No. 799,124. PATENTED SEPT. 12, 1905.

A. A. WESTMAN.

CUTTER FOR GROOVING AND TONGUING WOOD.

APPLICATION FILED MAY 23, 1901.

2 SHEETS—SHEET 1.

Fig. 1.

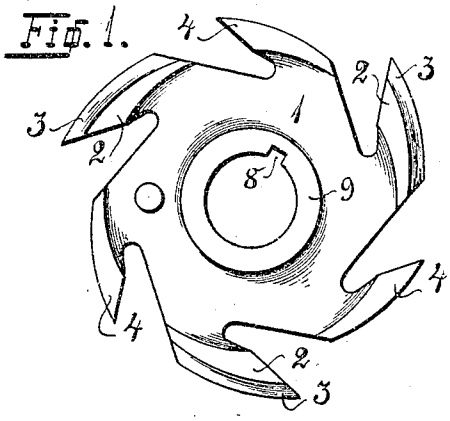


Fig. 2.

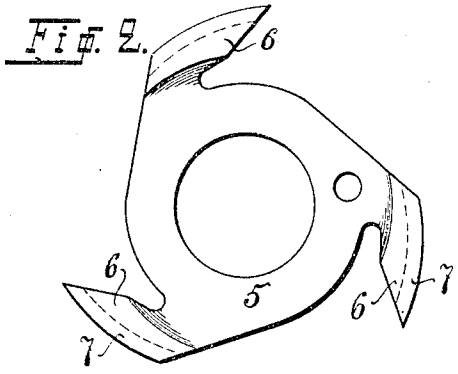


Fig. 3.

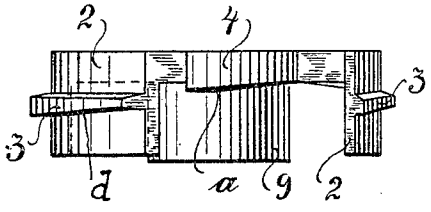


Fig. 5.

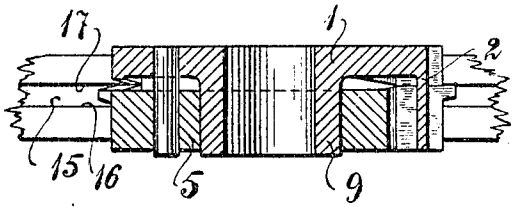
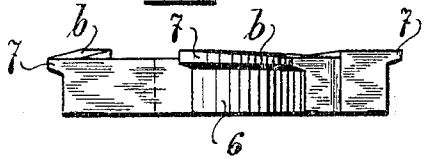


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 6.

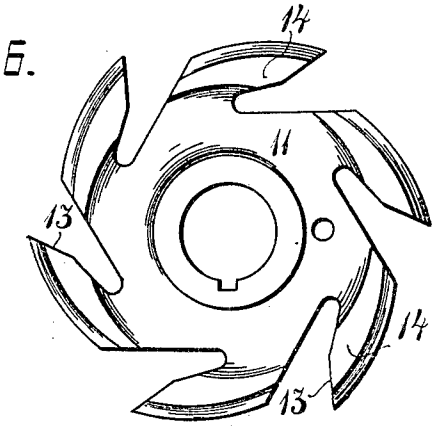


Fig. 7.

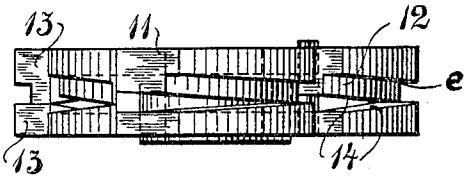
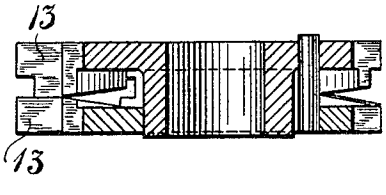


Fig. 8.



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UNITED STATES PATENT OFFICE.

