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J. H. THOMAS.

CHUCK OF ROCK DRILLING MACHINES.

APPLICATION FILED NOV. 14, 1904.

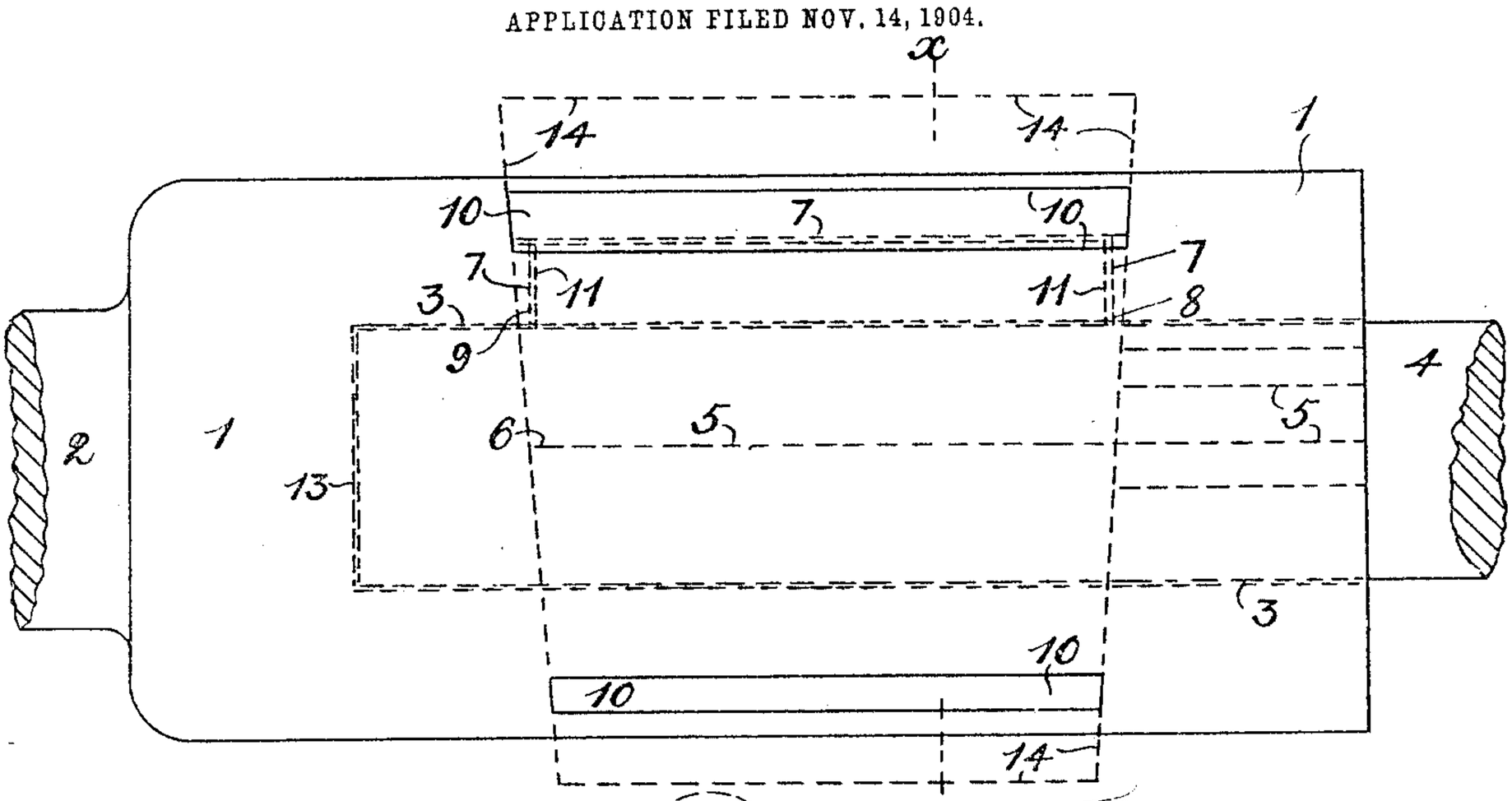

Fig. 1.

