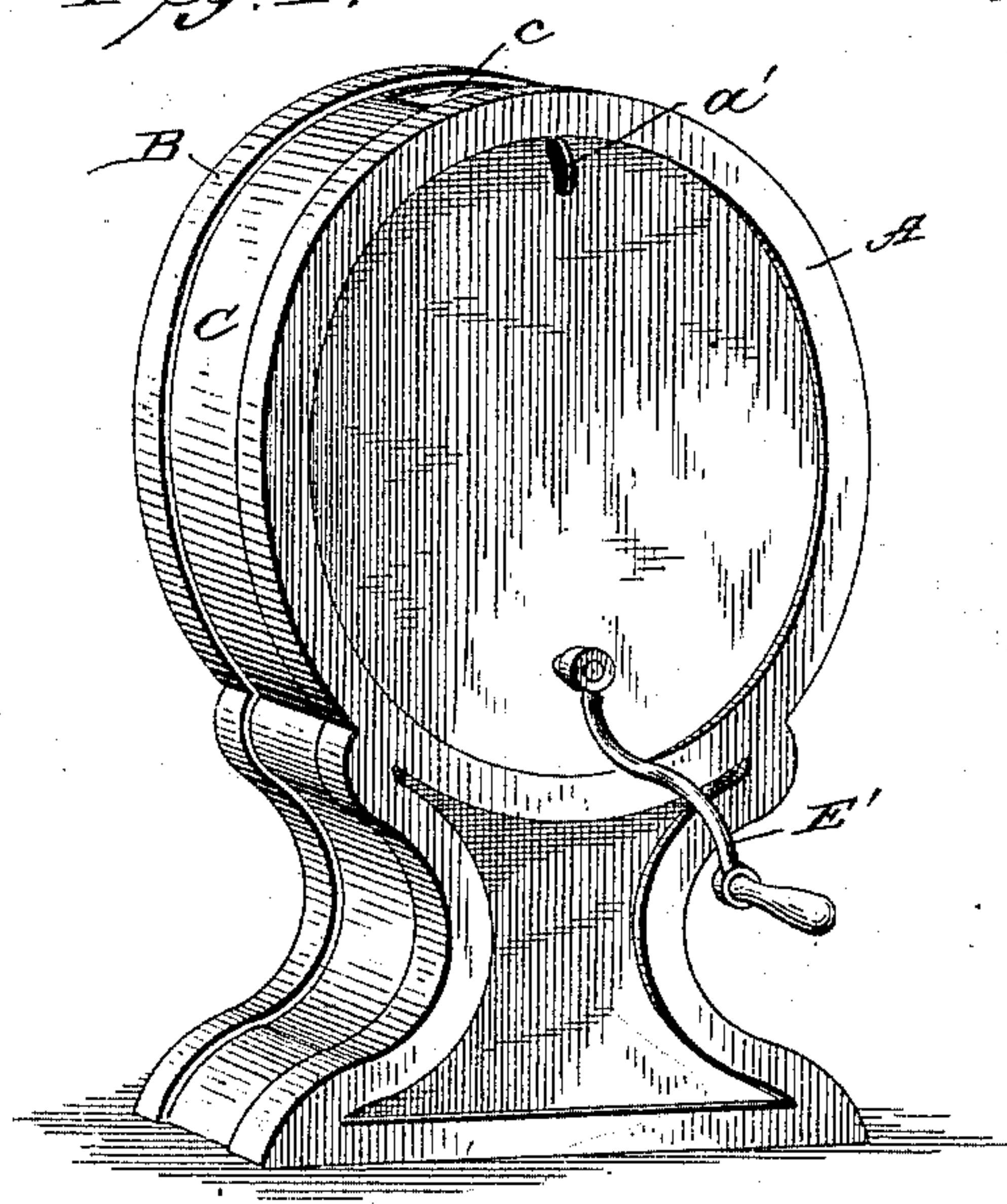


Fig. 2.

