

No. 833,261.

PATENTED OCT. 16, 1906.

C. B. TARDIF.
MILLING CUTTER AND HEAD.

APPLICATION FILED NOV. 21, 1905.

2 SHEETS—SHEET 1.

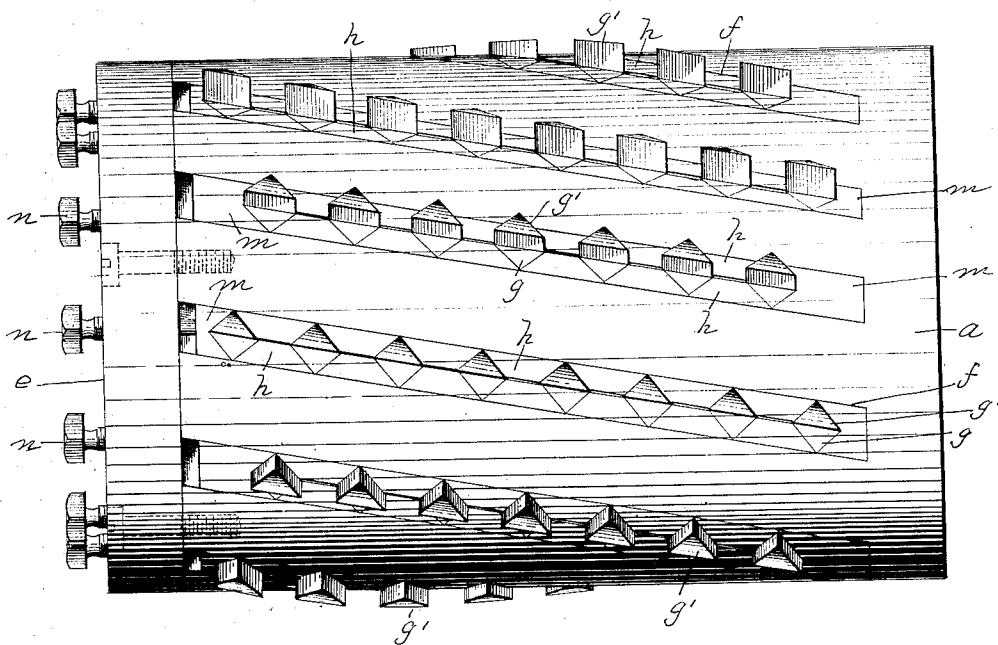


Fig. 1.



Fig. 2.

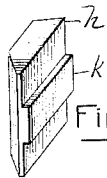


Fig. 3.

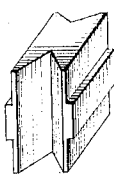


Fig. 4.

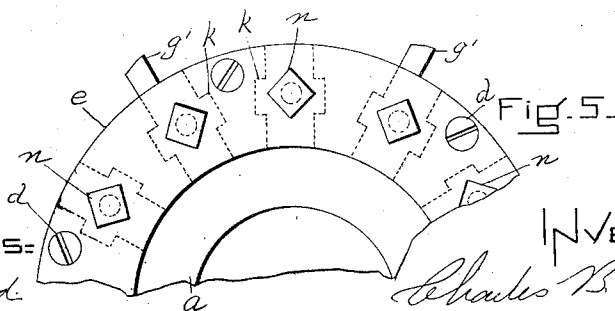


Fig. 5.

WITNESSES:

