(No Model.) 3 Sheets—Sheet 1.

S. J. SHIMER.

CUTTER HEAD FOR WOOD WORKING MACHINES.

No. 451,311. Patented Apr. 28, 1891.

Fig. 1.

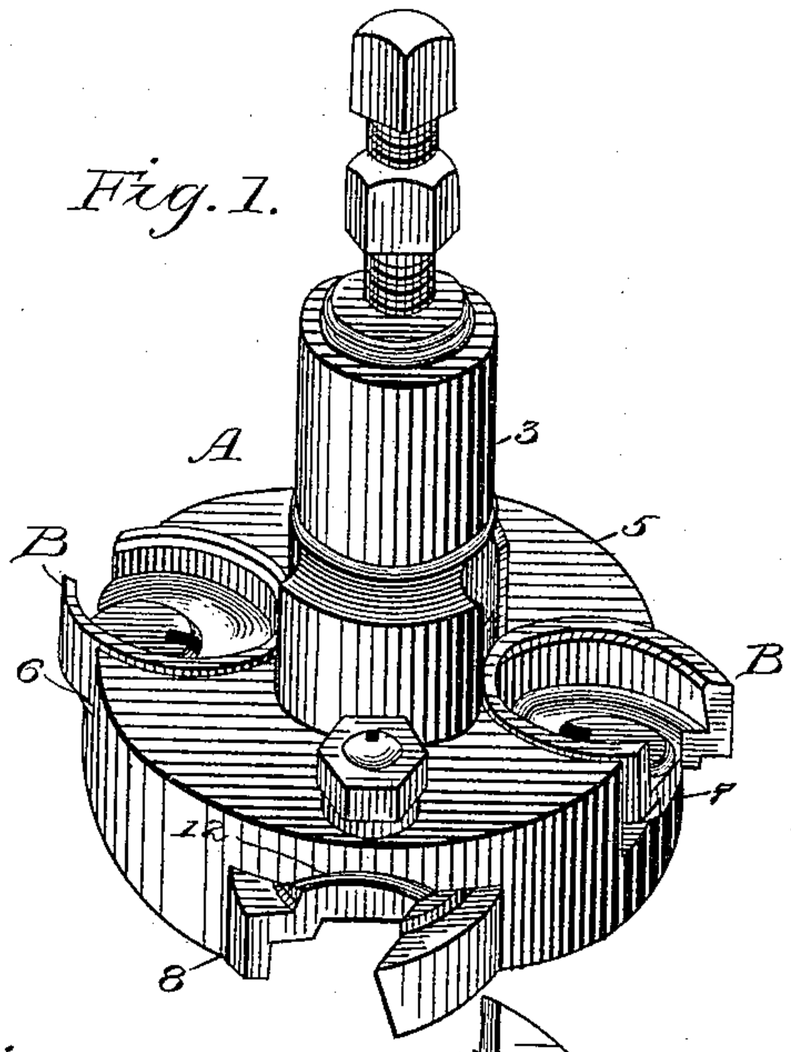
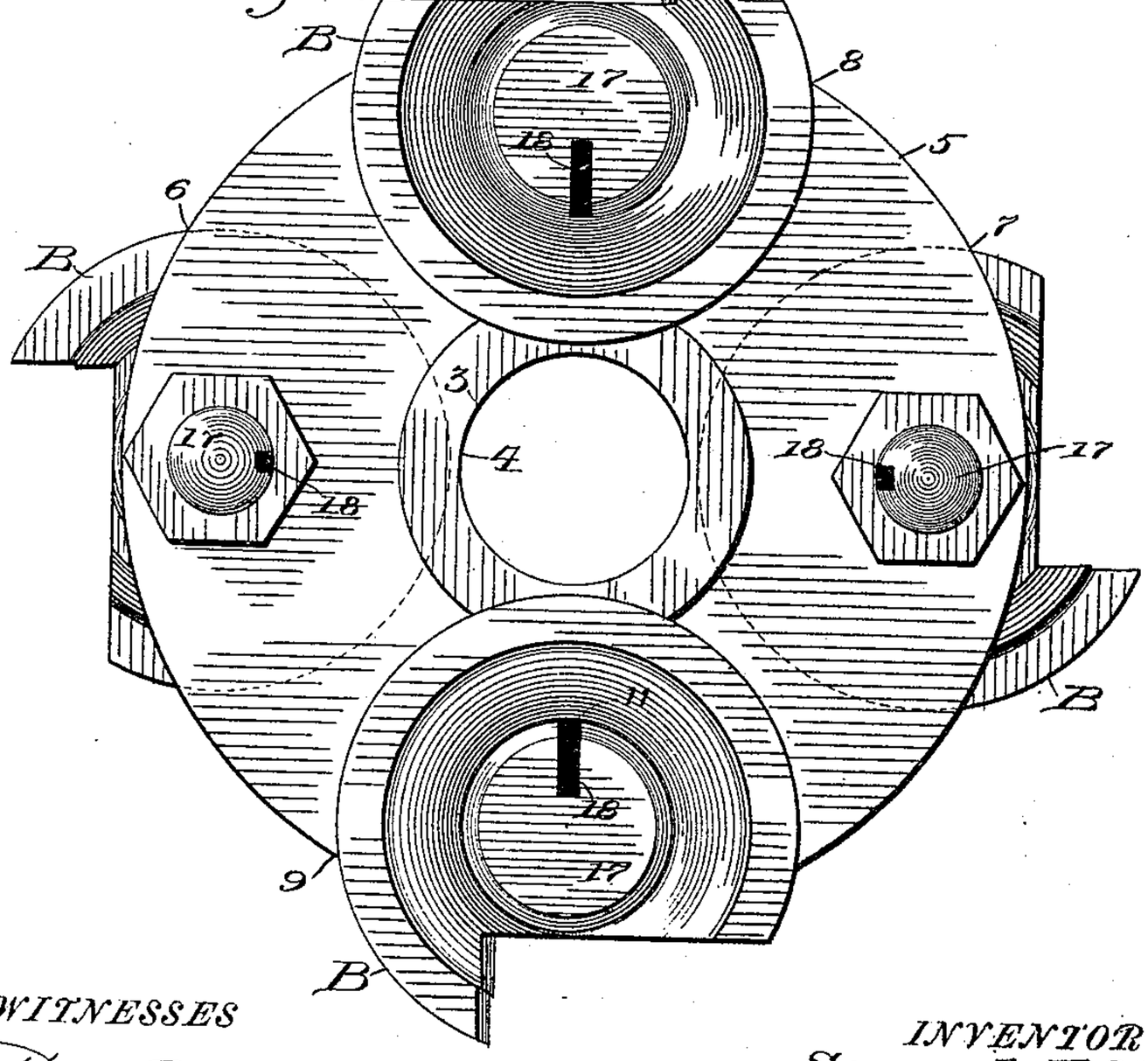


