No. 667,321. Patented Feb. 5, 1901.

M. L. KEYES.

EDGE TOOL GRINDER.

(Application filed Dec. 5, 1899.)

(No Model.) 2 Sheets—Sheet 1.

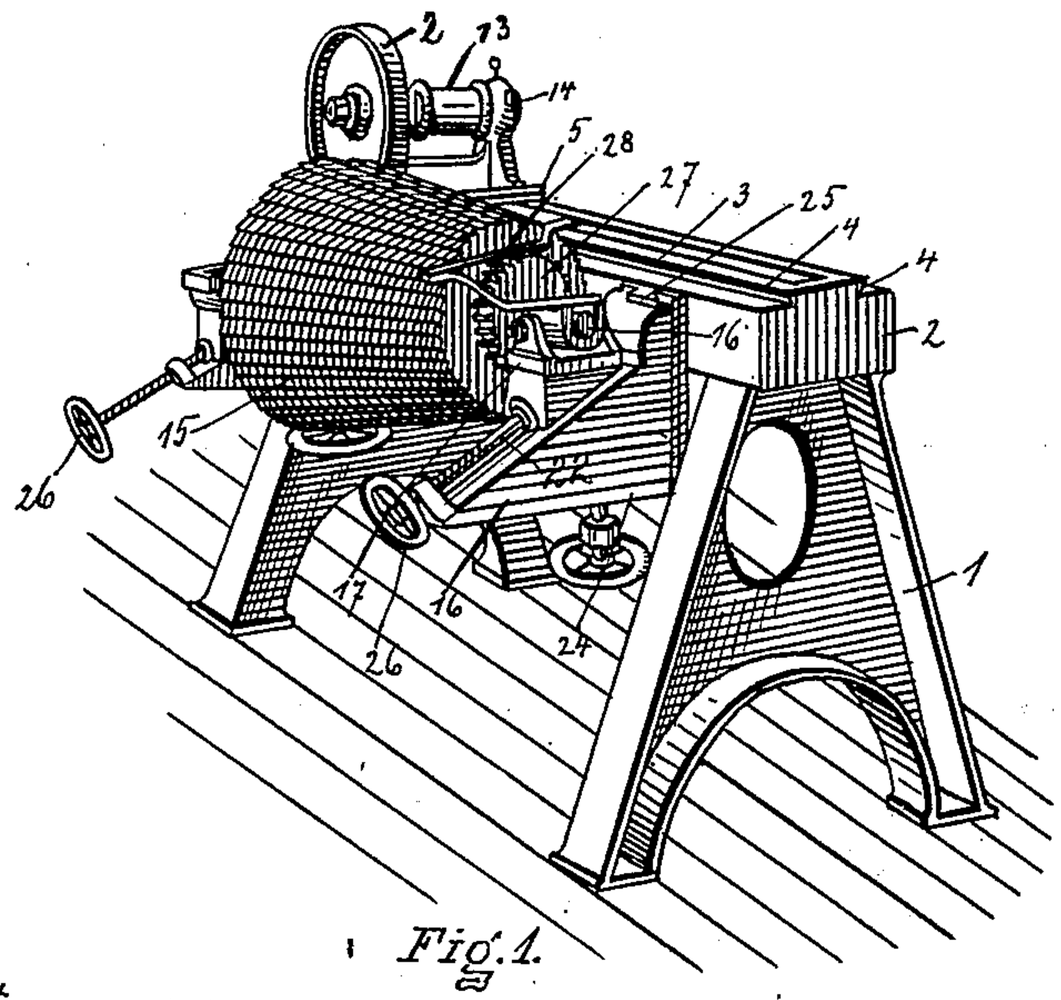

Fig. 1.

