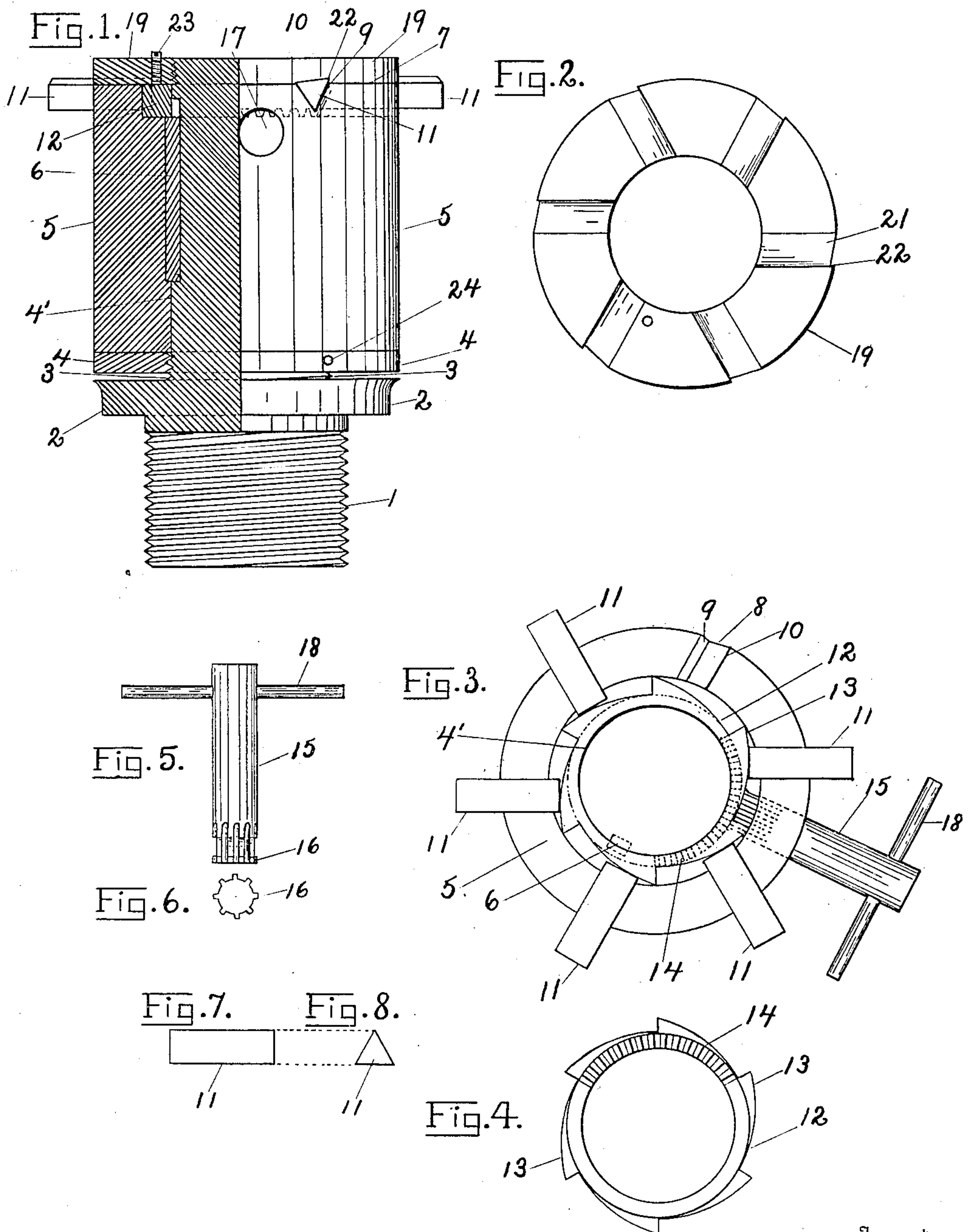


No. 882,530.

PATENTED MAR. 17, 1908.

R. N. MELVIN.
BORING TOOL.

APPLICATION FILED MAY 6, 1907.



Witnesses
W. E. Jones Jr.
W. O. Blackwood.

Inventor
Roy W. Melvin
By *W. H. Deane & Son*
Attorneys

UNITED STATES PATENT OFFICE.

ROY N. MELVIN, OF MEADVILLE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WINTERS D. HAMAKER, OF MEADVILLE, PENNSYLVANIA.

BORING-TOOL.

No. 882,530.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed May 6, 1907. Serial No. 372,215.

To all whom it may concern:

Be it known that I, ROY N. MELVIN, a citizen of the United States, residing at Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Boring-Tools, of which the following is a specification.

My invention relates to boring tools and reamers and its object is to provide a tool having removable cutters and convenient and easily operated means for adjusting the cutters radially, and means of a simple character yet of great strength, for clamping the cutters in position.

To these ends my invention is embodied, in preferable form, in the device hereinafter described and illustrated in the accompanying drawings.

In these drawings, Figure 1 is a view partly in elevation and partly in vertical section of my improved boring tool; Fig. 2 is a bottom plan view of the clamping ring; Fig. 3 is a top plan view with clamping ring removed; Fig. 4 is a bottom plan view of adjusting ring; Figs. 5 and 6, details of adjusting tool and Figs. 7 and 8, details of cutter.

Referring to the drawings, 1 is the shank of the tool and 2 is a fixed collar mounted on the shank. The stem of the tool is threaded at 3, beyond this collar, and such threaded portion is engaged by a lock-nut 4. The outer portion 4 of the stem has a smooth surface and on this part is mounted a vertically movable sleeve 5, constituting the head of the tool and the support for the cutters. A vertical key 6 is mounted in adjacent slots in the head and stem and serves to prevent rotary movement of the head, while permitting longitudinal movement thereof.

