

No. 711,999.

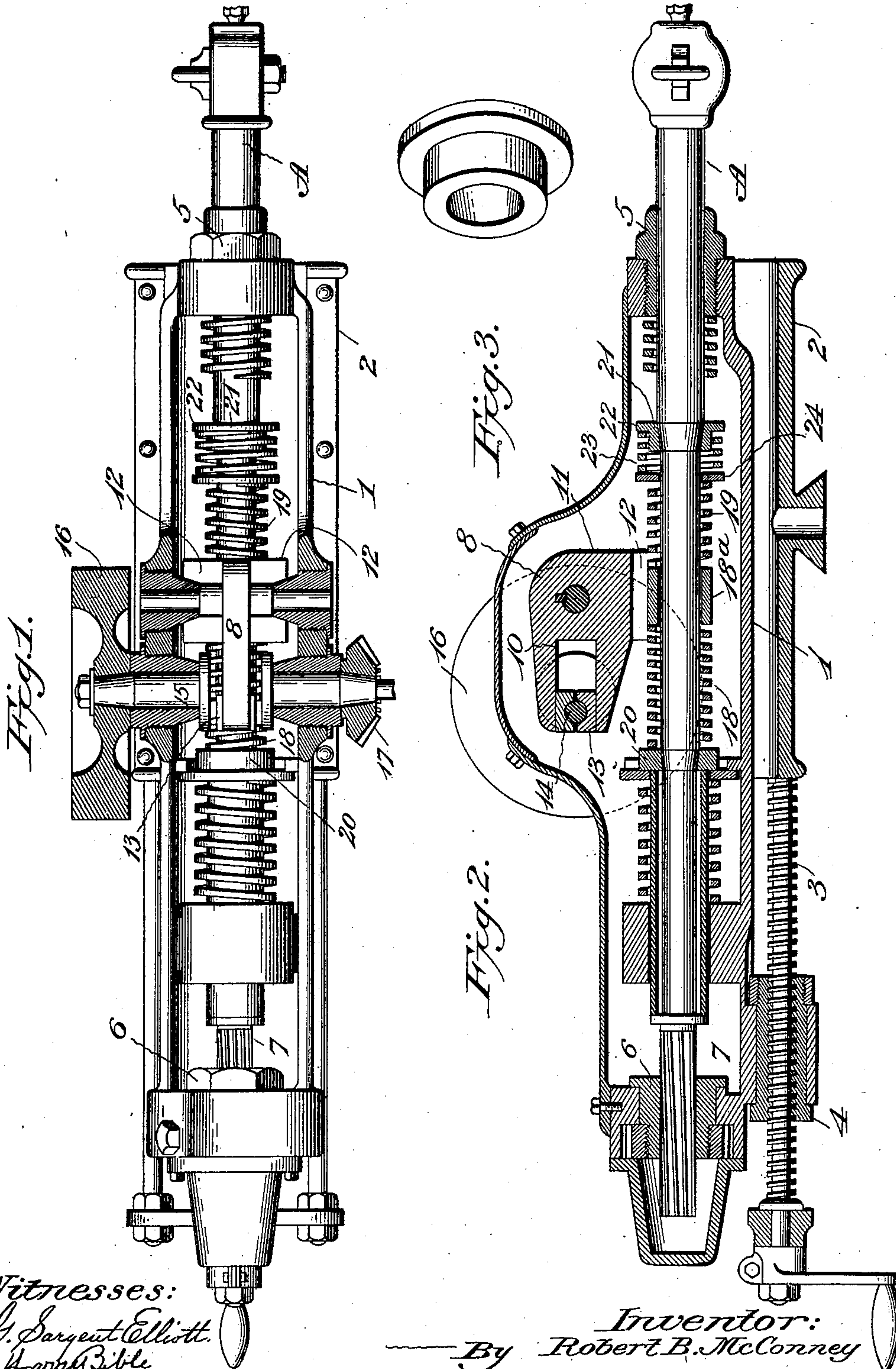
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R. B. McCONNEY.

QUICK RETURN SPRING FOR ROCK DRILLS.

(Application filed Feb. 15, 1902.)

(No Model.)



Witnesses:

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QUICK-RETURN SPRING FOR ROCK-DRILLS.

SPECIFICATION forming part of Letters Patent No. 711,999, dated October 28, 1902.

Application filed February 15, 1902. Serial No. 94,272. (No model.)

To all whom it may concern:

Be it known that I, ROBERT B. McCONNEY, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Quick-Return Springs for Rock-Drills; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in quick-return devices for drill-bar-actuating springs for rock-drills, and is designed more especially as an improvement over the drill-bar-actuating spring shown in patent to Lafayette Durkee, No. 675,202, of May 28, 1901.

The object of this invention is to provide means whereby when the forward actuating-spring has been compressed by the forward movement of the cross-head to quickly move the said spring rearward, so that it shall be held against the retreating cross-head and receive the return blow of the hammer-holder while under slight compression, and to this end I interpose between the forward collar of the drill-holder and the end of the forward actuating-spring a sliding washer, between which and the before-mentioned collar is a stout expansive helical spring which operates to hold the said actuating-spring in permanent engagement with the said cross-head no matter how rapid the reciprocation of the same may be. The said spring thus being in permanent engagement with the cross-head and under slight compression is not subjected to a blow from the said drill-holder as the same moves rearward, as would be the case if there should be even a very short space between the said spring and cross-head. Thus the spring is saved the crystallizing effect which such a blow from the said drill-holder would inevitably produce, and the liability to breakage is thereby greatly reduced.

