June 25, 1929. M. HARDSOCG 1,718,463

ROCK DRILL

Original Filed July 2, 1923

Fig-1

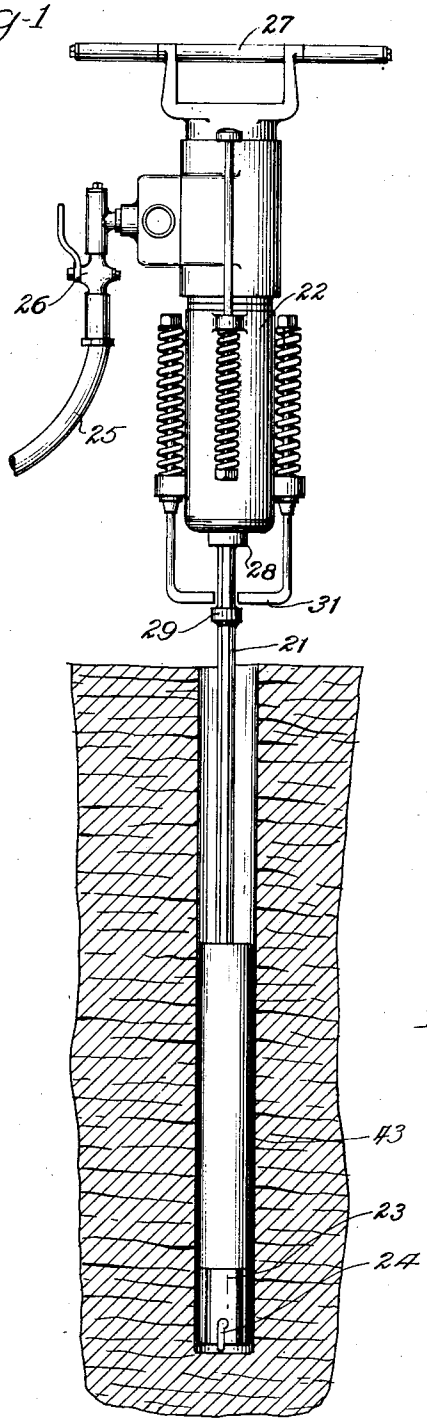


Fig-2

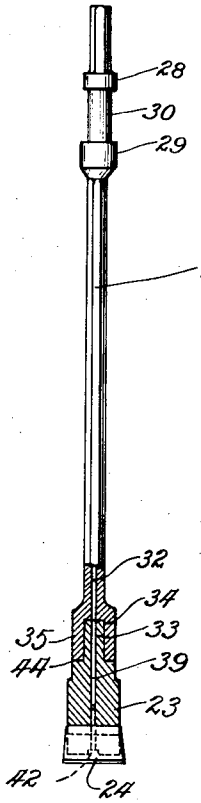


Fig-3

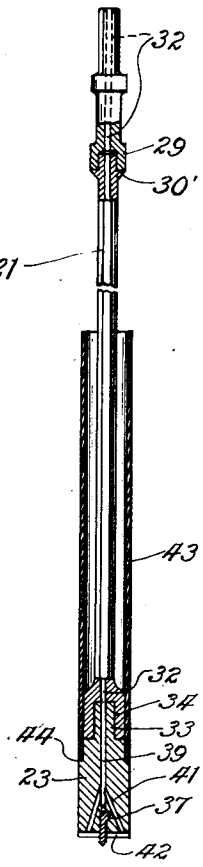
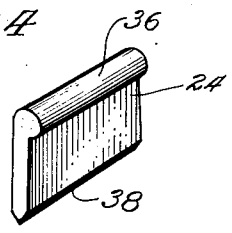


Fig-4



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UNITED STATES PATENT OFFICE.

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ROCK DRILL.

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The present invention relates to portable rock drills and more particularly to an improved bit construction and arrangement adapted to increase the usefulness and efficiency of the drill and to reduce the expense involved in its operation.

Drills of the general type to which my invention relates ordinarily are constructed with a bit formed in the drill bar, either by hand forging or by special machine and, in order to sharpen the bit, it is necessary to take the entire bar to a shop, which, of course, involves considerable loss of time, as well as the necessity for keeping quite a large number of drill bars on hand. Furthermore, it is obvious that every time a new bit is formed on the bar, it shortens the latter and consumes more or less of the material according to the extent of wear or breakage in drilling. Another disadvantage of such a construction is the requirement for employing a grade of material for the entire bar which is capable of functioning for cutting purposes and considerable difficulty has been experienced, due to the material either being too hard so that the bit would break, or being too soft, so that it would not serve to cut hard rock. A principal object of this invention is the provision of a bit for drills of this character which is separate from the body of the bar and may be positioned or removed readily, as occasion may require.

