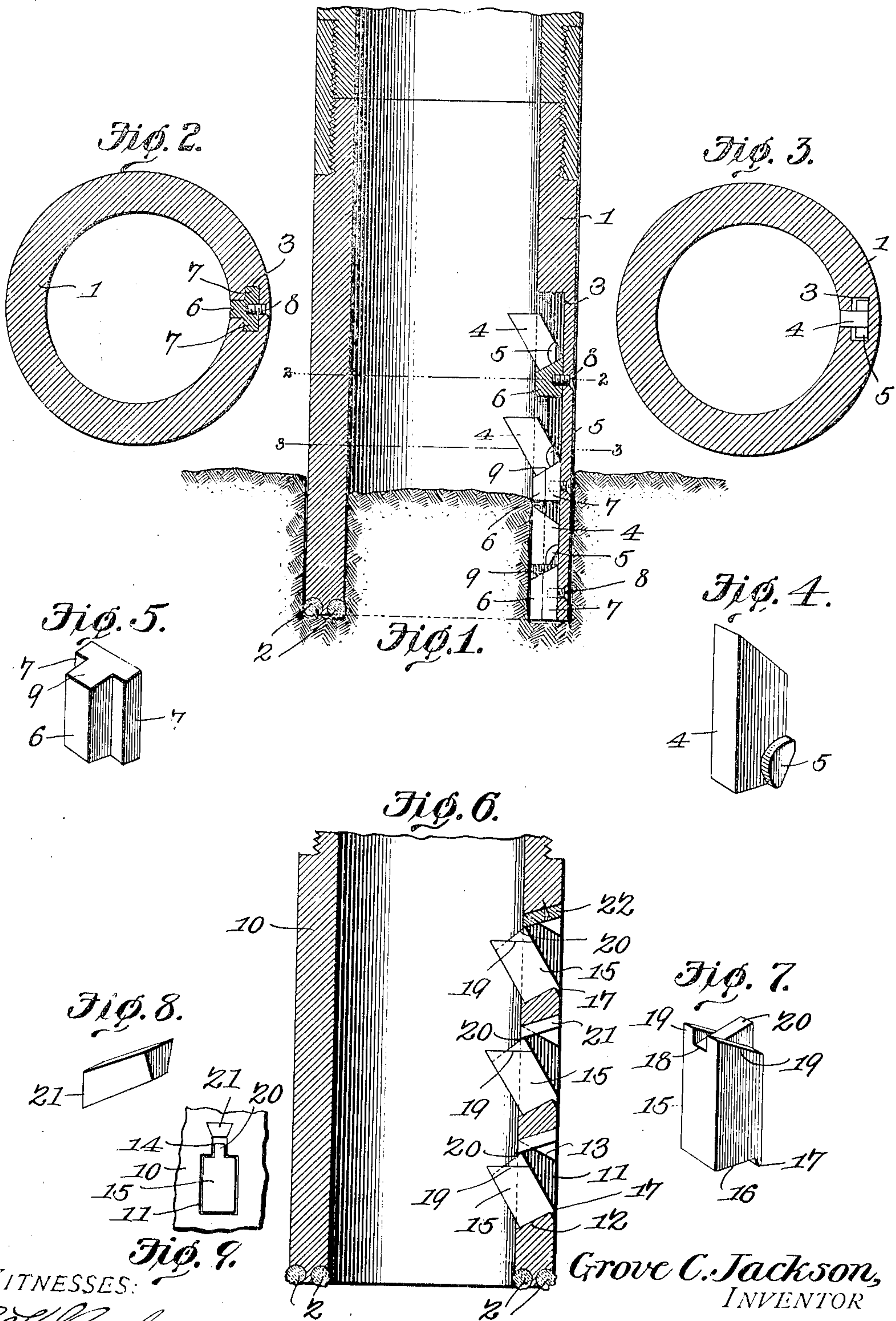


No. 871,800.

PATENTED NOV. 26, 1907.

G. C. JACKSON.  
EARTH DRILL.

APPLICATION FILED JULY 30, 1906.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

GROVE C. JACKSON, OF KINGWOOD, WEST VIRGINIA.

## EARTH-DRILL.

No. 871,800.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed July 30, 1906. Serial No. 328,425.

*To all whom it may concern:*

Be it known that I, GROVE C. JACKSON, a citizen of the United States, residing at Kingwood, in the county of Preston and State of West Virginia, have invented a new and useful Earth-Drill, of which the following is a specification.

This invention relates to earth drills of tubular form for receiving earth, coal, stone or other mineral cores to be withdrawn with the drill for the purpose of examination when prospecting, and has for its object to provide novel means for connecting the core with the drill when the latter is being withdrawn without interfering with the penetration of the drill. In this connection, it is proposed to employ bits which are mounted within the walls of the drill in such a manner as to be held in a retracted position by the core, and which are capable of impinging against the core when the drill is lifted so as to connect the core therewith. The bits are mounted to tilt from their normal inactive positions without the employment of springs, and are also arranged to have the weight of the core come directly upon the bodies of the bits rather than upon pivotal supports therefor.

An important object of the invention is to permit of the convenient replacing of the bits when worn or broken.

