

No. 652,695.

Patented June 26, 1900.

S. J. SHIMER.
CUTTER HEAD.

(Application filed Apr. 21, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

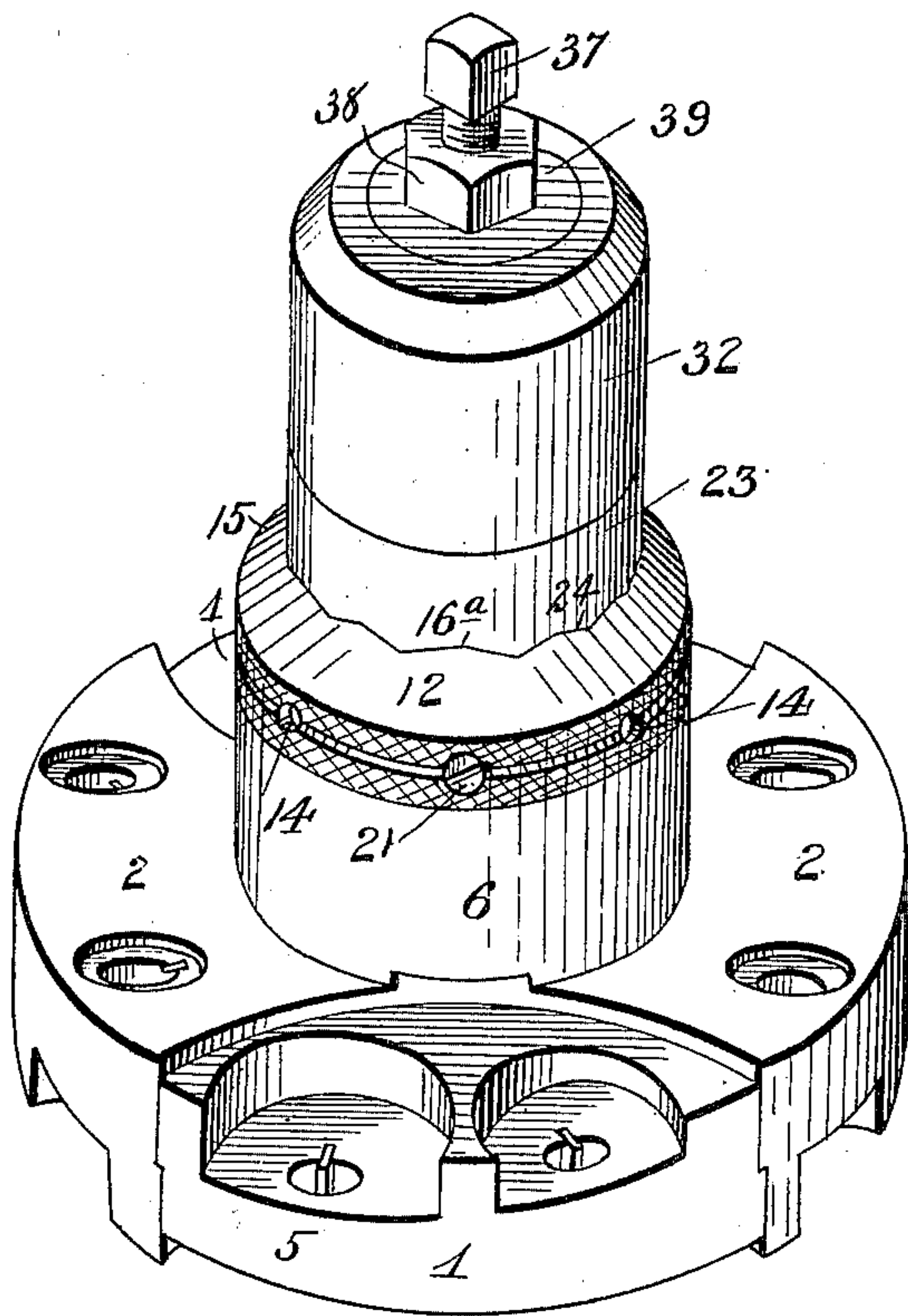


Fig. 5.

