

H. W. SCHORLEMMER.
 ROCK DRILL CHUCK.
 APPLICATION FILED FEB. 9, 1909.

950,030.

Patented Feb. 22, 1910.

Fig. 1.

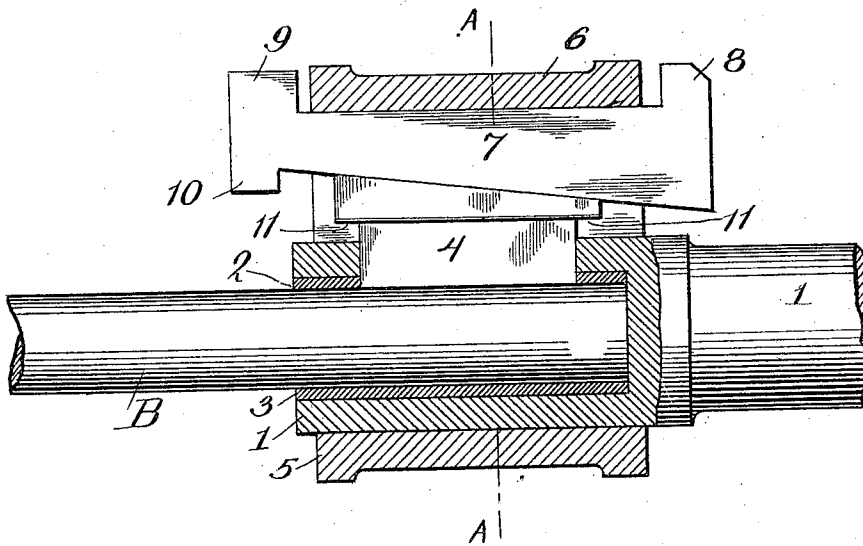
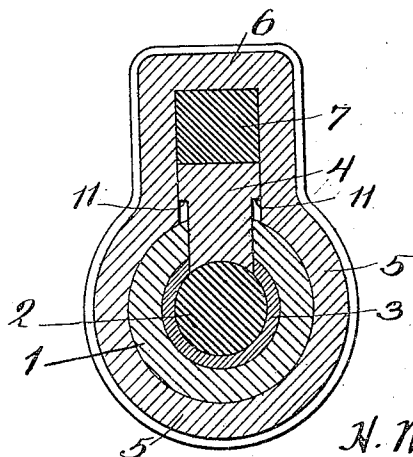


Fig. 2.



WITNESSES:

M. Lannon Dyer.
A. J. Dunham.

INVENTOR

H. W. Schorlemmer

BY

Herr, Page, Coopers & Hayward
 ATTORNEYS

UNITED STATES PATENT OFFICE.

HAROLD WILLIAM SCHORLEMMER, OF ROSSLAND, BRITISH COLUMBIA, CANADA.

ROCK-DRILL CHUCK.

950,030.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed February 9, 1909. Serial No. 476,989.

To all whom it may concern:

Be it known that I, HAROLD WILLIAM SCHORLEMMER, a subject of the King of Denmark, residing at Rossland, West Kootenay, British Columbia, have invented certain new and useful Improvements in Rock-Drill Chucks, of which the following is a full, clear, and exact description.

This invention relates to chucks for reciprocating rock-drills, and has for its chief object to provide a simple, compact, strong, and thoroughly reliable device for holding the bit in rigid connection with the reciprocating member of the apparatus, a further object being to provide a device of this character which shall be self-tightening, that is, one which will be tightened firmly on the bit by its own momentum as the bit strikes the rock in which the hole is to be drilled.

