Dec. 5, 1939. W. A. SMITH, SR 2,182,365

STEEL RETAINER

Filed Aug. 4, 1937

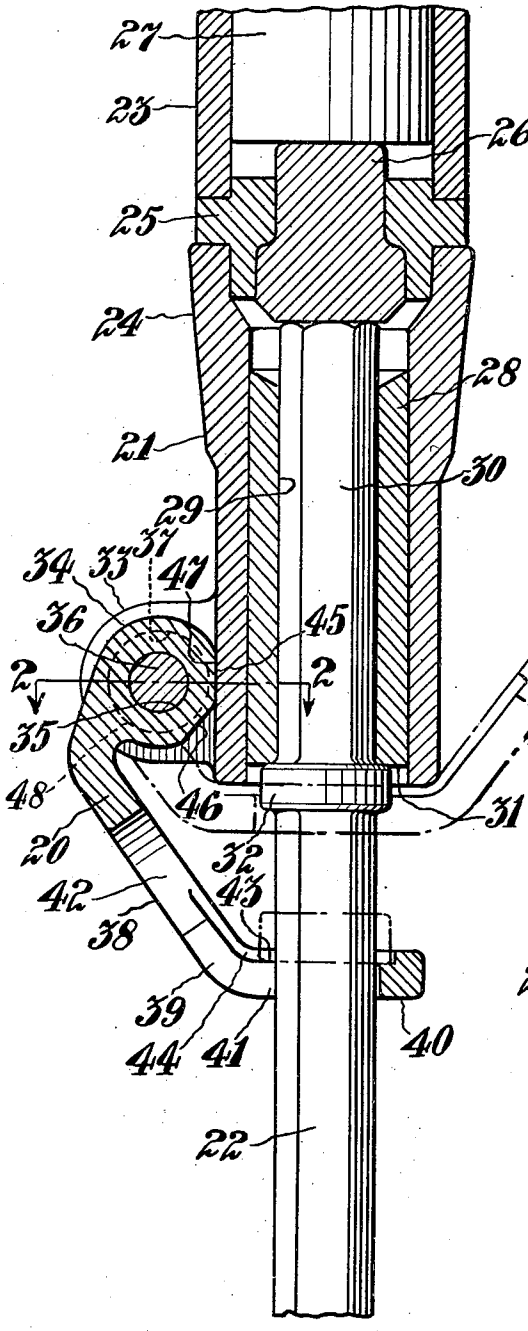


FIG.-1.

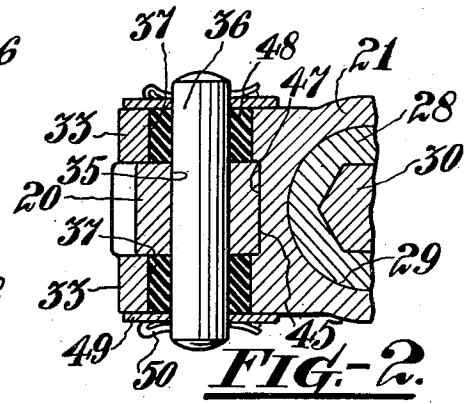


FIG.-2.

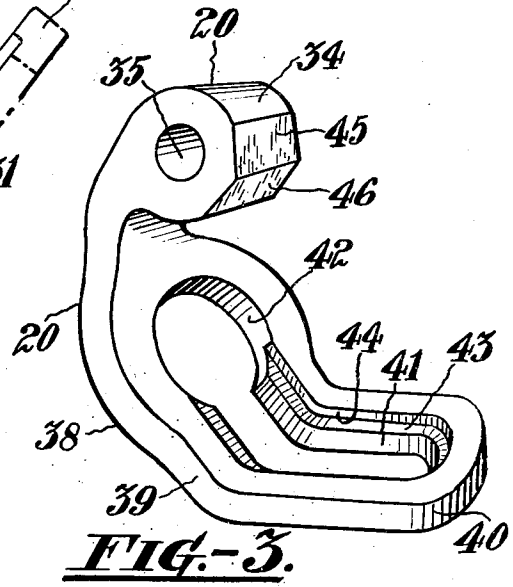


FIG.-3.

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STEEL RETAINER

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2 Claims. (Cl. 279—19.1)

This invention relates to rock drills, and more particularly to a steel retainer for rock drills of the hammer type in which the working implement and the hammer piston actuating it are capable of reciprocating independently of each other.

One object of the invention is to retain the working implement in the rock drill.

Another object is to cushion the movement of the retainer with respect to the member supporting it, and

Another object is to assure a simplified and rugged retaining device which is reliable in operation and may be conveniently manipulated.

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

In the drawing accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is an elevation, partly in section, of the retainer and the front end of a rock drill to which the retainer is attached,

Figure 2 is a transverse view taken through Figure 1 on the line 2—2, and

Figure 3 is a perspective view of the retainer.

Referring more particularly to the drawing, the retainer constructed in accordance with the practice of the invention and designated 20 is shown attached to the front end of a rock drill 21 for retaining a working implement 22 therein.

