No. 623,506. Patented Apr. 25, 1899.

W. D. BAKER.

DRILL OR AUGER.

(Application filed Nov. 18, 1897.)

(No Model.)

FIG. 1.

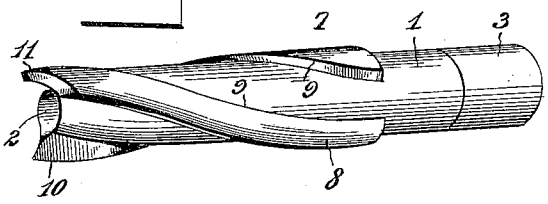


FIG. 3.

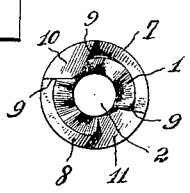


FIG. 2.

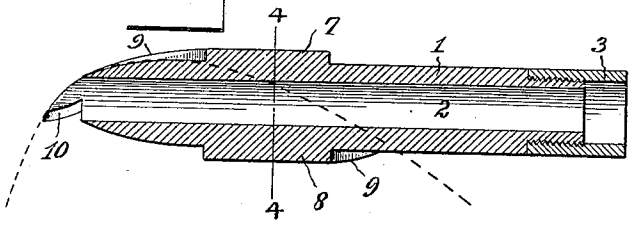


FIG. 4.

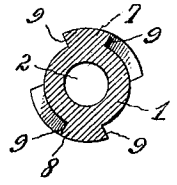
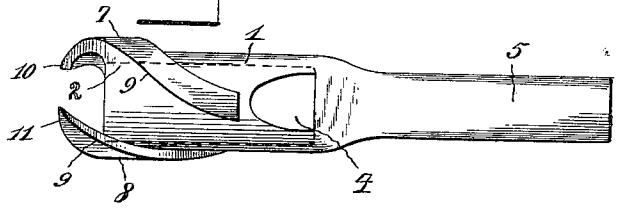


FIG. 5.



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UNITED STATES PATENT OFFICE.

WILLARD D. BAKER, OF ROGERS, ARKANSAS, ASSIGNOR OF ONE-HALF TO E. N. STEARNES, OF SAME PLACE.

DRILL OR AUGER.

SPECIFICATION forming part of Letters Patent No. 623,506, dated April 25, 1899.

Application filed November 18, 1897. Serial No. 658,960. (No model.)

To all whom it may concern:

Be it known that I, WILLARD D. BAKER, a citizen of the United States, residing at Rogers, in the county of Benton and State of Arkansas, have invented a new and useful Drill or Auger, of which the following is a specification.

My invention relates to improvements in augers or drills adapted for service in different kinds of materials or substances—such as, for example, for drilling in stones, as in limestone or marble quarries, or for boring in frozen ground.

The primary object that I have in view is to provide an improved construction of the drill or auger of that character wherein the instrument is designed to cut a core from the material operated upon and to provide for the discharge externally to the body of the instrument of the comminuted material reduced to substantially a pulverulent condition by the action of the bits or cutters.

A further object that I have in view is to so construct the drill or auger as to insure steadiness to the operation of the drill and to insure its cutting in a straight line or true direction into the material being operated upon.

With these ends in view my invention consists in the novel construction and arrangement of parts forming an improved auger or drill, as will be hereinafter fully described and claimed.

To enable others skilled in the art to which my invention relates to understand the same, I have illustrated the preferred embodiments thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective view of a drill or auger constructed in accordance with my invention. Fig. 2 is a longitudinal sectional elevation of the same, the dotted line indicating the curvature of the back face of each advance cutter, which merges into the exteriorly-tapered surface of the body. Fig. 3 is an end view of the drill or auger, and Fig. 4 is a transverse sectional view through the body on the plane indicated by the dotted line 4 4 of Fig. 2. Fig. 5 is an elevation of a drill or auger having a different construction of the means for discharging the bored material.

Like numerals of reference denote corresponding parts in all the figures of the drawings.

I construct my improved auger or drill with a cylindrical body 1, which is made in a single piece of metal of that class known technically to the trade as "tool-steel." The cylindrical body of the auger or drill is provided with a longitudinal bore or passage 2, which opens through the working or active end of the drill, and this bore or passage 2 may extend continuously through the drill, as shown by Fig. 2, or it may terminate within the heel of the drill-body, as shown by Fig. 5.

The construction of the drill or auger shown by Figs. 1 to 4, inclusive, is specially designed for service in stone-working, and it has the bore or passage extended continuously through the body of the drill, the heel or rear end of the implement being constructed for the attachment of a coupling 3, by which the auger may be attached to a hose or to a line of shafting, so that the auger may be rotated or driven at the required speed.