Fig. 2.



WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

S. J. SHIMER.

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Fig. 3.

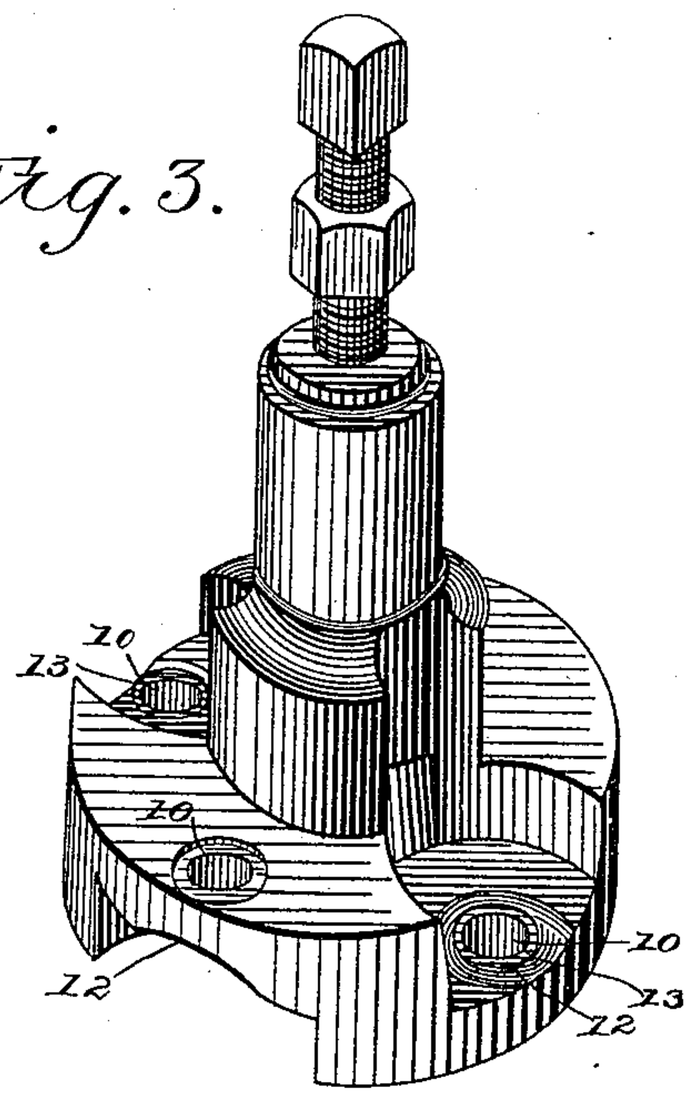
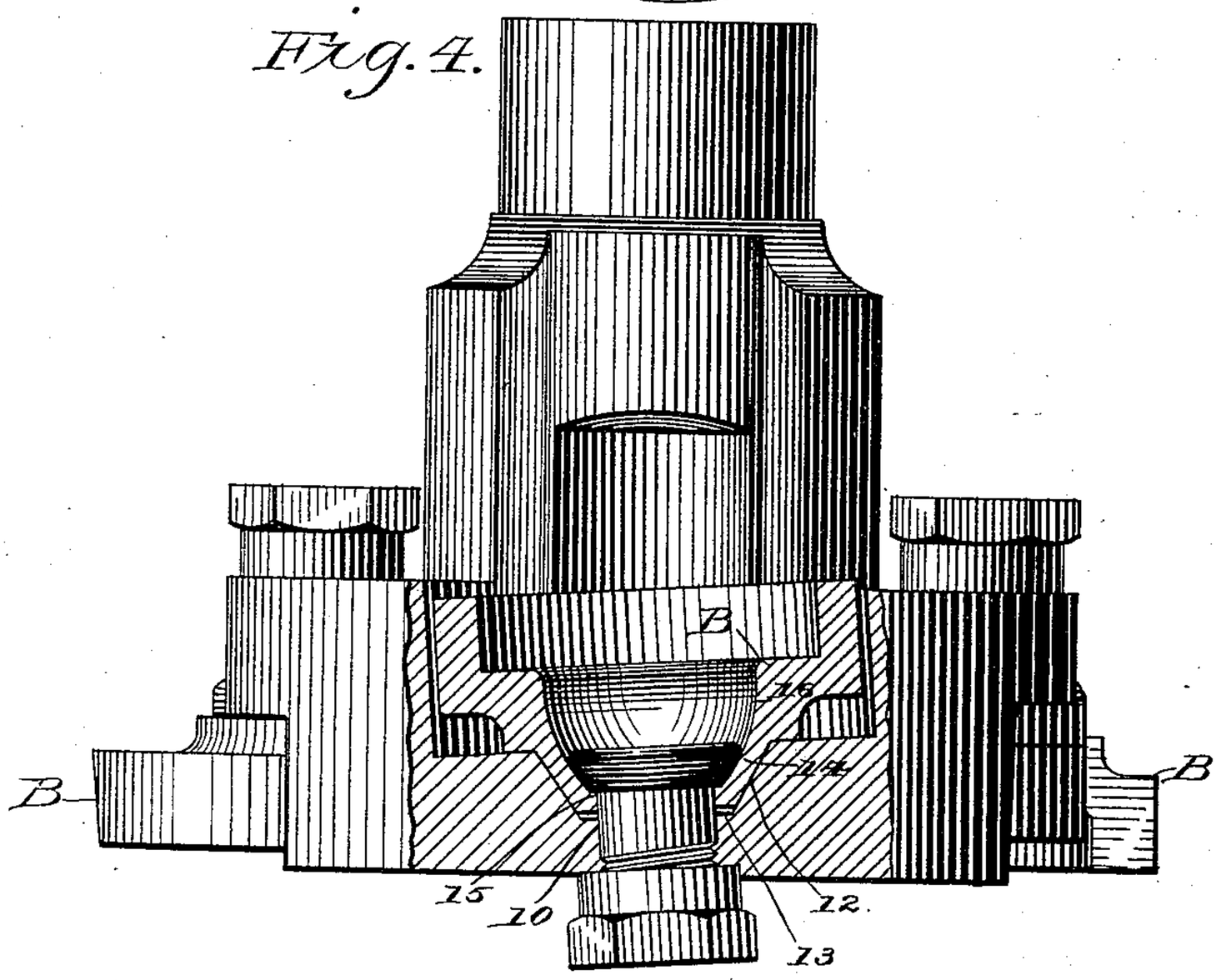


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

S. J. SHIMER.

CUTTER HEAD FOR WOOD WORKING MACHINES.

