

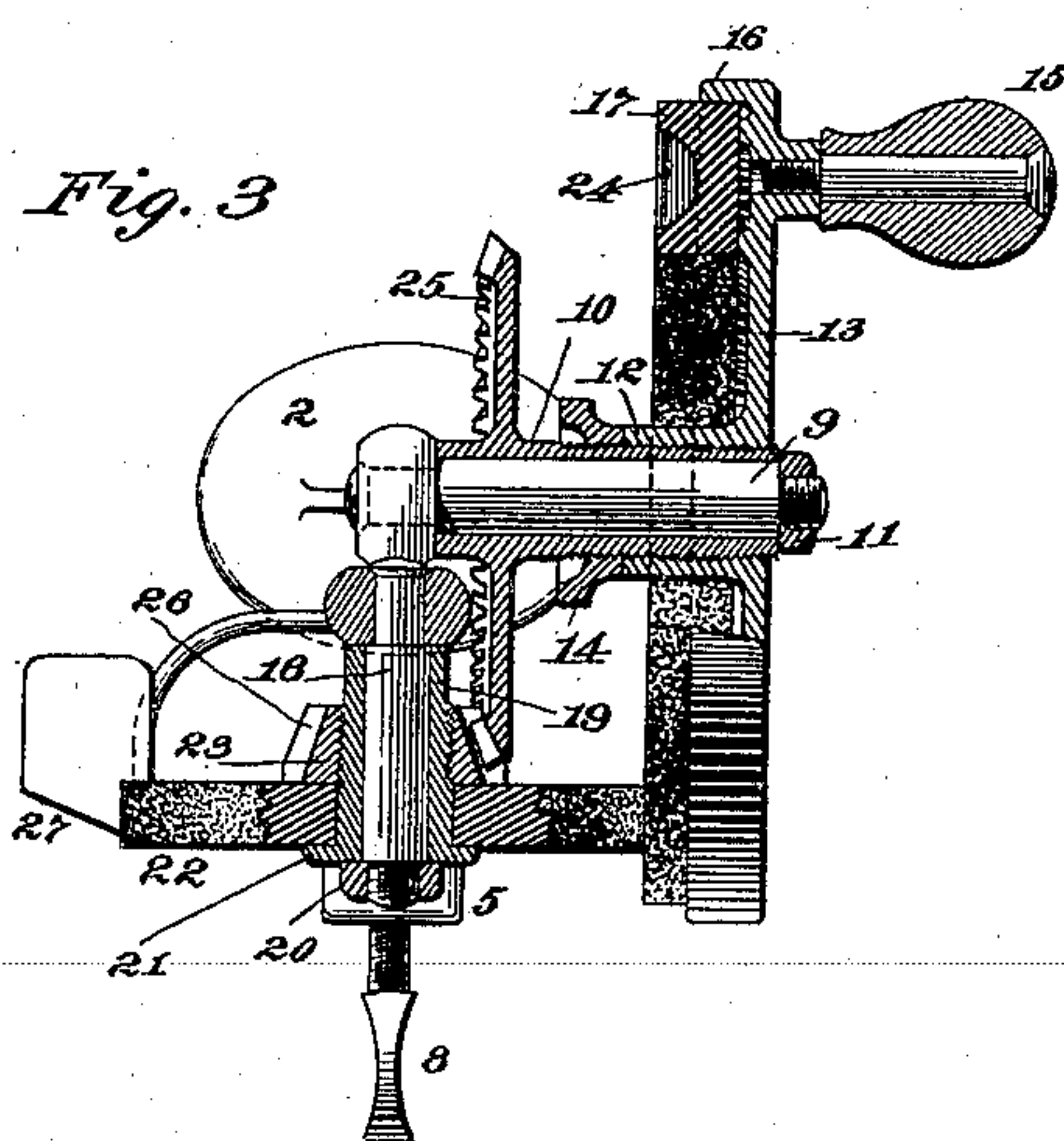