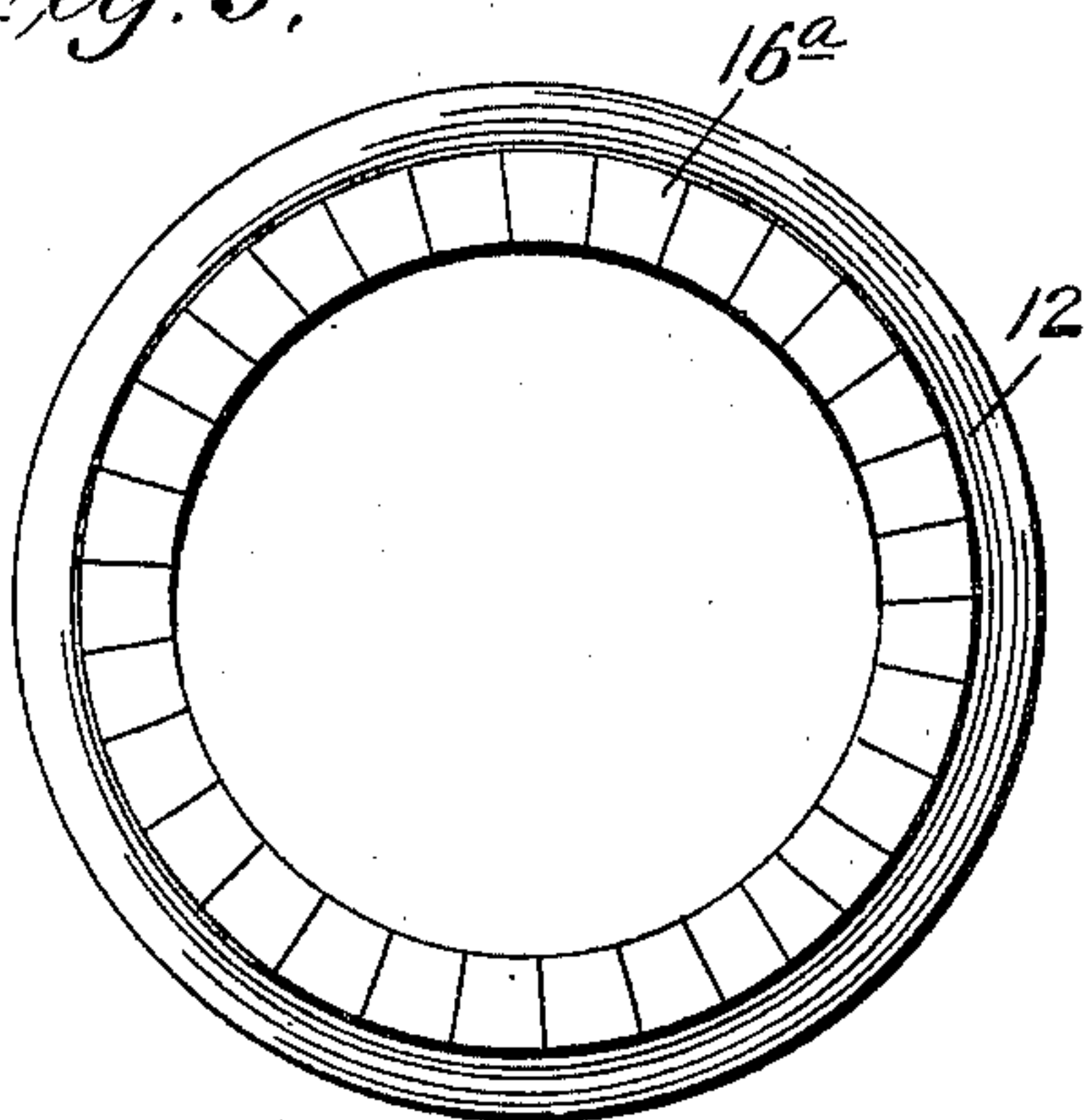
