C. F. COLLINS.

DRILL SHANK AND DRIVING MEMBER.

APPLICATION FILED JUNE 17, 1911.

1,053,709.

Patented Feb. 18, 1913.

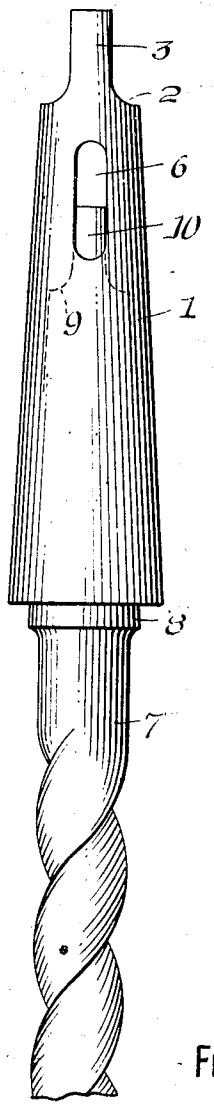


FIG. 1.

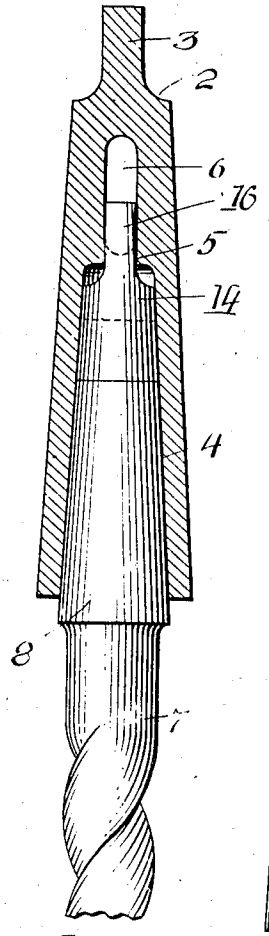


FIG. 2.

FIG. 3.

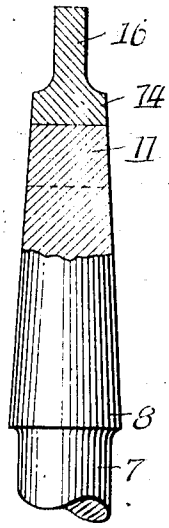
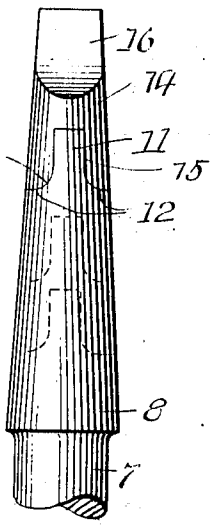


FIG. 4.



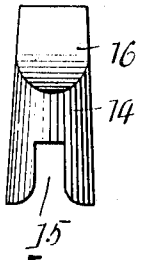


FIG. 5.

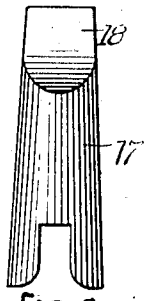


FIG. 6.

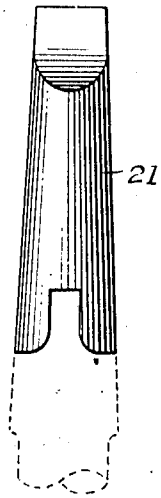


FIG. 7.

FIG. 9.

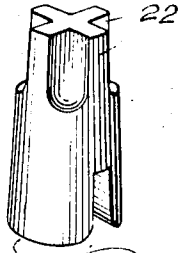
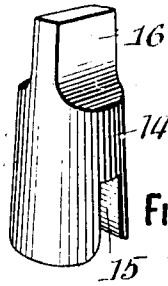


FIG. 8.



