

W. H. SWISHER.  
 DRILL.  
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1,372,257.

Patented Mar. 22, 1921.

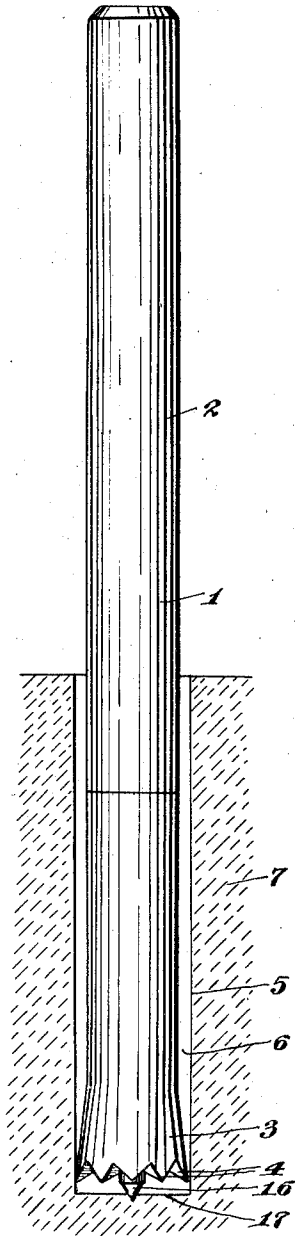


Fig. 1.

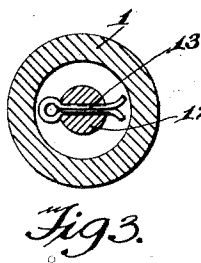


Fig. 3.

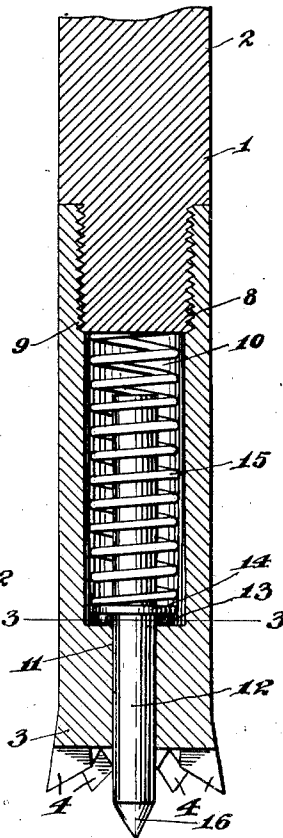


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## DRILL.

1,372,257.

Specification of Letters Patent. Patented Mar. 22, 1921.

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*To all whom it may concern:*

Be it known that I, WILLIAM H. SWISHER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Drills, of which the following is a specification.

This invention relates to drills, and has for its primary object to provide a drill with resilient means of such character as to maintain the cutting teeth of the drill normally out of contact with the base of the material through which the drill is penetrated, whereby through the use of said resilient means, the drill will be enabled to deliver a clean, sharp and cutting blow to said material so that the prongs of the tool there-through will be considerably facilitated, and to attain these and other advantages without causing undue damage or breakage to the surrounding portions of said material through which the drill is operating, whereby a hole may be produced in said material of substantially the same proportions as the widest diameter of the cutting end of the drill.

With these and other objects in view, as will appear as the description proceeds, the invention accordingly consists in the novel features of construction, combination of elements and arrangement of parts, hereinafter to be more fully described and to have the scope thereof pointed out in the appended claims.

In the accompanying drawing, forming a part of this specification, and in which similar characters of reference denote like and corresponding parts:

Figure 1 is a side elevation of a drill constructed in accordance with the principles of the invention,

Fig. 2 is a vertical sectional view taken through the lower or cutting end of the drill, and

Fig. 3 is a transverse horizontal sectional view taken along the line 3—3 of Fig. 2.

Referring more particularly to the details of the invention, the numeral 1 designates the drill comprising the present invention. This drill may be one of several varieties, but in its preferred adaptation it is preferably employed for cutting openings through marble, rock, brick or cement substances. To this end, the drill consists of a solid, elongated metallic handle portion 2 and a detachable cutting portion 3 at its lower ex-

tremity. The lower end of the portion 3 is provided with the usual cutting teeth 4 and, as usual, the diameter of that portion of the tool on which the cutting teeth are provided is appreciably larger than the diameter of the remaining portions of the tool, this being done to provide slight clearance between the sides of the tool and the corresponding sides 5 of the opening 6 in the material through which the drill is penetrated. This clearance enables finely ground pieces of material pulverized by the action of the drill to find escape from the opening 6 by way of the space formed between the sides of the opening and those of the tool.

