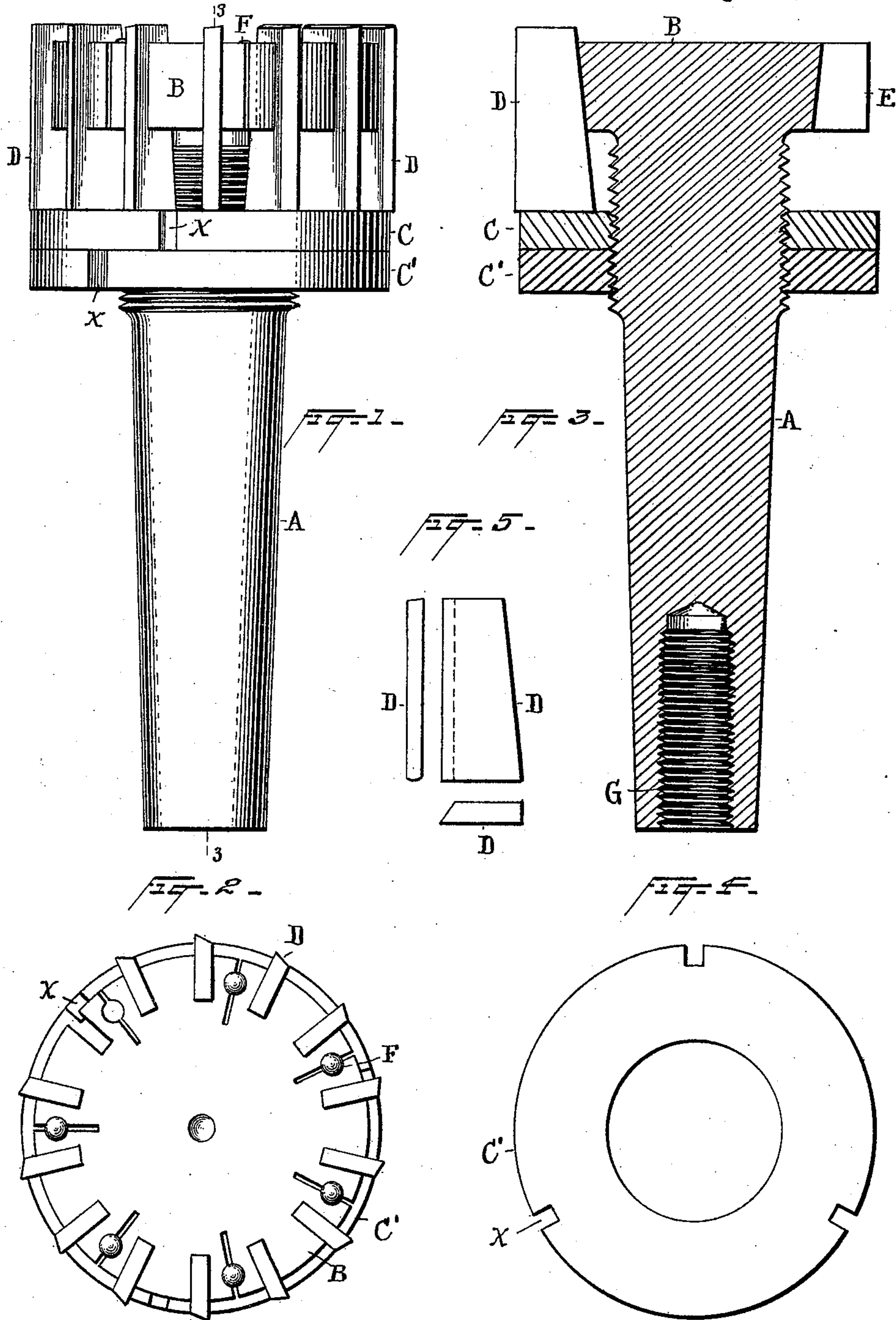


(No Model.)

L. SMITH.
MILLING CUTTER.

No. 602,039.

Patented Apr. 5, 1898.



Witnesses
Norris A. Clark.
Jno. R. Taylor.

Inventor
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By his Attorneys,
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UNITED STATES PATENT OFFICE.

LUKE SMITH, OF EASTON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO
GEORGE H. PFEIL, OF SAME PLACE.

MILLING-CUTTER.

SPECIFICATION forming part of Letters Patent No. 602,039, dated April 5, 1898.

Application filed January 6, 1897. Serial No. 618,114. (No model.)

To all whom it may concern:

Be it known that I, LUKE SMITH, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a certain new and useful Improvement in Cutters, of which the following is a specification.

My invention relates to an improved expanding cutting-tool which possesses advantages over previous articles of a similar kind which will be hereinafter enumerated.

