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GUIDE FOR WORKING IMPLEMENTS

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2 Sheets-Sheet 2
GUIDE FOR WORKING IMPLEMENTS.


This invention relates to rock drills, but more particularly to a guide for working implements adapted to be actuated by fluid actuated rock drills of the hammer type.

One object of the invention is to maintain the working implement in axial alignment with the rock drill whereby it is actuated and thus prevent the deflection of the working implement from a desired course.

Another object is to facilitate the starting of the drill hole. This may be accomplished by guiding the working implement near its cutting bit and thus prevent a gyratory movement of the cutting bit at the time the drill hole is being started.

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

The invention consists of the combination of elements and arrangement of parts having the general mode of operation substantially as hereinbefore described and claimed and illustrated in the accompanying drawings, in which:

Figure 1 is a longitudinal side elevation of the guide illustrating the manner in which it may be applied to a rock drill shell,

Figure 2 is a plan view of the guide,

Figure 3 is an end elevation of the guide,

Figure 4 is a plan view of a modification of the invention, and

Figure 5 is an end elevation of the modified form of guide.

Referring more particularly to the drawings, A and B generally designate two rock drills, only the front heads C and a portion of the cylinders D of which are shown. The rock drills A and B may be held in operative relationship with respect to each other by means of a mounting E of the type illustrated and described in the pending application of Charles C. Hansen Serial No. 215,366 entitled, Mounting for rock drills, and filed August 23, 1927.

As described in the aforesaid application, the mounting E may be slidably disposed in a rock drill shell F only the front end of which is shown in the present instance for illustrative purposes. The shell F may be secured to a column or other support in a well known manner and is provided with a feed screw G which engages a threaded feed nut H carried by the mounting E for effecting relative longitudinal movement between the rock drills A and B and the supporting shell F.

Extending into the front heads C are drill steels J against which the blows of the hammer piston (not shown) may be delivered. Near the rearward end of the drill steels are formed collars K which cooperate with the front ends of bushings L in the front heads for limiting the distance which the drill steels may extend into the path of the hammer pistons (not shown) of the rock drills. Any suitable means, such as spring pressed pawl retainers L', may be disposed in the front heads C to cooperate with the collars K for preventing ejection of the drill steels J from the front heads.

In accordance with the present invention, means are provided for maintaining the drill steels J in axial alignment with the rock drills A and B, particularly when drilling horizontal holes, in which case the free ends of the drill steels J tend to decline from the desired course of cut. This is due largely to the loose fit of the shank portions of the drill steels in the bushings L or such other equivalent means which may serve as chucks for the drill steels.

The means provided for the purpose described comprise in this instance a support O which may abut at its rearward end the front end of the shell F to which it is secured in this instance by means of bolts P. The support O is preferably of a length somewhat in excess of the maximum length of travel of the rock drills A and B in the shell F, so that the front end of the support O occupies a position somewhat in advance of the front ends of the front heads C when the rock drills A and B occupy their extreme forwardmost positions which the shell F will permit.

The forwardmost end of the support O may be bifurcated to form a pair of lugs Q in which are formed bores R for the reception of a pivot pin S.

On the projecting ends of the pivot pins S is mounted a guide T which, in its operative position, extends laterally of the support O.
The guide T may be held in this position in any suitable manner. The means employed for this purpose in the present instance comprise an eye-bolt U pivoted in a lateral projection V located near the front end of the support O. The eye-bolt U is adapted to lie in a slot W in the guide T, and a nut X threaded on the eye-bolt serves to clump the guide T firmly against the projection V.

On opposite sides of the slot W and integrally with the guide T are forks Y which are in coaxial alignment with the drills A and B and act as bearings for the drill steels J. The space between the branches Z and b of the forks Y preferably only slightly exceeds the diameter of the drill steels J.

