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2,555,302

TWIST DRILL

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FIG. 4.

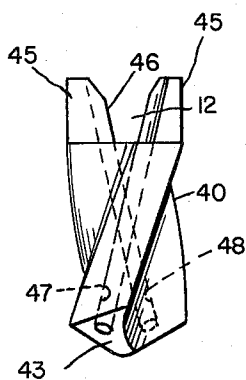
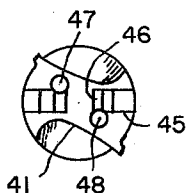


FIG. 3.

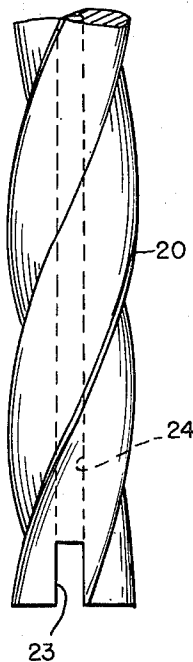


FIG. 2.

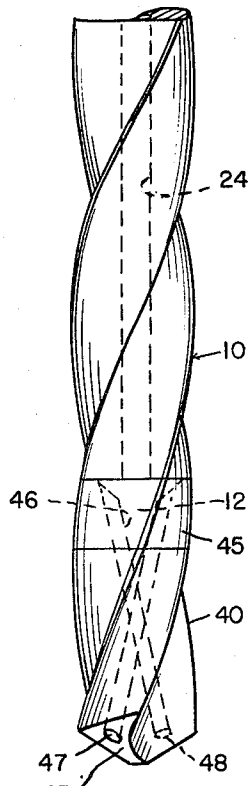


FIG. 1.

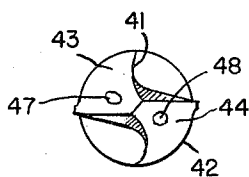


FIG. 5.

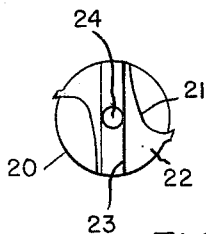


FIG. 6.

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2,555,302

TWIST DRILL

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1 Claim. (Cl. 77-68)

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The present invention relates to a twist drill and more particularly to a lubricated, helically fluted twist drill.

It is an object of the present invention to provide a twist drill having a longitudinally extending oil passage throughout its major portion and a plurality of inclined straight oil passages at its tip portion communicating at their inner ends with the first mentioned oil passage.

It is a further object of the present invention to teach a novel method of providing a lubricated twist drill which is characterized by the steps of forming a separate shank and tip, providing interfitting torque transmitting formations between said shank and tip and providing separate straight drilled oil passages in the shank and tip which are adapted to be in communication when the shank and tip are assembled together.

Other objects and features of the invention will become apparent as the description proceeds, especially when considered in conjunction with the accompanying drawings, wherein:

Figure 1 is a side elevation of the operating end of an assembled twist drill constructed in accordance with the present invention;

Figure 2 is a side elevation of a portion of the shank part of the twist drill;

Figure 3 is a side elevation of the tip part of the twist drill;

Figure 4 is a top plan view of the tip part illustrated in Figure 3;

Figure 5 is a bottom plan elevation of the tip part illustrated in Figure 3; and

Figure 6 is a bottom plan view of the shank part illustrated in Figure 2.

It is desirable in twist drills of the type referred to, to provide a supply of oil at the bottom of the hole being drilled. In accordance with the present invention, oil passages are formed which open into the end of the twist drill so as to provide oil at the bottom of the hole being drilled.

The twist drill illustrated at 10 in Figure 1 is composed of two elements, a shank or body portion 20 shown in Figures 2 and 6 and a tip portion 40 shown in Figures 3 to 5. Referring first to the shank or body portion 20, this portion is provided with a plurality of helically extending flutes 21 leaving intermediate ribs or blades 22 as is conventional in the art. At one end the shank 20 is provided with a transverse groove 23 which as illustrated in Figure 2 may be of rectangular cross section and which is of a dimension to leave adequate supporting material at its sides. Extending longitudinally through the lower portion

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of the shank 20 is an oil passage 24 which is preferably coaxial with the shank portion. The oil passage 24 at its upper end may open outwardly through the end of the drill or it may open laterally thereof. The only essential requirement is that it be arranged so as to afford connection with a source of oil under pressure.