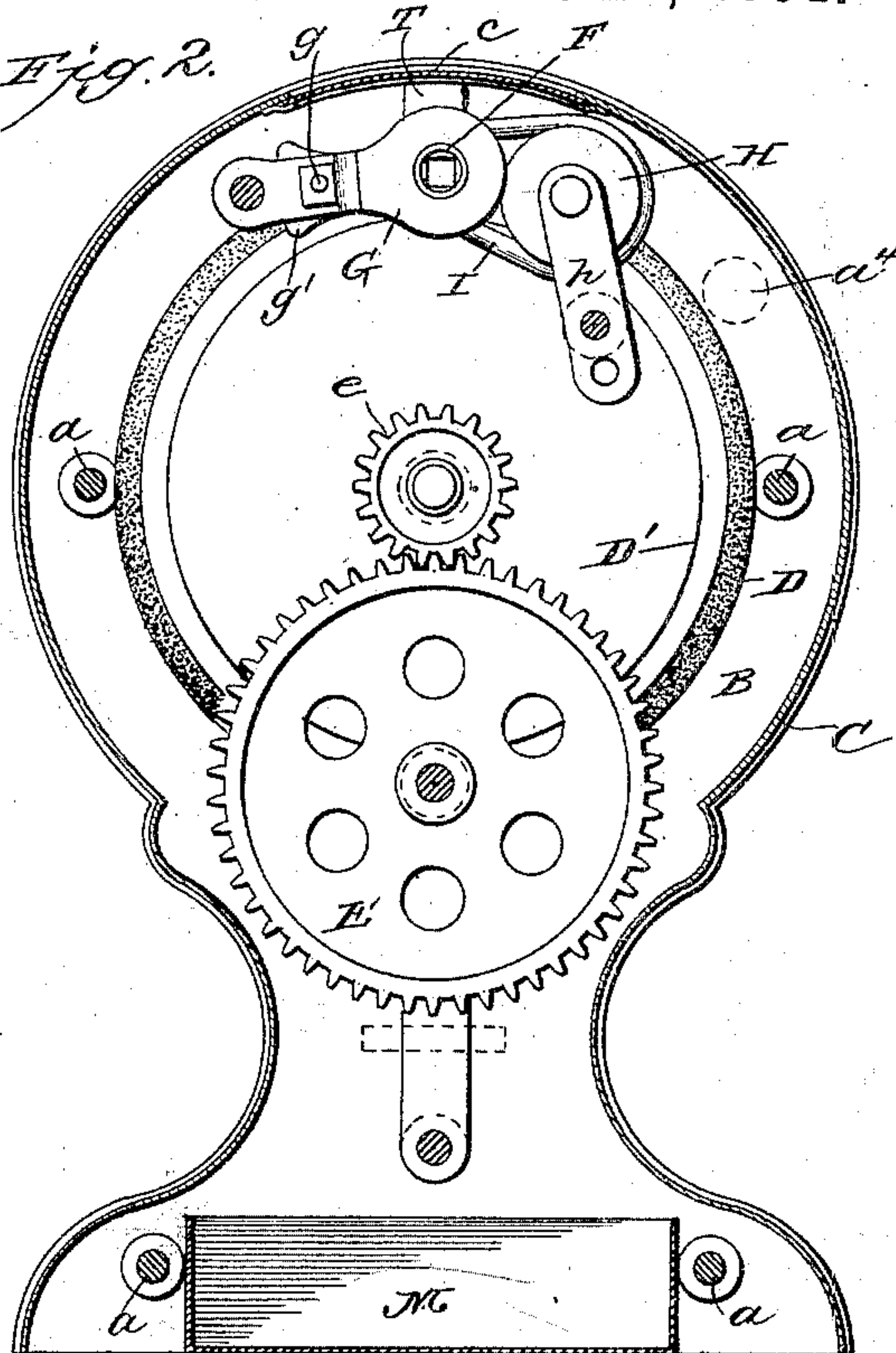


Fig. 3.

