Feb. 6, 1951 A. FEUCHT 2,540,574

ADJUSTABLE DRILL GUIDE

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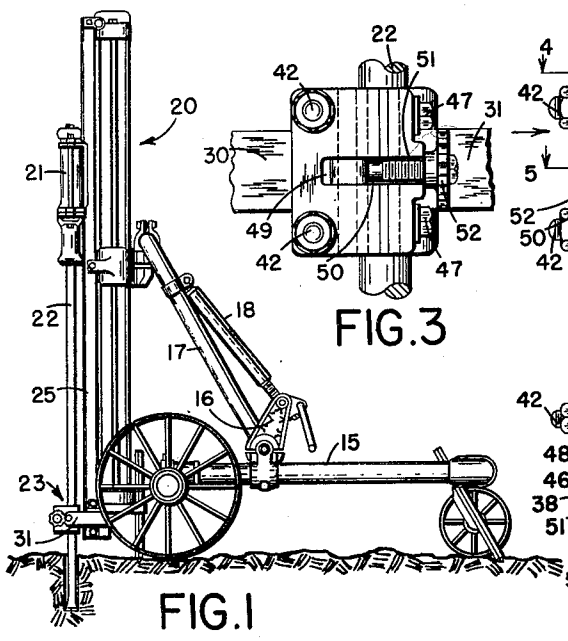

FIG. 1

FIG. 3

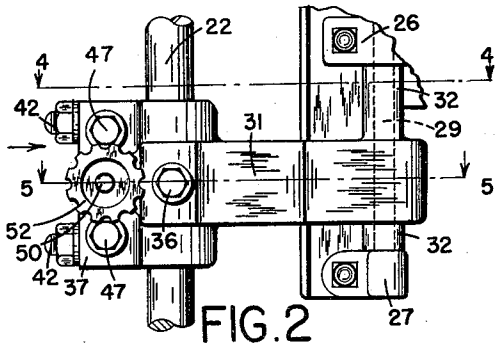

FIG. 2

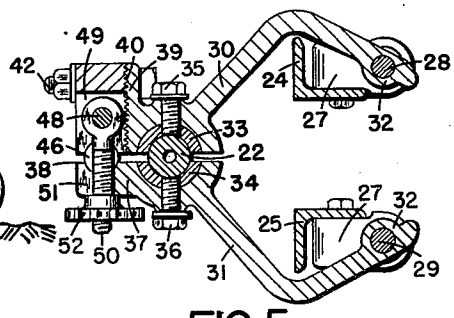

FIG. 5

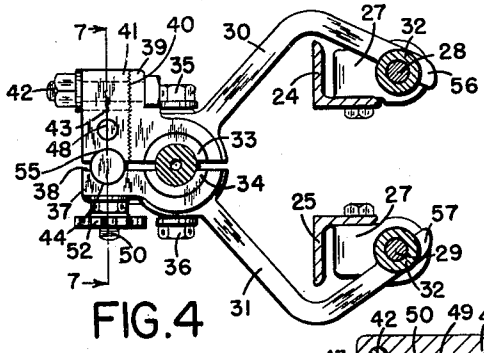

FIG. 4

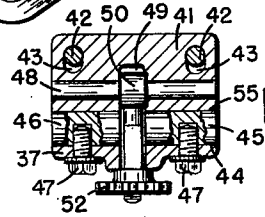

FIG. 7

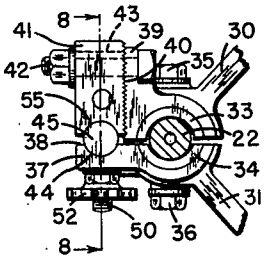

FIG. 6

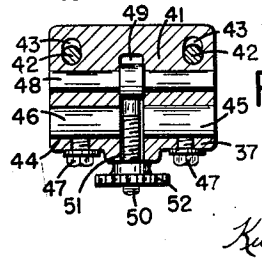

FIG. 8

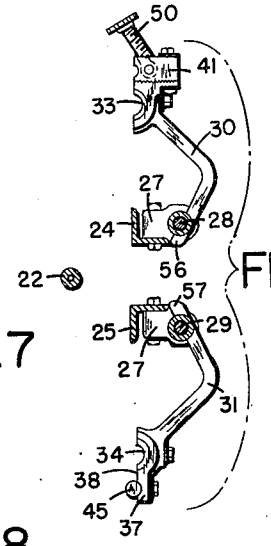

FIG. 9

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ADJUSTABLE DRILL GUIDE

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Application January 30, 1946, Serial No. 644,385

