

No. 698,331.

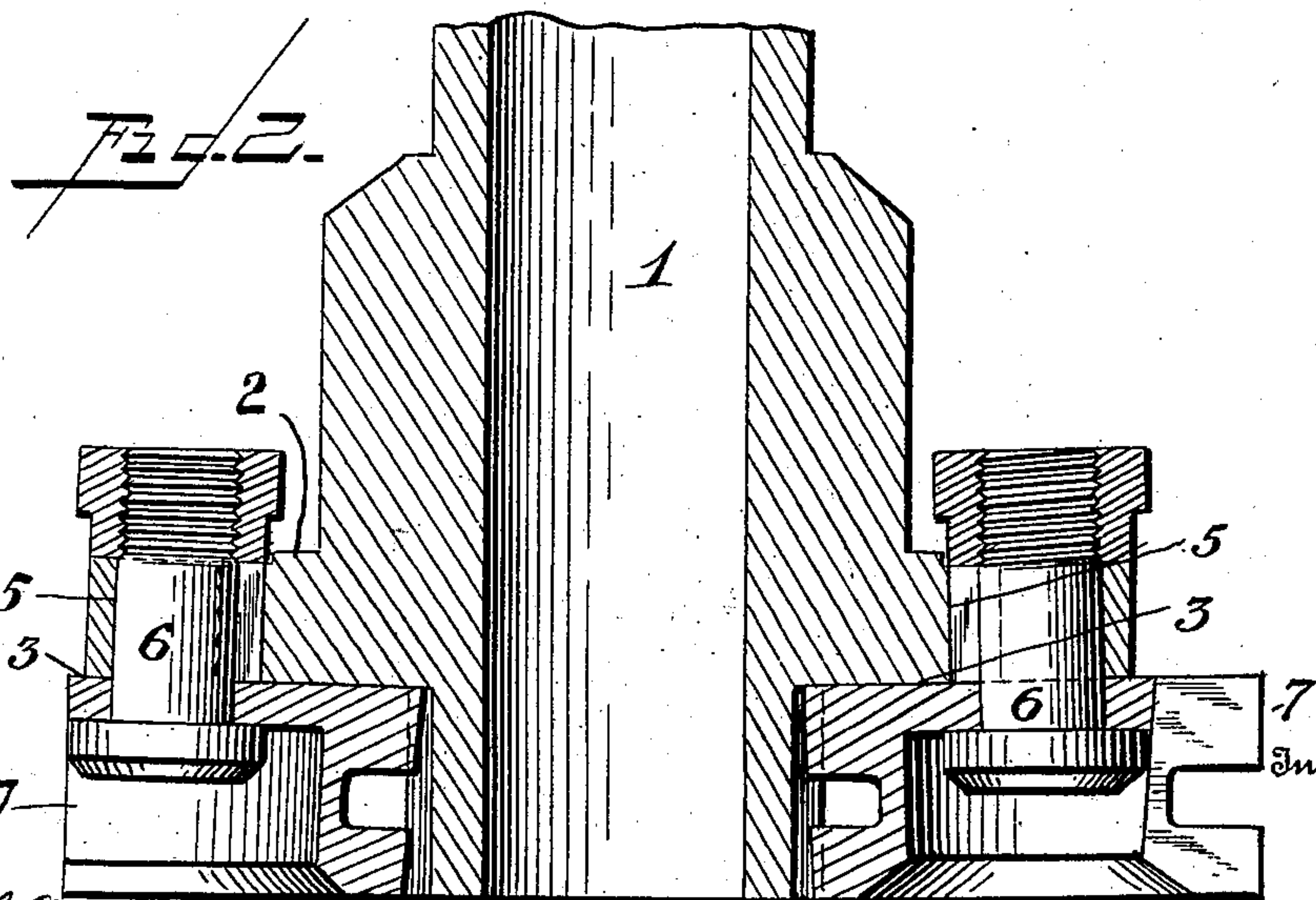
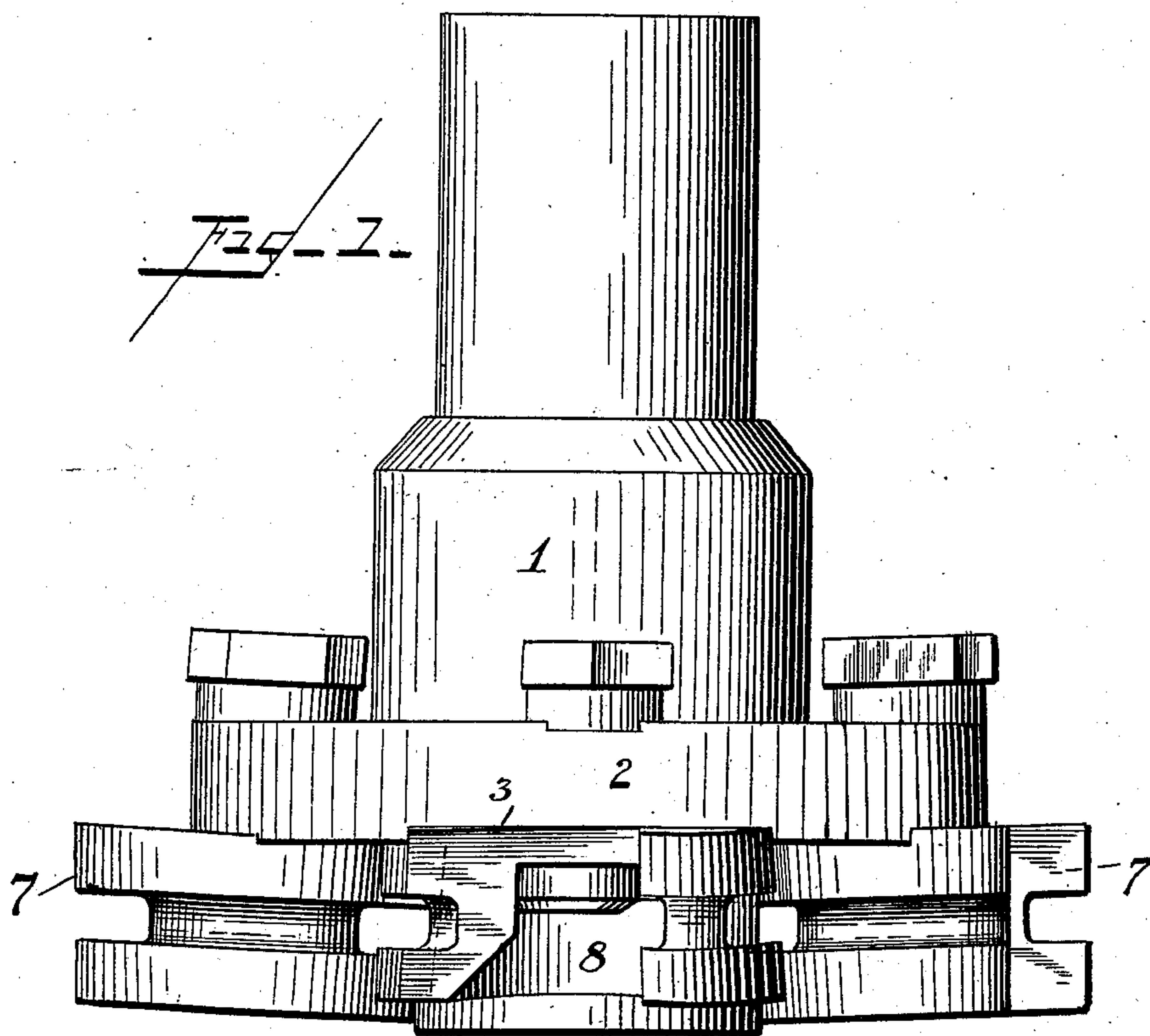
Patented Apr. 22, 1902.

