M. HARDSOCG.

PROCESS OF FORMING DRILL SHANKS AND SIMILAR IMPLEMENTS.

APPLICATION FILED FEB. 5, 1909.

1,011,055. Patented Dec. 5, 1911.

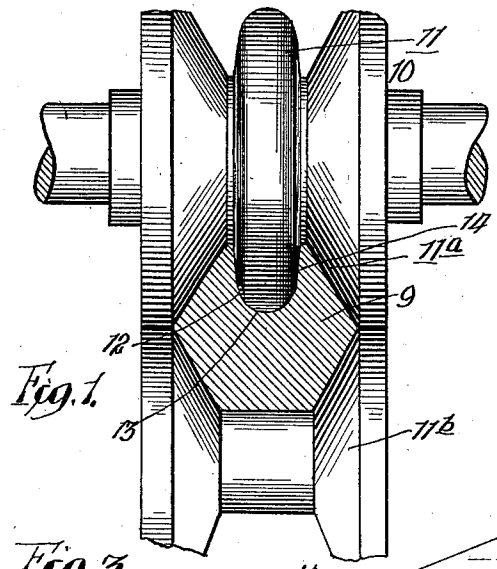


Fig. 1.

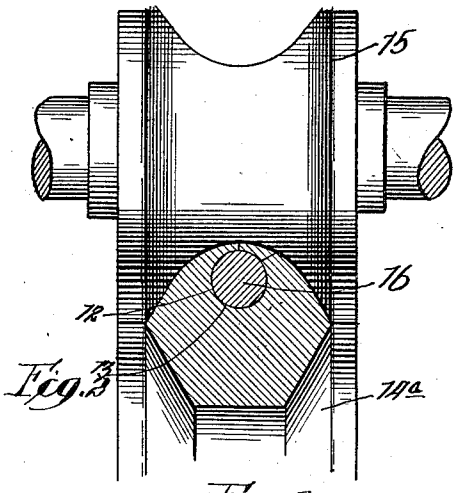


Fig. 2.

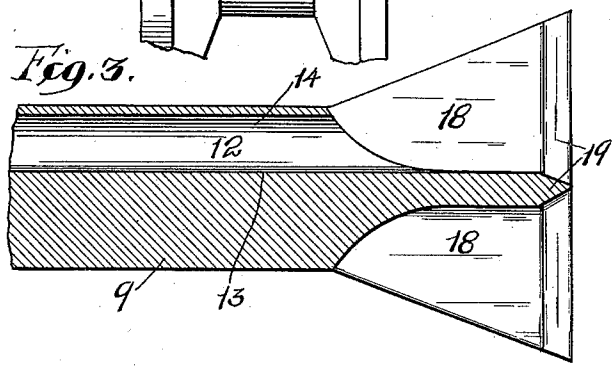


Fig. 3.

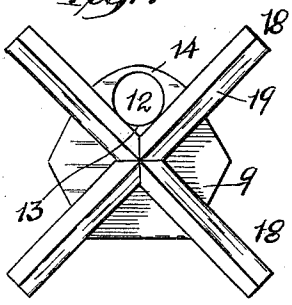


Fig. 4

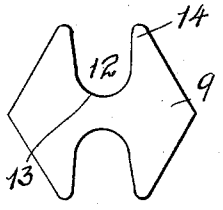


Fig. 5.

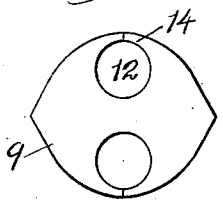


Fig. 6.

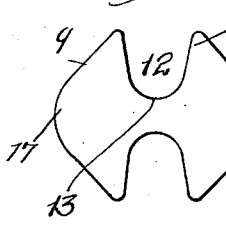


Fig. 7.

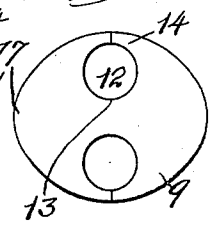


Fig. 8.

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UNITED STATES PATENT OFFICE.

MARTIN HARDSOCG, OF OTTUMWA, IOWA.

PROCESS OF FORMING DRILL-SHANKS AND SIMILAR IMPLEMENTS.

1,011,055. Specification of Letters Patent. Patented Dec. 5, 1911.

Application filed February 5, 1909. Serial No. 476,260.

To all whom it may concern:

Be it known that I, MARTIN HARDSOCG, 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 Processes of Forming Drill-Shanks and Similar Implements, of which the following is a specification.