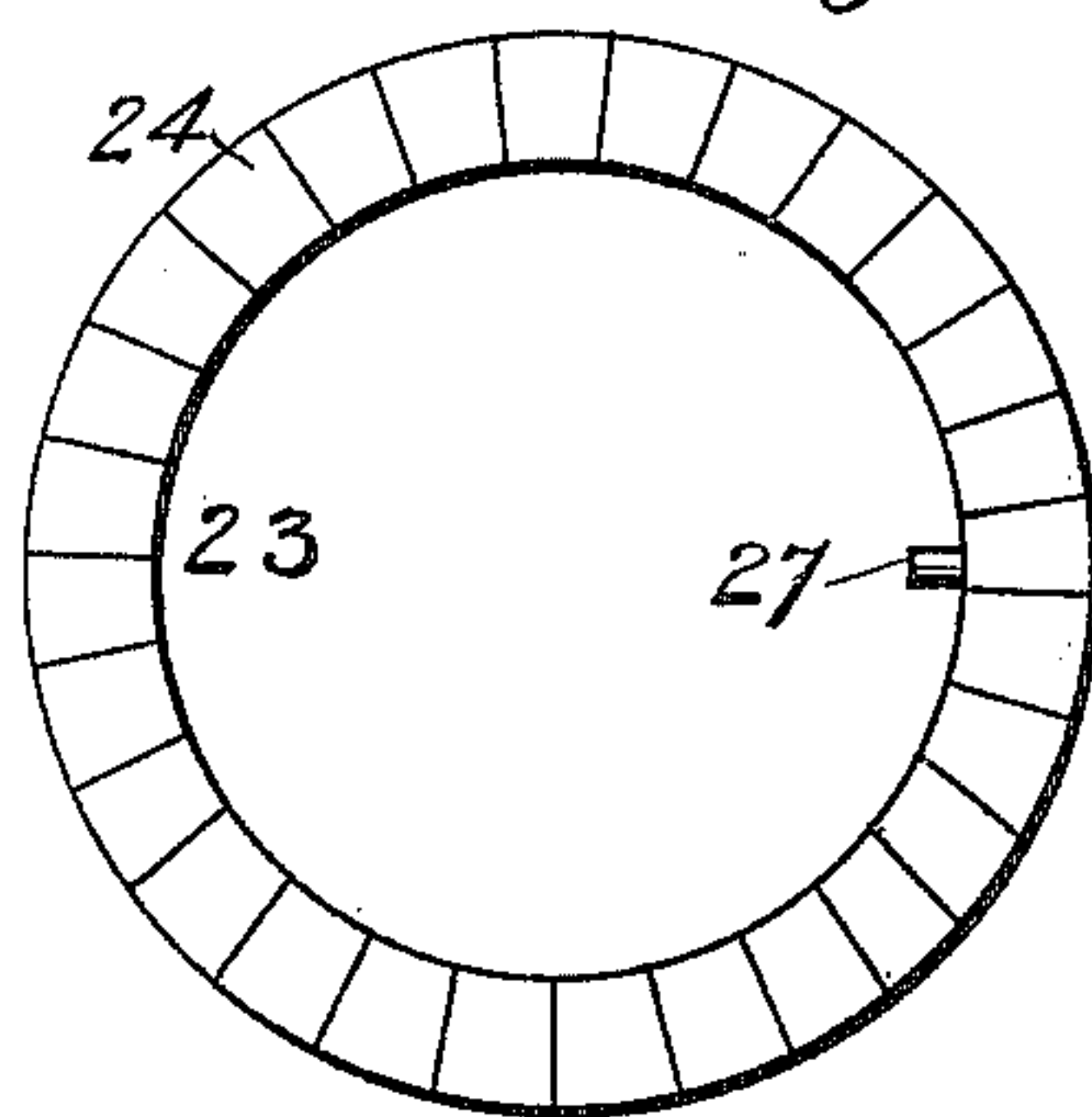


