J. R. WILSON & F. R. THACKRAH.

ROCK DRILL.

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903,936.

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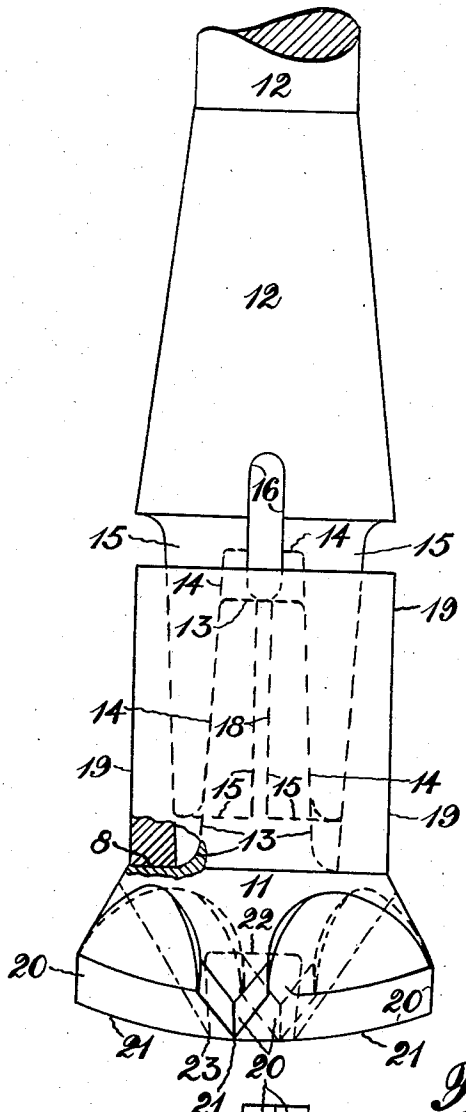


Fig. 1.

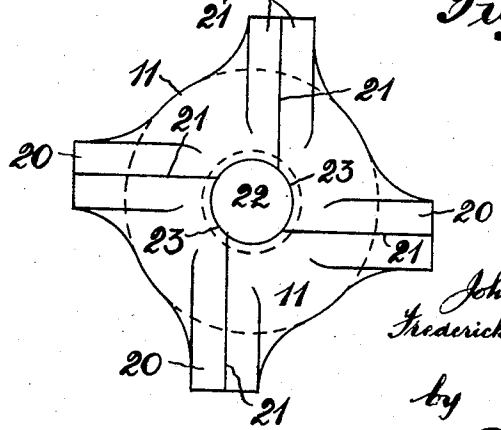


Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN ROBERT WILSON AND FREDERICK ROBERT THACKRAH, OF BENONI, TRANSVAAL.

ROCK-DRILL.

No. 903,936. Specification of Letters Patent. Patented Nov. 17, 1908.

Application filed October 16, 1906. Serial No. 339,232.

To all whom it may concern:

Be it known that we, JOHN ROBERT WILSON and FREDERICK ROBERT THACKRAH, subjects of the King of Great Britain, and residents of Benoni, Transvaal, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification.

This invention relates to detachable bits and their holders applicable for use either as hand-drills or rock-drilling-machine bits.

The objects of the present improvements are to provide a detachable bit of efficient and cheap construction and to provide simple and efficient means for securely fixing such detachable bits on the ends of their holders.

By our improved construction the impact of the cutting point or bit on the rock tends to more securely fix the bit to the holder, and it further provides a simple means for detaching the bit when worn, or when otherwise necessary.

In the accompanying drawings we illustrate the practical embodiment of our invention and we will proceed to describe the same in detail by aid of such drawings.

In the drawings: Figure 1 represents a portion of the holder or forward end of the drill steel and a detachable bit fixed thereon. Fig. 2 is a plan view of the cutting face of the bit.

12 designates the holder or forward end of the steel which is constructed with a central hole or recess 14 adapted to receive the shank or rear end 13 of the detachable bit or cutting point 11. The hole 14 may be of polygonal or circular cross section and the projection or shank 13 of the bit 11 be made of corresponding shape. The hole 14 and the projection 13 are as shown preferably tapered in a rearward direction.

The end of the holder 12, or that portion in which the tapered hole 14 is formed, is split for a portion of its length so as to form it into two resilient jaws or compressible segments 15 which are adapted to grip between them the tapered shank or projection 13 of the detachable bit 11.

