

No. 694,387.

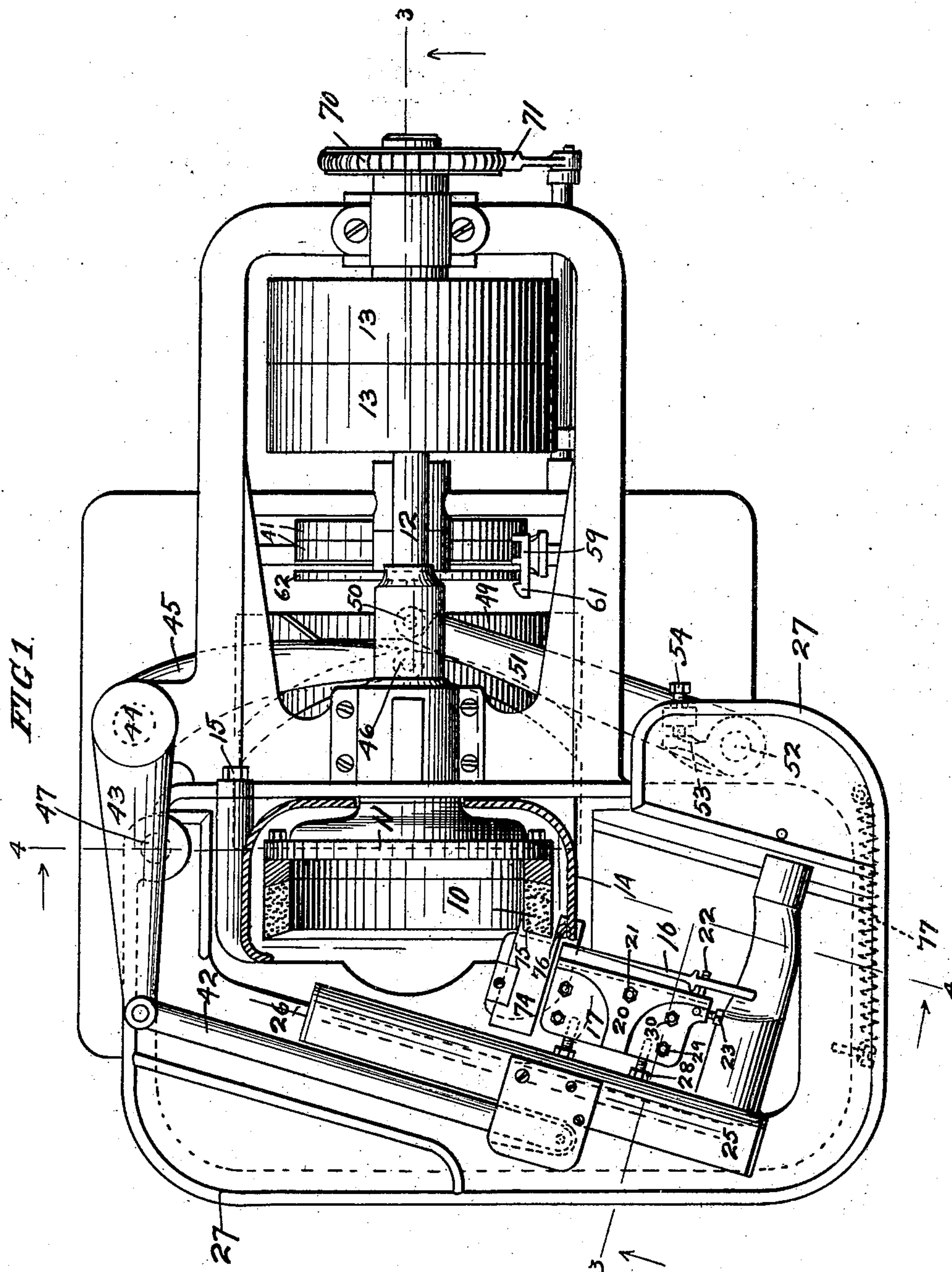
Patented Mar. 4, 1902.

A. JOHNSTON.
CUTLERY GRINDING MACHINE.

(Application filed Apr. 18, 1901.)

(No Model.)

