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DIAMOND BIT

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Fig. 1.

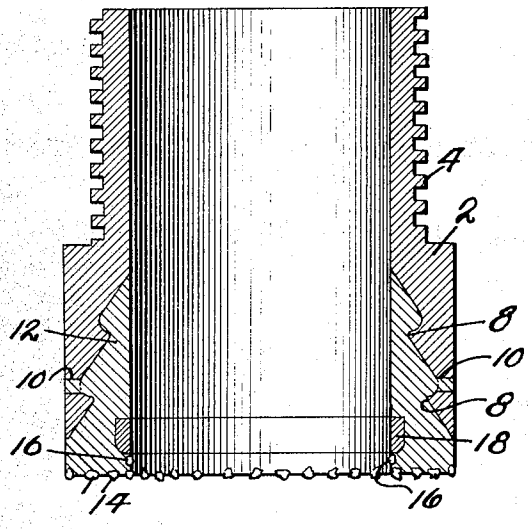
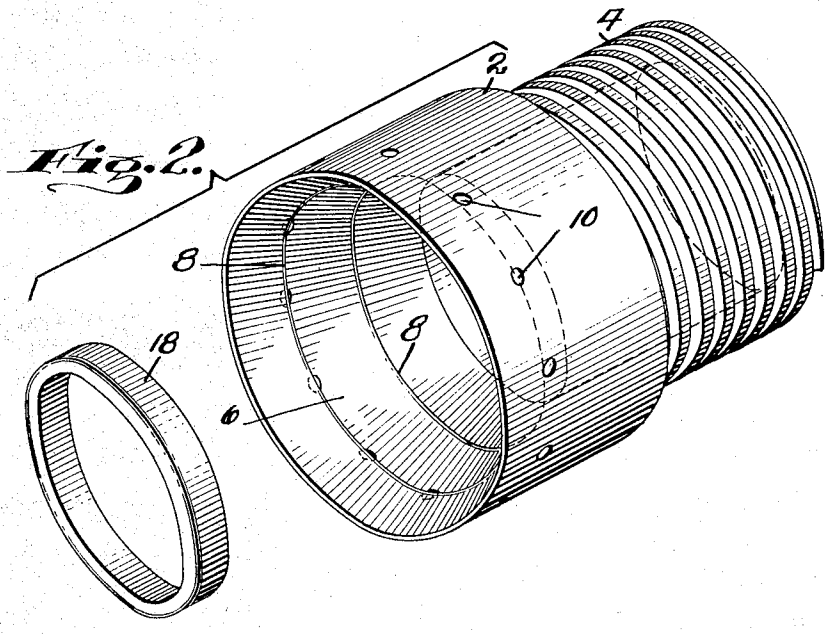


Fig. 2.



INVENTORS.
Clarence L. Heath.
BY Ellsworth B. Sherwood
Kiddle, Bechtel and Montgomery
ATTORNEYS.

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DIAMOND BIT

Clarence L. Heath and Ellsworth B. Sherwood, Kirkland Lake, Ontario, Canada, assignors to J. K. Smit & Sons, Inc., New York, N. Y., a corporation of New York

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9 Claims. (Cl. 255—72)

Our invention is directed to improvements in diamond bits and has for one of its objects the provision of a diamond bit of improved construction.

Diamond core bits as heretofore constructed have consisted of a bit blank with an alloy cast on the exterior of the end of the same, the face of this casting or matrix being studded with cutting stones, such as commercial diamonds, which are embedded in the alloy in the casting operation, and provide the cutting face or surface of the bit. The bit is hollow and the inner wall of the annular member or matrix, adjacent the outer end thereof, is lined with cutting stones also. In the manufacture of such bits the diamonds and the bit blank are set up in a suitable mold and molten metal flowed into the mold. In order that the diamonds may not be injured in the casting operation it is necessary to employ a metal or alloy for the matrix which has a relatively low melting point, that is, a melting point below that of steel, for example. While this protects the diamonds from being injured in the casting operation, it necessitates the use of a relatively soft metal for the matrix, so that when the bit is in use the core of the ore being drilled, as it passes through the bit, wears away the matrix and undercuts the diamonds, so that they become dislodged. This defect is well recognized by those familiar with this art and is overcome by our invention.

Broadly speaking, our invention provides a core bit wherein that part of the bit which previously is readily undercut is of a hard metal, thereby providing a bit which has a much longer life than prior bits and in which the diamonds are not readily dislodged.