In the accompanying drawings, Figure 1 is a plan view of a rock-drill embodying my improvement. Fig. 2 is a vertical longitudinal sectional view thereof, and Fig. 3 is a perspective view of an improved form of collar which is carried by the forward portion of the drill-bar.

Referring to the accompanying drawings, the numeral 1 indicates the drill-casing, and 2 the shell, which supports the casing and in which the casing has an endwise-sliding movement. The casing is moved back and forth by a feed-screw 3, which revolves in an elongated nut 4, carried by the under side of the casing, the said screw being revolubly secured at one end to the shell, while the other end has clamped thereto a handle by which the said screw is revolved. The forward end of the casing has a central bore, which is threaded and receives a nut 5, bored centrally to receive the forward end of the drill-shaft A. The rear end of the casing is also centrally bored and receives a nut 6, having a central bore which is spirally fluted and in which reciprocates the rifle-bar 7, which is screwed into the rear end of the drill-shaft and which causes the intermittent revolution of the drill-holder, as will be fully understood by reference to the patent above referred to. A bell-crank lever 8 is pivoted in the casing above the drill-holder A and about centrally of the same. This lever is made up of a member 9, which is horizontally disposed and is provided with an open-ended slot 10 and a vertically-depending member 11, which is formed into a yoke, the members 12 of which straddle the drill-holder and are each provided with an open-ended slot. The slot 10 of member 9 carries a sliding box 13, in which revolves the wrist-piece 14 of a crank-shaft 15, the said shaft carrying a fly-wheel 16 at one end and a beveled pinion 17 at its other end, the said pinion being designed to receive motion from a corresponding beveled pinion on the end of a flexible shaft, which is driven by any preferred motive power, the pinion, shaft, and means for operating the same not being shown.

The drill-holder is provided centrally with a cross-head 18^a, having lateral trunnions,

which are housed in sliding boxes carried by the slots in members 12 of the crank-lever 8, and the cross-head is held centrally of the drill-holder by springs 18 and 19, which bear
 5 one on each side of the cross-head, the opposite end of spring 18 bearing against a rigid collar 20, while spring 19 is held under compression in a manner to be presently described. The parts thus far mentioned are
 10 all clearly shown and described in the patent above referred to, and a more extended description thereof is unnecessary, as they form no part of the present invention.

The drill-holder A has in addition to the
 15 rear collar 20 a forward collar 21, which is provided with a peripheral flange 22, against which one end of a highly-resilient helical spring 23 abuts, the other end thereof abutting against a washer 24, which fits loosely
 20 upon the drill-holder A, so as to have a sliding movement thereon, and the said washer 24 is held against the spring 23 by the strong heavy drill-holder-actuating spring 19. The spring 23 forms an auxiliary means for cushioning the jar on cross-head 18^a and crank-lever 8, which they receive from the return
 25 stroke of the drill-holder, and also operates to keep the rear end of spring 19 in permanent engagement with the said cross-head. When
 30 operating at average speed, the drill-holder reciprocates very rapidly, which also means a very rapid movement of the crank-lever and cross-head, and in practice it has been found that the said drill-holder after reaching
 35 the limits of the forward movement of the cross-head continues onward for some distance, thus leaving a slight space between the rear end of the said spring and cross-head, which allows the drill-holder to strike the
 40 spring with great force on its return movement. The continual repetition of these blows from the drill-holder causes the spring to crystallize, which results in frequent breakages, causing a loss of time and the trouble and ex-
 45 pense of replacing the broken spring with a new one. By the employment of my improved device the jar upon spring 19 is cushioned by the spring 23, which also serves through
 50 its expansive pressure on washer 24 to hold spring 19 in constant engagement with cross-

head, thus saving the said spring from being struck by the same, thereby preventing crystallization of the said spring and the consequent frequent breakage of the same. It will thus be seen that in my improvement I have
 55 provided a very simple, effective, and inexpensive means for cushioning the jar upon the forward actuating-spring and for prolonging the life of the same, as when the said spring is normally held under pressure, as in
 60 the present instance, it is far less liable to be broken when suddenly compressed by the action of the drill-holder than when relaxed.

Having thus described my invention, what I claim as new, and desire to secure by Letters
 65 Patent, is—

1. In a quick-return device for drill-holder-actuating springs, the combination with the drill-holder, the actuating-lever and cross-head, and forward actuating-spring, of a
 70 washer loosely mounted upon the said drill-holder, against which the forward end of the said actuating-spring abuts; a collar rigidly secured upon said drill-holder, forward of the said washer, and a helical spring interposed
 75 between the said collar and washer, which holds the said actuating-spring in constant engagement with the said cross-head, substantially as shown.

2. In a quick-return device for drill-holder-
 80 actuating springs, the combination with the casing, the actuating-lever and cross-head, the drill-holder and forward actuating-spring, of a flanged collar rigidly secured upon the forward portion of the drill-holder; a washer
 85 loosely mounted upon the said drill-holder, at the rear of said collar, a spring interposed between the said collar and washer, which holds the said washer against the forward
 90 end of the said actuating-spring, thus holding the rear end of the actuating-spring in constant engagement with the cross-head, substantially as shown.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT B. McCONNEY.

Witnesses:

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 HARRY BIBLE.