Dec. 26, 1944. J. C. CURTIS ET AL 2,365,683

ROCK DRILL

Filed Sept. 18, 1941

Fig. 1.

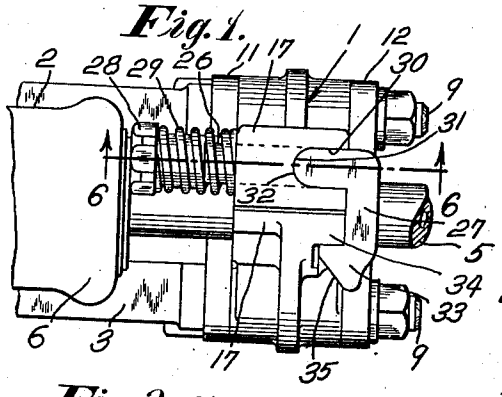


Fig. 2.

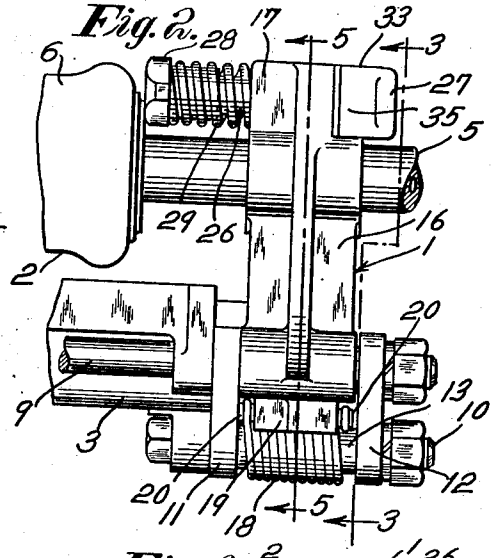


Fig. 3.

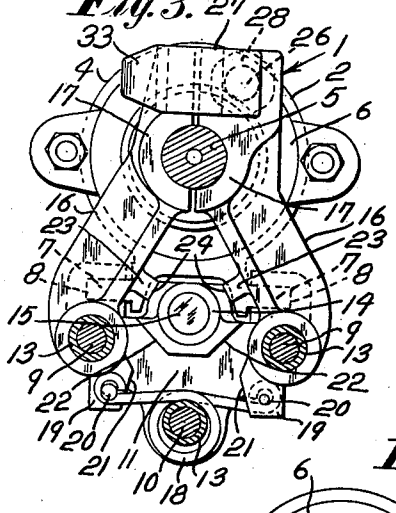


Fig. 5.

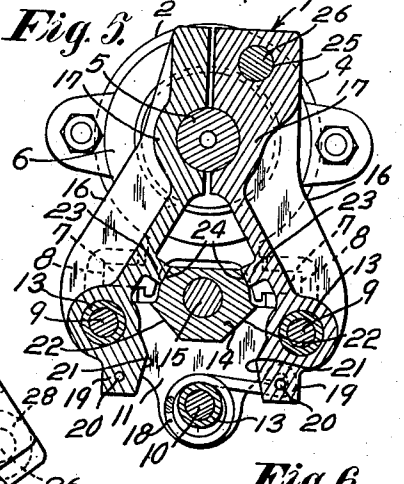


Fig. 4.

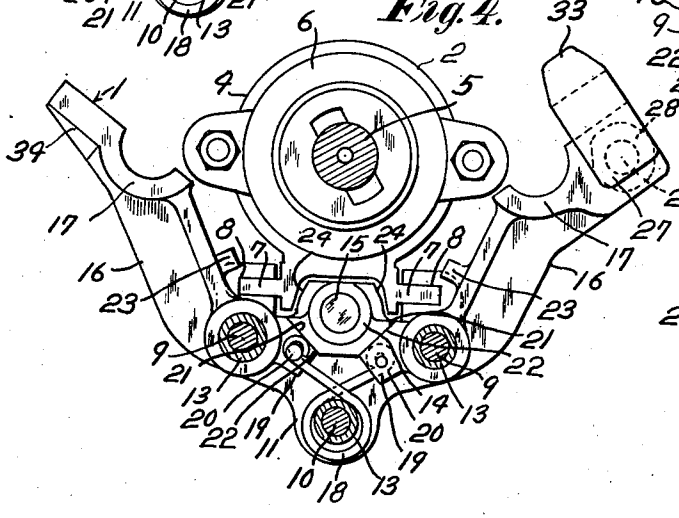
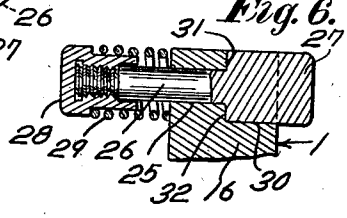


Fig. 6.