Referring now to Figures 3 to 5, the tip of the twist drill is formed as a separate element. It is provided with helically extending flutes 41 which are adapted to provide a continuation of the flutes 21, the flutes 41 forming intermediate ribs or blades 42. The end of the twist drill is tapered to provide the end surfaces 43 and 44. The inner end of the tip 40 is cut away to leave a tongue 45 of a cross section adapted to fit snugly within the groove 23. The central portion of the tongue 45 is cut away to provide a slot as indicated at 46 which forms a laterally enlarged oil chamber, as will subsequently appear.

In order to provide for a flow of oil at the end of the cutter tip, straight inclined oil passages 47 and 48 are provided. The oil passages 47 and 48 are arranged to extend substantially along the ribs 42.

The assembled twist drill is shown in Figure 1 and it will be observed that the tongue 45 is inserted within the groove 23. This results in the formation of a laterally enlarged oil chamber 12 which is formed by the transverse slot previously described. The elongated axial oil passage 24 formed in the shank 20 communicates with the top of the chamber 12 and the straight inclined oil passages 47 and 48 communicate with the bottom of the chamber 12.

In producing the twist drill, the shank 20 is provided with a slot by a suitable operation, such for example as milling or broaching. In a similar manner, the tip 40 is provided with the transversely extending tongue 45 by a milling or broaching operation. After the tongue 45 has been formed the transverse slot 46 is produced by a suitable operation, such for example as milling, broaching or the like. The dimensions of the transverse slot 46 are such as to provide an oil chamber 12 of a size adapted to communicate with the oil passages 24, 47 and 48 and at the same time to leave sufficient material therein to transmit torque between the shank and the tip and to provide a strong tool.

The oil passage 24 may be drilled in the shank of the tool and in like manner the straight inclined oil passages 47 and 48 may be drilled in the tip thereof. After the interfitting tongue and groove construction has been provided and the

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several oil passages drilled, the shank and the tip may be hardened by conventional heat treatment and thereafter the parts assembled together and brazed or otherwise secured in assembled position. As a final operation the twist drill may be finish ground as is usual in tools of this type.

The present construction renders the manufacture of the lubricated twist drill a relatively simple matter and at the same time permits the production of a lubricated twist drill in sizes smaller than has heretofore been considered practicable. At the same time, the provision of the oil holes and oil chamber is such as not to substantially weaken the completed twist drill, and the particular type of connection between the shank and tip of the twist drill is found well adapted to contribute to the ultimate strength of the completed tool, since the tongue and groove connection is well suited to transmit torque between the parts and the portion of the tongue which has been cut away to provide the laterally enlarged oil passage is that portion of the tongue which would contribute least to torque transmission.

The drawings and the foregoing specification constitute a description of the improved twist drill in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claim.

What I claim as my invention is:

A twist drill having a pair of helical flutes and corresponding helical ribs, said drill comprising a relatively long shank portion and a relatively short tip portion, the adjacent ends of said portions having a tongue and groove torque transmitting connection, the tongue and groove being located in ribs at the ends of said portions, the central portion of said tongue having a trans-

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verse slot therethrough defining a laterally enlarged oil chamber when said tongue and groove are interfitted, an axially extending oil passage in said shank portion communicating with said chamber, straight inclined oil passages in said tip portion opening at one end into the end face of the drill and at the other end into said chamber, said last mentioned passage being inclined in conformity with the helix angle of the drill and each disposed generally within a rib thereof the length of said tip being sufficiently short so that each of the straight passages extending from the end surfaces thereof into said chamber lies wholly within a helical rib.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
496,253	Federschmidt	Apr. 25, 1893
589,576	Rickey	Sept. 7, 1897
1,048,035	Campbell	Dec. 24, 1912
1,104,989	Hanson	July 28, 1914
1,285,869	Wineman	Nov. 26, 1918
1,407,328	Glenzer	Feb. 21, 1922
1,409,753	Moore	Mar. 14, 1922
2,148,805	Cogsdill	Feb. 28, 1939
2,237,901	Chun	Apr. 8, 1941
2,259,611	Burger	Oct. 21, 1941
2,325,973	Nurnberger et al.	Aug. 3, 1943
2,360,385	Anderson	Oct. 17, 1944

FOREIGN PATENTS

Number	Country	Date
15,608	Great Britain	July 27, 1916
21,155	Great Britain	May 22, 1913