N. J. McKENZIE.

DRILLING BIT.

APPLICATION FILED OCT. 15, 1917.

1,277,970.

Patented Sept. 3, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

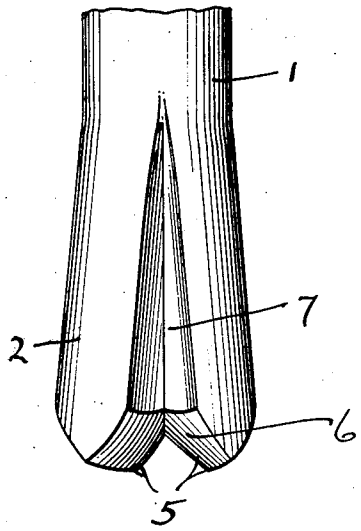


Fig. 2.

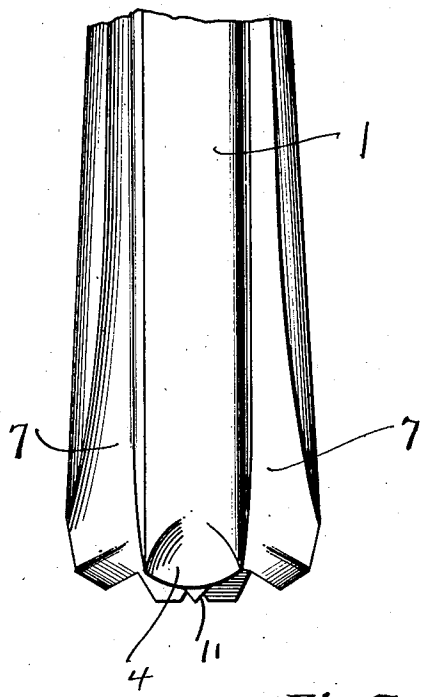
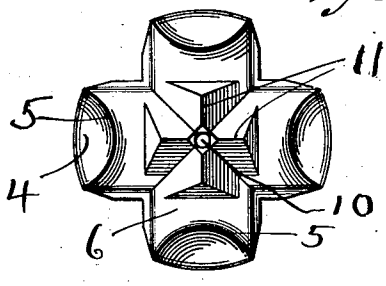


Fig. 3.



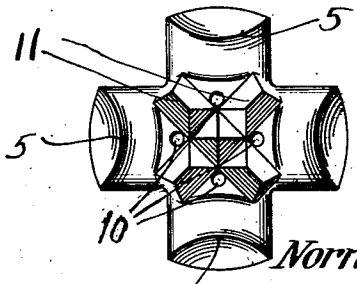


Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 5.

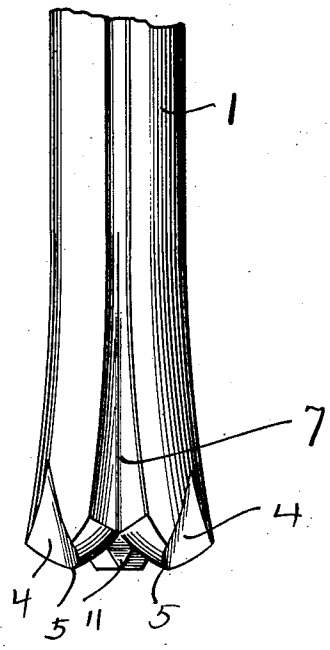


Fig. 6.

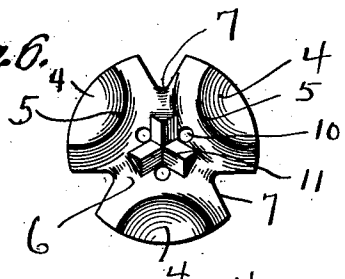


Fig. 7.

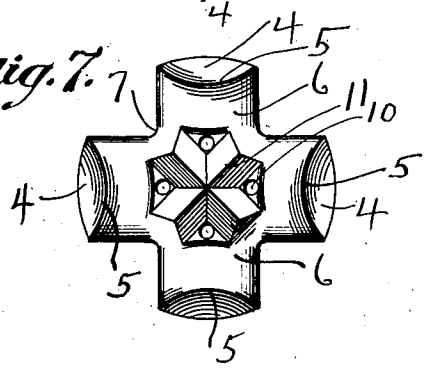


Fig. 8.

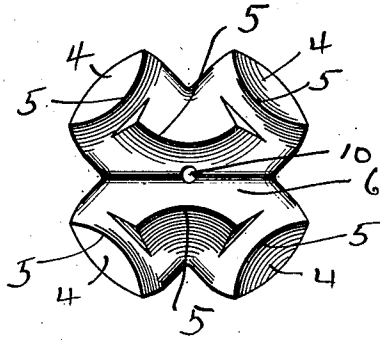


Fig. 9.

