Aug. 7, 1934. J. H. JOWETT ET AL 1,968,892

MOUNTING FOR ROCK DRILLS

Filed Jan. 27, 1932

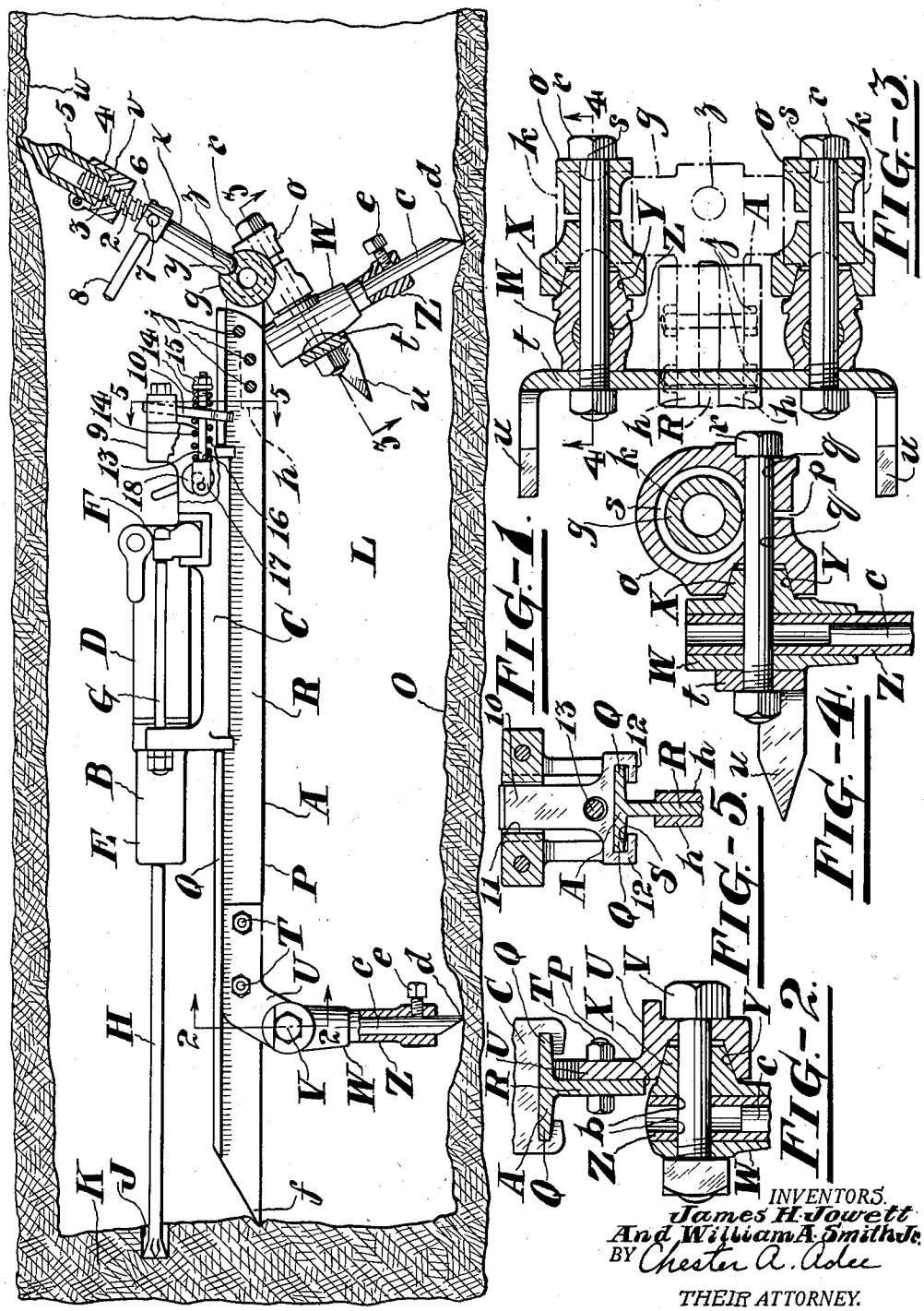


FIG.-1.

