

(No Model.)

M. L. ANDREW.
BIT SHANK AND CHUCK.

No. 525,573.

Patented Sept. 4, 1894.

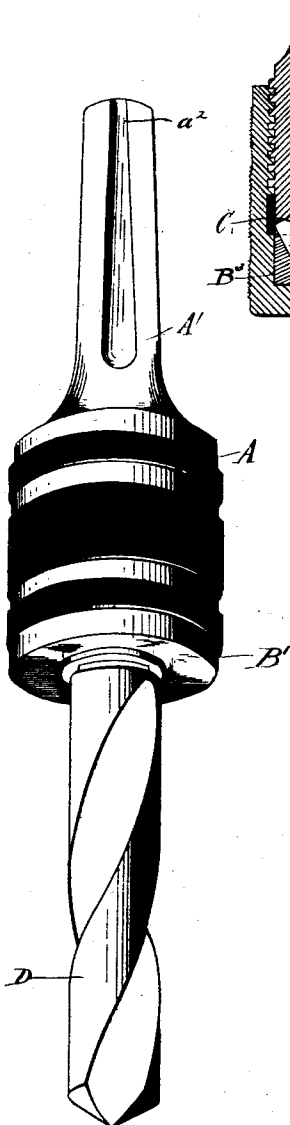


FIG. 1.

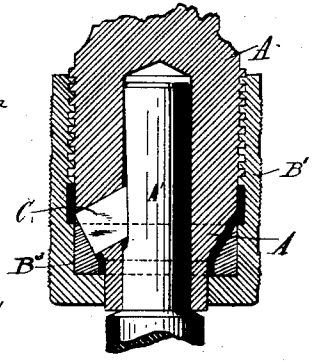


FIG. 2.

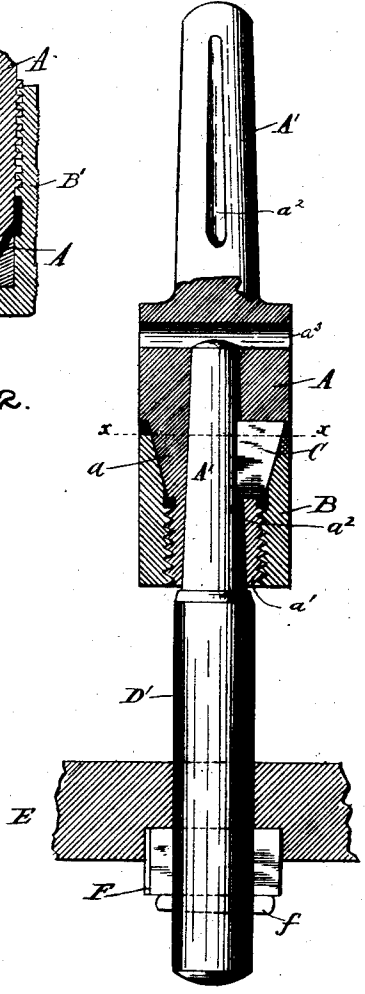


FIG. 3.

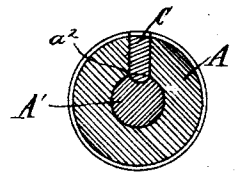


FIG. 4.

Witnesses
Frank S. Davis
David S. Oliver

Inventor
Moses L. Andrew
By his Attorney
Geo. J. Murray

UNITED STATES PATENT OFFICE.

MOSES L. ANDREW, OF DELHI, OHIO.

BIT SHANK AND CHUCK.

SPECIFICATION forming part of Letters Patent No. 525,573, dated September 4, 1894.

Application filed February 25, 1892. Serial No. 422,726. (No model.)

To all whom it may concern:

Be it known that I, MOSES L. ANDREW, a citizen of the United States, and a resident of Delhi, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Bit Shanks and Chucks, of which the following is a specification.

My invention relates to boring tools, and especially to the shank, and means for holding the shanks.

The object of my invention is to provide means to securely hold bits, especially those having tapered shanks, securely without injury to the shanks, by which means the shanks of bits or boring tools which have been rendered worthless by the means formerly employed for holding them, may be restored and used until the cutting portion of the bit is worn out.

Metal drilling bits for heavy or accurate work are usually made with tapered shanks to insure a close fit to the chuck, and absolutely accurate axial alignment with the spindle. To prevent these bits from turning in the holder they are commonly formed with a flat, or angular, end to enter a corresponding recess in the holder, and in addition to this it is found necessary when such shank is applied to a boring bar for dressing the under side of a hole, or forming a countersink, or the bit or bar is used in an upright drill press, that set screws must be employed to prevent the bit or bar from being pulled out. The set screws necessarily mar or injury the shank as they must be forced very firmly upon the shank to prevent the bit from turning.

It is the experience of every user of metal drills, that a very large percentage of the most expensive drills are rendered worthless by the angular end of the shank being twisted off, or the shanks being so injured by set screws as to prevent absolutely true centering of the bit, long before the cutting body of the bit is near worn out.

By my invention I provide means to hold the bits truly and firmly until worn out, and also to render the formerly worthless bits as effective as new ones.

The invention consists in the construction, which will be hereinafter particularly described in connection with the accompanying

drawings, and will then be particularly referred to and pointed out in the claims.

