

(Model.)

3 Sheets—Sheet 1.

S. J. SHIMER.
CUTTER HEAD.

No. 581,178.

Patented Apr. 20, 1897.

Fig. 1.

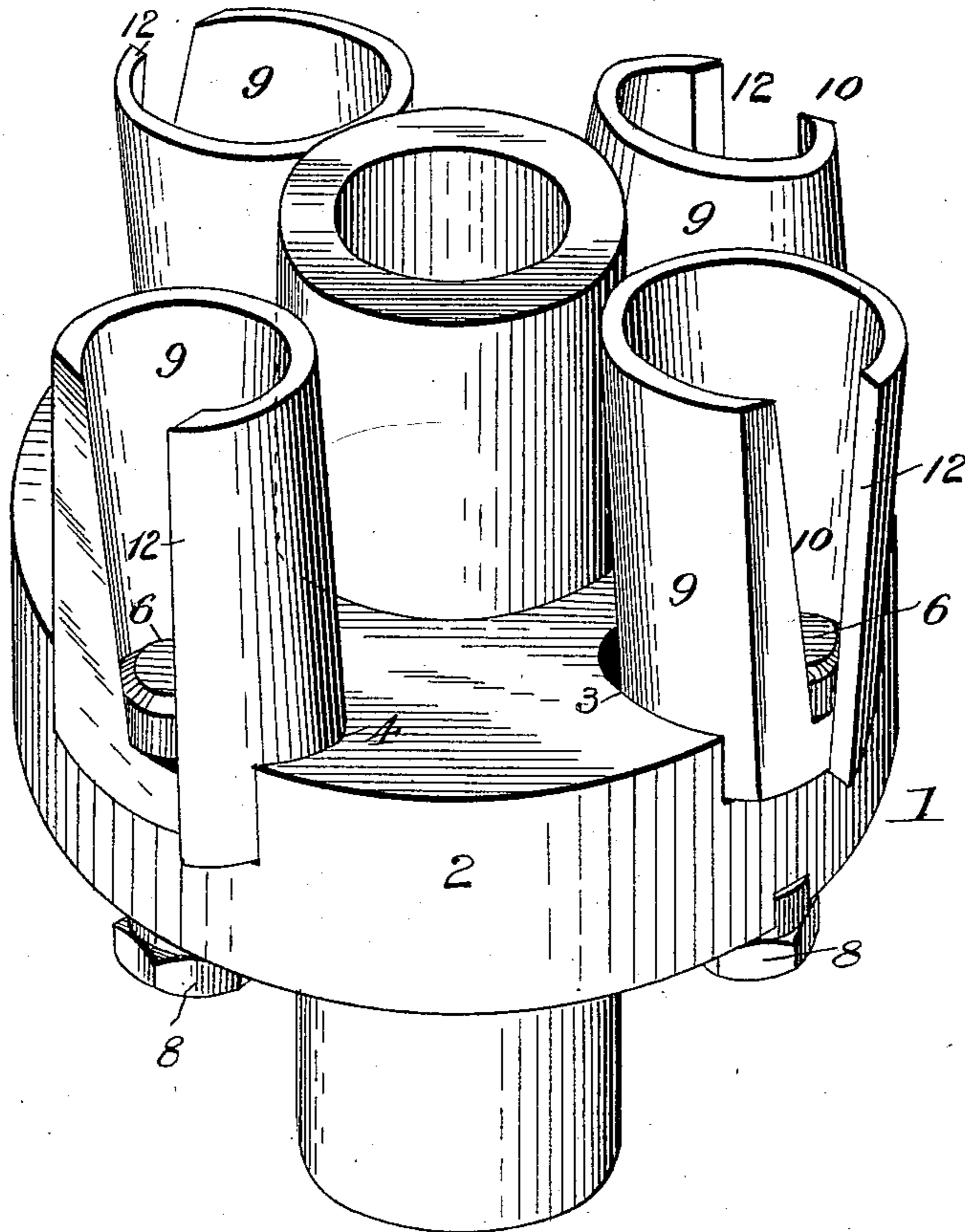
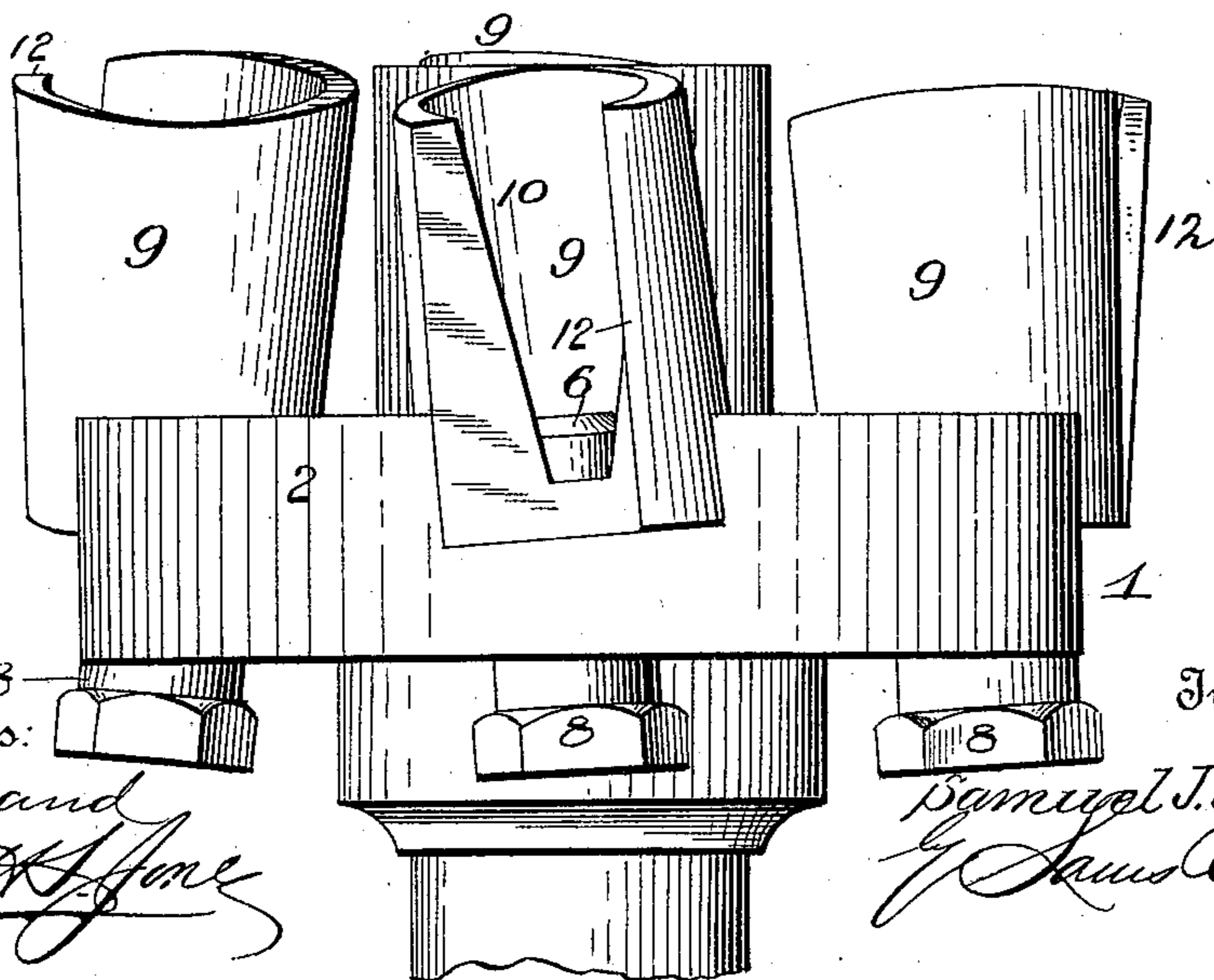