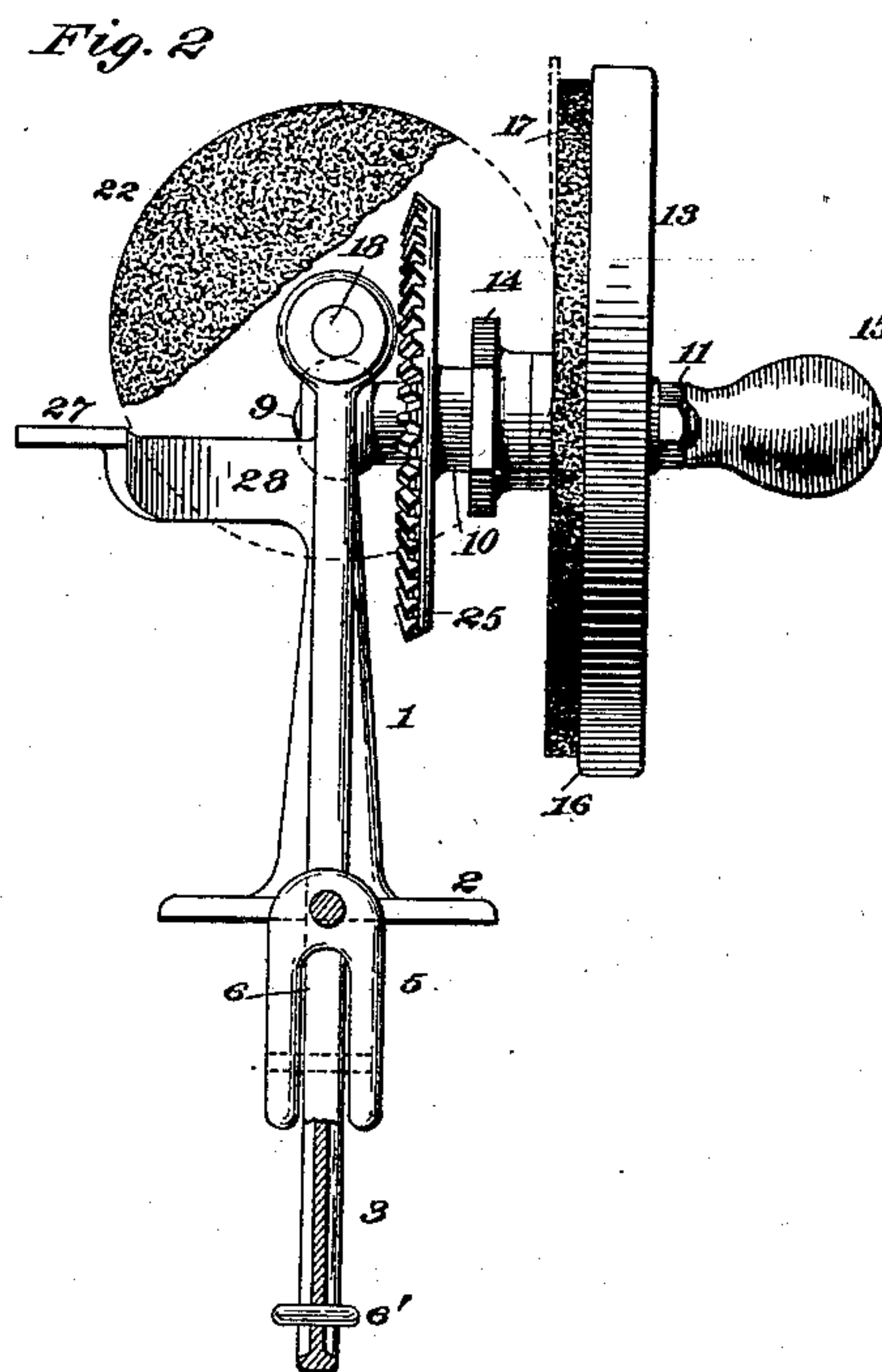