Fig. 6.



Witnesses
F. L. Ostrand
E. H. Bungea

Inventor:
Samuel J. Shimer
By Louis Rogers & Co.
Attorneys.

No. 652,695.

Patented June 26, 1900.

S. J. SHIMER.
CUTTER HEAD.

(Application filed Apr. 21, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 2.

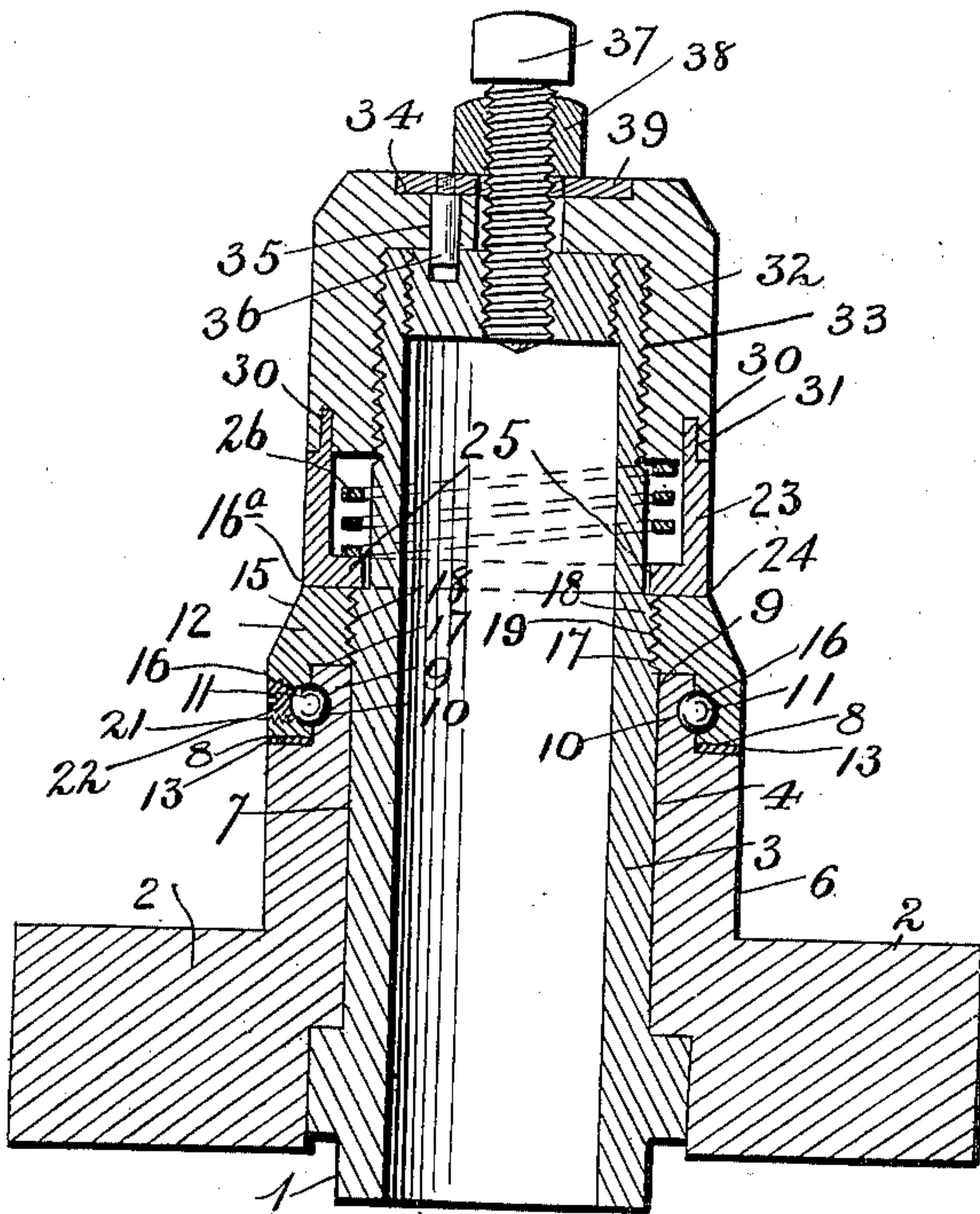


Fig. 3.