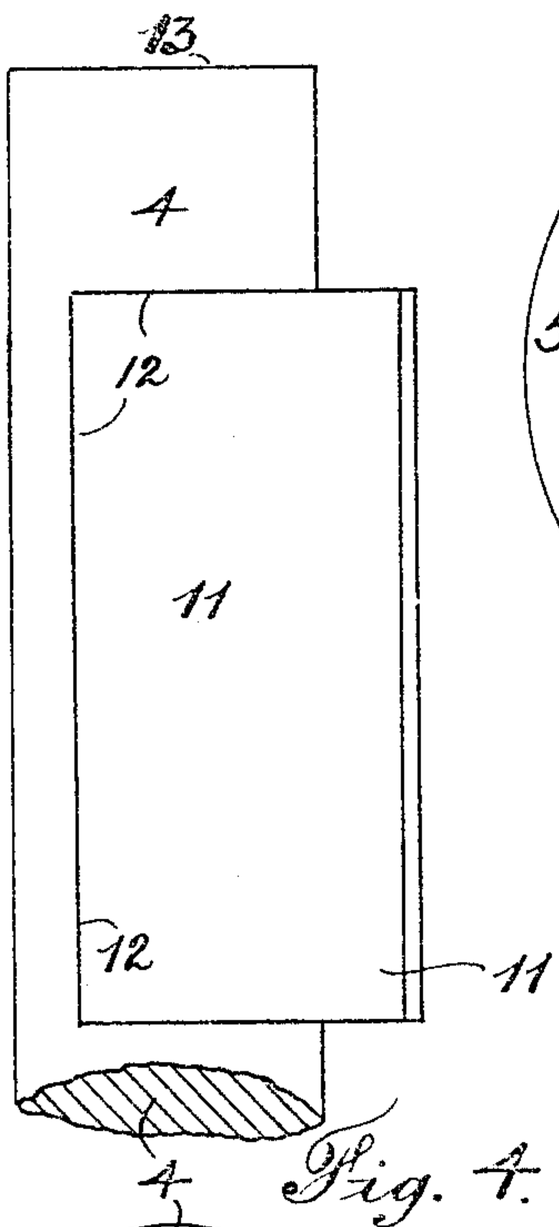

Fig. 4.

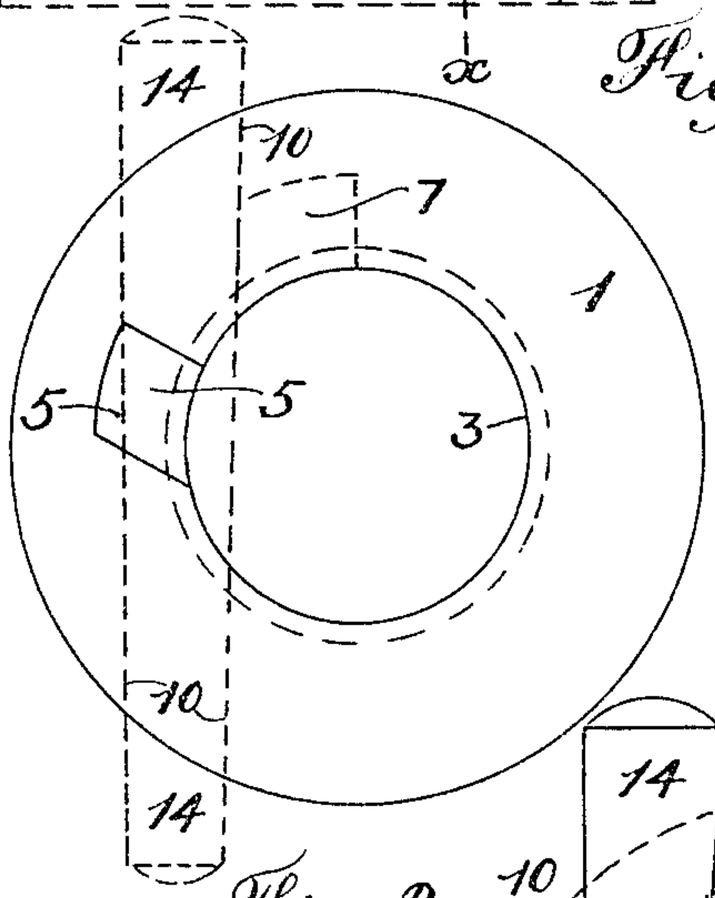

Fig. 2.

