

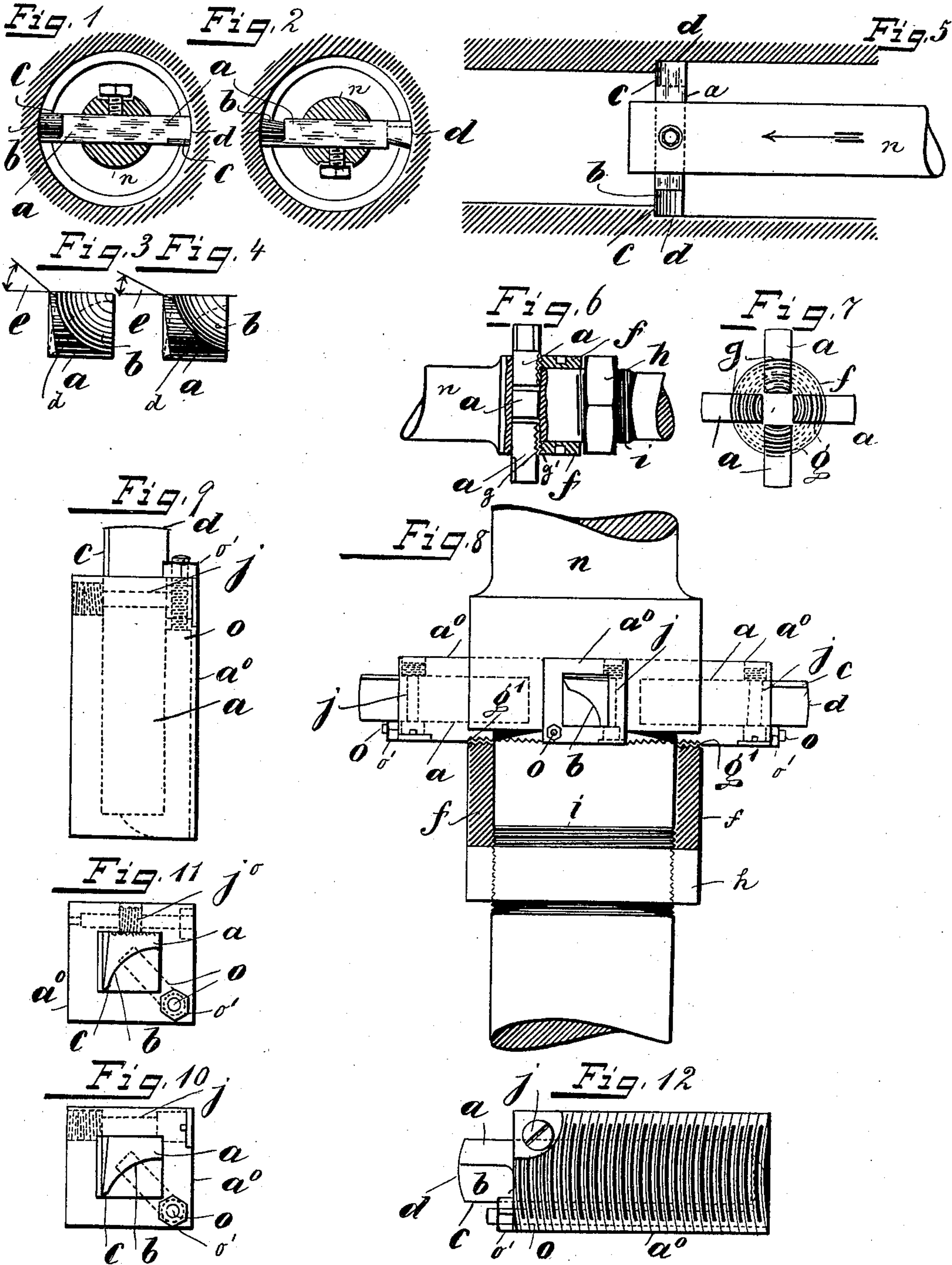
No. 613,660.

Patented Nov. 8, 1898.

F. BRUNNER.
BORING TOOL.

(Application filed Dec. 14, 1897.)

(No Model.)



Witnesses:

William Schulz
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UNITED STATES PATENT OFFICE.

FLORIAN BRUNNER, OF MUNICH, GERMANY.

BORING-TOOL.

SPECIFICATION forming part of Letters Patent No. 613,660, dated November 8, 1898.

Application filed December 14, 1897. Serial No. 661,809. (No model.)

To all whom it may concern:

Be it known that I, FLORIAN BRUNNER, a citizen of Germany, and a resident of Munich, Bavaria, Germany, have invented certain new and useful Improvements in Boring-Tools, of which the following is a specification.