Fig. 2.



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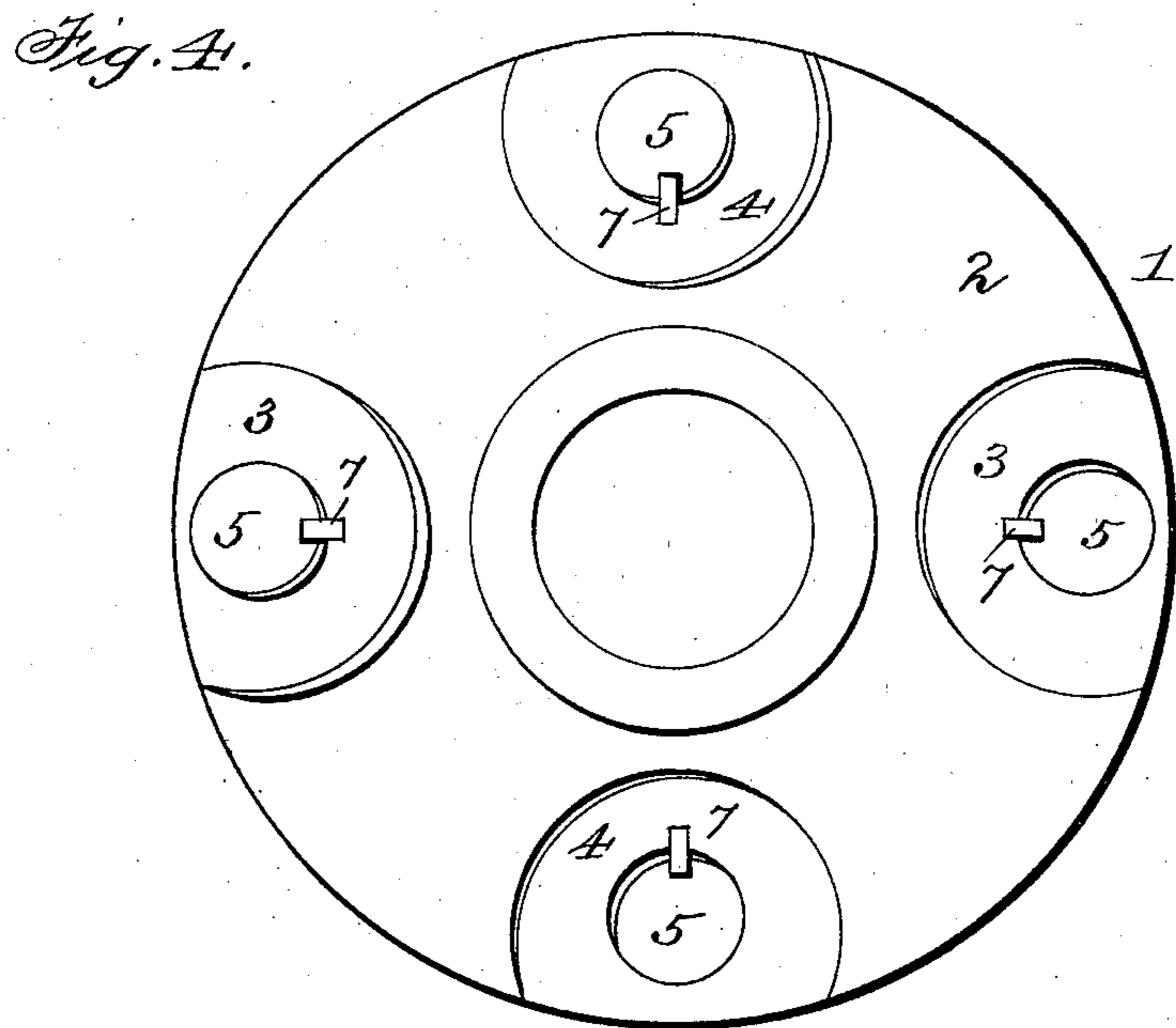
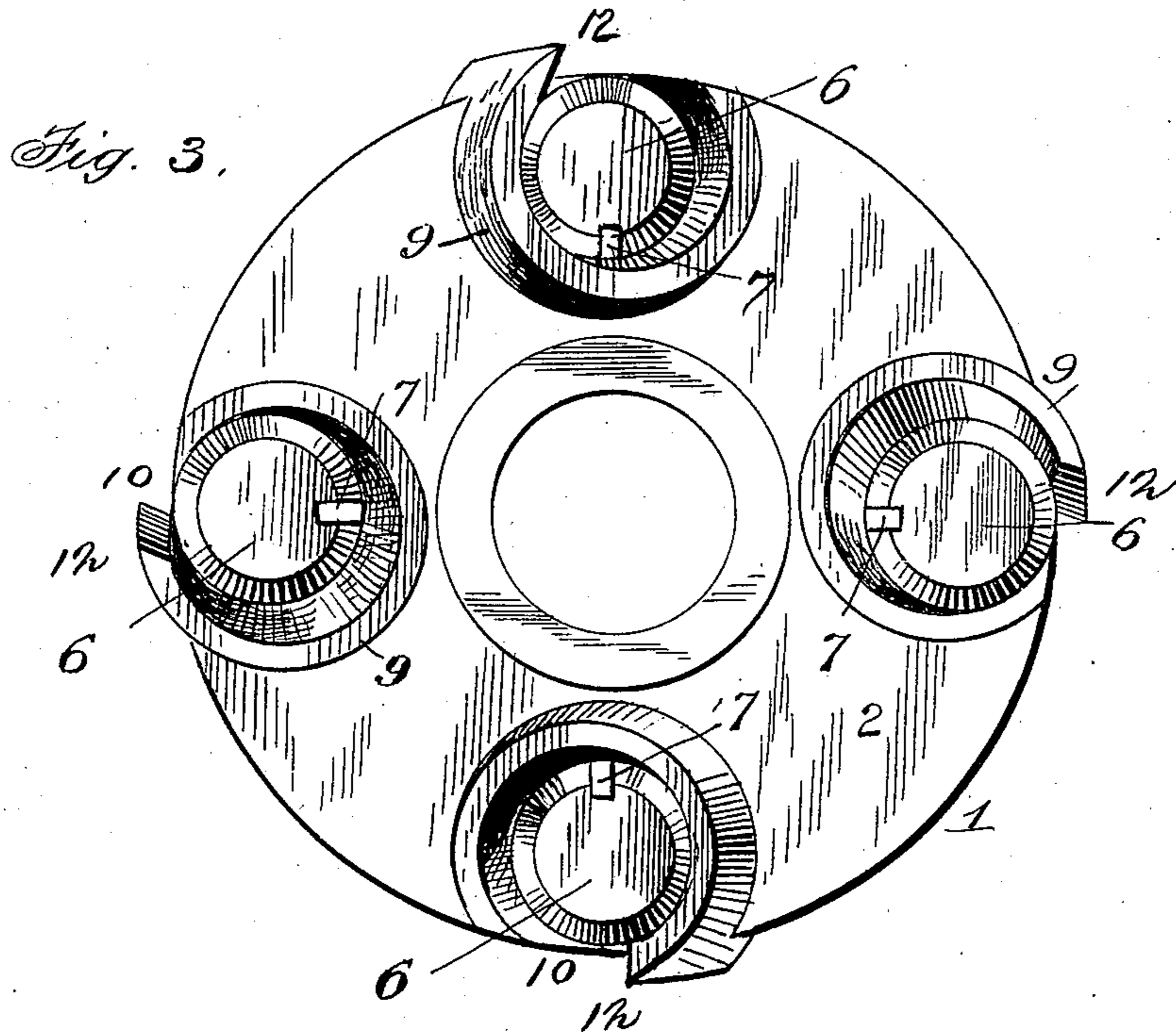
(Model.)