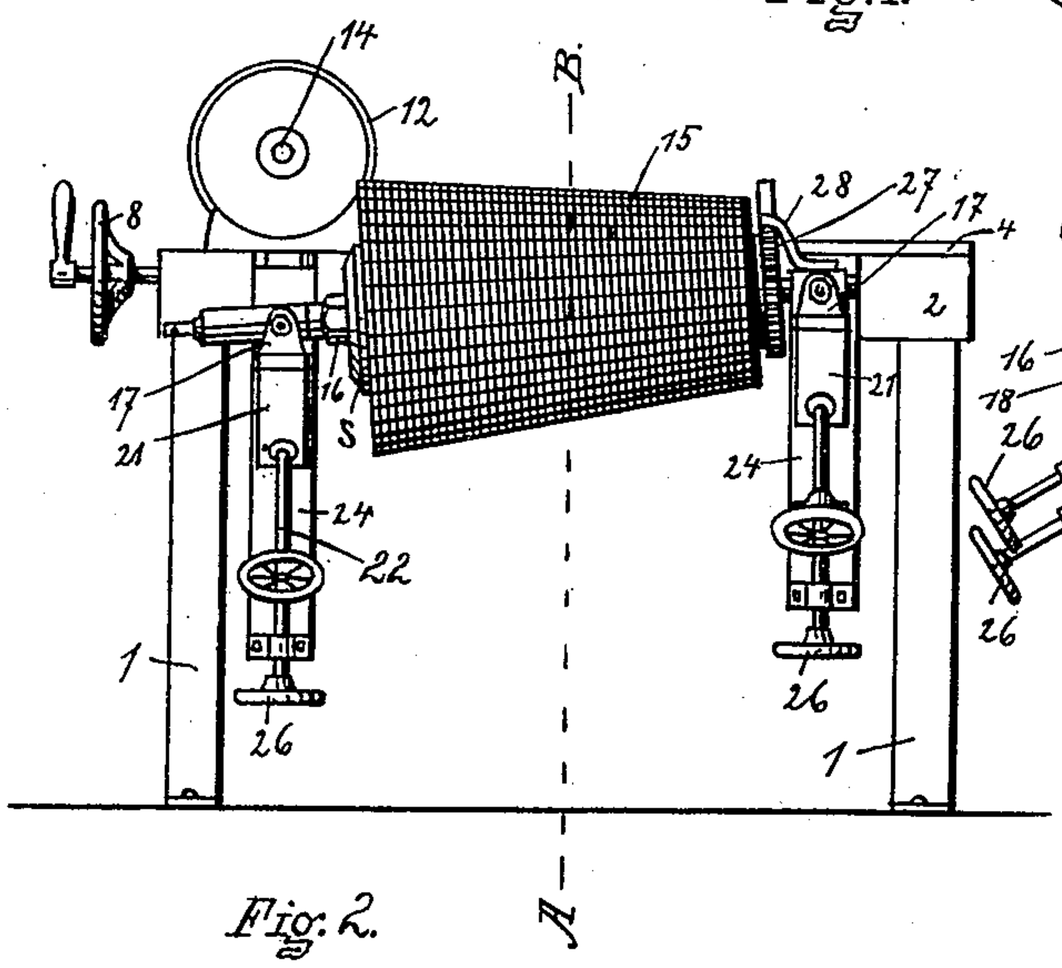

Fig. 2.