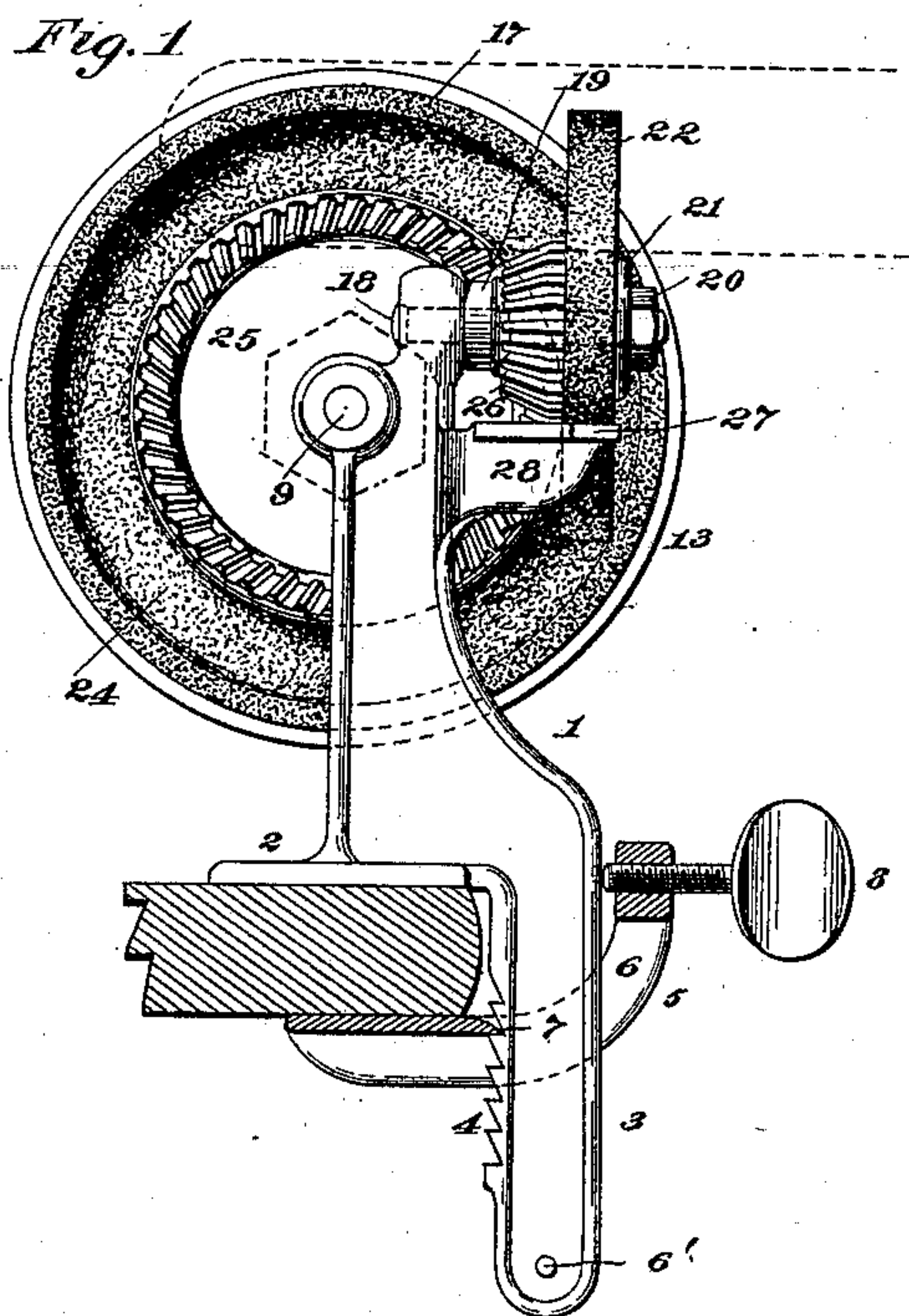
No. 624,437.