In the formation of certain styles of drills, especially those intended and adapted for deep rock drilling, it is necessary to provide the drill shank with one or more longitudinally extending bores or passageways, which are adapted to provide for the discharge of air under pressure at a point immediately behind the cutting end of the drill, for the purpose of removing dust or chips which would otherwise interfere with the cutting operation. In the making of drills having shanks of considerable length, great difficulty has been experienced in boring the drill shanks from end to end thereof, in order to afford the passage or passages above referred to. Furthermore, such a boring operation at best is a slow, tedious and expensive process, and, where the length of the shank is exceptionally great, it is practically impossible to bore deeply into the relatively small drill shank without danger of imperfections in the direction of the bore, which serve to weaken if not entirely destroy the value of the drill.

The object of the present invention is to entirely eliminate such a boring or drilling operation, together with the delay, expense and difficulty attendant thereon, by rolling the drill shanks in a manner to afford a longitudinally extending hole or passage, which will be true and exact from end to end of the drill shank, and which can be formed quickly, easily and without great expense.

Further objects and advantages of the process will appear from the detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a cross sectional view, showing the first step in the formation of a hexagonal drill shank; Fig. 2 a view showing the last step in such operation; Fig. 3 a longitudinal sectional view of the bit end of a drill shank, showing the formation of the bit thereon; Fig. 4 an end elevation of the same; Fig. 5 a view showing a bit shank intended to have two holes or passages, after the first stage of the rolling operation; Fig. 6 a view of the same shank, after the last stage of the rolling operation; and Figs. 7 and 8 views similar to Figs. 5 and 6, respectively, illustrating steps in the formation of a slightly modified form of drill shank.

In carrying out the process of the present invention, a bar of metal 9 of suitable size, shape and length is selected, which bar may be of the generally hexagonal shape shown in Fig. 1, or of the laterally grooved formation shown in Fig. 7, which bar is first heated to the degree required in a rolling operation, and is thereafter passed longitudinally under a roll or rolls 10 having a rounded central flange 11 and beveled side flanges 11^a, and coöperating with a grooved supporting roller 11^b, which rolling operation is continued until a relatively deep longitudinally extending channel 12 is formed in one side of the bar. The channel is preferably formed to have a curved floor 13 and slightly flaring side walls 14. When the bar has been thus rolled, it is again heated and is passed between a grooved supporting roller 14^a and a concave roll or rolls 15, which act upon the metal of the bar adjacent to the groove or channel and serve to work the edges of such metal in toward the center to overlie the floor of the groove or channel, so that when the rolling operation is complete the two edges of the metal will be brought together and welded, thereby completing the formation of a perfect cylindrical bore or passage extending uniformly from end to end of the bar. In the second rolling operation, it is desirable to employ a mandrel 16 of a size equal to the intended diameter of the bore or passage, in order to afford an inner supporting surface to coöperate with the rollers in securing a proper welding of the metal edges when brought into engagement with one another.

The hexagonal bar affords a shape which peculiarly adapts it for treatment by the present process, in that the initial groove or channel can be formed in one of the flat faces of the bar, and, after the formation of the groove or channel, the thin edged formation of the metal adjacent to the groove or channel renders such metal easy of manipu-

lation by the second rolling process. Figs. 5 and 6 show the two steps in the formation of a drill shank having two bores or passages formed therein; and Figs. 7 and 8 illustrate the two steps in the formation of a drill shank having rounded sides 17 in place of flat sides. Obviously, bars of other formation could be subjected to the same rolling process. Figs. 3 and 4 illustrate a convenient method of forming the bit on one of the drill shanks, which is done by swaging or forging the metal to provide flaring cutting wings 18, each having a chisel edge 19.

It is to be understood that the shape and number of the rolls employed will be determined by the ordinary rolling mill requirements and by the depth of channel required, the hardness of the metal, the shape of the metal, and similar considerations. Furthermore, although the specification speaks of the formation of drill shanks, it is obvious that the invention is not concerned with the particular use for which the shanks are intended, after the formation of the bores or passages therein.

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

The process of forming a drill shank which consists in first heating a polygon shaped bar, then subjecting it to a rolling operation to produce a longitudinally extending groove in one side of the bar extending practically the entire transverse distance across one face of the bar to produce thin edges at the juncture of said face with the adjacent faces, said groove extending to a point midway the center of the bar, then reheating, then inserting a mandrel within the groove, then subjecting the bar to a second rolling operation, bending in the drawn edges of the metal and forming a circular longitudinally extending bore or passage at one side of the center and close to the outer edge of the bar, and rounding the faces of the bar into circular formation, substantially as described.

MARTIN HARDSOCG.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."