This invention relates to a boring-tool for forming cylindrical and conical holes in a rapid and accurate manner.

In the accompanying drawings, Figure 1 is a transverse section through the boring-tool; Fig. 2, a similar section showing a modification of the cutting edge. Figs. 3 and 4 are end views of the knife; Fig. 5, a side view of the tool; Fig. 6, a sectional side view of the chuck for adjustably attaching the knives to the rod; Fig. 7, a transverse section thereof; Fig. 8, a sectional side view of a modification of the chuck; Fig. 9, a detail of box a° , shown in Fig. 8; Fig. 10, an end view thereof; Fig. 11, an end view of a modification, and Fig. 12 a side view of the box.

The letter a represents the steel body of the knife or cutter, provided at each end with a milled concavity b . The straight front cutting edge c for boring is formed by chamfering the end of the tool beneath the cavity, so that such cutting edge is arranged within the front plane of the knife. A second curved cutting edge d is formed at the outer end of the concavity b by undercutting the end of the tool and backing it off from the cavity backward. The knife a is attached to the boring-rod n by suitable means, such as the set-screw shown.

To effect the proper cut, the radius of the concavity b should be properly selected, inasmuch as by the shallowness, Fig. 4, or depth, Fig. 3, of the concave surface the tool is adapted for operation upon harder or softer material. The angle of rake e is also made larger or smaller in accordance with the degree of hardness of the work.

When the knife is advanced in the direction of the arrow, Fig. 5, the edge c will bore or cut the hole, while the edge d will smooth or trim its surface. If desired, the cutting edge c may be arranged radially, as illustrated in Fig. 2. The knife will guide itself within the bore-hole, as appears from Figs. 1 and 2, so that a catching or tearing action cannot take place, and as the knife performs si-

multaneously a cutting and smoothing operation increased speed is obtained and waste is avoided. The knife may be shaped without forging, which avoids the objectionable heating.

Figs. 6 and 7 illustrate a chuck for radially adjusting the knives to any desired diameter and for securely attaching them to the boring-rod. The rod n is provided with two or more radial sockets or guideways that receive the grooved shanks g of knives a , said shanks forming collectively a thread around the rod n . This thread is engaged by a scroll-ring f , which is revolvably seated on the rod and which upon being turned draws the knives by its thread g' radially inward or outward.

In order to lock the ring f and the knives a in position, a nut h is fitted upon a thread i of rod n , which, upon being tightened up, will bear against the ring. If desired, a jam-nut may be used to prevent accidental loosening of nut h .

To attach the knives more securely to the heads of boring-tools of larger dimensions and permit an accurate adjustment of the knives in the boring as well as the radial direction, the knives, in lieu of being attached directly by the ring f , may be set into adjustable boxes a° , as illustrated in Figs. 8 and 12. These boxes a° are secured to the rod n in a manner similar to that described with relation to the knives—viz., by scroll-ring f and nut h . They are provided on their outer side with teeth, Fig. 12, engaged by the ring, which on being turned adjusts them simultaneously in a radial direction. The knives are made adjustable within their boxes a° in a boring and radial direction to permit them to be properly set when unevenly ground. To this effect a double-headed screw-bolt j extends across the box and projects with both of its heads over the sides of the knife, Fig. 10, the box being at its front somewhat wider than the knife to permit the adjustment of the latter. The knife is set by turning the bolt j , the heads of which will tilt the knife and hold it in position.

In order to effect a radial adjustment of the knives within the boxes, the latter contain a second longitudinally-adjustable screw-bolt o , the hooked lower end of which projects

over the inner end of the knife, Figs. 9 and 10. By turning a nut *o'* on this bolt the knife will be drawn outward by the hook, so that in this way the position and rake of the cutting edges *c d* may be adjusted at pleasure.

In place of using the double-headed bolt *j* of Fig. 10 I may employ a worm *j'*, which engages the threaded body of the knife, as shown in Fig. 11.

10 What I claim is—

1. A cutter for boring-tools having a backed-off and undercut end to form a cavity and a curved trimming edge, and a chamfered straight cutting edge within the front of the tool, substantially as specified.

2. The combination of a boring-rod with a series of cutters and means for radially ad-

justing the cutters, each cutter having a backed-off and undercut end to form a cavity and a curved trimming edge, and a chamfered straight cutting edge within the front of the tool, substantially as specified.

3. The combination of a boring-rod with a scroll-ring, threaded radially-movable boxes engaged thereby, cutters projecting into the boxes, and means within the boxes for tilting and for radially adjusting the cutters, substantially as specified.

Signed at Munich, Bavaria, this 1st day of December, A. D. 1897.

FLORIAN BRUNNER.

Witnesses:

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