

M. HARDSOCH.
 DRILL AND DRILL SHANK.
 APPLICATION FILED JAN. 12, 1909.

968,472.

Patented Aug. 23, 1910.

Fig. 1.

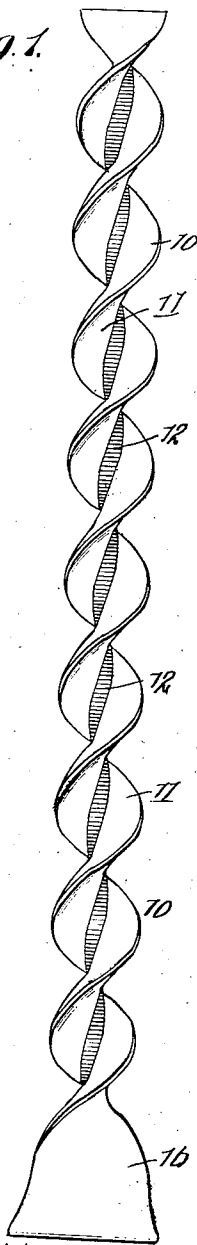


Fig. 3.

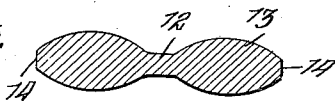


Fig. 4.

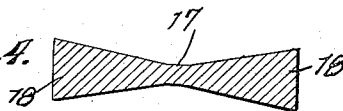


Fig. 5.

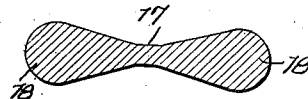


Fig. 6.

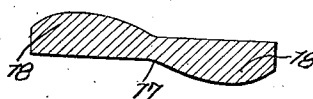


Fig. 7.

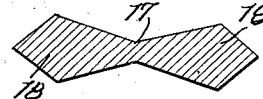


Fig. 8.

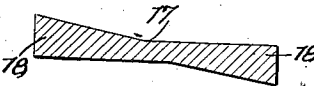
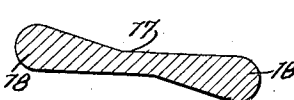


Fig. 9.



Witnesses:

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UNITED STATES PATENT OFFICE.

MARTIN HARDOGG, OF OTTUMWA, IOWA.

DRILL AND DRILL-SHANK.

968,472.

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Application filed January 12, 1909. Serial No. 471,848.

To all whom it may concern:

Be it known that I, MARTIN HARDOGG, a citizen of the United States, residing at Ottumwa, in the county of Wapello and State of Iowa, have invented certain new and useful Improvements in Drills and Drill-Shanks, of which the following is a specification.

This invention relates to drills and drill shanks of a type that is frequently used in the mining of coal or for similar purposes, which drill is in the form of a bar of steel twisted to form the spiral blade which affords space for the back feed of the material which is worn away by the bit end of the drill. As ordinarily constructed, such a drill is formed from a bar of steel, elliptical in cross section and having its greatest diameter in the center; and, in forming the bit end of such a drill, it is customary to subject the end of the twisted or spiral shank to heat and to thereafter flatten out the metal, drawing it down as well as possible toward the edge in order to give a broad chisel edge to the bit end of the drill. In seeking to thus draw out the metal of a drill shank, elliptical in cross section, difficulty is experienced by reason of the fact that there is an over-abundance of metal in the center and a scarcity of metal at the edge, so that it is difficult to draw the metal down to a straight chisel edge without unduly thinning and weakening the metal at the edges, which are the points most subjected to wear in the drilling operation. Furthermore, in the use of such a drill, the edges will be quickly worn away, necessitating grinding to sharpen the bit, and this grinding still further wears back the edges so that, after being ground, the bit will no longer present a chisel edge but will be beveled on each side to a point or apex, and after a few grindings the metal will be so worn away at the edges as to necessitate forging of the drill shank.

The object of the present invention is to overcome the difficulties above noted, by forming the drill shank from a bar of metal which is of reduced diameter in the center, so that the stock will be more evenly distributed from side to side of the shank, thereby permitting the metal to be more easily and satisfactorily forged and drawn out toward the edges of the bit, which results in a bit which can be more easily and satisfactorily forged and which will have

the metal distributed in such a manner as to greatly increase its efficiency and its wearing qualities. This result, furthermore, is obtained without unduly thickening the edges of the blade and without unduly obstructing the spiral groove and thereby impairing the back feeding qualities of the drill.

The invention consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a complete drill and bit, embodying the features of the present invention; Fig. 2 a cross sectional view of an elliptical drill of ordinary type; Fig. 3 a cross sectional view of the drill shank of the present invention; and Figs. 4, 5, 6, 7, 8, and 9, cross sectional views of slightly modified styles of shank, embodying the features of the present invention.

Referring to Fig. 1, the completed drill is formed of a bar of metal which is twisted to give the usual spiral blades 10, having the usual back feeding groove or channel 11 between them. The drill is formed from a bar of metal having the cross section shown in Fig. 3. This formation provides a center connecting portion 12 of reduced diameter, and wings or blades 13, each of substantially elliptical formation, having side edges 14 which are of substantially the diameter of the center connecting portion. When a bar of this configuration is twisted to form a drill, it will afford a spirally extending channel 15 on each side of the bar, and the spiral blades of the drill will be thickened on each side of said channel, but not to an extent which will obstruct the back feeding of the drill. A drill shank of this character terminates in a bit 16, which is of substantially chisel shape and is formed by heating the metal and drawing out the edges to the required degree. By reason of the reduced thickness of the shank in the center and increased thickness toward the edges, it is possible to draw out the metal toward the edges of the bit much more evenly and satisfactorily than if the greater mass of metal stock were in the center, as has ordinarily been the case. Figs. 4, 5, 6, 7, 8, and 9 show various modifications in the cross sectional shape of the shank, but in each case the shank is provided with a center 17 of reduced thickness, and side wings or blades 18 of increased thickness, so that the metal will be

properly distributed to facilitate the forging operation.

The bit formed on the drill of the present invention will be of substantially equal thickness from side to side when properly forged, and the distribution of the metal is such that it can be easily drawn to a straight chisel edge, which it is impossible to do in the case of drills of the ordinary style in which the superabundance of metal in the center causes the bit end, when forged, to round out in the form of a curve or to assume a pointed formation, and these conditions can only be overcome by abusing the metal and thinning it to a dangerous degree.

The drill of the present invention will be sufficiently thick and strong at its edges to withstand a much greater degree of wear than is possible with a drill of the older type, and, furthermore, can be re-ground from time to time without distorting the

proper shape of the drill and without destroying its chisel edge formation.

What I regard as new and desire to secure by Letters Patent is:

1. A drill shank of spiral formation, of reduced thickness in its center and increased thickness on each side of the center, and terminating in a flat broadened bit having a straight thin chisel edge, substantially as described.

2. A drill shank of spiral formation, of reduced thickness in its center and increased thickness on each side of the center, and having an edge of reduced thickness as compared with the thickened side portions, and terminating in a flat broadened bit having a straight thin chisel edge, substantially as described.

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Witnesses:

EDWARD J. LAMBERT,
W. A. WORK.