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R. H. KERGAN

REAMER DRILL

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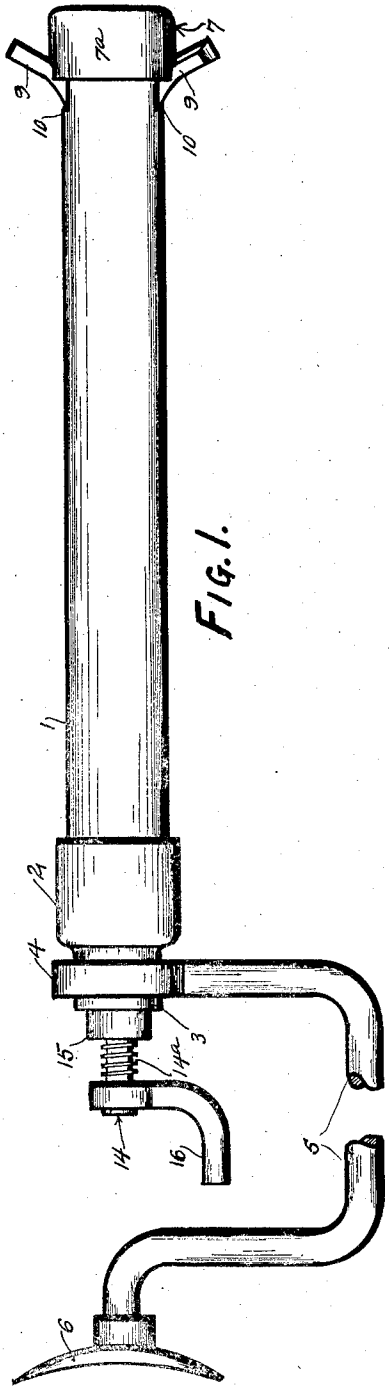


FIG. 1.

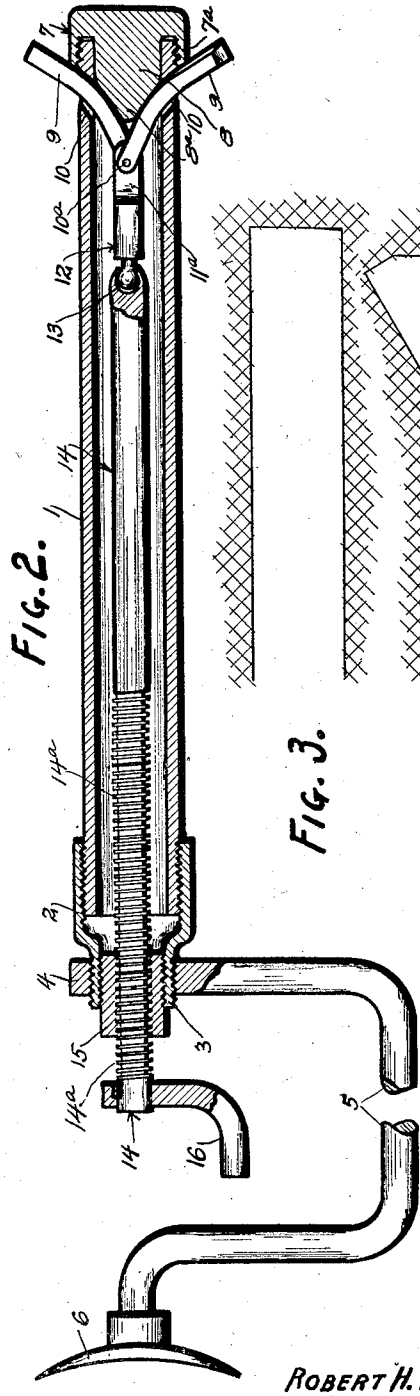


FIG. 2.

FIG. 3.

FIG. 4.

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REAMER DRILL.

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This invention relates to drills, and more particularly to what I term a reamer drill.

One of the main objects of the invention is to provide a tool of the character stated which can be readily inserted into a hole to be reamed out. Another object is to provide a tool of simple but strong construction in which the working parts are protected by an enclosing casing, this casing also providing means for rotating the cutting members. Further objects will appear from the detail description.

In the drawings:—

Fig. 1 is a side view of the tool;

Fig. 2 is a central longitudinal section through the tool, parts being shown in elevation;

Fig. 3 is a view illustrating the approximate shape of a hole drilled in the usual manner;

Fig. 4 is a view showing the approximate shape of a hole after being reamed out with my tool.

