No. 707,035. Patented Aug. 12, 1902.

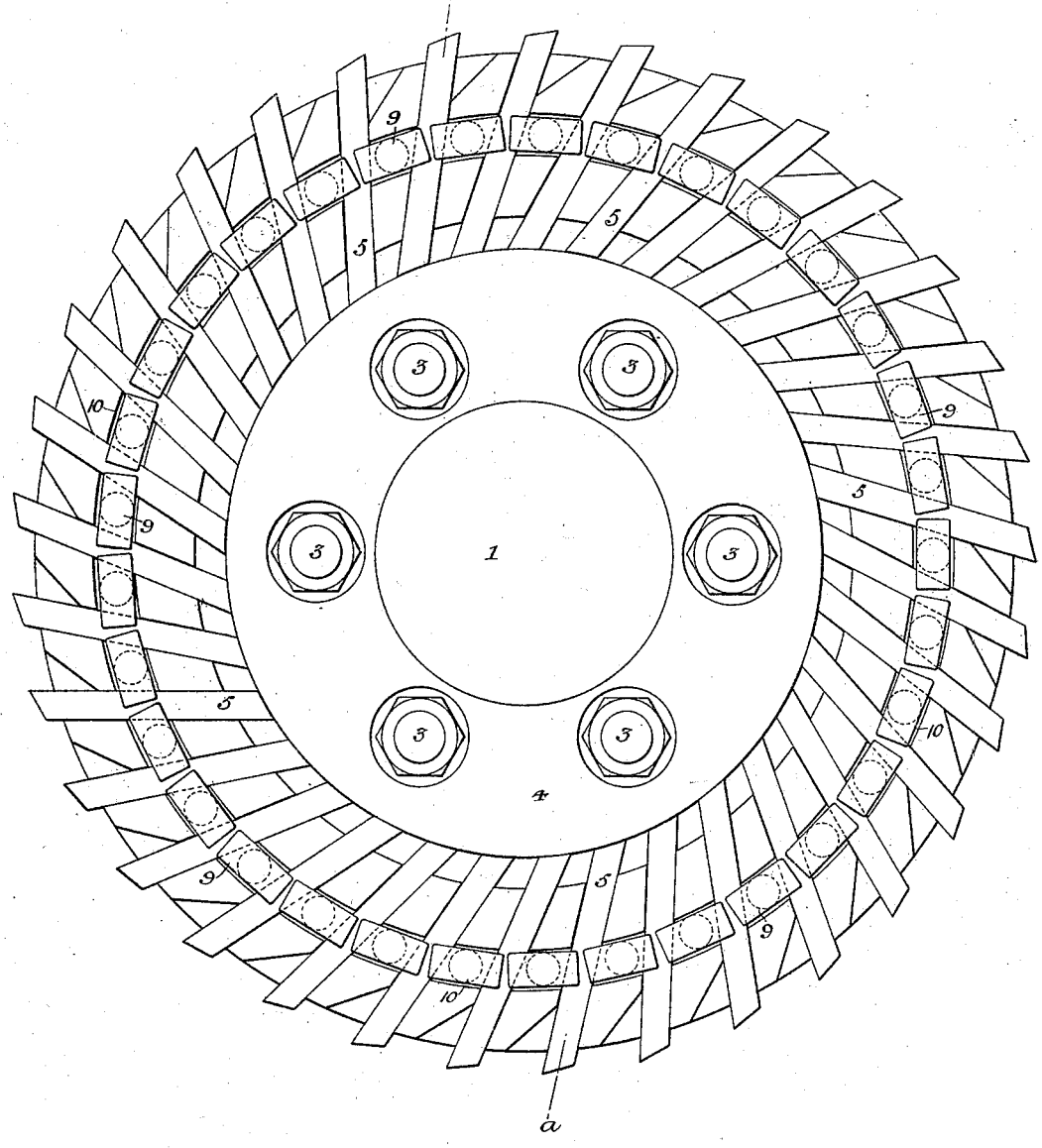
A. TINDEL.

METAL WORKING TOOL.

(Application filed Apr. 28, 1902.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 2.