Rock drills have, for some time past, been formed with a hole in the center of the drill bar through which compressed air is directed to blow the cuttings out of the hole, and it has been found that the formation of a bit upon the drill bar has tended to obstruct or plug this air hole with resultant interference with the intended operation. It is an important object of this invention to provide a bit socket adapted to be suitably connected to the lower end of a drill bar and provided with apertures extending off center, or otherwise disposed in such manner that the bit, or the parts of the socket member formed to receive the same do not interfere with the passage of air through the drill.

Other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings,

Figure 1 is a side elevation of a rock drill embodying my invention, the same being shown in operative position in the ground;

Fig. 2 is a side elevation, partially in section, of a drill bar adapted for use in the early stages of drilling;

Fig. 3 is a similar view of a drill bar adapted to operate at greater depth and provided with a bucket forming part adapted to receive cuttings which are not completely blown out of the hole; and

Fig. 4 is a perspective view of a bit or cutter blade formed in accordance with my invention.

As thus illustrated, the drill comprises an elongated bar 21 adapted to be acted upon by pneumatic hammers operating within a casing 22, said bar being provided at its lower end with a socket member 23 in which is carried a bit or blade 24.

The pneumatic hammer construction may be of any suitable portable form and is not illustrated in detail, since the details thereof are largely immaterial, from the standpoint of this invention. It need merely be noted that compressed air is supplied through a feed tube 25 and is controlled by a suitable valve 26 to operate the hammer at a rapid rate of speed. A handle 27 is provided for lifting the drill and holding it in operative position.

The drill bar, at its upper end, is secured in a holding member 30, which is provided with collar projections 28 and 29, guards 31 being provided on said casing 22 to prevent said holding member from falling out when the drill is removed from the hole. A shoulder 30′ is formed in the upper part of the bar and the upper extremity of said bar is welded, or otherwise secured in a socket formed in the enlarged portion 29 of said holding member.

The drill bar is centrally apertured, as indicated at 32 and provision is made for directing compressed air from the hammer through this aperture for the purpose of blowing out the cuttings from the drill hole. The socket member 23 is provided with a shank 33, which extends into a recess 34 in

an enlarged portion 35 of the drill bar and this may be welded, or otherwise secured in place.

The bit 24 is enlarged at its upper edge, as indicated at 36, and a recess 37 is provided at the lower end of the socket member 23 of such form that said bit may be inserted from the side and will be held in place by the enlarged portion 36, it being obvious that said bit may be readily withdrawn or knocked out when the drill is out of the hole. The lower edge of the bit is sharpened, as shown at 38 and, inasmuch as this member is separate from the drill bar, or socket, it may be, of course, easily replaced when it becomes broken or worn. By reason of the separate bit construction, it is, of course, possible to employ the best of material, since the amount required is relatively small. In this manner, a great saving is effected, since the drill bar need not be of tool steel of the expensive type which is necessary for the bit.

The socket member 23 is centrally apertured at 39 to form a continuation of the aperture 32 and diagonal apertures 41 are provided at the lower end of said member leading from the aperture 39 to the bottom of the socket member, preferably opening into a transverse slot 42. With this construction, it is clear that the apertures will not be readily clogged by cuttings and will not be restricted or obstructed due to the location of the bit at or near the outlet portions thereof.

When it is desired to drill at a considerable depth, a long bar, such as is illustrated in Fig. 3, is preferably employed and a bucket forming member 43 is positioned upon the lower part thereof, being formed to engage the enlarged part 35 of the bar and to rest upon shoulders 44 provided on the socket member 23. This bucket forming member is adapted to receive cuttings which are not completely blown out of the hole and which fall back after having been forced up above said member by the compressed air.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A portable rock drill, comprising a drill bar, a socket member at the bottom end thereof, said socket member having a transverse slot at its bottom end and a recess through the bottom end of said socket member disposed at right angles to said transverse slot, said recess being of greater width at its upper portion and a bit of hardened metal insertable in said recess, said bit having a cross-section substantially corresponding to the cross-section of the recess, so as to prevent said bit from dropping out and permitting the bit to be assembled and disassembled by sidewise movement, said drill bar and socket member having a continuous longitudinally extending air duct, said air duct terminating in branch ducts disposed in said socket member, said branch ducts extending on each side of said recess and discharging into the transverse slot on the bottom face of said socket member.

2. A rock drill, comprising a drill bar having a longitudinal air duct, said drill bar having a central recess at its bottom, a socket member having shoulders and a central shank adapted to be mounted in the recess at the bottom of said drill bar, said socket member having an air duct registering with air duct in said drill bar, said air duct terminating in branch extensions at the bottom face of said socket member, said socket member having a transversely extending recess disposed intermediate said branch ducts, a hard metal bit mounted in said recess and a sleeve enveloping the lower portion of said drill bar and upper portion of said socket and lying against the shoulders of said socket and flush with the outer face of said socket, said sleeve being spaced away from the drill bar for a considerable portion of its length and open at its upper end, whereby to form a pocket to receive cuttings.

MARTIN HARDSOCG.