

No. 700,552.

Patented May 20, 1902.

H. A. PARDOE & E. S. SHIMER.
CUTTER HEAD BIT.

(Application filed Feb. 21, 1902.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

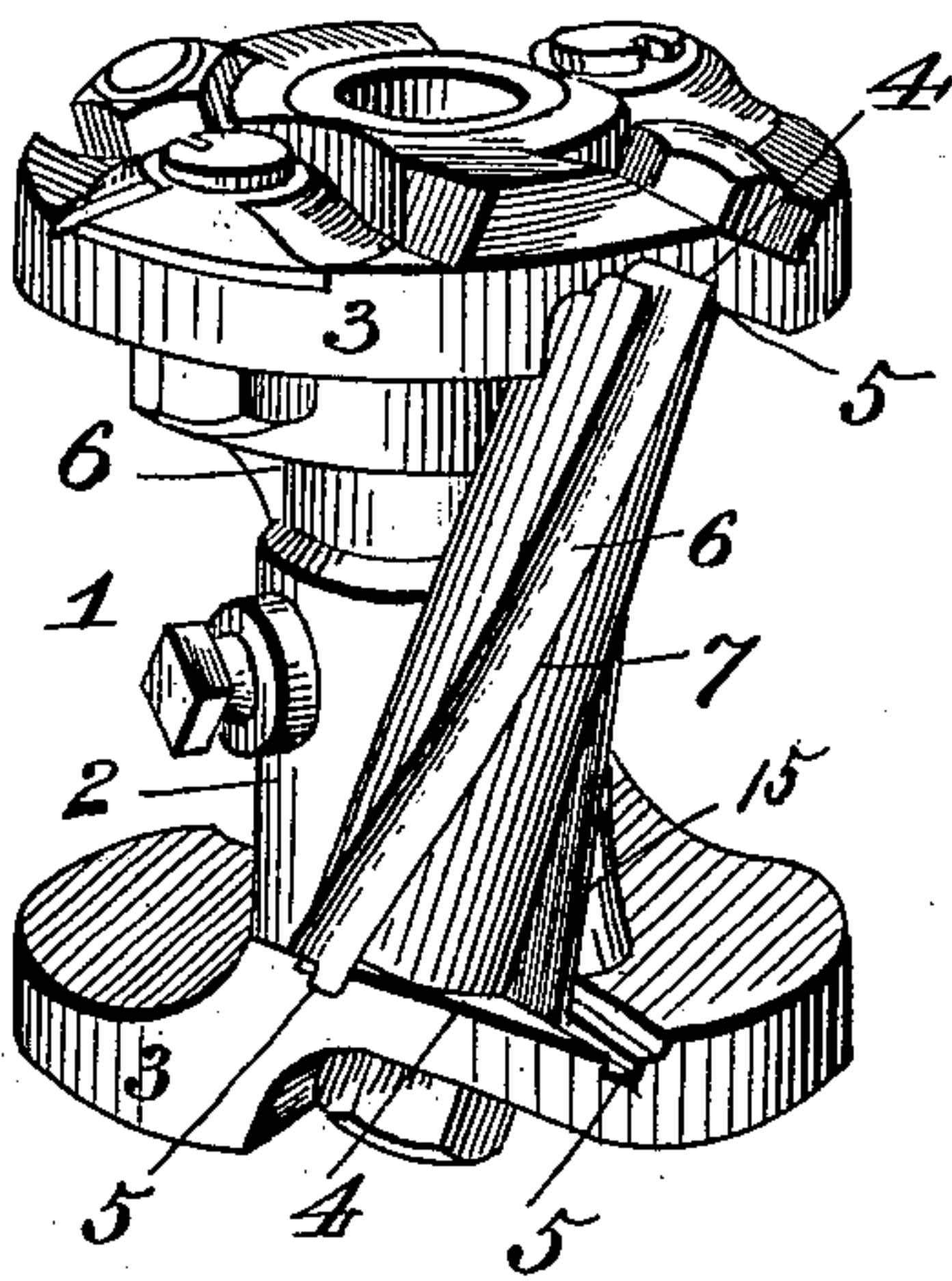
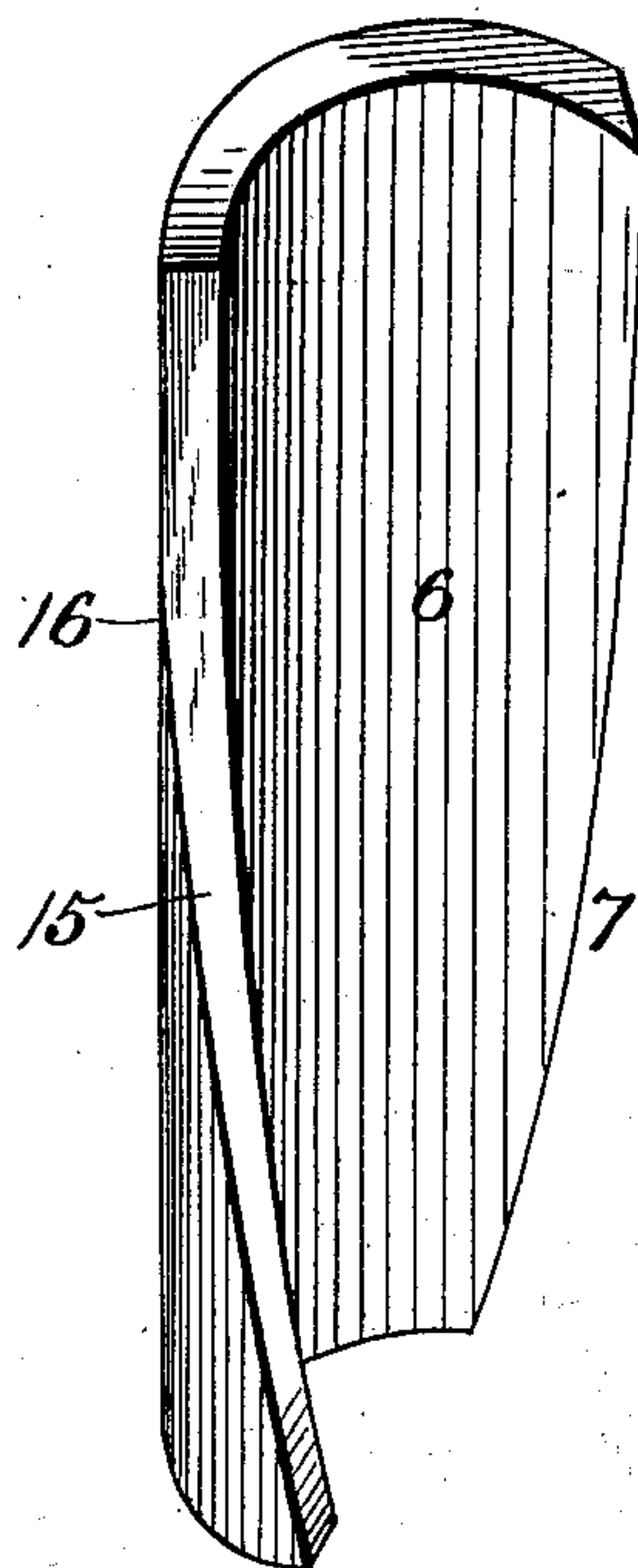


