

UNITED STATES PATENT OFFICE.

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SHACKLE FOR DRILLS, &c.

1,154,941.

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To all whom it may concern:

Be it known that I, MATHER W. SHERWOOD, a citizen of the United States, residing at Franklin, Venango county, Pennsylvania, have invented a certain new and useful Shackle for Drills, &c., of which the following is a specification.

My invention relates to means for holding the bits or steel of drills and similar machines and the object thereof is to provide a simple, efficient and reliable means for this purpose. In using a hammer drill it is often desirable to have the bits secured to the machine in such a manner as to permit of its unrestricted movement in response to the blows dealt by the hammer and yet so as to enable it to be "churned" up and down in the hole by raising and lowering the machine which assists in clearing the hole of cuttings. Heretofore devices have been employed to accomplish this result but in all cases it is necessary to provide the bit or steel with a collar, making the bit more expensive than when provided with a plain shank, besides which the means for holding such special form of bit was more or less complicated and cumbersome and did not permit of the ready removal of such bit. In the case of my holding means, which is in the form of a shackle, a plain bit of the usual construction is employed and the same is readily insertible or removable and is permitted the necessary movement in the operation of the machine.

In the drawing, Figure 1 is an elevation of the lower end of a hammer drill embodying my invention, showing a portion of the drill socket and adjacent parts in section; and Fig. 2 a similar view illustrating a modified form of construction.

My invention may be embodied in drilling machines of different constructions and in the present instance I have shown the same used in connection with a machine of the hammer drill type in which a reciprocating piston delivers its blow either directly upon the inner end of the drill bit or steel or indirectly through a striking piece or anvil. Inasmuch as only the front or lower end of the machine is concerned with an understanding of my invention, I have shown such portion only.

Referring to the embodiment of my invention illustrated in Fig. 1, the front end of the cylinder 1 has coupled or joined to

it the front head or socket member 2 in a suitable manner as by means of the front head bolts 3 passing through the lugs 4 and 5 on the cylinder and socket respectively. These bolts serve to hold the socket to the front or lower head with a yielding pressure by reason of the coiled springs 6 encircling the bolts between their heads and the lug 5, nuts 7 screwing on the upper ends of the bolts. It will be understood that there are two of these bolts and associated parts although only one set is shown in Fig. 1.

The socket member or drill socket is provided with a central bore to receive the inner or upper end of the drill bit or steel 8 which, in the present instance, is polygonal or angular in cross section. This bit projects inwardly and receives blows delivered by the piston (not shown) but in the present instance the blows are delivered to the bit in an indirect manner through the medium of a striking piece or anvil 9, such as is illustrated in Fig. 2 and which may be employed in the construction shown in Fig. 1. It will be observed that the bit is a plain bit of the usual commercial form, that is, having a shank of uniform size throughout its length.

My shackle means comprises a bar 10 of suitable shape and dimensions and having intermediate its length a hole 10^a which is of a size to fit fairly close upon the bit. This bar has a loose pivotal connection with the drill socket in order that it may be retained thereupon and also be permitted the proper movements hereinafter explained. In the present instance this loose pivotal connection is provided by means of a bolt 11 which passes freely through the opening 10^b in one end of the bar and whose head bears against the lower face of the bar and thereby supports the latter. As shown, and by preference, the bar is countersunk at the outer or lower end of the hole 10^a to receive the correspondingly shaped head of the bolt. This bolt passes upwardly through a spring chamber 12 formed in the body of the socket and is provided at its upper end with a sleeve 13 adapted to fit and slide in the upper end of the chamber 12. A nut 14 screws upon the upper end of the bolt and the same is used to hold the sleeve 13 onto the bolt and also to hold it in any desired adjusted position as against the tension of the coiled spring 15 which bears at one end

against the bottom of the chamber 12 and at its other end against the lower or inner edge of the sleeve 13. By these means the clamping or gripping bar 10 is held toward the socket with a yielding pressure.

The other end of the bar 10 is provided with a hole or slot 10^c through which passes a bolt 16 extending upwardly through a chamber 17 formed on the side of the socket diametrically opposite the chamber 12. This bolt also passes through a shell-like piston 18 adapted to fit and slide in the chamber 17 and to be projected through the lower end thereof into contact with the upper surface of the bar 10 by means of the coiled spring 19 bearing at one end against the outer end of the piston and its upper end against the top of the chamber 17. The bolt 16 is provided at its upper end with a nut 20.