5 Sheets—Sheet 1.



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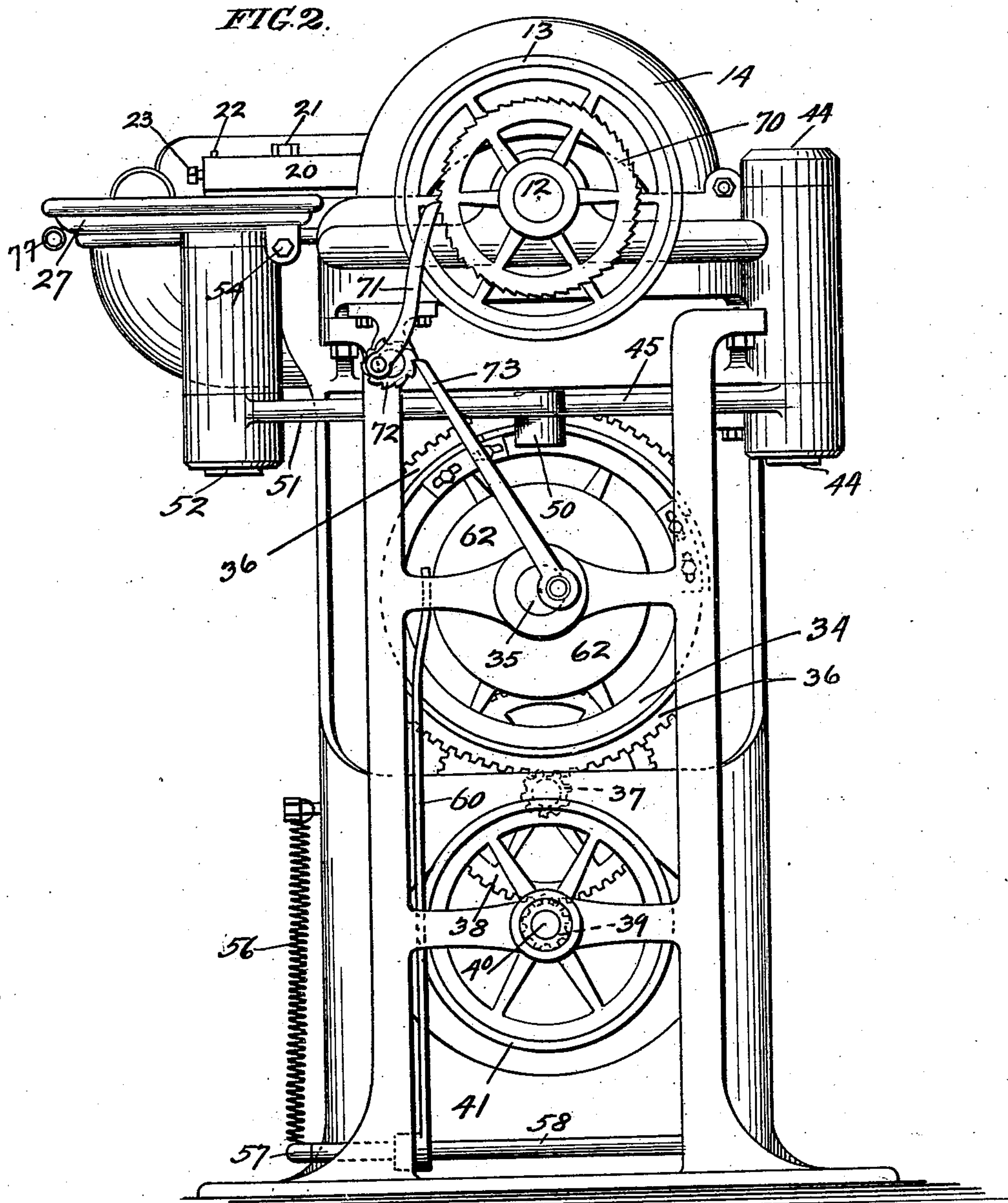
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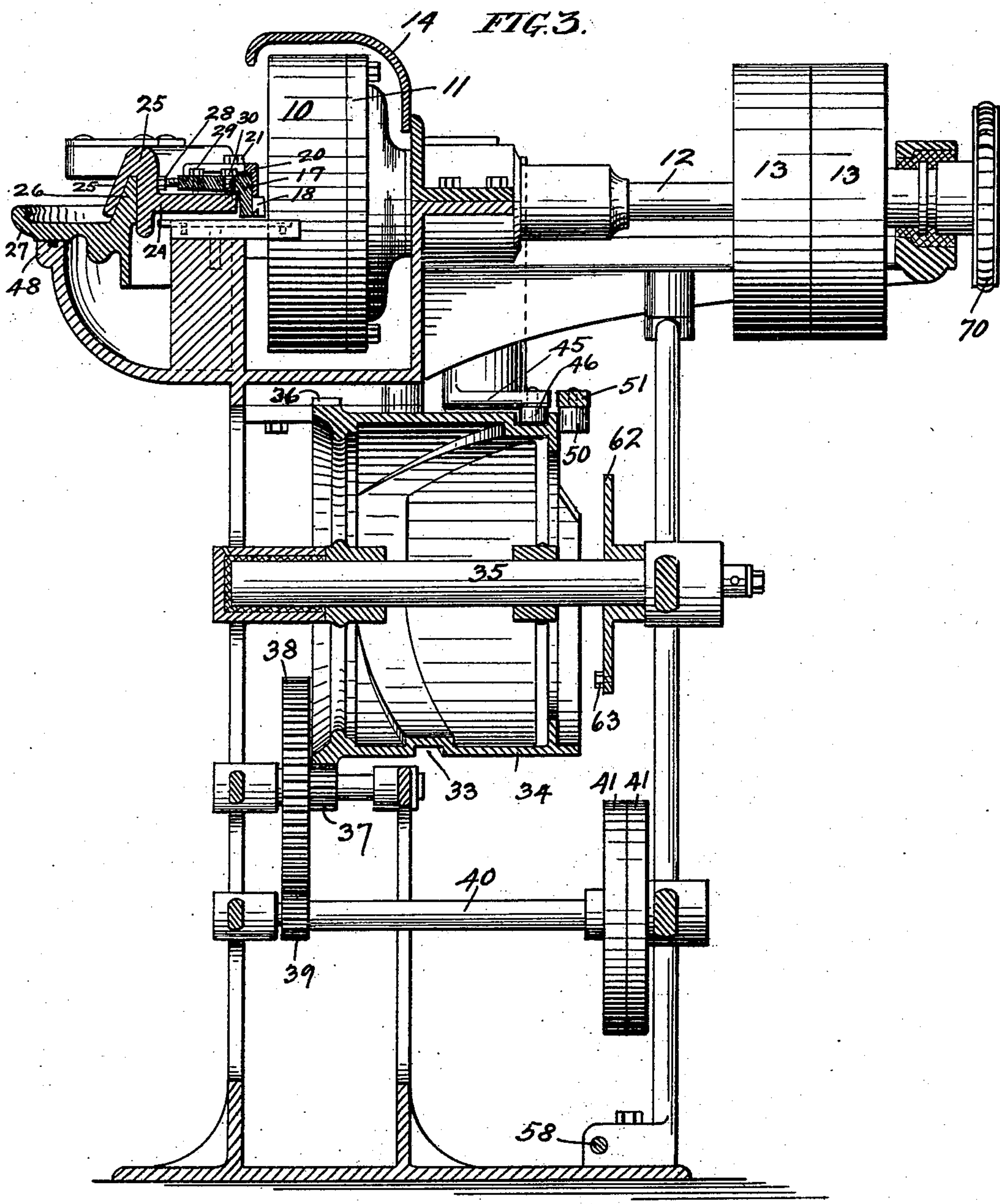
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5 Sheets—Sheet 3.