3 Sheets—Sheet 2.

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CUTTER HEAD.

No. 581,178.

Patented Apr. 20, 1897.



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3 Sheets—Sheet 3.

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Fig. 5.

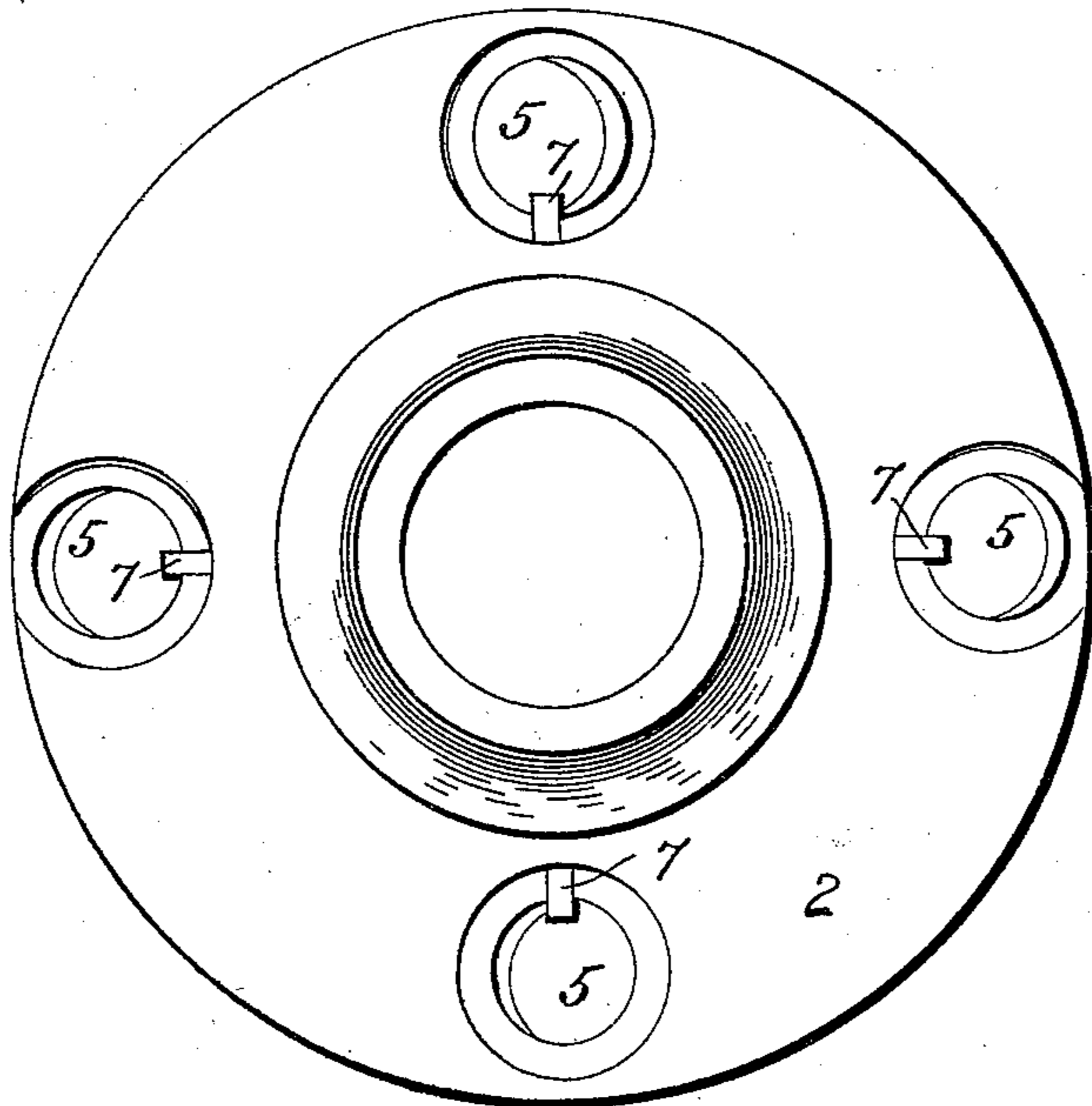
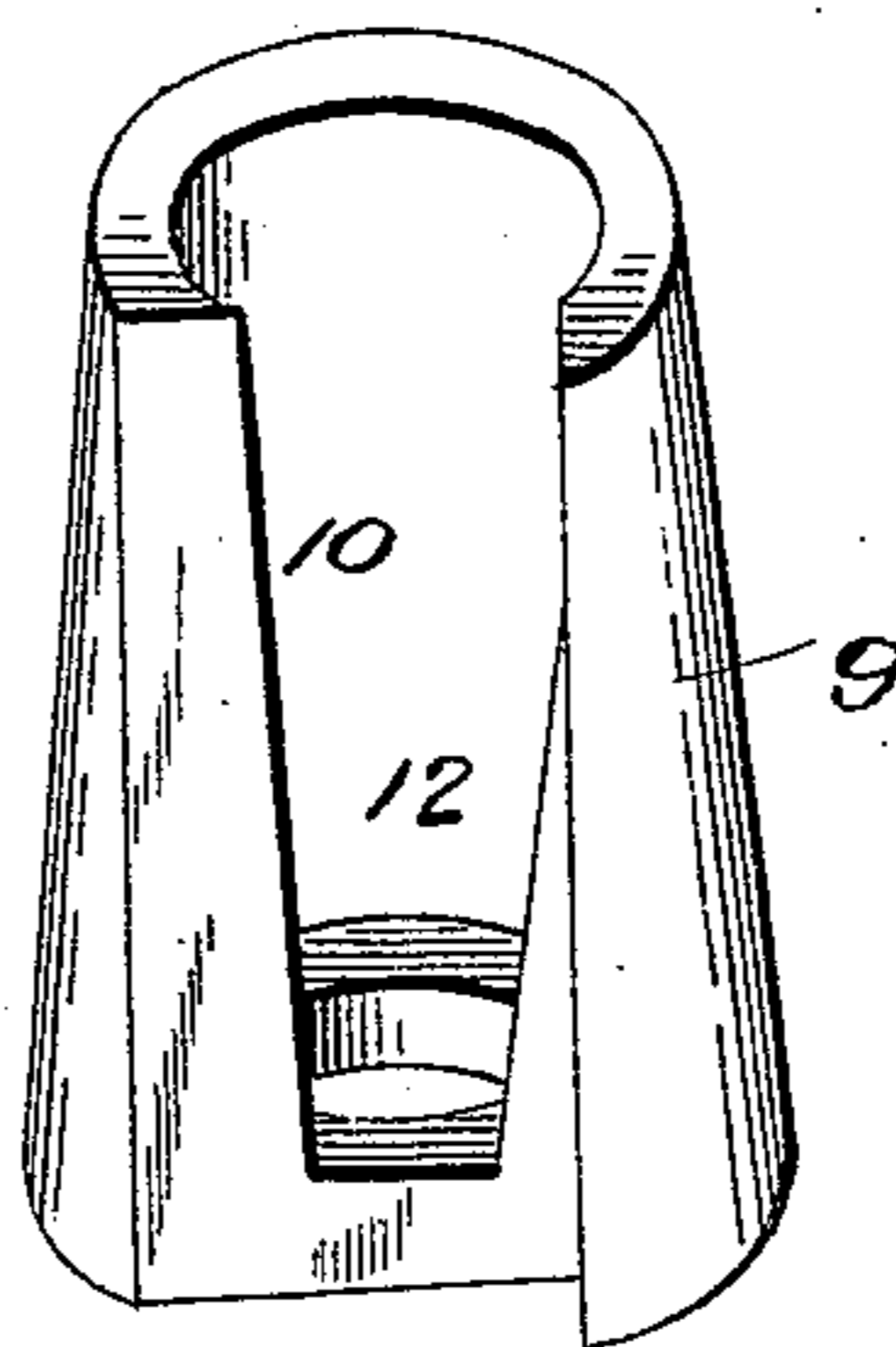
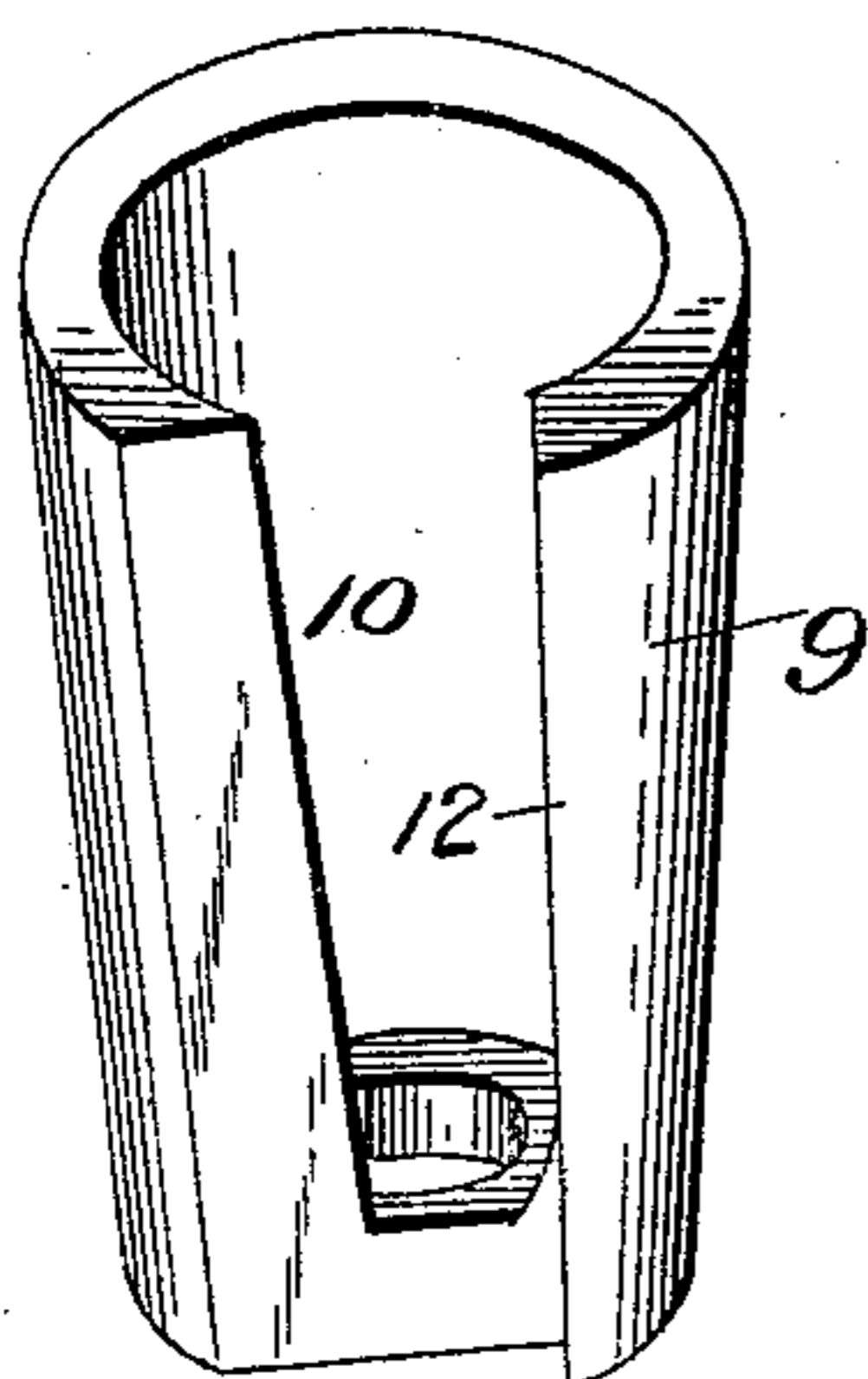