E. S. SHIMER.  
CUTTER HEAD.

(Application filed Dec. 4, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
Frank L. Curand

Frank G. Radelfinger

By

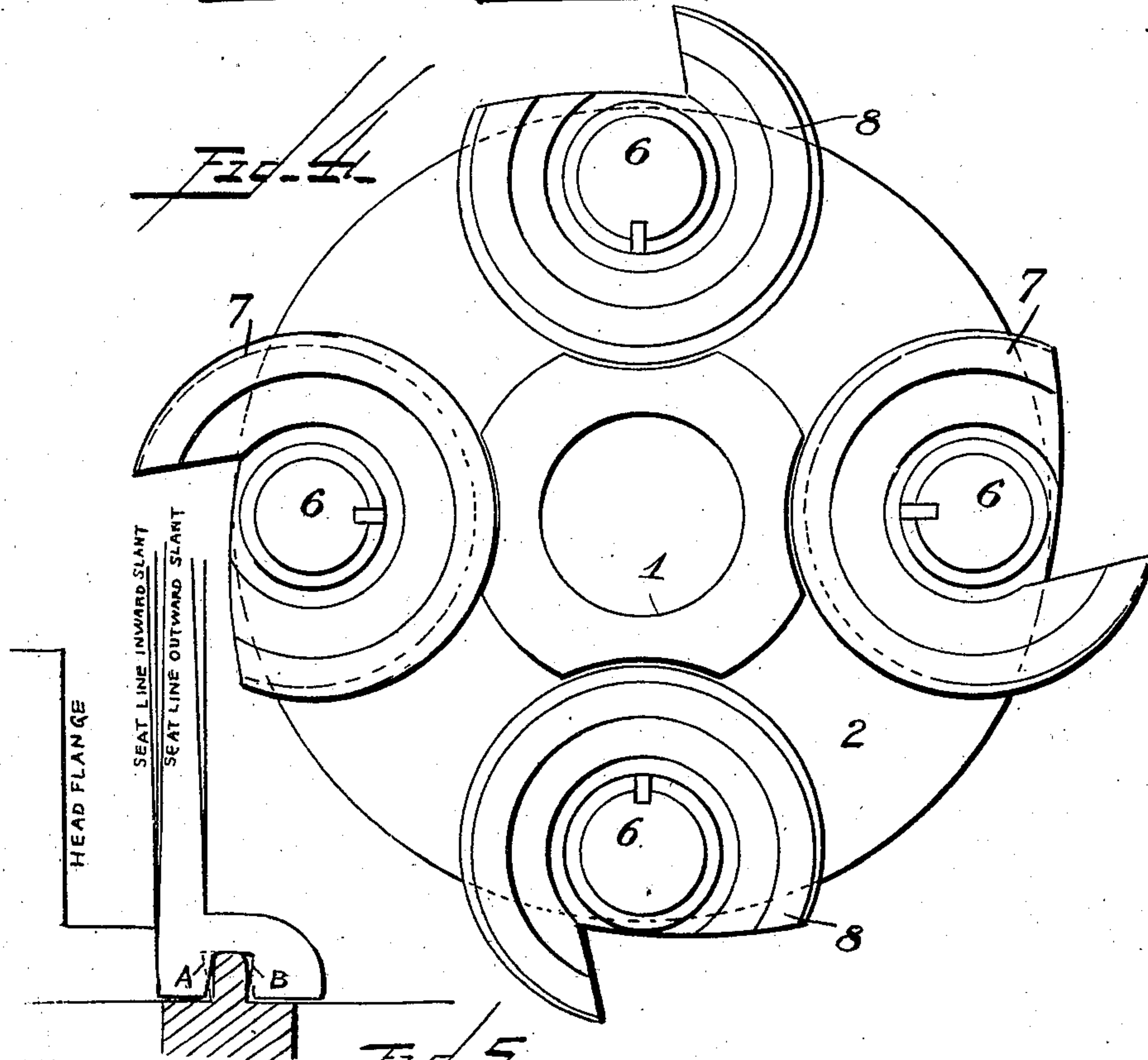