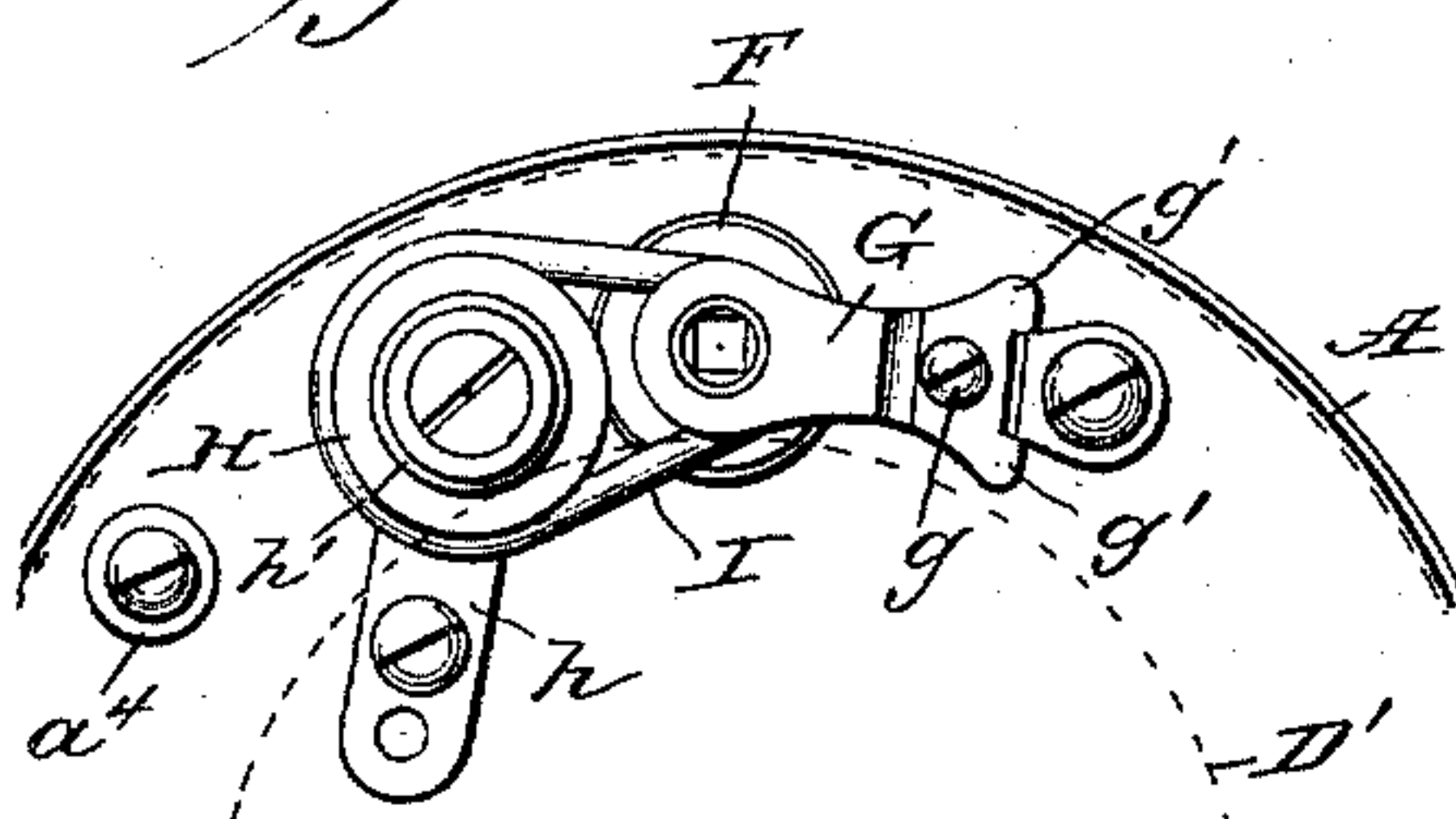