FIG.-2.

FIG.-3.

FIG.-4.

FIG.-5.

INVENTORS.
James H. Jowett
And William A. Smith Jr.
BY Chester A. Adee
THEIR ATTORNEY.

Patented Aug. 7, 1934 1,968,892

UNITED STATES PATENT OFFICE

1,968,892

MOUNTING FOR ROCK DRILLS

James H. Jowett, New York, N. Y., and William A. Smith, Jr., Phillipsburg, N. J., assignors to Ingersoll-Rand Company, Jersey City, N. J., a corporation of New Jersey

Application January 27, 1932, Serial No. 589,174

3 Claims. (Cl. 255—45)

This invention relates to drilling mechanism, and more particularly to a mounting for rock drills of the percussive type.

One object of the invention is to stabilize the support and to maintain it in the correct operative position unaffected by the vibration incident to the operation of the rock drill.

Another object is to enable the mounting to be placed and retained in a variety of positions.

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

In the accompanying drawing illustrating the invention and in which similar reference characters refer to similar parts,

Figure 1 is a side elevation, partly broken away, of a mounting constructed in accordance with the practice of the invention and showing a rock drill supported thereby.

Figures 2 and 3 are transverse views taken through Figure 1 on the lines 2—2 and 3—3 looking in the direction indicated by the arrows.

Figure 4 is a longitudinal sectional view taken through Figure 3 on the line 4—4 looking in the direction indicated by the arrows and illustrating the manner in which the supporting devices of the mounting are secured to the mounting, and

Figure 5 is a transverse view taken through Figure 1 on the line 5—5 looking in the direction indicated by the arrows.

Referring more particularly to the drawing, A designates, in general, the mounting, B a rock drill, and C a carriage for the rock drill and which is slidably disposed on the mounting A.

The rock drill B may comprise the usual cylinder D and front and back heads E and F which may be secured to the cylinder D by side rods G arranged on opposite sides of the rock drill. Disposed in the front head E is a drill steel H against which the hammer piston (not shown) of the rock drill strikes for drilling a hole J in the rock K at the end of a drift L wherein the drilling mechanism is arranged and, as shown in Figure 1, supported in part by the floor O of the drift.

The mounting A constructed in accordance with the practice of the invention, comprises a guide member P of structural shape such as a T-bar having the usual smooth unbroken lateral flanges Q and a depending flange R arranged perpendicularly thereto. The flanges Q serve as the guiding portion of the guide member P and extend into slots or guideways S of the carriage C which is adapted to slide on the guide member P.

Secured to the guide member P or, more particularly, to the flange R by bolts T is a bracket U to which is pivotally connected, as by means of a bolt or rod V, a bearing member W having an integral truncated cone X which seats into a correspondingly shaped socket Y in the bracket U. Seated with one end in the bearing member W is a sleeve or bushing Z having transverse apertures *b* to accommodate the bolt V for holding the sleeve Z fixedly in the bearing member W.

Disposed slidably within the sleeve Z is a rod *c* having a sharp or pointed end *d* to engage the surface of the rock. Any suitable means may be provided for maintaining the rod *c* in adjusted position with respect to the sleeve Z. The means illustrated consists of a set screw *e* threaded into the sleeve Z to seat against the rod.

The arrangement of the bearing member W and the associated elements which serve as a supporting device for the front end of the mounting is such that the mounting may be conveniently elevated or lowered by changing the relative positions of the sleeve Z and the rod *c* and also by adjusting the bearing angularly with respect to the guide member P. This latter mode of adjustment may be brought about by loosening the bolt V to permit of oscillatory movement of the bearing with respect to the bracket U and the bearing may be securely clamped to the bracket by again tightening the bolt.

The bracket U is preferably arranged closely adjacent the front end of the guide member P which is in the form of a pointer *f* adapted to engage the surface of the rock K in order to assist in maintaining that end of the mounting in substantially fixed position.

For convenience of illustration, the pointer *f* is shown as being an integral part of the guide member. It will be readily understood, however, that said pointer may consist of a separate piece and be affixed to the guide member in such wise that it may be conveniently removed for replacement or repairs when necessary.