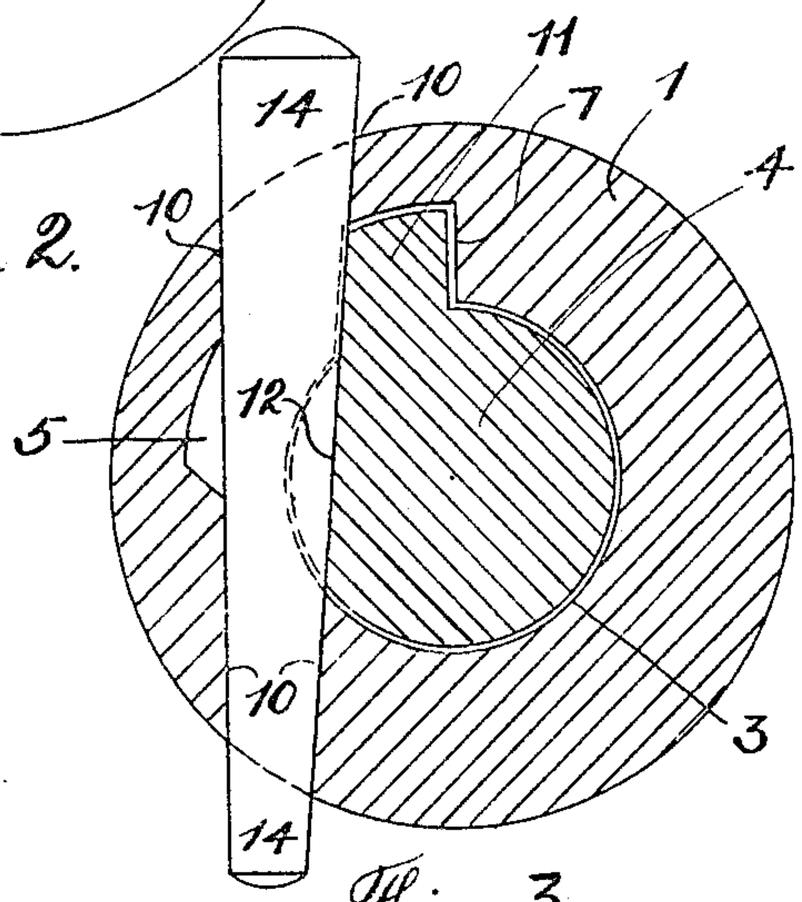

Fig. 3.

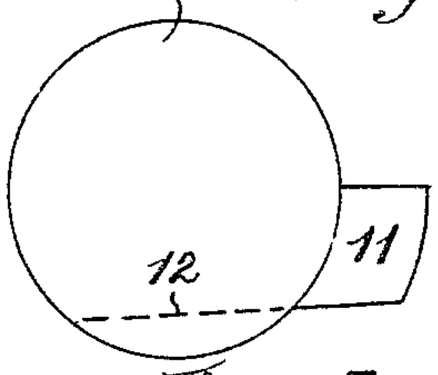

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN HENRY THOMAS, OF JOHANNESBURG, TRANSVAAL.

CHUCK OF ROCK-DRILLING MACHINES.

No. 804,686. Specification of Letters Patent. Patented Nov. 14, 1905.

Application filed November 14, 1904. Serial No. 232,654.

To all whom it may concern

Be it known that I, JOHN HENRY THOMAS, a subject of the King of England, residing at Johannesburg, in the Colony of the Transvaal, have invented certain new and useful Improvements in Chucks of Rock-Drilling Machines, (for which I have made application for patent in the Transvaal, No. 294, filed July 20, 1904,) of which the following is a specification.

This invention relates to the fixing of the bits or drills or boring-tools in the chucks of rock-drills or rock-drilling machines.

The object with which the present invention is designed is to dispense with the chuck bolts, pads, keys, and similar contrivances at present employed for securing the shank of the drill or tool in the bore or longitudinal hole in the chuck.

My invention provides a simple, thoroughly-efficient, and ready means for firmly securing the bit in the chuck, and it enables the changing of the drills or bits to be effected with greater expedition than the existing devices. Owing to the rough handling these machines receive at the hands of their operators, breakages are of very frequent occurrence, and the cost of maintenance of such machines is notoriously high. As my invention is simple and very readily manipulated I materially reduce the cost of maintenance on this account.

The invention consists, essentially, in constructing the shank of the bit with one or more lateral projections and in forming in the bore a locking groove or recess or grooves or recesses in which the lateral projection or projections are placed by the axial rotation of the drill after it has been projected into the bore of the chuck, the projection or projections being retained in said grooves or recesses by means of a key, cotter, or equivalent, which operates to prevent the disengagement of the lateral projection or projections from the locking grooves or recesses.

The invention will now be described in detail by aid of the accompanying sheet of drawings, in which—

Figure 1 represents the chuck in side elevation. Fig. 2 is an end elevation of the same. Fig. 3 is a transverse section on line *x x*, Fig. 1. Fig. 4 is a longitudinal elevation of a portion of the shank of the bit, showing the lateral projection. Fig. 5 is an end elevation of Fig. 4.