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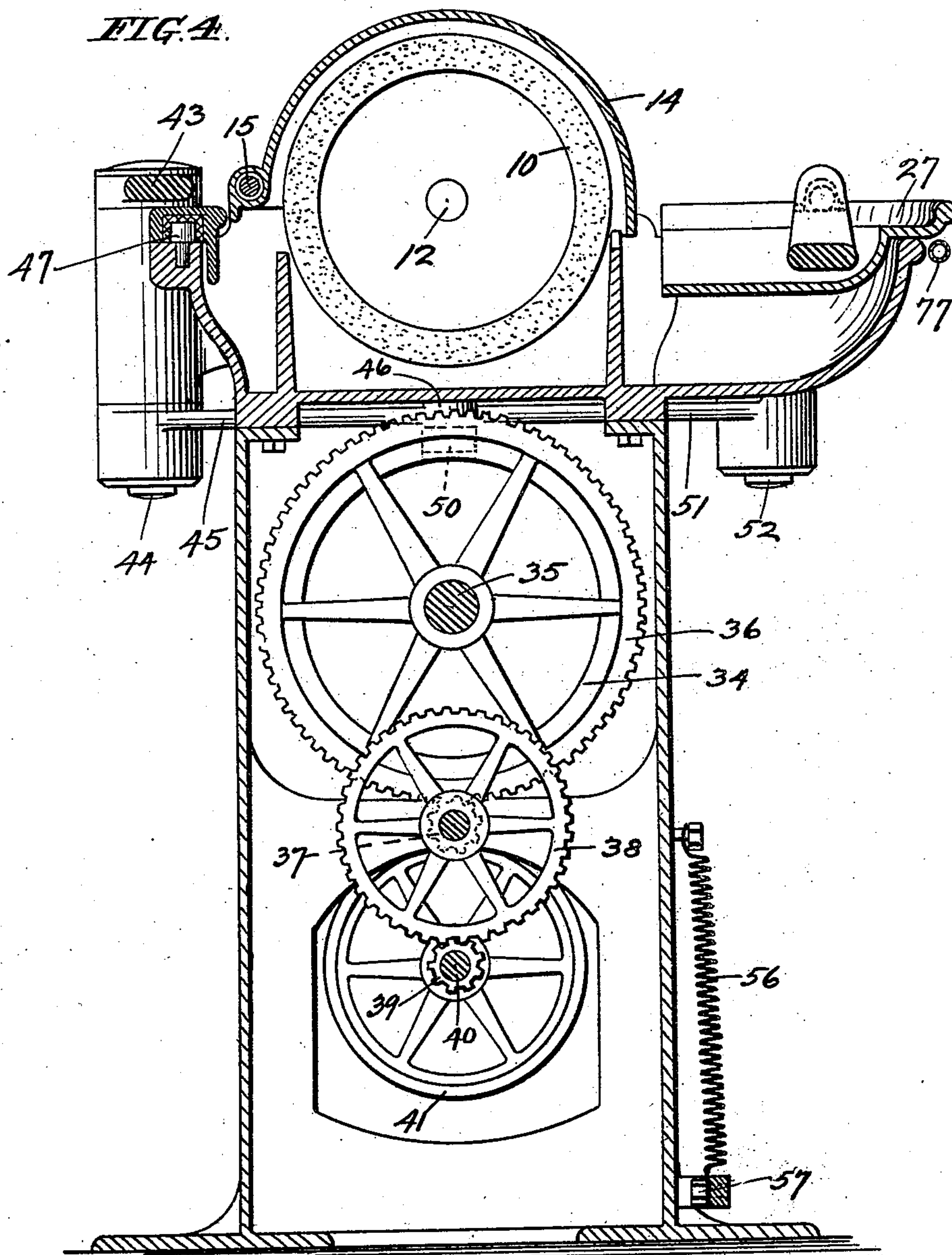
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CUTLERY GRINDING MACHINE.