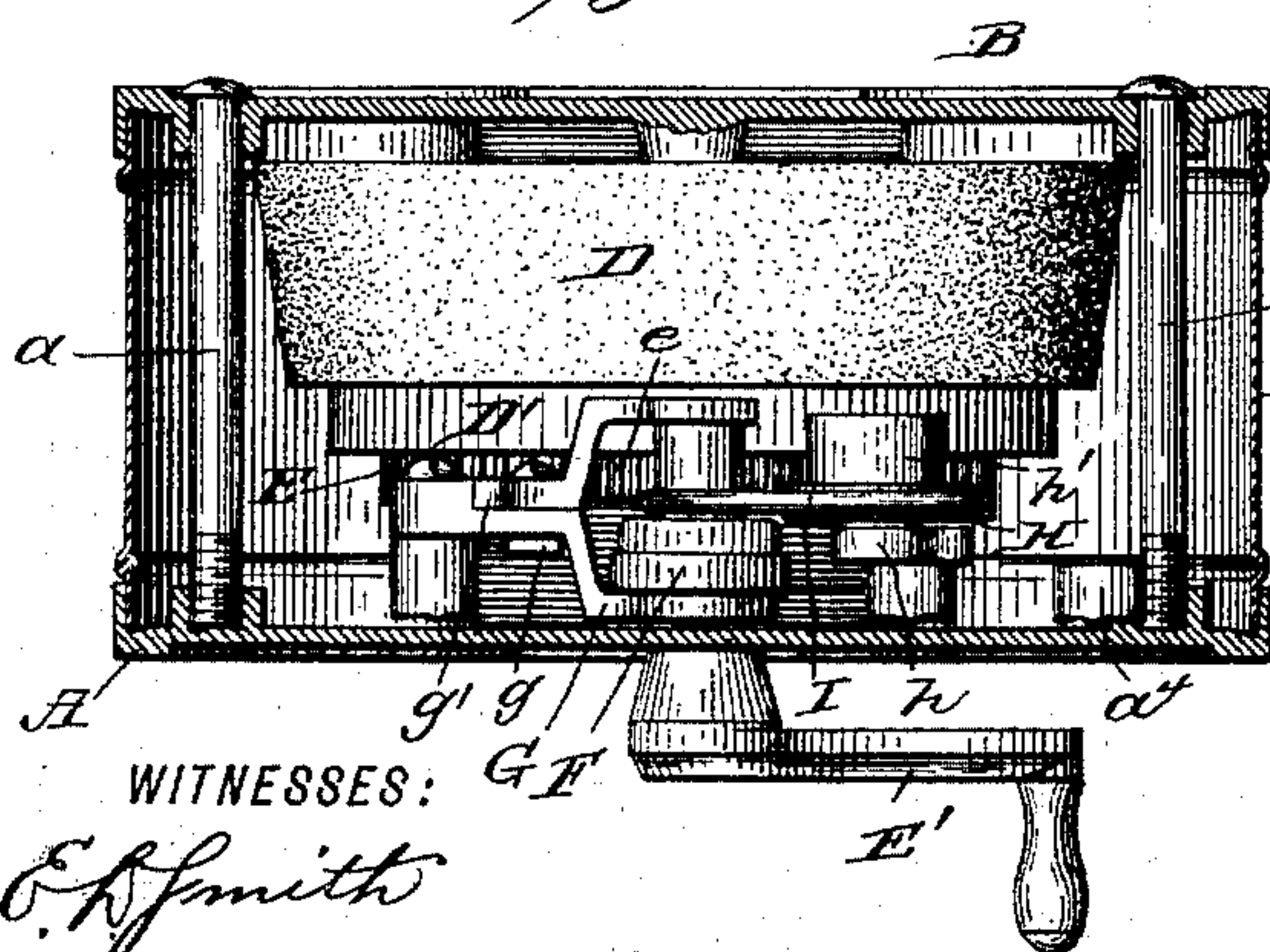