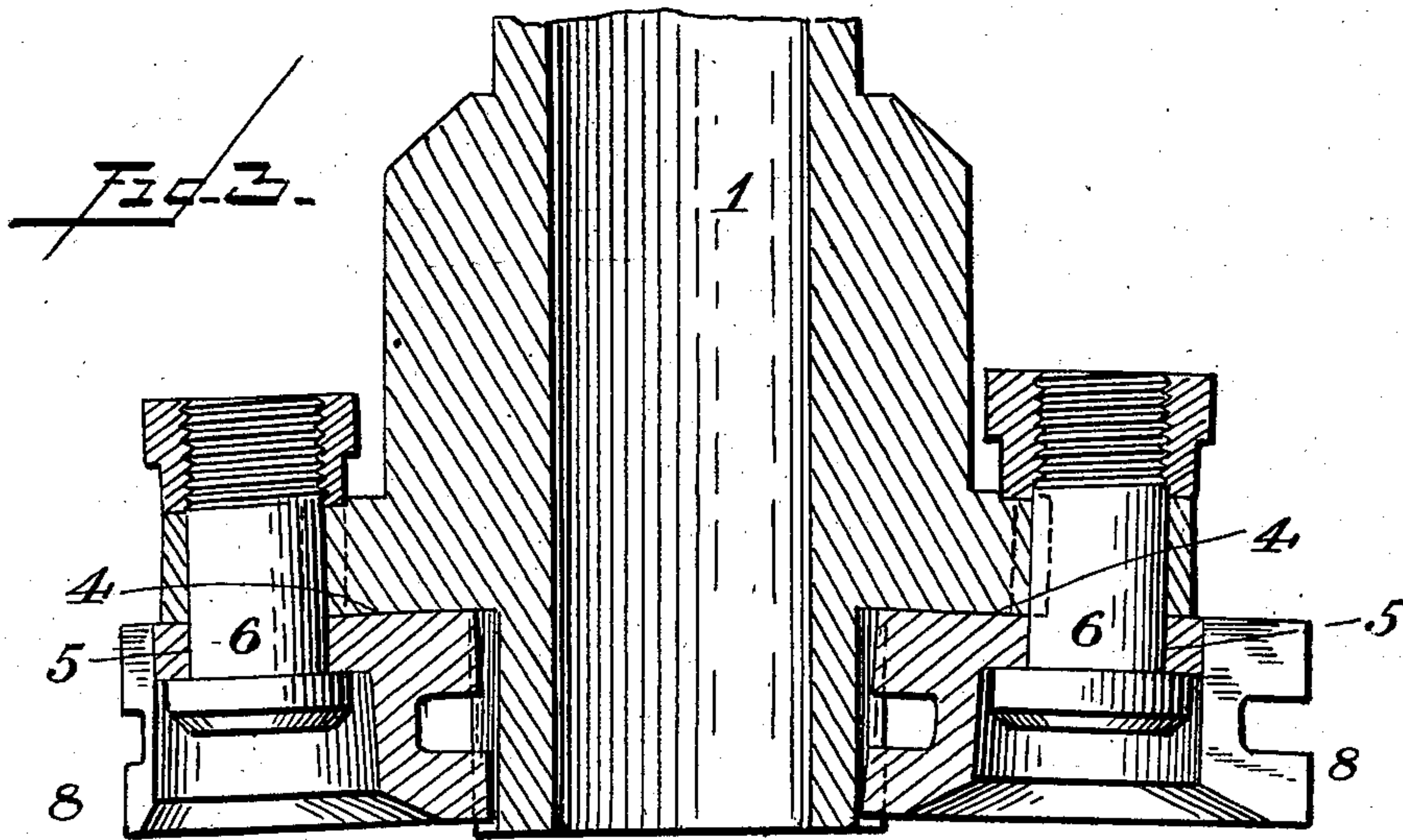
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2 Sheets—Sheet 2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