Fig. 2.



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Fig. 3.

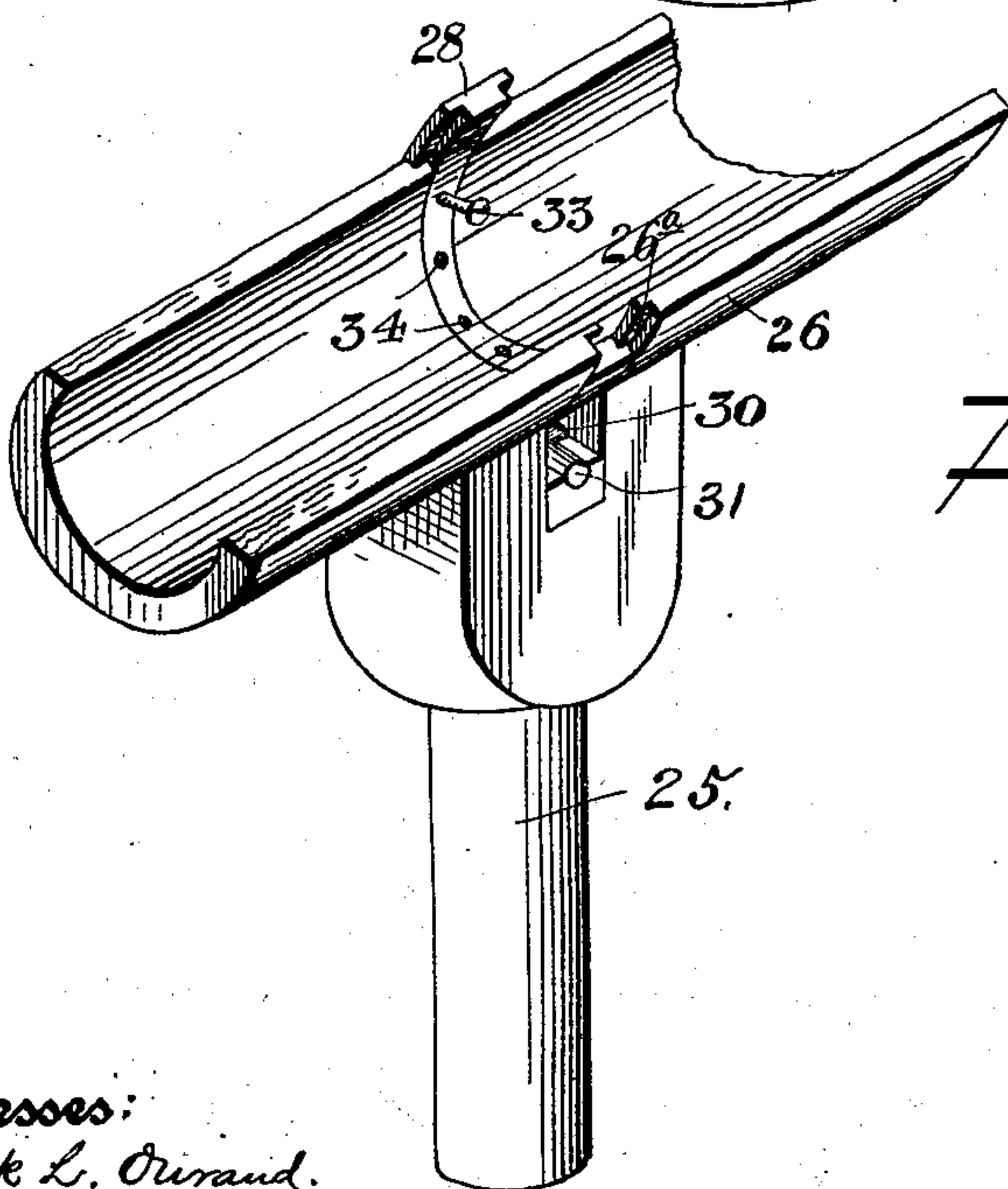
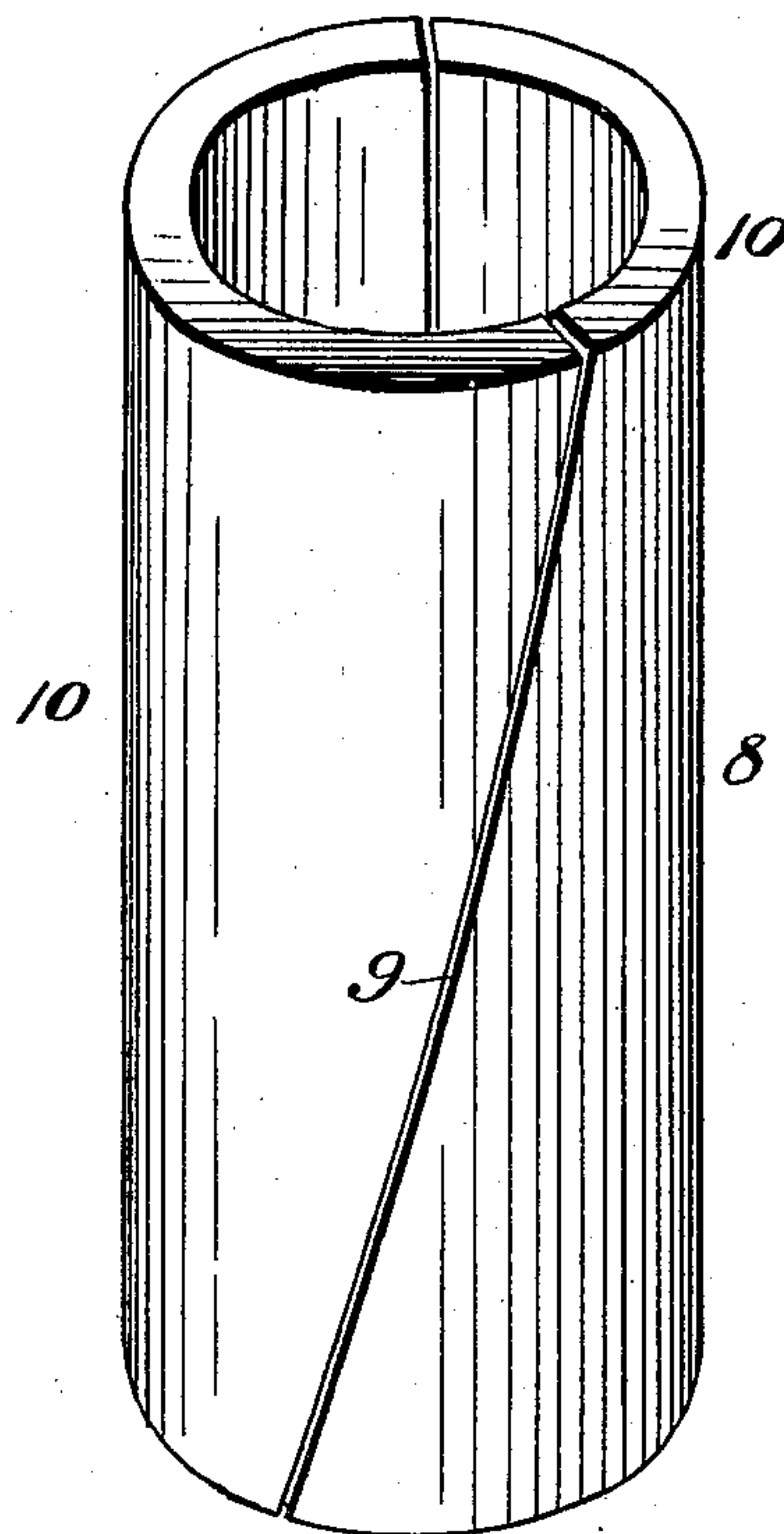


