

No. 750,537.

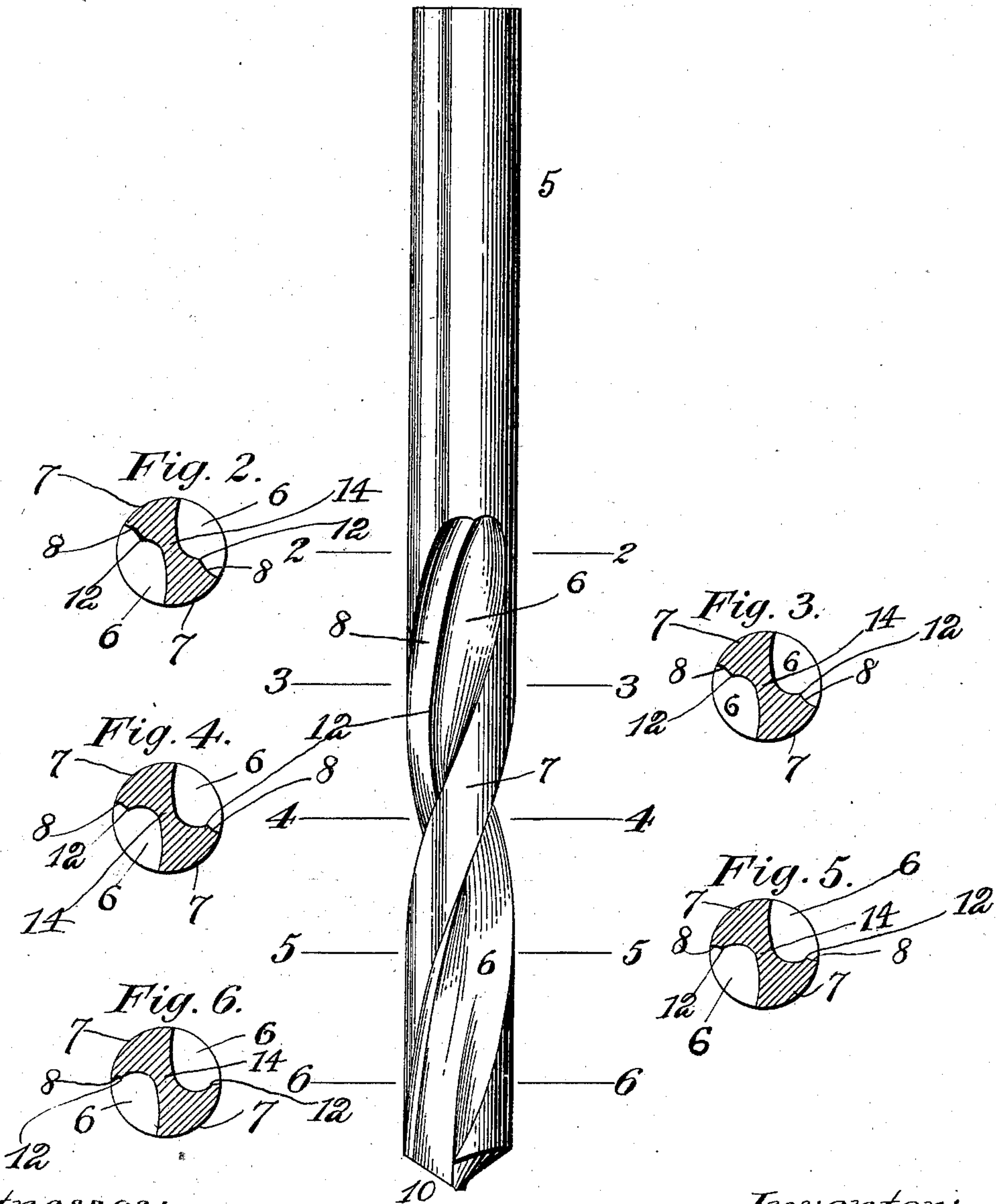
PATENTED JAN. 26, 1904.

B. M. W. HANSON.
DRILLING TOOL.

APPLICATION FILED JUNE 6, 1903.

NO MODEL.

Fig. 1.



Witnesses:
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UNITED STATES PATENT OFFICE.

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DRILLING-TOOL.

SPECIFICATION forming part of Letters Patent No. 750,537, dated January 26, 1904.

Application filed June 6, 1903. Serial No. 160,357. (No model.)

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Drilling-Tools, of which the following is a specification.

My invention relates to drilling-tools of what is known as the "twist-drill" type, and has for its object the provision of improvements in articles of the class set forth by which advantageous results are obtained in strength, wearing qualities, and mode of operation of said tool.

Other objects of the invention will be hereinafter set forth.