Fig. 4.



WITNESSES: G. F.

E. Smith

Alvan Macaulay

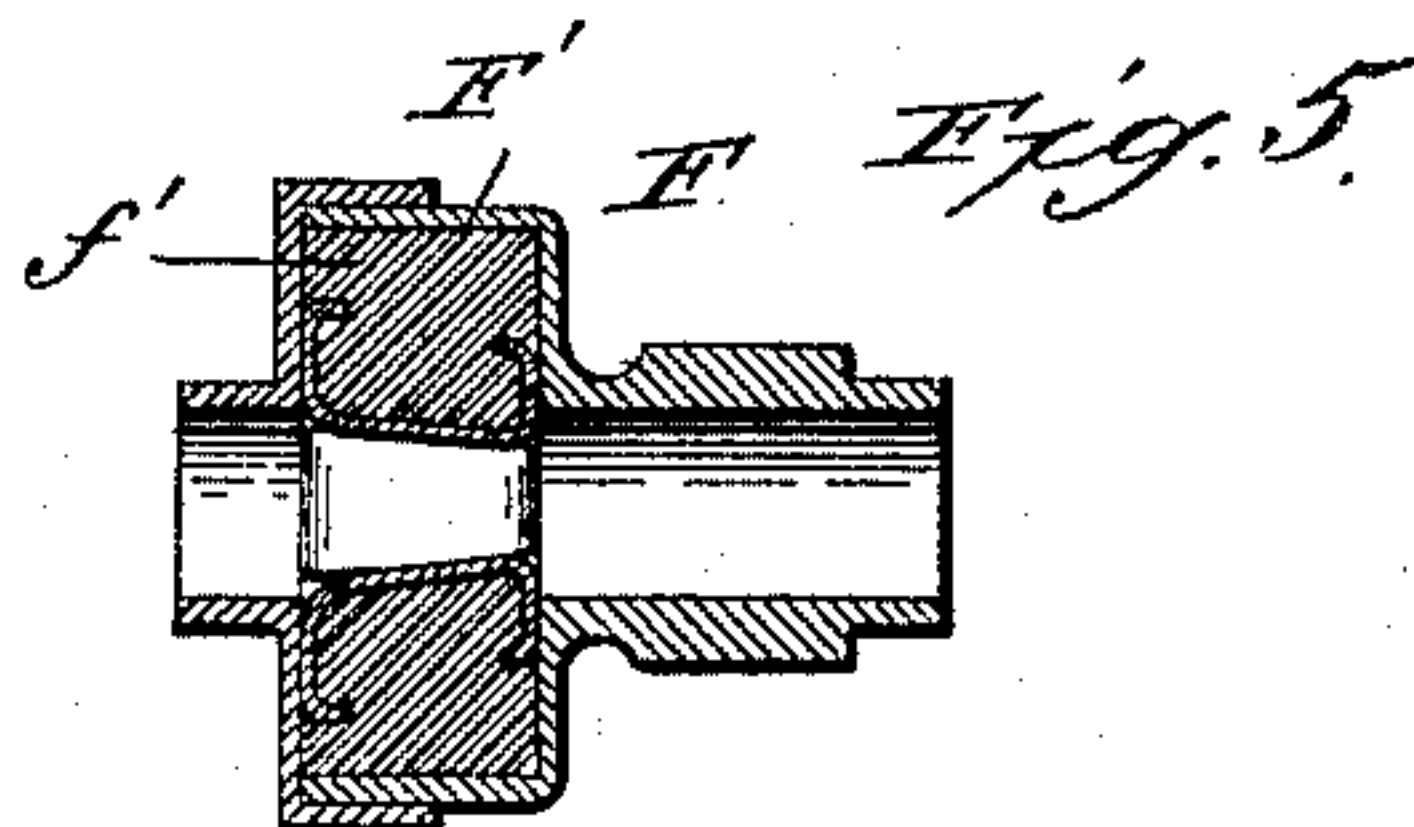
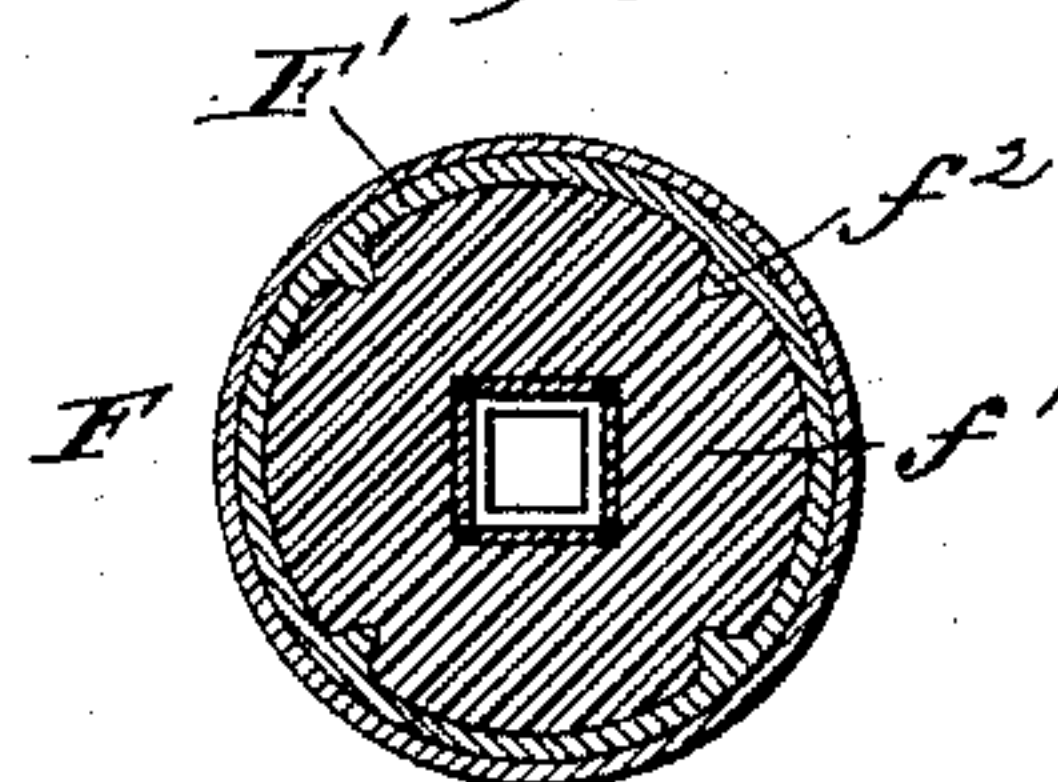


