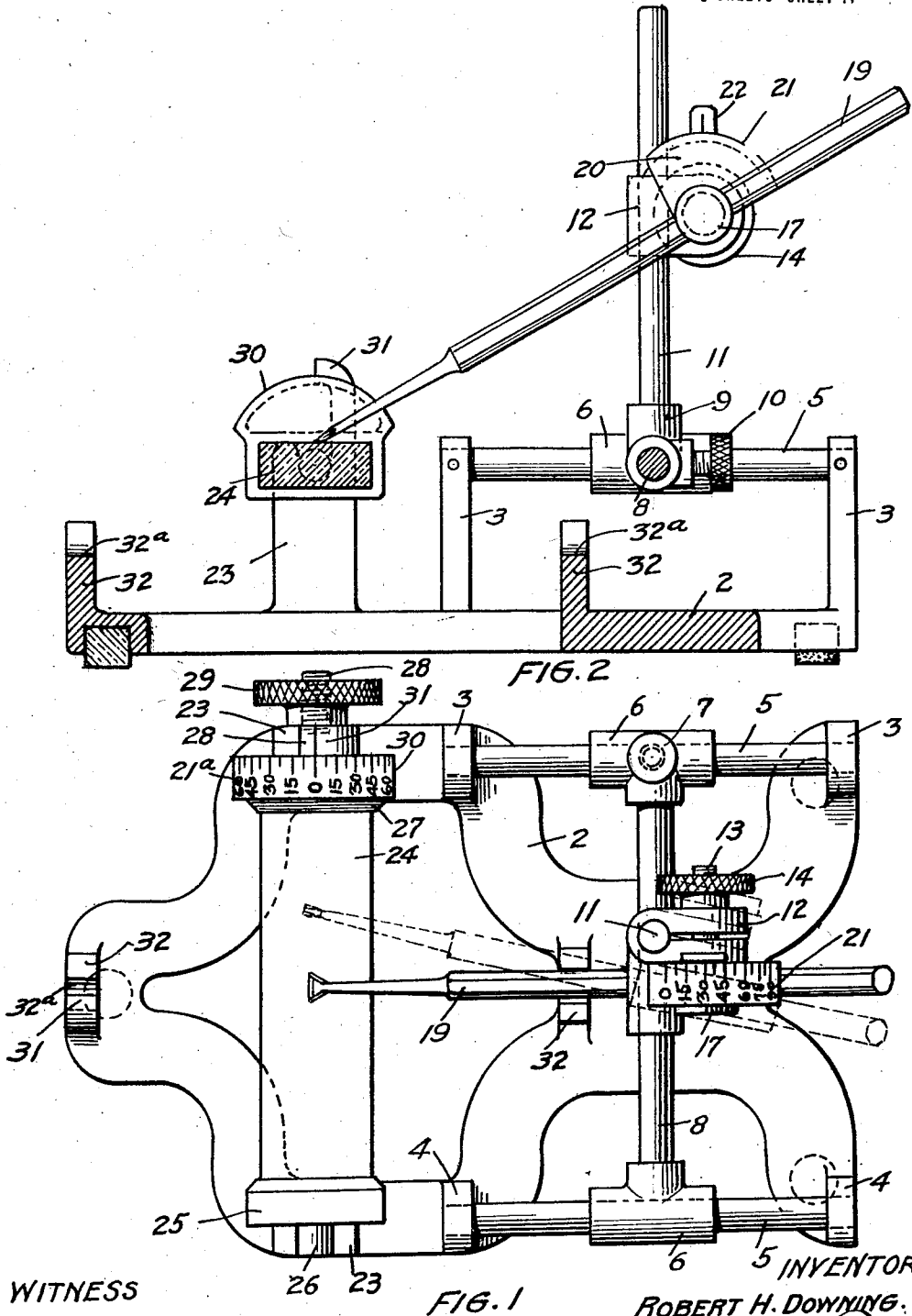


R. H. DOWNING.
DENTAL TOOL SHARPENER.
APPLICATION FILED APR. 5, 1919.

1,411,713.

Patented Apr. 4, 1922.

