To all whom it may concern:

Be it known that Robert C. Sharp, citizen of the United States of America, residing at Youngstown, in the county of Mahoning and State of Ohio, has invented certain new and useful Improvements in Electric Drilling Tools, of which the following is a specification.

This invention relates to drilling tools.

The principal object is to provide a tool adapted to be used in prospecting for oil, gas or other minerals.

Another object is to provide a tool suspended by cable or other means having within a shell a plurality of electric motors for energizing the shaft which in turn gives desired movement to the drill.

Another object is to provide a drill in combination with the drilling tool, whereby the same is released from the shell when the shaft is energized and in motion.

Another object is to provide means for allowing the drill to automatically descend the driving shaft until the same has reached a point where it is released from the rotary motion of the shaft, and held from escaping by means provided at the lower end of the shaft.

Another object is to provide means for securing the shell against rotation when placed in position for operation.

Another object is to provide a lowering and hoisting cable having electric wires encased therein for the purpose of energizing a plurality of motors encased within the shell of the tool.

A still further object is to provide means for admitting fresh air into a chamber containing a plurality of electric motors and means for a controlled outlet for the same, thereby providing a circulation of fresh air within the electric motor chamber.

With these and other objects in view the invention consists in the novel arrangement and combination of parts which will be more fully described and set out in the claims.

Figure 1 is a longitudinal sectional view of the tool.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a lower end view of the drill.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

Figure 5 is a detail sectional view.

Figure 6 is a side elevation of the drill.

By referring to Figure 1 it will be seen that I have provided a shell 1. At the upper end and within this shell 1 is secured a guide 2. Within this guide 2 I have provided a slidable plunger 3. Within the slidable plunger 3 I have provided an interior opening 4, and within this opening I have placed electric wires 5, which lead to an electric motor chamber. Positioned within the shell 1, I have provided a main shaft 6, secured by means of bearings 7, and by also projecting into a support 8 and 11. The bearings 7 are kept from longitudinal movement by means of the bearing parts 10 (see Figure 1). Mounted upon the main shaft 6, and within the motor chamber above referred to, I have provided a plurality of motors 9 which are so constructed as to cause the main shaft 6 to rotate when the motors 9 are operating.

In order to provide a water tight chamber for these motors 9 to operate within, I have provided a stuffing box 12, and a gland 13 fitting therein. Attached to the lower end of the shell 1, I have provided a drill 14 secured to the lower end of the shell 1 by means of threads 15, which are threaded in reverse order to the general direction of the drill 14 when in operation. The reason for threading this drill 14, as above described, is to allow the motors 9 to get under way before the drill 14 becomes unthreaded and engages with the material to be drilled, or below the base 18 supporting the tool. In order to allow water to be used for lubricating the drill 14 and cooling the same, I have provided water inlet holes 16 formed longitudinally in the upper portion of the drill 14. The lower end of the main shaft 6 is provided with thrust bearing 17.

By referring to Figures 1 and 2 it will be seen that I have provided a grip block 19 provided with grips 20. The grips 20 have inner ends slidably arranged in a cone shaped member so that when the tool is being lowered or hoisted from the hole, the cone shaped member or grip block 19 comes in contact with a helical spring 21, thereby withdrawing the grips 20 within the shell 1, and when the base member 18 rests upon the bottom of the hole the helical spring 21 acts on the grips 20, forcing them outwardly so as to penetrate the material or walls of the hole.

In order to provide a proper working
condition for the motors 9, I have provided an air vent 22 leading from the motor chamber, and an air inlet 23 leading into the motor chamber. This air vent 22 may have a controlling valve at its upper end so as to cause a continual pressure of air within the motor chamber, thereby eliminating danger of moisture entering the motor chamber. In order to lower or hoist the tool into the hole being bored I have provided a cable 24.

By referring to Figure 5 it will be seen that I have provided a drill point 25 which is attached by means of threads to the lower end of the drill 14 and a set screw 26.

By referring to Figure 3 the cutting end of the drill 14 may be seen.

By referring to Figure 6 it will be seen that the outer circumference of the drill 14 is provided with a covering of spiral grooves, so that when the drill 14 is in operation the material cut away by the drill 14 will be carried upwardly and fill in the space underneath the shell 1. This space will increase as the drill 14 becomes lowered and slides downwardly upon the main shaft 6 and is held from turning on said shaft 6 by means of key members 27 until the head of the drill 14 reaches the neck 28 at the lower end of the main shaft 6. By referring to Figures 5 and 6 it will be seen that the teeth 29 are longer at the inner than the outer cutting edge.

What I claim is:

1. In a device of the class described, the combination of a shell, a drill threaded to the lower end of same so that when the driving shaft rotates the drill, the drill will unscrew from the lower end of said shell, substantially as described for the purpose set forth.

2. In a device of the class described, a shell, a shaft mounted therein, said shaft caused to rotate by means of a plurality of motors, an air inlet into motor chamber, an outlet for said air, a drill attached to the lower end of said shell when being lowered into a hole, said drill being slidably maintained upon said shaft, a neck formed at the lower end of said shaft, in order to release the drill from rotation, horizontal 50 water inlet holes in the head of said drill, substantially as described for the purpose set forth.

3. In a device of the class described, the combination of a shell provided with internal threads at its lower end with a drill, the upper end of which is threaded into said internal threads so as to unthread when the shaft is caused to rotate in order to give movement to the drill, said drill provided with spiral grooves formed so as to carry the material cut by the drill in a spiral upward movement, substantially as described for the purpose set forth.

4. In a device of the class described, the combination of a shell provided with internal threads at its lower end with a drill, the upper end of which is threaded into said internal threads so as to unthread when the shaft is caused to rotate in order to give movement to the drill, said drill provided with spiral grooves formed so as to carry the material cut by the drill in a spiral upward movement, said drill comprising two parts connected by means of threaded engagement, the cutting part provided with teeth, the inner edge of same being longer than the outer, the cutting part being a trifle larger in diameter than the upper part, substantially as described for the purpose set forth.

In testimony whereof I affix my signature.

ROBERT C. SHARP.

Witnesses:
C. A. HARPMAN,
FRANK V. JACKSON.