Sept. 4, 1928.

1,683,502

H. R. TUNNELL

ROTARY DRILL BIT

Filed July 22, 1927

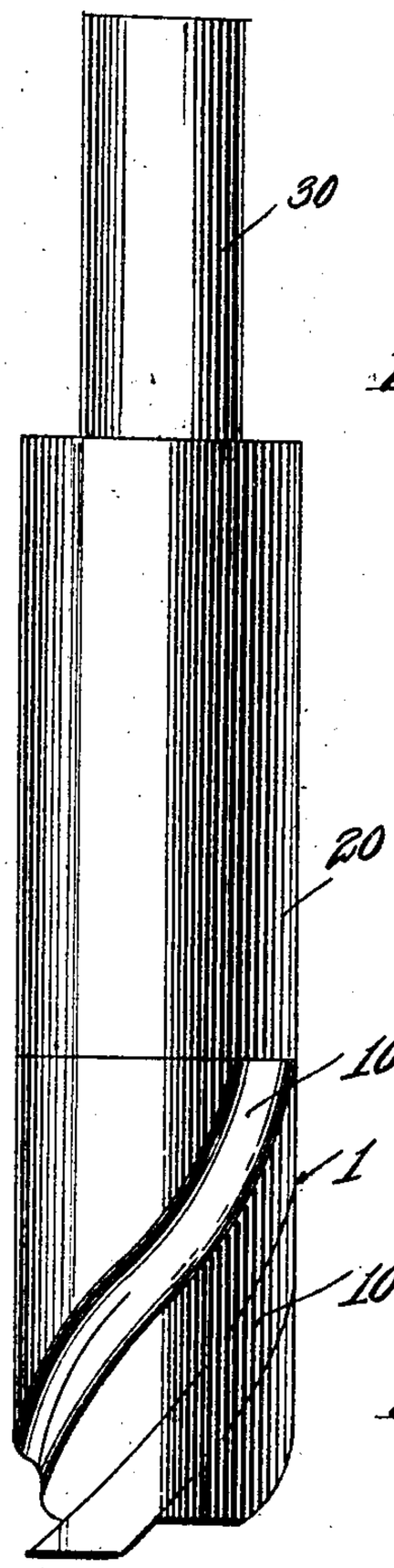

Fig. 1

Fig. 4.

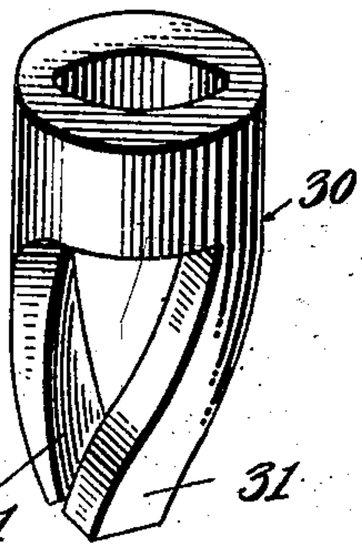

Fig. 5.