Suitable means are provided for supporting the rear end of the guide member P. The means illustrated comprises a trunnion *g* having a pair of integral laterally extending wings *h* which are suitably spaced to receive therebetween the rear end of the flange R. The wings *h* may be clamped to the flange R by means of bolts *j*, or otherwise.

The opposite ends *k* of the trunnion *g* are of

cylindrical shape and serve as bearings for sleeves or bushings *o*. Each bushing has a coniform socket Y in the side thereof to accomodate the cone X of a bearing member W which may be similar in all essential respects to the equivalent means described in connection with the supporting device at the front end of the guide member P. Each bushing *o* has a slot *p* which extends entirely through the wall of the bushing.

In the portions of a bushing lying on opposite sides of the slot *p* are aligned apertures *q* for the reception of a clamping bolt *r* which extends through the bearing member W to secure said bearing member to the bushing. The apertures *q* are so arranged with respect to the interior of the bushing that a portion of the bolt *r* lies within an annular groove *s* in the trunnion *g* to prevent longitudinal movement of the bushing on the trunnion although allowing the bushing *o* to rotate on the trunnion upon loosening of the bolt *r*. The arrangement is such that, upon tightening of the bolt *r*, the bushing *o* will be clamped securely upon the trunnion *g* and the bearing member W will be clamped fixedly to the bushing *o*.

In order to enable the rear end of the guide member P to be lowered to a degree beyond that which the sleeve Z and the rod *c* will permit, additional support means are provided which, in another position of the bushings *o* and the bearing members W, may serve as a support for that end of the guide member P. The means provided for this purpose comprises in the present instance a plate *t* which seats against the bearing members W and to which it is clamped by the bolts *r*. The plate *t* is provided at its ends with a pair of prongs or pointers *u* which may be, as shown, integral portions of the plate *t* and are arranged at right angles with respect thereto.

As may be readily appreciated, apparatus of the type to which the present invention pertains is subjected to vibratory movement of such an extent that, at best, it is a difficult matter to maintain the drilling mechanism in the correct operative relationship with respect to the work, such as the rock K. It is therefore desirable that means be provided to assure stability of the mounting and, in particular, to prevent the mounting from being thrust or forced away from the work.

The means provided to accomplish this result comprises a screw jack designated in general by *v* and which may seat with one end against a roof *w* of the drift L and with its other end loosely against the mounting, as for instance, on the trunnion *g*. In its operative relationship the screw jack *v* is arranged in an inclined position. It consists of a bar *x* having a rounded end *y* to seat in a socket *z* in the trunnion *g*. The opposite end of the bar *x* is provided with threads 2 for engagement with the threaded aperture 3 of a sleeve 4 clamped to a hollow pointer 5 which is seated against the roof *w*. The bar *x* may, as shown, be provided with a collar 6 affixed thereto and having apertures 7 into which an instrument, such as a rod 8, may be inserted for rotating the bar *x*.

In order that the rock drill B may at all times be maintained in a position to assure the most effective force of the hammer piston of the drill against the drill steel H the carriage C is shown provided with recoil arresting mechanism designated in its entirety by 9. The recoil arresting device may be of a known type which, described briefly, may consist of a link 10 loosely extending into an aperture 11 in the rear end of the carriage C.

On the link 10 are a pair of hooks 12 which are adapted to grip the flanges Q to prevent the drill and the carriage from rebounding when the piston reverses in the ends of the cylinder D. The link 10 is shiftable to limiting positions so that the rock drill B may be either advanced towards the work or retracted therefrom.

The means whereby the link 10 is shifted manually to its limited positions comprises a rod 13 extending through the link with springs 14 mounted on the rod 13 and being located on opposite sides of the link. The springs 14 act with their adjacent ends against the link and against abutments on the rod, one spring seating against a nut 15 threaded on the end of the rod to retain the springs 14 thereon, and the other spring 14 against a shoulder 16 of a head 17 on the bolt 13. The rod 13 and, therefore, the link 10 may be shifted to the different positions by means of an eccentric 18 journaled in the carriage C and which is connected to the head 17 in a well known manner.