In carrying out my invention in the preferred manner a member is provided, having a longitudinal socket to receive the end of the bit. In the side of this member is a longitudinal slot, through which projects a key adapted to bear on the bit and bind the same securely in the socket. The outer edge or surface of the key is inclined, the direction of the downward inclination being toward the rear, or, stated otherwise, away from the open end of the socket. Encircling the socketed member and the key therein, is a collar adapted to slide freely on the said socketed member, and within the collar, between the same and the bit-key, is a wedging key having the surface which engages the bit-key inclined in correspondence therewith. The bit being inserted in the socket, with the clamping key or bit-key loosely engaging it, the collar and the wedging key will, as the bit strikes the ground in the first blow, be carried forward by their momentum, and the inclined surfaces of the two keys will cause the inner or bit-key to move inwardly with considerable force, thereby crowding the bit against the opposite wall of the socket and gripping the bit with great firmness. Subsequent blows of the bit serve only to make the engagement still tighter.

It will be apparent to those skilled in the art that the scheme thus briefly outlined can be embodied in various forms.

In the annexed drawing I have illustrated an embodiment which has been found to be thoroughly effective for its purpose,

and referring now to the drawing for a detailed description of the said embodiment, Figure 1 shows the complete device in longitudinal section. Fig. 2 is a cross section on line A—A.

The member 1, connected in any convenient and suitable manner to the reciprocating plunger of the drill mechanism, is provided with a socket 2, open at the forward end and extending axially or longitudinally into the member, to receive the end of the drill bit, B, in the usual way. Said socket may be and preferably is provided with a suitable bushing 3 to protect the member 1 itself from wear. At one side the socket member, and its bushing, have a longitudinally extending slot in which is a key 4, fitting the slot loosely enough to permit radial movement but engaging the forward and rear ends of the slot so as not to move longitudinally therein. The outer edge or surface of the key 4 is beveled or inclined toward the rear, as shown.

Encircling the socket member and slidable thereon is a collar 5, having on the side adjacent the key 4 a lateral extension 6 in which the said key is movable radially. Between the key 4, which from the fact that it bears directly on the drill bit may be called the bit-key, and the outer wall of the extension 6, is a key 7 having its inner edge or surface inclined in correspondence with the inclination of the bit-key. On the rear end of the wedging key 7 is an outwardly extending gib 8, overlying the edge of the collar extension, and on the forward end of said key are two gibs, 9, 10, the former overlying the collar extension and the latter extending inwardly, as shown. The inclined or outer portion of the bit-key 4 is slightly longer and wider than the slot in which the key is mounted, so as to afford long bearing surface against the wedging key, and the shoulder 11 thus provided prevents the key from dropping through the slot into the socket 2 when the bit is not in place.

From the foregoing the operation of the device will be readily understood. The bit being pushed into the socket the drill mechanism is started. As the bit strikes the ground the momentum of the collar 6 and key 7 carries the two forward together, and the camming action of the cooperating inclined surfaces of the tapered keys 4 and 7 drives the former forcibly inward against

the bit, binding the same tightly against the opposite side of the bit socket. Subsequent impacts of the bit tighten the parts still further if the first blow were not sufficient to produce the maximum forward movement of the collar and wedging key. To release the bit the forward end of the key 7 is struck with a hammer, driving the key backward and thereby loosening the key 4, after which the bit can be withdrawn from the socket. This method of releasing the bit is an important feature of my invention. In certain prior devices of this character the collar is struck to release the locking key or keys, but as the collar is a heavy part and hence not easily started when the parts are wedged together the blow must have considerable force and is therefore liable to batter or deform the collar. In my device the key 7, which is the part struck, is comparatively light and less force is required to start it; but if it should be deformed, or become worn from use, a new key can be provided at less cost than a new collar. Constructing and arranging the collar 5 so as to move forward with the key 7 in the tightening operation is also an important feature, as the momentum of the heavy collar, added to that of the key 7, is sufficient to insure the key 4 being driven against the bit with such force as to prevent any possible loosening of the bit in the operation of the drill and to prevent the bit being pulled out of the socket in case it should "stick" in the hole which is being drilled. When the bit is withdrawn from the socket the key 7, and also key 4, are prevented from falling out of the collar, with consequent liability of being lost, by the gibs 8, 9, 10. Thus when the bit-key drops down in its slot until the shoulder 11 strikes the socket member the wedging key falls with it, but the gibs 8 and 9 prevent the wedging key from being pushed out of the collar, while the collar cannot slide off the socket member for the reason that gib 9, engaged by the collar in the forward movement thereof, would cause the key 7 to slide forward also; and when the said key has moved as far as permitted by the inclined surface of key 4 the gib 9 will arrest the collar. If the collar should slide to the rear the gib 8 would be engaged by it and would cause the key 7 to slide rearwardly until the gib 10 strikes the key 4. In fact the only way to remove the collar and keys is to allow the bit-key to drop down in its slot as far as permitted by the shoulder 11, and then hold the key 7 up against the outer wall or top of the collar extension 6. With the parts in this position the collar and the key 7 can be slid backward past key 4, the gib 10 being narrow enough to just clear the key 4, whereupon the key 7 can be slipped out of the collar and the key 4 lifted out of its slot. It will be recognized at once that it is practically