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2,365,683

ROCK DRILL

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10 Claims. (Cl. 255—51)

This invention relates to rock drills and more particularly has reference to a drill steel guide especially designed for use with a hammer rock drill.

An object of the present invention is to provide an improved drill steel guide. Another object is to provide an improved drill steel guide having novel means for locking the guiding elements thereof in steel guiding position, and wherein the locking means is automatically releasable by engagement of the hammer motor therewith. A further object is to provide a novel means for automatically moving the guiding elements into their released non-guiding position when the locking means is released. Still another object is to provide an improved drill steel guide of the pivoted arm type having a novel latch means for locking the guide arms in steel guiding position. A still further object is to provide improved means for limiting swinging movement of the guide arms in either direction about their pivotal axes. Yet another object is to provide an improved pivotal mounting structure for the guide arms of a drill steel guide. A further object is to provide an improved latch arrangement for locking the guide arms in guiding position, wherein the latch is automatically releasable by engagement of the hammer motor therewith as the latter is fed forwardly along its guiding support. Other and further objects and their resultant advantages will be apparent after the invention becomes better understood from an examination of the specification and claims in connection with the accompanying drawing in which the application of the invention is illustrated.

In the drawing:

Fig. 1 is a fragmentary plan view of a hammer rock drill with which the improved drill steel guide is associated.

Fig. 2 is a side elevational view of the rock drill and steel guide shown in Fig. 1.

Fig. 3 is a cross sectional view taken substantially on line 3—3 of Fig. 2, showing the guide arms in steel guiding position.

Fig. 4 is a view similar to Fig. 3, showing the guide arms in their released non-guiding position.

Fig. 5 is a cross sectional view taken substantially on line 5—5 of Fig. 2.

Fig. 6 is a detail view in longitudinal vertical section taken substantially on line 6—6 of Fig. 1, showing the improved latch.

In this illustrative embodiment of the invention the improved drill steel guide, generally designated 1, is shown associated with a conventional hammer rock drill of the mounted drifter type. It will be evident, however, that the drill steel guide may be associated with drills of other types.

The hammer rock drill comprises a conventional drill hammer motor 2 slidably guided on a conventional guide shell 3, the latter being adapted to be mounted on a conventional drill support. The hammer motor has a motor cylinder 4 containing a usual reciprocatory hammer piston (not shown) for percussively actuating a drill steel 5, the latter being supported in a usual chuck within a chuck housing 6 suitably attached to the front end of the motor cylinder. The hammer motor cylinder 4 has lateral guides 7, 7 slidingly received within longitudinal guideways 8, 8 of the guide shell. The hammer motor may be fed along the shell guideways by means of a conventional feed screw engaged with a feed nut carried by the motor cylinder so that when the feed screw is rotated, the hammer motor is fed longitudinally relative to the guide shell. Since, as above stated, the rock drill is of a conventional design and is well known to those skilled in the art, further description and illustration thereof are unnecessary.

Now referring to the improved drill steel guide 1, it will be noted that attached by the shell tie bolts 9 and a bolt 10 to the forward end of the guide shell is a pair of transversely arranged, parallel supporting plates 11 and 12, and these plates are held in proper spaced relation by spacing sleeves 13 interposed between the plates and arranged on the bolts 9 and 10. The top surfaces of the plates are disposed below the plane projections of the bottom surfaces of the shell guideways, so that the drill hammer may move forwardly above the plates when the guide arms are in their wide open position. The rear plate 11 has an integral bearing boss 14 in which the forward bearing portion 15 of the feed screw is journaled. Pivotally mounted on the spacing sleeves 13 on the upper tie bolts 9 between the plates 11 and 12 is a pair of cooperating guide arms 16, 16 having appropriately shaped guiding portions 17. The guiding portions of the guide arms are adapted to embrace the body of the drill steel to hold the latter centered during the starting or "spotting" of a hole in the manner well known to those skilled in the art. A torsion spring 18 encircles the spacing sleeve on the lower bolt 10 intermediate the arm pivot axes, and has its ends respectively engaging depending armlike lugs 19 integral with the guide