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5 Sheets—Sheet 4.



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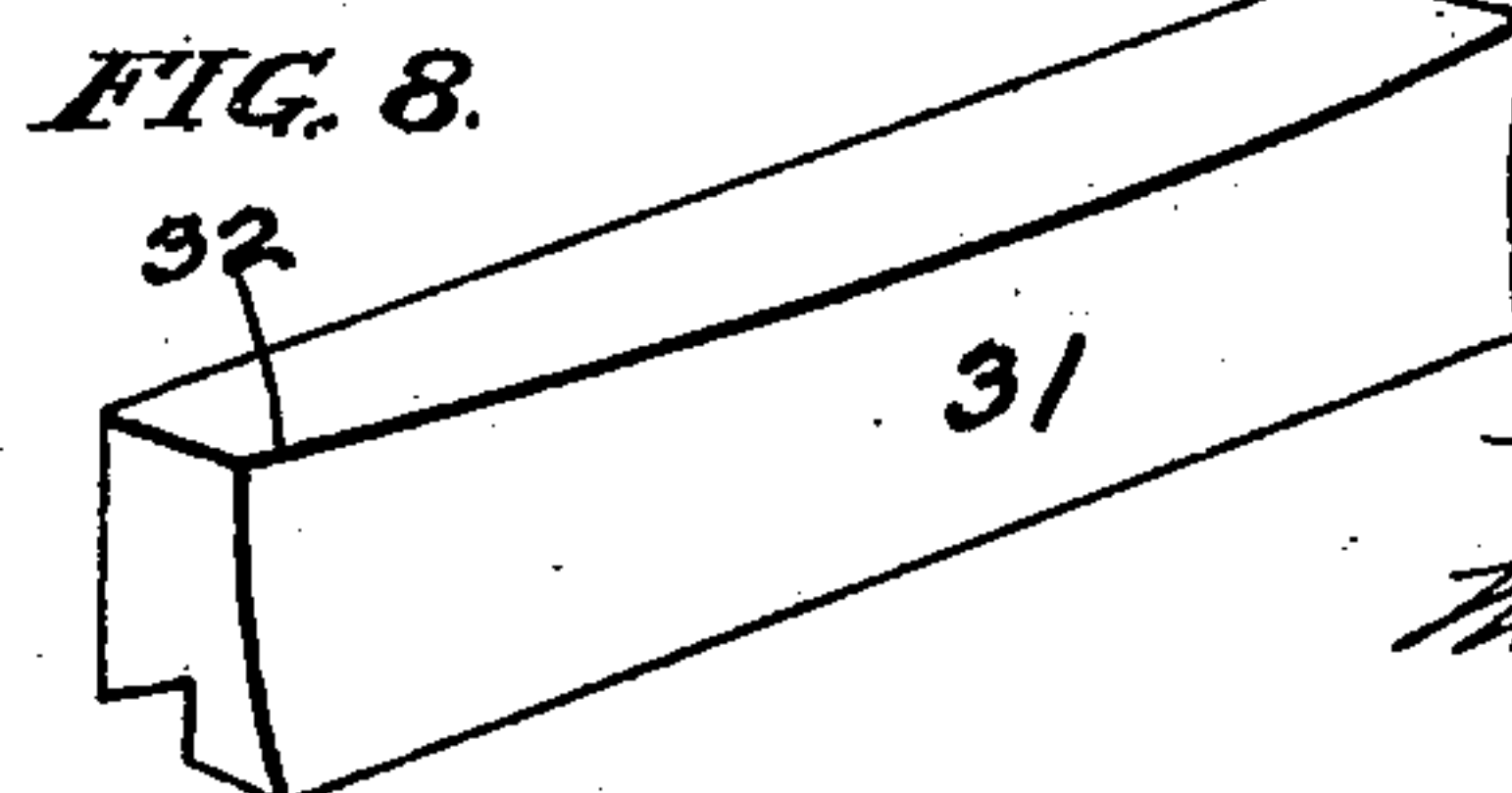
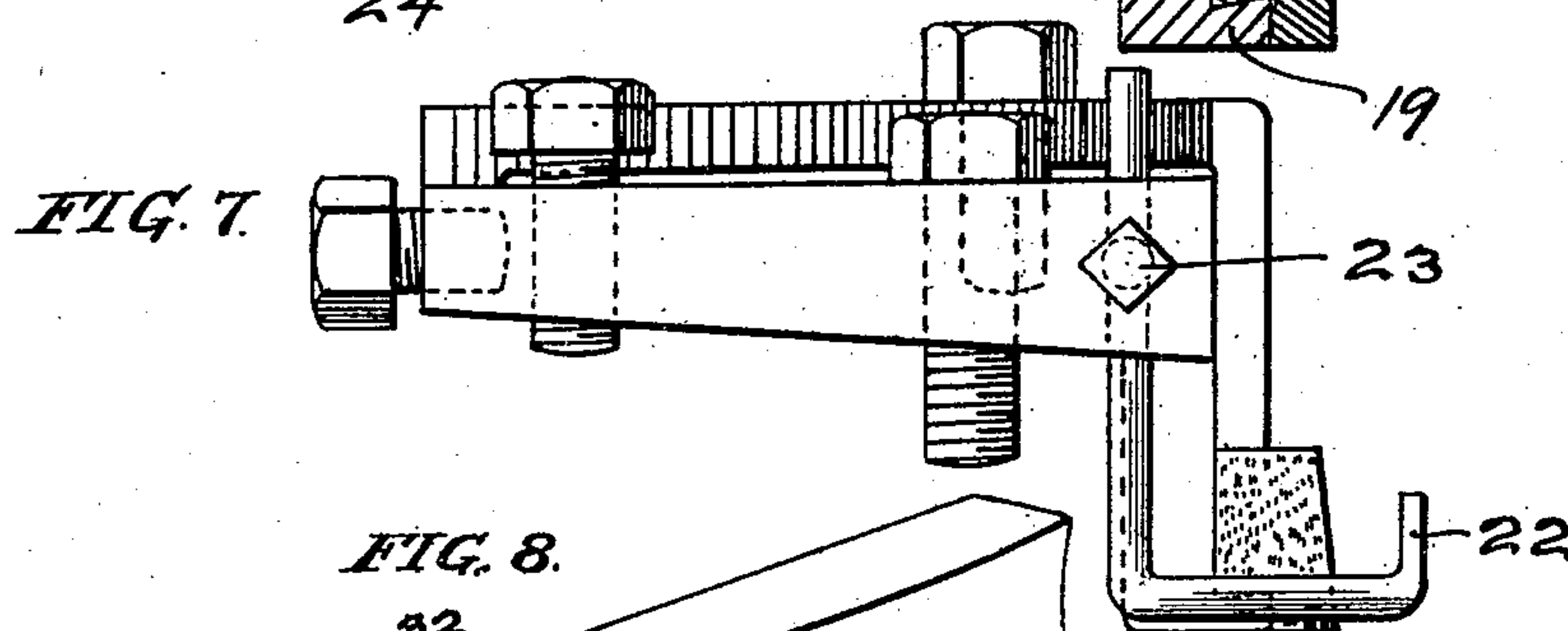