3 SHEETS—SHEET 1.



WITNESS
J. Jensen

FIG. 1

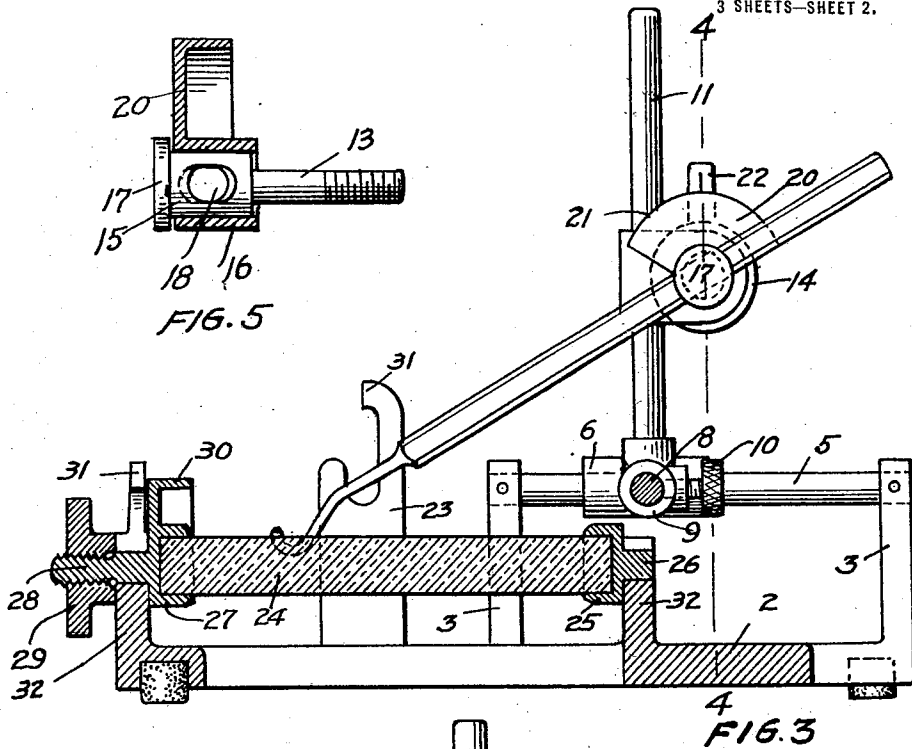
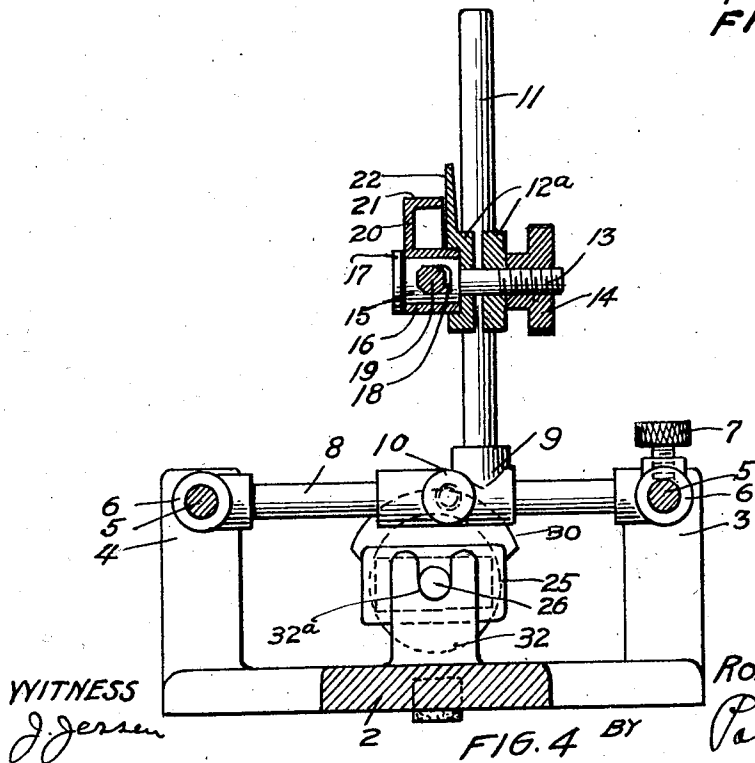
INVENTOR
ROBERT H. DOWNING.
BY *Paul & Paul*
ATTORNEYS