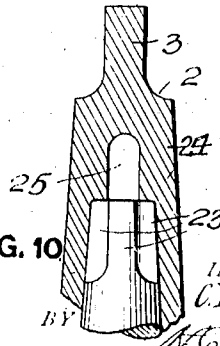


FIG. 10.

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CLYDE F. COLLINS, OF NEW KENSINGTON, PENNSYLVANIA.

DRILL-SHANK AND DRIVING MEMBER.

1,053,709. Specification of Letters Patent. Patented Feb. 18, 1913.

Application filed June 17, 1911. Serial No. 633,658.

To all whom it may concern:

Be it known that I, CLYDE F. COLLINS, citizen of the United States of America, residing at New Kensington, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Drill-Shanks and Driving Members, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to drill shanks and the driving members therefor, and more particularly to an auxiliary shank member.

The primary object of my invention is the provision of positive and reliable means, in a manner as will be hereinafter set forth, whereby the broken or twisted end of the shank of a drill can be repeatedly used, thereby increasing the longevity of the drill and producing a momentary saving, especially in large machine shops where a large number of drills are used.

Another object of this invention is to produce an improved drilling mechanism, the drill member of which is so constructed as to secure ready and certain engagement with the drill driving member, thereby preventing a drill from slipping or shifting during the operation of the mechanism.

A further object of this invention is to furnish a drill shank with an auxiliary tang member adapted to receive the strains and stresses set up when the drill is driven.

A further object of this invention is to furnish a drill with a set of auxiliary tangs adapted to be successively used when the main tangs are twisted or broken.

A still further object of this invention is to furnish a drill socket and drill with an interlocking member of such a character that it will securely engage within said socket to hold said drill and effectively resist the strain set up in drilling.

With these and other objects in view, the invention consists in certain constructions, and in certain parts, improvements and combinations to be hereinafter specifically described and then claimed.

Reference will now be had to the drawing forming a part of this specification, wherein there is illustrated a preferred embodiment of the invention, but it is to be understood that the structural elements are susceptible to such changes and variations as fall within the scope of the appended claim.

In the drawing:—Figure 1 is a side elevation of the drill socket and drill in accordance with this invention. Fig. 2 is a vertical sectional view of the socket showing the drill in side elevation. Fig. 3 is a side elevation of the shank of the drill partly broken away and partly in section. Fig. 4 is a front elevation of the same. Figs. 5, 6 and 7 are elevations of interlocking members constituting a set, Fig. 8 is a perspective view of one of the members. Fig. 9 is a perspective view of a modified form of an auxiliary tang, and Fig. 10 is an elevation of a portion of a modified form of tang mounted in a socket.

The reference numeral 1 denotes a tapering driving member or socket having the upper end thereof reduced, as at 2 to provide a tang 3 so that it may engage with the spindle of a drilling machine in the ordinary manner. The driving member or socket 1 has a tapering bore 4 extending from the lower end of the member to a point approximately intermediate the ends of said member, said bore having the walls thereof in parallelism with the outer walls of the member. The upper end of the bore is in communication with a tang socket 5 formed by providing the upper end of the member with a transverse oblong slot 6 and then milling the member to establish communication between the bore 4 and the slot 6.

The reference numeral 7 denotes a portion of the drill having a tapering shank 8 adapted to engage in the bore 4, and the upper end of the shank 8 is reduced, as at 9 to provide a tang 10 adapted to engage in the socket 5 and prevent the shank from rotating within the member 1. The tang 10 extends above the lower end of the slot 6, whereby a suitable instrument can be placed in the slot 6 and driven between the upper end of the slot and the upper end of the tang 10 to force the shank 8 downwardly and release it sufficiently from the member 1, whereby it can be removed.

The construction just described is that of the present type of driving member and drill, and when indurate metal is encountered by the drill 7, the tang 10 is often twisted off of the shank 8 at the reduced portion 9, thereby rendering the drill shank useless for further operation in connection with the driving member. The twisting or breaking of the tang 10 and the shank 8 repeatedly occurs in large machine shops

and a large number of drills are daily rendered useless and a large expense incurred by the replacing of the drills.