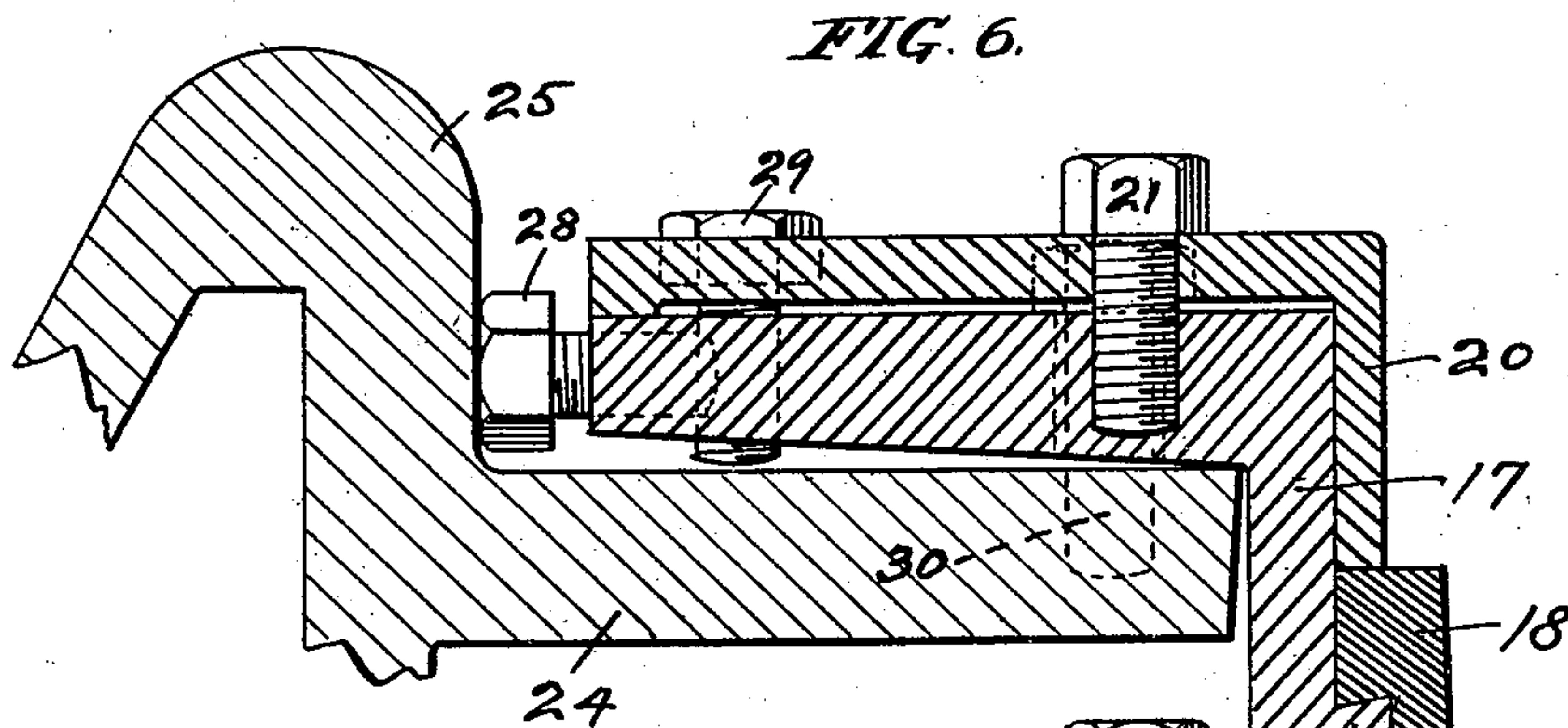
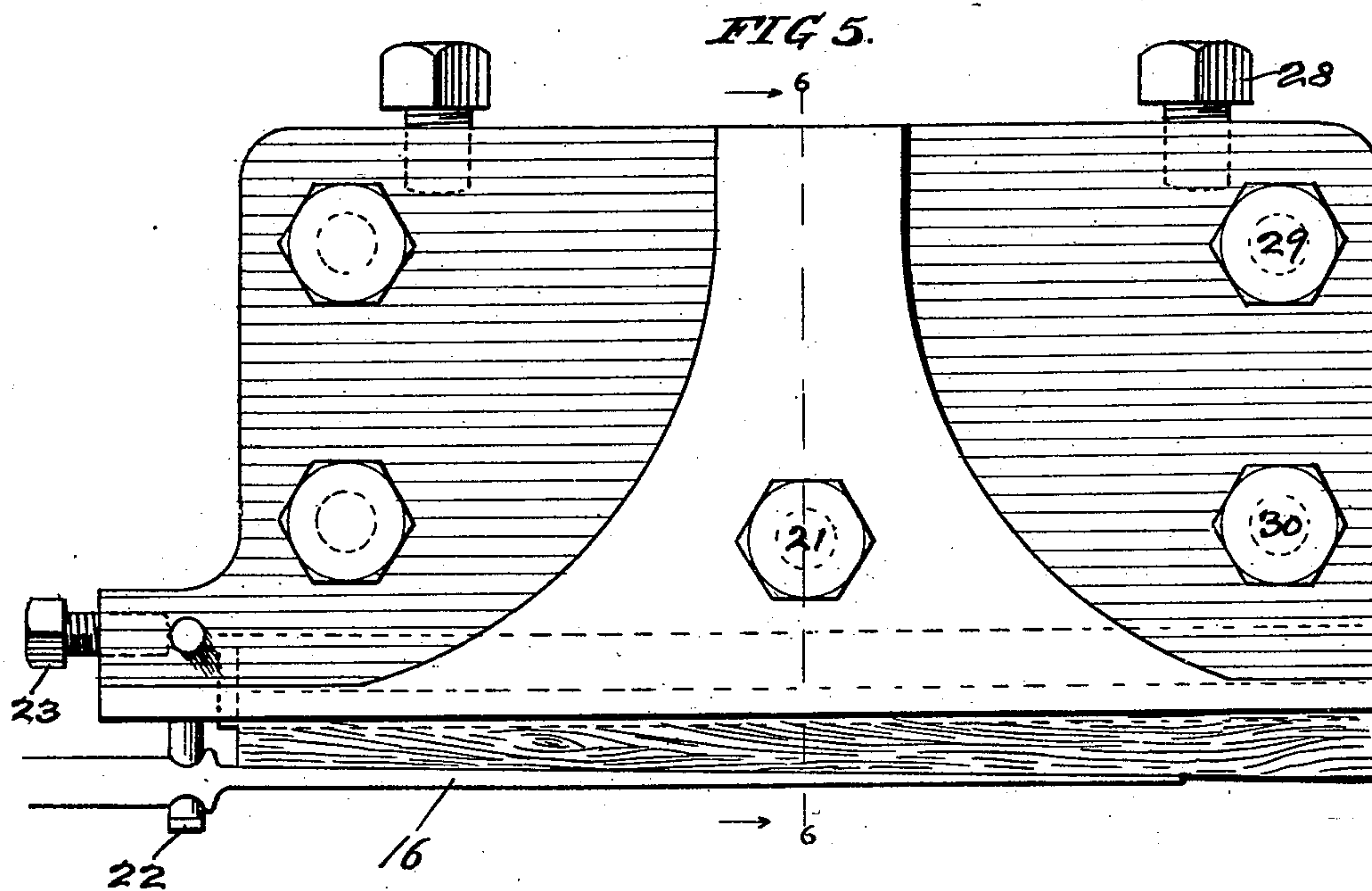
Patented Mar. 4, 1902.

