G. J. SHIMER.

Cutter-Head.

No. 159,226. Patented Jan. 26, 1875.

FIG. I.

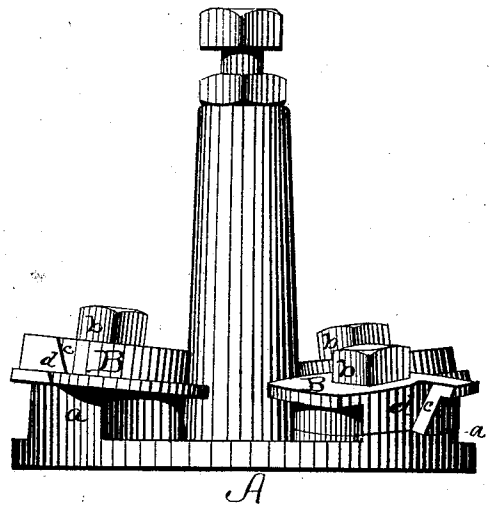


FIG. IV.

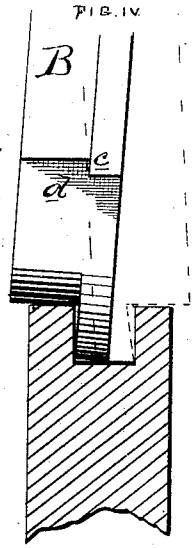


FIG. III.

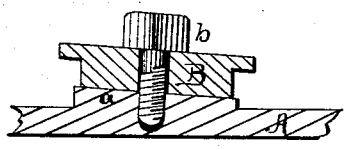
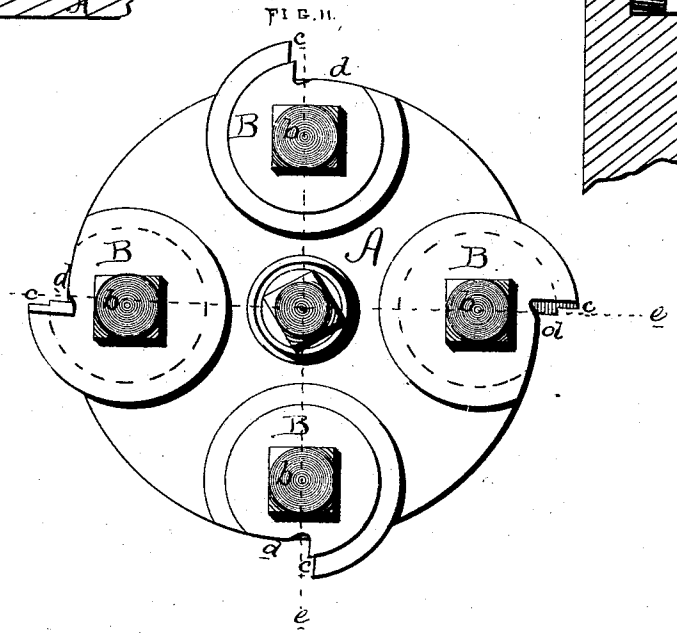


FIG. II.



WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE J. SHIMER, OF MILTON, PENNSYLVANIA.

IMPROVEMENT IN CUTTER-HEADS.

Specification forming part of Letters Patent No. **159,226**, dated January 26, 1875; application filed October 24, 1874.

To all whom it may concern:

Be it known that I, GEO. J. SHIMER, of Milton, in the county of Northumberland and State of Pennsylvania, have invented a new and useful Improvement in Cutter-Heads; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improvement. Fig. 2 is a face plan of the same. Fig. 3 is a transverse central section of one of the bits and its seat. Fig. 4 is an edge view of one of the bits, showing the mode of operation.

This invention relates to that class of cutters wherein removable bits are employed; and it consists, first, in a cutter-head constructed with oblique-faced hubs or seats to support the bits, said hubs having faces alternately inclined inward and outward, so that the bits will be correspondingly inclined, each bit cutting only one side of the tongue or groove, as the case may be; second, in a circular bit to be secured to the head by a screw-bolt passing through its axis.