I construct my improved drill or auger with the exterior fins or flanges 7 8, which are arranged to extend spirally in the direction of the length of the cylindrical body on the outer surface thereof, and these spiral ribs, fins, or flanges are made integral with the body for simplicity in construction and durability and efficiency in service. These ribs or fins are spaced apart properly to provide the conducting or escape channels, through which the reduced or comminuted material cut from the work is permitted to escape externally to the body, and thereby discharged from the work without passing through the longitudinal bore or passage 2 in the interior of the cylindrical body, thus discharging the material both interiorly and exteriorly from the work. The side faces or edges of the spiral fins or ribs 7 8 are undercut or inclined inwardly from the exposed faces of the faces toward the spiral lines, where the fins join with the cylindrical surface of the body 1,

and thus the ribs or flanges 7 8 are provided with longitudinal cutting edges 9 at the advancing edges of the ribs or flanges for the purpose of providing clearance to the drill or auger as it is fed or advanced into the material operated upon.

In my improved drill the bits or cutters partake of the curvature of the spiral ribs beyond which they project, so as to form prolongations thereof, and this is true whether the bits are integral with the ribs or insertible bits, as will hereinafter appear.

One of the important features of my improved auger is the arrangement of the cutting edges of the bits in the plane of the advancing edges of the drill—that is to say, the cutting edges face in the direction of the rotation of the drill, and the extremities of the bits are pointed, whereby the bits serve to cut the wall as well as the end face of the cavity in the work.

The ribs or flanges 7 8 project in front of the working or active end of the tubular body 1 of the drill, and these protruding ends of the ribs or flanges form the bits or cutters 10 11, which lie on diametrically opposite sides of the body in a manner to cut the material very efficiently. These bits or cutters 10 11 do not extend transversely across the working or active end of the tubular cylindrical body 1, but they lie in the line or surface of said tubular body, so as to permit the opening or passage 2 to open through the working end of the body in a manner to enable the core or material to pass easily and freely into the longitudinal passage or body of said body 1.

An important feature of the present invention is the peculiar disposition of the advance cutters 10 and 11, formed by the prolongation of the ribs 7 and 8 to the line of rotation of the tubular body and also the relation between these cutters and the exterior tapered surface, which produces a sharp circular edge at the active end of the tubular body. It will be observed by reference to the sectional view Fig. 2 of the drawings that the tubular body is exteriorly tapered for a considerable portion of its length contiguous to the active end thereof and that the advance cutters 10 and 11 have their extremities pointed to form cutting edges disposed in the direction of rotation of the drill. Furthermore, the back faces of said advance cutters 10 and 11 are beveled on a curved line, which intersects the adjacent sharp circular edge of the tubular body 2 and also merges into the exterior tapered surface thereof. By reason of the back faces of the cutters 10 and 11 being beveled on lines merging into the adjacent tapered surface of the body a perfect clearance is provided for the tool, and the reduced or comminuted material cut from the work is freely guided into the spiral exterior channels formed between the ribs 7 and 8. The construction described also greatly reduces the friction attending the use of the drill, and thereby facilitates the passage thereof through the material being operated upon. I attach especial importance to the construction of these spiral ribs or fins having their front ends extended beyond the working end of the drill-body and forming the protruding cutters or bits, and these bits or cutters have the peculiarly-formed edges or working faces which are at the advancing edges of the bits or cutters and which form the penetrating prongs at the terminals thereof. The described construction and arrangement of the bits or cutters at the terminals of the spiral flanges or ribs provide efficient cutting-surfaces, by which the material is cut to produce a core which passes into and through the longitudinal opening or passage in the body, while the material which would have a tendency to remain in the hole or cavity is free to pass into and through the exterior channels provided by and between the spiral ribs or flanges on the outside of the body.

In the modified construction represented by Fig. 5 the tubular body has all the features of the ribs and cutters heretofore described; but the passage does not extend through the body throughout its full length. The material is discharged through the lateral ports 4, which open at right angles through the sides of the body and which communicate with the passage therein.

The described construction of the auger or drill makes it very advantageous for working hard substances, such as stone, because the cutters are arranged to provide for the free discharge of the material cut and loosened by the auger or drill, thus reducing to a minimum any tendency of the instrument to become "choked" in the hole or cavity by accumulation of the loosened material therein.

It is thought that the operation and the advantages of my improved auger or drill will be readily understood from the foregoing description, taken in connection with the drawings.

I am aware that changes in the form and proportion of parts may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of the invention, and I therefore reserve the right to make such alterations as fairly fall within the scope thereof.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A drill or auger comprising a tubular body, open from end to end to form an interior longitudinal discharge-passage, and provided with an exteriorly-tapered surface at its active end to produce at such end a sharp circular edge, said body also having a pair of integral exterior ribs arranged spirally and extended beyond the sharp circular edge of the body to form advance cutters having their

extremities pointed and disposed in the plane of rotation of the tool, said advance cutters also having their back faces beveled on a curved line intersecting the adjacent sharp edge of the body and merging into the exterior tapered surface of the latter, substantially as set forth.

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

WILLARD D. BAKER.

Witnesses:
J. L. COTRILL,
T. W. SWANAGIN.