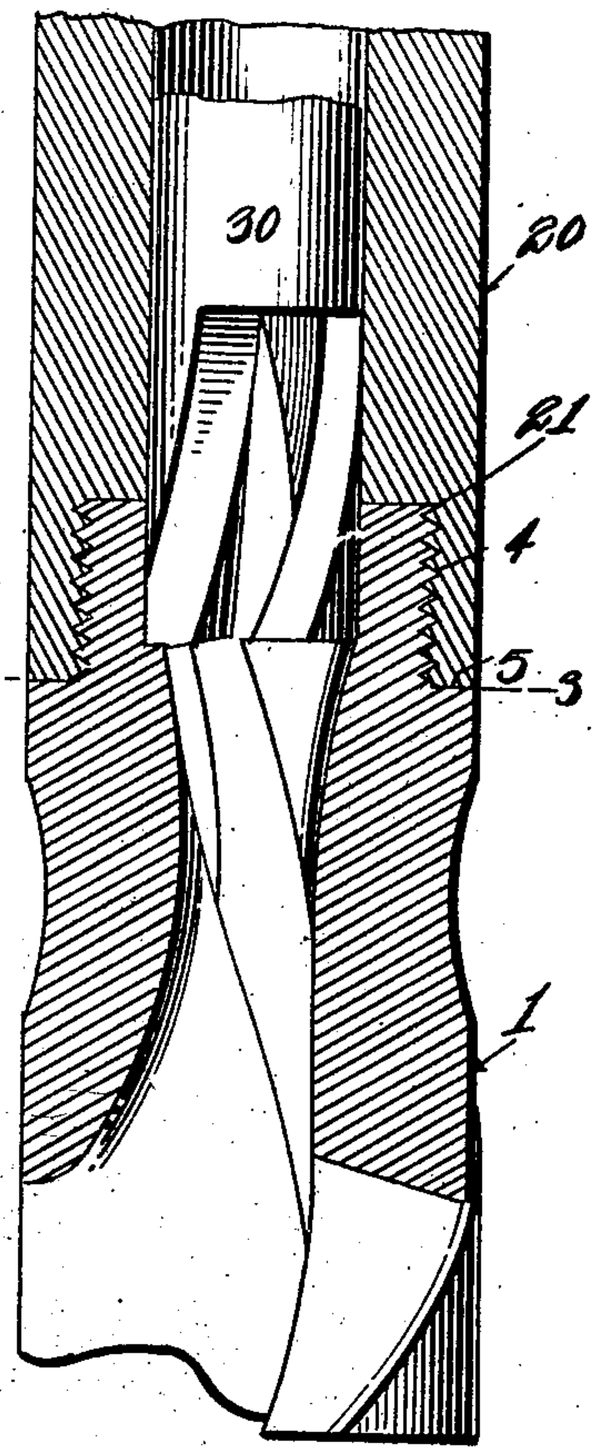

Fig. 2.

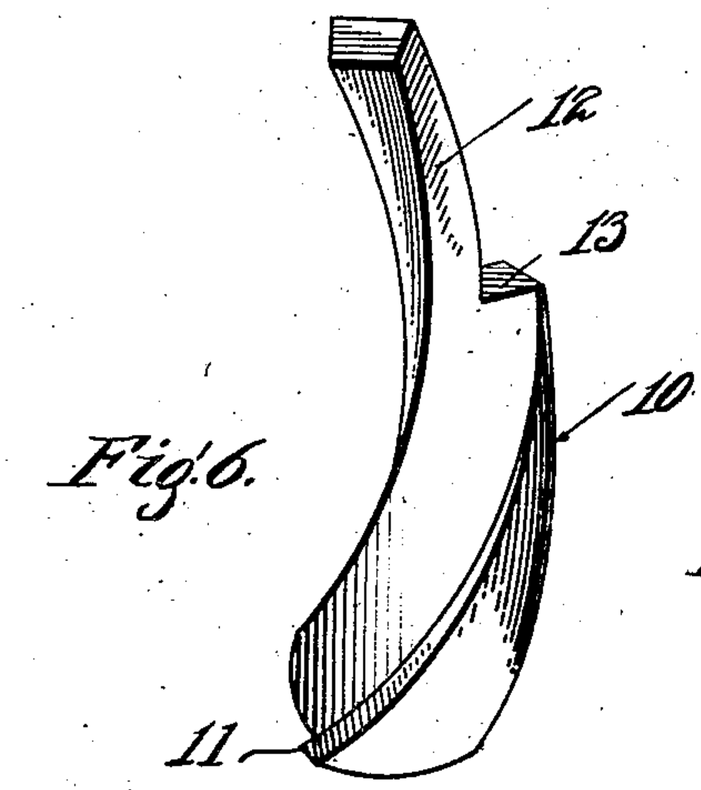

Fig. 6.

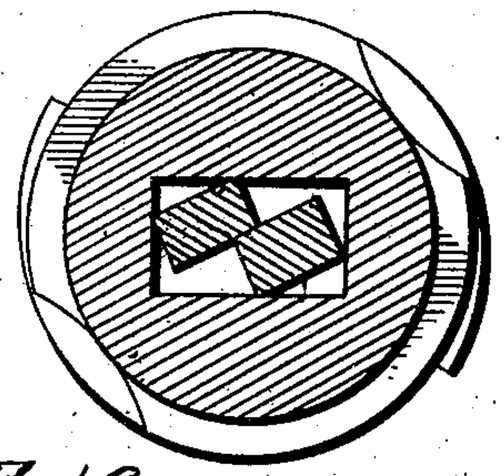

Fig. 3.