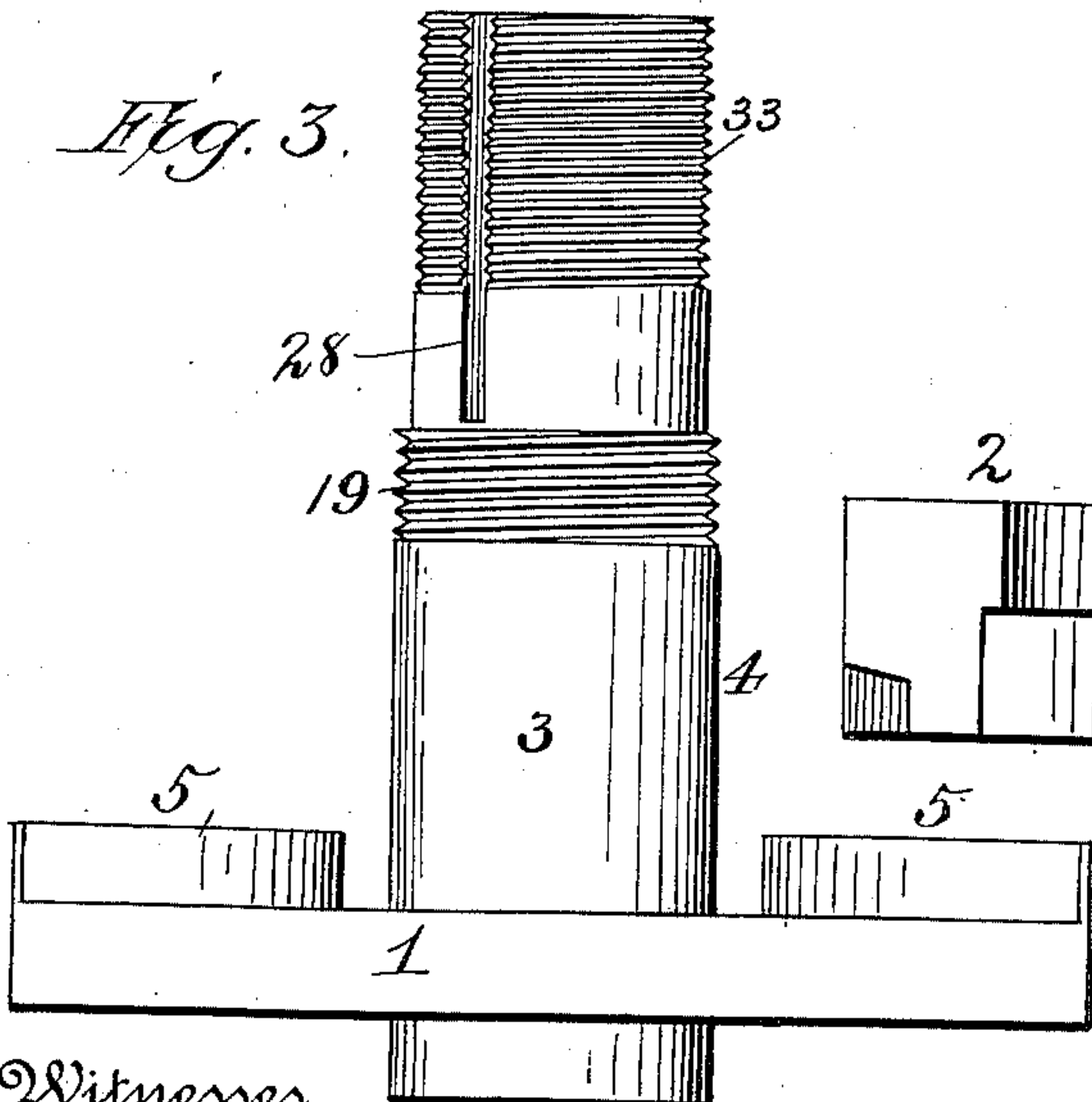
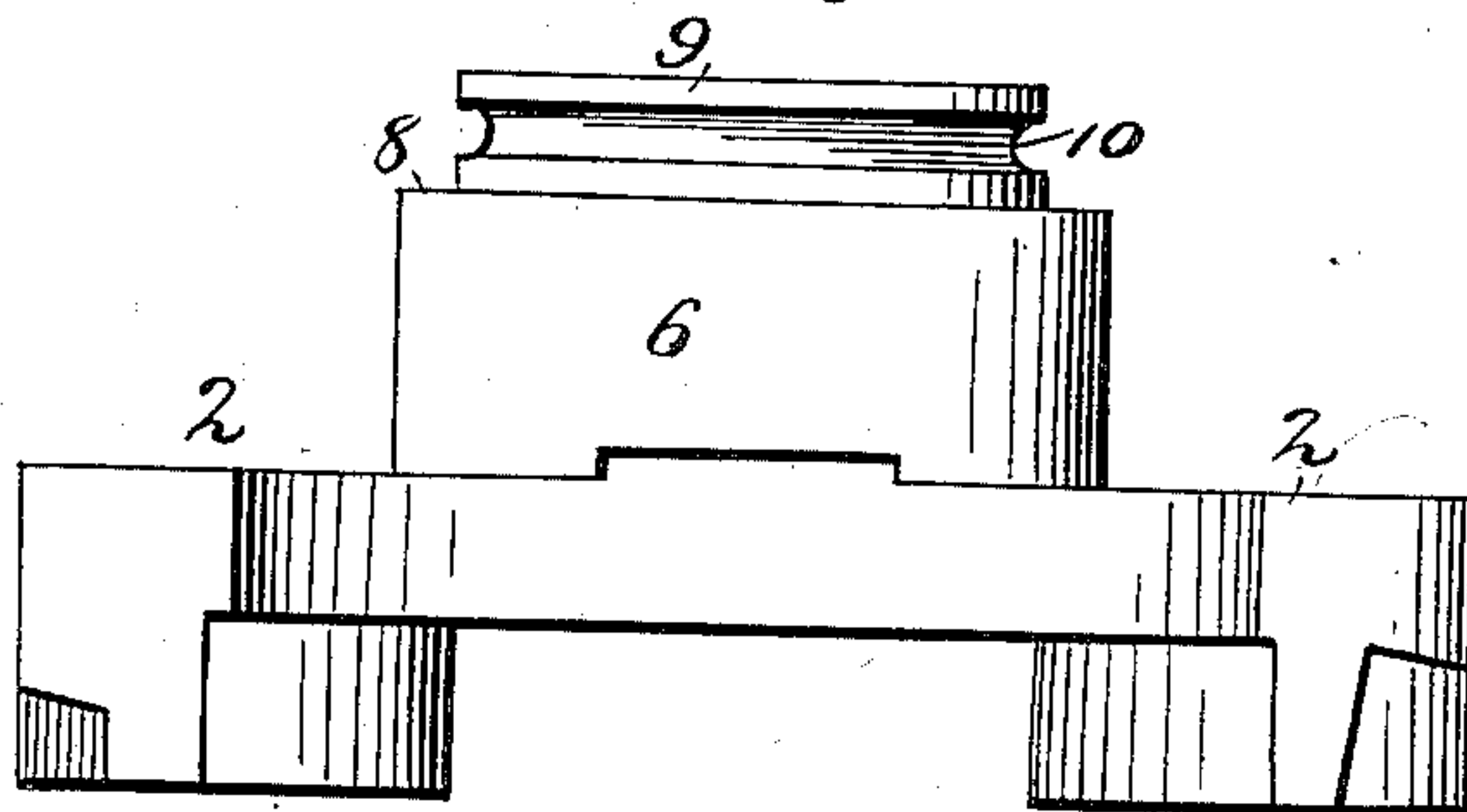


