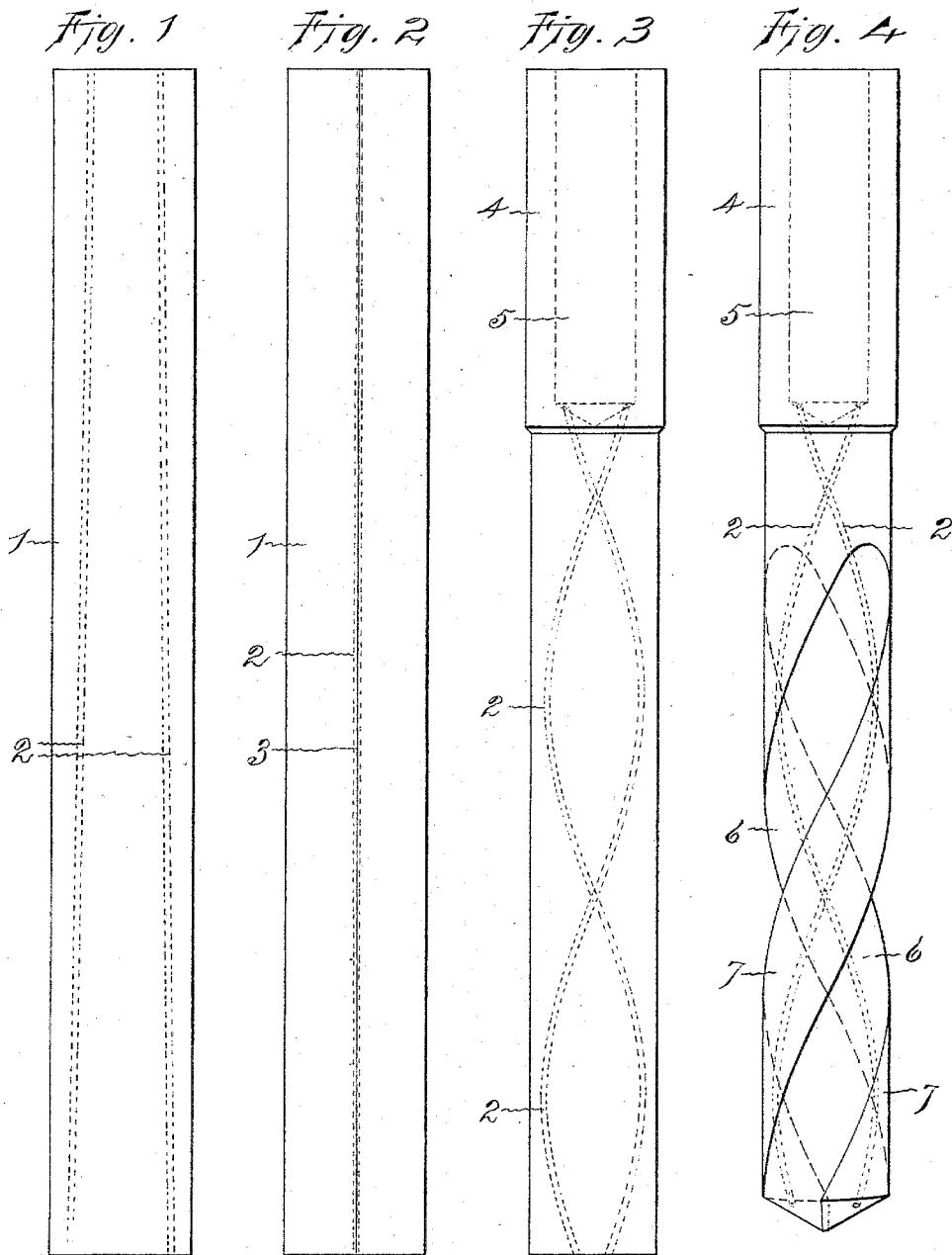


(No Model.)

W. J. RICKEY.
LUBRICATING TWIST DRILL.

No. 589,576.

Patented Sept. 7, 1897.

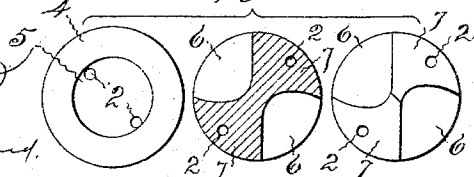


Witnesses:

Andrew Ferguson

Chas. E. B. B. B.

Fig. 5



Inventor:

Walter J. Rickey,
by
Harry P. Williams
att'y.

UNITED STATES PATENT OFFICE.

WALTER J. RICKEY, OF DANBURY, CONNECTICUT, ASSIGNOR TO THE T. & B. TOOL COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

LUBRICATING TWIST-DRILL.

SPECIFICATION forming part of Letters Patent No. 589,576, dated September 7, 1897.

Application filed February 20, 1897. Serial No. 624,380. (No model.)

To all whom it may concern:

Be it known that I, WALTER J. RICKEY, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Lubricating Twist-Drills, of which the following is a specification.

The invention relates to those twist-drills that have internal passages through which lubricating material may be forced to the cutting-lips for washing out the chips and conducting away the heat incident to drilling and for otherwise aiding the cutting action of the drill and prolonging its life.