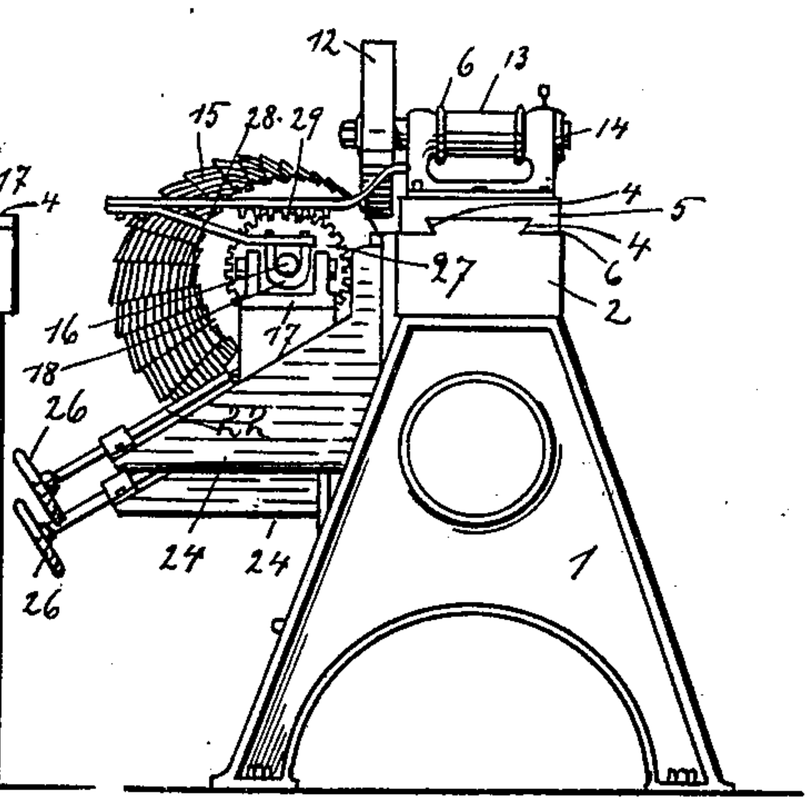

Fig. 3.

WITNESSES
Richard A. George
Thebe A. Tanner

INVENTOR
MARTIN L. KEYES
BY Keely & Fone
ATTORNEYS.

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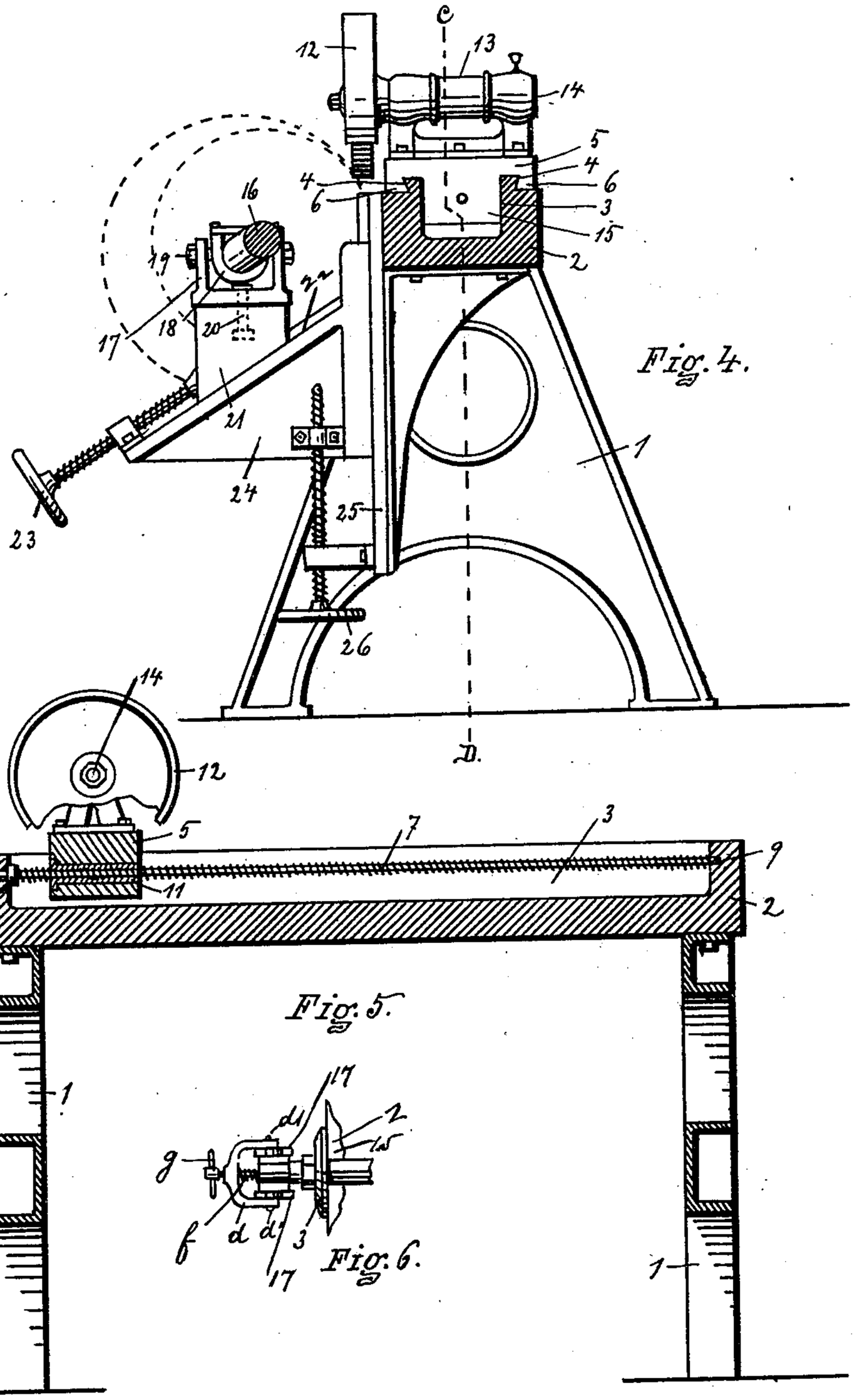