Fig. 4.



Witnesses
J. L. Ourand
E. R. Banger

Inventor:
Samuel J. Shimer.
By Louis Ruggie & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

SAMUEL J. SHIMER, OF MILTON, PENNSYLVANIA.

CUTTER-HEAD.

SPECIFICATION forming part of Letters Patent No. 652,695, dated June 26, 1900.

Application filed April 21, 1900. Serial No. 13,809. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL J. SHIMER, a citizen of the United States, residing at Milton, in the county of Northumberland and State of Pennsylvania, have invented new and useful Improvements in Cutter-Heads, of which the following is a specification.

My invention relates to cutter-heads; and one object of the same is to provide simple, reliable, and efficient means for coupling the two sections of an expansible cutter-head in a manner to permit easy relative adjustment of the two sections.

Another object of my invention is to provide a ball-bearing coupler for the two sections of a cutter-head which will make a close joint between the two sections and will also provide an antifrictional adjustment of one section relatively to the other.

I attain these objects by means of the construction illustrated in the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of a cutter-head of the well-known Shimer type, and it is to this type of cutters that my invention is particularly adapted. Fig. 2 is a central vertical section through the cutter-head, said view showing the combined ball coupler-ring and adjusting-nut in section. Fig. 3 is a side view of the lower section of the cutter-head. Fig. 4 is a similar view of the upper section of the same. Fig. 5 is a plan view of one of the parts of the adjusting-nut. Fig. 6 is a bottom plan view of the ring or collar fitting on the adjusting-nut.

Like numerals designate like parts wherever they occur in the different views.

