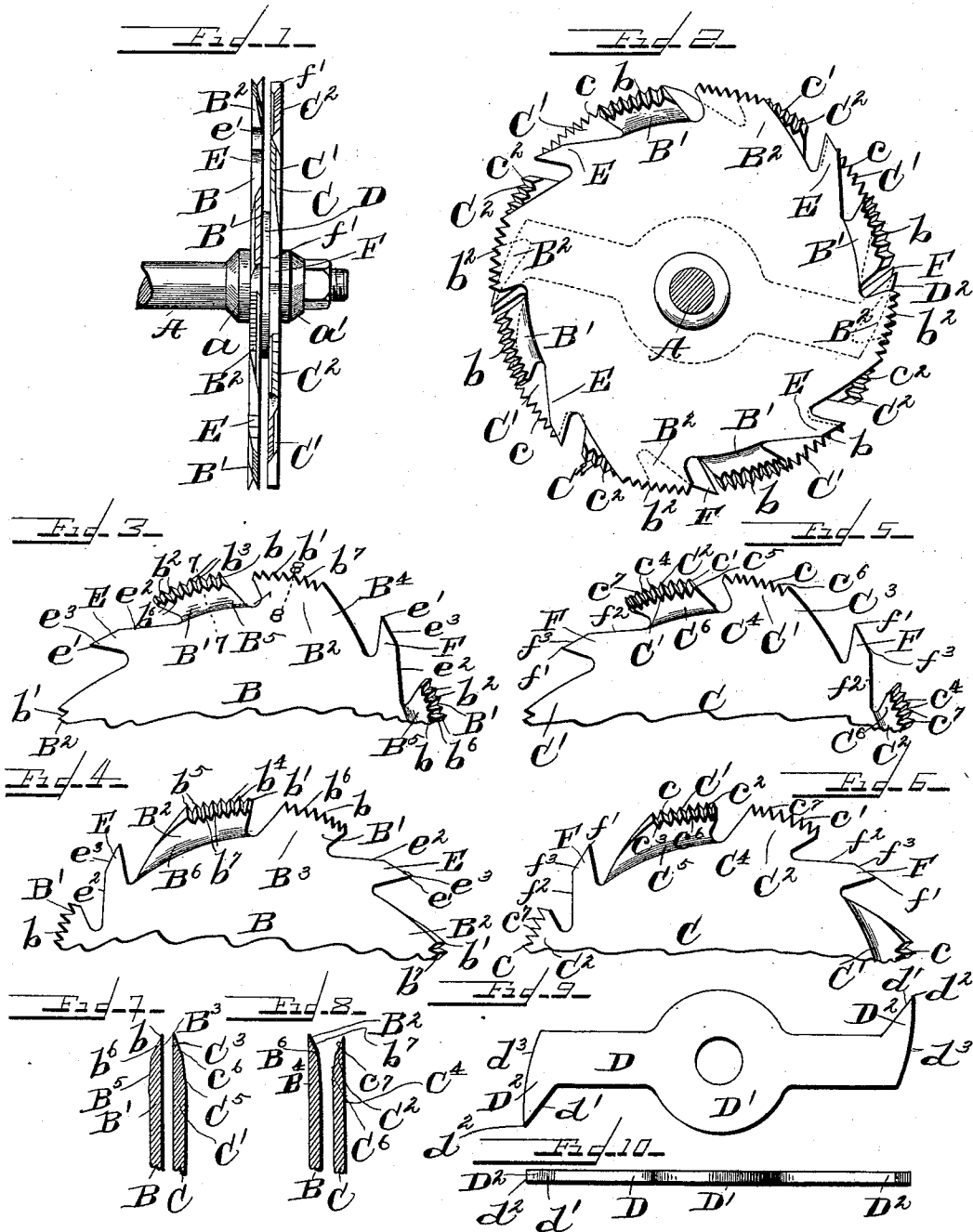


(No Model.)

W. B. HUTHER.
CUTTING HEAD.

No. 486,874.

Patented Nov. 29, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

WARREN B. HUTHER, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-HALF
TO ANGUS E. HUTHER, OF SAME PLACE.

CUTTING-HEAD.

SPECIFICATION forming part of Letters Patent No. 486,874, dated November 29, 1892.