Patented May 2, 1899.

G. F. BALLOU.
KNIFE SHARPENER.

(Application filed Mar. 15, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

GEORGE F. BALLOU, OF NEWARK, NEW JERSEY, ASSIGNOR TO HENRY N. FISHER, OF WALTHAM, MASSACHUSETTS.

KNIFE-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 624,437, dated May 2, 1899.

Application filed March 15, 1898. Serial No. 673,995. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. BALLOU, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Knife-Sharpeners, of which the following is a specification.

My invention relates to various new and useful improvements in knife-sharpeners of the type designed to simultaneously operate on both sides or faces of the blade. The improved device may also, with a slight addition, be utilized for the sharpening of scissors or other cutting instruments having a shearing action.

The essential object of the invention is to provide a knife-grinder by means of which both sides or faces of the blade may be ground simultaneously and a very smooth and fine edge obtained. This object I accomplish by employing two grinding-disks the operative surfaces of which absolutely overlap, whereby the blade will be ground on both sides to an actual edge.

Further objects of my invention are to provide and produce a knife-grinder of the type referred to which can be made cheaply, which will be durable and effective in operation, which can be readily applied to a table or shelf, and which, with a slight change, can be utilized in sharpening scissors and other cutting instruments having a shearing action.

In carrying out my invention I provide a suitable supporting-standard, with respect to which rotate two grinding or sharpening elements. One of these elements comprises an annulus or ring which is preferably secured to the face of a disk having an operating-handle attached thereto. The other grinding element comprises a disk the periphery of which operates in close engagement with the grinding annulus or ring and actually overlaps the same. This overlapping of the grinding elements is effected, preferably, by providing a groove in the annulus or ring referred to, in which works the periphery of the grinding-disk; but the same result may be effected by arranging the disk within or without the annulus or ring, with the periphery of said disk beyond the grinding-surface of said annulus or ring, or by employing two of said rings, be-

tween which the said disk will operate with its grinding-surface beyond the grinding-surfaces of said rings, or by employing two of said grinding-disks working on both sides of a single annulus or ring, with the grinding-surfaces of said disks beyond the grinding-surface of said annulus or ring. However these two grinding elements may be arranged, they are at all times so supported that the grinding-surfaces thereof will actually overlap, as stated, whereby a smooth and fine edge may be obtained on the knife or other instrument to be sharpened. The two grinding elements are simultaneously rotated by suitable gearing interposed between them—such, for instance, as ordinary bevel-gears. Preferably the axis of the grinding annulus or ring is arranged in a plane beneath the axis of the grinding-disk, so as to prevent the possibility of the knife or other instrument during the sharpening operation engaging with the shaft or sleeve to which the annulus or ring is secured. The said arrangement also enables me to obtain a better edge on the knife or other instrument to be sharpened, for reasons which I will explain hereinafter. When the axis of the grinding annulus or ring is arranged, as stated, in a plane beneath the axis of the grinding-disk, I may employ ordinary skew-bevel gears for communicating motion between the sharpening elements.

In order to render my improved knife-sharpener suitable for use in the sharpening of scissors and other instruments having a shearing action, I employ a suitable supporting-bracket adjacent to the periphery of the grinding-disk and on which the scissors or other instrument may be supported in such a way that the said grinding-disk will effectively grind the cutting-surface thereof. This support or bracket is located in a plane beneath the axis of the grinding-disk, whereby the desired inclination of the cutting edge of the scissors or other instrument may be secured.

In order to secure the device to a suitable shelf or table, I employ an improved form of bracket, which will be described in detail and by means of which the device may be secured to shelves and tables of varying thicknesses.

In order that my invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

5 Figure 1 is a front elevation, partly in section, of the preferred embodiment of my invention; Fig. 2, a side elevation thereof; and Fig. 3, a plan view, partly in section.

10 In all of the above views corresponding parts are represented by the same numerals of reference.

1 represents a suitable supporting-frame having a base 2 cast therewith, which base is adapted to rest upon the top of a table or shelf to which the device is to be secured. Depending from the base and cast therewith is an arm 3, provided with a series of serrations or teeth 4 on its inner edge. Coöperating with this arm is an adjustable clamp 5, which is provided with a slot 6 therein, through which the said arm extends. Extending through the arm 3, near its lower end, is a pin 6', by means of which the clamp will be prevented from disengagement with said arm. 25 The clamp is provided with an edge 7, adapted to engage with any one of the teeth 4, as will be understood.

8 represents a thumb-screw passing through the upper part of the clamp 5 and engaging 30 the smooth face of the arm 3.