In said drawings the numeral 1 designates the lower section of an expansible cutter-head, and 2 is the upper section thereof. The lower section is provided with a centrally-projecting shank or stem 3, having a smooth or unthreaded portion 4 near the bit-seat flange 5. The upper section is provided with a central sleeve 6, having a plain smooth interior surface 7, which fits the unthreaded portion 4 of said lower section. These two surfaces permit the two sections to move relatively for adjustment or expansion. Upon the upper and outer surface of the sleeve 6 a shoulder 8 is formed, and from said shoul-

der a reduced neck 9 projects. In the side of this neck a groove 10 is formed, which extends entirely around the neck, and this groove provides a raceway for the balls 11, which serve to couple the two sections of the head together and to provide an antifriction adjustment of said two sections. The combined adjusting-nut and coupling-ring 12 has a smooth under surface 13, which rests upon the shoulder 8 of the sleeve 6, and a portion of the outer surface of said ring-nut is milled and provided with a series of recesses 14 around the milled portion, said recesses being to accommodate a spanner for moving the ring to make adjustments. From the milled portion the ring tapers, as at 15, and the upper surface of said ring is serrated, as at 16^a. On the interior surface of the ring, opposite the milled portion, is an annular groove 16, which forms a companion to the groove 10 and provides a complete raceway for the balls 11, and the balls engaging the groove 16, as well as the groove 10, serve to lock or couple the sleeve 6 and the ring 12 together against axial separation, while permitting relative rotary motion. An interior shoulder 17 in the ring rests upon the top of the neck 9, and the interior screw-threads 18 fit the threads 19 on the shank or stem 3. When the two sections of the cutter-head are to be connected, the sleeve of the upper section is placed over the stem 3 and the two smooth portions 4 and 7 are fitted together. The ring-nut 12 is now placed upon the stem 3, and when the bottom surface of the ring comes in contact with the shoulder 8 the two grooves 10 and 16 are located coincidently, and the balls 11 may be inserted in the raceway through an aperture which extends entirely through the ring and communicates with said raceway. This aperture is threaded, and when the balls have been inserted in the raceway a threaded plug 21 closes the aperture. The plug may have a groove 22 in its inner end to form a continuation of the raceway.

Fitted upon the upper serrated portion of the ring 12 is a collar 23, having a serrated face 24 and an interior flange 25, which forms a shoulder or seat for an open spiral spring 26. A stud 27 is formed on the inner surface of the flange 25, and this stud is designed to

fit the longitudinal groove 28 in the shank or stem 3 to prevent the collar 23 from turning on said stem. The upper portion of the collar 23 is reduced in size to form an upper rim 30, which fits in a groove 31 in the bottom of a cap-nut 32, fitted over the end of stem 3 and connected to said stem by the thread 33. In the upper end of the cap-nut 32 a recess 34 is formed, and an aperture 35 in said recess serves as a seat for a pin 36 on a washer 39, seated in the recess 34. A bolt 37, provided with a lock-nut 38, is seated in a threaded hole in the top of the cap-nut, and said bolt is designed to connect the cutter-head to its shaft.

From the foregoing it will be understood that by turning the ring 12 the sections 1 2 are relatively adjusted against the stress of the spring 26, the serrations in the meeting faces of the ring and collar serving to lock the adjustment.

While in the foregoing description particular attention has been directed to the specific cutter-head illustrated in the drawings, it will be obvious that my improvements may be applied to expansible cutter-heads of quite different constructions, and I do not wish to be understood as restricting myself in this respect.

Having thus fully described my invention, what I claim is—

1. An expansible cutter-head comprising two sections, one section of which is provided with an exterior annular groove, a ring provided with an interior annular groove, said grooves adapted to be brought into coincidence to form a raceway, and a series of balls seated in the raceway to couple the two sections together against axial separation, and

to form an antifrictional bearing for the relative rotation of the ring and cutter-head sections, substantially as described.

2. A coupling for the sections of cutter-heads, consisting of a sleeve having a circumferential groove therein, a ring fitted to said sleeve and provided with an interior groove adapted to be located coincidently to the groove in the sleeve, to form a ball-raceway, a series of balls seated in said raceway to couple the two sections of the cutter-head together against axial separation and to form an antifrictional bearing for the relative rotation of the ring and cutter-head sections, an aperture in the ring communicating with the raceway for placing the balls in said raceway, and a plug for the aperture, substantially as described.

3. A combined coupling-ring and adjusting-nut for expansible cutter-heads, said ring having an interior groove, an aperture extending through said ring and communicating with said groove, and a plug for the aperture, in combination with a sleeve on a cutter-head section having a circumferential groove formed therein, and a series of balls seated in said raceway to couple the two sections of the cutter-head together against axial separation and to form an antifrictional bearing for the relative rotation of the ring and cutter-head sections, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SAMUEL J. SHIMER.

Witnesses:

W. H. BECK,
C. F. BALLIET.