Fig. 5.

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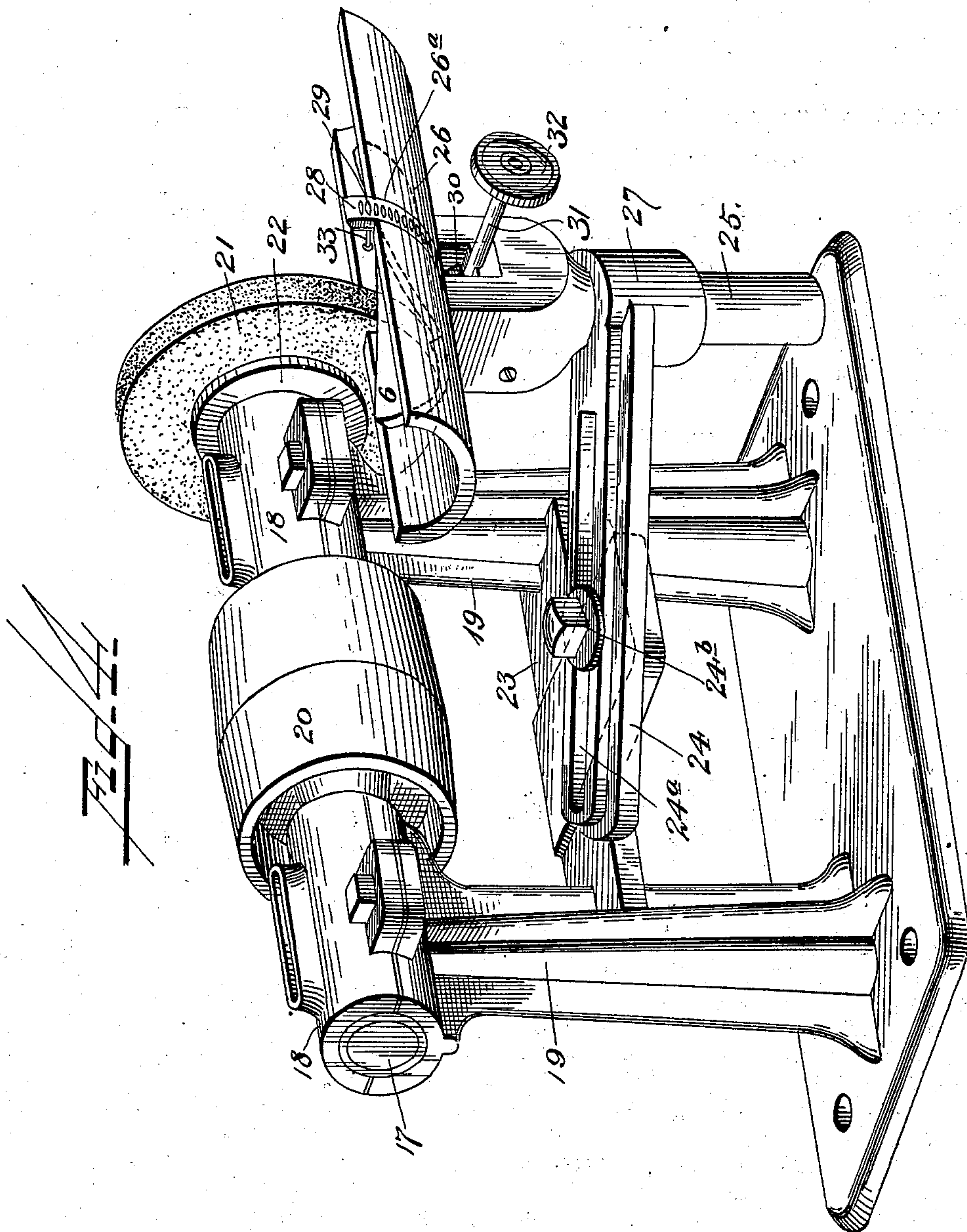
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

HENRY A. PARDOE AND ELMER S. SHIMER, OF MILTON, PENNSYLVANIA, ASSIGNORS TO SAMUEL J. SHIMER AND SONS, OF MILTON, PENNSYLVANIA.

CUTTER-HEAD BIT.

SPECIFICATION forming part of Letters Patent No. 700,552, dated May 20, 1902.

Application filed February 21, 1902. Serial No. 95,108. (No model.)

To all whom it may concern:

Be it known that we, HENRY A. PARDOE and ELMER S. SHIMER, citizens of the United States, residing at Milton, in the county of Northumberland and State of Pennsylvania, have invented new and useful Improvements in Cutter-Head Bits, of which the following is a specification.

In the Stutzman cutter-head for finishing plane surfaces with a shearing cut bits are employed having a body formed of a portion of a cylinder and bearing a cutting edge, which conforms to one of the lines of intersection of the surfaces of two non-parallel intersecting cylinders—viz., the cylinder of rotation of the head and the surface of the inner bore of the bit. While it is easy for the manufacturers to make a bit with the proper-shaped cutting edge, it is a very difficult matter for a workman to keep this edge in shape.

The object of our invention is to overcome this difficulty by designing bits of the kind described, which will be provided with a curved heel, which forms an accurate gage or pattern by which the cutting edge may always be set and sharpened by the use of a device described herein, but which is not claimed, as it forms the subject-matter of a separate application for patent.

The novel construction used by us in carrying out our invention is fully described in this specification, and claimed and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a perspective of a Stutzman cutter-head for making a shearing cut. Fig. 2 is a perspective of a bit constructed after the manner of our invention. Fig. 3 is a perspective of a slotted cylinder cut to form two bits. Fig. 4 is a perspective of our emery-wheel and holder. Fig. 5 is a detail of the bit-holder.

Like numerals of reference designate like parts in the different views of the drawings.