Extending inwardly from the plane outer surface of the shoulder 7 of the head, is a V-shaped socket 8, having one of its walls 9, at a greater angle to the plane surface of the shoulder than the other wall 10 whereby a shearing angle will be given to the projecting forward longitudinal edge of the cutter.

Adapted to be supported substantially bodily by this socket, is a cutter 11 equilaterally triangular in cross-section, and having similar longitudinal and end faces. The end of the cutter is ground square and all of the cutting is done by the front edge of the end, when the tool is used as a reamer.

When the tool is used as a boring head, the forward longitudinal edge of the cutter is the cutting edge.

Instead of beveling some of the edges in order to obtain the proper clearance for the cutters in starting the cut, I attain the same end by forming the seat or socket for the cutter somewhat ahead of the center of the tool, and thereby give the proper clearance on the outer circle in which the ends of the cutters move. This mode of effecting the clearance enables the cutters to be reversed from one cutting edge to another without grinding longitudinal edges, and since the cutter may also be reversed from end to end, six cutting edges may be utilized, without the necessity of any grinding of the tool.

On the outer surface of the head between the projecting shoulder 7 and the stem 4, is loosely mounted a cutter-adjusting cam-ring 12, provided with cam-projections 13. These projections are adapted to bear against the inner ends of the cutters, and to force the cutters radially outward or to permit them to be retracted, by rotating the cam-ring, in order to regulate the depth of cut.

To provide for the rotation of the cam-ring, the latter has a series of rack teeth 14 cut on a portion of its lower surface, and adapted to be engaged by a special adjusting tool 15 having pinion teeth 16 on one end. This tool is adapted to be inserted in a hole 17, in the head 5, and the pinion portion pushed into engagement with the rack portion of the ring. The tool is provided at its other end with a handle 18, whereby it may be turned so as to move the cam-ring.

A threaded clamping ring 19, engages an outer threaded portion of the stem and is provided with slanting recesses 21, terminating in shoulders 22. These recesses are adapted to fit over the upper surfaces of the cutters which have edges projected angularly above the plane face of the shoulder, owing to the tilted arrangement of the socket walls, and the shoulders 22 of the clamping ring are adapted to engage and grip these projected edges when the ring is screwed into place.

Extending through the clamping ring is a small screw 3, bearing on the cam-ring 12 and serving to hold said ring against its seat so that the proper engagement of the rack with the pinion tool will be insured.

In order to lock the cutters in place, the clamping ring is screwed to position, the

shoulders 22, thereof engaging the tilted edges of the cutters and then the lock-nut 4, is screwed up against the movable head 5, by means of a wrench placed in engagement with the hole 24 in the lock-nut. By the pressure of the lock-nut, the head is moved out on the tool stem and jammed against the cutters and clamping ring, thus securely clamping the cutters in place.

To adjust the cutters radially the lock-nut is loosened and the adjusting pinion-tool 18, inserted in the hole in the head and the cam-ring turned so as to cause a greater or less projection of the cutters, as desired.

It is clear that various changes in the details of the device may be made without departing from the principle of my invention.

Having thus described my invention, what I claim is:

1. In a cutting tool, in combination with a longitudinally movable head having sockets in its outer edge, removable cutters mounted in said sockets, a threaded clamping ring beyond said head and adapted to bear directly upon said cutters, and pressure means to hold said cutters locked between said head and ring, substantially as described.

2. In a cutting tool, in combination with a longitudinally movable head, said head having cutter sockets in its outer edge, removable cutters mounted in said sockets and having portions projecting beyond the head, a threaded clamping ring adapted to bear on said projected portions of the cutters and a threaded lock-nut mounted in the tool and adapted to press against the inner end of said head to force the cutters against the ring, substantially as described.

3. In a boring tool, in combination with a cutter having triangular similar end faces and similar longitudinal faces and having the end faces at right angles to the longitudinal faces, a supporting head, said head having sockets supporting the cutters with said end faces perpendicular to a radius of the tool

and with the major width of said cutter extending beyond said radius in the direction of the cutting movement so that a clearance of the outer end face behind the cutting edge is effected, whereby the cutter may be adjusted so that any one of the edges may be used as the cutting edge, substantially as described.

4. In a cutting tool, in combination with a fixed shank stem, a longitudinally slidable head mounted on said stem, radially movable cutters mounted in said head, pressure means to engage said head and cutters, a ring loosely mounted on said stem and capable of a free longitudinal and rotary movement thereon, said ring having exterior cam-projections adapted to bear against the cutters, and having a series of teeth in its inner face, said head having a radial aperture which covers the line of said teeth and is adapted to receive a rotatable toothed tool to operate said toothed ring, substantially as described.

5. In a cutting tool, in combination with a fixed shank-stem, a longitudinally movable head thereon, said head having an outer shoulder having cutter-sockets, radially movable cutters mounted in said sockets, a cam-ring loosely mounted in said head behind said shoulder and having a series of teeth on its inner surface, said stem having its outer and inner portions threaded to receive a threaded cutter-clamping ring, and a lock-nut respectively, means extending through said clamping-ring to press said cam-ring to its seat, said head having a radial aperture extending across the line of the cam teeth to receive a rotatable toothed tool adapted to rotate the cam ring, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROY N. MELVIN.

Witnesses:

W. H. SACKMAN,
HENRY BENDER.