Jan. 24, 1939. C. E. COOK 2,144,832

DETACHABLE BIT ROCK DRILL

Filed July 22, 1938

Fig. 1.

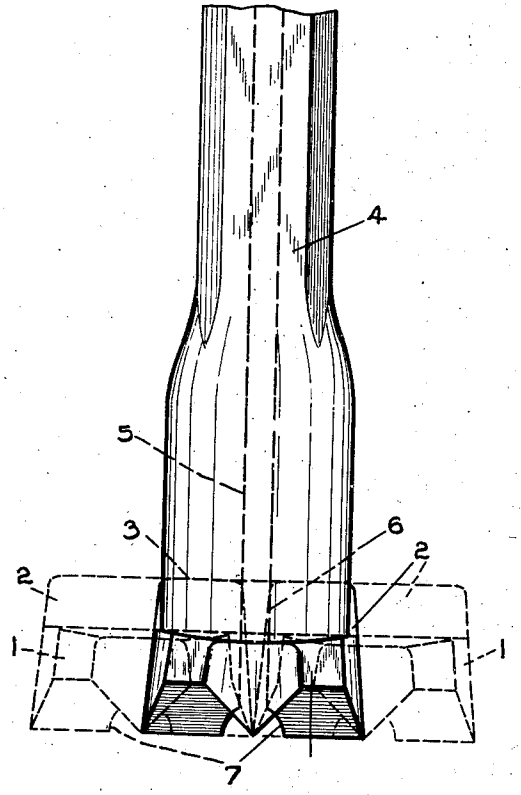


Fig. 2.

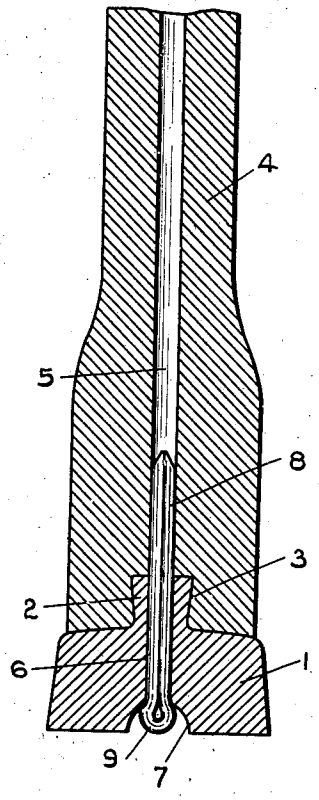


Fig. 3.

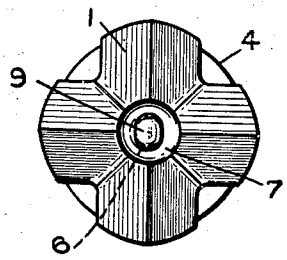
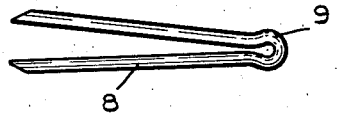


Fig. 4.



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DETACHABLE BIT ROCK DRILL

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Application July 22, 1938, Serial No. 220,768

6 Claims. (Cl. 255—64)

My invention relates to improvements in detachable bit rock drills of the kind wherein the bit is detachably interlocked with the shank against longitudinal displacement but is permitted lateral movement on the shank, and an object of the invention is to provide means for preventing such lateral movement of the bit on the shank wherein the drill may be used as a starter drill which is impracticable where the bit is permitted the above referred to lateral movement.

A further object is to devise means for locking the bit on the shank against lateral movement which will entail no alteration whatsoever in the construction of either bit or shank, such means being detachably insertable into the water hole in the bit and extending into the water passageway in the shank.

A still further object is to provide means for locking the bit on the shank against lateral movement which will be exceedingly simple, inexpensive and which can be easily applied and detached without the use of other than the ordinary tools in the possession of the miner.

Hitherto in the use of detachable bit rock drills in which the bit, while interlocked with the shank against longitudinal displacement, is permitted free lateral movement, such bit cannot be employed to start the hole in the rock on account of its being liable to be detached from the shank due to such lateral movement. Consequently a special starter drill has to be used.

By my invention, no starter drill is necessary as the detachable bit drill as above referred to may be employed throughout the drilling operation.

With the above and other objects in view which will hereinafter appear as the specification proceeds, my invention consists of the construction and arrangement all as hereinafter more particularly described and illustrated in the accompanying drawing in which:—

Fig. 1 represents in elevation a typical detachable bit rock drill in which the bit is interlocked to the shank by means of a dovetail tongue preventing longitudinal displacement of the bit from the shank, said tongue being inserted transversely into a dovetail slot in the shank and such bit being permitted lateral movement as indicated by the dotted lines.

Fig. 2 is a vertical section through the detachable bit rock drill as illustrated in Fig. 1 showing my means in place for preventing lateral movement of the bit on the shank.

Fig. 3 is a plan view thereof taken from the cutter end of the detachable bit, and

Fig. 4 is a detail in plan of my pin constituting the means for preventing the lateral movement of the bit on the shank.

Like characters of reference indicate corresponding parts in the different views of the drawing.