Fig. 6.



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UNITED STATES PATENT OFFICE.

SAMUEL J. SHIMER, OF MILTON, PENNSYLVANIA.

CUTTER-HEAD.

SPECIFICATION forming part of Letters Patent No. 581,178, dated April 20, 1897.

Application filed August 18, 1896. Serial No. 603,151. (Model.)

To all whom it may concern:

Be it known that I, SAMUEL J. SHIMER, a citizen of the United States, and a resident of Milton, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Cutter-Heads; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in rotary cutter-heads for wood-planing machines which have circular bits secured to inclined seat-surfaces upon one or both upper and lower sides of the head-flange; and the object of the invention is to so construct the same that the bits upon either side of the flange will cut in alternate opposite directions diagonally across the surface of the board.

Heretofore cutter-heads having circular bits secured to the head-flange eccentric to the cutter-head and exterior to the axis of rotation have had their bits or cutters arranged upon one common circle about the head-center for surfacing or cutting upon one and the same plane surface, and all the bits seated to one common surface cut were secured to one or the other side of the head-flange at relatively equal distances from the center of the cutter-head.

The present invention consists, essentially, in locating each alternate seat upon one and the same side of the head-flange at unequal distances from the center of the head at an incline alternately inwardly and outwardly and forwardly and rearwardly of the axial line of the head in such manner as to harmonize the cutting edge of each alternate bit with the surface of a cylinder of rotation in alternate opposite directions.

In carrying out the invention I locate each alternate seat upon a different circle described about a common head-center and so incline the seat located upon the larger circle that the bit secured thereto at the limit of its cutting width is central with the smaller circle, and for the next bit following I locate the seat central with the smaller circle and incline the bit secured thereupon so that at the

limit of its cutting edge it is central with the larger circle.

In the accompanying drawings, Figure 1 is an inverted perspective view of a cutter-head constructed according to my invention, showing the bits secured to the lower side only. Fig. 2 is a side elevation of the same. Fig. 3 is a bottom view. Fig. 4 is a similar view, the bits being removed. Fig. 5 is a plan view of the head, the bits being removed. Fig. 6 is a perspective view of two of the bits detached.

