(No Model.)

H. G. FOWLER & W. H. HILL.

BORING TOOL.

No. 547,880. Patented Oct. 15, 1895.

FIG. 1.

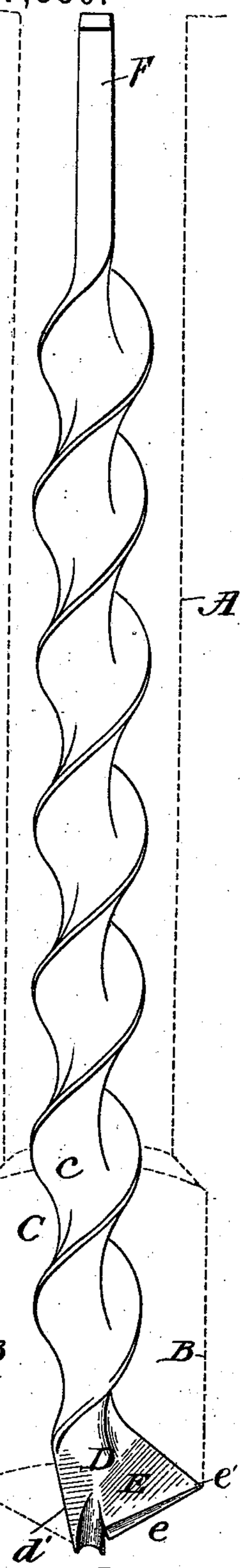


FIG. 2.

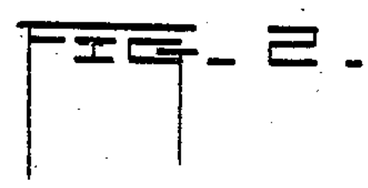
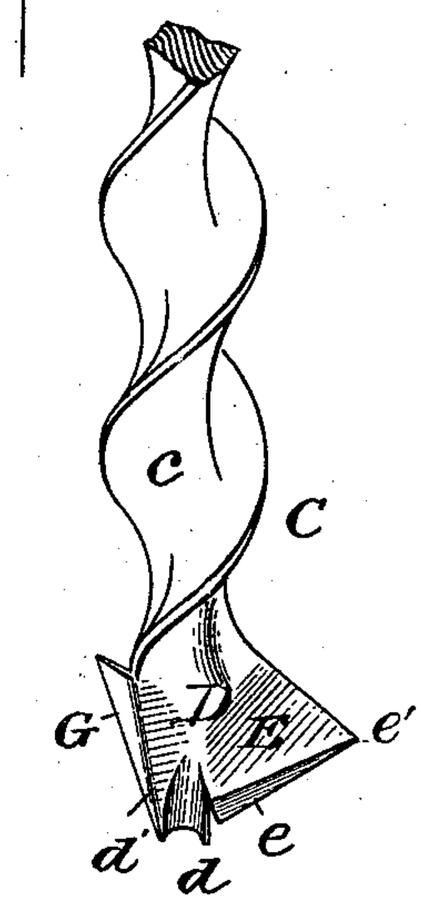


FIG. 3.



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UNITED STATES PATENT OFFICE.

HIRAM G. FOWLER AND WILLIAM H. HILL, OF BLUE RAPIDS, KANSAS.

BORING-TOOL.

SPECIFICATION forming part of Letters Patent No. 547,880, dated October 15, 1895.

Application filed February 16, 1895. Serial No. 538,712. (No model.)

To all whom it may concern:

Be it known that we, HIRAM G. FOWLER and WILLIAM H. HILL, citizens of the United States, residing at Blue Rapids, in the county of Marshall, State of Kansas, have invented certain new and useful Improvements in Boring-Tools, of which the following is a description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

Our invention relates to boring-tools, and more particularly to augers for use in boring-pockets for blasting, our object being to provide an instrument by which a pocket can be formed in rock or other material—that is, by which a larger hole can be made below a smaller one, so that the charge of powder or other substance for blasting can be more efficiently packed.

To this end the invention consists in the various matters hereinafter described, and referred to in the appended claims.

In the accompanying drawings, which illustrate our invention, Figure 1 is a perspective of our auger while boring the pocket. Fig. 2 is a bottom view of the cutting-point, and Fig. 3 is a perspective of a slightly-modified form of auger.

In blasting rock or other substance much better results can be obtained if a comparatively small bore is made with an enlargement or pocket at its inner end, so that the blasting material can be securely packed and thus more effectually break the rock. Many means have been devised for enlarging borings, but all of these are more or less defective for use in rock or like hard substances because of their complicated structure. We have produced an auger which is effective in operation and at the same time is made in a strong and simple manner, there being employed no springs, levers, or similar parts, which are always liable to get out of order and more particularly so when boring in rock.