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Fig. 5.

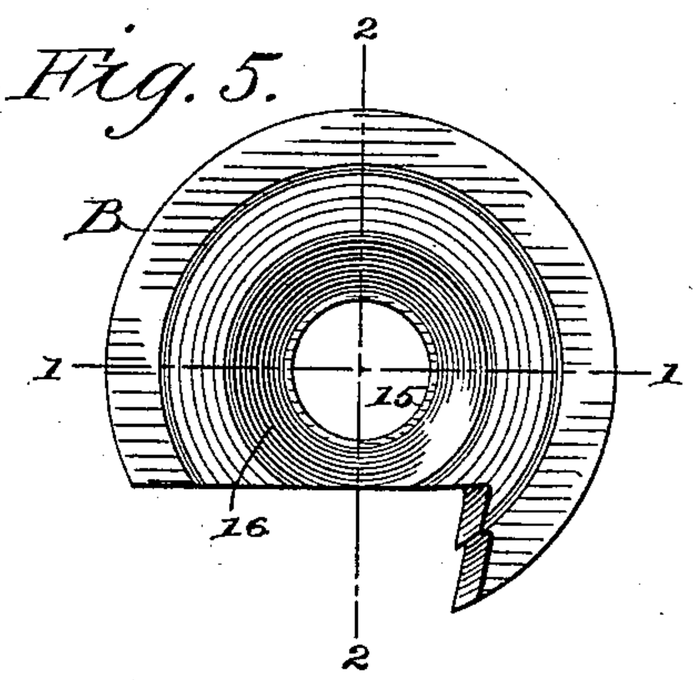


Fig. 6.

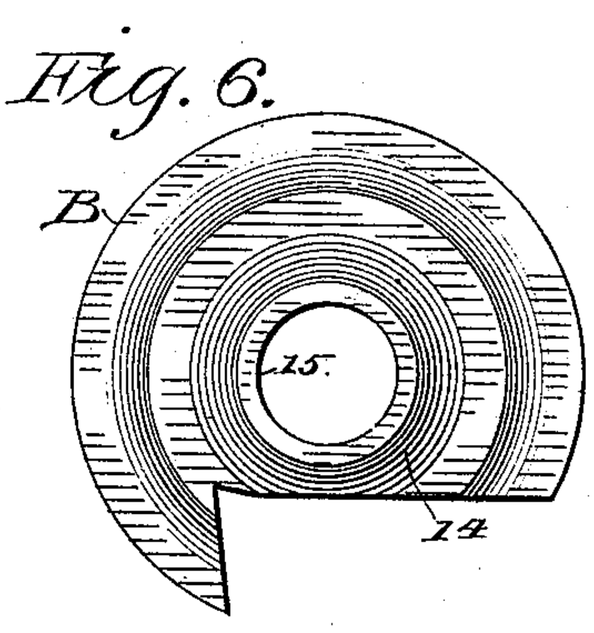


Fig. 8.

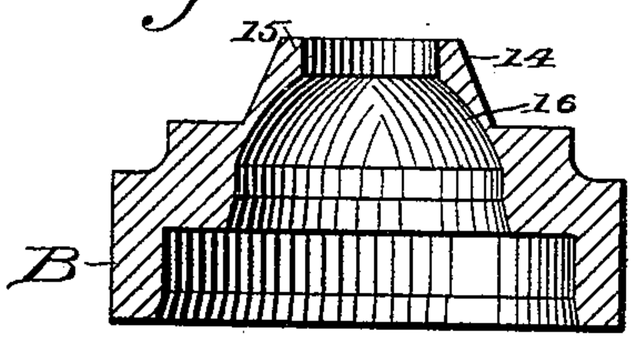


Fig. 9.

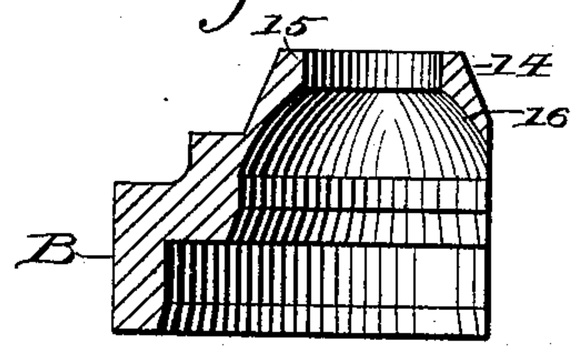


Fig. 7.