With these and other objects in view, the present invention consists in the combination and arrangement of parts as will be hereinafter more fully described, shown in the accompanying drawings and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings: Figure 1 is a longitudinal sectional view of a tubular drill having one embodiment of the present invention applied thereto. Fig. 2 is a cross sectional view on the line 2—2 of Fig. 1. Fig. 3 is a cross sectional view on the line 3—3 of Fig. 1. Fig. 4 is a detail perspective view of one of the bits employed in Fig. 1. Fig. 5 is a detail perspective view of one of the bit supporting elements. Fig. 6 is a longitudinal sectional view of a tubular drill equipped with another embodiment of the invention. Fig. 7 is a detail perspective view of the

form of bit employed in Fig. 6. Fig. 8 is a detail perspective view of a bit supporting member as employed in Fig. 6. Fig. 9 is an elevation of a portion of the drill shown in Fig. 6 to show the mounting of one of the bits.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

Referring at first more particularly to Figs. 1 to 5, inclusive, 1 designates an ordinary tubular drill provided in its lower edge with an arrangement or appliances suitable for use in the operation of cutting or "grinding" drills, such as diamonds or shot. In applying the present invention to this form of drill, a longitudinal groove or channel 3 is provided in one of the walls of the drill and intersecting the bottom thereof, said groove being flanged or substantially T-shaped in cross section, as clearly indicated in Figs. 2 and 3 of the drawing. Any preferred number of core engaging bits may be mounted in the groove, one of such bits being shown in detail in Fig. 4. Each bit consists of a solid rectangular block or body 4 provided upon each side and adjacent its lower rear corner with a laterally directed shoulder 5 having a convexed front face with its lower rear corner terminating short of the lower rear corner of the bit for the purpose that will hereinafter appear. The bit is of a width to fit loosely within the reduced open side of the groove 3, with the shoulders 5 working in the back of the groove and overlapping the flanges thereof with their convexed faces bearing against the flanges so as to rock thereon and thereby to permit of the bit tilting back and forth in the groove. Between successive bits, there is a support for the upper bit consisting of a block or abutment 6 of a size to fit in the open side of the groove and provided with flanges 7 back of the flanges of the groove to prevent outward displacement of the block. A screw or other fastening 8 is set through the back of the groove and into the block or abutment to rigidly hold the latter in place. The upper face or top 9 of the block is beveled downwardly and inwardly, and the bit rests upon the beveled top of the block and is capable of tilting thereon.

It will here be explained that any desired number of bits and abutments may be employed, each of these elements being slid



into the groove from the open bottom thereof, whereby any of these members may be conveniently replaced when worn or broken.

In practice, the drill is rotated in any suitable manner so as to sink the same into the ground. As the drill descends, the centrifugal force occasioned by the rotary motion of the drill as well as the core which enters the drill, forces the bits back into the groove, whereby said bits offer no resistance to the penetration of the drill, and, therefore, the slightest amount of wear is incurred by the bit on account of any friction with the core. When the drill is drawn upward, the core has a tendency to drop out of the drill, but this is prevented by reason of the bits tilting inward from the wall of the drill and thereby causing the corner or point of the bit to press against or sink into and bind the core within the drill with sufficient tightness to permit of the core being drawn up with the drill.

Another embodiment of the invention has been shown in Figs. 6 to 9, inclusive, wherein 10 designates a conventional form of tubular drill. In one side of this drill there is formed a longitudinal series of openings 11, each opening being oblong in shape and having its bottom wall 12 inclined downwardly and inwardly and constituting a support for a bit. Its upper wall 13 is inclined upwardly and inwardly and is intersected by a kerf 14, the top of which is inclined downwardly and inwardly. The bit 15 is oblong in shape and has its bottom 16 disposed at substantially right angles to its front and rear faces, there being a depending flange 17 at the outer lower corner of the body with its inner face beveled upwardly and inwardly. The top of the body is beveled or inclined upwardly and inwardly and is provided in its inner extremity with a notch 18 producing upstanding flanges 19 at opposite sides of the notch, there being an upstanding shoulder 20 in rear of the notch and having its upper face beveled or inclined downwardly and inwardly.

In assembling the bit with the drill, the bit is introduced into one of the openings 11 from the interior of the drill, after which a dovetailed key 21 is introduced into the dovetailed kerf 14 from the outer side of the drill and is held in place by means of a suitable fastening 22. The parts are so proportioned that when the bit is entirely within the opening 11, the key 21 will lie in the

notch 18 and the shoulder 20 will lie in the rear portion of the kerf 14, whereby outward displacement of the bit is prevented. The bit is capable of tilting inwardly until its shoulder 20 strikes the inner end of the key 21 whereby the bit is prevented from being displaced through the inner side of the opening and will therefore operate in the manner hereinbefore described to connect the core with the drill.

In each embodiment of the invention, it will be noted that pivot pins and the like are dispensed with, and the bits are mounted to rock or tilt upon their lower ends, whereby strains are taken up by the entire bit.

I usually prefer to employ the form of invention illustrated in Fig. 6, although the form shown in Fig. 1 can also be used whenever desired.

Having thus described my invention, what is claimed is:

1. The combination with a tubular drill and a support in the wall thereof having an inclined upper face; of a bit detachably mounted within the wall and upon the support, said bit being tiltable inwardly from the wall and upon the support, and means integral with the bit for limiting the inwardly-tilting movement of the bit.

2. A tubular drill having an opening therein with its upper end inclined downwardly and inwardly and intersected by a kerf, a bit fitting in the opening to tilt therein with its upper end inclined upwardly and inwardly and provided in its inner edge with a notch from the rear of which rises a shoulder having its upper face inclined upwardly and outwardly, and a key fitted in the kerf with its inner end received in the notch of the bit, the inner end of the key being disposed in the path of the shoulder of the bit to limit inward tilting of the latter.

3. A tubular drill having an opening therein, one wall of said opening being inclined, a bit tiltably mounted within the opening and bearing upon and engaging the bottom wall thereof, and a key secured within the opposite wall of the opening and disposed to limit the tilting movement of the bit.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GROVE C. JACKSON.

Witnesses:

RUFUS HOLDEN,  
A. G. HUGHES.