It will be noted that by placing the foot 2 on the table or bracket, with the arm 3 extending parallel with and against the outer edge thereof, and by elevating the clamp 5 until it engages with the bottom of said table or bracket, with the edge 7 in engagement with one of the teeth or serrations 4, the thumb-nut 8 may be then operated so as to firmly clamp the support 1 in position for 40 operation.

9 represents a spindle which is riveted to the support 1, and rotatably mounted on said spindle is a sleeve 10, held in place by a nut 11. The sleeve 10 is screw-threaded on its exterior, as shown, and engaging with this screw-threaded portion is a boss 12, carried by a disk 13. The longitudinal position of the disk 13 relatively to the sleeve 10 is determined by an adjusting-nut 14, which also 50 engages the screw-threads of said sleeve. The disk 13 is adapted to be operated by a handle 15. The said disk is provided with an exterior rim 16, within which, in the preferred form of my invention, is seated an annulus or ring 55 17, made of emery, carborundum, or other suitable grinding material. The said annulus or ring may be secured in place in any suitable way, but preferably by ordinary glue. 18 represents a spindle, which is also riveted 60 in place to the support 1, but is arranged, preferably, in a plane above that of the spindle 9. Rotatably mounted on the spindle 18 is a sleeve 19, lateral movement whereof is prevented by a nut 20. The outer end of the sleeve 19 is provided with a rim 21, against 65 which is held a grinding-disk 22 of any suitable grinding material. The said grinding-

disk is clamped in position against the rim 21 by a clamping-sleeve 23, engaging screw-threads on the exterior of the sleeve 19. 70

In order that a fine true edge may be formed on the knife or other instrument to be sharpened, I arrange the grinding elements, comprising in this instance the annulus or ring 17 and the disk 22, in such a way that they 75 actually overlap. This is accomplished in the preferred embodiment of the invention by providing the annulus or ring 17 with an annular groove 24 in its grinding-face, in which groove works the grinding-disk 22, as will be 80 understood. Rotary movement is applied to the two grinding elements in any desired way, but the means shown are considered preferable. These means comprise a skew-bevel gear 25, cast integral with the sleeve 10 and 85 engaging teeth 26, formed on the sleeve 23. It will be noted that the sleeve 19 will partake of a more rapid rotary movement than the sleeve 10; but since the diameter of the annulus or ring 17 is greater than that of the 90 grinding-disk 22 the peripheral speed of the two grinding elements will be substantially coincident. This, however, is of no consequence, since the peripheral speed of one may be much greater than that of the other without affecting the efficiency of the device. 95

In order to render the device suitable for the sharpening of scissors and other instruments having a shearing action, I prefer to employ a supporting shelf or bracket 27, which 100 is carried on an arm 28, cast with the support 1. The scissors or other instrument may be held on this bracket 27 and will be engaged by the periphery of the grinding-disk 22, so as to be effectively sharpened. It will be observed that the bracket 27 is arranged in a plane beneath that of the spindle 18, whereby the desired inclination of the cutting edge will be obtained. 105

The operation of the improved device will 110 be as follows: The knife or other instrument to be sharpened, as shown in dotted lines in Figs. 1 and 2, is introduced into the space formed between the annulus or ring 17 and the disk 22. The handle 15 is now rotated, 115 so as to tend to carry the knife or other instrument out of this position. The grinding-surface 17 will operate on one side of the knife and the periphery of the grinding-disk 22 will operate on the other side of the knife, 120 and since the said grinding-surfaces actually overlap, as explained, the edge which will be secured will correspond to the angle between these grinding-surfaces. By arranging the axis of the grinding-disk in a plane above 125 that of the annulus or ring I prevent the knife or other instrument from engaging with the sleeve 10. This arrangement also enables the annulus or ring to operate on its surface at a very considerable angle, the grinding action taking place in a direction approaching the longitudinal axis of the knife instead of approximately crosswise thereof. 130 I have found from experience that this opera-

tion results in the formation of a better edge than when the two grinding-surfaces work directly crosswise of the knife, in which latter case there is danger of the formation of a roughened serrated edge thereon. As the grinding-surfaces, either that of the annulus or ring or of the grinding-disk, or both, become worn the adjusting-nut 14 may be moved slightly toward the gear 25 and the disk 13 be then advanced upon the sleeve 10 until it once more engages said adjusting-nut. In this way I provide for a very effective adjustment to compensate for wear of either grinding-surface and in which only a single adjusting-screw is necessary.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a sharpener for knives and other cutting-blades, the combination of two grinding-surfaces operating simultaneously on opposite sides of the blade, said grinding-surfaces overlapping, and means for simultaneously operating said grinding-surfaces, substantially as set forth.