The tool includes a cylindrical barrel or casing 1 on one end of which is threaded a cap 2 provided with a reduced exteriorly threaded neck 3 onto which is threaded an eye 4 at one end of a brace 5 of a known type which is provided at its other end with a plate 6 to which pressure is applied, in a known manner, during manual turning or rotation of the brace. This provides simple and efficient means for rotating barrel 1 while simultaneously applying pressure to it.

A head 7 is threaded onto the other end of barrel 1 and is provided with a plug 8 which fits snugly into the barrel and has its inner portion tapered to form a spreader 8^a. This spreader fits between two bits or cutting members 9 which are curved longitudinally and operate through slots 10 provided through barrel 1 for this purpose. the walls of these slots adjacent to the heads being inclined similarly to and forming continuations of the inclined surfaces of spreader 8^a. The flange 7^a of head 7 is provided with recesses forming continuations of slots 10. As the cutting members 9 are normally projected beyond barrel 1, this provides simple and efficient means for normally locking the head against turning on the barrel, and the flange 7^a also acts to brace the cutting members beyond the body against transverse strains.

The cutting members or cutters 10 are pivoted at their inner ends, at 10^a to the flattened portion 11^a of a link 12 which is connected at its inner end, by ball and socket connections 13, to a feed rod or shaft 14. The outer portion 14^a of this shaft is threaded and operates through a bushing 15 threaded into neck 3 of cap 2. The shaft 14 is rotated, by means of a crank 16 secured on the outer end of the shaft, for projecting or retracting the cutters as desired. As will be understood, the cutters are oppositely related and are suitably shaped to cut or ream out the material into contact with which these cutters are forced during rotation of the tool. The brace 5 is of sufficient length to afford clearance of the crank 16 during rotation of the tool so as to facilitate use thereof. If desired suitable set screws or locking devices may be employed to hold the barrel 1 and cap 2, and associated parts against reverse rotation, though this is not ordinarily necessary when working in relatively soft material, such as soft coal.

The tool illustrated and described, is intended more particularly for use in mining soft coal. After a hole such as that illustrated in Fig. 3 has been drilled in a known manner, barrel 1 of the tool is inserted into the hole, the cutters 9 being in retracted position until head 7 contacts with the inner end of the hole, and is then withdrawn from the hole a distance corresponding to the desired depth of the pocket to be formed. The cutters are then forced into cutting engagement with the surrounding wall of the hole by means of shaft 14 and associated parts and the tool is rotated, the cutters being projected or fed out of barrel 1 as the cutting or reaming progresses. By this means the inner portion of the hole can be quickly and easily cut or reamed out to provide a pocket p, as shown in Fig. 4. This pocket is adapted for reception of a charge of dynamite or other suitable explosive which is tightly packed into the pocket. When the explosive charge is discharged the breaking effect is much greater than if it were placed in a cylindrical hole of substantially uniform cross-area, such as commonly drilled for this purpose. Also, by packing the explosive charge in a pocket at the inner end of the hole, all danger of a blow out shot is eliminated thus avoiding the danger of igniting gases which are at times present in considerable quantities in some mines. This avoids, to a great extent,

danger of mine explosions such as are frequently accompanied by loss of life and material damage to the mines in which such explosions occur.

While I have described my invention as used for mining soft coal, it can also be used in mining or quarrying many other materials of different degrees of hardness, and for many other purposes, and I do not, therefore, intend to in any way limit myself to this one use. Changes in construction and arrangement of parts of my invention may be resorted to without departing from the field and scope of the same, and I intend to include all such variations as fall within the scope of the appended claim, in this application in which a preferred form only of my invention is disclosed.

What I claim is:—

A tool of the class described including a barrel defining at one end portion opposite diametrical openings, a cap threaded upon the other end portion of the barrel, a brace threaded upon the cap, a bushing threaded into the cap, a shaft threaded through the bushing and projecting into the barrel coaxially therewith, a spreader at the said one end portion of the barrel, a link member, an operative connection between the inner end of the link member and the inner end of the shaft permitting rotation of the shaft independently of the link member, and oppositely directed cutting members pivotally carried by the link member at its outer end portion and disposed to be forced outwardly by the spreader through said openings when the shaft is adjusted inwardly of the barrel.

In testimony whereof I affix my signature.

ROBERT H. KERGAN.