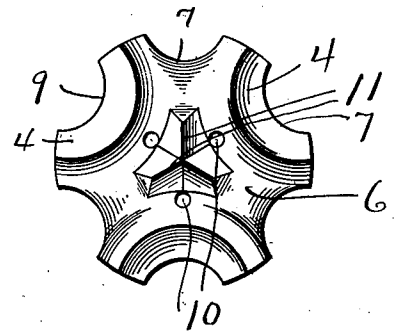
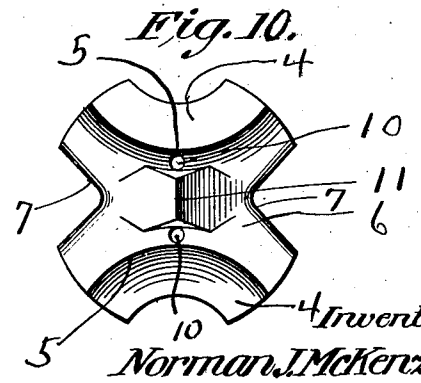


Fig. 10.



Inventor
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UNITED STATES PATENT OFFICE.

NORMAN J. McKENZIE, OF BISBEE, ARIZONA.

DRILLING-BIT.

1,277,970. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed October 15, 1917. Serial No. 196,668.

To all whom it may concern:

Be it known that I, NORMAN J. McKENZIE, a citizen of the United States, residing at Bisbee, in the county of Cochise and State of Arizona, have invented new and useful Drilling-Bits, of which the following is a specification.

The object of my invention is to provide certain improvements in bits which will enable them to perform the required work with a minimum expenditure of power and a minimum degree of resistance to the cutting teeth.

In the accompanying drawings, Figure 1 is a side elevation of one form of bit; Fig. 2 is a side elevation of a further modified form; Fig. 3 is an end view of same; Fig. 4 is an end view of a modified form; Fig. 5 is a side elevation of a further modification; Fig. 6 is an end view of same; and Figs. 7, 8, 9 and 10 are end views of other modified patterns of my invention involving like particulars of construction and operation.

Like characters of reference designate corresponding parts throughout the several views.

Referring to the accompanying drawings, 1 indicates the shank of the drill, which may be of any suitable shape or size; suitable ribs 2 are provided at the working end or face of the drill, preferably diverging outwardly as illustrated in Figs. 1, 2, 5.

The face of the drill is provided with a plurality of novel inversely curved cutting teeth 5, which are separated by grooves 6. These grooves provide a channel opening into the flutings 7 which extend upwardly and longitudinally from the face of the drill and provide a passage for chips and dust produced by the drilling. Each rib is provided with a clearance groove or cavity 4 opening into the longitudinal flutings 9 which are similar in shape and function to flutings 6 and 7. I may provide one or more center teeth 11 in the face of the drill. These center teeth are relatively small and may be of any suitable form, such as illustrated in the drawings. Their usefulness consists in their coöperation with the inversely curved teeth in fracturing rock that is especially hard. I preferably provide the drills with one or more suitable channels 10, so that water may be supplied through the drill to lessen the danger of the bore becoming choked.

While several patterns of my invention are illustrated, yet it will be observed that in each instance I require inversely curved teeth for cutting; grooves and cavities opening out of the face of the drill, and longitudinal flutings into which these grooves open to allow for the escape of chips and dust; while I may provide center teeth, the principal work of fracturing the rock is performed by the inversely curved outer teeth, which perform a more effective cutting operation than is accomplished with the ordinary drill bit.

It is by this novel positioning and shape of teeth that I am enabled to relieve the resistance in the center of the drill bit, and to increase the drill efficiency toward the outer edge of the bore, which relieves the corners of the bit while in operation. The outer portions of the inversely curved teeth strike approximately at right angles to their center portions, in the instance of the forms having relatively large inversely curved teeth; and, similarly the outer portions of these inversely curved teeth operate at approximately right angles to the relatively small center teeth, shown in the modified forms.

My drill bits are intended for general use in mining drilling and boring, and it is my object to uniformly increase the fracturing efficiency from the center to the periphery of the face of the drill. This peculiar form of cutting teeth has proven more efficient than any radially arranged cutting teeth, and overcomes the defect which many drills have of providing a disproportionate amount of cutting surface at the center, as compared with the outer portions of the face of the drill.

This is particularly important in view of the necessity for effectually ejecting cuttings from under the central portion of the drill,

and the grooves and flutings intervening between the inversely curved cutting teeth provide an efficient passage for chips.

What I claim is:

In drill bits, the combination of teeth positioned near the center of the drill, a plurality of inversely curved outer teeth spaced from the first mentioned teeth and having clearance grooves therebetween, longitudinal flutings extending up the sides of the drill and communicating with the clearance grooves in the face of the drill, the inversely curved teeth having concave outer faces for the ejection of chips and dust, substantially as and for the purposes described.

NORMAN J. McKENZIE.