Fig. 4.

Fig. 5.

Fig. 6.

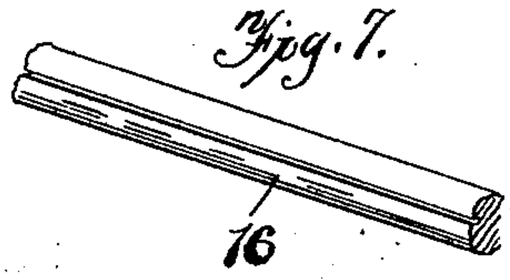

Fig. 7.

WITNESSES
Rich. A. George.
Phebe A. Tanner

INVENTOR
MARTIN L. KEYES.
BY Ruley & Lane
ATTORNEYS.

UNITED STATES PATENT OFFICE.

MARTIN L. KEYES, OF CARTHAGE, NEW YORK, ASSIGNOR TO FRANKLIN E. ROBINSON, OF SAME PLACE.

EDGE-TOOL GRINDER.

SPECIFICATION forming part of Letters Patent No. 667,321, dated February 5, 1901.

Application filed December 5, 1899. Serial No. 739,322. (No model.)

To all whom it may concern:

Be it known that I, MARTIN L. KEYES, a citizen of the United States of America, and a resident of Carthage, Jefferson county, New York, have invented certain new and useful Improvements in Edge-Tool Grinders, of which the following is a specification.

My invention relates to an edge-tool grinder; and it consists in the mechanism hereinafter more fully pointed out and claimed.

The purpose of my invention is to furnish a machine for sharpening-edge tools, and particularly to sharpen rotary cutters, such as gangs of saws and like cutting edges.

In the drawings, Figure 1 is a perspective view of my machine. Fig. 2 is a front or side view of Fig. 1. Fig. 3 is an end view of Fig. 1. Fig. 4 is a section view on line A B of Fig. 2. Fig. 5 is a section view on line C D of Fig. 4. Fig. 6 illustrates details of construction of the shaft-adjuster, broken lines indicating parts removed. Fig. 7 is a detail perspective of the shaft, showing the alining-mark thereon.

In the drawings similar reference characters refer to corresponding parts in the several views.

In the figures illustrated in the drawings I have represented a gang-cutter formed of independent cutter-blades with serrated or tooth edges mounted in conical shape where the cutting teeth or edges are placed in substantially the same axial alinement for cutting incline surfaces. I, however, do not intend to limit myself to this conical form of cutters, as they may be made in other forms and shapes, so long as the series of cutting edges are required to be in the same alinement or I can sharpen any straight cutting edge.

To avoid unnecessary details and repetition constituting the component parts of my machine, I will proceed to name and partially state the functions of the parts and will then more fully describe the working operation of the same.

In the drawings, 1 is the frame. 2 is the bed-piece, 3 the central groove in the bed-piece, and 4 4 dovetailed groove-flanges. 5 is the slide, provided with dovetailed surfaces. 6 6 are the dovetailed edges on the slide. 7 is a longitudinal screw, and 8 a wheel or crank-handle on the screw for turning the same, the screw being supported at its ends in bed-piece 2 at 9 and is held from end thrust by washer or nut 10. The screw 7 works in slide 5 in screw-threaded opening 11, the parts being arranged to horizontally move slide 5, which carries in suitable bearings rotary grinder 12, to which power is imparted by pulley 13, keyed or splined to shaft 14 for imparting a rotary motion to the rotary grinder.