The numeral 1 designates a cutter-head, which comprises a cylindrical hub 2 and two circular flanges 3. Each of the flanges 3 bears inclined bit-seats 4, having semicircular grooves 5 therein. Seated in these grooves 5 and extending diagonally the head—that

is, at an angle to the axis of rotation—are bits 6. The bits 6 are formed of a fragment of a cylinder a little less than half of the whole, so that two bits may be made out of a complete cylinder, as will appear. The cutting edges 7 of the bits 6 project a little beyond the periphery of the flanges 3 to permit clearance, and the heels of the bits are set in beyond the periphery. In order that the bit 6 may finish a plane surface, it is necessary that the edge 7 conform to one of the lines of intersection of a cylinder having a radius equal to the inner bore out of which the bit 6 was formed and a cylinder with a radius equal to the distance from the axis of the head 1 to the edge 7—that is, with a radius a little larger than the flanges 3.

In forming a bit 6 of the required shape a steel plate is taken of the proper size to form a slotted cylinder 8, having the curvature of the bit 6. The cylinder 8 is split along a diagonal line 9 to form two similar halves 10. These halves 10 are then clamped in a cutter-head 1, with their diagonal edges 9 projecting beyond the flanges 3. The head 1 is then clamped in a lathe, which will carry it past a fixed tool, which will cut the edge 7 of the required curvature. After the edge 7 has been formed the heel 15 is ground off on a curve 16, which is the counterpart of the curve of the edge 7 and parallel to it throughout—that is, the circular arcs intercepted on the cylinder by the curves 7 and 16 will be constant. To do this, a machine such as shown in Figs. 5 and 6 is employed, which forms the subject-matter of a separate application for patent. In this machine the numeral 17 designates a shaft journaled in boxes 18, mounted on standards 19. The shaft 17 bears a pulley 20 and an emery-wheel 21, held by clamping-plates 22. A cross-bar 23, connecting the standard 19, provides a support for an arm 24, having a slot 24^a therein, engaged by a bolt 24^b, seated in the cross-bar 23. A clamp 27 is formed integral with the outer end of the arm 24, which clamp embraces a stem 25, formed integral with a bit-holder 26. The holder 26 is semicylindrical and of the same curvature as the bit 6. A slot 26^a traverses the holder 26 transversely, and mounted to slide within the slot is a semicircular rack 28,

having teeth 29 formed on the outer surface thereof, which teeth are engaged by a worm 30, formed on a shaft 31, mounted to be turned by a head 32. A guide-pin 33 is seated in an aperture 34 in the rack 28 to form a guide for the bit 6. There are several of the apertures 34 in which the guide-pin 33 may be placed in grinding partially-worn-out bits.

In operation the bolt 24^b is loosened and the arm 24 swung around until the bit-holder 26 is opposite the emery-wheel. One of the bits 6 is then placed in the holder 26 with the sharp edge against the guide-pin 33. The milled head 32 is then turned to operate the rack 28 to bring the heel 15 of the bit in contact with the emery-wheel. The bit 6 is then reciprocated by hand back and forth in contact with the emery-wheel and the heel 15 ground off on a curve parallel to the curve of the edge 7. Having the heel ground, as above specified, the bit 6 is then reversed to bring the heel 15 in contact with the guide-pin 33 and the edge 7 finished with the emery-wheel. When this has been completed, the bit 6 is replaced in the cutter-head 1 and used until dull, when it may be easily sharpened to the same shaped edge as before by placing it in the holder 26 with the heel 15 in contact with the guide-pin 28.

We do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of our invention.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A bit for cutter-heads comprising a body having a curved cutting edge and a heel formed on an unbroken curve which is parallel to and a counterpart of the curve of the cutting edge, the curve of said heel being adapted to form a pattern by which to grind the said cutting edge, substantially as described.

2. A bit for cutter-heads comprising a cylindrical body having a curved cutting edge and a curved heel, the curve of said heel being parallel to the curve of said cutting edge and adapted to form a pattern for grinding the said cutting edge, substantially as described.

3. A cutter-head bit comprising a cylindrical body having a cutting edge conforming to a portion of the curve of intersection of the surfaces of two non-parallel intersecting cylinders and a heel formed on a curve parallel to the curve of said cutting edge, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HENRY A. PARDOE.
ELMER S. SHIMER.

Witnesses:

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JOHN A. KURTZ.