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R. E. COATES

2,750,156

ROCK DRILLING TOOL

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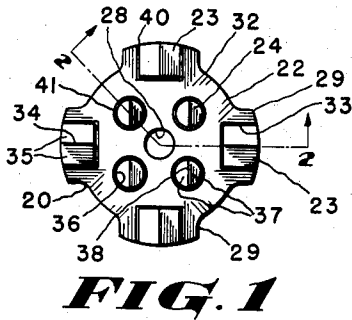


FIG. 1

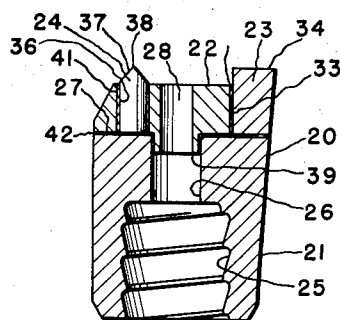


FIG. 2

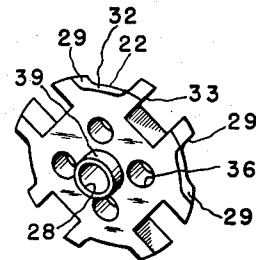


FIG. 3

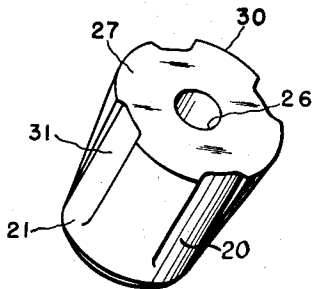


FIG. 4

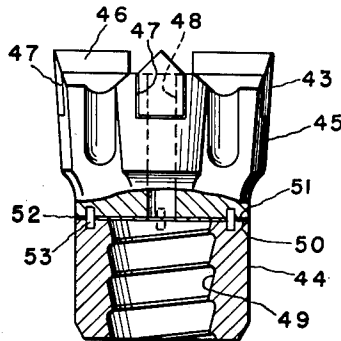


FIG. 5

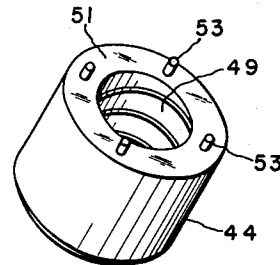


FIG. 6

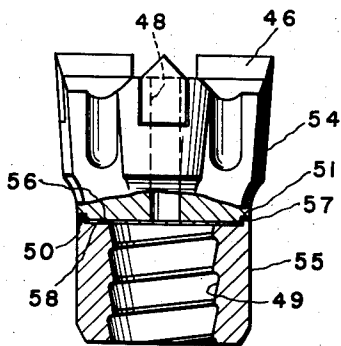


FIG. 7

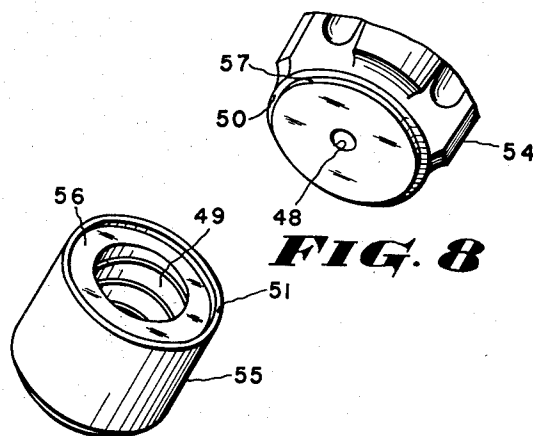


FIG. 8

FIG. 9

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2,750,156

ROCK-DRILLING TOOL

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2 Claims. (Cl. 255-64)

This invention relates to drilling tools, and more particularly to a rock drilling tool of the impact type, the body and cutting elements of which are formed of different grades of metal.

It is an object of the invention to increase the rate and minimize the cost of manufacture of tools of this type.

Another object is to render the various portions of the tool requiring accurate machining readily accessible for that purpose.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawings accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is an end view of a rock drilling tool constructed in accordance with the practice of the invention,

Figure 2 is an elevation, in section, taken through Figure 1 on the line 2-2 looking in the direction indicated by the arrows,

Figures 3 and 4 are perspective views of certain of the parts of the drilling tool shown in Figures 1 and 2,

Figure 5 is an elevation, partly broken away, of a modified form of the invention,

Figure 6 is a perspective view of the skirt portion of the drilling tool shown in Figure 5,

Figure 7 is a view similar to Figure 5 showing still another form of the invention,

Figure 8 is a perspective view of a fragmentary portion of one of the parts of the tool shown in Figure 7, and

Figure 9 is a perspective view of another part of the drilling tool shown in Figure 7.