In matching-machines it is a common practice to employ bits which cut the whole width of the groove or rabbet on each side of the tongue, as the case may be. Such bits undergo a continual relative change as they wear away, the grooving-bit becoming continually narrower, and the tonguing-bit continually wider, so that the tongue and groove fail to fit as perfectly as is desirable.

I am aware that straight bits have also been sometimes set so as to cut only one-half the tongue or groove; but, being set straight, the lumber is scotched if the feed, from any cause, ceases to operate, or materially decreases in speed. I am also aware that straight bits have been set obliquely, so as to have clearance at the side, and that a cutter of circular form, with a central orifice for the mandrel, has been employed for molding and milling machines.

To obviate the defects of these devices I propose to fashion the bits so that one-half the work will be done by each, and to mount them upon a head or disk by means of seats with inclined faces, so that said bits will be brought accurately into position with a proper clearance back of each cutting-edge.

When movable bits are employed, there is always a necessity for the utmost care as to their setting and fastening, as the least inaccuracy in the one, or insecurity as to the other, may lead to objectionable or disastrous results. I therefore have devised a circular bit, which is secured by a screw-bolt through its axis, and therefore cannot be out of place as to its distance from the center of rotation, and, being circular, its cutting-edge may continually recede, with successive sharpenings, with out decreasing its diameter, or changing its relation to the cutting-edges of other bits on the same head.

That others may more fully understand my invention, I will particularly describe it.

A is the head, to which the bits are attached. Said head is constructed and secured to the mandrel in the usual manner. At four or six points equidistant from the axis of the head A I place the hubs or seats *a a*, with their faces oblique to the plane of revolution, and alternately inclined inward and outward, and slightly backward, so that the cutters will cut with sufficient lead the one side and the other of the tongue or groove, as the case may be.

The bit may be clamped to the face of the seat *a* by any proper means; but I prefer to employ a circular bit having a hole at its axis, through which a screw-bolt may be inserted to hold said bit firmly in place.

My circular bit is shown at B, and it is secured by the screw-bolt *b*, which passes into the hub *a*. The bit B is shaped so that the edge of its transverse section will correspond with the outline of a little more than one-half of the shape to be formed. The cutting-tooth *c* is formed by cutting a throat, *d*, obliquely across the edge of the bit, as shown, the obliquity of the edge being just equal, and opposite, to the inclination of the bit, so as to produce a square cut, as shown in Fig. 4, and it becomes a right or left hand cutter, according to the direction of said obliquity.

In setting the bit B the point of the tooth is adjusted about one-eighth ($\frac{1}{8}$) of an inch back of a line, *e*, which would cut the axes of the head and bit, so that the cutting-edge has suf-

ficient clearance behind it. This adjustment may be made exact by means of a proper gage, but may be made with sufficient exactness by the eye alone, as a slight variation will not perceptibly change the depth of cut.

When it is necessary to sharpen the bits, it is accomplished by grinding or filing out the throat *d* and the face of the tooth, and therefore without changing either the figure or diameter of the bit.

If the holding-bolt *b* should become loosened it would be impossible for any disaster to occur, because the bit could neither fly out nor cut deeper, but would merely turn backward, and cease to cut at all. It will therefore be perceived that with my circular bit complete safety from accident is secured, and successive sharpenings cannot change the relative values of several cutting-edges, nor introduce any complications into the process of setting.

Having described my invention, what I claim is—

1. A revolving cutter-head, A, provided with hubs or seats *a*, having their faces oblique to the plane of rotation, and alternately inclined inward and outward, so as to cause the bits secured against said faces to cut to the right or left hand, as set forth.

2. A circular cutter or bit, B, constructed as set forth, combined with a revolving cutter-head, A, provided with seats *a*, having inclined faces, as described.

GEO. J. SHIMER.

Witnesses:
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F. B. TOWNSEND.