Application filed June 4, 1892. Serial No. 435,491. (No model.)

To all whom it may concern:

Be it known that I, WARREN B. HUTHER, of Rochester, in the county of Monroe, in the State of New York, have invented new and useful Improvements in Cutting-Heads, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in cutting-heads particularly applicable for grooving, &c., and has for its object the production of a simple and durable device which is effective in use, economical and practical in manufacture, and is readily sharpened when worn; and to this end it consists, essentially, in a disk formed along its periphery with major cutting-teeth arranged in pairs and having two opposite sides of each pair formed substantially parallel and the other two sides inclining from their bases toward their tops for forming the tops of said teeth of less width than their bases and having a series of minor teeth along their top edges, formed with their front and rear edges inclining downwardly from the substantially-vertical sides of the major teeth toward their inclining sides, and provided, also, with additional major teeth interposed between the former major teeth and having a top cutting-edge of substantially the same width as the bases of the former major teeth, and in the detail construction and arrangement of the parts, all as hereinafter more particularly described, and pointed out in the claims.

In describing this invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figures 1 and 2 are respectively edge view and face view of my improved cutting-head. Figs. 3 and 4 are opposite face views of a detached portion of the front one of the circular disks comprising the cutting-head. Figs. 5 and 6 are similar opposite face views of a detached portion of the rear one of said circular disks. Figs. 7 and 8 are detail vertical sectional views taken on lines 7 7 8 8, Fig. 3; and Figs. 9 and 10 are respectively face and edge views of the cutting-plate interposed between the two cutting-disks of my cutting-head.

A represents a suitable support for my invention, which, although it may be of any desirable form, size, and construction, is here shown as a spindle adapted to be revolved by any suitable construction of mechanism, not necessary to herein illustrate or describe.

B C are cutting-disks arranged upon the support or spindle A with their adjacent faces somewhat separated, and D is a cutting-plate interposed between the disks B C. These disks and the cutting-plate are firmly held in position by suitable collars *a a'* upon the support or spindle A', and, if desired, the collar *a* may be fixed to the spindle and the collar *a'* adjustable thereon. When the support A is a spindle, the disks B C and plate D are formed with suitable perforations for receiving the spindle; but, if desired, this support may consist of two opposite clamping-heads for engaging the opposite faces of the cutting-disks B C and firmly forcing said disks and the plate D together for rotating the same. The cutting-disks B C are formed with corresponding major teeth *B' B² C' C²*, arranged in pairs around their peripheries, and formed with two of their opposite sides *B³ B⁴ C³ C⁴* substantially parallel and their other sides *B⁵ B⁶ C⁵ C⁶* inclined from the bases of said teeth *B' B² C' C²* outwardly toward their tops for forming the tops of said teeth of less width than their bases. Along the edges of the major teeth *B' B² C' C²* are the respective minor teeth *b b' c c'*, having their respective front and rear sides *b² b³ b⁴ b⁵ c² c³ c⁴ c⁵* inclined downwardly from the respective substantially parallel plane faces *B³ B⁴ C³ C⁴* toward the faces *B⁵ B⁶ C⁵ C⁶*. The front and rear edges of these teeth *b b' c c'* meet each other at the top edge of the teeth, and consequently, as clearly seen at Figs. 3, 4, 5, and 6, these top edges *b⁶ b⁷ c⁶ c⁷* incline downwardly from the faces *B³ B⁴ C³ C⁴* toward the inclined faces *B⁵ B⁶ C⁵ C⁶*.

In practical manufacture of the cutting-disks B and C the major teeth are inclined in the proper direction by a milling-tool or grinding-machine. The small teeth are then readily punched and brought to the desired shape by a file. To one skilled in the art of

saw manufacture the practicability of my invention is apparent, since it is well known that a punch for forming fine teeth can only operate successfully upon metal comparatively thin. By forming one side of the major teeth tapering I greatly reduce the thickness of their top edges, and although the bases of the teeth are comparatively thick the fine teeth may be readily and practically formed upon their periphery without liability of injury to the forming-punch. Moreover, this peculiar construction of major and minor teeth causes the cutting-disks to make a smooth fine cut at their peripheral edges and provides the same with a great amount of sharp cutting-surface having a great abundance of clearance, thus reducing to a minimum the amount of power required in operating my cutting-head. The cutting-surfaces of the cutting-disks are also readily sharpened by filing the front and rear faces of the minor teeth and permit me to use a much wider cutting-disk than would otherwise be possible, as, although the disk may be of considerable width, the tops of the major teeth are of considerable less width.