2. In a sharpener for knives and other cutting-blades, the combination of a grinding annulus or ring and a grinding-disk, the periphery of the latter overlapping the grinding-surface of said annulus or ring, and means for rotating said grinding elements, substantially as set forth.

3. In a sharpener for knives and other cutting-blades, the combination of a grinding annulus or ring and a grinding-disk, the periphery of the latter overlapping the grinding-surface of said annulus or ring and the axis of said annulus or ring being arranged in a plane below that of the grinding-disk, and means for rotating said grinding elements, substantially as set forth.

4. In a sharpener for knives and other cutting-blades, the combination of a grinding annulus or ring having a groove in its grinding-face, a grinding-disk, the periphery of which works within said groove, and means for simultaneously rotating said annulus or ring and said disk, substantially as set forth.

5. In a sharpener for knives and other cutting-blades, the combination of a grinding annulus or ring having a groove in its grinding-face, a grinding-disk, the periphery of which works within said groove, the axis of said annulus or ring being arranged in a plane below that of said disk, and means for simultaneously rotating said annulus or ring and said disk, substantially as set forth.

6. In a sharpener for knives and other cutting-blades, the combination of a grinding annulus or ring having a groove in its grinding-face, a grinding-disk, the periphery of which works within said groove, means for simultaneously rotating said annulus or ring and said disk, and means for adjusting said

annulus or ring toward said disk, substantially as set forth.

7. In a sharpener for knives and other cutting-blades, the combination of a grinding annulus or ring having a groove in its grinding-face, a grinding-disk, the periphery of which works within said groove, means for simultaneously rotating said annulus or ring and said disk, and a regulating-screw for allowing adjustment of said annulus or ring toward said disk, substantially as set forth.

8. In a combined sharpener for knives and scissors, the combination of a grinding annulus or ring, a grinding-disk cooperating with said annulus or ring and between which and the latter the knives are sharpened, and a supporting-bracket adjacent to said disk on which scissors may be supported for grinding by said disk, substantially as set forth.

9. In a sharpener for knives and similar articles, the combination of a support, a spindle mounted in said support, a sleeve carried by said spindle, a disk on said sleeve, a grinding annulus or ring carried by said disk, a second spindle arranged at right angles to the first spindle, a grinding-disk carried on said second spindle and cooperating with said annulus or ring, and means for simultaneously rotating said annulus or ring and said grinding-disk, substantially as set forth.

10. In a sharpener for knives and similar articles, the combination of a support, a spindle mounted in said support, a sleeve carried by said spindle, a disk on said sleeve, a grinding annulus or ring carried by said disk, a second spindle arranged at right angles to the first spindle, a grinding-disk carried on said second spindle and cooperating with said annulus or ring, means for simultaneously rotating said annulus or ring and said grinding-disk, a handle for operating said annulus or ring, and gearing between said annulus or ring and said grinding-disk, substantially as set forth.

11. In a sharpener for knives and similar articles, the combination of a support, a spindle 9 carried by said support, a sleeve 10 mounted on said spindle, an adjusting-nut 14 carried on said sleeve, a disk 13 also mounted on said sleeve and engaging said adjusting-nut, a grinding annulus or ring 17 carried by said disk 13, a second spindle 18 also carried by said support, a grinding-disk 22 carried by said spindle 18, and connections between said disk 13 and the grinding-disk 22 for simultaneously rotating the same, substantially as set forth.

This specification signed and witnessed this 31st day of January, 1898.

GEO. F. BALLOU.

Witnesses:

FRANK L. DYER,
EUGENE CONRAN.