L. C. HARDEN & F. WILDESON.

CORE LIFTING APPLIANCE FOR DRILLS.

APPLICATION FILED MAR. 15, 1911.

**1,008,904.**

Patented Nov. 14, 1911.

Fig. 1.

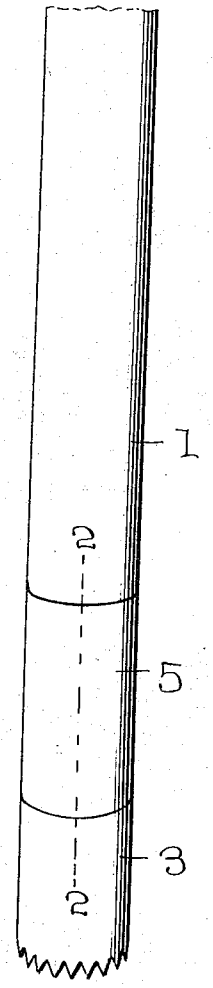



Fig. 3.

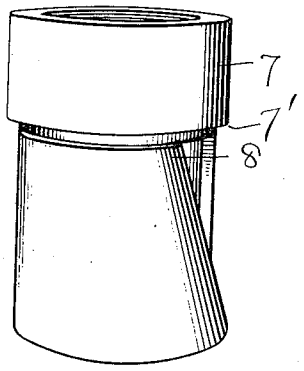
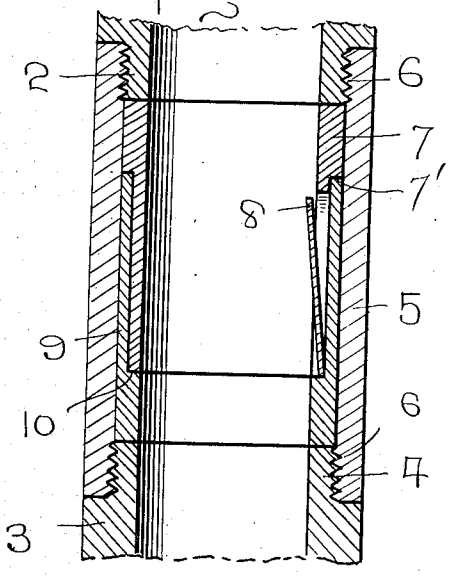



Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## CORE-LIFTING APPLIANCE FOR DRILLS.

1,008,904. Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed March 15, 1911. Serial No. 614,681.

*To all whom it may concern:*

Be it known that we, LESTER CHRISTOPHER HARDEN and FRANK WILDESON, citizens of the United States, residing at Kimberly, in the county of Shasta and State of California, have invented certain new and useful Improvements in Core-Lifting Appliances for Drills; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to diamond drills and more particularly to core lifters.

An object of the invention is to provide a core lifter for drills which may be positioned and held within the sleeve connecting the drill with the tube or barrel.

Another object is to provide a lifter which will allow the core to be forced upwardly into the barrel but will prevent the core from descending or dropping back into the hole.

Another object is to provide a core lifter of the above stated character which may be so positioned and held within the sleeve that it may remain stationary while the sleeve rotates.

Another object of the invention is to provide a lifter positioned within the sleeve and held against longitudinal movement by the ends of the barrel and of the bit screwing into the ends of the sleeve and which will resiliently engage the core and hold the latter within the barrel and sleeve, and, a still further object is to provide a lifter, composed of an extremely small number of parts of simple formation, which will be effective in operation and cheap to manufacture.

Other objects and advantages will be hereinafter set forth and pointed out in the specification.

In the accompanying drawings forming a part of this application, Figure 1 is a view of the lower end of the barrel and of the drill connected by means of the ordinary sleeve having the improved core lifter therein. Fig. 2 is a longitudinal sectional view on the line 2—2 of Fig. 1, and, Fig. 3 is a detail perspective view of the gripping member of the core lifter.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 designates the tube or barrel having a reduced lower externally threaded portion or end 2 and 3 represents the bit or other boring tool having the externally threaded upper end 4. The usual sleeve 5 having internally threaded end portions 6 is employed to connect the barrel 1 and drill 3, the threaded ends thereof screwing into the threaded ends of the sleeve. The sleeve 5 is preferably the same diameter throughout the bore thereof.

The lifter is positioned within the sleeve 5 before the ends of the barrel 1 and drill 3 are secured thereto. The lifter consists of two parts. The gripping member 7 carries the shoulder 7′ near its upper end. The lower and smaller cylindrical portion of the member 7 is provided with a substantially L-shaped slot extending from the lower edge thereof to within a short distance of the lower edge of the shoulder 7′ and from this point at right angles to the first portion nearly one-half way around the cylindrical portion just below the shoulder 7. The free corner 8 at the bend of this slot is bent inwardly and the lower free corner is bent slightly outwardly. Thus the core gripping portion of the lifter is formed, the free upper corner remaining in this position to grip the core and resiliently hold the latter when it is forced against the springy holding portion, which matter is preferably thinner than the remainder of the sleeve 7, below the shoulder 7′, to increase the resiliency thereof. The second part of the lifter is in the form of a protecting collar or sleeve 9 having the interior shoulder portion 10 near its lower end. The sleeve or collar 9 is forced upon the lower portion of the member 7 until its upper edge strikes the shoulder 7′ and the lower edge of the member 7 rests upon the shoulder 10 of the member 9. This forces the lower free end of the springy portion of the member 7 inwardly, which also compels the upper free corner 8 to move further toward the interior of the member 7.