To obviate the entire discarding of the drill that has had the tang twisted therefrom, I have devised an auxiliary tang or interlocking member, a set of which can accompany each drill when the same is disposed of by the manufacturer. The auxiliary tangs or interlocking members vary in size and the use of each member entirely depends upon where the tang is twisted from the drill shank. For instance, after the tang 10 has been twisted from the shank, the shank 8 is placed in a milling machine and the upper end thereof reduced to provide another tang 11, the formation of said tang providing oppositely disposed horizontal shoulders 12 having a fillet 13 with the tang 11, the milling of said tang being performed in the ordinary and well known manner similar to the formation of the tangs 3 and 10. The shank 8 will be milled a prescribed distance from the lower end of the shank when forming the tang 11, whereby an auxiliary tang or interlocking member of the prescribed size can be placed upon the upper end of the shank to serve functionally the same purpose as was performed by the tang 10. This auxiliary tang or interlocking member is shown in Figs. 5 and 8 and designated 14. The member is tapered and has the lower end thereof provided with a transverse slot 15 to receive the tang 11 and the upper end thereof reduced to provide a tang 16 adapted to fit in the socket 5. The member 14 has the same taper as the upper end of the shank that was removed to provide the tang 11, whereby the member 14 will represent a prolongation of the shank. In other words, it completes the shank 8 and imparts to the same a size practically the same as the original shank. The slot 15 is cut to snugly receive the tang 11, whereby there will be no lost motion between the member 14 and the shank 8, and when the member 14 and the shank 8 are placed in the socket 5 and the member 1 the walls of the bore 4 firmly brace the member 14 and back up or reinforce the connection between the member 14 and the tang 11.

During the operation of the driving member, should a drill equipped with an auxiliary tang have the tang 16 twisted off, the shank 8 can be quickly removed and another of the members 14 placed upon the tang 11. Should the tang 11 be twisted off of the shank 8, the shank and the member 14 can be removed, the shank milled a prescribed distance from the lower end thereof to provide another tang 19, and then the member shown in Fig. 6 and designated 17 can be placed upon the original shank, with the tang 18 of said member fitting in the socket 5 of the driving member 1. Now, it will be observed that the member 17 is constructed upon the same principle as the member 14 only it is made of a greater length to represent a greater portion of the original shank than that represented by the member 14. This same procedure can be taken by again milling the shank 8 to provide another tang 20 and resorting to the use of the member shown in Fig. 7 and designated 21.

It is obvious that should either of the tangs of the members 14, 17 or 21 be twisted off of said members that it is only necessary to replace the member. As the members can be manufactured at an expense comparatively small to that of the drill, it is apparent that the use of a large number of auxiliary tangs or interlocking members can be resorted to before a drill is discarded, but if each member is properly made of strong and durable material, there is less liability of the tangs 11, 19 and 20 being twisted from the shank than there is of the tangs fitting in the socket 5, consequently a drill shank will be maintained under ordinary conditions.

In Figs. 9 and 10 of the drawing there is illustrated a modification of the invention, wherein the interlocking member has a tang 22 Maltese cross-shaped in cross section and this tang is adapted to fit in a correspondingly cup-shaped socket 23 provided therefor in a driving member. The socket 23 is in communication with a single slot 25, whereby the tang 22 can be forced from the socket 23. This form of tang and socket provides a more positive connection between the driving member and the shank of a drill.

What I claim is:—

A repair member for broken shanks of drills comprising a body tapered to conform to the drill shank to which it is to be applied, said body when in position on the drill shank forming an extension thereof and having a slot in its larger end receiving the tang on the drill shank and having a tang on its smaller end.

In testimony whereof I affix my signature in the presence of two witnesses.

CLYDE F. COLLINS.

Witnesses:
H. C. Evert,
Max H. Srolovitz.