In the drawings, where similar letters of reference indicate similar features, Figure 1 shows an elevation of one of my improved cutters. Fig. 2 shows a plan view of the head of a cutter with a dowel and a cutter removed. Fig. 3 shows a section of a cutter, taken through the line 3 3, Fig. 1. Fig. 4 shows a plan of a lock-nut shown in section in Fig. 3, and Fig. 5 is a detail view of a taper-cutter.

The spindle A of the cutting-tool is threaded just under the head B to receive the adjusting-nut C and the lock-nuts C', which are threaded so as to take upon the threads of A. These lock-nuts are notched upon their periphery, as shown at *x*, in order that a spanner-wrench may be employed to tighten them up against the taper-cutters D, which fit in slots E around the periphery of the head B of the cutting-tool. These slots taper to correspond with the cutters. The cutters are separate pieces, preferably made of self-hardening steel, which fit into the tapering slots of the head B and which are held in place by driving the dowel-pins F into the expanding slots G, thus pinching the cutters in place. The dowel-pins F are made taper and when driven into the taper-holes in the expanding slots made to receive them force the sides of the slots apart. These expanding slots are preferably placed, as shown in Fig. 2, between pairs of cutters. The head B of the tool may be bored to receive an arbor, or it may be used as an end mill. The spindle A preferably has the female screw G, by which it may be attached to a suitable machine.

The cutters, sharpened both on the outside edge and on the face edge of the tool, are placed within the slots E and the adjusting-nut C screwed up to secure perfect alinement

of the cutters. The adjusting-nut is held in position by the lock-nut C'. The dowels are then driven in to fix the cutters in place, thus making a simple and efficient device for holding the cutters in place in the head of the tool. The lock-nut effectually prevents any forcing up of the cutters when in use. When the tool becomes dull, the cutters may be ground both on the face and on the diameter of the tool and then the tool made of the proper diameter by adjustment of the nut C. This may be repeated until the cutters are worn out, the tool always cutting exactly the same as when first used.

It will be seen that my cutter holds very decided advantages over solid cutters both in the economy of its use and in the efficiency of its work. A solid cutter cannot be ground without being made under size, while this tool can be ground until worn out and still retain its original diameter, with the sharp corner of each cutter made by the two ground edges at its normal distance from the face of the cutting-tool. When the cutters are worn out, they may be replaced at small cost instead of having to renew the whole tool, as in the case of a solid tool when the cutters are worn at the corners.

The advantages possessed by my tool over tools having detachable cutters lie in the fact that the size of the cut made by the tool may be varied, since the taper-cutters are adjustable, so as to permit the diameter of the cutting edge to be varied. These cutters may not only be collectively adjusted by the adjusting-screw, but may be individually adjusted, so that when the cutters are taken from the tool and ground they may be adjusted accurately, though some may have been ground more than others. This may be done by inserting a thin sheet of metal under the foot of the cutters which have been ground down more than the rest, and thus bringing the cutting edge of the cutter to the point desired. Thus after repeatedly grinding the cutters the tool itself may have its cutting edge kept at its original diameter. All cutting-tools having detachable cutters known to me require the insertion of new sets of cutters whenever the tool becomes dull, as

the old cutters cannot be ground without making the tool under size and uneven.

The cutters may be made of self-hardening steel in order that they will not lose their temper while in use or while being ground.

The tool may be made either as a left or right hand cutter by simply changing the cutters.

Having described the tool, what I wish to claim as my invention is—

1. In a cutting-tool with a spindle and a head, having radial taper-slots cut in its periphery, the combination of detachable taper-cutters loosely fitting in said slots, with means for adjusting the position of said cutters as a whole while permitting the individual adjustment of the cutters, and means for holding said cutters in place when adjusted, substantially as set forth.

2. In a cutting-tool having a spindle and a head, the combination of detachable taper-cutters fitting in taper-slots of the periphery of said tool, with means for adjusting the position of said cutters so as to vary the diameter of the cutting edge of said tool, slots in the head of said tool and dowels fitting into and expanding said slots to hold the cutters

in the head of said tool, substantially as set forth.

3. In a cutting-tool having a spindle and a head, the combination of detachable taper-cutters fitting in taper-slots in the periphery of the head of said tool, with a nut on said spindle for varying the diameter of the cutting edge of said cutters, a lock-nut on said spindle, slots in the head of said tool, and dowels fitting into and expanding said slots to hold the cutters in the head of said tool, substantially as set forth.

4. In a cutting-tool having a spindle and a head, the combination of detachable taper-cutters D fitting in taper-slots E, an adjusting-nut for moving said cutters in said slots, a locking-nut, and slots and dowels in the head of said tool for pinching said cutters in position when adjusted, substantially as set forth.

This specification signed and witnessed this 28th day of December, 1896.

LUKE SMITH.

Witnesses:

CHAS. B. BRUNNER,
JOHN BRUNNER.