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(Application filed Apr. 15, 1901.)

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5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

ALLEN JOHNSTON, OF OTTUMWA, IOWA.

CUTLERY-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 694,387, dated March 4, 1902.

Application filed April 15, 1901. Serial No. 55,838. (No model.)

To all whom it may concern:

Be it known that I, ALLEN JOHNSTON, a citizen of the United States, residing in Ottumwa, in the county of Wapello and State of Iowa, have invented a new and useful Improvement in Cutlery-Grinding Machines, of which the following is a specification.

This invention relates to the construction of machines for grinding the blades of cutlery and kindred articles, and is an improvement upon previous machines for doing similar work.

The invention is fully set forth below, and is also illustrated in the accompanying drawing, in which—

Figure 1 is a plan of the machine, partly in section. Fig. 2 is a rear elevation. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is an enlarged plan of the work-holder. Fig. 6 is a section on the line 6 6 of Fig. 5. Fig. 7 is an end elevation of the work-holder. Fig. 8 is a perspective of the supplemental block used in the work-holder.

In said drawing, 10 is the emery ring or wheel, bolted to a disk 11, carried upon the end of a shaft 12, driven by belt running on fast and loose pulleys 13 13. As clearly shown, the acting edge of the ring is inclined inwardly or internally cone-shaped, so that by moving the blade lengthwise across the inwardly-inclined edge of the ring the desired degree of convexity will be imparted to the ground surface and without any rocking of the blade while it is being ground. The wheel is inclosed at the sides and back, as plainly shown, the top 14 being hinged upon one side at 15, so as to permit it to be swung out of the way when replacing the wheel.

The cutlery to be ground, of which the table-knife is shown as an example at 16, is supported by a suitable holder adapted to carry the blade across the edge of the grinder. This holder in the construction preferred by me consists of a frame 17, preferably made L-shaped in vertical cross-section and having a support for the knife, and a supplemental piece 18 interposed between the blank and the frame 17 and forming a backing to receive the thrust or pressure caused by the grinder, said supplemental piece being made of some yielding material, such as wood, and shaped

on the side toward the blank to correspond in shape to the latter. The supplemental piece may be supported in any suitable way—as, for instance, by the ledge 19, formed on the vertical side of the frame, preferably having its upper face cut down and inwardly, as shown at Figs. 6 and 7, so that the supplemental piece, which is correspondingly shaped, will be prevented from slipping off the ledge. The supplemental piece is also clamped down upon the ledge by the L-shaped clamp 20, secured to the frame 17 by the vertical screw 21. The support 22 for the blank is hook-shaped, so that it is adapted not only to support one end of the blank vertically, but to hold it up against the backing-piece 18. The other end of the blank is supported by plate 74. The support 22 is preferably adjustable in the frame 17, being held in therein by a set-screw 23.

The blank-holder is mounted upon a slide 24, a portion of which 25 is made in the form of an inverted V and rides upon the ridge or track 26, formed upon a movable member 27 of the machine and which is hereinafter called the "carriage." The holder is adjustable on slide 24, the adjustment being effected in horizontal directions by set-screws 28, bearing against the part 25 of the slide, and in vertical directions by screws 29, bearing on the top of the slide. The screws 30, by which the holder is secured to the slide, pass through elongated openings in the frame 17, as shown by the broken lines in Fig. 6. The screws 28 permit the holder to be adjusted to the line of travel of the slide and to be moved toward or from the grinder, and the screws 29 permit the holder to be tipped slightly, so as to grind the back or edge of the knife thicker or thinner, as desired.

The supplemental or backing piece 18 is quickly removed when worn out or injured by simply loosening the screw 21. As shown at Fig. 8, it is shaped upon one of its vertical sides to conform to the blank, and in the instance illustrated this shaping is that used when grinding table-knives, and its principal features are the concavity of the face, as seen at 31, and the cutting away of one of the corners, as at 32, thus forming a concave twisted surface and conforming to the convex twisted surface of the knife.

The slide is adapted to carry the blank-holder across the acting face of the grinder and receives this movement from the cam-groove 33, formed upon the periphery of a drum 34, mounted on the shaft 35 and provided with a gear 36, driven by the train of gears 37, 38, and 39 from shaft 40, actuated by belt running on fast and loose pulleys 41 41. The slide is connected to the cam 33 by means of a link 42, a crank-arm 43, a vertical rock-shaft 44, to the upper end of which said crank-arm is attached, and a second crank-arm 45, attached to the lower end of the same rock-shaft and furnished with a roller 46, traveling in said cam 33. The parts described act to first carry the holder inward without contact with the grinder, so that the blank is thus positioned in readiness to be ground during its return movement, and at the inception of the return movement it is moved up against the grinder by giving the carriage 27 a slight turning movement on its axis 47. To permit this, the carriage is movably supported partly by its said axis and partly by the upper edge 48 of a portion of the main frame, and it is operated to carry the work to the grinder by a cam 49, formed on the side face of drum 34 and pressing against the roller 50 on the end of a crank-arm 51, secured to the lower end of a rock-shaft 52. At its upper end this rock-shaft carries a short arm 53, which is forced by the movement received from the cam against an adjustable stop 54, carried by the carriage, and whenever engagement between the arm 53 and the stop takes place the carriage will be swung sufficiently to force the blank against the grinder and be held in that position until the blank has been drawn across and been completely operated upon by the grinder, after which it is returned by a spring 77.