arms, and this spring constantly urges the guide arms toward their wide open non-guiding position. The ends of the torsion spring are attached to the arm lugs 19 by means of suitable pins 20 fitted within openings in the lugs. Abutment surfaces 21 on the arm lugs 19 are engageable with abutment surfaces 22 on the rear plate 11 for limiting outward swinging movement of the guide arms, and when the latter are in their released non-guiding position shown in Fig. 4, the torsion spring yieldingly maintains these surfaces in abutting engagement. Formed on the guide arms at their inner sides are projecting lugs 23 engageable with abutment surfaces 24 on the rear plate 11 for limiting inward swinging movement of the guide arms. Guided for axial movement in a bore 25 in one of the guide arms 16 is a boltlike portion 26 of a latch 27, this boltlike portion having threaded on its rear end a flanged nut 28. The guiding bore 25 is arranged with its axis parallel to the longitudinal axis of the rock drill, so that the latch is reciprocable longitudinally of the drill. Encircling the bolt portion 26 and interposed between the rear surface of the guide arm and the flange on the nut is a coil spring 29 for yieldingly urging latch 27 toward its rearmost position. The guide arm is recessed at 30 to receive the latch 27, and provides an abutment surface 31 against which a rear surface 32 on the latch is yieldingly held in abutting engagement by the coil spring. The latch 27 has a locking lug 33 engageable with a projection 34 on the other guide arm so that when the latch is in the position shown in Fig. 1, the guide arms are locked in steel guiding position with the lugs 23 in engagement with the abutment surfaces 24 on the rear plate 11. The lug 33 has an inclined wedging surface 35 so that when the guide arms are swung inwardly together, this inclined surface engages the inner surface of the arm projection 34 to cause the latch to spring forwardly past the arm projection 34 and thereafter to snap inwardly into its latching position. The latch 27, which fits in the recess 30, is of such cross section as to prevent rotation of the boltlike portion 26 within its bore.

In the operation of the improved drill steel guide, when it is desired to start or "spot" a drill hole, the guide arms 16, 16 may be swung about their pivots into the position shown in Fig. 3 with their guiding portions 17 in engagement with the drill steel 5, and at that time the arms are locked in steel guiding position by the lug 33 of the latch engaging the arm projection 34 (see Fig. 1). As the drill hammer motor is fed forwardly along the shell guideways, the front chuck housing 6 engages the rear surface of the nut 28 and shoves the latch 27 forwardly axially with respect to the guide arms to effect release of the locking lug 33 from the arm projection 34. When the latch is released, the torsion spring 18 automatically swings the guide arms into their wide open non-guiding position shown in Fig. 4 so that the hammer motor can move forwardly between the guide arms without interference therewith. When the drill hammer motor is again in its retracted position on the guide shell, the guide arms may be swung manually against the tension of the torsion spring into their steel guiding position shown in Fig. 3, and as the guide arms are swung together the inclined wedging surface 35 on the latch engages the inner surface of the arm projection 34 so that the latch automatically snaps into its locked position shown, thereby to hold the guide arms in steel guiding position.

As a result of this invention, it will be noted that an improved drill steel is provided having improved latching means whereby the guide arms are positively locked in their steel guiding position, and which is releasable by engagement of the drill hammer motor therewith as the hammer motor is fed forwardly along the guideways of its supporting guide. It will also be noted that by the provision of the torsion spring the arms are automatically swung into the released non-guiding position when the latch is released. By means of the particular arrangement of abutment surfaces on the guide arms, swinging movement of the latter is limited in either direction. Other uses and advantages of the invention will be clearly apparent to those skilled in the art.

While there is in this application specifically described one form which the invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What we claim as new and desire to secure by Letters Patent is:

1. In a drill steel guide, a support, a pair of guide arms pivotally mounted on said support to swing toward and from one another into and out of steel guiding position, a latch guided on one of said guide arms for movement relative thereto in a direction parallel to the longitudinal axis of the drill steel, said latch being engageable with said other guide arm when said arms are together for locking said guide arms in steel guiding position, and operating means for said latch for moving the latter longitudinally relative to said arms to free the latter for swinging movement from one another.