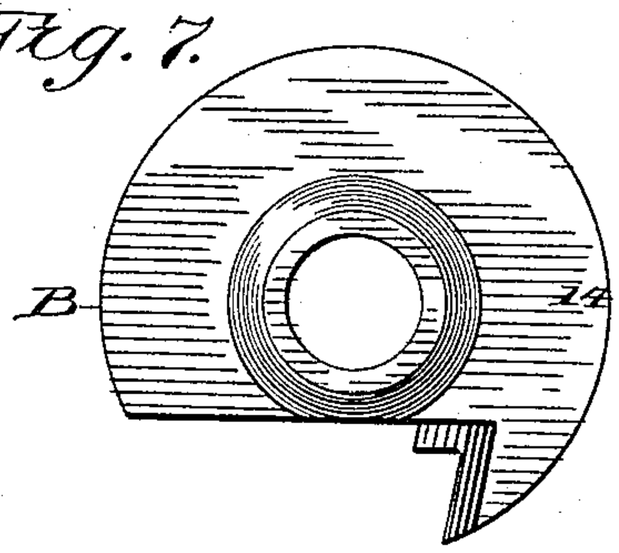
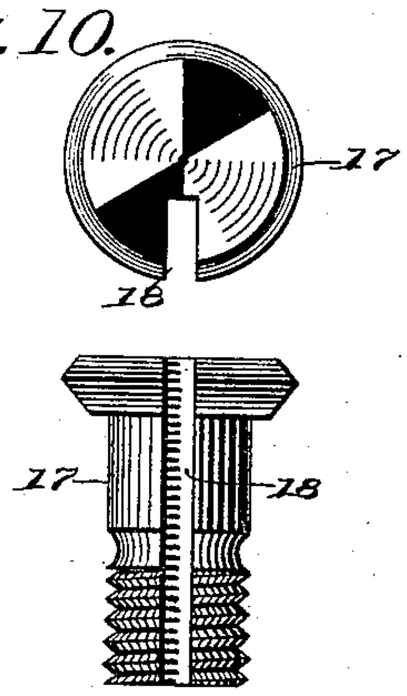


Fig. 10.



WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL J. SHIMER, OF MILTON, PENNSYLVANIA.

CUTTER-HEAD FOR WOOD-WORKING MACHINES.

SPECIFICATION forming part of Letters Patent No. 451,311, dated April 28, 1891.

Application filed July 18, 1890. Serial No. 359,202. (No model.)

To all whom it may concern:

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

My invention has relation to cutter-heads for wood-working machines of that class wherein the cutter-head is secured to a vertically-rotatable spindle or arbor and provided with bit-seats formed on opposite surfaces of the body-flange of the cutter-head, and having bits in the bit-seats arranged to give a clearance cut in tongue-and-groove cutting, usually styled "matcher-heads;" and the object is to provide improved constructions for securing the bits in their seats in the cutter-head.

My invention therefore consists in the novel construction of parts or elements and their combination, as will be fully specified, and particularly pointed out in the claims.

My invention is generally designed to improve cutter-heads of that construction shown and described in United States Letters Patent No. 261,266, dated July 18, 1882.

I have fully illustrated my invention in the accompanying drawings, wherein—

Figure 1 is a perspective of my improved cutter-head equipped with bits. Fig. 2 is a bottom view of the same. Fig. 3 is a perspective of the head without the bits. Fig. 4 is a vertical central sectional view showing the bits in the seats and one of them removed. Fig. 5 is a top view of a bit. Fig. 6 is a bottom view of a bit. Fig. 7 is a bottom view of another form of bit. Fig. 8 is a section on the line 1 1 of Fig. 5. Fig. 9 is a view on the line 2 2 of Fig. 5. Fig. 10 is a view of the clamping-bolt.

A designates the cutter-head, formed with a hub 3, having a bore 4 for the spindle and formed with an extending body part 5, constituting the part or flange in which are located the bit-seats. These bit-seats are arranged in pairs, two 6 7 being oppositely arranged in the upper face, and two 8 9 being oppositely arranged in the under surface at right angles to those above, so that the bits are carried by the head at substantially right angles to each other at radii of the flange.