1 Claim. (Cl. 255—51)

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This invention relates to improvements in adjustable drill guides, and has to do more particularly with guides of the type known as centralizers for guiding the drill steel in a rock drilling machine.

A drill hole must be maintained straight, as otherwise the drill would bind against the sides of the hole, in hard rock especially. To prevent the drill from wandering, particularly while the hole is being started, a rigidly supported drill guide is employed close to the surface of the rock in which the hole is to be drilled. When the hole has been drilled to a depth such that the walls thereof will function effectively for holding the drill in alignment the guide may be removed and the hole completed without it.

One of the objects of the present invention is the provision of a guide of the character stated having means for adjustment to compensate for wear in the bushing surrounding the drill shaft, or for limited differences in diameter of the drill shafts used.

Another object is the provision of a drill guide or centralizer of rugged design that is of simple construction and is quick acting in operation.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application I have illustrated in the accompanying drawing, in which

Fig. 1 is a side elevational view of a rock drilling machine of the wagon drill type embodying the invention.

Fig. 2 is a fragmental elevational view on a larger scale of that portion of the machine in which the present invention is embodied.

Fig. 3 is an elevational view looking in the direction of the arrow in Fig. 2.

Figs. 4 and 5 are cross-sectional views taken substantially on the lines 4—4 and 5—5 respectively of Fig. 2.

Fig. 6 is a fragmental sectional view similar to Fig. 4 but with the parts in a different position of adjustment.

Fig. 7 is a vertical sectional view taken substantially on the line 7—7 of Fig. 4.

Fig. 8 is a similar view taken substantially on the line 8—8 of Fig. 6, and

Fig. 9 is a cross-sectional view on a smaller scale, corresponding to the section line 4—4 of Fig. 2 but showing the free ends of the guide arms disconnected and swung away from the drill steel.

The invention is illustrated in Fig. 1 as applied to a wagon type drilling machine, although the

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mounting of the mechanism upon any suitable type of support is well within the scope of the invention. In the drawing there is shown a frame structure 15 carrying an adjustable brace made up of three elements 16, 17 and 18 forming the sides of a triangle. The element 18 is adjustable as to length. On the end of element 17 there is fastened by a lockable pivot construction a conventional rock drill supporting and feeding mechanism 20 carrying a drill motor 21 with a drill steel 22. The construction described in the foregoing is conventional, and forms no part of the present invention.

The assembly in which the present invention is embodied is located on the extreme end of the drill supporting and feeding mechanism 20 near the rock to be drilled, and is marked 23 in Fig. 1. The supporting and feeding mechanism 20 embodies two angle irons 24 and 25, to each of which are secured upper and lower brackets 26 and 27 that support pins or shafts 28 and 29. These shafts carry a pair of arms 30 and 31 that have elongated hinge portions 32 that extend above and below the arms proper and are bored to receive the shaft 28 or 29, as the case may be.

The arms 30 and 31 are shaped to clear the angle irons 24 and 25, passing around them and converging toward each other at their free ends when the device is in operative position. Near their free ends these arms are provided with curved recesses to receive the two sections 33 and 34 of a split bushing that is designed to substantially surround and form a rotary and slide bearing for the drill steel 22. The two sections of the bushing are somewhat less than half cylinders, and are secured within their sockets by means of cap screws 35 and 36 or other suitable means.

The free extremity of arm 31 has an extension 37 with a face 38 that may be flush with the edge surfaces of bushing section 34. Arm 30 has an extension 39 with a serrated face 40 that is perpendicular to face 38 when the guide is in operative position. A block 41 with serrations matching those of face 40 is adjustably mounted on the extension 39, preferably by means of a pair of bolts 42 which are set into round holes in the extension 39 and project through slots 43 in block 41. By loosening the bolts 42 the block 41 may be moved toward or away from the face 38, two different positions being indicated in Figs. 4 and 6. When the bolts 42 are tightened they, in combination with the matching serrations, accomplish a rigid mounting of the block on the extension 39.