As illustrated, the detachable bit rock drill comprises a detachable bit 1 having a transverse tongue 2 of dovetail cross-section inserted sidewise in a slot 3 of correspondingly dovetail cross-section formed in the bit engaging end of the shank 4. A water passageway 5 extends axially through the shank 4 and registers with an axial water orifice 6 through the bit and its tongue which terminates in a cup-shaped extremity 7 from which radiate the bit cutters.

In a detachable bit rock drill as constructed above, the bit 1, while interlocked with the shank 4 against longitudinal displacement, is free to move laterally as illustrated in dotted lines in Fig. 1 and consequently cannot be used as a starter drill. Its purpose is for drilling the hole after the latter has been started by a special starter drill as then the bit 1 will be prevented from lateral movement by the wall of the hole being bored.

The use of an independent starter drill entails unnecessary complication in the drilling operation and while attempts have previously been made to make the drill as above described a universal one such, for instance, by employing spring plungers and other locking devices for holding the bit to the shank against such lateral movement, they have all failed either due to cost, complexity or their inability to stand up in service.

In order to overcome the above disadvantages and provide an efficient locking device against lateral movement between bit and shank, I insert detachable means from the cutter end of the bit through the water orifice 6 into the water passageway 5. Such means may well comprise a pin 8 normally held in place by friction between its surface and the walls of the orifice 6 and passageway 5. As illustrated, such pin 8 is made of spring steel being, therefore, resilient and is of the form of a cotter pin having a head 9 received into the cup 7.

By the use of the pin 8 any lateral movement between bit and shank is prevented and the rock drill may consequently be employed as a starter drill as well as a drill for boring the entire hole. When it is desired to remove the pin 8 in drilling or otherwise, it is only necessary to withdraw it

by means of a cotter pin puller, pliers or other suitable tool and the drill will be restored to its initial condition as illustrated in Fig. 1.

Although I have described and illustrated my invention as applied to a detachable bit rock drill having a dovetail connection between bit and shank it will be apparent that it may be employed with any drill of the type in which lateral movement between bit and shank is normally permitted.

What I claim as my invention is:

1. In a detachable bit rock drill of the type wherein the bit while interlocked with the shank against longitudinal displacement is permitted lateral movement, the combination with the bit having the usual cutters and an axial water orifice therethrough and a shank having an axial water passageway therethrough adapted to register with the water orifice of the bit, of integral resilient detachable means inserted into the water orifice of the bit and extending into the water passageway of the shank for locking bit and shank against relative lateral movement, said means held in position solely by the friction between its surface and the walls of the water orifice and passageway.

2. In a detachable bit rock drill of the type wherein the bit while interlocked with the shank against longitudinal displacement is permitted lateral movement, the combination with the bit having the usual cutters and an axial water orifice therethrough and a shank having an axial water passageway therethrough adapted to register with the water orifice of the bit, of a headed pin inserted into the water orifice of the bit from the cutter end thereof and extending into the water passageway in the shank for locking bit and shank against relative lateral movement, said headed pin being held in position solely by the friction between its surface and the walls of the water orifice and passageway.

3. In a detachable bit rock drill of the type wherein the bit while interlocked with the shank against longitudinal displacement is permitted lateral movement, the combination with the bit having the usual cutters and an axial water orifice therethrough and a shank having an axial water passageway therethrough adapted to register with the water orifice of the bit, of a headed resilient pin inserted into the water orifice of the bit from the cutter end thereof and extending into the water passageway in the shank for locking bit and shank against relative lateral movement, said headed resilient pin being held in position solely by the friction between its surface and the walls of the water orifice and passageway.

4. In a detachable bit rock drill of the type wherein the bit while interlocked with the shank against longitudinal displacement is permitted lateral movement, the combination with the bit having the usual cutters and an axial water orifice therethrough and a shank having an axial water passageway therethrough adapted to register with the water orifice of the bit, of a headed bifurcated resilient pin inserted into the water orifice of the bit from the cutter end thereof and extending into the water passageway in the shank for locking bit and shank against relative lateral movement, said headed bifurcated resilient pin being held in position solely by the friction between its surface and the walls of the water orifice and passageway.

5. In a detachable bit rock drill of the type wherein a bit is provided with a diametrical tongue of dovetail cross-section with an axial water orifice therethrough insertable into a diametrical slot of dovetail cross-section in the end of a shank which has an axial water orifice therethrough adapted to register with the water orifice in the bit whereby the bit is detachably interlocked with the shank against longitudinal relative movement while permitting free lateral movement, an integrally formed resilient pin detachably inserted into the water orifice of the bit and extending into the water orifice in the shank for preventing relative lateral movement between bit and shank, said pin being held in place solely by the friction between its surface and the walls of the water orifices in the bit and shank.

6. In a detachable bit rock drill of the type wherein a bit is provided with a diametrical tongue of dovetail cross-section with an axial water orifice therethrough insertable into a diametrical slot of dovetail cross-section in the end of a shank which has an axial water orifice therethrough adapted to register with the water orifice in the bit whereby the bit is detachably interlocked with the shank against longitudinal relative movement while permitting free lateral movement, an integrally formed headed resilient bifurcated pin detachably inserted into the water orifice of the bit and extending into the water orifice in the shank for preventing relative lateral movement between bit and shank, said pin being held in place solely by the friction between its bifurcated legs and the walls of the water orifices in the bit and shank.

CHARLES EDWARD COOK.