We have shown an embodiment of our invention in the accompanying drawing, in which:

Fig. 1 is a sectional elevational view of the bit; and

Fig. 2 is an exploded view of the bit blank and hard metal ring entering into our construction.

Referring to the drawing in detail: 2 designates the bit blank. This bit blank may be of steel or other metal desired. The shank of the bit blank is threaded, as shown at 4, as is usual.

The head of this bit blank is flared internally, as seen at 6, and this flared interior is provided with locking shoulders 8. The wall of the head of the bit blank is provided with apertures 10 which also function as locks, as will be brought out hereinafter.

Within the flared portion of the head of the bit blank is the matrix 12 for the diamonds 14 or other cutting elements. The matrix, as will be understood, is an annulus, and the cutting elements 14 are not only disposed in the face of this annulus but about the inner wall of the annulus adjacent the working face or forward end of the bit, as shown at 16. The matrix 12, which is a casting, is composed of any of the metals or alloys commonly employed in the diamond bit industry.

Adjacent the mouth or forward end of the bit, we provide a preformed hard metal ring 18, for example, a steel ring. This ring is embedded in the matrix 12 and lies just within the end of the matrix just above the cutting stones 16 with which the mouth of the bit is provided, as above explained.

In manufacturing our bit, the bit blank 2, the ring 18 and the stones 14 are assembled in a suitable mold, and the metal of the matrix 12 poured thereinto, the metal flowing about the cutting stones and about the hard metal ring 18 to embed the same. It will be appreciated, also, that the metal flows into the locking apertures 10 and that these together with the locking shoulders 8 securely lock the matrix to the bit blank.

It will be appreciated from all of the foregoing that the preformed hard metal ring 18 will reinforce the matrix and prevent undercutting and dislodgment of the diamonds or other cutting elements, when the bit is being used, the core of the ore being drilled, as the same passes through the hollow matrix, being kept out of contact with the matrix adjacent the nose of the bit by the ring.

It is to be understood that changes may be made in the details of construction and arrangement of parts above described without departing from the spirit and scope of our invention.

What we claim is:

1. A core bit comprising in combination a bit blank, a matrix in the form of an annulus carried by the bit blank, cutting stones in the face of the matrix, and a preformed hard metal ring embedded in the inner wall of the matrix adjacent the working face of the bit.

2. A core bit comprising in combination a bit blank, a matrix in the form of an annulus carried within the blank, cutting stones in the inner wall of the matrix, and a preformed hard metal ring embedded in the inner wall of the matrix adjacent said stones.

3. A core bit comprising in combination a bit blank, an annular matrix cast within the blank, cutting stones embedded in the inner wall of the matrix, and a preformed hard metal ring em-

bedded in the inner wall of the matrix adjacent said stones.

4. A core bit comprising in combination a hollow bit blank, locking shoulders formed on the interior of the head of the bit blank, the wall of the bit blank being provided with locking apertures, a cast matrix within the bit blank and held against dislodgment by said shoulders and apertures and cutting stones embedded in the face of said matrix.

5. A core bit comprising in combination a hollow bit blank, the head of which is outwardly flared internally, and a diamond-carrying annular matrix cast within the flared portion of the bit blank.

6. A core bit comprising in combination a hollow bit blank, the head of which is outwardly flared internally, said flared portion of the blank being provided with locking shoulders, a matrix cast within the outwardly flared head of the blank, and held therein by said locking shoulders, and cutting stones embedded in the outer end of the matrix.

7. A core bit comprising in combination a hollow bit blank, the head of which is outwardly flared internally, said flared portion of the blank being provided with locking shoulders, a matrix cast within the outwardly flared head of the blank and held therein by the said locking shoulders, cutting stones embedded in the outer end of the matrix, and a metal ring of a metal harder than the matrix embedded in the matrix interiorly thereof.

8. A core bit comprising in combination a bit blank, a cast matrix with cutting stones embedded therein carried by the bit blank, and a preformed ring of a material harder than the material of the matrix embedded in the matrix interiorly thereof.

9. A core bit comprising in combination a bit blank, a matrix, provided by a cast metal annulus and having cutting stones embedded in its outer face and in its inner wall, secured to said bit blank, and a preformed ring of a metal harder than that of the matrix embedded in the inner wall of the matrix adjacent the outer end of the matrix and constituting a lining ring for the matrix.

CLARENCE L. HEATH.
ELLSWORTH B. SHERWOOD.