(No Model.)

O. TYBERG.

TWIST DRILL.

No. 546,041. Patented Sept. 10, 1895.

Fig.3

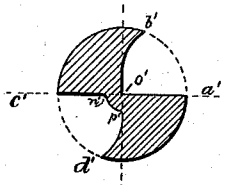


Fig.2

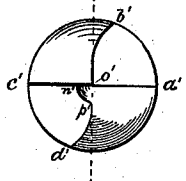


Fig.1

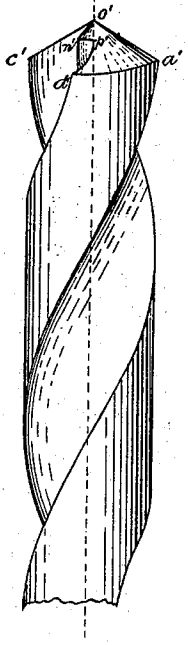


Fig.6

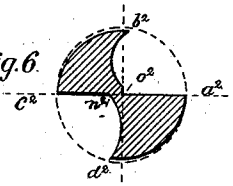


Fig.5

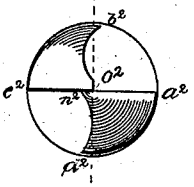


Fig.4

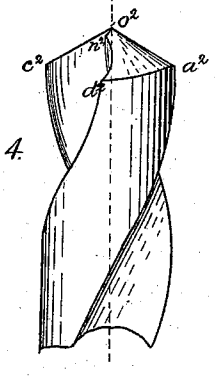


Fig.7

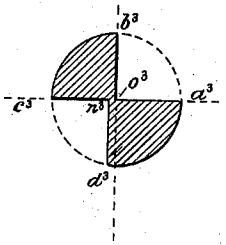
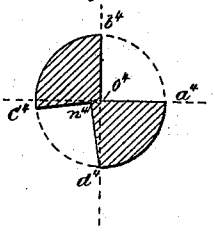


Fig.8.



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UNITED STATES PATENT OFFICE.

OLUF TYBERG, OF BROOKLYN, NEW YORK.

TWIST-DRILL.

SPECIFICATION forming part of Letters Patent No. 546,041, dated September 10, 1895.

Application filed October 2, 1894. Serial No. 524,748. (No model.)

To all whom it may concern:

Be it known that I, OLUF TYBERG, a subject of the King of Denmark, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Twist-Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

In twist-drills as heretofore made, so far as I am aware, neither of the cutting-edges extends to the axial center of the drill, and usually the two cutting-edges are tangential to a small circle of which the axis is the center. The center portion, therefore, of such drills must remove the stock by a crushing or scraping action only, resulting in a retardation of the feed and development of considerable frictional heat.

The object of my invention is to produce a twist-drill in which the true cut of the tool extends to its axis. To this end I so modify the cross-sectional shape as to produce two cutting-edges, one of which is of the usual character, but extends inward to the axis of the drill. The modification of cross-section consists in having one of the grooves extend to the axis, while the opposite one is of such shape as to leave a sufficiently substantial connection on that side of the axis between the two sides of the drill. I am aware that in twist-drills in which neither of the grooves extends to the axis it has been proposed to grind a chamfer on the stock connecting the two sides of the drill and to thus attempt to extend the cutting-edge to or closer to the axis. Such an operation is, however, difficult, requires a sharp-edged grinding wheel or tool, and is unsatisfactory in results. I am also aware that it has been proposed to make a twist-drill in which one of the grooves is extended beyond the axis, thus removing the central portion of the drill entirely. In such case a core corresponding to this central portion would remain in the center of the hole unless the hole be drilled entirely through the stock. Such a drill would be difficult to start, not having a center, and it would be practically impossible to grind it.

In the accompanying drawings, Figure 1 is a side view of a drill embodying my invention; Fig. 2 an end view, and Fig. 3 a section, through any portion of the drill. Figs. 4, 5, and 6 are views, respectively, similar to Figs. 1, 2, and 3, showing a somewhat modified form of my invention. Figs. 7 and 8 show sections of two other modifications embodying the same invention.

Referring to Fig. 3, this section shows the drill to have two spirally-cut angular grooves, one of which $a'\ o'\ b'$ has its apex in the center or axis of the drill throughout its entire length, while the other groove $c'\ n'\ p'\ d'$ is shaped so as to leave sufficient stock around the other portion of the center to connect the two sides of the drill which carry the cutting-lips or cutting-edges. These lips $a'\ o'$ and $c'\ o'$ are shown in Figs. 1 and 2. When grinding the drill and relieving the stock behind the lips, it is possible to grind in such a manner as to procure two perfect cutting-edges, both running directly to the axis of the drill, by removing the stock in front of the cutting-edge $c'\ o'$, as indicated in Fig. 1 by line $o'\ n'$. This, however, is not absolutely necessary, as it is sufficient if only one cutting-edge $a'\ o'$ runs directly to the center, which the shape of the groove $a'\ o'\ b'$ will always insure.

Figs. 4, 5, and 6 show a drill formed in a similar manner, except the shapes of the grooves are somewhat modified, so as to obtain a lighter drill, and illustrate how the circular relief indicated by lines $c^2\ b^2$ and $a^2\ d^2$ used in some of the present drills may also be obtained in my drill.

Fig. 7 illustrates the accomplishment of my invention by two rectangular V-shaped grooves $a^3\ o^3\ b^3$ and $c^3\ n^3\ d^3$.

Fig. 8 shows how the cutting-edges $a^4\ o^4$ and $c^4\ n^4$ may be radial without necessarily being diametrically opposite each other.

It is not essential that the entire cutting-edge $a\ o$ should be a straight line. It might also be a curve, provided it runs to the axis of the drill, and a practically sharp angle is procured there.

I claim as my invention—

1. A twist drill having two grooves opposite

each other, one groove being V-shaped and having its apex in the axis of the drill.

2. A twist drill having one groove shaped so as to form an angle with its apex in the axis of the drill, while another is so shaped as to leave a substantial connection between the two sides of the drill.

In testimony whereof I have hereunto subscribed my name.

OLUF TYBERG.

Witnesses:
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