ANDERS AUGUST WESTMAN, OF STOCKHOLM, SWEDEN.

CUTTER FOR GROOVING AND TONGUING WOOD.

No. 799,124. Specification of Letters Patent. Patented Sept. 12, 1905.

Application filed May 23, 1901. Serial No. 61,522.

To all whom it may concern:

Be it known that I, ANDERS AUGUST WESTMAN, a subject of the King of Sweden and Norway, and a resident of Wasagatan 40, Stockholm, Sweden, have invented a new and useful Improvement in Cutters for Grooving and Tonguing Wood, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof.

Cutting of grooves and tongues of exact width in wooden boards and the like is well known to be accomplished by means of rotating milling-cutters, the edges of which have a shape corresponding to the section of the groove and tongue to be formed. In such cutters it is necessary in order to prevent the cutter becoming wedged to the work or the creation of such a considerable frictional resistance as to heat and consequently dull the cutter to make the thickness of the teeth smaller in the rear of the cutting edge, and in order to enable the sharpening of the edges of the milling-cutter while at the same time their shape is retained the teeth of said cutters must be provided with edges of the usual rectangular shape; but their side edges must be made to form an angle with each other and the metal in the rear of the edges be given an eccentrically-located surface. Cutters of the aforesaid kind have, however, hitherto had the disadvantage that the size of the groove or tongue cut by them is changed when the cutter is sharpened by grinding, so that the width of the tongue will become wider and that of the groove narrower.

The object of the present invention is to improve cutters of the aforesaid kind so that they can be sharpened only by grinding the front faces of the teeth, but will all the same cut tongues or grooves of the same width as before the sharpening.

The invention consists chiefly in having the grooving and tonguing cutters made in two parts, in which the surfaces of the teeth facing each other run at an angle to the end surfaces of the cutters and parallel to the side surfaces of the teeth forming at their front ends parts of the cutting edges, so that the two parts of the cutters bear on each other only along the lines of intersection between the first-mentioned surfaces and the front surfaces of the teeth.

In the accompanying drawings two cutters constructed according to the present invention are illustrated.

Figures 1 and 2 show, respectively, elevations of the two halves of a grooving-cutter, the said halves in joining them together being placed one on top of the other in such a manner that the pin 10 in one half will enter in the corresponding aperture in the other. Fig. 3 shows a top view of the cutter half shown in Fig. 1. Fig. 4 shows a top view of the cutter half shown in Fig. 2. Fig. 5 shows a horizontal section through the center of a cutter composed of the two cutter-halves shown in Figs. 1 to 4. Fig. 6 shows a side view of one-half of a tonguing-cutter. Fig. 7 is a top view of the latter, and Fig. 8 a horizontal cross-section through the center of the said tonguing-cutter.

In the grooving-cutter shown in Figs. 1 to 5 one half, 1, is provided with six teeth, of which the teeth 2 are undivided. Said teeth serve in the position shown in Fig. 5 for cutting the left side edges 16 of the groove 15. The remaining three teeth 4 of the cutter-half 1 serve for cutting the joint faces of the board. The other halves of the divided teeth are arranged on the second half 5 of the cutter, the latter half likewise being provided with but three teeth 6. The projections 7 of the teeth 6 cut the right-hand edge 17 of the groove 15. The projections of both sets of teeth are respectively so arranged that the non-cutting edges of the projections 7 are located inside of cutting lateral edges of the projections 3, as also the non-cutting edges of the projections 3 are located inside of the cutting lateral edges of the projections 7.

As will be understood from Figs. 3 and 4 compared with Fig. 5, the side surfaces *a* and *b* of the teeth 4 and 6 facing each other run at an angle to the end surfaces of the cutter in such manner that they incline away from each other, and the said side surfaces *a* are parallel to the side surfaces *d* of the projections 3, forming at the front end cutting edges, while the side surfaces *d* facing the said side surfaces *a* are in plan with the side surfaces of the projections 7, forming at the front end cutting edges.