The cam is adapted to be stopped whenever a blank is finished by shifting the belt from the tight to the loose one of the pulleys 41. This may be done by a spring 56, acting on an arm 57, extending horizontally from the rock-shaft 58, the belt-shifter 59 being supported upon a swinging lever 60, attached to said shaft. The lever also carries a latch 61, adapted to be forced over the edge of a disk 62, mounted on the cam-shaft, when the arm 57 is depressed by the operator and power stored in the spring. This latch controls the spring when it is thus caught on the disk, and it is released therefrom automatically by the bolt-head 63, carried by the disk, upon the completion of a revolution of the cam-shaft and simultaneously with the completion of the grinding upon each blank. As soon as it is released the spring rocks shaft 58 and causes the shifter to move the belt onto the loose pulley, thereby withdrawing power from the cam.

The grinder may be fed toward the work to compensate for the wearing away of its operating-surface. A part of the mechanism employed for that purpose consists of the ratchet 70, pawl 71, operating said ratchet

and secured to a ratchet-pinion 72 eccentrically of the latter, and a pawl 73, operating pinion 72 and itself secured to the shaft 35 at one side of its center. As the construction of the balance of this mechanism is well understood by those skilled in the art and forms no portion of the present invention, I have not deemed it necessary to fully illustrate it.

While the construction illustrated is the best now known to me, it will be understood that the same may be greatly varied without departing from the spirit of the invention or the scope of the claims.

A stationary plate 74 is placed close under the blank-holder and is cut out at the end adjacent to the grinder, so as to leave points 75 and 76 projecting at either side of the grinder, as seen at Fig. 1. This plate supports the blade as it is being ground and is arranged to be moved toward the grinding-wheel as it is worn by use in grinding.

I claim—

1. In a cutlery-grinding machine, a rotating cylindrical grinder having an internal cone-shaped end surface, in combination with means for carrying the blank across and parallel with such cone-shaped end, such means consisting of a rigidly-supported metal slide, a supplemental piece or backing of wood or other soft material supported from said slide and having both a tipping and a horizontal adjustment thereon, and means for securing the blank to said backing, substantially as specified.

2. In a cutlery-grinding machine, a rotating cylindrical grinder having an internal cone-shaped end surface, and a holder for the cutlery adapted to carry the blank across such end surface, in combination with a carriage 27 pivoted at one edge and swinging horizontally at the other, a slide moving upon a track formed on the carriage, means for holding the work attached to said slide and having both a tipping and a horizontal adjustment thereon, means for actuating the slide and means for actuating the carriage, substantially as specified.

3. In a cutlery-grinding machine, a carriage movable toward and from the grinder, and a slide mounted on the carriage and carrying the work past the grinder, in combination with a work-holder having both a tipping adjustment and a horizontal adjustment on the slide, substantially as specified.

4. In a cutlery-grinding machine, a carriage movable toward and from the grinder, and a slide mounted on the carriage and carrying the work past the grinder, in combination with a work-holder mounted on the slide, and a stationary plate 74 for supporting the blade vertically during the grinding, substantially as specified.

5. In a cutlery-grinding machine, a carriage 27 pivoted at one edge and swinging horizontally at the other, a slide moving upon a track formed on the carriage, means for holding the work attached to said slide and embodying a

wood or soft backing 18 for the blank, means for actuating the slide and means for actuating the carriage, substantially as specified.

6. The work-holder consisting of the frame 5 17, the wood backing 18, supported on a ledge of the frame, the blank-support 22, and the clamp 20, in combination with the slide 24, substantially as specified.

7. The work-holder having screws 28 for 10 horizontal adjustment and screws 29 for tipping adjustment, in combination with the slide carrying the holder and against which said screws bear, substantially as specified.

8. In a cutlery-grinding machine, the com- 15 bination with the slide for carrying the work past the grinder, of a work-holder having both a tipping adjustment and a horizontal adjustment toward the grinder, and a cylindrical or ring grinder having an internal cone-shaped 20 end surface, substantially as specified.

9. The combination with a ring or cylindrical grinder having an internal cone-shaped end surface, of a work-holder carrying the blade across said end surface and having 25 means for securing the handle end of the blank, and a stationary device located close to the grinder and supporting the blade while it is being ground, substantially as specified.

10. The work-holder consisting of the L- 30 shaped frame, the wood backing 18, the blank-support 22, and the clamp, and the adjusting-screws for the frame and support, in combina-

tion with means for moving the same across the grinder and a rest 74, substantially as specified.

11. In a cutlery-grinding machine, the com- 35 bination with a suitable work-holder of means for moving said holder across the grinder and a movable carriage for said holder adapted to carry the holder toward the grinder and at 40 right angles to the path of the holder, and a plate upon which the blade rests while it is being ground, substantially as specified.

12. The work-holder of a cutlery-grinder embodying a wood backing for the work and 45 means for securing such backing, consisting of devices clamping it on the top and bottom, substantially as specified.

13. The work-holder of a cutlery-grinder embodying a wood backing for the work, such 50 backing having an upper-cut offset along its bottom engaging a correspondingly-shaped ledge on the holder, substantially as specified.

14. The work-holder having a screw or screws for horizontal adjustment, and a screw 55 or screws for tipping adjustment, in combination with a slide carrying the holder and against which said adjusting-screws bear, substantially as specified.

ALLEN JOHNSTON.

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