E F are grooving or smoothing teeth interposed between each pair of the teeth B' B² and C' C² for removing any portion of the article to be cut which may be interposed between the peripheral edges of the cutting-disk and not removed by the major teeth B' B² C' C². As preferably constructed these teeth E F are formed with transverse front faces *e' f'*, top cutting-edges and downwardly-inclining rear edges *e² f²*, having their upper extremities *e³ f³* of less downward inclination than the remaining portions of said sides.

The cutting-plate D, interposed between the cutting-disks B C, preferably consists of a bar having a central hub D' and oppositely-extending arms or teeth D² D³, formed with rearwardly-inclining front faces *d' d'*, front cutting-edges *d² d²* of substantially the same width as the distance between the cutting-disks B C, and rearwardly-curving top or rear faces *d³ d³*.

If desired to cut a narrow groove by my invention, a single cutting-disk of the required width is mounted on the spindle A and firmly clamped in position. Should it be desired to cut a larger groove, two disks may be mounted side by side, and for cutting a still larger groove a cutting-plate D may be interposed between two disks, as shown at Figs. 1 and 2 of the drawings.

It will thus be readily apparent that my improved cutting-head is quickly and readily adjusted at will for cutting any desired width of groove and that the cutting-surfaces thereof may be readily sharpened and are of such form as to render the action of the cutting-head positive, effective, and practical. It will be understood, however, that the form of said cutting-surfaces may be somewhat varied from that shown and described. Hence I do

not limit myself to the exact described construction.

Having thus fully described my invention, what I claim as new, and desire to secure by 70 Letters Patent, is—

1. In a cutting-head, the herein-described circular disk, provided with a major tooth having one side substantially vertical and the other inclining from its base toward its top for forming the top of less thickness than the base and having a series of minor teeth along its top edge, formed with their front and rear edges inclining downwardly from the substantially-vertical side of the major tooth toward the inclined side of said tooth, and formed, also, with a sharp top edge inclining in the same direction as their front and rear faces, substantially as and for the purpose described.

2. In a cutting-head, the herein-described circular disk, provided with a major tooth having one side substantially vertical and the other inclining from its base toward its top for forming the top of less thickness than the base and having a series of minor teeth along its top edge, formed with their front and rear edges inclining downwardly from the substantially-vertical side of the major tooth toward the inclined side of said tooth, and a second major tooth at the rear of the former one, having a top cutting-edge of substantially the same width as the base of the former major tooth, substantially as and for the purpose described.

3. In a cutting-head, the herein-described circular disk, provided with a pair of major teeth, one in advance of the other, having two of their opposite sides formed substantially parallel and their other two sides inclining from their bases toward their tops for forming the tops of said teeth of less width than their bases and having a series of minor teeth along their top edges, formed with their front and rear edges inclining downwardly from the substantially-vertical sides of the major teeth toward the inclined sides of said teeth, and a second major tooth at the rear of one of the former teeth, having a top cutting-edge of substantially the same width as the bases of the former major teeth, substantially as specified.

4. In a cutting-head, the combination of a spindle, a pair of circular disks on said spindle, each provided with a series of major teeth having two of their opposite sides formed substantially parallel and their other two sides inclining from their bases toward their tops for forming the tops of said teeth of less width than their bases and having a series of minor teeth along their top edges, formed with their front and rear edges inclining downwardly from the substantially-vertical sides of the major teeth toward the inclined sides of said teeth, said disks being provided, also, with major teeth arranged at intervals thereon between the former teeth

and formed with top cutting-edges of substantially the same width as the bases of the former major teeth, and a cutting-plate mounted on said spindle and formed at one
5 of its ends with a cutting-edge of substantially the same width as the distance between said circular disks, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Rochester, in the county of Monroe, in the State of New York.

WARREN B. HUTHER.

Witnesses:

STEPHEN C. TRUESDALE,
GEO. TRUESDALE.