

UNITED STATES PATENT OFFICE.

LOUIS T. SICKA, OF DENVER, COLORADO.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 672,083, dated April 16, 1901.

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To all whom it may concern:

Be it known that I, LOUIS T. SICKA, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Rock-Drills; and I do hereby 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.

My invention relates to rock-drills; and its object is to produce a device of this class which shall be simple in construction, economical in cost, and reliable and efficient in use; and to these ends the invention consists in the construction hereinafter described and claimed, the features of which will be understood by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of my drill. Fig. 2 is a section on the line 2 2 of Fig. 1, and Fig. 3 is a detail view of the clevis-block and clevis.

Referring to Fig. 1, the numeral 1 designates a suitable casing, generally cylindrical in cross-section, which is adapted to be adjustably mounted in a supporting-frame by means of an adjusting-screw of ordinary form engaging the nut 1^F, preferably formed integrally with the casing 1, near one end thereof. Journaled in bearings 1^B 1^C at opposite sides of the casing is a crank-shaft 2, provided with a preferably integral crank-pin 2^A, revolving in an enlarged chamber 3^A at the end of the casing. A cross-head 5, fitted to slide in guideways 1^A formed on the inside of the casing-walls, is cut away along portions of its periphery to provide air-passages between itself and the casing in order to avoid air-cushioning. The cross-head 5 is provided with lugs 5^A, between which is a link pivoted by a bolt 4. The opposite end of this link is hung to the crank-pin 2^A, so that a rotation of the crank-shaft 2 will produce a reciprocation of the cross-head in the guides.

A bow-spring 6, bent into the form of a U and provided with hook ends 6^A 6^B, is secured in a concave seat in the cross-head 5 by means of a bolt 9 and beveled washer 8. The hook ends 6^A and 6^B engage the rounded ends 10^A of the clevises 10, which are provided with perforated inner ends 10^B, by which they are

secured by means of pins 12 to blocks 11, said pins being held in place by cotters 12^A. The blocks 11, which are held together by the pins 12, form a collar which surrounds the reduced neck 13^B of the plunger-rod 13. This plunger-rod 13 is mounted for reciprocating movement in bearings 1^B and 1^C, formed interiorly to the casing 1, and bearing 1^D, formed by the reduced end of the casing. To the outer end of the rod 13 is secured a chuck of any preferred form to receive the drill-bit 14. In order to provide the necessary rotation of the drill in operating, ratchet mechanisms 15 and 16, of any well-known form, are mounted on the plunger-rod between bearings 1^B and 1^C and serve to rotate the plunger-rod and bit as the latter devices are reciprocated.

The operation of the device is as follows: Rotary motion being imparted to the crank-shaft 2 by any suitable means, the crank-pin 2^A imparts a reciprocation to the cross-head 5 through the connecting-link 3. The spring 6, which is rigidly connected to the cross-head 5, participates in this reciprocation, with the result that the plunger-rod is reciprocated, through the intermediacy of the pivoted clevises 10 and the swivel-block 11, with a gradually-accelerated movement, terminating in a sharp quick blow at the end of the stroke.

In the ordinary operation of the drill the spring reciprocates the rod with a practically positive motion, yielding only slightly to the impulse of the crank and the ordinary constructions of the work. In case, however, the drill gets stuck in the hole or any excessive or unusual obstructions are encountered, the ends of this spring yield laterally of the line of motion of the rod and allow the cross-head to move independently of the rod and bit without injuring or straining the mechanism.

Although I have herein shown and described only a U-shaped spring, I do not desire to be limited to this particular form, as evidently two springs might be fixed to the cross-head at one end and have the clevises connected to their opposite free ends, and I intend my claims to cover any kind of a spring connection between the rod and head which will yield laterally of the path of reciprocation of the rod.

Having thus described my invention, what I claim is—

In a rock-drill, the combination of an inclosing case, a shaft journaled in one end thereof, a cross-head mounted to slide in said case, and connected by a link to a crank on the shaft, a U-shaped spring secured to the cross-head and extending lengthwise within the case, a plunger-rod mounted to slide within the case lengthwise of and with its ends between the arms of the spring, a swiveled collar encircling the neck of the rod so as to

permit it to rotate, and a pivoted link connection between the collar and the free end of the spring-arms.

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

LOUIS T. SICKA.

Witnesses:

JOHN McDONOUGH,
ARTHUR J. CLARK.