J. DuBOIS.

CUTTER-HEAD.

No. 192,242. Patented June 19, 1877.

Fig. 1.

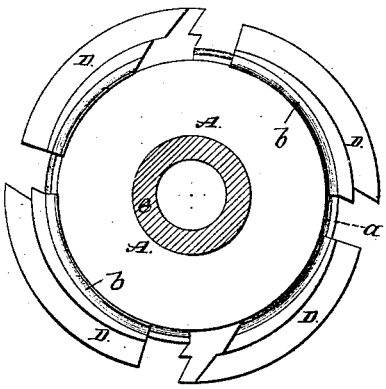



Fig. 6.

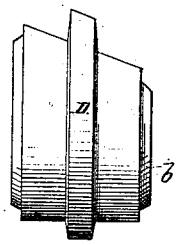



Fig. 5.

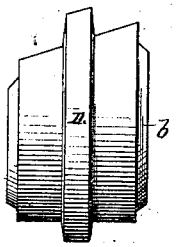



Fig. 3.

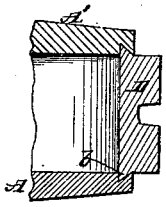



Fig. 2.

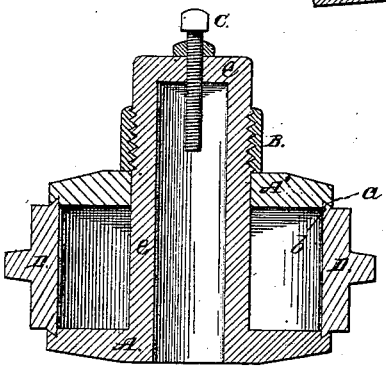
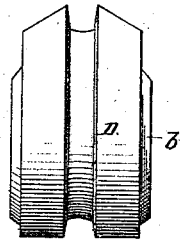



Fig. 4.




Attest:

Geo. R. Vosburg

Jas. L. Vosburg.

Inventor:

John DuBois

# UNITED STATES PATENT OFFICE.

JOHN DU BOIS, OF WILLIAMSPORT, PENNSYLVANIA.

## IMPROVEMENT IN CUTTER-HEADS.

Specification forming part of Letters Patent No. **192,242**, dated June 19, 1877; application filed August 7, 1876.

*To all whom it may concern:*

Be it known that I, JOHN DU BOIS, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Cutter-Heads, of which the following is a specification:

My invention relates to that class of cutter-heads in which removable bits or cutters are employed; and consists in the combination of two clamping-plates having circular concentric grooves in their inner faces, with bits having their ends seated in said grooves and their outer faces curved in the arc of a circle eccentric to the axis of the head; and also in providing one of the clamping-plates with a central tubular neck passing through the other plate and provided with a screw-thread to receive a nut by which the plates are forced together upon the bits.

Figure 1 represents a side view of my head with one of the clamping-plates removed to expose the ends of the bits; Fig. 2, a central cross-section of the head in a line with its axis; Fig. 3, a similar section through one edge of the head, showing another form of bit therein; Figs. 4, 5, and 6, face views of three different forms of bits to be used in the heads.

A and A′ represent two flat circular-plates, provided in their inner faces with circular concentric grooves *a* near their outer edges, as shown. The plate A is also provided at its center with a tubular neck or sleeve, *e*, passing through a central hole in the plate A′, and provided with an external screw-thread to receive a nut, B, which bears upon the outside of the plate A′, as shown in Fig. 2, so as to force the plates tightly upon the bits or cutters. D represents the bits or cutters, two or more of which may be used in each head. Each bit consists of a thin curved steel plate having its ends provided with curved ribs *b*, which are seated in the grooves of the clamping-plates, as shown in Figs. 2 and 3, so as to hold the bits firmly and immovably in the head when the nut is tightened up. Each bit has its outer surface curved in the arc of a circle from its cutting-edge slightly inward toward the axis or center of the head, in order that the knives may have a free clearance and that they may not come in contact with the wood except at their edges. The cutting-edges of the bits are inclined or beveled laterally, in order to cause them to cut cleanly and evenly in all woods and under all circumstances.