2. In a drill steel guide, a support, a pair of guide arms pivotally mounted on said support to swing toward and from one another into and out of steel guiding position, a latch guided on one of said guide arms for movement relative thereto in a direction parallel to the longitudinal axis of the drill steel, said latch being engageable with said other guide arm when said guide arms are together for locking said guide arms in steel guiding position, operating means for said latch for moving the latter longitudinally relative to said arms to free the latter for swinging movement from one another, and constantly acting means for automatically swinging said arms apart into their released non-guiding position when said latch is released.

3. In a drill steel guide, a support, a pair of guide arms pivotally mounted on said support to swing into and out of steel guiding position, one of said arms having a bore extending in a direction parallel to the longitudinal axis of the drill steel, said bore being located in adjacency to the steel engaging end of said arm, and a latch guided for reciprocatory movement in said bore and engageable with said other guide arm to lock said arms in steel guiding position.

4. In a drill steel guide, a support, a pair of guide arms pivotally mounted on said support to swing into and out of steel guiding position, one of said arms having a bore extending in a direction parallel to the longitudinal axis of the drill steel, said bore being located in adjacency to the steel engaging end of said arm, and a latch guided

for reciprocatory movement in said bore and engageable with said other guide arm to lock said arms in steel guiding position, said latch having a transverse portion and a rearwardly projecting locking lug, and said guide arm with which said latch engages having a projection with which said lug cooperates.

5. In a rock drill, a supporting guide providing guideways extending to the forward end thereof and along which a drill steel actuator is guided for movement, said guide having longitudinal tie bolts extending along the sides thereof in close adjacency to the longitudinal planes in which both of said guideways lie, a support attached to the front end of said guide by said tie bolts and extending across the forward end thereof but leaving said guideways unobstructed, and a pair of guide arms pivotally supported by said tie bolts and swingable about their pivots into and out of their steel guiding position.

6. In a rock drill, a supporting guide along which a drill steel actuator is guided for movement, said guide having longitudinal tie bolts extending along the sides thereof and a feed screw extending longitudinally thereof between the sides thereof, a support attached to the front end of said guide by said tie bolts and providing a bearing for said feed screw, and a pair of guide arms pivotally supported by said tie bolts and swingable about their pivots into and out of their steel guiding position, said support including front and rear plates supported by said tie bolts and said arms being pivotally mounted on said tie bolts intermediate said plates.

7. In a rock drill, a supporting guide along which a drill steel actuator is guided for movement, and a drill steel guide attached to the front end of said guide including cooperating relatively movable guiding elements, latching means reciprocably guided on one of said guiding elements for movement relative thereto and engageable with said other element to lock said elements together in steel guiding position, and operating means for said latching means disposed in the path of movement of said steel actuator for moving said latching means relative to said guiding elements for freeing the latter for movement away from the drill steel, said steel actuator as it moves forwardly along said supporting guide being engageable with said operating means to effect release of said latching means.

8. In a rock drill, a supporting guide along which a drill steel actuator is guided for movement, and a drill steel guide attached to the front end of said guide including cooperating relatively movable guiding elements, latching means reciprocably guided on one of said guiding elements for movement relative thereto along a line parallel to the longitudinal axis of the drill steel and engageable with said other element to lock said elements together in steel guiding position, and operating means for said latching means disposed in the path of movement of said steel actuator for moving said latching means relative to said guiding elements for freeing the latter for movement away from the drill steel, said steel actuator as it moves forwardly along said supporting guide being engageable with said operating means to effect release of said latching means.

9. In a rock drill, a supporting guide along which a drill steel actuator is guided for movement, and a drill steel guide attached to the front end of said guide including cooperating relative movable guiding elements, latching means reciprocably guided on one of said guiding elements for movement relative thereto and engageable with said other element to lock said elements together in steel guiding position, operating means for said latching means disposed in the path of movement of said steel actuator for moving said latching means relative to said guiding elements for freeing the latter for movement away from the drill steel, said steel actuator as it moves forwardly along said supporting guide being engageable with said operating means to effect release of said latching means, and constantly acting means for automatically moving said guiding elements apart into their released non-guiding position when said latching means is released.

10. In a drill steel guide, a support, a pair of guide arms pivotally mounted on said support to swing toward and from one another into and out of steel guiding position, a latch guided on one of said guide arms for movement relative thereto in planes parallel to the longitudinal axis of the drill steel, said latch being engageable with said other guide arm when said arms are together for locking said guide arms in steel guiding position, and operating means for said latch for moving the latter longitudinally relative to said guide arms for freeing the latter for swinging movement from one another.

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