In the said drawings the reference-numeral 1 designates the cutter-head, and 2 the flange thereof, formed in the present instance with four bit-seats 3 3 and 4 4 on the lower side, which are alternately inclined inward and outward and forward and rearward of the axial line of the head. These bit-seats are alternately described on different circles, so that the bolt-holes 5 and bolts 6, which center the bits in their seats, are at alternately unequal distances from the center of the head. (See Figs. 4 and 5.) The bolt-holes are inclined at a right angle to the face of the bit-seats.

The numeral 7 designates a key fixed in the bolt-holes and adapted to engage with a groove in the bolt to prevent rotation of the latter, and 8 designates the securing-nuts.

The numeral 9 designates the bits, having flat circular seats which engage with the seats in the head-flange. These bits are conical in shape and formed with a clearance 10, and the cutting edges are at right angles with the faces of the seats and in line with the axial line of the several bits secured to these seats, and they agree with the cylinder of revolution common to a cutter-head of the diameter herein shown.

The bits, as before stated, are conical in shape, and the large and small ends thereof are alternately secured to the bit-seats in the head-flanges, and owing to the inclination of said seats will alternately incline or slant in opposite directions, and as each alternate bit-seat is described upon a different circle about a common head-center the bit secured to the head on the larger circle at the limit of its cutting width is central with the smaller circle.

It will be observed that all the bits secured

to the seat formed upon the larger circle slant one way and all the seats formed upon the smaller circle slant in the other or opposite direction.

5 It will be seen that the cutting edges of the several alternate bits are in line with the surface of revolution common to the surface-cut diameter of the cutter-head and that they terminate their several edge curvatures in line
10 with the cylinder of revolution in alternate opposite directions to cut a plane surface.

The bit-seats diametrically opposite to each other are equidistant from the center of the head, and said seats are alternately inclined
15 toward and away from each other in alternate opposite directions upon the head-flange.

It will also be noticed that the bit-seats are alternately inclined forwardly and rearwardly of the axial line of the head, and they
20 also incline inwardly and outwardly by as much as the bits incline forwardly and rearwardly to bring their cutting edges within the cylinder of rotation common to the surface-cut diameter of the cutter-head. The
25 said bits are inversely conical in contour and have elliptical cutting edges—that is to say, the one bit which is larger at the seat-line tapers to a smaller diameter throughout its length and the next bit which follows is
30 smaller at the seat-line and tapers to a larger diameter throughout its length when made to harmonize with the seat inclinations on the cutter-head.

It will be obvious that bit-seats can be
35 formed and bits applied to each upper and lower face side of the flange of the cutter-head.

Having thus described my invention, what I claim is—

40 1. As an improved article, a cutter-head formed with circular bit-seats alternately described on different circles from a common center, and alternately inclined inwardly and outwardly and forwardly and rearwardly of
45 the axial line of the head, and the seats which

are formed with their centers on the circle more remote from the axis of the cutter-head being smaller than those formed with their centers upon the circle nearer said axis, substantially as described. 50

2. As an improved article, a cutter-head having a flange formed with circular bit-seats upon one or both sides, and the seats upon either side alternately described upon different circles from a common center and alternately inclined inwardly and outwardly and forwardly and rearwardly of the axial line of the head, and the seats which are formed with their centers on the circle more remote from the axis of the cutter-head being smaller than
60 those formed with their centers upon the circle nearer said axis and said seats formed with bolt-holes at alternately unequal distances from the head-center and inclined at right angles to the faces of the bit-seats, substantially as described. 65

3. The combination with a cutter-head formed with circular bit-seats alternately inclined inwardly and outwardly and forwardly and rearwardly of the axial line of the head
70 and alternately described on different circles common to the head-center, of the conical bits having their large and small ends alternately secured to said bit-seats, substantially as described. 75

4. The combination with the cutter-head, of the conical bits formed with elliptical cutting edges, and having their large and small ends alternately secured to said head, and alternately inclined inwardly and outwardly
80 and forwardly and rearwardly of the axial line of the head, substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

SAMUEL J. SHIMER.

Witnesses:

W. H. BECK,
C. F. BALLIEF.