Transversely of the holder 12 at the bottom of the taper hole 14 and in the plane of the split of the segments or jaws 15 is provided a driftway 16 in which a drift may be inserted for displacing the bit 11 to renew the same. The exterior of the segments 15 is tapered forwardly and surrounding the same is a corresponding internally tapered sleeve or collar 19. This sleeve 19 at its forward end abuts the shoulder 8 formed on the bit 11 round the tapered shank or rearward projection 13 so that said sleeve or collar 19 receives directly on its forward end the impacts of the bit 11 when the latter strikes the rock, thus causing the opposing inclines of the sleeve or collar 19 and segments or jaws 15 to engage, thereby compressing the jaws and causing them to more securely grip the tapered shank or projection 13 of the bit 11.

The detachable bit 11 is provided with four wings 20 on which are formed the four cutting edges 21. The wings 20 are made more or less tangential to the center of the bit and not radial as in existing cruciform bits.

In the center of the bit 11 is formed a hole or recess 22 tapering forwardly, which hole 22 separates or forms the termination of the inner ends of the wings 20 of the bit, so that in operation they have the same effect as four chisel bits. The central tapered hole 22 is constructed to provide a circular cutting edge 23 which owing to the taper externally and internally of the cutting point, is self-sharpening. The cutting edges 21 are, see Fig. 2, more or less tangential to the central hole 22 thereby slightly increasing the length of each cutting edge, which combined with the additional circular central cutting edge 23 provides a much greater length of cutting edge than in an ordinary star bit of similar gage or width.

The cutting end of the bit 11 is as shown preferably made convex, that is to say, the cutting edges 21 of the wings 20 are curved or rounded off from the center to the outer ends. This produces a greater penetrating effect for a given blow, and also largely obviates the liability to fracture of the drill points and shanks as compared with existing star bits with flat faced cutting edges.

The bits are easily removed by driving a drift through the driftway in the holder, which drives forward the tapered collar and releases the bit.

What we claim as our invention and desire to protect by Letters Patent is:

1. A rock-drill of the nature specified comprising in combination a holder and a

detachable bit having a plurality of substantially tangential cutting edges and a circular cutting edge at the center.

2. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential cutting edges and a circular cutting edge at the center, and means for detachably securing the bit to the holder.

3. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential cutting edges and a circular cutting edge at the center, means for detachably securing the bit to the holder and means for releasing said securing means.

4. A rock-drill of the nature specified comprising in combination a holder, a cutting bit, and means for detachably securing said bit to said holder, said bit having a plurality of substantially tangential cutting edges and a circular cutting edge at the center.

5. A rock-drill of the nature specified comprising in combination a holder, a cutting bit, means for detachably securing said bit to said holder, said bit having a plurality of substantially tangential cutting edges and a circular cutting edge at the center, and means for releasing said securing means to detach the bit.

6. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential cutting edges curved longitudinally, and a circular cutting edge at the center.

7. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential wings on which are formed cutting edges rearwardly curved from their inner to their outer ends.

8. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a central circular cutting edge and a plurality of substantially tangential wings on which are formed cutting edges rearwardly curved from their inner to their outer ends.

9. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential cutting edges curved longitudinally, and a circular cutting edge at the center, and means for detachably securing the bit to the holder.

10. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential wings on which are formed cutting edges rearwardly curved from their inner to their outer ends, and means for detachably securing the bit to the holder.

11. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a central circular cutting edge, and a plurality of substantially tangential wings on which are formed cutting edges rearwardly curved from their inner to their outer ends, and means for detachably securing the bit to the holder.

12. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential cutting edges curved longitudinally, and a circular cutting edge at the center, means for detachably securing the bit to the holder, and means for releasing said securing means.

13. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a plurality of substantially tangential wings on which are formed cutting edges rearwardly curved from their inner to their outer ends, means for detachably securing the bit to the holder, and means for releasing said securing means.

14. A rock-drill of the nature specified comprising in combination a holder and a detachable bit having a central circular cutting edge and a plurality of substantially tangential wings on which are formed cutting edges rearwardly curved from their inner to their outer ends, means for detachably securing the bit to the holder, and means for releasing said securing means.

In witness whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JOHN ROBERT WILSON.
FREDERICK ROBERT THACKRAH.

Witnesses:
CHAS. OVENDALE,
R. OVENDALE.