Referring more particularly to the drawings and first to the form of the invention shown in Figures 1 to 3 inclusive, 20 designates a drilling tool comprising a member 21, a body 22 disposed at one end of the member and groups of cutting inserts 23 and 24 arranged in the body 22. The member 21 has a threaded socket 25 for connection to a drill rod (not shown), and a bore 26 extends from the bottom of the socket to the adjacent end of the member 21 for the passage of cleansing fluid to the working surface.

The body 22 is seated upon a plane surface 27 at the end of the member into which the bore 26 opens and has an axial passage 28 to register with and form an outlet for said bore. On the periphery of the body 22 are a plurality, four in the example shown, of radial extensions 29 that overlie and are buttressed by ribs 30 extending along the periphery of the member 21, and the spaces between the ribs 30 and the extensions 29 constitute outlets 31 and 32, respectively, for the passage of cuttings from the working surface.

The radial extensions 29 have slots 33 of rectangular shape which open from the peripheral surfaces of the extensions and extend part way into the body 22 for the accommodation of the inserts 23. The inserts are preferably constructed of tungsten carbide and their cutting edges 34 are, as is customary, defined by the line of convergence of a pair of inclined surfaces 35.

The inserts 24 are disposed in and conform with circu-

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lar recesses 36 located on a circle lying between the axis of the body and the recesses 33. They have end portions projecting from the body and inclined surfaces 37 thereon to define cutting edges 38.

5 The recesses 36 and the slots 33 extend from end to end of the body 22 and, therefore, admit of free access to all portions of their surfaces for machining them to a desired degree of accuracy, and the inserts 23 and 24 extend entirely through the slots and the recesses with their inner ends flush with the corresponding end of the body. The body 22 is preferably interlocked with the member 21 and, to this end, is provided with a projection 39 on its innermost end to extend into the bore 26.

10 The inserts 23 and 24 are secured to the body 22 by brazed connections 40 and 41, respectively, and the body 22 is bonded to the member 21 by a brazed connection 42 which preferably also extends into such clearance as may exist between the projection 39 and the surface of the bore 26.

15 In constructing the drilling tool, the parts constituting it, together with brazing alloy, are placed in the correct assembled relationship with each other and the assembly is next subjected to a suitable degree of heat for fusing the brazing alloy to form the bonding connections.

20 In the form of the invention shown in Figures 5 and 6 the drilling tool, designated in its entirety by 43, comprises a member 44 which is hollow throughout its length and a body 45 having cutting inserts 46 arranged therein and suitably bonded to the body. The body 45 is accordingly provided with a plurality of slots 47, four for example, that are arranged at right angles to each other in an end of the body and terminate at their inner ends adjacent a passage 48 which extends axially through the body for conveying cleansing fluid to the working surface.

25 The member 44 has internal threads 49 for engagement with the threaded end of a drill rod (not shown) and the threads extend from one end to the other of the member so that all portions thereof may be formed accurately and finished for full contact throughout the length of the member 44 with the mating portion of a drill rod. On the opposed portions of the body and the member are plane surfaces 50 and 51, respectively, which are bonded together by a brazed joint 52.

30 Means are provided to reinforce the brazed joint 52 for protecting it against failure incident to the severe shocks and strains of drilling. To this end a series of pins 53 are embedded in the opposed ends of the body 45 and the member 44 and said pins serve the additional function of maintaining the parts in the correct relationship with each other during the assembling and brazing operations.

35 The form of drilling tool shown in Figures 7 to 9 inclusive comprises a body 54 and an internally threaded member 55 and differs from that shown in Figure 5 only in that the body and the member are in telescopic engagement with each other, the member 55 having a shallow recess 56 in its inner end surface and the body 54 carrying an annular extension 57 to conform with and extend into said recess. The cooperating surfaces of the recess and the extension, as well as the encircling portions of the surfaces 51 and 50, are bonded together by a brazed joint 58.

40 As will be readily appreciated by those skilled in the art, by forming the threads of the drilling tool within a separate part, the threading tools may be run entirely through the member, thereby obviating the pressure of a blank, unthreaded portion at the bottom of the threaded cavity and, making possible a reduction in the length and the weight of the unit below that of tools of this type wherein the threads are formed in blind sockets, as heretofore.

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I claim:

1. A rock drilling tool of the impact type, comprising a member having threads for threaded connection to a drill rod, a body to seat upon an end of the member having a plurality of recesses therethrough at its peripheral portion and having a group of recesses therethrough arranged on a circle located between the axis of said body and the first mentioned recesses, cutting elements in the recesses and seated on said end of the member, and brazed connections for securing the cutting elements to the body and for securing the body to the member.

2. A rock drilling tool of the impact type, comprising a member having threads for threaded connection to a drill rod, a body to seat upon an end of the member having a plurality of rectangularly shaped recesses therethrough at its peripheral portion and having a plurality of circular recesses therethrough arranged on a circle located between the axis of the body and the rectangularly shaped

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recesses, cutting elements in the recesses and seated on said end of the member, and brazed connections for securing the cutting elements to the body and for securing the body to the member.

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