After the members 7 and 9 are assembled in the above described manner, forming the lifter, they are placed within the sleeve 5 extending from the threads of one end of said sleeve to the threads of the opposite

end. The barrel 1 and the boring tool 3 are then screwed into the opposite ends of the sleeve 5 and nearly touch the upper and lower ends, respectively, of the core lifter, leaving only a slight play for said lifter to allow the latter to remain stationary while the sleeve and parts connected thereto are rotated. The purpose of this will be later described.

The above described lifter may be positioned in the manner indicated in Fig. 2 within the connecting sleeve of any drilling machine desired, but is specially adapted to machines used for diamond drilling when the formation is hard enough to form cores. As the circular hollow drill is forced therethrough, the core travels upwardly through the hollow bit 3, through the sleeve 5, having positioned therein the lifter, and into the barrel 1. As the core is forced upwardly against and past the gripping portion 8, the latter is forced outwardly toward the collar 9 to allow the core to move upwardly. The springy portion of the member 7, however, presses resiliently against the surface of the core and prevents the latter from moving downwardly. As soon as the core presses against the lifter, however, the latter grips the core and is held thereby against rotation. The sleeve 5, however, rotates with the bit 3 and barrel 1, but on account of the slight play allowed the lifter within the sleeve 5 and between the threaded ends 2 and 4 of the barrel and bit, said lifter cannot be forced to rotate but will simply grip the surface of the core to hold the latter as previously described.

As there is no tendency on the part of the sleeve and parts connected thereto to rotate the lifter there is no danger of bending or breaking the corner 8 of the member 7 or the core within the lifter. When it is desired to withdraw the boring tool and the core held by the lifter, said core is broken off at or near the bottom of the hole and the parts lifted or drawn up out of the hole, the lifter preventing the core from dropping back into the bottom of the hole, which accident causes much trouble and expense. Heretofore, whenever the rods were removed from the hole the core was likely to slip out and fall back to the bottom of the hole. This has been of frequent occurrence and necessitated chopping up the core with an iron or steel bit before returning the diamond set bit to the bottom of the hole to make a second attempt to remove the core which slipped in removing the rods. One is also liable to break diamonds in trying to remove or grind up loose core in the bottom of the hole.

In the above described invention (which is used with a rotary drill employing water under pressure) no stroke or jar is necessary nor is recutting. After the core has been cut or broken off near the bottom of the hole, the lifter holds it until the parts are drawn to the surface, after which the core may be easily removed from within the sleeve, drill and bit. Thus, it will be seen that we have provided a core lifter which will be very useful and effective in operation, saving great loss of time and money to diamond drillers and other persons engaged in mining, and one which may be manufactured very cheaply on account of its simplicity.

What we claim is:

1. A core lifter for a drilling machine adapted to be positioned within a connnecting sleeve of a drilling machine connecting the barrel and the drilling tool, said core lifter consisting of a tubular member having an external shoulder and a spring portion below said shoulder, and a protecting collar surrounding said spring portion and carrying a shoulder, the reduced end of each part resting against the shoulder of the other part.

2. A core lifter within the connecting sleeve of a drilling tube of a drilling machine, said lifter consisting of a tubular member having a shoulder and a spring portion below said shoulder, and a protecting collar surrounding said spring portion of the tubular member and carrying a shoulder, the reduced end of each part resting against the shoulder of the other part, said protecting collar serving to force the spring portion inwardly to grip the core forced upwardly into the sleeve to hold said core against downward movement.

3. In combination, a connecting sleeve between and connecting a drilling machine barrel and bit, and a core lifter within the sleeve, said lifter comprising a tubular member having a shoulder and a spring portion beneath said shoulder, said spring portion being formed by an L-shaped cut through the tubular portion below the shoulder, one portion of the L-shaped cut extending to the lower edge of the tubular member, the other portion of the slot being directed in parallel relation to the lower edge of the shoulder, and a protecting collar surrounding the spring portion of the tubular member and carrying a shoulder, the reduced end of each part resting against the shoulder of the other part, the protecting collar serving to force the spring portion inwardly to grip a core forced upwardly through said sleeve and lifter and hold the core against downward movement.

4. A core lifter for drilling machines consisting of a tubular member having a shoulder and a spring portion adjacent said shoulder and a protecting collar surrounding said spring portion and carrying a shoulder, the reduced end of each part resting against the shoulder of the other part, said core lifter

adapted to be freely held within a connecting sleeve by the ends of the members connected to the ends of said sleeve, and adapted to grip a core forced upwardly through said sleeve and lifter to hold said core against downward movement.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

LESTER CHRISTOPHER HARDEN.
FRANK WILDESON.

Witnesses:
M. G. VARIAN,
GEORGE MILLER.