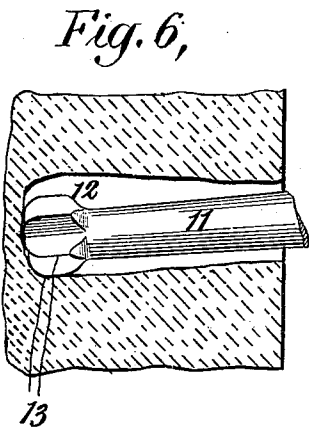
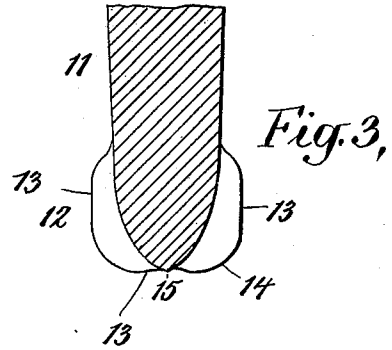
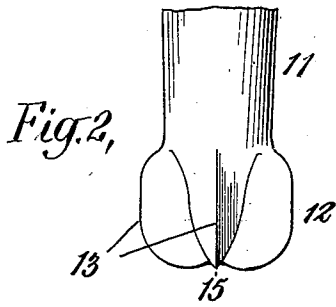


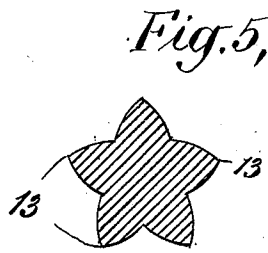
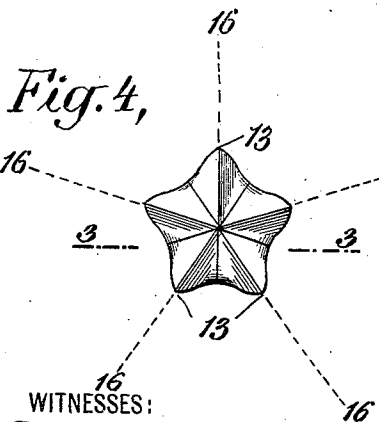
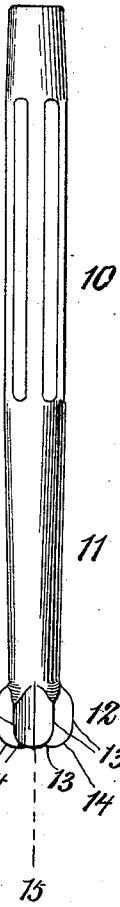
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 DRILL.  
 APPLICATION FILED MAR. 7, 1910.

991,830.

Patented May 9, 1911.



*Fig. 1,*



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

CHARLES J. CLEMENTS, OF BROOKLYN, NEW YORK.

## DRILL.

991,830.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed March 7, 1910. Serial No. 547,682.

*To all whom it may concern:*

Be it known that I, CHARLES J. CLEMENTS, a citizen of the United States of America, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Drills, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to drills and particularly to percussive drills employed for boring holes in stone, bricks or the like, the drill being operated by a succession of blows imparted thereto from a hammer in the hand of an operator, the drill being constantly given a partial movement of rotation intermediate the blows; and the main object of my invention is to provide a drill of this character with suitable cutting edges whereby it will be adapted to undercut, that is to say, it will be adapted to cut a hole of increasing diameter as the depth of the hole increases. Such holes are largely required for the reception of anchor bolts employing expansible shields, and great difficulty has been experienced in the past in forming them.

To this end my invention consists in a percussive drill provided with a plurality of radial cutting edges having projections which extend both laterally and longitudinally thereof. Preferably, these edges are formed in a plurality of planes which radiate from the axis of the drill as a common center, the lateral portions of the cutting edges being parallel and rounded therefrom to the axial center of the drill.

In order that my invention may be thoroughly understood, I will now proceed to describe an embodiment thereof having reference to the accompanying drawings illustrating the same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in side elevation of a percussive drill constructed in accordance with my invention. Fig. 2 is an enlarged view in side elevation of the end thereof having the cutting edges, the point of view being taken at an angle with respect to the point of view of Fig. 1. Fig. 3 is a view in longitudinal section through the end of the drill, the plane of section being indicated by the line 3—3 of Fig. 4. Fig. 4 is an end view of the drill. Fig. 5 is a transverse sectional view through the end of the drill. Fig. 6 is a sectional

view through a portion of a stone wall with a part of the drill shown as being employed for producing a hole therein.

The drill comprises a body portion 10, a tapered neck 11, and a head 12. The head is provided with a plurality of chisel shaped cutting edges comprising laterally disposed portions 13 extending longitudinally of the drill and parallel with each other and with the axis thereof, and rounded portions 14 which extend around the end of the head of the drill to the axial center 15 thereof. These cutting edges are arranged in a plurality of planes 16 which radiate from the axial center of the drill as will be well understood by reference to the drawings, and particularly to Fig. 3 thereof. The desired number of these cutting edges may be employed, but I find it advantageous to use an odd number such as three, five or seven, five being shown in the drawings.

In Fig. 6, I have shown the drill in use, it being understood that the drill is operated in the ordinary manner by a succession of blows delivered from the hammer. The drill is rotated by the operator as is common, during use, but in addition it is inclined in the different directions, the peculiar formation of the cutting edges causing the drill to undercut and produce a hole of progressively increasing diameter.

What I claim is:

1. A hand drill of the percussive type comprising a shank provided at the extremity thereof with a plurality of radial cutting edges having portions which extend from a point at the end of the drill, coincident with the axis thereof, laterally, and thence around to the side of the drill, and along the side thereof for a distance parallel with the axis thereof, the side portions of the cutting edges extending beyond the shank, substantially as set forth.

2. A hand drill of the percussive type comprising a shank provided at the extremity thereof with a plurality of radially disposed cutting edges provided with lateral parallel sided portions which extend beyond the shank and portions rounded therefrom to the axial extremity of the drill.

3. A hand drill of the percussive type having at its extremity a plurality of similarly disposed radial cutting edges provided with lateral parallel sided portions extending parallel with the axis of the drill, and beyond the lateral surface of the said shank,

portions rounded therefrom to the extremity of the drill, and portions rounded from the said rounded portions, back to the axial center of the drill, at which point all of the  
5 said edges meet, the latter said point being slightly to the rear of the plane at right angles to the axis of the drill which inter-

sects the extremities of the said rounded portions, substantially as set forth.

CHARLES J. CLEMENTS.

Witnesses:

I. B. MOORE,

CHAS. A. STUTZ.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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