Extension 37 is provided with a groove 44 of cylindrical contour in which are mounted two

spaced steel cylinders or spacers **45** and **46**. These cylinders are held in the groove **44** by suitable means, for example by cap screws **47** which project through holes in the extension **37** and are threaded into tapped holes in the cylinders. When the arms come together the spacers **45** and **46** fit into a groove **55** in block **41**. The grooves **44** and **55** are of less than semi-cylindrical shape, and hence the elements **37** and **41** are spaced apart as indicated in both of Figs. 4 and 6. Projections **56** and **57** on the hinge ends of arms **30** and **31** serve to engage angle irons **24** and **25** and thus constitute stops to prevent the swinging of the arms beyond the positions illustrated in Fig. 9.

The block **41** is bored throughout its length to receive a pivot pin **48** which is pressed or driven into the bore, and the block is further formed with a transverse slot **49** which intersects the bore for pin **48** and receives the eye portion of an eye bolt **50** that turns upon pin **48** and is adapted to swing through a slot **51** in extension **37** when the arms **30** and **31** are swung into operative relation. The arms may then be clamped together by means of a knurled nut **52** threaded onto the eye bolt **50**.

Operation. With the guide arms **30** and **31** in the position of Fig. 9 the feed mechanism **20** and drill motor **21** are operated to bring the drill bit end of the drill steel **22** into contact substantially with the surface of the rock to be drilled. The guide arms **30** and **31** are then swung from the position of Fig. 9 around to the position of Figs. 4 and 5, when the bushing sections **33** and **34** engage the drill shaft. The eye bolt is then swung around through the slot **51** and the nut **52** is tightened down to clamp the free ends of the arms together with the spacers **45** and **46** between them. The motor **21** is then turned on and the drill operated until the hole in the rock is well started, after which the clamp may be loosened and the arms **30** and **31** separated. The drilling operation is then resumed and continued until a hole of the desired depth has been formed.

When the bushing sections **33** and **34** have become worn to such an extent that their guiding function is impaired, the block **41** may be adjusted outwardly, as indicated in Fig. 6, with the result that thereafter when the block **41** and extension **37** are clamped together with the spacers **45** and **46** interposed between them, the extension **39** will approach more closely the extension **37**, and thus the bushing sections **33** and **34** will be brought closer together, taking up the wear.

In the event that it is desired to use a drill of a somewhat larger or smaller diameter than that for which the bushing sections are primarily intended, the adjustment of block **41** inwardly or outwardly upon the extension **39** will permit such use without a change in bushing sections. Obviously, however, further changes may be effected by substituting bushing sections of different thicknesses and contour.

In the foregoing description I have necessarily gone somewhat into detail in order to explain fully the particular embodiment of the invention herein illustrated, but I desire it to be understood that such detail disclosure is not to be construed as amounting to a limitation, except as it may be included in the appended claim.

Having thus described my invention, I claim:

In a drill steel centralizer, a pair of arms each carrying one section of a split cylindrical bushing adapted to form a rotary and slide bearing for the drill steel, said arms having parallel edge surfaces, a pivot pin for each of said arms whose axis is parallel to the axis of said bearing, an extension on the extremity of one of said arms having a face substantially parallel to a continuation of the edge surfaces of its split bushing, an extension on the extremity of the second arm having a surface substantially perpendicular to its edge surface when said arms are in operative position, a block releasably mounted on said perpendicular surface, said releasable connecting means between said block and said perpendicular surface consisting of matching serrated surfaces and locking means enabling adjustment of the block toward and away from the edge surface on said first named arm, a cylindrical spacer fixedly mounted on the extension of said first named arm whose axis is in parallel with the axis of said bearing, a partly cylindrical groove on the adjacent end of said block adapted to fit over said spacer for spacing said arms apart, and a clamp for securing said arms together with said spacer therebetween.

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