The bottoms or floors of the respective bit-seats have a general inclination to the plane of revolution of the cutter-head, the two upper seats being inclined upward and the two lower ones inclined downward from the direction of rotation, so that the bits secured therein may have their proper relative positions and be given the requisite clearance in the cut. Substantially in the center of each bit-seat, were the circle of the seat completed, is formed a bolt-hole 10, to receive the bolts which hold the respective bits in their seats, and within each bolt-hole is a lug 11, which engages a groove 18 in the bolts and keeps them from turning when being screwed up or when removing the holding-nuts. As the lug 11 need not extend the entire length of the bolt-hole, but may be formed near the lower end thereof, it is not shown in Fig. 3.

The description thus far given applies generally to the form or construction of cutter-head shown and described in the Letters Patent of July 18, 1882, heretofore cited.

My present invention as applied to the cutter-head consists in constructing the bit-seats in the cutter-head with a dished-out middle portion 12, forming a cup-shaped or conical depression, constituting a seat to receive and hold the similarly-shaped bottom of the bits. The wall of the conical seats terminates preferably in an annular flange or shoulder 13, surrounding the hole through which the clamping-bolt passes.

B designates the bits, which are of the circular form employed in matcher-cutter heads for tonguing and grooving boards.

My invention as forming a part of the bits consists in making them with a conical bottom or middle portion 14, surrounding the bolt-hole in the bit and adapted to set flush in the depressions or bit-seats in the head, so that the clamping-bolts will draw them tight on the head. The bottom of the conical or cup-shaped projection preferably terminates in an annular rim-flange 15, which leaves the wall of the conical part stronger at this part and less liable to chip or crack. About the top of the conical bottom may be a shoulder, or the extended flange of the bit may be ex-

tended immediately therefrom, as shown in Figs. 6 and 7 of the drawings. The interior of the bits is dished out, as seen at 16, making the middle portion surrounding the bolt-hole concavo-convex, the concave surface forming a conical seat for the under face of the clamping-bolts 17. The clamping-bolts have a groove 18 cut in them, in which the lug 11 sets when the bolt is in place, and, as stated, the bolts are thereby kept from turning when being tightened or loosened.

The conical constructions of the bottoms and the bit-seats give a stronger grip on the bits in the seats in the head than in the flat-bottomed connections. The bits also have a greater seating-surface and are located out of the direct line of the force of the cut.

It will be perceived by examination of the drawings that the bits rest in the conical seats and do not rest on the extensions surrounding them. The construction also serves as a guide in keeping the bits accurately in position when loosened and when adjusting them.

Having thus described my invention as required by the statute, I proceed to particularly point out and declare what I claim as follows:

1. In combination, the cutter-head formed with bit-seats having the middle portions around the bolt-holes dished out into conical-shaped seats, circular cutting-bits formed with conical-shaped bottoms projecting from the body of the bit to set in the bit-seats of the cutter-head, and clamping-bolts projected through the bits and head, substantially as described.

2. In combination, the cutter-head formed with inclined bit-seats alternately arranged on opposite sides of the head-flange and formed with conical depressions in their middle portions, circular bits in the bit-seats, formed with conical projections on their bottoms to set in the conical depressions of the seats in the head, and clamping-bolts projected through the bits and head, substantially as specified.

3. In combination, the cutter-head having inclined bit-seats alternately arranged on opposite sides of the head-flange and formed with conical depressions in the middle portions, circular cutting-bits in the bit-seats, formed with concavo-convex portions surrounding the bolt-holes to set in the conical depressions of the bit-seats and take the under side of the head of the clamping-bolts, and clamping-bolts having heads to set in the concavity of the bit, substantially as described.

4. The circular bit for a cutter-head herein described, consisting of a body formed with a cutting-flange, a clamping-bolt hole, and a conical-shaped bottom portion projecting from the body of the bit and surrounding the bolt-hole, substantially as and for the purpose specified.

5. The circular bit for a cutter-head herein described, consisting of a body formed with a cutting rim or flange, a clamping-bolt hole, and a concavo-convex middle portion projecting from the body of the bit and surrounding the bolt-hole, substantially as and for the purpose specified.

6. The cutter-head herein described, formed with bit-seats alternately arranged on opposite sides of the head-flange, bolt-holes in the seats, and conical depressions surrounding the bolt-holes, which latter are in parallel plane with the spindle-bore of the cutter-head, substantially as and for the purpose specified.

In witness whereof I have hereunto set my hand in the presence of two attesting witnesses.

SAMUEL J. SHIMER.

Attest:
ELMER S. SHIMER,
JOHN A. BECK.