The rock drill selected for the purpose of illustration comprises a cylinder 23 and a front head 24 which is centralized with respect to the cylinder 23 by a front cylinder washer 25 interposed between the two and having portions extending into their adjacent ends. The front cylinder washer 25, moreover, serves as a guide for an anvil block 26 which transmits the blows of a hammer piston 27, reciprocable in the cylinder 23, to the working implement 22.

Within the front head is a chuck 28 having a bore 29 to receive and conform with the shank 30 of the working implement. The chuck 28 may be affixed to the front head 24 in any well known manner and its front end 31 serves as an abutment for a collar 32 at the juncture of the body portion of the working implement and the shank 30.

In accordance with the practice of the invention, the front head 24 is provided, near its front end, with a pair of laterally extending lugs 33 which are arranged in parallelism with respect to each other and suitably spaced to receive therebetween a head 34 forming, in the present instance, the rearmost terminal of the retainer 20. The head 34 is of substantially the same width as the space between the lugs 33, having only a slide fit between the lugs, and has an aperture 35 to receive a pivot pin 36 which also extends through coaxially aligned apertures 37 in the lugs 33.

Depending from the head 34 is a loop 38 consisting of portions 39 and 40 which are angularly arranged with respect to each other and in such wise that when the retainer 20 occupies its retaining position the portion 40 lies perpendicular to the working implement 22, which it partly encircles.

The retainer 20 is in the form of a loop and its interior an oblong slot 41 extending through the portion 40 and partly through the portion 39 and opens into an aperture 42 which is of sufficiently larger diameter than the collar 32 to permit the latter to pass readily therethrough. The slot 41 is only of slightly smaller width than the diameter or maximum cross-dimension of the working implement in order to avoid contact between the two. Preferably, the surface of the retainer which is intended to engage the collar 32 is formed by the bottom 43 of a depression 44 surrounding the slot 41.

In order that the retainer 20 may be securely held in either the retaining or releasing position the peripheral surface of the head 34 is provided with diverging inclined surfaces 45 and 46 adapted to seat against a surface 47 on the periphery of the front head 24 and lying between the lugs 33. The surface 45 serves to hold the retainer in the retaining position and lies perpendicular to the portion 40, while the surface 46 bears a similar relation to the portion 39 of the retainer and engages the surface 47 for holding the retainer in the releasing position, as indicated by dot and dash lines in Figure 1.

To the end that the retainer and the portion of the rock drill wherewith it is associated may be protected against the destructive effects accompanying or following the impact of the collar 32 against the retainer, the ends of the pivot pin lying exteriorly of the retainer and extending through the apertures 37 are journalled in flexible, preferably rubber, sleeves 48 seated in the apertures 37. The walls of the sleeves 48 are of suitable thickness so that they will exert a cushioning effect both upon the delivery of a blow against the retainer and during the subsequent rebound of the retainer.

In order to prevent the rubber of the sleeves 48 from being squeezed out of the apertures 37 plates or washers 49 are disposed upon the pivot

pin 36 and held firmly seated against the outer surfaces of the lugs 33 by cotter pins 50 arranged in the pin 36.

In practice, the sleeves 48 will yield readily to any force or shock applied to the retainer 20 and will act to immediately restore the retainer to the position which it occupied prior to the delivery of such force thereto. The sleeves, moreover, supply the yieldable pressure essential to maintain the surfaces 45 or 46, depending upon whether the retainer is in the retaining or releasing positions, against the surface 47 on the front head.

The operation of the device is as follows: Whenever it is desired to change working implements 22, the retainer is rocked to the position illustrated by dot and dash lines where it is held by the pressure of the rubber sleeves which will then maintain the surface 46 firmly seated against the surface 47. With the retainer thus arranged the aperture 42 will be in registry with the bore 29. The working implement 22 may then be withdrawn from the chuck since, as has been previously explained, the collar 32 will then pass readily through the aperture 42.

After another working implement has been placed in the chuck 30 the retainer is again rocked to the retaining position where it will be held by the sleeves 48 which supply the force required to maintain the surface 45 firmly seated against the surface 47. If, during the subsequent operation of the rock drill the working implement is projected sharply forwardly, as frequently happens when insufficient resistance acts against the end of the working implement to maintain the collar 32 against the chuck 28, the collar 32 will strike the portion 40 of the retainer and in this way the working implement will be prevented from being projected from the rock drill.

I claim:

1. A steel retainer for a rock drill comprising, in combination with a front head and a collared working implement, a pair of lugs on the front head having coaxially aligned apertures, a retainer cooperating with the collar of the implement to retain the implement in the front head, a pivot in the apertures extending through the retainer, seating surfaces on the retainer to engage the front head for holding the retainer in retaining and releasing positions, and resilient sleeves in the apertures to serve as bearings for the pivot and to press the seating surfaces into engagement with the front head.

2. A steel retainer for a rock drill comprising, in combination with a front head and a collared working implement, a pair of lugs on the front head having coaxially aligned apertures, a retainer cooperating with the collar of the implement to retain the implement in the front head, a head lying between the lugs and forming a closure for the inner ends of the apertures, a pivot pin in the head and the apertures, seating surfaces on the head to engage the front head for holding the retainer in retaining and releasing positions, rubber sleeves in the apertures to serve as bearings for the ends of the pivot pin and to press the seating surfaces against the front head, and closures for the outer ends of the apertures.

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