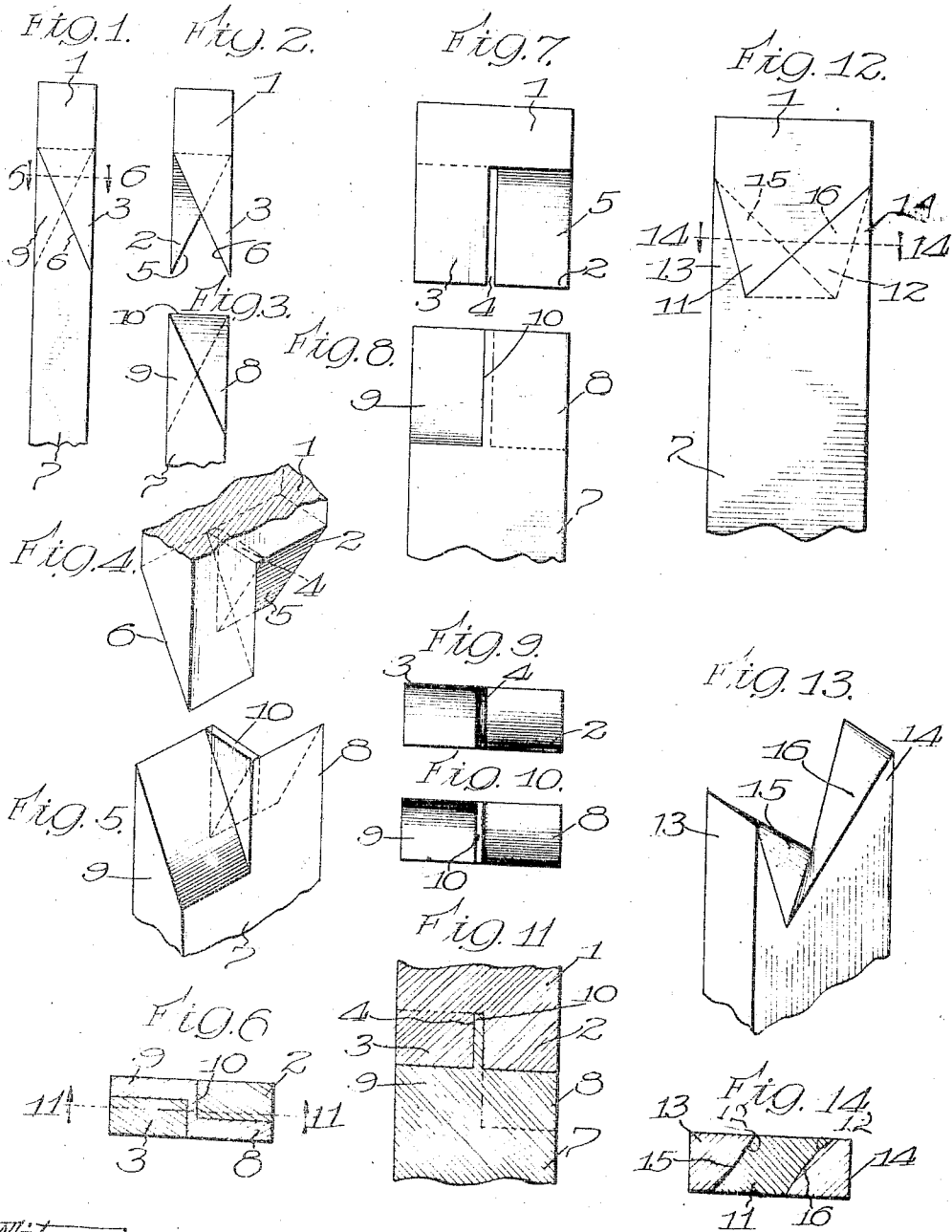


L. J. CAMPBELL.
HIGH SPEED DRILL.
APPLICATION FILED JUNE 30, 1911.

1,044,625.

Patented Nov. 19, 1912.



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UNITED STATES PATENT OFFICE.

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HIGH-SPEED DRILL.

1,044,625.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed June 30, 1911. Serial No. 636,220.

To all whom it may concern:

Be it known that I, LEON J. CAMPBELL, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in High-Speed Drills, of which the following is a complete specification.

The main objects of this invention are to provide an improved construction of high speed drills; to provide a high speed drill having a hard or tool steel point or bit, and a soft steel body or shank; to provide improved means for attaching a tool or hard steel drill bit to a soft steel shank; and to provide a very strong and durable high speed drill at a minimum cost.

The invention consists of the matters hereinafter described in the specification and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a fragmentary side elevation of the narrow side or lateral edge of a high speed drill embodied in this invention. Fig. 2 is a similar view of the point detached from the shank; Fig. 3 is a similar view of the shank with the point detached. Fig. 4 is a fragmentary, perspective view of the joint end of the point. Fig. 5 is a similar view of the joint end of the shank. Fig. 6 is a section taken on line 6--6 of Fig. 1. Fig. 7 is an elevation of the broad side of the point or bit. Fig. 8 is a fragmentary elevation of the broad side of the shank. Fig. 9 is an end elevation of the joint end of the point or bit. Fig. 10 is an end elevation of the joint end of the shank. Fig. 11 is a fragmentary, longitudinal section of the drill taken on line 11--11 of Fig. 6. Fig. 12 is a fragmentary broad side elevation of the drill with a modified form of joint. Fig. 13 is a fragmentary view of the joint end of the shank shown in Fig. 12. Fig. 14 is a section taken on line 14--14 of Fig. 12.