ELMER S. SHIMER, OF MILTON, PENNSYLVANIA.

## CUTTER-HEAD.

SPECIFICATION forming part of Letters Patent No. 698,331, dated April 22, 1902.

Application filed December 4, 1901. Serial No. 84,691. (No model.)

*To all whom it may concern:*

Be it known that I, ELMER S. 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 the object of the same is to construct a cutter-head of maximum compactness in which all of the bits thereon operate on the whole surface of the work exclusive of the sides of the tongue or groove. The novel construction by which this object is accomplished is described and claimed in this specification and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a side elevation of my cutter-head. Fig. 2 is a vertical longitudinal section through one set of bits. Fig. 3 is a vertical longitudinal section of the other set of bits. Fig. 4 is a bottom plan of my cutter-head. Fig. 5 is a diagrammatic view illustrating the clearance-bits of opposite inclinations.

The body of the cutter-head employed by me is of the standard non-expansible form, with a hollow hub 1 and a circular flange 2. Formed on the outer face of the flange 2, adjacent to the periphery thereof, are four bit-seats located diametrically opposite to each other, with their centers all situated at equal distances from the axis of rotation and in the same plane of rotation. The seats 3 of two of the opposed bits are downwardly inclined, as viewed in Figs. 1, 2, and 3, the angles of inclination being measured from the outer end of the radius beyond the center as the line of zero inclination and not, as in trigonometry, always from the right of the origin to radial lines drawn through their centers and lying in the said plane of rotation, while the seats 4 of the other two are upwardly inclined with respect to similarly-drawn radial lines. I may employ three or more sets of two opposed seats by giving the alternate seats an opposite inclination, measuring angles, as stated above, from the outer end of the radius and arranging those of the same inclination diametrically opposite each other.