Fig. 6.



John Dix Mills

INVENTOR

BY  
Church & Church

HIS ATTORNEYS



# UNITED STATES PATENT OFFICE.

JOHN DIX MILLS, OF CINCINNATI, OHIO, ASSIGNOR TO GEORGE C. McDERMOTT, OF SAME PLACE.

## PENCIL-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 448,723, dated March 24, 1891.

Application filed December 8, 1890. Serial No. 373,925. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN DIX MILLS, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Pencil-Sharpener; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in that class of pencil-sharpener in which the pencil is held in a rotating chuck and presented to a rotary abrading-surface at the proper angle to give the correct taper to the pencil-point, the object of the invention being to provide a simple machine capable of being operated by any one to sharpen pencils of any style or size, a further object being to confine the dust within the sharpener-casing and to provide an abrading-surface capable of being easily and quickly renewed at small cost.

The invention consists in certain novel details of construction and combinations and arrangements of parts to be hereinafter described, and pointed out particularly in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a sharpener constructed in accordance with my invention. Fig. 2 is a front elevation with the front of the casing removed. Fig. 3 is a detail elevation looking toward the front. Fig. 4 is a top plan view of the part shown in Fig. 3 and the abrading-wheel. Fig. 5 is a section through the chuck for holding the pencil. Fig. 6 is a section through the chuck at right angles to Fig. 5.

Similar letters of reference in the several figures indicate the same parts.