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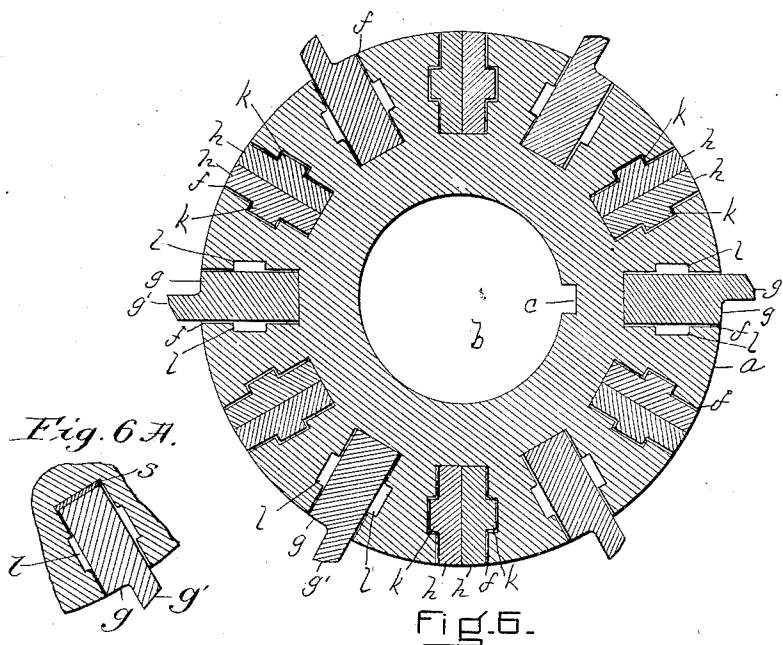
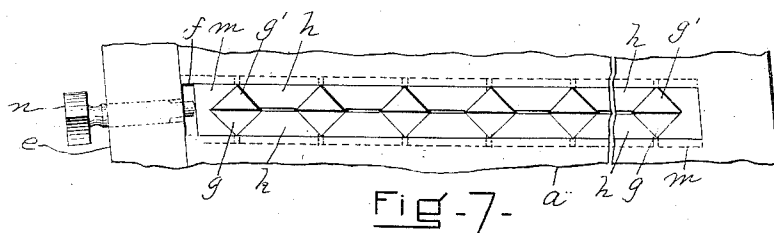
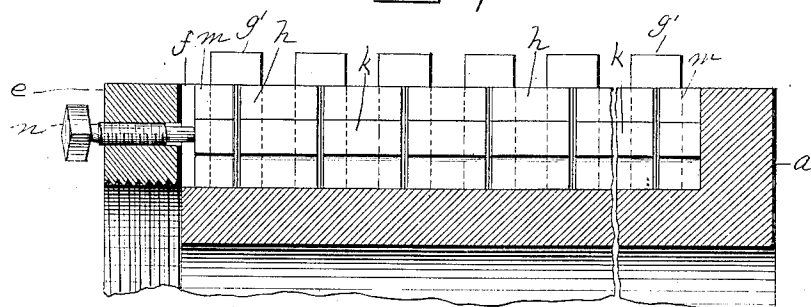
Henry W. Williams

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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES B. TARDIF, OF CONCORD, NEW HAMPSHIRE.

MILLING CUTTER AND HEAD.

No. 833,261.

Specification of Letters Patent.

Patented Oct. 16, 1906.

Application filed November 21, 1905. Serial No. 288,388.

To all whom it may concern:

Be it known that I, CHARLES B. TARDIF, a citizen of the United States, residing in Concord, in the county of Merrimack and State of New Hampshire, have invented certain new and useful Improvements in Milling Cutters and Heads, of which the following is a specification.

This invention relates to that class of milling cutters and heads in which a bored head adapted to fit on the spindle of a milling-machine is provided with a plurality of individual cutters arranged in gangs.

My invention consists in the novel construction and arrangement of parts hereinafter described, and illustrated in the accompanying drawings, whereby the cutter-blocks and cutters are easily removed from the head when the cutters become worn and replaced by others or reground and returned to their positions, and whereby the device is rendered more durable and efficient in its operation.

In the drawings, in which similar letters of reference indicate corresponding parts, Figure 1 is a side elevation of my improved device. Fig. 2 is a view of one of the cutters removed. Fig. 3 is a view of one of the blocks removed. Fig. 4 is a view of a modification comprising a double block. Fig. 5 is an end elevation of a portion of the left or outer end of the device. Fig. 6 is a cross vertical section. Fig. 6^a represents a sectional detail illustrating a cutter which has become worn and has been underlaid in order to lift it to the proper point. Fig. 7 is a view of a row of cutters and cutter-blocks and the adjacent parts of the holder. Fig. 8 is an elevation of a row of cutters and cutter-blocks with the adjacent parts of the holder in section.