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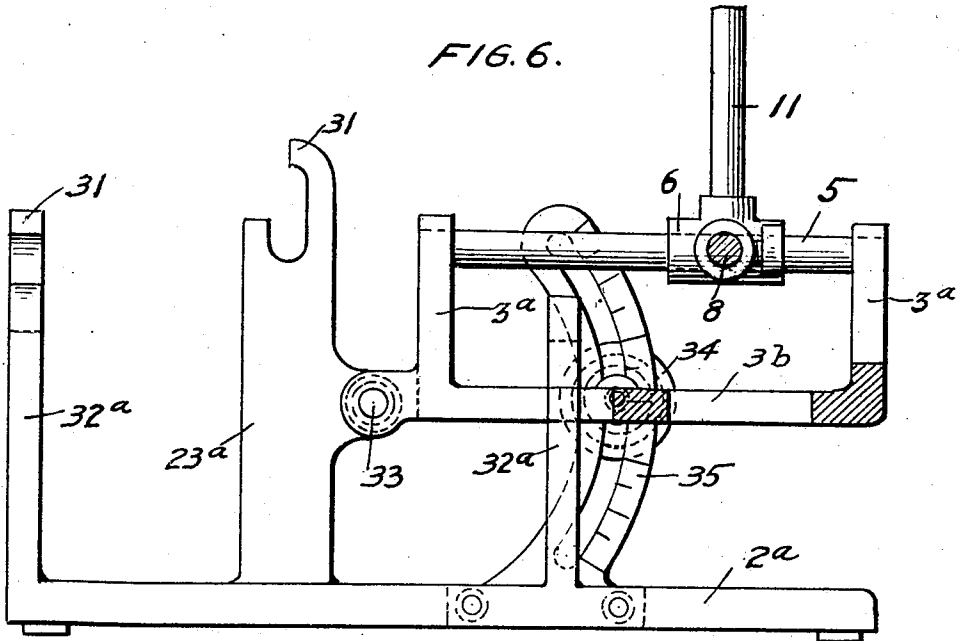
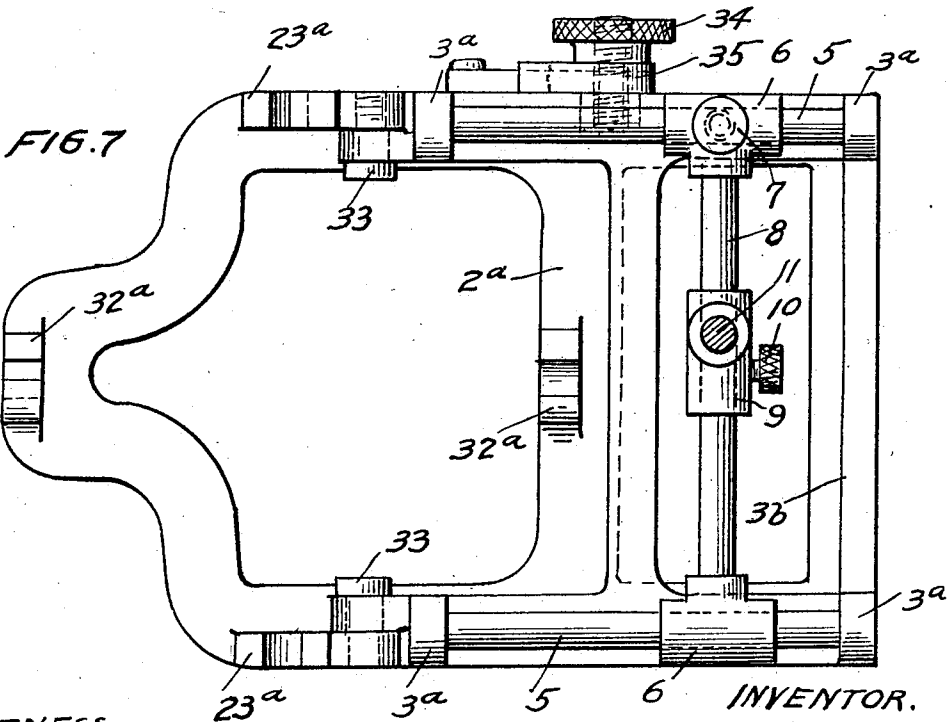
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3 SHEETS—SHEET 3.

F16.6.



WITNESS
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INVENTOR.
ROBERT H. DOWNING.
BY *Paul & Paul*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT H. DOWNING, OF ST. LOUIS PARK, MINNESOTA.

DENTAL TOOL SHARPENER.

1,411,713.

Specification of Letters Patent.

Patented Apr. 4, 1922.

Application filed April 5, 1919. Serial No. 287,779.

To all whom it may concern:

Be it known that I, ROBERT H. DOWNING, a citizen of the United States, resident of St. Louis Park, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Dental Tool Sharpeners, of which the following is a specification.

The object of my invention is to provide a tool sharpening device adapted particularly for those used by dentists by means of which the tool may be supported and moved back and forth over the grinding or sharpening surface and be held during such movement at the same angle with respect to such surface.