INVENTOR
H. R. Tunnell
BY
Munn & Co.
ATTORNEY

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HERBERT R. TUNNELL, OF BUTTE, MONTANA.

ROTARY DRILL BIT.

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This invention relates to drill bits and more particularly to rotary bits of this character.

A primary object of the invention is to provide a rotary drill bit so constructed that it will cut hard ores and abrasive material, as well as coal and soft rock.

Another object of the invention is to provide a bit of this character with replaceable cutters which are self-sharpening, the cutters being tempered or otherwise hardened on the face which contacts with the ground, and as the softer material wears away, leaves a cutting edge which is constantly sharp in spite of the wearing away of the cutter itself.

In carrying out these objects, the invention is susceptible of a wide range of modification without departing from the spirit or sacrificing any of the advantages of the claimed invention; there being shown in the drawings for illustrative purposes a preferred and practical form, in which;

Figure 1 represents a side elevation of a drill bit constructed in accordance with this invention with the parts shown assembled ready for use,

Fig. 2 is a longitudinal section thereof,

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2,

Fig. 4 is a side elevation of the bit holder,

Fig. 5 is a similar view slightly in perspective of the feed rod, and

Fig. 6 is a similar view of one of the cutting blades shown detached.

In the embodiment illustrated a bit holder 1 is shown provided with a longitudinal bore 2 and having spiral slots 3 for the reception of the bits or cutters 10 two of which are used and which are spiraled to conform to the shape of the slots 3.

The holder 1 has a threaded reduced extension 4 at its upper end for connection with a section 20 of the drill rod. This extension 4 has a shoulder 5 formed at its inner end which is designed to abut the adjacent end of the drill rod 20 which is recessed on its inner face at its meeting end and threaded as shown at 21 to receive the threaded extension 4 of the cutter holder.

Each of the blades 10 is constructed as shown in detail in Fig. 6 and has cutting edges 11 tempered for making them hard to adapt them for self-sharpening. These cutters 10 are provided at their upper ends with a reduced extension 12, it being understood, of course, that there is one extension to each cutter, and this is provided at its inner end with a shoulder 13 adapted to abut the inner end of the slots 3 when assembled, the extension 12 being mounted within the holder 1 and adapted to be engaged by the fingers 31 of the feed rod 30, which latter is hollow throughout its length and has spiraled fingers, as shown in Fig. 5, which are designed to engage the ends of the extension 12 of the cutter blades and move them forwardly during the drilling operation.

The hollow feed rod 30 is designed to be mounted in the rod 20 such as is ordinarily used in standard diamond drill practice, and this rod 30 by being fed into the end of the bit holder 1 will advance the cutters 10. The feed rod 30 is not continuous as more revolutions are made for the two screw ends than by the end which enters the bit holder. It is of course understood that the outside rod 20 drives the bit, while the inside rod 30 advances the cutters in said holder. This bit may be driven by any suitable means and rapid advances may be made thereof either by a single machine or by a number of machines with a gang setting and in charge of a single operator.

The cutters 10 being replaceable obviously may be removed and others substituted when they become broken or worn, and the tempered cutter edges thereof adapted to cut hard ores and abrasive materials, as well as coal and soft rock.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention or its scope as claimed.

I claim:—

The combination with a bit holder provided with a longitudinal bore and having spiral slots for the reception of the cutters, cutters removably mounted in said slots and spiraled to conform to the shape of the slots, each cutter having tempered cutting edges and provided at its upper end with a reduced extension with a shoulder at its inner end to abut the inner end of the slot in which it is mounted to limit its insertion in the holder and a feed rod operable in said holder and having fingers to engage the ends of said extension and move the cutters forwardly during the drilling operation.

HERBERT R. TUNNELL.