a represents a cylindrical metallic head, the central hole *b* in which is adapted, by means of a suitable groove *c*, to be applied to the spindle of a milling-machine. The outer end of the head has secured to it by means of screws *d* a ring-shaped plate *e*, whose outer edge is flush with the surface of the head. The cutter-head is provided with parallel rows of diagonal and approximately spiral peripheral grooves *f*, and in these grooves cutters *g* are set radially, each cutter being disposed with its diagonally opposite corners next opposite sides of the groove in which it is located. Between the cutters are pairs of rectangular blocks *h* of equal size, each block

having its outer surface preferably curved to conform to the curvature of the surface of the head *a*, the depth of each block being uniform with the depth of the grooves *f* and each block being oppositely beveled at its ends. The back or longer side of each block is provided with a longitudinal rib *k*, which fits in a longitudinal groove *l* in one side of the groove *f*, each side being provided with a groove *l*, and the blocks which constitute a pair are set with their shorter ends facing each other, whereby a pair of blocks completely fill the space between two adjacent cutters and fit against said cutters. The cutters in each row or gang are thus separated from each other and at even distances apart by pairs of blocks. At the opposite ends of each row of cutters blocks *m* are placed, each being of suitable width to extend across its groove *f*, and the inner end of each block being notched to fit against the outer end of the cutter at that end of the row. Set-up screws *n* extend through correspondingly-threaded holes in the plate *e* against the outer blocks *m* and hold the blocks and cutters in each row snugly together, thus enabling the blocks to hold the cutters firmly in position, the blocks being held in position by means of the ribs *k* and grooves *l*. From the main portion or shank of each cutter *g* the knife or cutting edge *g'* extends, said edge being suitably placed to perform its work, and the portion *g'* being preferably of approximately one-half the thickness of the main portion or shank *g*.

To remove any cutter for any purpose, the screw *n*, which sets against the row or gang containing said cutter, is simply loosened, and another cutter can be substituted by dropping it into place. If a cutter has become worn, it can be reground into a rectangular shape and again placed in position, a perfect fit being secured by underlaying it by means of a small block or layer *s*, of metal. By setting the cutters with their corners next the walls of the grooves *f* and by beveling the blocks *h* to fit the other corners of the cutters it becomes possible to produce an exceedingly strong frictional hold on the cutters by setting up the screws *n*. It is evident that blocks of the shape shown in Fig. 4 can be used in place of the pairs of blocks shown in the other figures with the same general effect. Preferably the cutters in each gang or row are set opposite the spaces between the cutters in the adjacent gangs or rows.

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

1. In a device of the character described, a cylindrical cutter-head provided with peripheral grooves; independent gangs or rows of cutters, each gang being set in one of said grooves; cutter-blocks set between the cutters in each row; means for locking said cutter-blocks in position in the grooves; and mechanism adapted to be set against the outer ends of the different rows of cutters and blocks whereby the cutters and blocks in each row are held in position by friction, for the purpose set forth.

2. In a device of the character described, a cylindrical cutter-head provided with a series of peripheral grooves; independent gangs or rows of cutters having substantially rectangular shanks; each gang being set in one of said grooves, and the individual cutters being disposed with their diagonally opposite corners next the opposite sides of the groove; cutter-blocks set alternately with the cutters in each row, said blocks being of shape to fit the cutter-heads between which they are placed; means for locking the blocks slidably into engagement with the sides of the grooves; and set-up mechanism for bearing against the outer ends of the different rows of cutters and blocks, for the purpose set forth.

3. In a device of the character described, a cylindrical cutter-head provided with a series of substantially parallel peripheral grooves; independent gangs or rows of cutters, each cutter consisting of a shank rectangular in cross-section and an operating or cutting end extending from one side of said shank, each gang being set in one of said grooves, and the individual cutters being disposed with their diagonal-opposite corners next the opposite sides of the grooves; pairs of cutter-blocks beveled to correspond in shape with the corners of the shanks of the cutters, one pair of blocks being set face to face in the groove between each pair of cutters; cutter-blocks provided with V-shaped grooves and extending across the grooves in the cutter-head at the opposite ends of the rows of cutters and fitting against the outer cutter in each row; means for locking the blocks into engagement with the sides of the grooves; and set-up screws bearing against the outer ends of the rows of cutters and blocks, for the purpose set forth.

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

CHARLES B. TARDIF.

Witnesses:

EMMA A. ROBINSON,
ELWIN L. PAGE.