The bits, curved and mounted in the manner shown and described, are cheap and durable, and need no adjusting whatever, as the seating of their ends in the annular grooves brings them at once in the precise position required. The bits are sharpened by simply grinding away their cutting ends on the inside, and as they are all made of precisely the same form and size it follows that when they are all ground to the same length and seated in the grooves their edges must all be at precisely the same distance from the center of the head, and consequently that they will all cut in precisely the same plane, and thereby produce smooth and finished work. As the knives are ground away and shortened, the diameter of the head will, of course, be diminished, but so long as all the knives of the head are of a length they will cut in the same plane.

In order, therefore, to insure the proper action of my knives, it is only necessary to grind them to the same length and seat them in the grooves, which bring them at once to their proper positions without requiring any adjustment.

This construction of my head, so that the knives do not require adjustment radially in the head, but merely to be of a uniform length, is of great importance, inasmuch as the grinding of my detached bits or knives to gage is a very simple and easy matter, while, on the contrary, the adjustment of the knives in the ordinary cutter-heads so that they will cut exactly in line is a matter of great delicacy and difficulty.

Another advantage arising from my construction is that the bits cannot be driven or forced by knots or other unusual obstructions inward toward the center of the head, for in the event of their being driven backward they simply slide in the annular groove and remain in their working positions.

Among other advantages incident to my mode of construction is the important one that the number of bits in the head may be increased or diminished at will, as demanded in practice by different kinds of work and dif-

ferent classes of wood. The construction also admits of bits or cutters of different kinds or forms being readily inserted and adjusted in the same head, so that in practice a single head or clamp may be used for a great variety of cutters.

In those heads in which the bits are adjustable to and from the center it often happens that a knot will drive one cutter back and throw the entire work upon the others, but in my head this cannot happen.

By forming the tubular neck on one of the clamping-plates and threading it to receive the nut, the device is cheapened and simplified, the ordinary fastening-bolts dispensed with, and the plates held directly opposite to each other.

It will be observed that the grooves *a* in the plates are of a V-form in cross-section, and that the ribs or lips on the ends of the cutters are of a like form, so that when the plates are forced together the ribs wedge fast in the grooves and hold the cutters very firmly.

I am aware that cutter-heads consisting of two solid semicircular blocks arranged eccentrically to each other, with their flat sides in contact and secured together by means of rings seated in their sides, are old. And I am also aware that in metal-working cutters it is old to use a series of small bits in a radially-slotted plate in combination with a flanged fastening-plate on the opposite side, and I wish it to be understood that I lay no claim thereto; but,

Having described my invention, what I do claim is—

1. A cutter-head, in which the number of bits or cutters may be changed at will, consisting of two clamping-plates, A A′, provided with annular-concentric grooves *a* and thin curved bits or cutters D, having their ends provided with the ribs *b* to enter the grooves *a*, and their outer surfaces curved in the arcs of circles eccentric to the ribs, as shown and described.

2. In a cutter-head for wood-working purposes, the combination of two clamping-plates, A A′, provided with annular concentric grooves *a* and thin bits or cutters D, constructed and arranged in the peculiar manner shown and described.

3. The combination of the plate A, provided with the annular V-shaped groove *a*, and the central neck having the exterior screw-thread, the plate A′, provided with the annular groove *a*, the nut B, mounted on the central neck and turning loosely against the outside of the plate A′, and the cutting plates or blades D, provided with the V-shaped ribs *b*, seated in the grooves *a*, and having their outer surfaces curved in the arcs of circles eccentric to the axis of the plates A A′, as shown.

JOHN DU BOIS.

Witnesses:
GEO. R. VOSBURG,
JAS. L. VOSBURG.