For moving the edge of the tool to be sharpened into the line traveled by the rotary grinder I provide an adjusting-frame, on which in this instance I mount cutters or series of saws or cutting edges, which in the instance shown are conical shaped for cutting an incline face. The tool to be ground in the instance illustrated in the drawings, 15 is mounted on shaft 16. This shaft is provided with a straight line marked on its diameter for guiding the cutters on the shaft to be ground. The ordinary splined seat in the opening in the cutter is centered on this line, and when the cutters are thus mounted they are clamped rigidly to the shaft by screw-cap S on the shaft, so that the cutters are held rigidly to the shaft. The shaft and cutters are capable of being adjustably rotated, which revolve in adjustable bearings 17, which carries at both ends of the shaft a yoke 18. (Best illustrated in Fig. 4.) The yoke 18 is supported by pivotal bolts 19 19, passing through flanges and supporting the yoke, so that yoke 18 swings on pivot 19. The adjustable box 17 is pivotally supported in the frame at 20, Fig. 4.

For adjusting the edges of the tool to be ground into position so that the cutting edges are in alinement with the rotary grinder I provide sliding incline boxes 21, constructed to engage and slide in dovetailed flanges 22 at each end. The inclined sliding boxes are adjusted through screw and hand-wheel 23 at each end of the tool to be ground.

For vertically elevating the tool to be operated on I provide vertical slides 24, which are gibbed to the frame at 25, Figs. 1 and 4, and are operated by hand-screws 26, operated in a well-known manner. The vertical slides

can be adjusted, together with the incline slides, so as to bring the cutting edge into proper alinement for being operated upon.

For accommodating circular cutters having a series of cutting edges and to accommodate circular cutters of a more or less number of cutting edges I provide templet or disk 27, which is provided on its periphery with a number of serrated teeth or notches corresponding to the number of teeth to be sharpened, and these templets or disks can be placed on the shaft and held from rotating by being made to rotate with the shaft, thereby securing a large range of rotary cutters with independent rows of teeth or cutting edges. I mount on the yoke a bracket 27, which supports the spring-catch 29, having serrated edges to engage the edges on the disk, so that by raising the spring-catch the rotary cutters can be rotated at regular intervals corresponding with the number of cutting edges to be operated on. By using a proper holder a single straight cutting edge can be brought into contact with the rotary grinder and sharpened equally, as with the rotary cutters having a series of cutting edges.

Having described the mechanical construction of my invention and defined the names of the parts, I will now mention its operation.

I place the circular cutter 15 in the machine and adjust the first row of cutter-teeth into proper alinement to be engaged with the rotary grinder, the rotary grinder being in motion by turning screw 7, through the operation of the crank arm or handle 8. The rotary cutter and the box in which it is mounted are driven forward, while the rotary cutter runs in contact with the cutting edges, making a complete and perfect alinement of the cutting edge. When one of the cutting edges has been thus sharpened, I lift spring-catch 29 and turn the rotary cutters one notch, which brings the cutting edges to be operated on in proper alinement to receive the grinding action of the rotary grinder, and this process is repeated until the cutting edges are all suitably sharpened.

By providing disks with serrations on their peripheries corresponding to the number of teeth rotary disks having any number of cutting edges can be sharpened. The operation of adjusting the cutting edge to the track of the rotary grinder is brought into alinement by the operation of the vertical and incline slides operated by screws and hand-wheels, which secures a nicety of adjustment. For adjusting endwise shaft 16 I provide pivoted yoke *d*, Fig. 6, pivoted at *d' d'*, which receives and carries screw *f* with handle *p* for turning the screw, shown on the right-hand end of screw *f*. The end of screw *f* engages the end of shaft 16 and holds the same from longitudinal movement when the cutters are adjusted into alinement for the purposes of being sharpened, as before described.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination, in a cutter-sharpening machine, a frame having a way, a reciprocating head in said way, a rotary grinder carried by said head, means for reciprocating the head, a pair of independently vertically and laterally adjustable supports carried by said frame, means for effecting said adjustments, independently vertically and horizontally rockable shaft-holders carried by said supports and a shaft mounted therein at its end portions and adapted to receive the cutter-disks to be sharpened by said grinder, substantially as described.