In the drawings, 1 represents the chuck, shown fashioned in one piece with the piston-rod 2 of the rock drill or machine.

3 represents the bore or hole formed longitudinally of the chuck-body 1, into which the shank end of the bit is projected and in which it is secured. This hole 3 is preferably made parallel and circular in transverse section. When the drill or bit is in position in the bore 3, the extremity abuts the bottom of the hole or bore 3.

In the bore 3 at the front end of the chuck 1 is formed a slot 5, which slot, as shown in Fig. 1, enters the chuck for some distance in a longitudinal and rearward direction and terminates at or about the point 6. In the bore 3 of the chuck 1 on the inside is formed a longitudinal slot or recess 7. This recess 7 at the forward end starts at the point 8 and extends in a rearward direction inside the bore 3 to the point 9. (See Fig. 1.)

10 is a keyway or taper hole formed through the chuck 1 in such a position that it passes down one side of the longitudinal recess 7, formed in the bore 3. This keyway 10 is preferably tapered in two directions, as shown in the drawings. (See particularly Figs. 1, 2, and 3.)

The shank 4 of the drill or bit is formed with a lateral projection or wing 11, which runs longitudinally of the shank 4 for a suitable distance. The lateral projection 11 is made equal or approximately equal in length to the length of the longitudinal recess 7, formed in the bore 3. The shank 4 of the bit is made flat on one side, as is indicated at 12 in Fig. 5. The projection 11 on the shank 4 is formed in such a position and of such a length that when the extremity 13 of the shank 4 abuts the bottom of the bore 3 said projection 11 on partial rotation of the drill-bit will come into engagement with or enter the longitudinal recess 7.

14 is a taper key or wedge located in the keyway 10, which key is tapered in two directions, as illustrated, to correspond to said keyway 10. When in position, the key 14 engages one side of the projection 11, and by retaining said projection in the longitudinal recess 7 prevents the rotation of the bit in the bore 3, and so secures the bit in position in the chuck.

The operation of securing the bit in the chuck 1 is as follows: The extremity of the shank 4 is placed in the bore 3 and the lateral projection 11 brought into coincidence with the longitudinal slot 5 and the bit-

shank 4 projected to the bottom of the bore 3. When the end 13 of the bit-shank 4 abuts the bottom of the bore 3, the drill 1 is axially rotated part of a revolution to place the lateral projection 11 in the longitudinal recess 7. (See Fig. 3.) The key 14 is now placed in the keyway 10 and driven down tightly, and by engaging the flat face 12 of the lateral projection 11 on the shank 4 of the bit securely retains said lateral projection 11 in said longitudinal recess 7. The removal of the bit is effected by reversing the sequence of the above cycle of operations.

Instead of forming the one longitudinal recess in the bore of the chuck and providing one corresponding projection on the shank, as described, and illustrated in the accompanying drawings, two or more such recesses may be constructed in the bore and a corresponding number of projections be formed on the shank end of the drill or bit.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. In chucks of rock-drills or rock-drilling machines and means for fixing the bits or boring-tools therein, in combination, the chuck-body constructed with an axial bore, a longitudinal slot formed in the bore, a longitudinal recess formed inside the chuck in communication with the bore, a bit or drill-shank constructed with a lateral projection adapted to be brought into engagement with the longitudinal recess inside the bore by the axial rotation of the drill or bit, a keyway or tapered slot formed through the chuck passing down one side of the longitudinal recess, and a tapered key or wedge arranged in said keyway engaging the shank and lateral projection of the bit or tool to maintain the projection in engagement with the recess, substantially as described.

2. In chucks of rock-drills or rock-drilling machines and means for fixing the bits or boring-tools therein, in combination, the chuck-body 1 formed with the bore 3 and with the longitudinal slot 5 in the bore 3 and the internal longitudinal recess 7 communicating with the bore 3 and the keyway or slot 10 tapered in two directions the shank 4 of the bit or tool provided with the lateral projection 11 adapted to pass down the longitudinal slot 5 and to be placed in the longitudinal recess 7 by the axial rotation of the drill or bit, the key 14 in the keyway 10 tapered in two directions at right angles to correspond to said keyway, said key 14 engaging the side of the shank 4 and projection 11 to retain the projection 11 in the recess 7, substantially as described and shown.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN HENRY THOMAS.

Witnesses:

CHAS. OVENDALE,

R. OVENDALE.