Bolt-holes 5 pierce the seats 3 and 4, with their centers coinciding with the said centers of the seats, and accommodate bolts 6 for se-

curing the bits. Bits 7 are mounted in the seats 2, and these bits taper from their base up—that is, they are frusto-conical and seated on their large bases. Bits 8 are mounted in the seats 4, and these bits are frusto-conical and seated on their small bases—that is, they are inverted frustums.

It should be noted that the opposed bits have the same degree of inclination relative to the plane of rotation and that the axes of the opposed bits if prolonged in each direction would intersect the axis of the cutter-head. The axes of one pair of opposed bits would intersect on one side of the flange 2, while the axes of the other pair would intersect on the other side. Therefore we may say that the axes of one pair converge and the axes of the other pair diverge. The points of clearance of one set of opposed bits come on one side of the plane of revolution of the centers, while the points of clearance of the other set come on the opposite side of said plane.

The advantages of my construction can now be set forth. By arranging the bits on one side of the head the bits are admitted down into the cup, which prevents the scattering of chips around the planer-spindle to suit any machine. When arranged on alternate sides of the flange, the cup of many machines is not deep enough to accommodate the cutters. Hence the advantages of the above-described form. When the bits are arranged in alternate inwardly and outwardly inclined seats, they will cut both edges of a tongue or groove with clearance. The bits resting upon the upwardly-inclined seats will cut the upper portion of the groove, and the oppositely-inclined bits will cut the lower portion of the grooves. Tongue-bits would cut just oppositely. It will be seen that the tongue or groove would be cut with clearance at the leading portions A and B of these bits.

Another advantage of my construction is that all parts of the work but the tongue or groove itself have all the cutting edges working on it, since the broad edges of the bits are parallel to the axis of rotation of the cutter-head, (see Fig. 5,) which in the ordinary construction is only true of the overlapping portion. This is very important, as in matched lumber the quality of the tongue and groove



is largely judged by the smoothness of the square face above and below the tongue. In general the smoothness of a face is proportioned to the number of cutting edges working on it. Therefore by means of my improved cutter the finish of the work will be greatly improved.

Having described my invention, what I claim as new, and wish to secure by Letters Patent, is—

1. The combination with the body of a cutter-head comprising a hub bearing a circular flange, of inclined surfaces constituting bit-seats, formed on one side of said flange with their centers in the same plane of revolution, said seats being arranged diametrically opposite each other in pairs and there being two pairs, the opposed seats having the same degree of inclination with respect to the plane of revolution, the axes of one pair of diametrically-opposed seats converging and intersecting the axis of the cutter-head, the axes of the other pair of opposed seats diverging and intersecting the axes of the head, and bits mounted in said seats, substantially as described.

2. The combination with the body of a cutter-head comprising a hub bearing a circular flange, of inclined surfaces constituting bit-seats with their centers lying in the same plane of revolution, said seats being arranged diametrically opposite each other in pairs and there being two pair, the axes of one pair of

diametrically opposite seats converging and intersecting the axis of said cutter-head on one side of said flange, and the axes of the other pair diverging and intersecting the axis of said cutter-head on the other side of said flange, a pair of upright frusto-conical bit-seats in one pair of opposed seats and inverted frusto-conical bits seated in the other pair of opposed seats, said bits being secured by bolts fitting said apertures, substantially as described.

3. The combination with the body of a cutter-head comprising a hub bearing a circular flange, inclined surfaces constituting bit-seats formed on one side of said flange with their centers in the same plane of revolution, said seats being arranged diametrically opposite each other in pairs and there being two pair, the axes on one pair of diametrically-opposed seats converging and intersecting the axis of the cutter-head on one side of said flange, the axes of the other pair of opposed seats diverging and intersecting the axis of the cutter-head on the other side of said flange, and bits mounted in said seats, substantially as described.

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

ELMER S. SHIMER.

Witnesses:

PETER J. CRISTE,  
EDWIN PAUL.