impossible for this operation to take place by accident, and hence for all practical purposes there is no possibility of any of the parts being accidentally disconnected from the socket member when the bit is not in place. The retention of the movable parts on the socket member by their own cooperation makes it possible to dispense with the usual bead or flange at the forward end of the socket member to retain said parts on the latter, the socket member being thus of uniform diameter throughout, and hence there is no impediment to the forward movement of the collar in the tightening operation, thus further insuring a secure and effective engagement with the bit.

The device herein specifically described is merely the preferred embodiment of the invention and may be modified with respect to details of construction without departure from the proper scope and spirit of the invention as defined by the appended claims.

What I claim is:

1. In a chuck for rock-drills, in combination, a member having an axial socket to receive the drill bit and having in its side a longitudinal slot, a bit-key movable radially in the slot and having its outer surface or edge inclined rearwardly, a collar encircling the socketed member and bit-key and adapted to slide freely on said member, and a movable wedging key interposed between the bit-key and the adjacent outer wall of the collar, having an inclined surface or edge corresponding to and bearing on the similar surface or edge of the bit-key and having at its ends outwardly extending gibs adapted to engage the front and rear faces of the collar and at its forward end an inwardly extending gib adapted to clear the bit-key and permit the collar and wedging key to be moved together rearwardly past the bit-key when the latter is in its innermost position, as set forth.

2. In a chuck for rock drills, in combination, a member having an axial socket to receive the drill bit and provided in its side with a slot, a bit-key movable radially in said slot and provided with means for limiting its inward movement, said bit-key having its outer surface or edge inclined rearwardly, a collar encircling the socketed member and the bit-key and adapted to glide freely on said member, and a movable wedging key between the bit-key and the adjacent outer wall of the collar, having its inner surface or edge inclined in correspondence with the similar surface or edge of the bit-key, said wedging key being provided at its ends with means for normally preventing displacement relative to the collar and having at its forward end means adapted normally to engage the bit-key when the wedging key is moved rearwardly except when the wedging key is in its radially outermost position.

and the bit-key in its radially innermost position, as set forth.

3. In a chuck for rock drills, in combination, an elongated member of uniform diameter throughout its length, provided with an axial socket and having in its wall a longitudinal slot; a bit-key movable radially in said slot, provided with means for limiting its inward movement and having its outer surface or edge inclined rearwardly; a collar mounted to slide freely on the socketed member and having a lateral extension enclosing the bit-key, the inner surface of said collar and extension being at every point parallel to the outer surface of the socketed member; and a movable wedging key between the bit-key and the outer wall of the collar extension, having its inner surface or edge inclined in correspondence with the

similar surface or edge of the bit-key, said wedging key being provided at its ends with means adapted to normally prevent forward and rearward displacement relative to the collar extension and at its forward end with an inwardly extending gib adapted normally to engage the bit-key in the rearward movement of the wedging key but to clear the bit-key when the same is in its radially innermost position and the wedging key is in its radially outermost position; as set forth.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

HAROLD WILLIAM SCHORLEMMER.

Witnesses:

J. C. DARLINTON,
RAYMOND HALL.