Inasmuch as the recoil arresting device 9 forms no part of the present invention, but is shown merely to illustrate one manner in which the rock drill B may be actuated on its support, it is thought that a detail description thereof is unnecessary.

The manner in which the mounting A may be adjusted to a desired operative position, as for instance that illustrated in Figure 1, is as follows: The mounting is first disposed in substantially the desired position with respect to the rock K and in such wise that the point *f* abuts the rock face. The mounting is then raised or lowered on the rods *c* to the desired position after which the screws *e* are tightened to lock the sleeves Z fixedly to the rods *c*.

The rear supporting device is preferably inclined somewhat so that, during the subsequent operation of the drilling mechanism, the jars resulting therefrom will tend to cause the pointed ends *d* of the rearmost rods *c* to firmly engage the rock surface upon which they seat. The screw jack *v* may then be placed on the trunnion *g* with one end and with its pointed end against the roof *w*. Thereafter the bar *x* is rotated in the required direction to force the pointer 5 into firm engagement with the roof *w*. In this way the mounting will be held securely in position and unaffected by the vibrations incident to drilling. The screw jack *v* will then act to press the pointer *f* firmly against the rock and also to maintain the rear rods *c* seated firmly upon the floor of the drift L.

From the foregoing it will be apparent that the mounting may be conveniently lowered or elevated at will and that it may also be readily released from a given position by merely unscrewing the bar *x*. This is the mode of usage for drilling all such holes as may be conveniently drilled by adjusting the mounting only on the rods *c*. In such cases, however, where it is contemplated to drill holes closely to the floor of the drift the bearing W at the front end of the mounting may be oscillated about its pivot until it lies substantially parallel to and beneath the guide member P. The rear supporting devices may then be rotated about their pivot, that is, about the trunnion *g* and the rear end

of the mounting may be lowered to rest upon the pointers *u*. In this position of the parts and with the rear portion of the mounting supported by the pointer *u* the screw jack *v* may also be interposed between the trunnion *g* and the roof *w* to hold the mounting securely in the desired position.

In practice, the present invention has been found to be highly practical and efficient. It provides a convenient means for supporting a percussive tool such as a rock drill and lends itself for use in a variety of positions so that holes may be drilled into the rock either perpendicularly thereto or in inclined positions, depending upon the requirements of the work. The device may, moreover, also be used for drilling vertical holes, and in which position, of course, the weight of the apparatus may rest upon the pointer *f*. The rear supporting device including the rod *c* and the screw jack *v* may then serve, in the manner explained, to stabilize the rear end of the mounting.

We claim:

1. A mounting for a rock drill, comprising a guide member having smooth unbroken guide flanges coextensive therewith and whereon the rock drill is slidably mounted, means at one end of the guide member to seat against a rock surface, a pivot member on the guide member and having a socket, means pivotally mounted on the pivot member to support the other end of the guide member, and a screw-jack seated with one end in the socket for applying pressure to the guide member for maintaining the first said means in firm engagement with the rock surface.

2. A mounting for a rock drill, comprising an elongated guide member whereon the rock drill is slidably mounted, a leg pivotally connected to the front end of the guide member and being adapted to assume a position parallel with and beneath the guide member, legs connected to the rear end of the guide member and being extensible and adjustable angularly with respect to the guide member, a pointer on the front end of the guide member and being integral therewith, and a screw-jack acting against the other end of the guide member to press the pointer into firm engagement with a rock face.

3. A mounting for a rock drill, comprising an elongated guide member of structural shape whereon the rock drill is slidably mounted, a pointer at the front end of the guide member, front and rear extensible support devices secured to the guide member and being adjustable angularly with respect to the guide member, said front support device being adapted to assume a position parallel with and beneath the guide member, a screw-jack acting against the rear end of the guide member to press the pointer firmly into engagement with a rock surface, and a pair of legs affixed to the rear support device and being arranged laterally thereof.

JAMES H. JOWETT.
WILLIAM A. SMITH, JR.