The object is to provide an attractive appearing and inexpensive drill of this class which will be strong, durable, and very efficient.

The invention resides in a twist-drill having a common cutting-point and holding-shank, a strong web and ordinary spiral grooves, and lands between the point and shank, with spiral passages in the solid metal beneath the surfaces of the spiral lands, as more particularly hereinafter described, and pointed out in the claims.

On the accompanying sheet of drawings, which illustrate an embodiment of the invention and the method of producing the same, Figure 1 is a view of a rod with two perforations and illustrates the blank at one period during the process of making a drill, which embodies the invention. Fig. 2 is a view of the same rod rotated ninety degrees. Fig. 3 is a view of the blank after other operations of the process of manufacture have been performed. Fig. 4 is a view of a completed drill made from this blank; and Fig. 5 shows a view of the shank end, a transverse sectional view, and a view looking at the point of the of the drill shown in Fig. 4.

In the process of making a drill which embodies the invention a steel rod 1 of circular cross-section formed to approximately the diameter and length of the completed drill is bored to form passages 2. These passages may be bored completely through or only part way of the length of the rod and they may extend parallel with each other and with the axis of the rod or, as is most preferred, they may in-

cline toward each other and toward the axis of the rod, as shown in Fig. 1. A line 3 is usually scored on the surface of the rod thus bored just outside of and parallel with one or both of the passages, as indicated in Fig. 2. This scored blank is then heated and while hot one end is held and the other end twisted until the passages assume the spiral of the lands that will remain after the grooves have been formed. The spiral of the lands being known the necessary twist to give the passages the proper spiral is readily determined by the positions of the lines 3. These lines being on the surfaces directly outside of the passages the heated blank is twisted until the lines occupy positions which will be practically the middle of the lands to be formed. Any common shank 4 may then be formed, and this shank is usually bored to provide a chamber 5, into which the passages 2 may lead. After the body of this twisted blank, as illustrated in Fig. 3, has been turned to about the size of the completed drill grooves 6, of any approved shape, may be milled or otherwise formed on the desired pitch between the passages. The pitch of the grooves may be either constant or increased, according as the passages have been twisted, which passages are thus left in the solid body of the lands 7 between the grooves. The blank is then by any common means given the desired point and cleared and sharpened in the usual manner.

The grooves are preferably formed in such manner as to leave a web of increasing thickness from point to shank, and the passages are located far enough from the axis of the drill to leave a strong web and yet not be sufficiently near the surfaces to weaken the lands or the cutting edges. It is preferred that the passages incline toward each other from the point to the shank in order that they may be in the heaviest part of the lands, away from the web near the point, and yet enter a chamber in the shank of such moderate size that it will not materially weaken the walls of the shank.

When a drill embodying this invention is in use, as in a screw or other chucking machine, a stream of lubricating-oil can be forced by a small pump or otherwise from the shank through the passages to the point,

so as to wash out the chips incident to the cutting by the lips and conduct away the heat generated by rapid boring. The application of a lubricant in this manner permits of a considerable increase in the rate of boring over the ordinary manner and prolongs the life of the drill beyond the limit of an ordinary drill. This drill is strong, for a web of good form may be left intact and the comparatively small chamber provided in the shank does not appreciably weaken the structure of the drill. It is durable, for the exterior surfaces of the lands are solid and stiff, and it is efficient, for the passages in the solid metal of the lands permit of the thorough lubrication of the cutting-lips of the drill without necessitating the removal of but a slight portion of the metal of the body of the drill. The drill is neat and attractive in appearance, for the passages are entirely concealed, except at the point, and the surfaces of the lands are not cut, marred, or filled with metal different from that of which the drill is formed, and the drill is inexpensive, for the operations performed in the process of its manufacture are not complicated or many.

I claim as my invention—

1. A drill having spiral grooves and spiral lands with spiral passages surrounded by solid metal beneath the surfaces of the lands, substantially as specified.

2. A drill having point, shank, web, spiral grooves and spiral lands with spiral passages in the solid metal beneath the surfaces of the

lands, said passages opening through the point and shank, substantially as specified.

3. A drill having point, shank, web, spiral grooves and spiral lands with spiral passages in the solid metal beneath the surfaces of the lands, said passages inclining to the axis of the drill and opening through the point and shank, substantially as specified.

4. A drill having point, shank, web, spiral grooves and spiral lands with spiral passages in the solid metal outside of the web of the drill but entirely beneath the surfaces of the lands, substantially as specified.

5. A drill having a point, chambered shank, web, spiral grooves and spiral lands with spiral passages in the solid metal beneath the surfaces of the lands, said passages opening through the point at one end and into the chambered shank at the other end, substantially as specified.

6. The method of forming lubricating-drills which consists in boring a rod to form passages, scoring said rod outside of the passages, heating the scored rod and twisting it while hot until the passages assume the spiral of the lands to be formed, then milling the grooves and pointing and finishing the drill, substantially as described and for the purpose specified.

WALTER J. RICKEY.

Witnesses:

A. SHELTON DAVENPORT,
JOHN R. BOOTH.