In order to form additional bearing surfaces for the drill steels J on the side towards the open ends of the forks Y, pins c are disposed in the free ends of the branches Z and b. The pins c are inserted from the outer side of the forks Y and in this instance are held against accidental removal by a coil spring d which may exert a constant pressure on the outer ends of the pins c tending to move them in an inwardly direction. If desired, links e may be interposed between the ends of the spring d and the pins c. Grooves f are preferably formed in the ends of the branches b of the forks Y to engage the spring d.

In the operation of the device, when desired to change the drill steels J for steels of greater length, the pins c may be removed from the forks Y and the eye-bolt U may be rocked out of the slot W to enable the guide T to be rocked out of the operative position. If then the paws L are rocked out of the path of the collars K of the drill steels J, the drill steels J may be freely removed and others inserted in the front heads C.

After such insertion of the drill steels in the front heads, the guide T may be restored to its operative position and locked in that position by means of the eye-bolt U and the nut X. Thereafter the pins c may be inserted in the forks Y wherein they will be held securely by the spring d. The drilling apparatus will then be in readiness to advance the drill holes to a greater depth and the drill steels J will at all times be held co-axial with the rock drills A and B. This is an advantageous feature in devices of this character since it is essential that the adjacent drill holes are drilled substantially parallel with respect to each other and perpendicular to the mounting, such as a column or quarry bar on which the apparatus may be mounted, so that the working implements used during a succeeding broaching operation may retrace substantially the path traveled by the drill steels.

Another distinct advantage of the present invention is the manner in which the free ends of the drill steels are held against gyralatory movement at the time the drill hole is being started, particularly when the entrance to the drill hole is being formed on a slanting rock surface. Ordinarily, in the absence of suitable guide means, the bit end will creep to the lowermost point of a concentric circle which the bit end tends to describe about its longitudinal axis.

In the modification illustrated in Figures 4 and 5, broaching tools g of the flat rectangular type are substituted for the drill steels to remove walls h of rock between adjacent drill holes j. These broaching tools g may be of considerable length, depending upon the depth of cut and, consequently, of such weight that their free or cutting ends tend strongly to decline from the axis of the rock drills A and B.

In shallow cuts, such declination of the cutting ends of the broaching tools g may not be objectionable although, obviously, a greater length of time is required and a greater expense involved in removing the comparatively large mass of material than would be necessary if the cutting bits followed the narrower portion of the walls h. When making cuts of great depth, however, such declination of the broaching tools g is not only serious both in the matter of time and expense but, if not checked, the broaching tools may depart entirely from the drill holes and form a deflected cut in the solid rock. In order to avoid an occurrence of this kind, a guide k is pivoted on the pin S and carries at its free end a pair of off-set wings o. On the uppermost sides of the wings o are bearing surfaces p over which the broaching tools g may be slidably moved in the direction of the work.

At each side of the bearing surfaces p are formed upwardly extending prongs q to prevent sidewise movement of the broaching tools g. The prongs q may be of any suitable length and are preferably spaced with respect to each other only a slightly greater distance than the width of the broaching tools g.

From the foregoing it will be readily seen that after the operation of drilling the holes j has been completed, and the broaching tools g have been substituted for the steels J, an adequate guide may be provided for the broaching tools by simply substituting the guide k for the guide T used in connection with the drill steels J.

I claim:

In combination with a plurality of rock drills and a supporting shell therefor, working implements in the rock drills, a support secured to the front end of the shell and extending in advance of the rock drills, a lateral projection on the support, a guide pivot ed to the support, a plurality of forks on the guide to slideably receive the free ends of the
working implements, pins through the ends of the forks cooperating with the forks to form bearings for the working implements and thus hold the said working implements in axial alignment with the rock drills, a spring acting on corresponding ends of the pins for maintaining said pins in operative position, and means including an eye-bolt and a nut attached to the lateral projection for holding the guide in operative position. In testimony whereof I have signed this specification.

CHARLES C. HANSEN.