A further object is to provide improved means for supporting the tool and improved means for supporting the grinding stone or block whereon the tool is sharpened, to adapt the stone for tools of different shape.

A further object is to provide a device of comparatively simple construction and one which can be easily and quickly adjusted for use.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification,

Figure 1 is a plan view of a tool sharpener embodying my invention,

Figure 2 is a vertical sectional view of the same, showing the sharpening stone or block mounted transversely to the longitudinal axis of the tool,

Figure 3 is a vertical sectional view, showing the sharpening stone arranged longitudinally with respect to the longitudinal axis of the tool,

Figure 4 is a sectional view on the line 4-4 of Figure 3,

Figure 5 is a detail view of the means for adjusting the tool on a horizontal axis.

Figures 6 and 7 show a modified construction of the support for the grinding stone or block.

In the drawing, 2 represents a suitable base or frame whereon the operating parts of the sharpener are mounted. 3 and 4 are standards arranged in pairs on opposite sides of said frame and supporting the parallel guide rods 5 a suitable distance above the base of the machine. Upon these guide rods, which are preferably cylindrical

in cross section, though any other suitable form may be employed, I arrange slides 6 secured upon the rods 5 by suitable means, such as clamping screws 7. Between these slides and connecting them across the machine is a transverse rod 8 corresponding substantially to the guide rods 5 and supporting a slide 9 provided with a clamping screw 10 by means of which the slide may be secured at any point on the transverse rod. In this slide 9 I mount an upright standard 11 extending a suitable distance above the device and supporting a clamp 12 having jaws 12^a for gripping the upright standard 11 and provided with a screw 13 passing transversely through said jaws 12^a and having a threaded end and thumb nut 14 for drawing said jaws together to clamp them on the standard. The screw 13 has an enlarged end portion 15 fitting within a sleeve 16, the end of the screw having a flange 17 for contact with the end of the sleeve, the opposite end of the sleeve being seated in one of the jaws 12^a. The sleeve and the head 15 have transverse sockets 18 therein to receive the shank 19 of the tool to be sharpened and the position of the socket in the screw head with respect to the socket in the sleeve is such that when the thumb nut 14 is tightened, the socket in the screw head will move out of register with the corresponding socket in the sleeve and grip the shank of the tool between the head and the sleeve and hold it firmly. A quadrant 20 is mounted on the sleeve 16 and provided with a graduated curved surface 21 adapted for movement past a finger or indicating hand 22 carried by one of the jaws 12^a, to enable the user of the device to adjust the tool in a vertical plane and change its angle with respect to the grinding surface. The scale enables the user to determine the exact degree of such movement and make the adjustment correspond to a similar movement of the grinding surface. The screw 13 and the thumb nut 14 perform therefore two functions. The jaws 12^a are locked on the upright standard and the tool shank is at the same time locked on the socket of the screw and sleeve.

The base is also provided with upright standards 23. These standards are designed to support the grinding block or stone which I have represented herein by reference numeral 24 and comprising a rectangular sharpening member having flattened sur-

faces to receive the edge of the tool and provided at one end with a head 25 having a stud 26 that is seated in one of the standards and its opposite end provided with a head 27 having a similar stud 28 terminating in a threaded end to receive the clamping nut 29 which engages the outer face of the adjacent standard and locks the heads securely in the sockets provided for the studs therein. The head 27 is also provided with a quadrant-shaped surface 30 having graduations 21^a thereon and an indicator 31 is positioned adjacent the graduations for use in adjusting the heads and the grinding block on a longitudinal axis to vary the angle of its surface with respect to the tool. When the grinding block is mounted transversely to the longitudinal axis of the tool, I prefer to lock the slide 6 on the guides 5 while the slide 9 is free to move back and forth on the guide 8 and the tool will then slide lengthwise of the grinding block which, by means of its adjustment in the supporting standard, may be tilted or rotated on its longitudinal axis to vary the angle of its surface with respect to the tool.

In sharpening tools of this kind, it is desirable to provide means for mounting the sharpening block so that the tool may be moved lengthwise with the block having the same relative position, instead of being transverse to the tool shank, to adapt the device for grinding tools of different shape. For this purpose I provide standards 32, preferably shorter than the standards 23, and having seats 32^a therein for the studs on the supporting heads of the grinding block so that when the block is mounted in these standards it can be locked in a manner corresponding to the locking means of the standards 23 and also rotated on its longitudinal axis to vary its degree of inclination with respect to the tool shank. Thus the user can rock the block so that its grinding surface will reach any angle of the point of the tool and the sharpening operation can be performed, the user relying absolutely on the same angle being maintained between the edge to be sharpened and the surface of the stone.