2. In a cutter-sharpener, the combination of a frame, a reciprocating head mounted thereon, means for reciprocating said head in a fixed path, a rotary shaft mounted in said head and provided with a rotary grinder, a pair of independent vertically-movable supports confined to said frame beneath the path of movement of said grinder, means for independently adjusting said supports, a pair of independent blocks confined on said supports, respectively, and independently adjustable thereon laterally toward and from the path of reciprocation of said grinder and provided with independent adjusting means, shaft-holders mounted on said blocks, a shaft carried by said holders and adapted to receive toothed disks for sharpening, means to lock the disks on said shaft, and means to normally hold the shaft against rotation and permit step-by-step rotation thereof to regularly present the teeth of the disks to the grinder, substantially as described.

3. In a machine of the character described, the combination of a frame, a reciprocating head thereon provided with actuating means, a rotary sharpening-tool carried by said head and provided with actuating means, supports independently adjustable laterally and vertically with respect to the path in which said tool reciprocates, adjusting mechanisms for said supports, respectively, independent shaft-holders, each having a universal mounting on its support, a shaft resting in said holders and adapted to receive the series of toothed disks to be presented to said tool, means for clamping the disks together on the shaft, a templet rigid on the shaft, and a spring-lock carried by one of said holders to normally hold the shaft and templet against rotation and permit the step-by-step rotation thereof, substantially as described.

4. In a machine of the character described, the combination of a frame, a sharpening-tool having a reciprocating carrier movable on the frame in a fixed path, operating means, a shaft, independently vertically and laterally adjustable supports having holders to receive the shaft ends, whereby the vertical and horizontal position of the shaft can be varied and its angle from either end can be varied universally from the path of reciprocation of said tool, said shaft adapted to receive the toothed disks to be sharpened, means to clamp the disks on the shaft, and

means normally holding the shaft and disks against rotation and permitting step-by-step rotation thereof, substantially as described.

5. In a machine of the character described, the combination of a frame, a sharpening-tool and its operating means, a shaft adapted to receive the toothed disks to be sharpened, means to clamp said disks together on said shaft with their teeth alined, a templet on one end of the shaft, holders for the shaft ends, adjustable supports for the holders, a bracket, and a toothed spring carried by said bracket and normally engaging the templet to hold the same and the shaft and disks against rotation, and whereby the disks and shaft can be turned step by step to present the series of teeth in succession to said tool, substantially as described.

6. A frame having a horizontal dovetailed way with a central depression, a screw arranged longitudinally throughout said depression and provided with means for rotating the same, a head having a dovetailed base movable on said way and a nut in said depression receiving said screw, a rotary sharpening-tool carried by said head and provided with means for rotating the same, a shaft having means to clamp a series of toothed disks thereon with their teeth alined for sharpening by said tool, manually-operated locking means normally holding said shaft and disks against rotation and permitting step-by-step rotation thereof to successively present the rows of teeth to said tool, and independently laterally and vertically adjustable holders for the shaft ends provided with separate adjusting means, substantially as described.

7. In combination, a frame, a sharpening-tool mounted thereon, said frame provided with a pair of parallel vertical ways, a pair of separate vertically-adjustable supports confined to said ways, and provided with adjusting means, said supports provided with top downwardly and outwardly inclined ways, blocks adjustable longitudinally of said inclined ways, respectively, and provided with independent adjusting means, horizontally-turnable frames pivotally mounted on said blocks, respectively, vertically-tiltable shaft-holders pivotally mounted to said frames, respectively, and a shaft at its ends mounted in said holders, said shaft adapted to receive the series of toothed disks to be sharpened and provided with means for securing the disks thereon, substantially as described.

Signed by me at Carthage, New York, this 24th day of November, 1899.

MARTIN L. KEYES.

Witnesses:
C. HERBERT WILSON,
PHEBE A. TANNER.