In the accompanying drawings, Figure 1 is a view in elevation of a twist-drill embodying the features of my invention. Fig. 2 is a transverse section on line 2 2 of Fig. 1. Fig. 3 is a transverse section on line 3 3 of Fig. 1. Fig. 4 is a transverse section on line 4 4 of Fig. 1. Fig. 5 is a transverse section on line 5 5 of Fig. 1. Fig. 6 is a transverse section on line 6 6 of Fig. 1, and Fig. 7 is a view of the cutting end of the tool.

Like numerals designate similar parts throughout the several views.

Heretofore in tools of the class to which my invention relates the spiral grooves have been so formed that trouble has ensued by the clogging of the chips, due to the lack of clearance qualities of the grooves, and the web of the drill has been in these old constructions so much reduced in thickness that it has been weakened, and said tools often break under strain and have to be discarded, cut down, and resharpened. In my invention these defects are avoided, and a tool of constructional qualities fully equal to all demands upon it and one of strength sufficient to resist torsional strains incident to its employment is the result.

Referring to the drawings, the numeral 5 designates a tool shown for purposes of illustration as a twist-drill, although it may be an auger, bit, or the like, having spiral grooves 6, formed by milling or otherwise and extending longitudinally of the tool-body for the

requisite distance to produce lands 7, each of said lands having its side, at the end of which the cutting-surface is formed, of a constant angle. Designated by 8 are grooves formed in the tool-body adjacent to said grooves 6 and from which they are separated by spiral ribs 12. Each spiral groove 8 substantially merges into the body of the tool at the cutting-point 10 thereof, as shown in Figs. 1 and 7, and from said point it gradually increases in width and has a quicker lead from end to end. This feature is clearly illustrated in Fig. 1 and in the various cross-sectional views, by referring to which it will be seen that in Fig. 6 said groove 8 is narrow, that it is wider in Fig. 5, still wider in Fig. 4, again wider in Fig. 3, and finally attains its full width in Fig. 2, where it terminates in the body of the tool. From what has been stated it will be manifest that at the cutting-point the two grooves 6 and 8 substantially coincide or merge into each other at 10 to constitute a main groove of full width and that from said point each groove 8 diverges from the main groove 6 and also gradually increases in width to afford proper clearance for the chips or cuttings.

Intermediate each pair of grooves 6 and 8 is the spiral rib or ridge 12, varying in angle throughout its length and which serves to divide the grooves 6 and 8 and to strengthen the tool, so that it will not break under torsional strain. This rib or ridge is quite pronounced near the shank of the tool and is of gradually-decreasing height toward the point thereof, where it substantially merges into the main groove 6, as above stated.

Designated by 14 is the thin web of the tool, which is of uniform or substantially uniform thickness throughout its length. By providing a thin web of uniform thickness or only slightly increasing in thickness toward the shank the tool may have a short nearly uniform cutting-point and will still be strong and rigid in action, for the reason that the rib or ridge 12 adds materially to the strength of the core. In this way a tool is produced which overcomes many of the defects in the common kinds, has a cutting side of constant angle

and a clearance-space of gradually-increasing width, one that has been found ample in practice to receive the chips or cuttings and to permit their escape without clogging or interfering in the slightest degree with the proper action of the implement.

Changes may be made in the form of the clearance-groove and of the rib or ridge separating it from the main spiral groove without departure from the invention, which is not limited to the precise details shown and described.

Having thus described my invention, what I claim is—

1. A tool having a spiral groove with a side of constant angle, and adjacent to said groove a clearance-space of gradually-increasing width from point to rear.
2. A tool having a pair of spiral grooves each with a side of constant angle, a spiral rib or ridge intermediate each pair of grooves, and clearance-spaces of gradually-increasing width from point to rear.
3. A tool having pairs of spiral grooves, the grooves of one pair being each of a constant lead, and those of the other pair increasing gradually in width from front to rear, and having each a constant lead different from the lead of the other pair.
4. A tool having main spiral grooves, spiral ribs of gradually-increasing projection from

point to rear, and spiral clearance-grooves separated from the main grooves by said ribs.

5. A tool having a pair of spiral grooves, one of said grooves being of constant lead, and the other of said grooves gradually increasing in width from front to rear, and being of a different constant lead.

6. A tool having a web of substantially uniform thickness, main spiral grooves, spiral strengthening ribs or ridges, and clearance-grooves of gradually-increasing width from point to rear, and separated from the main grooves by said ribs.

7. A tool having a pair of spiral grooves merging into each other adjacent to the cutting end, one of said grooves being of gradually-increasing width from front to rear, and a spiral rib of gradually-increasing projection from front to rear separating said grooves.

8. A twist-drill having main spiral grooves, clearance-grooves merging into the main grooves at the point of the drill, spiral ribs or projections of constantly-varying angle separating the main and clearance grooves, and a web of substantially uniform thickness.

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

BENGT M. W. HANSON.

Witnesses:

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