The casing of the instrument preferably consists of front and back plates A B, respectively, held together by bolts *a* and clamping between them the sheet-metal side casing C, the latter having a mica-covered opening *c* in the top, through which the pencil being sharpened may be inspected, as will hereinafter more fully appear. The upper portion of the casing, it will be observed, is substan-

tially circular, and at the center of the same is journaled the abrading-wheel D; the abrading-surface thereof being inclined, giving the wheel the appearance of the frustum of a cone, although it is obvious that the surface may be of any shape to conform to the shape of the pencil-point desired. Below the abrading-wheel and meshing with a small pinion or gear-wheel *e* is a large drive gear-wheel E, rotated by a crank E', applied to the shaft of wheel E in front of the casing.

The pencil is inserted through an opening *a'* in front of the casing and passes through a chuck F, by which it is held substantially parallel with the axis of the abrading-wheel and rotated in any suitable manner, preferably, however, by mechanical means to be now described.

In the preferred form the chuck consists of a casing F, journaled in bearings formed substantially parallel with the axis of the abrading-wheel in a swinging frame G, pivoted to the front of the casing, which frame is formed in two parts to permit the removal of the chuck, and held together by a bolt *g*. Lateral movements of the two parts with relation to each other is prevented by the lugs *g'*, as shown. Within the chuck-casing are held spring-pressed holding-jaws, preferably formed by four pieces of metal inserted through a central opening in an elastic disk *f'*, and having the ends bent back and clamped into the disk, the tapering opening between the jaws being smaller than the smallest pencil the machine is designed to operate upon, but capable of being enlarged by the insertion of larger pencils, the elastic disk serving to press the jaws in to grasp the pencil. The disk is entirely inclosed within the chuck-casing and held from rotating independently thereof by lugs or screws *f*<sup>2</sup>.

The opening *a'* and chuck are arranged on the center line of the device above the abrading-wheel and immediately beneath the sight-opening *c*. On the side of the wheel opposite the pivot of the chuck-frame is pivoted a frame *h*, carrying a chuck drive-wheel provided with a grooved portion H, adapted to communicate motion to the chuck through the medium of an elastic band I. The other



portion of the chuck drive-wheel consists of a comparatively broad rim having an elastic surface of rubber or equivalent  $h'$ , adapted to rest and be driven by friction from the rim  
 5 D' of the abrading-wheel. Thus it will be seen that the pencil held within the chuck and the chuck drive-wheel are held against the abrading-wheel by the action of the single elastic belt I, and the pencil is held with  
 10 such a light yielding touch and the motion imparted thereto is so gentle (the mechanism yielding when any unusual strain comes upon it) that it is possible to give the pencil an exceedingly fine point with a pleasing taper.

15 It will be noted that the direction of rotation of the pencil-chuck is opposite to that of the abrading-wheel; and hence the surfaces of the pencil being acted upon and the abrading-surface move in the same direction, but  
 20 at very different speeds, the pencil-surface being moved comparatively slow; but at the same time the relative movements are such as that there is little or no liability of the fine point of the lead catching and breaking off,  
 25 as there would be if the surfaces traveled in opposite directions.

The abrading-wheel is preferably cast metal, and the abrading-surface is formed of corundum ground flint or emery applied thereto by  
 30 first coating the wheel with glue, and then covering the same with the granulated material. Thus the surface may be quickly and easily renewed by the user at any time.

For the purpose of varying the pressure of  
 35 the chuck drive-wheel against the rim of the abrading-wheel, as well as the pressure of the pencil on the abrading-surface, the position of the pivotal points of the frames carrying the same may be varied. The chuck-drive-  
 40 wheel frame, for instance, may be located on the pivot  $a^4$ . In order to prevent the wearing away of the pencil after the proper point has been given to it, the frame carrying the chuck is adapted to come in contact with the rim on  
 45 the abrading-wheel or other suitable stop at the proper moment, as will be readily understood.

With a pencil-sharpener of the character specified it is entirely practical to sharpen  
 50 pencils of any grade at a rapid rate, it being necessary to but insert the pencil the proper distance to a gage T, or the distance may be readily determined by looking through the sight-opening, then turning the crank in either  
 55 direction. The dust and dirt are kept entirely within the casing and caught in a removable drawer or receptacle M at the bottom, which may be removed and emptied as often as necessary.