Referring now to the drawings, A represents a boring in the rock desired to be blasted, and B represents the pocket at the inner end of this boring. The tool for producing this pocket forms the subject-matter of the present invention. The shank of this tool C is preferably twisted, as shown, to produce the worm *c* and is provided with the peculiarly-formed cutter D. The point *d* of the cutter is placed to one side of the center and is usually grooved, as shown. The side of the tool at *d'* tapers toward the point. An upwardly-inclined pointed lip E extends from the auger-point, said lip projecting beyond the side of the worm *c* and being sharpened at *e* to present a cutting-edge, which edge projects beyond the side of the worm *c*. This lip E does not lie in the vertical plane of the auger, but projects forwardly, as shown, at an angle thereto, whereby the tendency for the point *e'* to take into the rock is greatly increased. Any suitable means, as the angular end F, may be provided for holding the auger in its handle.

In Fig. 3 we have shown a slightly-modified form of auger, in which a second edge G extends along the inclined portion *d'* to aid in the cutting, as will be hereinafter described.

In practice the smaller boring A is made with a suitable tool, and when this has gone to the required depth the tool is withdrawn and the auger forming the subject-matter of the present invention is inserted. The smaller boring is made of a diameter about equal to the greatest diameter of our auger, so that when our auger is inserted it fits the hole rather snugly. The point *d* being off center, it will not when the auger is first inserted enter the center formed by the first boring-tool, but will rest at one side of this center. When, however, the auger is turned, the point *d* is at first carried in a circle, but this point constantly seeks to find the old center. This forces the pointed cutting-edge *e* into the rock, and when the auger-point reaches the old center the point *e'* of the cutting-edge will be describing a circle of greater diameter than the old boring, the difference in diameters of the pocket and first boring being determined by the location of the point *d* and the size of the lip E. In some cases it will be found convenient to make the first boring with a pointed tool, so that an inclined bottom is presented, in which case the point of our auger when inserted will rest upon the incline, and the auger will be aided in finding the old center by the inclined portion *d'* sliding down the slanting wall left by the first tool. The character of the tool used for the first boring is not, however, essential to the successful operation of

our auger, it being possible to employ our auger in conjunction with a boring having any character of bottom. The grooved point *d* forms a channel for the borings, and these are conveyed along the worm *c* away from the cutting-head. In the form of auger shown in Fig. 3 the edge G aids in the cutting. It will thus be seen that by reason of making the cutter D in the peculiar manner shown an auger is produced which effectively cuts the desired pocket, and yet which is simple and durable. The entire tool is preferably made of a single piece of metal, and no springs, levers, or similar parts are presented for breaking or becoming clogged with borings. In addition to this all borings are immediately removed from the point, thus leaving its cutting properties unimpeded.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. An auger comprising a shank provided with a cutter, a point eccentrically placed upon said cutter, and a lip upon said cutter, said lip being provided with a cutting edge and extending at an angle to the vertical plane of the cutter, which plane includes the cutting edge; substantially as described.

2. An auger comprising a shank provided with a cutter, a point eccentrically placed upon said cutter, and a lip upon said cutter, said lip being provided with a cutting edge and extending at an angle to the vertical plane of the cutter, which plane includes the cutting edge, said cutting edge also projecting beyond the side of the shank; substantially as described.

3. An auger comprising a shank having a cutter tapering in an oblique straight line at one side to a point eccentrically placed upon said cutter, a cutting edge along said tapering portion, and a cutting edge E also upon said cutter; substantially as described.

4. An auger made of a single piece of material comprising a twisted shank having a cutter tapering at one side to a grooved point eccentrically placed upon said cutter, and a pointed cutting edge projecting beyond the side of the cutter and extending at an angle to the vertical plane of the cutter; substantially as described.

5. An auger comprising a worm-shank having a cutter, a grooved point eccentrically placed upon said cutter, and a lip upon said cutter, said lip being provided with a cutting edge and extending at an angle to the vertical plane of the cutter, which plane includes the cutting edge, said cutting edge also projecting beyond the side of the shank; substantially as described.

6. An auger made of a single piece of material comprising a twisted shank having a cutter tapering at one side to a grooved point eccentrically placed upon said cutter, a lip upon said cutter, said lip being provided with a cutting edge and extending at an angle to the vertical plane of the cutter, which plane includes the cutting edge, said cutting edge also projecting beyond the side of the shank; substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

HIRAM G. FOWLER.
WILLIAM H. HILL.

Witnesses:
C. O. TEAGUE,
GEORGE ROACH.

Corrections in Letters Patent No. 547,880.

It is hereby certified that in Letters Patent No. 547,880, granted October 15, 1895, upon the application of Hiram G. Fowler and William H. Hill, of Blue Rapids, Kansas, for an improvement in "Boring-Tools," errors appear in the printed specification requiring correction, as follows: In lines 58–59, page 1, the words "projecting beyond the side of the worm *c* and" should be stricken out; on page 2, in line 49, the word "cutter" should read *shank;* and line 61, same page, the syllable *ma* should be inserted; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 22d day of October, A. D., 1895.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

S. T. FISHER,
Acting Commissioner of Patents.