The tendency of the spring 19 is to force the piston 18 outwardly and to thereby move or cant the bar 10 in such a manner as to grip and hold the bit by frictional engagement. In this movement of the shackle or bar by means of the spring 19 one end of such bar, that is the right hand end in Fig. 1, is moved downwardly and the bit gripped as explained, and the downward movement of the opposite end of the bar or shackle is resisted by the yielding support provided by the bolt 11. The spring 15 which is associated with this bolt is interposed to afford sufficient resiliency so as to permit of a slight forward movement of the bit when the blow is struck by the hammer and to prevent the shackle itself from sustaining a part of the force of the blow which would result from a rigid support at that point. The downward movement of this end of the bar or shackle is limited by means of the flange or collar 13^a of the sleeve 13 which is adapted to come into contact with the top of the chamber 12. This arrangement prevents undue strain upon the spring 15 and also prevents such forward movement of the bar or shackle as would too greatly diminish the pressure exerted by the other spring 19 when the machine is lifted to withdraw the bit from the hole. It is obvious that by pulling upwardly on the end of the bar or shackle 10 by means of the hand the spring 19 will be compressed and the bit will be released.

It will be understood that the bolt 16 is not essential but is provided merely as a guide to keep the shackle or bar in position and to prevent undue displacement by the action of the spring 19 when the bit is removed from the socket.

In Fig. 2 I have shown a modified form of embodiment of my invention according to which the front head bolts are utilized to support the shackle, thereby dispensing with the separate bolts 11 and 16. In this modified form of construction the head bolts 21 and 22 pass through the lugs 4 and 5 and

also through the shackle or bar 23. The bolt 21 supports its end of the bar through the medium of the coiled spring 24 and a thimble 25 whose flanged end 25^a fits underneath the bar, the spring being contained within the thimble and bearing at its lower end against the head of the bolt and at its other end against the top of the thimble. This bolt is also provided at its intermediate portion with the usual spring 26 bearing at one end against the lug 5 and at its other end against the collar 27 fitting upon the bolt.

The other bolt 22 likewise passes through the lugs 4 and 5 and is provided with a similar coiled spring 26 and a collar 27. Between this collar and an end of the shackle or bar 23 is interposed a spring 28 which has the same action upon the bar as the spring 19 of the first described form. If desired, the shackle may be provided on one or both sides with flanges or wings 23^a in order to add lateral support to the bolts 21 and 22 which would otherwise be supported only at their engagement with the lugs of the cylinder and front head or drill socket through which they pass.

I claim:

1. In combination with a drill socket and a drill bit therein, a spring-pressed tilting gripping member provided with a hole through which said bit passes for frictionally gripping the same.
2. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit, comprising a bar pivotally connected with the drill socket and provided with a hole through which the bit passes.
3. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit, comprising a bar pivotally connected with the drill socket and provided with a hole through which the bit passes, and a yielding means acting on the bar to cant the same and thereby grip the bit.
4. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit, comprising a bar pivotally connected at one end with the drill socket and provided in the middle portion with a hole through which the bit passes, and a yielding means acting on the other end of the bar to cant the same and thereby grip the bit.
5. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit comprising a bar provided with a hole through which the bit passes, a bolt which depends from the drill socket and on which one end of the bar is pivoted, and a yielding means acting on the other end thereof to cant the same and thereby grip the bit.
6. In combination with a drill socket and a drill bit therein, means for frictionally

gripping the bit comprising a bar provided with a hole through which the bit passes, a bolt mounted in the drill socket and spring-pressed inwardly thereof, the bar being pivoted at one end upon the bolt, and a yielding means acting on the other end thereof to cant the same and thereby grip the bit.

7. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit comprising a bar provided with a hole through which the bit passes, said socket having openings on opposite sides, a bolt arranged in one of the openings and engaging one end of the bar, and a yielding member arranged in the other opening and bearing against the adjacent end of the bar.

8. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit comprising a bar provided with a hole through which the bit passes, said socket having openings on opposite sides, a bolt arranged in one of the openings and engaging one end of the bar, and a spring-pressed plunger in the other opening arranged to bear against the adjacent end of the bar.

9. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit comprising a bar provided with a hole through which the bit passes, said socket having openings on opposite

sides, a bolt arranged in one of the openings and engaging one end of the bar, a spring-pressed plunger in the other opening arranged to bear against the adjacent end of the bar, and a bolt passing through the plunger and engaging the bar.

10. In combination with a drill having a socket member and a drill bit slidably mounted therein, means for frictionally gripping the bit comprising a bar provided with a hole through which the bit passes, a spring-pressed bolt also mounted in the socket member and loosely engaging one end of the bar, and a spring-pressed plunger also mounted in the socket member and bearing against the other end of the bar.

11. In combination with a drill socket and a drill bit therein, means for frictionally gripping the bit and yieldingly supporting it comprising a tilting gripping member provided with a hole through which the bit passes, a pivotal support for one end of said tilting member yieldingly connected to the drill socket, and spring means connected to the other end of said tilting member and also connected to the drill socket for tilting said member to frictionally grip the bit.

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Witnesses:

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