60 It will be noted that the frames carrying the chuck and chuck drive-wheel are pivoted to swing at right angles to the axis of the abrading-wheel, while the chuck and drive wheels are journaled in bearings substantially paral-  
 65 lel with said axis, which arrangement, besides aiding materially in the successful operation of the device, forms a most compact and sim-

ple arrangement, easily and cheaply constructed and not liable to become disarranged by rough usage.

Having thus described my invention, what I claim as new is—

1. In a pencil-sharpener, the combination, with the frusto-conical abrading-wheel, of the rotary chuck mounted to rotate in movable  
 75 bearings substantially parallel with the axis of the abrading-wheel, substantially as described.

2. In a pencil-sharpener, the combination, with the frusto-conical abrading-wheel, of the  
 80 chuck-frame pivoted to swing toward and away from said wheel and the chuck mounted to rotate in bearings in said frame substantially parallel with the axis of the abrading-wheel, substantially as described. 85

3. In a pencil-sharpener, the combination, with the rotary abrading-wheel, of the chuck-frame pivoted to swing in a plane at right angles to the axis of the wheel and the chuck  
 90 journaled in bearings in said frame substantially parallel with the said axis, substantially as described.

4. In a pencil-sharpener, the combination, with the rotary abrading-wheel, the pivoted  
 95 chuck-frame, and chuck, of the chuck drive-wheel in frictional contact with the abrading-wheel, and the elastic band connecting said drive-wheel and chuck, substantially as described.

5. In a pencil-sharpener, the combination, 100 with the rotary abrading-wheel, the pivoted chuck-frame, and chuck, of the pivoted chuck drive-wheel frame and drive-wheel journaled thereon and engaging the abrading-wheel, and the elastic belt connecting the chuck drive-  
 105 wheel and chuck, substantially as described.

6. In a pencil-sharpener, the combination, with the rotary abrading-wheel, the pivoted  
 110 chuck-frame, and chuck, of the pivoted chuck drive-wheel frame and drive-wheel journaled therein, having the elastic surface making frictional contact with the abrading-wheel, and the elastic belt connecting the chuck  
 115 drive-wheel and chuck, substantially as described.

7. In a pencil-sharpener, the combination, with the rotary abrading-wheel having the  
 120 forwardly-extending flange and the chuck, of the chuck drive-wheel engaging said flange and the band connecting said drive-wheel and chuck, substantially as described.

8. In a pencil-sharpener, the combination, with the rotary abrading-wheel having the  
 125 forwardly-extending flange and the chuck mounted in a pivoted frame, of the pivoted chuck drive-wheel frame, the drive-wheel journaled therein and resting on the flange on the abrading-wheel, and the elastic band uniting said drive-wheel and chuck, substan-  
 130 tially as described.

9. In a pencil-sharpener, the combination, with the frusto-conical abrading-wheel having the forwardly-extending flange, the pivoted  
 chuck-frame, and chuck journaled therein in



bearings substantially parallel with the axis of the abrading-wheel, of the pivoted chuck drive-wheel frame, the drive-wheel journaled therein and resting on the flange on the abrading-wheel, and the elastic belt connecting the said drive-wheel and chuck, substantially as described.

10. In a pencil-sharpener, the combination, with the rotary abrading-wheel, of the chuck journaled in bearings substantially parallel with the axis of the abrading-wheel and rotated in a direction opposite to the direction of rotation of said wheel, whereby the surface of the pencil being acted upon and the surface of the abrading-wheel will move in the same direction, substantially as described.

11. In a chuck for pencil-sharpeners, the combination, with the elastic disk, of the holding-jaws secured thereon, substantially as described.

12. In a chuck for pencil-sharpeners, the combination, with the elastic disk, of the holding-jaws consisting of the metallic pieces inserted in an opening in the disk and having their ends turned in to grasp the disk, substantially as described.

JOHN DIX MILLS.

Witnesses:

THEO. W. MEADER,  
LIPMAN LEVY.