As shown in the drawings, referring first to Figs. 1 to 11 inclusive, the point or bit 1, which may be of any desired length and have any desired form of cutting edge, is formed of hard or tool steel and at its joint end, or that opposite the cutting edge, it is provided with two oppositely facing, endwise extending connecting jaws or arms 2 and 3 disposed at opposite sides of a plane

passing through the central, longitudinal axis of the drill. Said jaws, as shown, are each of slightly less width than half the width of the drill, thereby providing a space or slot 4 therebetween. The jaws 2 and 3 are beveled from their ends toward their bases, one being beveled on one of the broad sides of the drill and the other on the other broad side of the drill, as shown more clearly in Figs. 2 and 4, thereby providing oppositely beveled bearing or contact faces 5 and 6, one of which is at one lateral edge of the drill and the other at the other lateral edge of the drill. The beveled faces 5 and 6 are arranged in reversely offset relation to each other at the bases and outer ends of the jaws (Figs. 5 and 9) so that lines indicating the planes of said faces when the jaws are seen in side view as in Fig. 2 cross or intersect each other; both of said planes in which said beveled faces are located being perpendicular to a single plane passing through the central axis of the drill between the jaws. The shank 7 is preferably but not necessarily of the same cross sectional dimensions as the bit 1. Said shank is likewise provided with endwise extending jaws 8 and 9 which are beveled to form bearing or contact faces corresponding with or complementary to the bearing or contact faces of the jaws 2 and 3; it being understood that when the bit and shank are joined the jaws on the two members overlap each other. A transversely arranged web 10 made integral with the jaws 8 and 9 on the shank 7 is adapted to enter the slot 4 of the bit 1 when the latter is in place on the shank.

After the joint ends of the bit and shank have been formed as above described they are placed together with the beveled faces of the jaws 2 and 3 overlapping and lying on the beveled faces of the jaws 8 and 9 respectively, and with the web 10 lying in the slot 4 between the jaws 2 and 3. The joints between the beveled faces are then brazed or welded together or the shank and bit are otherwise joined to form a rigid structure.

In the construction shown in Figs. 12 to 14 inclusive, the shank 7 is provided with jaws 13 and 14 which are provided with spirally beveled attaching faces 15 and 16, which at the ends of the jaws lie parallel with the narrow sides of the drill, and at

their inner ends extend diagonally across the drill between the broad sides. The joint end 11 of the bit 1 is provided with concavely beveled sides 12 which fit between the jaws 13 and 14. The overlapping jaws of the bit and shank are so arranged that when the drill is in operation the jaws on the bit are in advance of the jaws on the shank, that is the jaws on the shank are pushing against the jaws on the bit, thereby relieving the joint of all strain tending to pull it apart. Obviously when the drill is of sufficient size the overlapping jaws may be riveted together as well as brazed, or welded, if desired. Obviously, also, a high speed drill constructed in accordance with this invention will be of much less cost than a drill constructed entirely of tool steel, since it is only necessary in this construction to construct the wearing part of the drill of tool steel, and the remaining or greater portion of the drill can be constructed of much cheaper material. As the point of the drill wears away it can be ground down until practically all of the jaws 2 and 3 have been used up, since they will provide the hard steel for the cutting edge of the drill. Obviously also many details of the construction shown may be varied or omitted without departing from the scope of the claims. Moreover, in its broader aspects the invention includes a construction embracing a shank and bit each having a plurality of endwise projecting arms or jaws embracing the features of construction hereinbefore described, and is not limited to the specific construction shown in which two only of such jaws are present on each member. The construction embracing two jaws only on each member has, however, the important advantage that the oppositely facing beveled or inclined bearing or contact faces of such jaws may be easily, conveniently and cheaply formed, and this construction is therefore also claimed as part of my invention.

I claim:

1. A drill comprising two members a shank and a bit, each having a plurality of endwise extending jaws overlapping those of the other, the jaws of each member being disposed laterally with respect to the central longitudinal axis of the drill and having their

bearing or contact faces inclined or beveled to give endwise tapered form to said jaws.

2. A drill comprising two members a shank and a bit, each having a pair of endwise extending jaws overlapping those of the other, the jaws of each member being located at opposite sides of a plane passing through the central longitudinal axis of the drill and having their bearing or contact faces oppositely inclined or beveled to give endwise tapered form to said jaws.

3. A drill comprising two members a shank and a bit each having a pair of endwise extending jaws overlapping those of the other, the jaws of each member being located at opposite sides of a plane passing through the central longitudinal axis of the drill and having their bearing or contact faces oppositely beveled or inclined and located in planes perpendicular to the said first mentioned plane.

4. A drill comprising two members a shank and a bit, each member being provided with endwise extending jaws overlapping those of the other member, the jaws of each member being located at opposite sides of a plane passing through the central longitudinal axis of the drill and having their bearing or contact faces oppositely inclined or beveled to give tapered form to said jaws, said oppositely inclined faces being in offset relation to each other both at the bases and outer ends of the jaws.

5. A drill comprising two members a shank and a bit, each having a pair of endwise extending jaws overlapping those of the other, the jaws of each member being located at opposite sides of a plane passing through the central longitudinal axis of the drill and having their bearing or contact faces inclined or beveled to give tapered form to said jaws, one of said members having a transverse slot between its jaws, and the other member being provided with an integral transverse web adapted to enter said slot.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

LEON J. CAMPBELL.

Witnesses:

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