The lines of intersection between the front faces or grinding-surfaces of the divided teeth and the inclined side faces of the teeth 4 and 6 are approximately perpendicular to the geometrical axis of the milling-cutter. The two halves of the cutter, therefore, are brought in contact with each other only along these lines of intersection.

For securing the cutter on the spindle one

half of the cutter is suitably provided with a hub 9 with a keyway 8, on which hub the other half is placed and secured by means of a pin or bolt 10 or by similar means.

When the cutter is ground, the width of the groove would evidently be diminished, owing to the decreasing widths of the projections 3 and 7 of the teeth, unless a lateral adjustment of the two cutter parts in relation to each other were possible. By the above-described construction with divided teeth such an adjustment is directly made possible, since the two halves of the cutter after grinding off the front grinding-surfaces of the divided teeth 4 can be made to approach each other exactly as much as the width of the groove would otherwise be diminished.

The cutter shown in Figs. 6–8 is arranged for cutting tongues. It is of essentially the same construction as the grooving-cutter described above with the only difference, however, that all the teeth are divided. The recess corresponding to the tongue may be arranged in one of its halves 11, as shown, or be divided and placed on both halves. This recess widens slightly toward the bottom, the lateral edges pointing outward, while the bottom surface 12 of the recess in the half 11 is of uniform width. The teeth of the two halves also in this case bear against each other on a single line—viz., the line of section between the forward grinding-surfaces 13 of the teeth and the opposite and inclined inner side surfaces 14 of the two cutter halves.

As is clearly shown in Fig. 7, the side surfaces *e* and 14 of the teeth forming at the front end cutting edges are backed off—*i. e.*, inclining away from each other—and are parallel to the non-cutting side surfaces 14 facing each other, the surfaces *e* of the upper cutter part in Fig. 7 being parallel to the surfaces 14 of the same cutter part, and the part of the surface 14 of the lower cutter part forming at the front end a cutting edge being in plan with the remaining part of the last-mentioned surface 14 facing the side surface 14 of the upper cutter part. Consequently the two halves of the cutter on grinding off the plane grinding-surfaces 13 of the teeth can be brought together as much as the mouths of the recesses would otherwise be widened, so that their width always can be restored to the original one. Evidently the teeth may also be divided in other manner. In the cutter shown in Figs. 1–5 the teeth might, for instance, be so divided that, aside from the hub, two symmetrical halves are obtained. Half the number of projections may then be arranged on each half of the cutter. The tonguing-cutter may, for instance, be so divided that every other bottom surface is placed on the same half, and every other tooth of this cutter might alternatively be left undivided. These teeth might in this case, as in the grooving-cutter above described, be arranged to cut only one of the sides of the groove while the other side is cut by the divided teeth.

The present invention, however, is not limited to the constructions shown and described, nor its application only to cutters for grooving and tonguing boards, deals, and the like, but may be varied in details and be used in connection with all other cutters by which it is desirable or necessary to always obtain depressions or projections of an exact width.

Having now described my invention and how it may be carried out, I claim—

1. Grooving and tonguing cutters made in two parts in which the surfaces of the teeth facing each other run at an angle to the end surfaces of the cutters and parallel to the backed-off side surfaces of the teeth forming at their front ends parts of the cutting edges so that the two parts of the cutters bear on each other only along the lines of intersection between the first-mentioned surfaces and the front surfaces of the teeth, for the purpose set forth.

2. Grooving and tonguing cutters made in two parts in which the surfaces of the teeth facing each other run at an angle to the end surfaces of the cutters and parallel to the backed-off side surfaces of the teeth forming at their front ends parts of the cutting edges so that the two parts of the cutters bear on each other only along the lines of intersection between the first-mentioned surfaces and the front surfaces of the teeth, some of the said teeth being undivided and located so that they cut only by the one side edge while the divided teeth are so located that they cut only by the opposite side edge, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDERS AUGUST WESTMAN.

Witnesses:

— LINDHVIST,

GUSTAF TSFALT.