Referring to the drawings in which like parts are indicated by similar reference letters wherever they occur throughout the various views: Figure 1. is a perspective view of my improved chuck with the standard taper shank formed according to my invention. Fig. 2. is a diametrical sectional view of my improvements applied to a straight shank bit. Fig. 3. is a view in longitudinal diametrical section of my improved chuck, and a cutter bar; my improved shank is secured therein; the cutter bar and key for holding it is shown in elevation. Fig. 4. is a transverse sectional view, taken through line x, x Fig. 3.

The chuck body shown in Fig. 2. is substantially the same as the body of the chuck in my Patent No. 403,083, of May 14, 1889, but the shank of the bit, and edge of the locking key bearing upon it, is constructed according to my present invention.

Referring to the parts by reference letters and particularly to Figs. 3 and 4 A, is the head of the chuck, which has formed integral with it the tapered shank A'. The intermediate portion of the head A, is cone shaped at a , and the forward end is a reduced screw threaded neck a' .

B is a cap, interiorly screw tapped at its forward end to engage the screw threaded neck a' , of the head. The rear portion of the cap base is made flaring counter to the cone shaped portion a , of the head A. The cone shaped part a , is radially slotted to receive the hardened steel key C, the outer edge of which is beveled to the same taper as the cone shaped portion a of the head A, and the flaring inner wall of the screw cap. The inner edge of the key is rounded as seen clearly in Fig. 4. to enter the circular depression a^2 , in the shank of the chuck, bit, or cutter bar D'. The longitudinal lower edge of the key is inclined from its front to rear end at the same angle to the axis of the head and bit, as the circular depression of the shanks. The depression a^2 , in the shank is formed by a milling tool and is made deeper at its end near the shoulder, than at the rear end, that is the bottom of the depression is about one thirty second of an inch nearer the axis of the bit

or shank at its inner end, than it is at the end of the shank, so that when the key is forced into the depression a^2 , it is impossible to pull the shank out until the cap is loosened to free the key C. This feature of the rearwardly flaring key seat is especially valuable in use with boring bars as D', Fig. 3. as it prevents the bar from being pulled out when dressing the under side of a hole or forming a countersink as seen in Fig. 3. in which E, is the article being dressed, F, the customary cutter, held in a slot cut through the cutter bar D', by the key f.

The key C, snugly fits the depression a^2 , and when forced to place as shown, locks the shank to the holder as firmly as if the shank and holder were a single piece, and the periphery of the shank is not marred or injured in the least.

The perforation a^3 , through the head A, is to admit a drift to start the shank outwardly when it is desired to remove the bit chuck or cutter bar.

It is obvious that the circular and rearwardly inclined grooved shank A', may be more firmly held by an ordinary round pointed set screw than the ordinary shanks now in common use, and with less injury to the bit, and that with the use of said shank and my set key, and screw cap, the angular end on the common taper shank may be omitted when the bit is made, and the labor of so grooving the shank is much less than the labor of forming the shank with a taper end.

I prefer to make the longitudinal and rearwardly inclined groove a^2 , circular in transverse section, because it is easier made, and so made, the boring tool may be readily adapted to the common chucks in which a set screw is employed, in such case it would only be necessary to form the point of the screw counter to the curve of the groove, but I do not desire to limit myself to such specific construction as any groove which inclines outwardly from the axis as it extends toward the end of the shank, would attain the same result in kind but not in degree.

In Fig. 2. the cap B', is screw threaded at the rear end and within the forward end is fitted the flaring ring B³, the same as (x x) in my former patent. This form of cap, screw threaded connection between the cap and

head and the flaring clamping ring may of course be employed in place of the flaring mouthed cap B, shown in Fig. 3.

I am aware that it is not new to form in bit shanks slots, key seats and grooves parallel to the axis of the bit and hence make no claim to a bit shank so constructed.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the taper shank having a longitudinally grooved key seat formed in it, said key seat being deeper near the shoulder and diverging rearwardly from the axis toward the end of the shank, the radially slotted tool holding head, axially bored to receive said shank, the key fitted to slide in said slot and bear upon the inclined seat in the shank, the cap to fit over the head and bear upon the outer edge of the key, for the purpose of forcing the key upon its seat when turned in one direction and releasing it therefrom when turned in the opposite direction, substantially as shown and described.

2. The combination substantially as hereinbefore set forth of the taper shank tool having the shank longitudinally grooved, said groove being deeper near the shoulder than at the end of the shank, with the tool holder axially bored to receive said shank, and provided with a set key, adapted to be forced into said groove for the purpose of locking the tool against revolving, and retraction, until the key is withdrawn from the groove.

3. The combination substantially as hereinbefore set forth of the head A, having transversely slotted inclined part a, screw threaded neck a', and shank A', said shank having the rearwardly diminishing longitudinal groove a^2 , the key C, adapted to slide in the head A, and the flaring mouth screw cap B, adapted to force the key to its seat in the tool shank when screwed forward.

4. A taper shank boring tool having formed in it a longitudinally grooved key seat, inclined with relation to the axis, rearwardly and outwardly from near the shoulder to the taper end.

MOSES L. ANDREW.

Witnesses:

S. R. SMITT,
CHAS. BARNES.