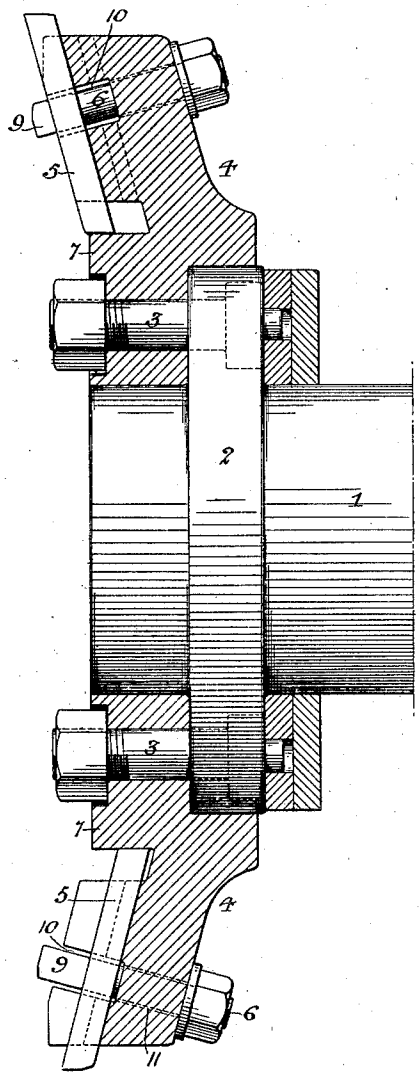
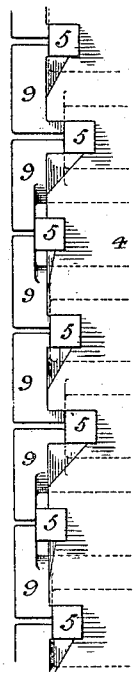


Fig. 3.



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UNITED STATES PATENT OFFICE.

ADAM TINDEL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO TINDEL-MORRIS COMPANY, OF EDDYSTONE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

METAL-WORKING TOOL.

SPECIFICATION forming part of Letters Patent No. 707,035, dated August 12, 1902.

Application filed April 28, 1902. Serial No. 105,052. (No model.)

To all whom it may concern:

Be it known that I, ADAM TINDEL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Metal-Working Tools, of which the following is a specification.

The object of my invention is to so construct a milling, slotting, planing, or like metal-working tool as to effect a maximum extent of cut with less strain than usual upon either the work or the tool, and this object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a face view of a rotary cutter-head constructed in accordance with my invention. Fig. 2 is a view of the same, partly in elevation and partly in transverse section, on the line *a a*, Fig. 1; and Fig. 3 is an edge view of part of the cutter-head.

1 represents part of a shaft or spindle to which rotary motion is intended to be applied in any available manner, this shaft having a flange 2, to which is rigidly secured by bolts 3 or other convenient means an annular head 4, which carries a series of tools 5, each of the latter being adapted to a groove or slot formed in the face of the cutter-head 4 and being secured therein by projecting portions of the heads of the bolts 6, confined to said cutter-head, the inner ends of the cutting-tools having a rigid bearing upon a flange or shoulder 7 on the cutter-head, as shown in Figs. 1 and 2. The tools are inclined forwardly in the head, as shown in Fig. 2, and are also inclined forwardly in respect to radial lines, as shown in Fig. 1, so as to insure the best cutting effect of each tool, and the series of tools occupy different planes transverse to the axis of the cutter-head and overlapping each other, as illustrated in Fig. 3, whereby the width of cut represents the aggregate overlap of all three of these planes, each tool, however, making a cut equal only to the extent to which one plane overlaps another, so that the strain upon the individual tools is diminished, while the strain upon the work is likewise diminished owing to the fact that but a portion of the total cut at any one point is being made at any one time. In the present instance the tools are arranged in successive groups of three, the slots or grooves in the face of the cutter-head for receiving each group of tools being of varying depth, as shown in Fig. 3, so that the third tool of each set will be let into the face of the cutter-head 4 to a greater extent than the second tool and the latter to a greater extent than the first, the head 9 of each bolt 6 being constructed so as to overlap a pair of adjoining tools, and said head being consequently deeper on one side than on the other to accord with the varying depth of insertion of the tools in the face of the head, as shown in Fig. 3. For convenience the face of the head has an annular groove 10 for the reception of the heads 9 of the bolts 6, openings 11 extending from the base of this groove to the back of the head for the reception of the stems of the bolts, as shown in Fig. 2.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. A cutter-head having cutters disposed in groups, the cutters in each group being in different planes transverse to the axis of rotation of the cutter-head and securing-bolts for said cutters, each bolt having a head engaging with a pair of adjoining cutters, one side of the head being of greater depth than the other, substantially as specified.

2. A cutter-head having cutter-receiving grooves in the face of the same, an annular groove transverse to said cutter-receiving grooves, and openings extending from the base of said annular groove to the back of the cutter-head, a series of cutters adapted to the cutter-grooves, and cutter-securing bolts having heads overlapping the cutters and adapted to said annular groove in the face of the cutter-head, the stems of the bolts passing through the openings in the cutter-head, substantially as specified.

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

ADAM TINDEL.

Witnesses:
F. E. BECHTOLD,
JOS. H. KLEIN.