The lower end of the handle portion 2 is reduced and threaded as at 8, and adapted to be connected with this reduced end is a sleeve-like cutting portion 3. The upper end of the portion 3 is threaded as at 9 so as to be connected with the threads of the reduced end 8, and in this manner the two essential parts of the tool are capable of being securely united. Formed in the sleeve or cutting portion 3 of the tool is a spring chamber 10, which terminates at its lower end in a reduced pin receiving bore 11, the latter being extended so as to establish communication between the chamber 10 and the exterior of the tool. Slidably mounted within the bore 11 and disposed to extend within the chamber 10 and beyond the teeth 4 is a centering pin 12. This pin is maintained in its operative position by providing the same with a transversely projecting cotter 13, upon which rests a spring seat 14, and a coil spring 15 is normally interposed between the seat 14 and the lower reduced end of the handle portion 2. By being thus confined the normal tendency of the spring 15 is to force the pin 12 outwardly so that its pointed outer extremity 16 will extend an appreciable distance beyond the teeth 4 and to maintain the pin in this position when the drill is relieved of pressure.

In view of the foregoing it will be manifest that the pin 12 will serve to maintain the cutting teeth 4 in spaced relationship from the face 17 of the material through which it is cutting, and by thus spacing said teeth, blows delivered to the drill will tend to force the teeth 4 into positive cutting relationship with the face 17, said pin thus serves to enable the drill to impart a sharp and well defined cutting blow to the face 17 so that the maximum cutting effort

of the drill may be produced at a concentrated point upon the material 7. This construction is in contradistinction to the old form of drill wherein the cutting teeth are constantly maintained in engagement with material upon which the drill is working, and in this old form the blows delivered to the drill are also imparted to the material surrounding the same so that the opening which the drill finally produces is one of a ragged character, caused by the breaking down of the material surrounding the opening through which the drill is passing. In the present construction of the drill 1 this breaking down of the material is entirely obviated and the entire effort of the drill is concentrated only upon that portion of the material 7 through which it is passing, hence cleavage of the surrounding material is obviated. By widening the lower end of the cutting extremity 3, the space is provided for the escape of the ground or pulverized material caused by the cutting operations of the teeth 4, and this escape of material is oscillated by the compression of air caused by the downward stroke of the drill as a whole. This insures a smooth and hard face 17 upon which the drill will operate and, accordingly, prevents the collection of waste or cut material between the teeth 4 and the face 17.

What I claim is:

1. A concussion drill for penetrating mineral substances comprising a handle, a sleeve carried by one end of said handle and having cutting teeth formed therewith, said sleeve being provided with a centrally situated bore, a pin slidably mounted within said bore, and spring means coöperative with said pin for projecting the outer end thereof beyond said cutting teeth.

2. A concussion drill for penetrating mineral substances comprising a handle, cutting teeth formed upon the lower end of said handle, a pin mounted axially for sliding movement in the lower end of said handle, and resilient means coöperative with said

pin for projecting the outer end of the same beyond said cutting teeth.

3. A concussion drill for penetrating mineral substances, comprising a handle, cutting teeth formed with the lower end of said handle, a pin located centrally within the lower end of said handle and arranged to be slidably received within a bore formed in said handle, and spring means mounted in said bore and coöperative with said pin to normally project the outer end of the latter beyond said cutting teeth.

4. In a concussion drill, a handle having a reduced lower end, a sleeve detachably connected with the reduced end of said handle, cutting teeth formed upon the lower end of said sleeve, a pin slidably mounted within a bore extending centrally through said sleeve; a spring confined between the reduced end of said handle and a fixed portion of said pin and serving to normally project the outer end of said pin beyond said cutting teeth, and said fixed part of said pin serving to limit the outward movement of the pin.

5. In a drill of the class described, a handle of substantially uniform diameter throughout its effective length, a sleeve detachably connected with one end of said handle, said sleeve being of substantially the same diameter as said handle but having its lower end flared outwardly and provided with cutting teeth whose effective diameter is greater than that of the major portions of said sleeve and handle, a guide pin slidably mounted within a bore extending axially through the lower end of said sleeve, a spring positioned within said sleeve and coöperative with said pin to project the outer end of the latter beyond said cutting teeth, and means for limiting the outward movement of said pin said pin serving to maintain said cutting teeth normally out of engagement with the surface to be drilled.

In testimony whereof I affix my signature.

WILLIAM H. SWISHER,