In using the stone in the position last described, the slide 9 will generally be locked on the guide 8 and the clamping screws 7 loosened so that the tool and its supports can be moved freely back and forth on the guides 5 over the grinding surface.

By means of the graduations on the head supporting the grinding block and the clamp support for the tool, the user is able to accurately adjust the grinding surface with respect to the edge of the tool and also effect a corresponding accurate adjustment of the tool itself, the exact movement of the grinding block and the tool being accurately determined by the graduations on the scales.

In Figures 6 and 7 I have shown a modified construction which consists in hinging the standards 3^a on the base and providing a pivot pin 33 and a thumb nut 34, adjustable in a curved graduated guide 35, by means of which the hinge is locked and held rigid when the standard and the grinding block supported thereby are adjusted to the desired angle with respect to the base and the tool.

The frame 2^a shown in these figures has the standards 23^a thereon, forming supports for the grinding block in its transverse position, and standards 32^a are also provided for supporting the block when it is desired to move the tool lengthwise thereof. In other respects the device shown in Figures 6 and 7 corresponds to the structure of the other figures.

I claim as my invention:

1. A device of the class described comprising a base, a grinding block mounted thereon, a slide, longitudinal and transverse guides whereon said slide is mounted for movement longitudinally and transversely of said grinding block, a tool clamp carried by said slide, said block being mounted for adjustment in a position transversely of the longitudinal axis of the tool or lengthwise thereof.
2. A device of the class described comprising a base, a grinding block mounted thereon, guide rods mounted on said base, slides movable on said rods toward and from said block, and means for clamping said slides on said rods, a guide rod connecting one slide with the other, a slide on said last named guide rod, and having a supporting clamp for a tool shank, and means for locking said last named slide on its guide rod.

3. A device of the class described comprising a base, a grinding block thereon, a tool support, said grinding block being mounted for adjustment transversely of the shank of the tool, or longitudinally thereof, and guides for said tool support to adapt the movement thereof to the respective positions of said grinding block.

4. A device of the class described comprising a base, a grinding block, heads wherein the ends of said grinding block are mounted, said heads having studs thereon, standards wherein said studs are journaled, one of said heads being provided with a curved surface and graduations thereon, and means for clamping said heads in said standards.

5. The combination, with a base, of a grinding block mounted thereon, a tool holder mounted for oscillation on a horizontal axis on said base and for vertical adjustment, and means for locking it against movement, the adjustment of said tool holder changing the angle of the cutting edge of the tool mounted therein with respect to the surface of said grinding block.

6. The combination, with a base, of a

grinding block mounted thereon, a tool holder mounted for oscillation on a horizontal axis on said base, and means for locking it against movement, the adjustment of
5 said tool holder changing the angle of the cutting edge of the tool mounted therein with respect to the surface of said grinding block, and a graduated scale provided in connection with said tool holder for deter-
10 mining the degree of adjustment thereof.

7. The combination, with a base, of a grinding block mounted thereon, an upright standard, a tool holder mounted for vertical adjustment on said standard and also having
15 a rotary movement on a horizontal axis for changing the angle of the cutting edge of the tool mounted therein with respect to the surface of the grinding block.

8. The combination, with a base, of a
20 grinding block, heads mounted on said base to rotate on a horizontal axis and having seats for the ends of said block, a scale device for determining the degree of adjustment of said block, means for locking said
25 heads and block, and a tool holder mounted to support a tool with its cutting edge on the surface of said block.

9. The combination, with a base, of a grinding block, heads having seats to receive

the ends of said block, standards mounted in
30 pairs on said base and having bearings for said heads, a tool holder mounted to support a tool on the surface of said block, said standards being positioned to support said block
35 in line with said tool or transversely with respect thereto.

10. The combination, with a base, of a grinding block mounted thereon, a tool holder mounted to move lengthwise of said
40 block or transversely thereof and support a tool with its cutting edge on the surface of the block, said block being movable to present its longitudinal surface to the cutting
45 edge of the tool when said tool carrier is moved lengthwise of the base or transversely thereof.

11. A device of the class described comprising a base, a grinding block thereon, a
50 spindle supported on said base, a tool holder vertically adjustable on said standard and including a clamp having a horizontal axis for adjusting the tool in a vertical plane to vary its angle with respect to said block, and
55 a quadrant and indicating finger provided in connection with said clamp.

In witness whereof, I have hereunto set my hand this 26th day of March 1919.

ROBERT H. DOWNING.